

# Active asset management

Enabling utilities to gain a competitive edge



**CGI**

Experience the commitment®

# Table of Contents

Introduction	03
The current picture - a new pressure on utilities	04
What has changed in the last five years?	06
Key recommendations for effective active asset management	08
Active asset management in action: a case study	10
Conclusion	11

---

## Executive summary

As one of the most asset-intensive industries in the world, utilities face the constant challenge of maintaining, repairing and replacing their assets, along with meeting new or changing demand. Despite many organizations practicing good asset management, the future is becoming more challenging. In the midst of this change, utilities have the chance to turn these challenges into opportunities that can improve efficiency and cost savings across the entire asset life cycle.

This paper demonstrates how organizations that choose to adopt active asset management and an optimized network utility model can align, optimize and re-optimize their asset plans in near real-time to relieve ever-changing regulatory and stakeholder pressures, achieve operational excellence and increase customer satisfaction.

As utilities prepare to compete in a digitally-connected world, they need to assess whether their asset management approach is fit for the future.

# Introduction

Asset management is not a new concept for utilities. The companies that bring power, water, heat and communications to homes across the world have always had to manage their physical assets, so that consumers can enjoy uninterrupted service.

As one of the most asset-intensive industries in the world, utilities have always faced the constant challenge of maintaining, repairing and replacing their assets, along with meeting new or evolving demands. So what has changed?

Utilities are increasingly facing pressure to provide “more for less”. In many countries with an open utility market, competition has intensified, with consumers always on the lookout for a better deal. This is placing pressure on utilities suppliers, who in turn are pushing the generation and distribution companies to lower their prices. Other changes, such as the shift from centralized to distributed networks in many countries, are having an impact too. Where power supply was previously a one-way flow from utility to consumer, energy resources now come from many different sources. Renewables such as solar panels and wind farms, and the emergence of the “prosumer” — the consumer as a micro-supplier of energy — are changing the shape of power distribution.

Along with these challenges, this evolving energy ecosystem presents numerous opportunities too. The Internet of Things (IoT), big data and predictive analytics, and mobile technologies are having an unprecedented impact on utilities. The access to data through smart devices, supervisory control and data acquisition (SCADA) systems and the adoption of IoT-based solutions means that utilities have more data than ever before. But how good is the quality of this data, and how can it be used most effectively?

Despite many organizations practicing good asset management, the future is becoming more challenging. Yet, in the midst of all this change, utilities have the chance to turn these challenges into opportunities that can improve efficiency and cost savings across the entire asset lifecycle.

Is your organization equipped to align, optimize and re-optimize your asset plans in near real-time to relieve ever-changing regulatory and stakeholder pressures, improve operational efficiency and increase customer satisfaction? This paper will demonstrate how organizations that choose to adopt active asset management and an optimized network utility model can.

# The current picture - a new pressure on utilities

Utilities have been managing their assets since the very first pipes and wires were laid, and the earliest power plants and reservoirs constructed. But it wasn't until the 1990s that asset management became a recognized discipline, culminating in the creation of an internationally-agreed standard, ISO 55000 in 2013. Organizations began to get better at following good practices throughout the lifecycle of their assets, particularly in the areas of planning, maintenance and renewal. However, asset management is evolving further to meet the growing demands of a more complex marketplace.

## New pressures on utilities

Today's cost-conscious consumer is adept at scouring the market to get the best price for utility services. The ease of comparing prices, together with the perception that there is always a better deal to be had, means that very often the price comes down to what the consumer is willing to pay. In turn, suppliers or retailers pressure the utility companies to keep costs down, so that the pricing can be more attractive to customers.

Although regulations vary globally and standards are constantly changing, the fundamental role of regulators is to ensure that utilities deliver the quality of service they promise, at a fair and sustainable price. To this end, regulators are applying increasing pressure on utilities by challenging them to justify the money they spend, and to provide evidence that the consumer is getting value for money.

## Rising and changing consumer expectations

Consumers today demand better value for the money they pay for their utility supply and services along with an enhanced customer experience. They are rapidly embracing technology in their everyday lives, including home monitoring devices, and smart thermostats and appliances. As such consumers are expecting improved service, convenience and transparency from their utilities supplier.

