Understanding the total cost of smart meter operations

Introduction
As of 2014, we estimate that over 30% of the global utility market has rolled out its smart meter solutions. As the number of meters installed and those in operation increases, utilities are starting to realize that achieving the expected benefits of their smart meter implementation can be complex and cost challenging.

Traditionally, utilities have focused their energy on managing and controlling the cost to implement, logically the critical aspect to manage. Key items with regards to implementation such as meter procurement, deployment, software licenses, project management and other information technology (IT) costs have been among those actively managed and monitored. However, as the number of installed meters
increases, the cost to operate and maintain these meters has slowly begun to creep higher than expected, at a rate that is unsustainable.

It is essential for utilities to understand that at some point, the smart meter project will be complete and that resulting support and maintenance of this new meter network will have to be transitioned to a sustainment model. If utilities start their smart meter program with this end state in mind, they will be more adequately prepared and will ensure continued success of their smart meter program while taking advantage of the expected business benefits.

Why are costs not being fully managed or measured?

Smart Meter Operations are a complex endeavour for utilities. This inherent complexity may make it very challenging for a utility to get a true view and understanding as to what the total cost to operate (TCO) the smart meter network is. Inexperience with smart meter operations, organizational structure challenges, and long project durations create barriers for a utility to actively monitor and manage these costs.

Managing the operations for a utility’s smart meter network represent a new business function to a utility. It is not part of the core established practices and creates needs for new skill sets, new technologies, new risks, and additional unknowns. This lack of experience and understanding can create gaps in the utility’s ability to identify and manage cost items within the operating model.

Projects related to the implementation of a smart meter network are longer in duration than many other IT projects within a utility. Deployments run over several years with multiple releases of technology and business functionalities throughout the project. In reality, operations begin as soon as the first smart meter is installed, and in many cases utilities build the capability to handle operations within the projects, leveraging project budgets and contractor-based resources. This approach may serve its purpose while in project mode, but once the project closes and begins to transition to a sustainment model, it has been observed that teams struggle for additional resources within the organization to incorporate the new function.

The value chain to realize the expected benefits of a smart meter program is not aligned to how a utility is organized. Established business units such as customer service, customer billing, network engineering, information technology, supply chain, metering, and field service as well as new business support entities like meter operations and meter network testing teams all participate in the smart meter value chain. This siloed approach creates deferred decision making and redundant costs across multiple budgets. However, like a domino effect, decisions made within one unit have immediate financial / operational impacts on another, pushing the need for greater collaboration between the business units. It is important for a utility to recognize this and either have a team responsible for the end-to-end smart value chain and supporting operational level agreements between units, or to outsource the support with strict business based SLAs.

What are the major cost elements that impact smart meter operations?

To efficiently manage a smart meter network and understand the costs associated with it, utilities must recognize that Smart Meter Network Operations reaches well beyond the management of networks. Many elements have an impact on the total cost to operate the smart meter network and controlling these elements and their interdependencies is critical to creating a cost efficient smart meter network.
1. Exceptions/error handling: Both head-end systems and meter data management systems are new enterprise applications being introduced into the utility IT environment. As volumes of data increase with each incremental meter joining the network, the number of errors and exceptions generated by these applications also increases proportionally. Continuing to add FTEs in a linear fashion to support the handling of exceptions is not sustainable. The quality of the workforce, level of automation, and the strength of the business processes are all important elements that will contribute to the overall TCO of the smart meter network.

2. Meter mitigation and field intervention ratio: Cost of field service to repair or replace operational technology (OT) equipment is one of the decisive cost items to impact the TCO of a smart meter network. The volume of field intervention as a ratio of the total meter estate (FIR – Field Intervention Ratio) is a very important KPI that utilities should actively track and monitor. Remote troubleshooting and active problem management is the cornerstone of any smart meter operations solution. All efforts should be directed towards resolving any OT issue remotely, and a field work order should be placed only when all other efforts to resolve the issue has failed. Strength of the team, the availability of proper tools, and processes designed with this cost control mindset are all important factors to control this cost element. Our observations in the market demonstrate that a best-in-class smart meter network operation should have a FIR between 1-2%. Small improvements in the FIR can generate significant savings. For example, a 1M meter utility that is able to reduce their field visit intervention by 1%,\(^1\) would generate an OPEX avoidance ranging between 3M€ and 4M€ annually.

3. Scarcity of skilled resources: Through the project phase of smart meter deployment utilities tend to rely on sub-contractors to fill temporary project roles. This is done for many valid reasons ranging from lacking the skill set within the organization to project completion within a stipulated time frame. However, as the project bleeds into a sustainment view, utilities find themselves still highly dependent on higher priced sub-contracted resources to operate and manage their smart meter network. The lack of skilled resources in the market coupled with an absence of long term strategy can leave a utility in a fragile and costly position. It is important for a utility to have a long term sustainment strategy in place early in their project so that the project activities can be built around this sustainment model. The high demands of skilled resources have started a trend for utilities to look toward an outsourced model to manage the smart meter network and control costs.

4. Customer service costs: Customer service activities are one of the cost items that are directly linked to the success of smart meter operations. As the number of field visits required to customer sites increases and the quality of meter reading and customer billing decreases, the effect on volume of calls to a customer support centre will increase and overall customer satisfaction will most likely decrease. As an ancillary effect, the increased scrutiny from regulators and government can create noise within the organization and add costly remedial programs to a utility’s operational costs. Utilities must realize this co-relation and monitor it so that issues that may evolve can be flagged and addressed early before they become wider scale enterprise issues. Linking customer service levels to the TCO of a smart meter network operation is a prudent approach to the overall health of the business.

5. Utilizing and Managing big data: One of the key secondary benefits of a smart meter program is the ability to more efficiently run grid operations through the analysis and management of data that becomes available through the smart meter network. Grid reliability, revenue protection, and outage planning/notification are only some of the future enhanced services that can be made available. Utilities that are not adequately capitalizing on this are missing out on valuable opportunities to reduce

\(^1\)Based on observed truck-roll cost, during operations, ranging between 300€ and 400€ depending on the continents.
cost, increase efficiency and improve customer service throughout their organization, not just within their smart meter network operations.

6. **Logistics:** Controlling the smart meter network supply chain for all OT assets is important to ensure full traceability of the assets, the leveraging of available warranties for faulty meters and equipment, and the re-use of un-mounted meters and parts. Again pointing to the interdependencies, controlling the supply chain while understanding the configuration inventory of the meter estate are critical aspects that will affect the ability to remotely mitigate meter issues and prevent unwarranted field work. To effectively manage this risk, teams will require strong tools and processes to prevent asset shrinkage and cost inefficiencies.

By having a strong understanding of the broader scope and also interdependencies in operating a smart meter network, a utility will be better equipped to identify where cost pressures are emerging from and react accordingly. Addressing these pressures early in the implementation project will serve great dividends to the overall business.

## Conclusion

Utilities must closely monitor the activities/cost centres identified to avoid slippage of cost and escalation of FTEs. A very successful implementation can be spoiled by inefficient uncontrolled operations. By understanding the value chain of the smart meter network and how it relates to their existing operations, utilities will be better equipped to make strong decisions on their operations (in-house vs. outsourced) and ensure the expected benefits of their smart meter networks are realized. This effort can be facilitated through the creation of a detailed operational strategy early in the implementation project. In any scenario, a utility’s first step to control its operational costs related to the smart meter network is to understand, what to explore.

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