Asset management in the utilities industry.
Executive summary

Energy and utility companies depend on critical assets to drive their business. While executives view themselves as running a seamless enterprise, in reality what they often have is a collection of strategic assets, each with its own silo of IT systems.

Energy and utility companies have been challenged repeatedly by waves of change brought on by deregulation, globalization, restructuring and, most recently, new environmental policies. Utility industry CEOs must optimize shareholder value while at the same time meeting stringent safety and regulatory requirements and fulfilling customer demand for high reliability in an increasingly competitive market. This challenge has put business operations at center stage.

To achieve higher corporate performance—whether measured in terms of shareholder value, revenue growth, profitability or customer satisfaction, companies are adopting more sophisticated asset management approaches that make it possible to manage diverse and often widely dispersed assets with a single, more easily scaled and deployed system. They are recognizing that maximizing the value of asset investment is a responsibility that reaches from the mechanic in the plant or the inspector on the transmission line all the way to the executive suite, where enterprise-wide asset management strategies are taking hold. Executives across the globe are finding new roles and responsibilities emerging for various parts of the energy value chain.
How are executives in this industry thinking about their future? How are they dealing with questions such as these?

- Is there a single system that could manage assets anywhere in the world?
- How can executives optimize the performance of thousands of different assets for the benefit of the organization as a whole?
- What new scrutiny will energy and utility companies face from investors, employees, analysts, customers and regulators?
- How can utilities deal with an aging infrastructure and workforce?
- How can they bring standardization and best practices to diverse operations and new acquisitions?
- How can they be better prepared for whatever comes next?

This paper reviews the trends and issues facing the utilities industry. It also discusses why and how asset and service management offers solutions for addressing these and other critical issues across the energy value chain.

Figure 1: Energy value chain

Asset and service management can help maximize assets across the energy value chain.
Asset and service management is an approach that enables companies to maximize the performance of critical capital assets that have a direct and significant impact on achieving corporate objectives. It is a comprehensive approach that includes all types of assets and addresses how they are purchased, maintained and optimized throughout their useful life. Asset and service management is an enterprise-wide approach that gives corporate executives, for the first time, the ability to view and manage assets for the benefit of the corporation as a whole.

The role of IT

The quest to improve shareholder value in investor-owned utilities and customer satisfaction in municipal utilities has led many CIOs to reach the same conclusion—that nearly all efforts to reduce costs, improve business processes and improve overall return on assets (ROA), both physical and human, depend on information technology.

Today, key business drivers include regulatory compliance, operational efficiency, aging assets and an aging workforce. Increased regulatory compliance is the result of cyber security, physical security and reliability concerns affecting grid integrity, emissions, safety and, in some jurisdictions, new governance and accounting requirements.

Aging assets and aging workforces are also linked to technology as aging infrastructure is replaced with more technically sophisticated equipment, all capable of remote sensing and some able to self-diagnosis. In an effort to reduce costs, utilities need to capture the processes that long-time employees have in their heads and add these processes to business process automation tools.
Utility executives are depending on technology-based business process management (BPM) to allow process improvement to support reduced staffing levels without affecting worker safety, system reliability or customer satisfaction. These standardized and enforced processes result in common work practices throughout the organization, regardless of region or business unit. The use of BPM in conjunction with system consolidation yields an integrated set of applications that can be deployed in a rational way to improve work processes, meet regulatory requirements and reduce total cost of ownership.

BPM is an approach that offers organizations a profound opportunity to positively change their business operations. Business processes driving work and asset management activities can be the source of competitive advantage, through risk management, revenue generation and customer satisfaction.

