

BIOGRAPHICAL INFORMATION

Brian A. Martin
Associate Partner
Accenture - Utilities

Specific Responsibilities

Mr. Martin is an Associate Partner in Accenture's Utilities segment, responsible for delivering Energy Delivery consulting and systems integration projects, as well as, leading the Work Management and Design Practice within Accenture's T&D Practice.

Past Experience

Mr. Martin has over 21 years of Utility T&D experience focused on delivering business transformation and value by integrating business strategy, technology solutions and business integration to enable a high performance Utility. Mr. Martin focuses on T&D Operational systems with a focus on Work and Asset Management technologies and processes. Mr. Martin has worked with over 40 North American electric and gas utilities in his career, focusing on process optimization consulting, business and technology architectures and developing transformational benchmarks, metrics and roadmaps for his clients.

Educational Information

B.S. - Electrical Engineering, Clemson University

BIOGRAPHICAL INFORMATION

Paul Yarka
Associate Partner
Accenture – Utilities Practice

Specific Responsibilities

Joined Accenture in 2004. Responsible for leading the utilities asset management practice. Serve as lead asset management-focused consultant to energy and water/wastewater utilities in North America.

Past Experience

Paul has worked with more than 40 utilities providing a variety of asset management-focused, business and solution consulting services including end-to-end asset management strategy, planning, investment management, technical management, and information management. During his career, Paul has served his employers including the Convergent Group, SchlumbergerSema, UGC Consulting, TAG The | Asset | Group, Royal Dutch Shell, and Marathon Oil, and his global utility clients filling roles ranging from principal consultant, global consulting and IT services executive, executive technology officer, chief strategy officer, to enterprise architect, solution architect, business architect, and project / program manager.

Educational Information

B.S. – Geomathematics, Syracuse University

M.S. – Geomathematics, Syracuse University

Professional Memberships

GITA

AMQ International

Leveraging Work and Asset Management Systems as an Integral Component of Your Asset Management Strategy

Brian Martin
Accenture – Utilities Practice
100 William St
Wellesley, MA 02481
617-454-4362
E-mail: brian.a.martin@accenture.com

Paul Yarka
Accenture – Utilities Practice
1400 16th Street, Suite 500
Denver, CO 80202
720-359-6500
E-mail: paul.j.yarka@accenture.com

Learning Objectives:

- 1.) Develop an understanding of work management and asset management 'business capabilities' including: strategy, process, human performance, and enabling technologies
- 2.) Learn the strengths and weaknesses of today's work management and asset management systems
- 3.) Understand critical success factors for achieving strategic asset management business discipline

Abstract

Work management systems, asset management systems, GIS, and enterprise integration frameworks are critical to the success of your asset management program. With widely varying work management and asset management concepts and technologies being introduced to the utility marketplace, utility business and IT leaders continue to seek the 'silver bullet.' Their goals are to address the challenges of designing and implementing enhanced investment strategy, technical policy, regulatory approach, process improvement, business applications, and enabling systems integration.

Sorting through available work management and asset management capabilities and technologies in the marketplace today is challenging. How you can leverage associated concepts and technologies to meet your customer, capital investment, operations and maintenance, and operational asset management goals are very hot topics amongst transmission and distribution utilities. Industry concepts in work management process optimization, integrated asset management strategy,

and business process management-driven systems integration are proving to be fundamental in achieving sustainable investment management, technical management, and operational excellence.

Introduction

Many energy and water/wastewater utilities are pursuing advanced asset optimization strategies and techniques to address their aging infrastructure, while facing significant capital and operations and maintenance (O&M) budget shortfalls. In addition, utilities are currently emphasizing work process and resource optimization. One objective of the work process and resource optimization trend is to reduce overall workforce labor and material costs, thereby reducing O&M expenditure. Utilities are targeting cost savings from work process and resource optimization that can be subsequently applied to infrastructure refurbishment, renewal, and replacement investments.

Successful development and implementation of an asset optimization strategy typically requires the enhancement of current utility investment management strategies and capabilities, as well as improved technical management and regulatory management strategies and capabilities that address network planning, design, construction, maintenance, and operations. In addition, asset information management capabilities that deliver timely, appropriate, and accurate recent and historical asset performance information are required to facilitate technical management and investment management capabilities. Work management process optimization targets reducing labor, material, vehicle, and equipment costs, allowing utilities to do more of the right work the right way, with reduced O&M investment. An integrated suite including a work management system, an asset management system, and a GIS, along with business process management-driven systems integration to back-office systems is becoming essential to achieving and institutionalizing work management and asset management business capabilities.