## Utilities in the spotlight

A new challenge has emerged in the form of personal responsibility too. Ten years ago, few people would be able to name the CEO of a utility, but today, these names are appearing more and more frequently in the media following their organization's failure to meet customer expectations. Now more than ever before, utilities are prey to negative reports in the media, piling more pressure onto organizations to preserve their good reputations. Additionally, the proliferation of customer comments on social media and user forums means that utilities often find themselves in the spotlight. A tweet about poor service that goes viral can be as damaging as a negative article in the newspaper.

## Responding to these pressures

With growing expectations from consumers, regulators and the media, it is no longer enough for utilities to provide uninterrupted services at competitive prices; they also need to improve overall operating efficiency, deliver greater cost savings, and remain beyond reproach while doing so. Today, active asset management can help organizations to gain a deeper understanding of their business and assets and utilize data to make the decisions that will shape their future.

## Greater efficiency, but at a lower cost

To achieve optimum efficiency, utilities need to track asset health to enable them to predict and prevent breakdowns that threaten to cause interruptions in service. Previously, organizations did not have enough information to tell them where it would be best to focus their improvements; so they took a blanket approach. Now, with access to more asset data, utilities can make faster, better-informed decisions across operations and reduce equipment downtime and maintenance costs.

Through active asset management, utilities can keep track of each asset and decide where to make improvements and optimize their investments across the asset base, rather than trying to improve everything. Furthermore, they can monitor, review and re-align their investment plans in near real-time to ensure they remain on the right path to success, in the most effective manner.



A hand in a white shirt sleeve points towards a digital interface. The interface features a network of red nodes and lines, a white gear icon, and a white L-shaped cursor. The background is a blurred blue and white grid.

Cost savings can also be made if organizations have a clear understanding of the criticality of their assets, when assessed directly against promised outcomes. This is particularly true for assets that have been in use for many years and a deeper understanding of their behavior is available.

### **Understanding assets to assess risk**

Evaluating asset performance data can help to measure the risk of failure from an asset perspective. Here's an example. On the face of it, a weak electricity pole might be generically categorized as a low cost, non-critical asset that might not justify speedy replacement. However, if the pole is located at the center of a bustling town, it could be argued that the asset now presents a greater risk. What would happen if the pole were to fall in front of a car? What would be the implications for the driver and passengers as well as other drivers and pedestrians? Should the pole cause an injury, what would be the impact on the utility in terms of insurance claims, fines and bad publicity?

By storing and accessing information about each asset's performance and location, utilities are better prepared to evaluate failure risk and equip themselves to face a multitude of possibilities. From a business perspective, understanding which assets have a greater impact on corporate risks can drive appropriate investments in mitigating actions.



## What has changed in the last five years?

### **Digital technology is dramatically increasing the availability of data to utilities**

The revolution in digital technology has seen dramatic improvements in the accessibility, quantity and quality of data available to utilities. Previously, the data that utilities generated was sufficient for a generic approach to future planning. However, due to the sheer number of assets owned by an organization, it was impossible to analyze the data, either in sufficient depth or on an asset-by-asset basis to improve efficiency or make significant cost savings. Today, with the kind of advanced analytics tools and computing power available, utilities are far better equipped to manage the entire life cycle of their assets.

Utilities are seeing vast amounts of data coming from a number of different sources. Smart devices and sensors are being widely installed on utilities' networks, in customers' homes and businesses. These devices are sending new and updated data to utilities on the state, performance and condition of their assets, as well as consumer usage of services. Additionally, SCADA systems provide increased real-time data on plants and equipment, boosted by the growth in IT/OT integration.

IoT is heralding a new world of connected devices and appliances, offering utilities even more opportunities to collect, analyze and utilize the data to make better business decisions. In fact, in the 2016 CGI Global 1000 outlook<sup>1</sup>, 41% of the utilities executives interviewed concurred that "connecting devices and assets through the emergence of IoT" is a major industry trend.

But with the burgeoning availability of data comes the danger of reporting data simply for the sake of it. Utilities must take the opportunity to analyze the wealth of data at their disposal to help them achieve measurable objectives, such as driving efficiency, saving costs, ensuring safety and compliance, and keeping customers and stakeholders satisfied.