System consolidation
The notion of system consolidation involves more than simply combining applications. System consolidation is driven by an underlying need for utilities to become agile enough to support transparency across lines of business (LOBs), with near real-time visibility on the one hand and the ability to satisfy regulators and customers on the other. To do this, utilities have an imperative to enforce a modern enterprise architecture that supports service-oriented architecture (SOA) and BPM. System consolidation allows utilities to create a framework that can support three key areas:

- Optimization of both human and physical assets.
- Standardization of processes, data and accountability.
- Flexibility to change and adapt to what's next.
Using one system for all work and asset management can help deliver three operational benefits: more productive workers, more reliable assets and technology cost savings. One large Midwest utility adopting the system consolidation approach was able to standardize six core applications: work and asset management, financials, document management, geographic information systems (GIS), scheduling and mobile workforce management. The asset management system alone was able to consolidate more than 60 legacy applications. In addition to obvious cost savings, consolidated asset management systems are better able to address operational risk management, worker health and safety, and regulatory compliance efforts (both operational and financial), helping to make utilities more competitive. Now the same information is available throughout the organization, the system provides information faster, and processes modeled after best practices help give the organization visibility and capability to more efficiently manage all phases of the business.

System consolidation also facilitates the elimination of rogue applications. These are niche applications that appear throughout an organization—such as on an engineer’s desktop in spreadsheets or in a stand-alone database. Many of these applications perform critical roles in monitoring and documenting regulatory compliance efforts yet are unlikely to pass muster at any Sarbanes-Oxley review. Typically, these applications are built to fill a functionality gap in existing legacy systems. Using an asset management system with a standards-based platform allows utilities to roll these applications directly into their standard supported work and asset management system.
Today, using new standards-based technologies like SOA, utilities can work to eliminate the counter-productive mix of disparate commercial and “home-grown” systems. Automated processes are delivered as Web services, allowing asset and service management to be included in the enterprise application portfolio, joining the ranks of HR, finance and similar applications. Consolidating systems offers major opportunities for gains in productivity and elimination of cost from the IT budget, and it can help improve an organization’s agility. It helps eliminate the historical drift toward stovepipe or niche systems by providing appropriate systems for critical roles and stakeholders within the organization.

**Convergence of information technology (IT) and operational technology (OT)**

Three key issues are driving the trend toward convergence of information technology (IT) and operational technology (OT) – the systems, equipment and other assets from which utilities deliver service. The first relates to corporate governance, where corporate-wide standards and policies are forcing operational units to rethink their use of “siloed” technologies. Second, the boundaries between IT and operational assets are blurring. Finally, utilities are realizing that the only way to deal with their aging assets, workforce and systems is to increase their investment in advanced information and engineering technologies. Utilities need to understand the increased interdependency of assets – the way individual assets affect service to the business – and the requirement to provide visibility in order to properly address questions relating to risk management and compliance efforts. IT service management plays an important role in meeting the needs of this convergence trend.
Trends and business drivers

Focus on operational excellence

Among utility and energy companies, operational excellence means getting more from the assets that serve their customers. Many companies believe that systems offering flexibility, scalability and open integration standards will improve overall productivity.

As utilities refocus on the fundamentals, many are increasing their investment in work management systems. The scope of work management projects is growing to include supply chain management, condition-based maintenance, equipment reliability, advanced planning and scheduling for spare parts, automated workforce scheduling/optimization, and mobile computing. All help to drive operational efficiency and raise the ROA.

Best practices are being introduced and becoming integral to more efficient work management in a number of ways. Best practices build integrity-based checks and balances into the system. Standardizing processes throughout the enterprise can help improve asset performance and enhance worker productivity and safety. Some best practices are quite simple but can have powerful results, as these examples show.

• “Do the Right Work” involves periodically reviewing and adjusting preventive maintenance (PM) and repair activities. With a workforce of 500, saving just four hours a week can equate to US$6 million over the course of a year.
• A large Southern energy company was able to eliminate expensive testing, determine when the cost to repair would exceed the cost to replace, and identify potential moisture problems on expensive auto-transformers earlier all by implementing a basic failure-code reporting process on its transmission and distribution substation assets.
• Focusing on operational excellence enabled a nuclear plant to improve its capacity factor and post its shortest refueling outage ever. Encompassing the core values of professionalism, quality, safety and excellence in all operations, the program is called “Values For Excellence” and includes an initiative to automate and thereby improve the maintenance elements of the plant’s work control.
Highlight

Utilities are recognizing life-cycle asset management as an important source of cost savings, regulatory compliance, availability enhancements and competitive advantage.