Today's Required Work and Asset Management Business Capabilities

Work and asset management systems enable critical utility business processes. In Figure 1, many integral components of a fully integrated energy delivery organization and required capabilities are illustrated. It is imperative to develop a strategy that optimizes all of these focus areas and enabling integrated systems to meet overall corporate goals and objectives.

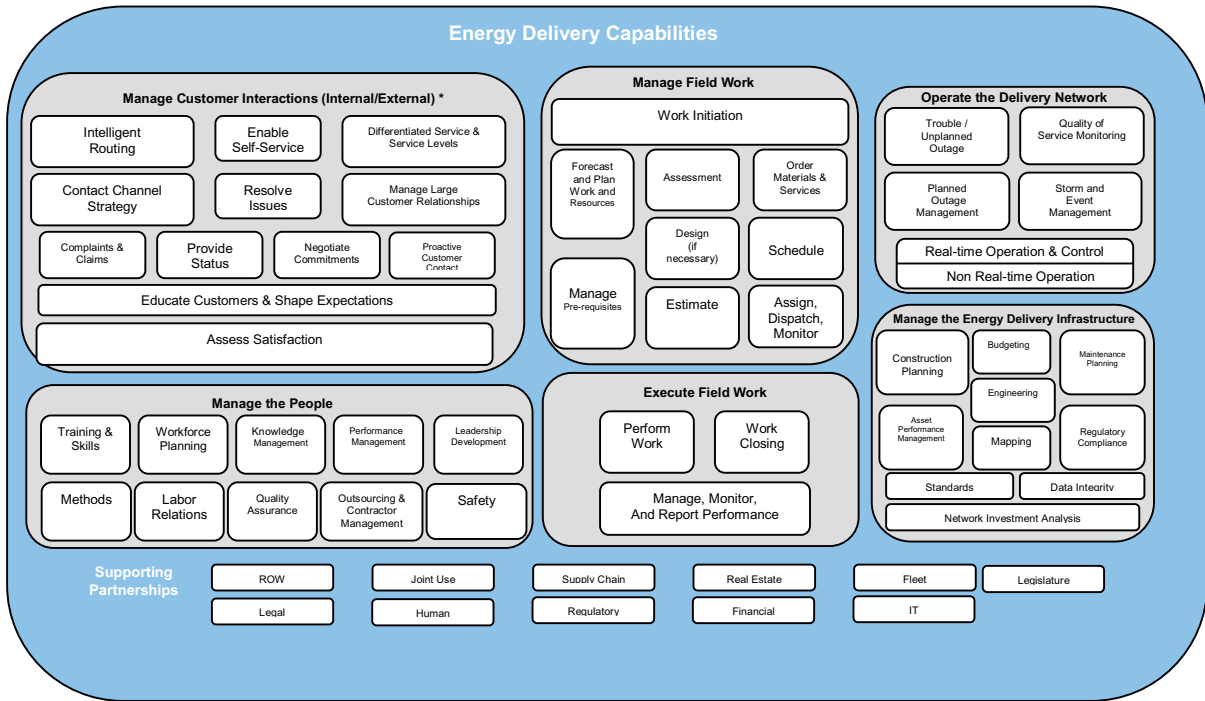


Figure 1. Illustration of key energy delivery business capabilities.

Work and asset management systems have evolved over the past decade into applications that clearly enable the utility’s business from an operations perspective. Clear work and asset management system implementation drivers include being able to take cost out of the business through optimized process improvements; reduce hand-offs between departments; empower office and field forces; optimize resources, equipment, vehicles and materials; keep track of all work activity associated with assets and or asset classes; and provide historical work activity information that can be integrated with financial system-based, cost data to aid in repair/replace decision making. All of these drivers target optimized O&M expenditures and efficient and appropriate capital spend, while improving customer service and achieving improved regulatory relationships.

Asset Management Concepts, Strategies, and Capabilities

Effective asset management requires a set of capabilities for identifying, defining, commissioning, and managing work on new and existing assets to generate the optimum sustainable financial return, considering desired levels of service and reliability while mitigating risk. Asset management strategy of 2005 brings a balance-sheet focus to asset optimization with revenue and profit priorities, as opposed to legacy rate-case-inspired asset growth and cost management strategies.

