

Path to a Successful DLMS Deployment

Background

Customer:

Large utility in Malaysia

Region:

Asia Pacific

Industry:

Power Generation, Transmission, and Distribution

Solutions

- DLMS Consulting & Validation Services
- ASE DLMS FET & ASE DLMS Meter Explorer

Challenge

The utility sought a DLMS consulting partner for its nationwide AMI roll out to resolve interoperability challenges between various vendors involved in the project.



Business Need

One of the largest utilities in Malaysia planned an Advanced Metering Infrastructure (AMI) deployment based on DLMS. The initial phase included +300,000 DLMS-compliant smart meters in one of the states in the southwest coast of Malaysia. The long-term plan approved by the utility's Board of Directors is a phased rollout of smart meters to its +8 million customers, over 5-years with completion targeted by the end of 2021.

Key benefits the utility sought in deploying AMI were:

- Ability to potentially offer new services such as demand response, enhanced time of use tariffs, critical peak pricing, outage management, enhanced customer experience and net energy metering.
- Part of government initiative to improve service quality under the 11th Malaysia Plan.

The utility selected products from three different meter manufacturers, two communication vendors and a Meter Data Management System (MDMS) vendor. The AMI specification developed by the utility for vendors to comply with identified DLMS specification (IEC 62056 parts 42, 46, 47, 53, 61, 62) as a requirement which all the vendors met. A pilot project involving a total of 1000 consumers in 2 states was completed in March 2015. The intent of the pilot was to enable the utility to understand the technologies, regulatory and customer challenges in deploying AMI.

During the pilot phase of the project, the utility discovered interoperability issues at multiple levels. They found during system integration that the meters, communication modules, data concentrators and head end systems from different vendors were not interoperable. Each vendor was DLMS compliant but differences in their respective interpretation and implementation of the DLMS standard resulted in incompatibility challenges.

While DLMS is a comprehensive metering protocol, it offers multiple choices for data models, communication profiles and media, data security and OBIS codes. Hence, DLMS implementations across vendors are very likely to be different and result in interoperability issues.

Solution

The utility selected Kalkitech to consult and provide guidance and technical knowledge to help ensure a successful DLMS adoption. Kalkitech has deep expertise with DLMS/COSEM and has actively participated in standards development as well as other aspects of smart metering projects including Meter Data Management (MDM), Meter Data Analytics and Home Area Networks (HAN). In addition, Kalkitech has implementation experience in various international DLMS companion specifications such as with Iberdrola (Spain), CIG (UK) Italy, TEPCO (Japan), DSMR (Netherlands) and SEC (Saudi Arabia).

Kalkitech recommended the utility take a step back and develop a standard framework for all future projects related to DLMS-based field devices and communication interfaces. This approach was intended to benefit the utility by reducing total cost of ownership and project rollout time as well as enable assessment of security risks in advance so that contingency plans could be developed.

Kalkitech outlined a multi-phased project plan based on best practices and shown in Figure 1.

Kalkitech's team of technical experts assisted the utility in the development of their own tailored DLMS Companion Specification in addition to providing guidance on implementation and associated processes for best practices. The Companion Specification serves as the backbone for successful DLMS projects. It is tailored for a specific set of utility or regional requirements and can also serve as the basis for interoperability tests to reduce issues that may arise at the time of integration in a multi-vendor system environment. A well-defined Companion Specification is used as a foundation during all phases of a successful AML rollout and can evolve over time as needed.

Kalkitech Project Deliverables Overview:

- **DLMS Companion Specification:** Development of a utility-specific Companion Specification started with analysis of the utility's functional and technical requirements, use cases, current specifications etc., which was captured over detailed discovery sessions with multiple stakeholders. Business requirements were then mapped to COSEM objects. The draft Companion Specification was presented to the utility and then circulated to involved vendors for review and feedback. Vendor workshops were conducted as part of the process to complete the specification.