**Structural unbundling**

Asset accountability is evident in the new asset management model being implemented by many transmission companies. These utilities are realizing that profitability, stability and performance are closely related to how mission-critical assets are purchased, maintained and optimized throughout their entire life cycle; they are recognizing life-cycle asset management as an important source of cost savings, regulatory compliance, availability enhancements and competitive advantage.

This focus has consequently resulted in major developments and changes in business and operating models, with the trend being to unbundle the operations into three distinct units.

- The asset owner sets the overall business goals and parameters for risk, cost and performance, and is responsible for implementing the steps required to meet any regulations or legislation. The asset owner provides the operating guidelines for the asset manager and ensures that an active service level agreement is available and tracked with the asset manager.
- The asset manager focuses on asset strategy and policy definition, risk management, investment and maintenance planning (not scheduling) and contract management. This approach promotes decision making that is driven strictly by the needs of the asset. The asset manager decides how and where money is spent and sets policies and procedures for service providers.
- The asset maintainer focuses on providing the actual maintenance services. This includes scheduling manpower and obtaining parts to deliver programs more efficiently and effectively against defined service levels. The asset maintainer does not decide where or how to invest budgets.

By focusing on core competencies, transmission and distribution managers are realizing that the long-term viability of their company hinges on how to create further value from its complex and distributed asset base. That is why they are introducing best practice asset management principles, linking strategy and values to key processes across the asset life cycle, and balancing the trade-off between cost, performance and risk. Survivors in open markets will be those organizations that can manage this balance—and demonstrate it through greater financial performance.
Asset management in the utilities industry.

**Asset portfolio management: In generation**

Success in today’s power generation business requires plant managers to monitor both tactical and strategic or operational constraints as well as manage their strategic objectives as conditions change.

Portfolio management is no small feat, given that power plants have been changing owners at a rate previously unimaginable. New owners must move quickly to put their own processes, best practices and systems in place in order to best ensure that the new addition operates in the top quartile. Similarly, new systems must be implemented quickly and linked to other plants and systems in order to ensure the plant is operated safely and efficiently in accordance with applicable regulations. This is true for all plant types, big or small, fossil, hydro or nuclear.

Quickly integrating new acquisitions—or standardizing across existing plants—can also open the door to significant savings. One large merchant generator has a fleet of nearly 100 power generating facilities and has achieved significant savings through inventory reduction and sharing.

Asset management often adds value even if a plant is sold, for a well-documented and positive asset history can enhance the value of the plant.

**Asset portfolio management: In water and wastewater**

There is a parallel trend in the water industry fueled by consolidation and privatization. Rapidly aging infrastructure and increasing government regulation of drinking water and wastewater are both issues that the industry is facing. The American Society of Civil Engineers (ASCE) predicts that the U.S. will see an $11 billion annual shortfall for replacing aging facilities and complying with safe drinking water regulations. Federal funding for drinking water infrastructure remains at US$850 million, which is less than 10 percent of the total requirement.¹ On a global basis, the World Bank has become an important investor in rural and small town water supply and sanitation, currently funding 21 stand-alone projects with loan amounts totaling $807 million.²
Through consolidation, water utilities can often manage engineering expertise, centralize billing and customer care, and operate more efficiently. Water companies can be quite large; one company alone provides water and wastewater treatment services to 200 million residential customers and 500,000 industrial customers, and has 3,000 municipal operations in more than 130 countries.

*Increase in regulatory and environmental pressure*

Every segment of the utilities sector is facing increased regulatory and environmental protection requirements.