Modern asset management strategy requires complex decision-making capabilities. Today, making investment decisions requires a utility to integrate and balance system integrity considerations; 1-, 3-, 5-, and 10-year planning strategies; risk and asset criticality; and life-cycle planning and management. In addition, capital and O&M resource optimization must be in balance with growth, refurbishment, renewal, and regulatory priorities.

Successful asset management is achieved when it is practiced as an encompassing business discipline. Asset management must balance conflicting interests and stakeholder drivers, in order to generate the highest level of sustainable financial return. Advanced asset management capability requires delivering on conflicting utility obligations for system performance, customer service, safety, regulatory compliance, and environmental stewardship. Achieving asset management business discipline requires focus on investment, technical, asset performance, and asset information management.

Successful asset management is rooted in leveraging comprehensive, integrated, enterprise work management capabilities (Figure 1). Enterprise work management includes all short- and long-duration work ranging from service, maintenance, and construction to emergency work. The comprehensive planning, designing, estimating, scheduling, assigning, and executing of a utility's work along with the tracking of all asset-related work activity from asset inception to beyond asset retirement are crucial to achieving higher-level asset management business goals.

How Today's Work and Asset Management Systems Aid the Delivery of Asset Management Business Capabilities

Several types of currently available work management systems have very different capabilities that are designed to meet unique operational needs. Differing classes of work management system products have been developed in response to varying market demands and markets. Due to the unique requirements of asset management, one common work management platform may not adequately support a utility's integrated asset management goals. Today, two general types of work management systems are offered:

- Process-based work management system
- Asset-centered work management system (referred to as an asset management system)

Both types of work management systems can be critical to a utility's asset management strategy because they focus on different but complementary priorities.

For a utility with a mature distribution system experiencing limited growth or expansion, an asset-centered work management system may prove to be an optimal choice. On the other hand, a utility experiencing substantial distribution system growth might prefer a process-based work management system to meet their new construction-focused priorities. Utilities having a combination of high customer growth rates and significantly aged distribution infrastructure could benefit from an integrated combination of process-based and asset-centered work management systems.

Through an integrated model of process-based and asset-centered approaches, there are key synergies that can be gained in several areas of resource, material, vehicle, and equipment management. In addition, an enterprise integration framework can be leveraged to integrate financial and accounting systems and to support compliance with Sarbanes-Oxley requirements. Work and asset management systems play an integral role in any asset management strategy simply in their ability to plan, design, coordinate, schedule, manage, and report on all work on all assets.

Process-based, work management systems allow utilities to improve the way in which work processes are created, monitored, and completed within an organization to deliver services to customers or to improve system reliability. Key focuses of process-based work management systems are to improve efficiencies of each process, help streamline hand-offs between departments, and promote an empowered workforce, both in the office and in the field. By leveraging the appropriate combination of work management systems, utility work can be prioritized based on set criteria that integrate well with an asset management strategy and target asset management business capabilities.

Figure 2 depicts process-based work management capabilities and how advanced processes and functions meet overall capability requirements.