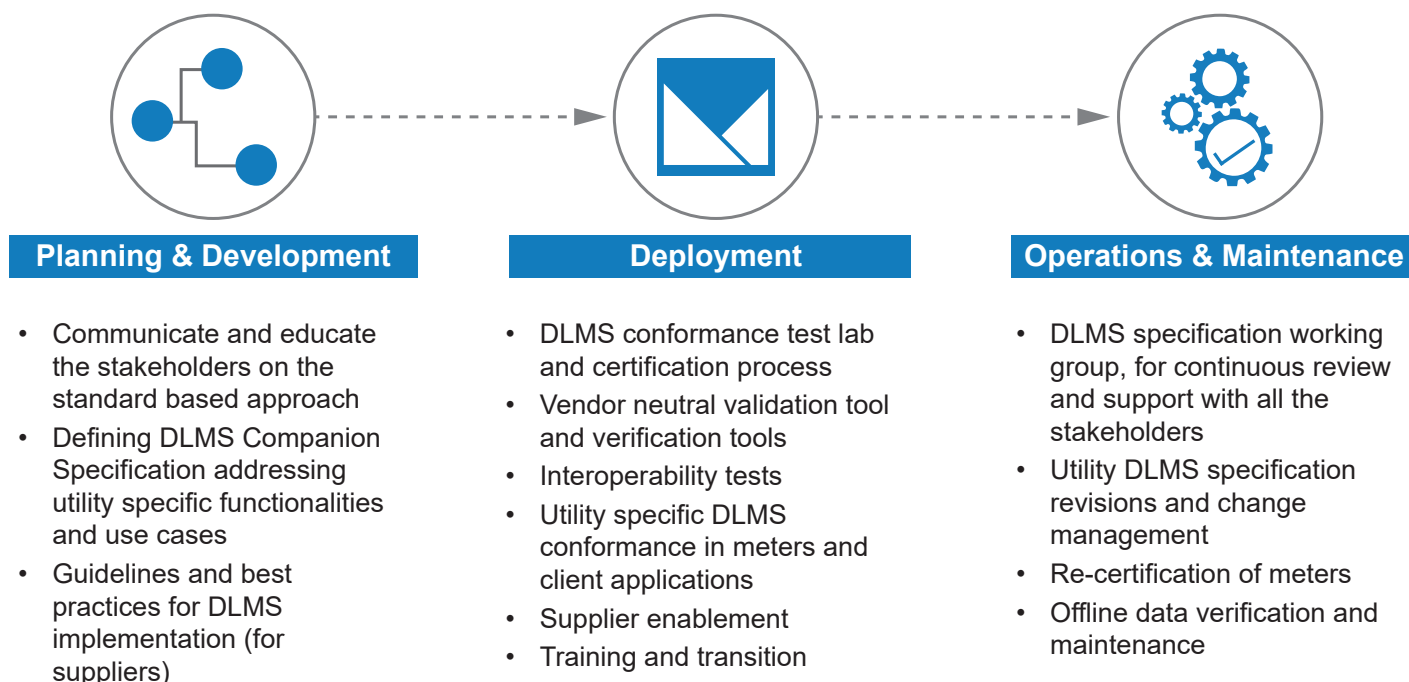


Figure 1: Recommended Best Practices for DLMS Projects

- **Conformance and Certification Test Lab:** The purpose of the lab is to verify conformance of the meters for compliance with the utility's DLMS Companion Specification. Kalkitech worked with the utility on defining a test case list for evaluating meter conformance. Kalkitech configured its Functional Evaluation Tool (FET), a PC-based software tool, to meet the utility's DLMS conformance test requirements. FET was set up in the utility's metering lab and training was provided to in-house meter test engineers on the usage of the tool for executing test cases and generating a conformance report. In addition to reports, FET also supports other output files such as communication log and traffic to help in verifying the tests. Figure 2 below shows an overview of the conformance and certification lab.
- **Technical Advisory on DLMS:** Kalkitech led periodic vendor enablement workshops to educate vendors on utility's Companion Specification as well as on protocol integration and vendor product customization to help ensure compliance. The scope also included enabling all the stakeholders within the utility to adopt the standards with ease.

Results

Kalkitech's engagement with the utility on development of its DLMS Companion Specification provides long-term benefits for the utility enabling them to continue to build out their AMI deployment, meeting schedules, reducing compatibility and system integration risks and reducing overall cost of ownership.

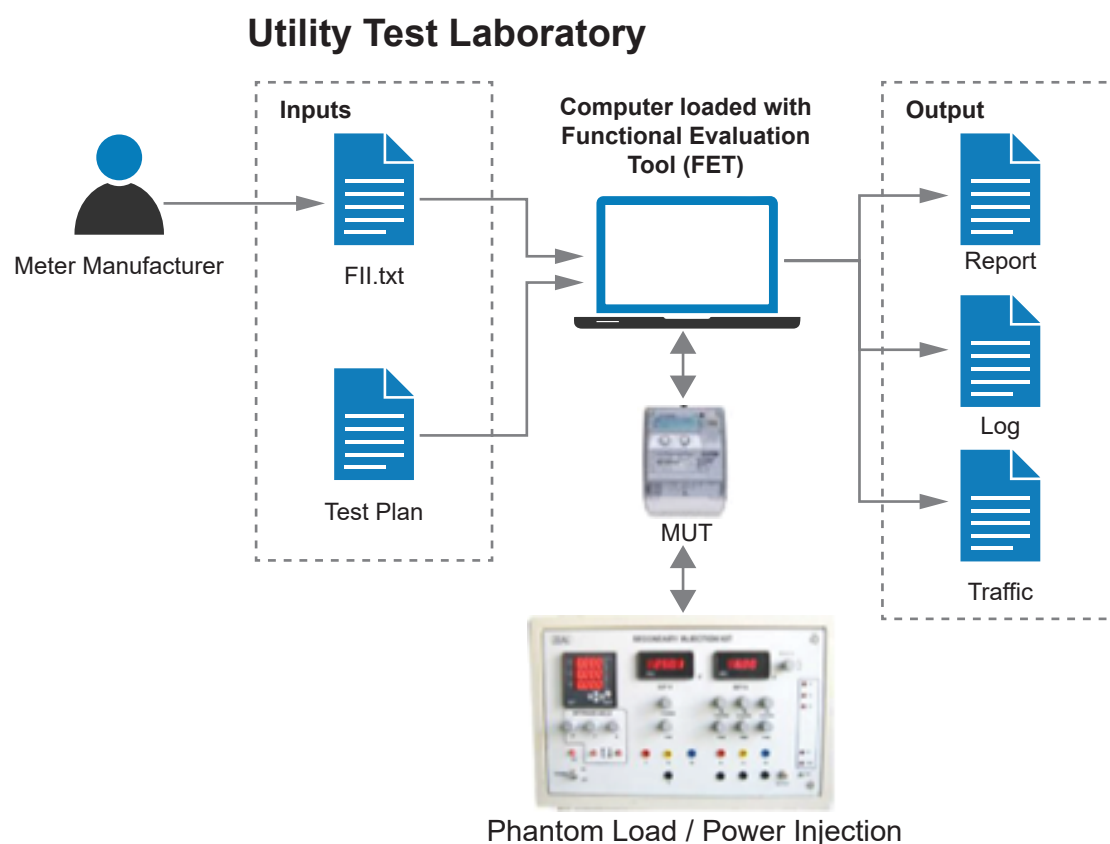


Figure 2: DLMS Functional Evaluation Test Overview