- Regulatory agencies in the gas pipeline business include DOT Pipeline Safety, OSHA, the EPA and state environmental agencies. Typical regulations require relief valve inspections, fire extinguisher and eye wash station inspections and exhaust emissions testing. In addition, utilities now face new guidelines from the U.S. Department of Homeland Security, particularly in the area of pipeline integrity.
- Generation answers to many of the same regulatory agencies but must also meet EPA mandated emissions limits, Federal Energy Regulatory Commission (FERC) requirements, and local air quality standards.
- Nuclear power is overseen by the U.S. Nuclear Regulatory Commission (NRC) as well as related oversight groups such as the Institute of Nuclear Power Operation (INPO), the World Association of Nuclear Operators (WANO), and the Nuclear Energy Institute (NEI).
- The water/wastewater industry in particular is undergoing change on a number of fronts brought on by health-related quality issues, public perception of drinking water quality and the business trend of privatization and consolidation of water utilities. Increasing regulation at every level is being directed at drinking water, storm runoff and wastewater. Municipal utilities also face the challenges of reduced budgets, an aging workforce and a vocal populace.

Regulation serves many purposes; in fact, many credit the improved operating capacity of nuclear plants to INPO and WANO, both of which have worked with plant operators to share best practices.
State and local governments who operate utilities are also subject to General Accounting Standards Board (GASB) Statements 34 and 35, which further identify the use of asset management solutions to maintain assets and include guidelines for depreciation based on the physical condition of the asset. Such full accrual accounting allows governments to identify exactly where taxpayers’ money is being spent—specifically, whether current-year citizens’ funds are being spent on current-year costs or whether that money was shifted to cover costs of services for future-year citizens. It is generally agreed that there is a relationship between the EPA’s Capacity, Management, Operation and Maintenance (CMOM) regulations and GASB 34, as municipal utilities must determine how to report the cost of deferred maintenance.

**CMOM: Regulation in the water industry**

The intent of CMOM for Municipal Sanitary Sewer Systems is to reduce sanitary sewer overflows (SSOs). Introduced as part of the SSO rule to the National Pollution Discharge Elimination System (NPDES), the CMOM rule requires collection system owners to develop programs to address the problems leading to SSOs. The resulting programs require ongoing planning, continual review and analysis as well as preventive maintenance to mitigate the causes of SSOs.

The proposed rule promises important benefits, including:

- Reducing health/environmental risks.
- Improving the performance of treatment facilities.
- Protecting the nation’s collection systems.
- Reducing equipment and operational failures.
- Extending the life of the treatment equipment.
Although the EPA began policy development in 1994, it was not published in the Federal Register until January 2001. It was withdrawn just as a new administration was taking office and is still being deliberated within the EPA with no clear date for resubmission. CMOM is now part of the EPA's and various states' permitting strategy to manage SSOs, and it is affecting every collection system in the U.S. regardless of size, through administrative orders, consent decrees and fines (both civil and criminal).

Utilities still need to prepare for CMOM. This series of nearly 100 operational, reporting and administrative programs will require water utilities to convey information on base and peak flow, proper management, operation and maintenance, at all times, on all parts of both owned and operated collection systems.

**Performance-based regulation**

Performance-based regulation (PBR) clearly puts the focus on the asset instead of financial cost accounting. It has become an important trend in transmission and distribution and may show up in other sectors in the future.

PBR seeks to provide a substitution for competition in a regulated environment through rules and financial incentives that encourage a regulated firm to achieve certain performance goals, while allowing the company significant discretion in determining how to achieve the goals. If a utility has superior processes and systems with which to address these goals, they will benefit financially. Typically, PBR focuses on service interruption metrics such as SAIDI, SAIFI, CAIDI, and MAIFI; customer responsiveness; and billing issue resolution.

PBR is a new area for regulators, who must fine-tune the “reward and penalty” framework to ensure adequate investment in the assets, human capital and technology required for robust transmission and distribution networks.
Aging assets and aging workforce: Liabilities for the industry

Many utility industry workers “grew up” in the industry, and it was a stable place to be. Few people left, and not many new employees came in. As a result, the median age of workers in the utility industry is second only to work in oil and gas, as shown in Figure 2. As this workforce ages, it raises several issues for utilities. First, having spent 30 years in their companies, workers have a great deal of information about the company’s assets in their heads. It is vital to transfer this information into repeatable processes and procedures to allow new employees to operate assets effectively.