Capability	Basic	Intermediate	Advanced	Leading Edge
Work Order Entry & Assess Scope	<ul style="list-style-type: none"> Customers must go through contact center for all inquiries Multiple prioritization models 	<ul style="list-style-type: none"> Field can take requests & relay manually 	<ul style="list-style-type: none"> Customers can use Internet, IVR for some inquiries Diagnosis at initial contact to eliminate duplicate/repeat work 	<ul style="list-style-type: none"> Customer has option of self service
Design & Estimate	<ul style="list-style-type: none"> Majority of work reviewed by designer No view of designer workload/ETC 	<ul style="list-style-type: none"> Design activities assigned based on geography Design workload managed informally 	<ul style="list-style-type: none"> Some centralization of design activities, designs assigned based on specialty/capability 	<ul style="list-style-type: none"> Builder completes design based on company standards Some design outsourced
Manage Requirements	<ul style="list-style-type: none"> Requests are defined on a case-by-case basis 	<ul style="list-style-type: none"> Dependencies are coordinated and managed within an office 	<ul style="list-style-type: none"> Management of dependencies are separated from design activities Permitting centralized 	<ul style="list-style-type: none"> Automated integration with municipalities/localing Permitting outsourced
Forecast & Plan Work	<ul style="list-style-type: none"> Little to no forecasting or planning capabilities Budget drives work forecast 	<ul style="list-style-type: none"> Some attempts to smooth out peaks and valleys at local levels by work type 	<ul style="list-style-type: none"> Forecast integrated across all work types Work forecast published to other areas of the organization 	<ul style="list-style-type: none"> External data used in long-term forecast Integrated resource planning across the organization
Forecast & Plan Resources	<ul style="list-style-type: none"> Resource planning done separate from work planning 	<ul style="list-style-type: none"> Resources needs planned locally 	<ul style="list-style-type: none"> Resource needs planned regionally Resource forecast integrated across all resource types 	<ul style="list-style-type: none"> Forecasted work used with contractors to negotiate best possible price
Schedule	<ul style="list-style-type: none"> Work is scheduled weekly Supervisor schedules manually 	<ul style="list-style-type: none"> Work is scheduled daily Scheduling role exists Automated tools 	<ul style="list-style-type: none"> Work is scheduled to day/order in a rolling 3 week window Scheduling occurs regionally Universal scheduling tool/role 	<ul style="list-style-type: none"> Real-time scheduling based on all resource requirements Centralized Resource Management Organization
Order Materials	<ul style="list-style-type: none"> Materials ordered via paper forms and delivered to equipment shops 	<ul style="list-style-type: none"> Some integration between materials ordering and design process 	<ul style="list-style-type: none"> Integration between work design process and supplier directly Direct shipments from supplier to site 	<ul style="list-style-type: none"> Material barcode/RFID used to manage inventory levels and ordering needs
Assign, Dispatch & Monitor	<ul style="list-style-type: none"> No skill/availability records used to assign work Supervisor determines crew 	<ul style="list-style-type: none"> Automated tracking of skills Crew assignments integrated with scheduling role 	<ul style="list-style-type: none"> Progress monitored and work drip-fed to fill the day Auto-schedule for majority of work types 	<ul style="list-style-type: none"> Optimal skill/financial/labor policy combination used to assign work Tools that propose work for crews
Perform Work	<ul style="list-style-type: none"> Restrictive skill classifications All work is paper based 	<ul style="list-style-type: none"> Limited use of mobile device based on work type 	<ul style="list-style-type: none"> Mobile "desktop" used for all work types 	<ul style="list-style-type: none"> Information push/pull from field Universal soldier/multi-skill
Manage & Monitor Work	<ul style="list-style-type: none"> Majority of time spend in office administering crews 	<ul style="list-style-type: none"> Percent of time spent with crews in field – some site checks/safety audits 	<ul style="list-style-type: none"> Most of time in spent field with crews 	<ul style="list-style-type: none"> Supervisor "toolkit" provides performance information with diagnostics
Work Order Closing	<ul style="list-style-type: none"> Verbal or paper report only upon job completion 	<ul style="list-style-type: none"> Paper report on daily basis for complete and in progress work 	<ul style="list-style-type: none"> Electronic completion and close out of all work Work reconciliation by exception only 	<ul style="list-style-type: none"> As-built information used for root-cause analysis/asset planning Closing information integrated across organization
Report Performance	<ul style="list-style-type: none"> Metrics not defined and not tracked 	<ul style="list-style-type: none"> Metrics defined but data difficult to track 	<ul style="list-style-type: none"> Metrics aligned across the organization Individualized metrics based on goals 	<ul style="list-style-type: none"> Real time performance comparison across projects/crews/areas

Figure 2. Process-based work management capabilities.

Asset-centered, work management systems or enterprise asset management systems were originally developed for plant maintenance. Some of these tools were developed as separate modules to integrate with modularized financial, supply chain, and accounting systems. As the industry evolved through deregulation and re-regulation in several states, utilities began to increasingly leverage asset-centered work management systems for transmission and distribution maintenance. Emphasis was also placed on tools that helped manage complex substation asset maintenance, as well as maintenance of other costly pieces of network operating equipment. The focus of these tools and processes has been to identify, define, track, and provide results of maintenance and inspection activities on the most costly utility assets, thereby helping extend asset life and optimize Return on Asset (ROA).