At CGI, we believe that a utility's data should help to make it fit for the future—a principle that lies at the heart of active asset management.

## THE OPTIMIZED NETWORK UTILITY: A new way of seeing for utilities.

CGI believes that embracing active asset management is integral to successfully managing the energy transition and transforming into an Optimized Network Utility (ONU). Evolving into an ONU is a journey that includes adopting an enterprise-wide approach to asset management and operating using three key organizational shifts:

### 1. The holistic view

In the past, managing assets and network operations were two totally separate concepts. But in today's digital world, everything is connected. With the growth in renewables, and consumers generating their own energy, there is a move away from centralized networks toward distributed networks. This means network utilities need to bring together energy supplies from a range of sources and distribute them efficiently.

In this more complex landscape, utilities will need decentralized intelligent assets to manage the two-way flow of both energy and information. Utility leaders recognize that to control the flow of energy, they need to achieve this holistic mindset. In the 2016 CGI Global 1000 outlook<sup>1</sup>, 81% of industry executives said that utilities will need to enable the transformation of the energy value chain by becoming digital organizations.

### 2. Trialling technology

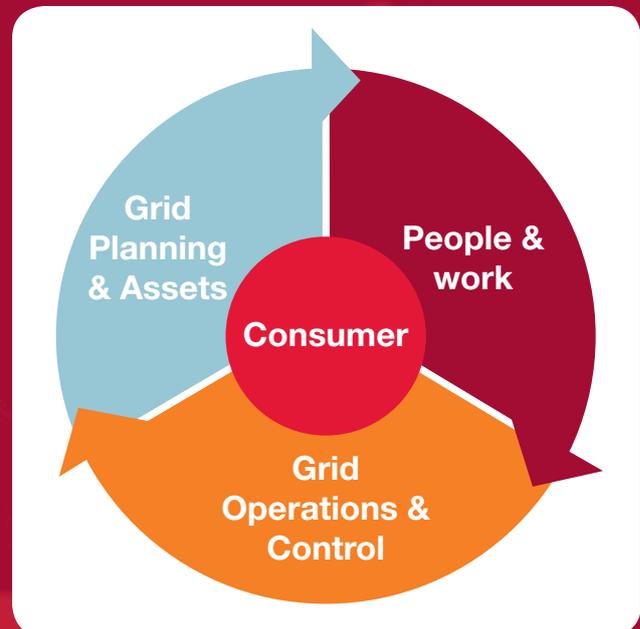
A key part of the ONU journey is embracing risk in small, controlled ways, progressively rolling out new technologies and measuring their impact and ROI. This can mean modernizing the systems that are already in place, or trying new ones, on an ongoing, small-scale basis. By running pilot schemes using new technology, utilities will be able to envision what added

value they can achieve. At the same time, they can build knowledge and flexibility, which will help them better understand and manage assets.

### 3. An end-to-end approach

New data streams represent a huge opportunity for utilities, but only if they are fully integrated. Utilities are harnessing digital technologies by uniting their operational technology (OT) with their IT, and gathering information from other digital initiatives such as smart meters, sensors and IoT. The key to achieving an end-to-end approach is to ensure that silos are broken, so that data can flow through the organization, all the way to the decision makers.

To find out more about how active asset management fits into the ONU vision, please download our brochure.



# Key recommendations for effective active asset management

Active asset management provides a number of opportunities for utilities to improve operational performance and profitability, while minimizing downtime and extending the life of their assets. In order to stay ahead of the energy transition curve and give themselves a competitive advantage, organizations will need to:

## Manage the current and future performance of assets

The first step for an organization is to have a clear understanding of its asset health. This includes knowing how long a current asset can be maintained, and when it will need to be replaced. However, there are other variables to take into account too. Asset degradation, for instance, will vary from one location to another. An overhead power line that is in use in a coastal area may be subject to salt erosion, while the same line being used in a hot, arid climate may suffer heat damage. A utility's data alone may not provide the information required to assess how an asset behaves under certain conditions. However, the right collation of disparate data and deeper real-time analytics through active asset management will help an organization decide exactly when an asset requires maintenance or replacement.