Figure 2: Labor Statistics, 2006

The median age of workers in the utility industry is higher than the national average.
Source: Energy Insights, June 2007
Second, as companies try to “do more with less,” they are turning to technology-based equipment and systems that require different skill sets from those that older workers possess. Many companies are installing digital control systems to operate the assets, take readings and record condition monitoring data. In the field, workers are using global positioning systems (GPS), GIS, and tablet-based computer-aided design (CAD) systems.

The workforce that “grew up” in the utility industry is rapidly reaching retirement age. By 2010 approximately 50 percent of utility workers are expected to retire. To further compound the problem, a number of utilities have instituted programs to reduce staff, including early retirement incentives or layoffs.

Another study has shown there is an exodus of professional staff that is not expected to be filled in key areas: gas utility employment is projected to fall 6.2 percent by 2010, and electric utility employment is projected to fall 9.2 percent, coupled with a downward trend of about 10 percent for electric and nuclear engineers. The utility industry is especially sensitive to engineering and technical positions, as well as operations and maintenance personnel (who comprise more than 50 percent of the utility workforce), since the use of less skilled workers will directly impact key performance indicators, especially for safety and reliability. This issue has created the need to move business processes that are in the heads of workers into systems so the knowledge will be captured.

Research has shown that the best way to get the knowledge in a worker’s head into some type of system or application is to transfer the knowledge to systems they already use. Work and asset management systems hold job plans, operational steps, procedures, images, drawings and other documents. It is also the best place to put information required to perform a task an experienced worker “just knows” how to do. With workflow and BPM, workers can be guided through a debrief stage, where they can review existing job plans and procedures, and look for tasks that are not defined sufficiently. The procedure can then be flagged for additional input by a knowledgeable employee. The same is true for the application itself, since the BPM tools will allow guidance to be built in with online help, or additional text to explain the next step.
Along with an aging workforce the industry has aging infrastructures and assets.

- Water companies have pipes in the ground that have been there since Teddy Roosevelt was president.
- Nuclear plants are reaching the end of their initial 40-year operating licenses. In the U.S., 39 plants are currently seeking 60-year operating licenses.
- According to the Energy Information Administration, 49.7 percent of the nation’s electricity is generated in corrosive, coal-fired plants.\(^5\)
- Transmission systems have been victims of hurricanes and ice storms.

These assets need maintenance, repair or replacement more than ever. Energy and utility companies are depending on technology systems to be sure they are doing the right work on these assets to improve performance, prolong asset life and control costs. Many variations of reliability-centered maintenance (RCM), total productive maintenance (TPM), predictive maintenance (PdM), and plant maintenance optimization (PMO) are being employed primarily to ensure the right work is done, by the right people and at the right time.

According to the Electric Power Research Institute, the industry needs to invest US$180 billion over the next 20 years on load growth, upgrading transmission lines and building the “system of the future” using new technologies to greatly improve grid reliability and provide a stable electric supply for future economic growth. In addition, another US$123 billion is needed to build out the distribution system.\(^6\)

According to the ASCE, the U.S. power transmission system is in urgent need of modernization. Despite increased demand, transmission capacity has decreased. In addition, maintenance expenditures have decreased one percent annually since 1992.\(^1\) In 2002, the Department of Energy warned that the existing transmission system was not designed to meet demand.\(^1\) The blackouts that followed in August 2003 cost billions of dollars in lost productivity and revenues.

Aging workforce and aging assets are real problems, and many utilities are counting on new information technology deployments to make workers more efficient and productive and make assets more reliable, safe and affordable.
Looking ahead

It may help to understand the direction in which we are headed by looking at where we have been. The early days of asset management were centered on preventive maintenance of equipment. Typically, PMs were based on the equipment manufacturer’s instructions and recorded manually on a card in the supervisor’s office. Computerized maintenance management systems (CMMS) focused on the maintenance department and on maintenance management of specific equipment. Stand-alone departmental CMMS solutions met the basic needs of the maintenance staff who were concerned about tactical issues, such as when the lube oil was last changed on a critical feed pump.