By integrating process-based and asset-centered work management systems, utilities can employ a solution that will drive business benefits, not only from the 'sweating' of an organization's assets, but gaining the efficiencies associated with either the initial installation of or replacement of assets. This solution will also allow a utility to make analytically based and more educated decisions on asset repair vs replace. In addition, a combined solution aids the maintenance and inspection of assets in a more timely and efficient manner by integrating

workforces and supplemental processes, such as supply chain, financials, contractor management and accounts payable, accounting, and regulatory and FERC reporting.

Some of the key areas in which both process-based and asset-centered work management systems support an integrated asset management approach include:

Compatible Units (CUs)

The backbone feature of both types of work management systems is a compatible units or standard utility items capability that can be defined for construction, maintenance, office tasks, field tasks, or even supplemental tasks. These CUs typically drive the material, labor, accounting structures, attributes, field force requirements, equipment, and vehicles required to perform work. CUs vary in structure across vendor products and by types of systems.

Process-based work management systems tend to have a very open CU structure, providing capabilities across many processes supported within a utility. These processes can include short- and long-duration work across capital, operations, and maintenance. Process-based CUs are typically, but not always, driven by a design process in the selection of CUs to meet company standards and design criteria for expansion of the network or replacement of assets.

Asset-centered work management system CUs may not necessarily be titled CUs. Rather, they may be termed “work tasks” or “activities” because they have been developed based on short duration, typically single task efforts that may or may not include any material items as part of that task. However, there is commonality across accounting structures, accounts payable, supply chain, and reporting of field work.

An integrated solution of these two technologies allows for the synchronization of CUs across technologies to support common CU structures that are developed to leverage common resource scheduling processes across the utility. This improves the utility’s ability to leverage the same workforce and crew skills to perform various types of work across processes. CUs can be configured to support an asset management strategy by leveraging construction standards, material standards, and structural and analytic attributes of the CUs in each construction item. By configuring CUs this way, a utility is able to design and construct a more reliable network with a well-aligned maintenance strategy and program that is based on the specific materials used.

Integrated Field Force

In today's utility, the days of a fully skill-segregated workforce are coming to a close. More and more utilities are moving to a self-empowered, multi-tasking field force that performs a variety of field tasks across construction, service, maintenance, operations, and trouble work. Because of this shift, integrated technologies must support these processes across multiple work types and crew skills. Due to the inherent differences between a process-based and asset-centered work management system, business and system integration is critical to the success of this solution. Process-driven systems integration is absolutely required to bring these technologies and processes together, providing the benefits that utilities are demanding. By integrating multiple systems and leveraging the strengths of each system, a utility can expect to achieve their business goals and streamline their processes, while leveraging common integration points across technologies.

One key capability that has been the focus of process-based work management systems is resource planning and scheduling. By leveraging this enhanced capability, a utility resource planner or scheduler will now be able to see 'all work' across functional or geographical boundaries. This improves the efficiency of planning and scheduling crew work and helps a planner set the proper priorities for that work. A resource planner or scheduler can also leverage geospatial information to combine work for a crew, potentially reducing 'windshield' time or multiple visits to similar locations. By scheduling and dispatching common work to crews across processes, a utility has the ability to improve work and resource planning, to change buying patterns on equipment and materials, and to enhance the way they leverage contractors or supplemental labor.

Common Field Data Collection

As part of developing integrated processes and workforces, the integration of mobile technology can be a critical component for gaining field force productivity and efficiencies in collecting key field information. Today's mobile technologies and systems integration can support integrated data across multiple applications spanning short-duration work, long-duration work, and maintenance and condition assessment work. Data can be collected across both process-based and asset-centered work management systems while integration technologies may be employed to parse the data to the appropriate systems for update.

Business Process Management Integration of Process-Based Work Management, Asset-Centered Work Management, GIS, and Back-Office Systems

An integral part of a fully implemented asset management strategy is to leverage a process-based work management system and an asset-centered work management system within a business process and enabling application architecture. The business process-application architecture will define how the data can be leveraged across the organization. The following diagram depicts the extent of legacy and operational system integration with a core work management system implementation. The integrated work management system can maintain the critical financial, supply chain, FERC, asset hierarchy, and field force information that pertains to the action taken on a particular asset or groups of assets.

