

# AMI Process Improvement

---

How Upgrading Work Processes Can Ensure Utilities Get Full Value from Their AMI Deployments

Prepared by



**THE SHPIGLER GROUP**  
STRATEGY MANAGEMENT CONSULTING SERVICES

---

**AMI Process Improvement: How Upgrading Work Processes Can Ensure Utilities  
Get Full Value from Their AMI Deployments**

Prepared by

The Shpigler Group  
(404) 600-5480  
[www.shpigler.com](http://www.shpigler.com)



The Shpigler Group is a strategy management consulting firm offering our clients a full range of services. We have designed our practice to add value to our clients' organizations, identifying suitable opportunities and optimal solutions. We deliver custom consulting services to four major industry groups:

- Energy
- Water
- Telecom
- Smart Cities

Our services include financial and operational analysis, business case development, and detailed studies that examine best practices. We listen to our clients and incorporate their input alongside our own industry knowledge, ability, and experience to develop a comprehensive plan that addresses client needs while providing viable options that add value.

The Shpigler Group offers services to clients in a wide range of areas:

- Developing feasibility studies for program implementation
- Performing benchmarking studies to support performance enhancement
- Conducting financial analysis of operations and detailing areas for improvement
- Supporting network design and construction management
- Performing technical research relating to projects or solutions designed
- Conducting management and operational audits
- Implementing go-to-market strategies
- Developing comprehensive and fact-based business plans
- Developing complete network designs and performing economic analysis of chosen models
- Developing detailed operating analysis and managing deployment efforts

For more information, please visit [www.shpigler.com](http://www.shpigler.com).

## Executive Summary

Automation approaches enable the building of the utility of the 21<sup>st</sup> century. It involves “smart” systems to measure consumption at different times of the day, new communications networks to send data to and from utilities, and new database systems to manage and use the valuable new data which advanced systems generate. It may also involve new “smart” systems that can respond to signals automatically to turn themselves on or off, up or down. These initiatives have become reality due to the advancements in communications technologies, coupled with the reduction in the cost of communication components. Adherence to widely adopted industry standards for communication interfaces creates the possibility of an open architecture. Specifically, the inclusion of Ethernet interfaces in devices deployed across the distribution network can facilitate diverse, redundant access to infrastructure devices.

The combination of redundant communications paths and advanced analytics creates a system which overcomes the inherent weaknesses of the “hub-and-spoke” utility system architecture. A robust communication system, coupled with centralized management systems and correctly applied business intelligence, creates an environment where advanced metering and other automation programs can be developed and implemented, supporting a variety of distribution functions. With these advanced systems in place, it is possible for utilities to develop and implement systems to automate and/or greatly improve common operational functions to enhance service and reduce operating costs.

Advanced Metering Infrastructure (AMI) offers the potential to drive significant value for electric and water utilities. However, without a thoughtful approach to developing new work processes and data mapping approaches, utilities that blindly deploy AMI systems risk investing valuable capital into a metering system that does little more than “change the shape of the cash register on the side of the house”. Luckily, there are steps that utilities can take to avoid this mistake.

## Issues in Process Improvement

AMI should be more than using the latest new technology, but rather finding ways to use technology to achieve measurable business results. For example, utilities that have employed careful and thoughtful approaches to process improvement using AMI have found a wide range of benefits, including:

- Reduced frequency of special/off-cycle meter reads
- Improved customer service capabilities
- Reduced back office expenses
- Reduced call volume
- Reduced cycle times and costs for service reconnects
- Reduced truck rolls
- Reduced outage minutes
- Increased utility revenue

Achieving gains in these areas and other does not happen by accident. There needs to be a thoughtful process put in place to address the inherent need for change management – updating work processes to account for the new technologies put in place. Some of the common challenges for utilities include:

Issue	Legacy Approach	Process Improvement
Billing Process	Meter data is moved manually on a monthly basis into the CIS	The implementation of a Meter Data Management system allows for an automated and continuous process throughout the month
High Bill Complaints	Customers calling with high bill complaints frequently result in meters having to be bench tested to ensure accuracy	The meter can now be automatically pinged on demand by a CSR to ensure accuracy while the customer is on the phone
Outage Management	Line workers have to try to assess the location of the fault and "find" the source of the outage in order to engage in restoration efforts	An OMS that is fully integrated into the AMI system automatically locates the source of the fault and provides dispatching support
Customer Leak Detection	Customers with unusually high water bills may be flagged for potential internal leaks - by that time the leak may be over 30 days old	Monitoring systems that engage with the MDM identify potential customer leaks within 72 hours and provide a process to notify customers
Asset Management	Meter data is never used in making decisions about maintenance schedules; decisions are made on a perceived "best practices" basis	An asset optimization scheme can be set up to utilize meter data and other system metrics in order to optimize asset replacement and maintenance schedules