The CMMS market evolved into enterprise asset management (EAM). Most companies, as well as the software vendors with products in this space, are focused here today. EAM solutions extend beyond the needs of one department and separate pieces of equipment; they are integrated to some degree with financial, enterprise resource planning (ERP) and other key systems. But EAM solutions themselves do not embrace the full breadth of asset types on which a company depends, nor do they provide senior management with the tools they need to take an active and strategic role in managing asset performance. Asset and service management does.

Optimization across the enterprise

So why is asset and service management an unfamiliar concept? The management of assets from an enterprise perspective has been impossible in the past because there was no single asset management application that could span their requirements. The distinct management needs of different assets resulted in a fragmented patchwork of unrelated systems that made a corporation’s assets invisible in any meaningful way at the executive level. A single work and asset management solution is now available. Utility companies can begin to replace many of their siloed applications with one asset management system that supports the needs of different lines of business and different assets.
Driving corporate performance
At the executive officer level, the CFO in particular needs to understand the role of asset management in driving financial performance, including revenue generation, cost structure and ROA. This person must make educated allocation decisions among multiple asset investment options. Only with information that includes historical maintenance expenses, projected costs, current asset values and replacement costs can the CFO make knowledgeable investment choices that will optimize performance of the enterprise as a whole, not just individual LOBs.

The CFO is also concerned with ROA as a key financial metric; improving this financial ratio can correlate closely with greater shareholder value and higher stock price. Armed with measurement metrics and key performance indicators such as actual vs. budget maintenance costs, lost-time incident rates and software license utilization rates, the CFO can identify areas for greater scrutiny and delve into underlying drivers in pursuing continuous improvement. Asset and service management offers senior executives, including the CFO, information they need for informed decision making and effective corporate governance.

Asset and service management
Asset and service management maximizes the performance of fixed, physical or capital assets that have a direct and significant impact on achieving corporate objectives. This is of tremendous importance for energy and utility companies that are both asset intensive and highly dependent on those assets to deliver service to their customers and profits to the bottom line.

The challenges of the past decade—deregulation, globalization and restructuring—have meant that energy companies and utility CEOs have been asked to increase shareholder value and, simultaneously, comply with a host of stringent safety and regulatory requirements and fulfill customer demand for high reliability in an increasingly competitive market. Upheaval has put the entire industry on a new course in many ways, and brought new approaches, attitudes and understanding.
Asset management in the utilities industry.

For example, there is the growing sophistication and recognition in the industry that asset management can have a significant impact on corporate performance. As executives have recognized that their “seamless enterprise” is actually a collection of strategic assets each with its own silo of IT systems, they are changing and broadening their approach to asset management. Instead of a narrow focus on maintaining isolated assets, they are looking at multiple ways to manage assets for improved performance, including:

- Managing the interrelationship between all of the similar types of assets that drive a single LOB’s operations—assets that have previously been viewed as functioning separately from one another.
- Seeing value in managing assets from a strategic perspective across multiple LOBs.
- Recognizing that using common solutions and practices across different asset types can further improve operational excellence.

**What are the strategic assets of a utility company?**

Exactly which assets are considered strategic—essential to corporate success—differs by company and within that, by lines of business; however, managing critical assets to optimize their value is universally important. Better integrating and synchronizing management practices, both at a strategic and tactical level, across multiple types of assets and across the entire enterprise, is the essence of asset and service management.

For power generation plants, equipment uptime is critical to meet power production and capacity factor goals; for them, specific plant equipment is clearly strategic. In a water company, the treatment plant equipment is strategic; on a gas transmission pipeline, it’s the compressor at a pumping station, while distribution companies are focused on service level agreements in an effort to meet regulatory requirements and maintain positive customer relationships.