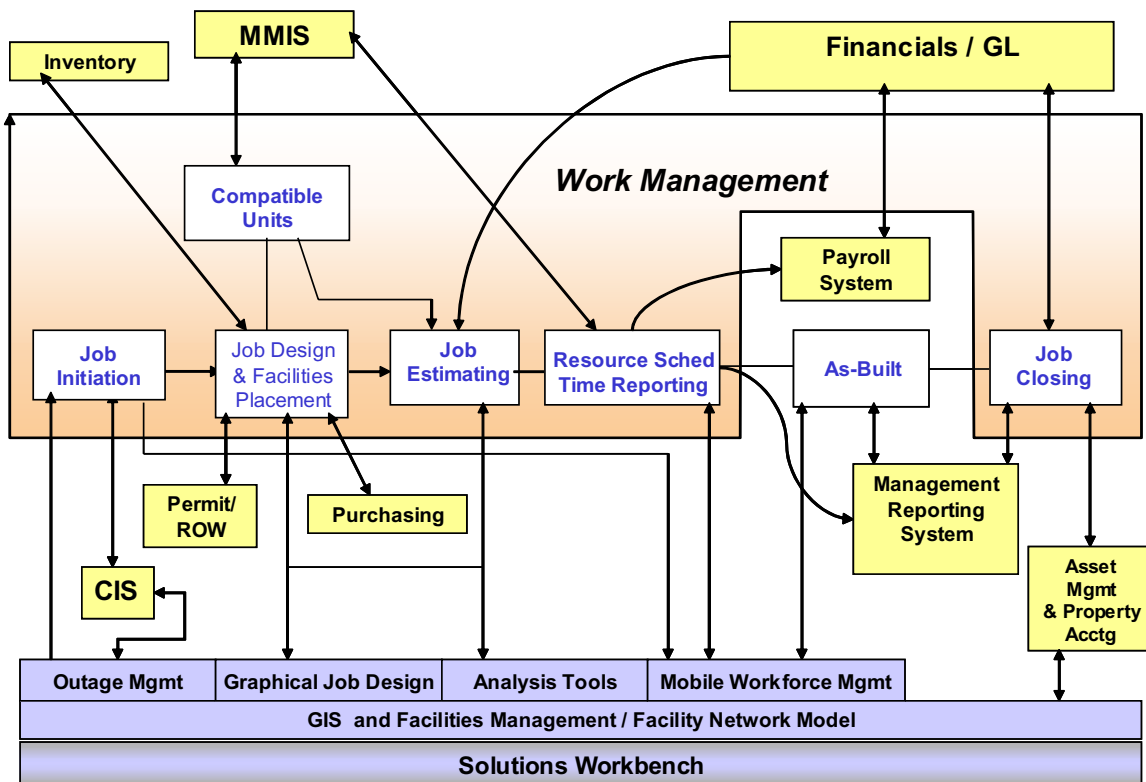


Figure 3. Overview of processes implemented and enabled by business process management-oriented systems integration.

Conclusions

Work and asset management systems have evolved considerably over the past decade into applications that truly drive the utility's operations pulse. The industry is currently experiencing a ramp-up in the procurement, implementation, and integration of work and asset management systems, replacing aged work management systems. Drivers behind this trend include desired cost take-out through business process optimization; reduced hand-offs between departments; empowered office and field forces; optimized resources, equipment, vehicles, and materials; keeping track of work activity linked to asset or asset class; and historical tracking of all asset-level, work activity for each major asset from inception through retirement. All of these drivers target reduced O&M and optimized capital expenditures. Vendors that build, market, and implement these systems have successfully responded to their clients and the industry's needs for broad capabilities and integrated process-based and asset-centered models that help utilities do more with less.

Capabilities required of process-based work and asset-centered work management systems to meet the industry's needs for an integrated work process include:

- Customer- and asset-focused work initiation
- Pre-designed, asset-specific work tasks
- Integrated process workflow technology
- Marketing tools for new service as well as maintenance pricing
- Design with compatible / macro units / templates for optimized material configurations
- Advanced contractor management
- Resource, vehicle, and equipment planning, forecasting, scheduling, and management
- Field force reporting
- Vehicle and equipment utilization and fleet management
- As-built balancing of assets
- Accelerated and automated capitalization of fixed assets
- Integration models linked to asset-focused legacy and core business systems
- Repository of critical activity data for regulatory and asset management transactions and reporting

In summary, successful asset management is not having the best managed assets or the best asset management systems. Successful asset management is delivering the best possible service, by doing the right work at the right time at the optimal cost! Modern integrated work and asset management systems are helping utilities achieve their higher-level asset management goals by successfully tracking and managing all operations activities.