In order to achieve all of the potential benefits that can come from the deployment of an AMI system, there are a number of questions that any electric or water utility needs to consider prior to full system deployment:

- What legacy work processes need to be updated once AMI is implemented?
- How can we best utilize the AMI system to achieve system benefits?
- What systems need to be put in place in order to ensure that data is made available to all utility departments?
- What customer-facing tools can be utilized to help customers self-address issues they may have?
- What changes to staffing need to be addressed?
- What training needs to be put in place?

## Sources of Value

Too often, utilities that have deployed AMI have found out that capturing the potential value inherent in advanced metering systems involves more than just replacing meters with newer digital meters. In fact, far too many utilities have found that deploying AMI without optimizing processes and data flows only results in more complications as the utility finds itself flooded with meter data and trying to manage a new system with legacy operational practices. Fortunately, addressing these issues can create positive change – resulting in operational and financial impacts that can be quantified.

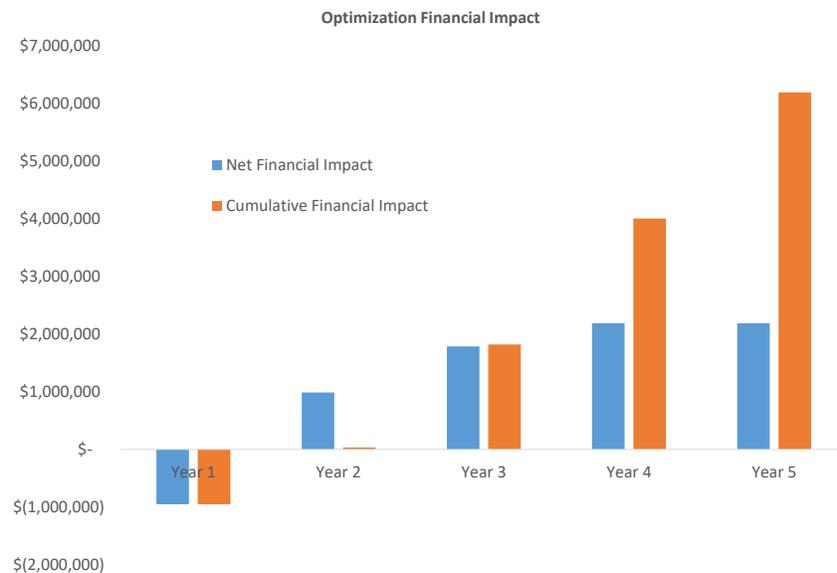
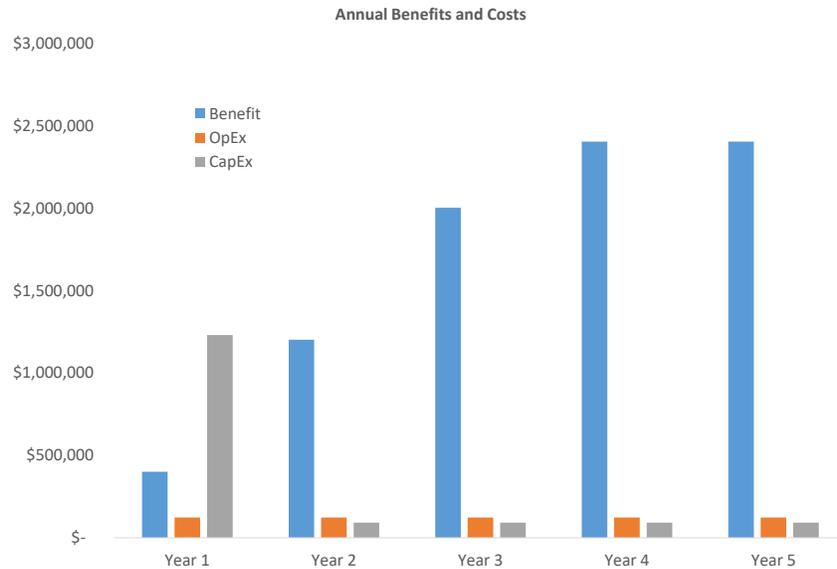
Consider a 50,000-meter municipal electric and water utility that has deployed AMI but never conducted any of the work to explore process improvement. This utility features advanced meters, but currently cannot capture any of the benefits they hoped for during project implementation. Some of the problems are readily apparent:

- Billing data is still manually transferred from the meter head end to the CIS
- Electric outage data is unwieldy, with system operators receiving hundreds or even thousands of outage notifications during an outage event with no real dispatching ability
- Customer service agents lack controls over customer accounts to easily make payment arrangements or schedule disconnects
- Meters are used to gather consumption data, but are not utilized to monitor distribution network conditions
- Increased volume of meter data has resulted in the need to pay for external hosting
- There is no systematic way to identify the potential site of water leaks, either on the customer-side or on the distribution-side

Fortunately, these problems could be fixed by putting in place some new systems (Meter Data Management, Outage Management System, Conservation Voltage, and Leak Detection) while also putting in place new protocols for data management and work processes. With an update to the overall utility process, the following annual benefits could be realized:

	Use Case	Annual Benefit	Sources of Benefits
Centralized Operations	Process Reengineering	\$231,335	Reducing read-to-bill cycle; enhancing billing efficiency; reducing bad debt
	Asset Optimization	\$367,739	Optimizing maintenance to extend asset life; deferring capital investment
Electric Operations	Outage Management	\$47,974	Increasing labor efficiency during outages; reducing outage minutes; extending transformer life; reducing cost of conductor splices
	Conservation Voltage	\$578,929	Reducing wholesale demand charges; reducing line loss
Water Operations	Leak Detection	\$793,224	Reducing system leaks; reducing cost of water treatment; enabling faster detection of customer leaks
	Smart Pumping	\$384,210	Increasing efficiency of pumps; reducing electric charges for pump operation

Properly designed, this redesign of the AMI system offers an annual benefit in excess of \$2.4 million. Since the AMI system has already been deployed, the cost of the AMI may be considered as “sunk cost” that need not be reassessed. Instead, we consider the incremental capital and operating expenses. The new capital needed to achieve these benefits is estimated at \$1.23 million, roughly 6 months’ worth of the forecasted benefit, while annual operating expenses are estimated to be roughly 5% of annual benefits. As a result, this utility can expect to generate full payback of the effort within two years, and cumulative financial impact to the utility is forecasted to exceed \$6 million over the first five years:



## Operational Issues

Successful AMI implementation involves managing the intersection of technology, business transformation, and customer engagement. Any utility that seeks to achieve the potential gains associated with an AMI deployment will need to address some of the inherent issues that arise from updating work processes. Some of the common business processes that need to be updated when moving to AMI include:

- Business Workflows – addressing how specific tasks need to be remapped to take advantage of the added capabilities associated with advanced networks and the availability of additional data
- Processes and Procedures – establishing updated processes and procedures helps ensure that updated business workflows can be supported
- Reporting – tracking system operations for new system capabilities and data management requires updating approaches for system monitoring and reporting
- Human Resources – changes are not only needed to the meter shop staff, but updates may also be required within field operations, finance, customer service, and other departments
- Data Mapping – in order to realize the full potential of AMI, it is crucial to ensure that operational systems are provisioned with the appropriate system configurations
- Data Access – each department within the utility should be able to access the AMI data; moving beyond using meters just for billing purposes enables utilities to realize full system potential
- Service Requirements – the deployment of AMI carries with it some opportunities to enable new capabilities within customer service, ratemaking, and field operations
- Performance Tracking – utilizing the aggregate systems can better enable utilities to monitor system performance; effectively, advanced meters now can be utilized as health monitors of the distribution network

In addition, there are a number of systems that need to be updated and included in the overall AMI system architecture:

- Account Management
- Asset Management
- Billing Management
- Credit & Collection Management
- Customer Care
- Financial Management
- Inventory Tracking
- Rates Management
- Service Order Management
- Usage Management

**Summary**

Many electric and water utilities have found that AMI systems have greatly increased operational efficiency. Those that have achieved the greatest gains are typically the ones that have invested the most time and effort and training toward ensuring that process change accompanies the deployment of new technologies.

The best time to pursue these changes is after selection of the AMI vendor, but before full system deployment. Ideally, a utility should take the time to deploy a small “pilot” portion of the system to test business processes and data mapping protocols. While a pilot may not be needed to ensure the technical performance of the meters themselves, there is tremendous value in using this stage to explore the process improvements that need to happen. Without them, any utility employing AMI runs the risk of creating tomorrow’s legacy network. However, with a careful approach to process change, a utility stands to achieve strong results from their AMI system.