Today, utilities have plant assets located around the corner, across the country and on other continents. Transmission and distribution assets are equally far flung. Responsibility for asset investment reaches from the mechanic in the plant or inspector on the transmission line all the way to the executive suite.
Asset and service management requires the attention of the entire enterprise. All utilities, regardless of their nature, have a variety of assets in addition to generation or treatment plants and transmission and distribution equipment. They have repair trucks, vehicles and other portable assets that must be inspected, maintained and repaired. They have an IT infrastructure that supports their vital assets, and they have facilities that house both capital and human assets. At the same time, companies must be able to manage them all from the “corner office” with an integrated, enterprise-wide view of asset performance and the tools to drive maximum ROA.

When we consider asset and service management, we refer to assets that either directly generate revenue or are closely associated with revenue creation. This includes fixed, physical and capital assets rather than financial assets or intangible assets such as knowledge capital. In the utility industry we distinguish four broad categories: generation and delivery assets (production), buildings (facilities), utility vehicles and portable equipment (fleet), and IT hardware and software (IT assets).

**Figure 3: Asset and service management**

<table>
<thead>
<tr>
<th>Production &amp; Delivery</th>
<th>Power Plant Equipment</th>
<th>Turbines</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Transmission Pipes/Wires</td>
<td>Substations</td>
</tr>
<tr>
<td>Facilities</td>
<td>Office Buildings</td>
<td>Maintenance Sheds</td>
</tr>
<tr>
<td></td>
<td>Grounds</td>
<td></td>
</tr>
<tr>
<td>Fleet</td>
<td>Utility Vehicles</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Portable Equipment</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Medium Duty Trucks</td>
<td></td>
</tr>
<tr>
<td>Information Technology</td>
<td>Desktops/Servers</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Microwave Tower</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mobile Data Terminals</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Customer Communications</td>
<td></td>
</tr>
</tbody>
</table>

Asset and service management allows organizations to better manage and optimize performance of all assets that have a direct and significant impact on company operations and performance.
Asset management in the utilities industry.

Generation and delivery assets: In the utility industry, production assets are turbines and compressors used for power generation; they also include the transmission and distribution assets that deliver output to customers. For many utilities there is a strong value proposition in being able to use a single asset management solution for fossil, hydro and nuclear generation as well as for transmission and distribution. Some merchant generating companies have amassed a large number of plants—nearly 100 units in several cases. Some investor-owned utilities have a similar number of plants, plus the related transmission and distribution assets, which can include as many as 12,000 miles of transmission, 2,000 substations and 200,000 distribution transformers. The ability to manage all of them with a single system is understandably attractive.

Utility vehicles and portable equipment: Fleet assets are often over-the-road vehicles such as medium-duty trucks, utility vehicles, backhoes and large boom trucks. These can include motor pools of shared vehicles for engineers and corporate staff as well as specialized wheeled equipment like air compressors for field crews. Utility fleets of either vehicles or specialty equipment can also be surprisingly large, ranging from 200 to 10,000 units.

IT assets: The operations of most companies today are critically dependent on the organization’s IT infrastructure. On the hardware side, this includes servers, desktops, laptops, mobile phones, PDAs, hubs/routers, printers, microwave towers, mobile data terminals and call center telecom equipment. How critical are IT assets to an organization? One typical utility reported the following assets: 10,000 desktops, 200 LANs, 1,000 servers, 1,500 mobile data terminals, 2,000 printers, 450 microwave towers, 6,500 pagers and 4,500 cell phones. Software is equally important to day-to-day operations, and helping to monitor, manage and enforce software license compliance is an important part of IT asset management.

What is an IT asset? The answer to this question has become more complex with the growth of the intelligent utility network populated with smart meters at residences and substation automation in the distribution system. These devices will be connected by wires or wirelessly, have an IP address, and contain firmware that needs to be inventoried, calibrated and kept in compliance. Now it becomes more important to have an asset management system that is better able to address the devices found on an intelligent grid.
Building assets include many types of buildings, from corporate headquarters and regional offices to engineering labs and a whole host of specialized facilities. Maintaining all of these facilities can involve mechanical, HVAC and electrical systems as well as landscaping and parking lots. To give this some perspective, one utility in the Southwest has more than 72 buildings and manages 1.5 million square feet of owned and leased space.

