Benchmarking Large AMI and Smart Grid Programs: 
Are you doing the right things, in the right sequence, at the right times?

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Successful smart grid solution implementation is the result of many factors that go well beyond the technologies themselves. Successful project implementation requires vigilant work by all members of the team from start to finish. Wildly successful projects guard against complacency by continuously asking that all-important question, “Are we doing the right things, in the right sequence, at the right times?”

For utilities where implementation of advanced smart grid technologies is already under way, projects can be enhanced by taking time to periodically validate and reassess the critical elements driving success. For utilities that are ready to take the initial steps to evaluate their options or begin a project, a thorough and open assessment of their readiness can be applied and thus provide valuable insights that will contribute to long-term success.

Benchmarking of a smart grid implementation can be accomplished through comparison to best practices, as well as to other utilities’ experiences.

**BEST PRACTICES**

Successful smart grid projects typically examine a number of industry-accepted benchmarks whose key elements include:

- Business Opportunity Assessment
- Business Process Redesign
- Change Management
- Customer Communications and Engagement
- Project Implementation Framework
- Program and Project Management
- Performance Metrics

Refer to the checklist at the end of this article to benchmark your project against industry standards.

**Business Opportunity Assessment**

A clear understanding of project costs and benefits is essential for smart grid implementation success. The business case must accurately and honestly assess the total costs of the project and the potential benefits. It also needs to accurately account for the fundamental changes to the utility’s operations that are expected to occur with successive implementation of each project phase. At this upfront stage, it is critical to have the buy-in of the impacted organizations including commitment from key stakeholders.

The range of underlying benefits and costs can vary significantly by project and utility, making it essential that these be examined in the context of your utility’s operational, strategic and regulatory drivers.
Assessing Costs
Benchmarking of costs is important but challenging. Project cost is influenced by a wide variety of factors. For example, a seemingly simple benchmark that looks at the “average cost per meter” or “average cost per customer” can be influenced by a number of utility-specific circumstances, such as: How mature is your utility's infrastructure? What is the relative age and flexibility of the underlying IT architecture upon which the smart grid solutions will be implemented? Will the proposed solutions be primarily owned and operated by the utility, or will portions be outsourced? What financial contribution is the project expected to make for utilizing, refreshing or expanding portions of the existing utility infrastructure like the communications network, or perhaps expanding it with new capabilities and functionality? What level of expertise resides in-house to manage the project, and what level of third-party support is expected?

Achieving Solution Benefits
The benchmarking of benefits is equally important but can also be tricky. This involves not only the benchmarked value but also the ability and preparedness of the utility to achieve the benefit goal. How realistic and achievable are the proposed benefits? Has your utility performed an accurate assessment that properly classifies each benefit as hard, soft, societal, etc.? What categories of benefits will be considered, such as organization operational improvements as well as new customer services and products? Are the benefits achieved on a one-time or recurring basis, and in which parts of the organization do they accrue? If, for example, labor savings are projected for the reduction of field metering and related services, does the impacted organization support these and does the utility’s long-term budget plans reflect the reduction of workforce that this benefit implies? Have previous investments in predecessor technologies such as automated meter reading (AMR) already reaped some portion of the expected benefits, and are you able to distinguish the incremental benefits expected of the planned smart grid solutions?

Business Process Redesign
Successful project implementation and benefits realization requires a keen understanding of the utility's current state (“as is”) business processes, the potential business process impacts, and the future state (“to be”) business processes that the solution is expected to enable. Business process engineering and redesign examines the expected business and operational benefits, and thus provides critical inputs to the design of the systems and solution integrations that are necessary to achieve these functions. Honest and thorough business process design and verification provides the framework for the underlying project design and changes therein, which results in successful achievement of critical project requirements. Assessing and adjusting your utility's business processes is an iterative activity that should be continuously performed to assure that the appropriate combinations for success are achieved.

Change Management
The implementation of smart grid technologies touches virtually all parts of the utility organization. Successful smart grid solution implementation is not based solely on technology, but rather is based on how well the utility employees and its customers adopt and embrace the solutions that these smart grid technologies enable. Change management recognizes the company culture and represents the structured approach that leads employees, various interested stakeholders and, ultimately, customers through the successive project phases to successful implementation. While success is measurable in many ways, it is certainly measured by the degree of success that the utility achieves as it moves from its current state practices, through the temporary or interim states that are necessary during deployment, through final completion and sustaining adoption. Change management is a perpetual process.
Customer Communications and Engagement

Working hand in hand with change management, successful project implementation requires proactive and careful communication with your customers. Smart grid technology projects create profound changes to “business as usual” within the utility, and thereby require a skilled utility workforce that understands how to effectively implement the solutions to ensure maximum engagement with its customers. Lessons abound throughout the industry of successful implementations built on outstanding communication, and the pitfalls that can be encountered when such communication is absent or misdirected. Positive examples include web portal implementation, advance customer notifications, customer education sessions, robocalling, and evolving game approaches.

Implementation Framework

Successful smart grid project implementation requires a tightly integrated plan whose framework necessitates a wide range of expertise from virtually all core lines of the utility business, yet provides the flexibility to adapt to the inevitable changes that will occur. In developing a cohesive smart grid implementation framework, it is useful to think through the project life cycle and phases. Figure 1 represents a common industry smart grid implementation approach.

![Figure 1. Smart Grid Project Implementation Life cycle](image)

The suggested project life cycle represents a logical sequence of activities to accomplish the smart grid project’s goals and objectives.