Critically, this information will need to be built into an organization's forward planning. Then again, it is not enough to simply draw up a five-year plan based on current and future asset health; the plan will need to be constantly reviewed, remodeled and tweaked, based on real-time performance and services data, in order to achieve established business goals.

## Understand the criticality of assets

Utilities need to strike a balance between containing costs, while still continuing to deliver good service. In order to do so, they need to understand how critical each asset is to meet their business objectives and outcomes. Spending money on maintaining and replacing an asset which does not make a significant difference to performance may be an unwise business decision. Through the analysis of near-real-time data and predictive modeling, active asset management will help a utility determine at what point the performance of an asset will start to affect service, cost or expose the organization to risk.

These decisions, however, are multi-layered. Think back to the weak electricity pole. What appeared on the surface to be a high-volume, non-critical asset could in fact be a priority for replacement in order to avoid injury or damage to property and any resulting litigation or bad publicity. Each asset needs to be linked directly back to the utility's performance to evaluate how critical it is to the business, on a number of levels.

## Harness asset data

In the 2016 CGI Global 1000 outlook<sup>1</sup>, 67% of utilities executives said that delivering the benefits of data and analytics is a top technology priority, compared to 41% last year. However, this data is only useful if it can be transformed into actionable insights that drive business performance and results.

Remote maintenance is an ideal example. In-built sensors can monitor a utility's assets remotely, and in real-time. The asset can send out a signal when it is working well, thus eliminating the need for a field inspection. In addition, by extracting data from the smart sensors and applying intelligent analytics, it is possible to gain valuable insight into the asset's condition and predict when it needs to be serviced. This predictive approach to maintenance enables utilities to minimize downtime and extend an asset's life, while reducing operating and maintenance costs.

For instance, previously, if an organization was monitoring a motor that had started to crack, they would only know if the motor was functioning or not. They would not have a clear idea of how much longer it would continue to function before breaking down. However, a vibration sensor fitted on the motor could send out an alert, well in advance, about the motor's impending failure.

Better connectivity is helping organizations to track and understand their asset health. However, to make a real difference, decision makers will need to factor asset data into the organization's strategic plans.

## Manage the total expenditure plan

From an accounting perspective, an organization's spend is divided between capital expenditure (CAPEX) and operational expenditure (OPEX). However, asset

management spans this divide and focuses more on how much value each asset-related outlay will add to the organization.

Depending on the financial and political climate of the region, some organizations may face pressure to reduce their capital spend and buy lower-priced assets or delay the replacement of old assets. Good asset management helps an organization to make the best possible decision, while ensuring the right balance between capital and operational expenditures. A clear and accurate view of the overall asset health will help to determine whether it is better to buy low-cost assets and replace them every five years, or buy expensive assets, and incur lower maintenance costs.

Some utilities are looking into integrating their core asset and work management systems with their investment planning tools. This will help to streamline the overall planning and delivery process and facilitate faster, data-driven asset investment decisions. By taking advantage of increasingly sophisticated modeling tools, organizations can see how different investment scenarios, such as investing to maintain the current level of risk, or increasing capex in order to reduce future risk and improve service reliability might unfold, and re-align plans if the impact of their initial investment strategies is not as anticipated. Improved integration across a utility's operations is central to an active asset management approach.

## INVESTING FOR THE FUTURE: A CASE STUDY

CGI executed a leak detection project for Vitens, a Dutch water company with 5.5 million customers and 49,000 kilometers of pipes. Based on a number of data sources, which focus on the water grid, sensors, other geographical data sources and open data, CGI's solution allowed the company to pinpoint the location of leaks more precisely (up to 6 km<sup>2</sup>). Previously, this could only be done for a much larger area (up to 900 km<sup>2</sup>).

## Break down operational silos

Since the establishment of ISO 55000, organizations have become more focused on managing assets across their life cycles as a part of an end-to-end business process. Simultaneously, regulators have started to require more information about which assets an organization needs to spend money on in order to deliver the promised level of service and outcomes.

The combination of better access to data and more reliable analytics now presents utilities with the opportunity to integrate asset management across the enterprise. This involves adopting a new mindset and a behavioral change across the organization's workforce. To achieve best practices in asset management, an organization needs to involve everyone on its payroll—from maintenance engineers and the finance team to project managers, business directors and even its contractors.

