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The ABCs of MDM

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Add yet another acronym to the metering professional's lexicon. Meter data management, or MDM, is gaining ground as a system add-on. Also referred to as MDMS, which stands for meter data management *systems*, this technology bridges the gap between consumption-data collection devices at customer premises and a host of applications that can use such information throughout a utility.

"Utilities have always managed meter data to some degree," says Kris Beck, chief operating officer for WACS, LLC, an MDM provider. "But now that utilities are installing advanced metering infrastructures, there's more data to be managed." That, Beck maintains, is why the need for meter data management systems is on the rise.

MDM 101

Asked to define MDM, you'll hear a quick answer from Patti Harper-Slaboszewicz, director of AMR and demand response for UtiliPoint® International, a research and consulting firm. "It's a place for utilities to put meter data," she says, half joking about the simplicity of her answer. She defines meter data as any information a meter can supply the utilities, which may include customer consumption, as well as voltage information, blink counts, tamper alerts and more.

Beck adds to this description. She notes that MDM is the place where information from metering devices can be "consolidated, cleansed, validated and made available to authorized parties" inside or outside of the utility. This definition leads back to what

Harper-Slaboszewicz says is a key purpose behind an MDM: allowing different utility users to "retrieve data in different ways, or to retrieve subsets of data."

For instance, interval data that will help distribution system planners size transformers may be of little value when sending residential bills that reflect only the total consumption within a billing period. Similarly, blink counts may have little use in an outage management system, but integrating the same blink counts into a vegetation management system could help utility professionals see when and where it's time to trim trees that might be slapping against power lines on windy days.

No wonder Wendy Lohkamp, director of meter-data management solutions at Itron, an AMR technology company, defines MDM systems as something that helps "centralize the *processing* of meter data – including collection and distribution." Along with handling the ins and outs of data, experts cite a few must-have MDMS features.

The Basics

Harper-Slaboszewicz – and the two other experts interviewed for this story – maintain that any MDM should be vendor-neutral when it comes to metering collection systems themselves. That is, the system should be able to process data regardless of the collection method used.

"Most utilities use more than one meter-data collection technology," Harper-Slaboszewicz says, explaining that at the very least, most utilities have different meter-reading systems for residential customers versus their largest commercial or industrial accounts.

Lohkamp adds that MDM systems might be useful regardless of whether the utility is using handheld, mobile or fixed-network meter-reading equipment. "A lot of utilities use MDM for multi-vendor integration," she says.

Other essential features of an MDMS include:

Persistent storage of data

"There has to be a data repository," Lohkamp says. "That's a persistent data storage space so utility managers can go back and examine the data over time."

Validation, editing and estimation (VEE) capabilities

Editing functions in the MDM allow users to make data changes or corrections and then resave the data to the MDM repository. Estimation capabilities help the system fill gaps in whatever meter data was collected.

Validation means that the system looks at data coming in and uses consistent rules to judge whether the data seems reasonable, Beck explains. She notes a case where data has been coming in at a rate that produces a predictable consumption increase every day, and then all of a sudden, the consumption "spikes to a very large number or goes negative." According to Beck, that would indicate something happened to make the meter data

suspect. Validation routines can help utilities catch outliers quickly, she says, thereby finding meter malfunctions, tampering or other device problems.

Tracking for multiple versions of data
Lohkamp sees this as a fundamental MDM feature because she points out that the same data can come into utility systems multiple times. For instance, users might edit and resave the data. Multiple queries of meters with memory would also result in different versions of the same information.

Another example: Sometimes meter-reading technologies overlap, and a utility with a fixed network solution for most of its customers might have a few customers on the outskirts of town whose meters don't consistently reach network data-collection units, so those meters are read with drive-by technology as a back-up. The result? Duplicate data, and Lohkamp maintains that the MDM system should be able to identify it.

Calculation of values for billing
Lohkamp also says MDM systems should be able to do calculations necessary to present final billing values to the billing system. Aggregation, time-of-use billing calculations, net metering and demand-ratchet calculations are among the computations she sees happening in the MDMS.

Interfaces to utility systems
Harper-Slaboszewicz adds interfaces as an MDM essential. Beck agrees. "You have to have a way to get the information to other utility systems," Beck says. In addition, she notes that an MDMS should have reporting capabilities, and it should support query from a variety of utility applications.

Big Benefits

Why do utilities add MDM systems? The flood of data from fixed-network AMR systems is one driver. A customer information system – CIS – "can only handle getting data once a month, and now there are meters sending data every hour," Lohkamp says. "An MDM system fits nicely in the middle as a collection point for data that's going to be used further upstream" throughout the utility.

All three experts quoted in this story can recite a long list of "upstream" users for the metering data, including capital investment planners, revenue protection units, demand forecasters and outage restoration staff.

Considering all the potential users of the data, Harper-Slaboszewicz cites "risk management" as another benefit of an MDMS. "You want to be able to change the applications that use meter data," she says, but sometimes, changes in one application require changes in others. "With a meter data management system, you don't need to change other utility applications until you're ready to, because the MDMS acts as a buffer." It also allows utilities to leverage their investment in advanced metering at their own pace, she maintains. "You don't have to get all your applications running at the same

time."

This flexibility can be a big plus for any utility that might become involved with a merger or acquisition, Lohkamp says, because MDM systems allow utilities to expand or contract their meter reading technologies – as they might in a merger -- without affecting billing systems adversely. "We see a lot of acquisitions going on now," she observes, and the result might be that a utility winds up looking at "two billing systems, four handheld systems, five MV-90 systems and AMR from two different vendors. To rationalize that, you would probably look to your MDM systems," she adds. "A utility with MDM before an acquisition is going to be a lot more nimble."

Finding MDM's Place

Some benefits MDM systems deliver translate beyond the electric utility world and into gas and water utility markets, as well. Harper-Slaboszewicz says that while MDM is more prevalent in the electric industry, there are applications for utilities selling other commodities. "Leak detection is one area of interest to water utilities," she says. She also notes that more detailed information could help gas utilities with demand forecasting. Customer service advantages and on-demand meter reads are two other benefits for any utility type. So are consumption audits in which customers could compare their usage to that of other households with similar characteristics.

To help utilities understand what MDM offers, Harper-Slaboszewicz was instrumental in creating AMI MDM, an organization and online forum for utilities and regulators interested in moving forward with advanced metering infrastructures that facilitate collection of high-interval meter data with enterprisewide applications.

"Utilities are looking at guidance on what to look for and how to evaluate technologies, and those utilities that already have AMI want to know how to leverage their systems," Harper-Slaboszewicz says. Her vision of the AMI MDM group is to provide a backdrop for free exchange of information among utility professionals and others who "assume there's more than one good way to do things." AMI MDM is in the process of developing a framework to evaluate the benefits of MDM and to relate MDM requirements to benefits. Free articles and white papers are already available on the group's Web site.

Ahead, the organization may develop best practices and guidelines that will likely reflect the group's stated belief that AMI and MDM work best when paired. "In general, if a utility has invested in advanced metering, it will be difficult to attain all the benefits possible without adding MDM," Harper-Slaboszewicz concludes.