- These are initially defined by the Business Case and Smart Grid Vision task in the Vision/Select phase.
- This is followed by the Plan phase, in which the solution is fully defined in all dimensions to establish the project baseline, including business process, solution architecture, detailed requirements, and project management deliverables such as the master schedule.
- The Design phase is where the underlying design of the various smart grid technologies is devised, and IT elements such as the MDMS, Energy Web Portal and DRMS are configured.
- These different elements all come together in the Build and Run phases, where the system is built out, technologies and solutions are deployed, and all components taken through increasingly larger elements of test. Testing itself progresses from verifying functionality and integration to validation of integrated business processes.
The final stage is when the fully validated solution is made operational and your utility uses the system in day-to-day operations.

**Program and Project Management**

Success is incumbent upon successful implementation of sound program management principals. Comprehensive planning is needed, beginning with development of a smart grid technology implementation plan (See Sidebar). Other critical project management practices include development of, and tracking to, a reasonable and appropriate Scope of Work (SOW), Work Breakdown Structure (WBS), baseline schedule, financial and resource plans, requirements traceability matrices, integration and test plans, and other project management plans (e.g., risk and quality plans). In addition, management, oversight, scope and timing are key elements that often “slip” over time so vigilance is necessary for these areas.

Project success also depends on identifying, planning for and addressing key regulatory issues and drivers. Important considerations include state and federal mandates or incentives, opt-in/out provisions and the potential acceptance or rejection of proposed cost recovery mechanisms.

**Performance Metrics**

Well-defined performance metrics define and support successful smart grid solution implementation. Metrics should be clearly defined to allow the utility to measure progress at key implementation phases and determine that the expected results are achieved. Key Performance Indicators (KPIs) should also be adopted to assess and measure the attainment of actual benefits achieved as compared to the expected benefits derived during the business case assessment. Finally, customer satisfaction surveys can be restructured to measure the impact and adoption of smart grid investments by your customers.
PERIODIC ASSESSMENT

The advancement of smart grid technologies and solutions will profoundly reshape the future landscape of utility services. Smart grid projects almost by definition are transformational in nature and thus have the potential for significant positive impacts on the organization. Conversely, challenged projects can have significant negative impacts and thus these projects require attention to the items identified above.

Making time to stand back and assess your project’s success can help maintain focus and avoid missteps. Good questions to periodically ask include:

- Are we being too aggressive or conservative in our approach to costs and benefits?
- Based on the experiences of others, is our effort proceeding at the appropriate pace?
- What unexpected requirements (internal and/or external) have others needed to address?
- Have we adapted our business processes to the changes that smart grid solutions bring, and are we ready to take full advantage of these new solutions?
- Is our utility workforce trained and ready to embrace the changes these solutions require?
- Are we communicating effectively with our customers so that they are able to fully benefit from these investments?
- What lessons can be gleaned from other utilities to reduce risk in executing our smart meter program?

For utilities in all stages of examination and implementation of smart grid solutions, this article offers insights to help guide them through an assessment and validation of their opportunity for increased success by exploring the question “Are you doing the right things, in the right sequence, at the right times?”

CHECKLIST FOR BENCHMARKING AMI AND SMART GRID PROGRAMS: ARE YOU DOING THE RIGHT THINGS, IN THE RIGHT SEQUENCE, AT THE RIGHT TIMES?

Financials

- Business case model fully accounts for the total life cycle costs associated with all of the investment decisions made by the project, and those costs are built into the utility’s long-term budgets
- Project budget contains sufficient detail to account for all activities and can be readily rolled up to view
- Financial models fully account for the total life cycle costs associated with all of the investment decisions made by the project and are built into utility’s long-term budgets

Business Process

- Utility has mapped current state (“as is”) business processes and has a full understanding of future state (“to be”) business processes that the solution is expected to enable along with their impacts
- Utility has mapped the complete suite of new technologies and all required integrations to future state business processes
Change Management

☐ Utility has a well-defined and visible change management plan that reflects the utility’s culture and its customers, and provides the roadmap to guide the project through successful completion

☐ Utility has studied lessons learned from other utilities and applied them to its change management approaches

Customer Communications and Engagement

☐ The communications plan is comprehensive and involves all key internal and external stakeholders

☐ Metrics are in place to objectively measure the effectiveness of communication efforts and customer engagement

Project Implementation Framework

☐ Implementation plan/framework provides for a logical sequence of activities across the smart grid project life cycle to accomplish the utility’s goals and objectives

Program and Project Management

Work Breakdown Structure (WBS)

☐ The project’s WBS provides an effective and informative structure that allows individual contributors, resource managers and executives to understand how the key elements of the project are linked together

☐ WBS provides good visibility on the key project deliverables and supports meaningful tracking and understanding of the underlying financial metrics that demonstrate how well the project is performing

Schedule

☐ Project team accurately accounts for actual progress against the baseline schedule and thus provides an accurate representation of how well the project is tracking toward completion

Resourcing

☐ The project is properly resourced by utility and vendor personnel based on the project schedule and WBS

☐ The organizations in which the project participants reside are able to continue to meet not only the needs of the project but also the ongoing needs of the rest of the business

Performance Metrics

☐ Metrics are clearly defined to allow the utility to measure progress at key implementation phases and determine that the expected results are achieved

☐ Project reports facilitate tracking of progress against performance metrics
AUTHOR BIOS

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