Also, too many organizations still look at their different data streams in isolation. For example, an electricity company may have a vast repository of data about the health of its transformers and switches, all held in a database, alongside, but not integrated to a geographic information system (GIS) that holds the exact location or route of the associate circuits. If these two data sources are not connected, the organization can miss vital clues about which part of that network could fail. Integrating this data will provide a clearer picture of how the assets are connected and how they work together to ensure the uninterrupted flow of power from generator to consumer.

Similarly, many organizations still hold their financial information in a separate system from their asset data. As cost codes rarely provide data at an individual asset level, it can be difficult to access all the related financial information. With greater integration, it will be possible to drill down and capture costs related to each asset, and gain a better understanding of the relationship between cost and performance, service and risk. Breaking down silos ensures a single, enterprise-wide view of the utility's asset and infrastructure network.

In addition to the newer digital data streams, utilities must not lose sight of the importance of monitoring their workforce costs, outage management and resource optimization along with their physical assets.



## ACTIVE ASSET MANAGEMENT IN ACTION: A CASE STUDY

A North American utility, which owns and operates electricity infrastructure, water and wastewater facilities within several Canadian provinces and U.S. states, wanted to improve its asset investment planning process to reduce costs, optimize risks and improve processes.

### The challenge

The company realized that its current asset investment planning method was limited in two areas:

- Historic budgets and current asset performance were used to identify risk and benefits
- Projects were assessed in isolation of one another

The utility sought to find the “sweet spot” for investments by examining the underlying causes of reliability and identifying how this manifests as risks—both present and future.

### The solution

CGI, in collaboration with SEAMS developed an optioneering tool that forecasted budgets for maintaining low-lift pumps in water plants. The modeling approach used information about the assets, including: reliability, redundancy, age, useful life, cost, and impact of maintenance to form a view on whole life cost and forecast the performance of each asset.

Optimization was used to assess how different maintenance, rebuild and replacement strategies impact reliability and therefore the outcome (risk). The optimizer is an automated process that searches within the millions of possible combinations of maintenance choices to determine the most cost-effective solution; something beyond current spreadsheet model capabilities.

### The benefits

This transparent risk-based approach has enabled the company to better meet regulatory demands by providing multiple scenarios on how asset performance impacts revenue requirements. The tool enables a quick assessment of how reliability and performance change in response to different spend levels. This provides regulatory authorities with an informed and justifiable view for investment, and therefore revenue needs.

By employing active asset management and using analytics tools to interpret the data, the company was able to make informed decisions at an individual asset level, and plan for a more certain future. The project is currently being extended to model all remaining water plants fleet vehicles distribution mains. This will enable multiple assets to be brought into one modeling tool for a cross-asset decision making process that will, for the first time, compare different assets, with different failure modes and consequences. This will in turn enable seamless communication between asset managers and finance teams completing the loop between assets, customers, and funding.



## Conclusion

In today's increasingly complex and rapidly evolving energy market, utilities need to take control of their destiny to ensure a successful future. With growing pressure to cut costs, drive efficiencies and provide secure, reliable service to customers, utilities have never been under more pressure to get the most from their asset base.

The advent of new data streams and improved technology means that utilities have a far deeper pool of knowledge than ever before about the current performance of their assets. The development of better analytics tools also enables them to make predictions about the future performance.

It is a challenging, yet exciting time for utilities, with new opportunities to feed vast, untapped knowledge from their assets into the decision-making process. These new possibilities will allow organizations to consider the impact of their decisions, from the maintenance of their most inexpensive asset, right through to their largest capital investment project. But these opportunities will only bear fruit if utilities fully integrate asset management across the entire organization. There is immense potential for utilities to extract genuine value from their data in order to make the crucial link between their assets and their business decisions.