Leveraging the benefits of integrated asset and service management

Using an integrated asset and service management approach makes particular sense in light of many current industry issues. The right solution can provide the answer to two overriding asset issues facing utilities and energy companies: finding a single system for managing similar assets regardless of their location, and finding a single system that can manage different types of assets.

With this approach, utilities can:

- Implement and monitor best practices and other programs to help increase efficiency and attain operational excellence.
- Consolidate acquired operations more easily.
- Help reduce IT integration and deployment issues, both within the enterprise and with supply chain partners.
- Work to compensate for an aging workforce, and help capture the vital knowledge of these workers.
- Better manage and maintain an aging infrastructure.
- Help improve equipment (and thus service) reliability.
- Follow the trend of IT and OT convergence.

All of these benefits can add up to improved corporate performance and competitive opportunity.

Conclusions and recommendations

Integrated asset and service management offers a municipal or multi-utility the capabilities to better manage electric, gas, water and wastewater, including generation, transmission, substations, raw water treatment, wastewater collection, and distribution construction and maintenance. While there is value for some energy and utility companies to have a single asset management solution across even one sector, there can be even greater value in having a single asset management solution addressing the needs of generation, transmission, distribution, facilities, fleet and information technology.
Asset and service management as a mission-critical application

Utility companies run the core of their business on just a small set of mission-critical software applications. This set of applications may include financial software, customer management software, supplier and supply chain management software, and human capital management applications. As utility companies recognize the value and critical contribution that asset and service management can make to achieving corporate objectives, CIOs, CFOs and CEOs are including asset and service management solutions among the inner circle of applications on which they depend to drive the company.

With benefits that range from easier and better monitoring and management of compliance efforts and enforcement, to overall operational efficiency and higher ROA, executives in the utility industry are urged to evaluate how asset and service management can help them drive corporate performance.

Asset management has evolved significantly over time as utility companies have sought new avenues to achieve their business objectives more profitably. Asset and service management represents a major leap forward in this evolution because, for the first time, companies can use a single asset management system to help manage all of the critical assets in the enterprise.

For more information

To learn more about asset and service management solutions from IBM, please contact your IBM representative or IBM Business Partner, or visit ibm.com/tivoli

About Tivoli software from IBM

Tivoli software provides a 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. Helping meet 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 business 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
© Copyright IBM Corporation 2007
IBM Corporation Software Group
Route 100
Somers, NY 10589
U.S.A.
Produced in the United States of America
6-07
All Rights Reserved
IBM, the IBM logo, Maximo and Tivoli are trademarks of International Business Machines Corporation in the United States, other countries or both.
Other company, product and service names may be trademarks or service marks of others.
References in this publication to IBM products and services do not imply that IBM intends to make them available in all countries in which IBM operates.
No part of this document may be reproduced or transmitted in any form without written permission from IBM Corporation.
Product data has been reviewed for accuracy as of the date of initial publication. Product data is subject to change without notice. Any statements regarding IBM’s future direction and intent are subject to change or withdrawal without notice, and represent goals and objectives only.
THE INFORMATION PROVIDED IN THIS DOCUMENT IS DISTRIBUTED “AS IS” WITHOUT ANY WARRANTY, EITHER EXPRESS OR IMPLIED. IBM EXPRESSLY DISCLAIMS ANY WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR NON-INFRINGEMENT. IBM products are warranted according to the terms and conditions of the agreements (e.g. IBM Customer Agreement, Statement of Limited Warranty, International Program License Agreement, etc.) under which they are provided.
The customer is responsible for ensuring compliance with legal requirements. It is the customer’s sole responsibility to obtain advice of competent legal counsel as to the identification and interpretation of any relevant laws and regulatory requirements that may affect the customer’s business and any actions the customer may need to take to comply with such laws. IBM does not provide legal advice or represent or warrant that its services or products will ensure that the customer is in compliance with any law or regulation.

6 “America’s Distribution and Transmission Infrastructure: Industry Issues & Opportunities.” Electric Power Research Institute. Mark Ostendorp, PhD.