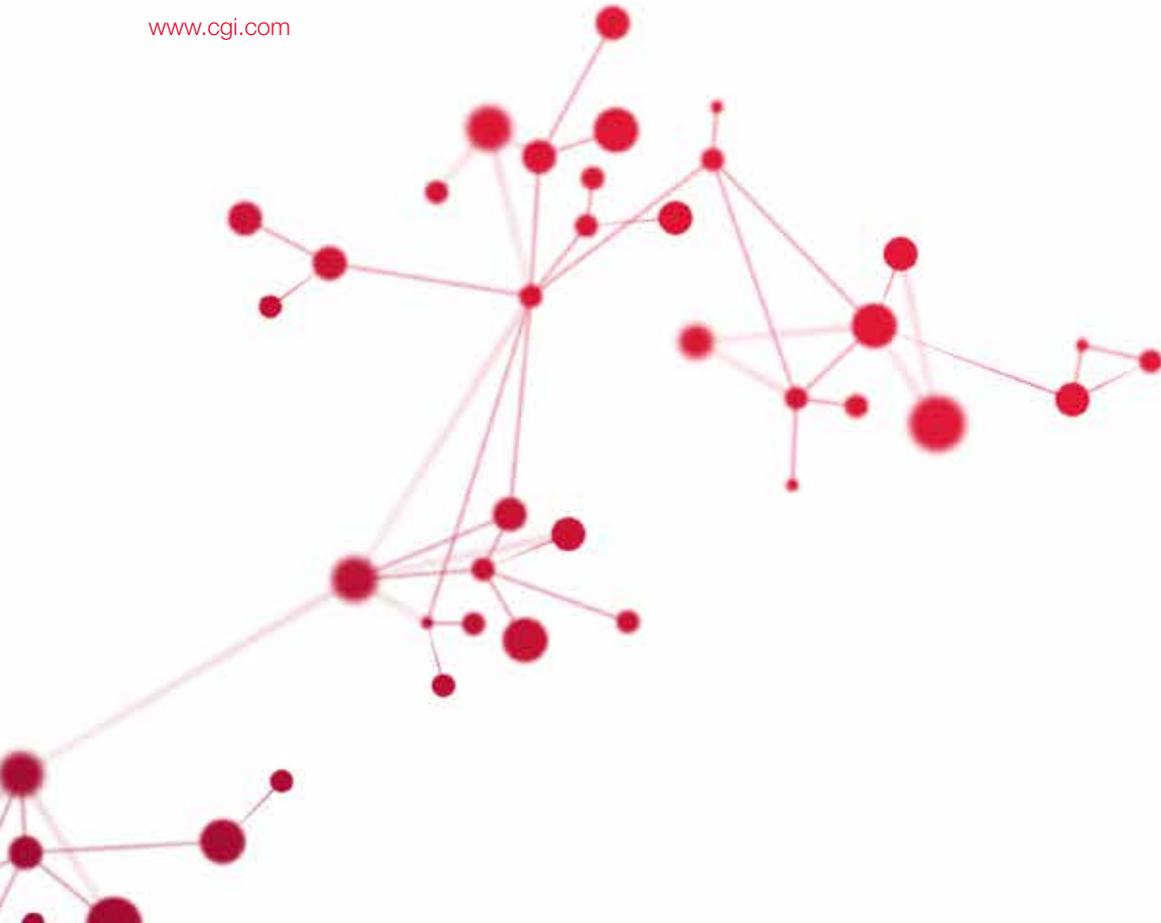
As utilities prepare to compete in a digitally-connected world, they need to assess whether their asset management approach is fit for the future and gives them an edge over the competition.

Footnotes:

1. CGI Global 1000 outlook 2016-2017



[www.cgi.com](http://www.cgi.com)

A network diagram consisting of red circles of varying sizes connected by thin red lines, forming a complex web of connections. The diagram is positioned in the upper half of the page, extending from the left edge towards the right.

## About CGI

Founded in 1976, CGI is one of the largest, end-to-end IT and business process services providers in the world. Operating in hundreds of communities across the globe, we help clients become customer-centric, digital organizations. Our high-end business and IT consulting, systems integration and transformational outsourcing services, complemented by more than 150 IP-based solutions, help clients accelerate their digital strategies. Our unique client proximity and best-fit global delivery model enables highly responsive service, on-time and within budget delivery, and competitive advantage for an increasingly digital world. We are one of the few providers with the talent, scale and end-to-end capabilities that clients need to connect legacy to digital for holistic success.

For more information about CGI, visit [www.cgi.com](http://www.cgi.com), or contact us at [info@cgi.com](mailto:info@cgi.com).

© 2017 CGI GROUP INC.