Best Practices: Veolia Water
Transforming Metering — The m2ocity
Innovative Business Model and Oracle
Utilities MDM Deployed by Power Reply

IDC Energy Insights: European Utility IT Strategies

BEST PRACTICES #EIOS04T

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IDC ENERGY INSIGHTS OPINION

Smart metering is being heavily discussed across Europe and the rest of the energy world, but while there are at least a handful of smart metering initiatives concerning electricity and even fewer concerning gas, water smart metering is still for the most part ignored. France-based Veolia Water is among the pioneers in water smart metering, and a world leader in water and wastewater services. It is responsible for the installation and maintenance of more than 20 million electromechanical water meters worldwide, and a significant share of its revenues is directly generated by these water meters, so deployment of smart water meters was an obvious next step to enhance its operational performance.

- Veolia Water's Meter Data Management project was begun as part of an IT modernization initiative, starting in Veolia Water France and simultaneously implementing new applications for billing, customer relationship management (CRM), meter data management (MDM), and work order management (WOM). The objective was to restructure the IT architecture and reduce manual labor by introducing a higher level of automation. It is expected to "go live" by the end of 2011 in France. Veolia Water selected the Oracle Utilities Meter Data Management solution to be deployed by Reply's energy and utilities arm Power Reply.

- In the meantime, Veolia Water's MDM project has expanded to support the needs of its newly created metering service company, m2ocity. m2ocity was created in April 2011 in collaboration with Orange, the mobile telecommunications operator, and will focus on remote environmental data and water meter reading services.

Veolia Water's smart metering project is enabling the company to offer new or improved services to its different types of customers, and the creation of m2ocity is a clear step toward the development of new service offerings.
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IN THIS STUDY

This study provides an in-depth look at Veolia Water's overhaul of its water metering services by deploying smart water meters and field sensors and a meter data management solution that offers better customer service through more accurate billing and greater efficiencies through early loss and theft detection. The study analyzes the evolution from a smart metering project, including the selection of the Oracle Utilities Meter Data Management solution, to the creation of the m2ocity metering service company by Veolia Water.

IDC Energy Insights' Case Study Series

IDC Energy Insights' case study series provides utilities with a fact-based, comparable, consistent, and independent view of projects implemented across geographies. The focus is on information technology (IT) and operational technology (OT), or more broadly on energy technologies implemented in the energy industry. Collaborating with utility company and IT vendor personnel directly involved in the projects, IDC Energy Insights is able to gather all the relevant information, analyze the approach, and assess the solutions aimed at meeting organizations' goals. Case studies are assessed on four criteria, which IDC Energy Insights believes are critical to generate additional value: the contribution to operational effectiveness, the degree of technological innovation, the transformational impact on the company's businesses, and, more broadly, on the utilities industry value chain.

Why This Case Study?

This case study was selected as a demonstration of a best practices approach in the area of operational excellence and innovation. While there are a handful of smart metering initiatives in the energy area, particularly in the electricity sector, smart metering in the water sector is still rare. The Veolia Water project is very interesting for multiple reasons — it involves smart metering implementation in the water business, it combines investment in network infrastructures with a redesign of the IT applications (particularly the MDM solution), and it is evolving in a unique way in terms of transformation of business models. One such transformation took place on March 28, 2011, when Veolia Water and Orange announced the creation of a new service company, m2ocity, an operator specialized in remote environmental data and water meter reading services.

SITUATION OVERVIEW

Company Overview

Veolia Water is a world leader in water and wastewater services. Specializing in outsourcing services for municipal authorities, as well as industrial and service companies, it is also one of the world's major
designers of technological solutions and constructors of facilities for water and wastewater services. Veolia Water is involved in all stages of the water cycle: it withdraws water from the environment, it produces and distributes drinking water and industrial process water, and it collects and transports wastewater to Veolia's treatment plants where the water is made fit for recycling or is discharged back into the ecosystem. Veolia is also active in seawater desalination.

Founded in 1853 as Compagnie Générale des Eaux, the company changed its name to Veolia Water in 2005. It is one of Veolia Environnement's four divisions, along with Veolia Environmental Services, Veolia Energy-Dalkia, and Veolia Transport. With 96,260 employees in 67 countries, Veolia Water provides water services to 100 million people and wastewater services to 71 million people. Its 2010 revenue was €12.1 billion ($16 billion), more than half of which came from outside France (see Figure 1).

In April 2011, Veolia Water announced the creation of a new company specialized in remote environmental data and water meter reading services, m2ocity, which is a joint venture between Veolia Water and Orange, the mobile telecommunications operator.

**FIGURE 1**

*Veolia Water Revenues by Geography*

Source: Veolia Water, Web site 2011, redrawn by IDC Energy Insights
**Business Needs**

Veolia Water is responsible for the installation and maintenance of more than 20 million electromechanical water meters worldwide. A significant share of company revenues is directly generated by these water meters, so innovation in the management of water metering is fundamental for Veolia Water offering new or improved services to its customers. The following new or improved services are available:

- **For individual consumers:**
  - Invoicing for exact water usage (no longer based on estimates)
  - Automatic alerts to customers in case of abnormal consumption
  - Improvement in management of new contracts, end of contracts, and claims
- **For real-estate management agencies:**
  - Simultaneous metering of several buildings
  - Individualization of invoices and access to specific consumption information
  - Better control of water consumption
- **For industrial and professional consumers:**
  - Detection of potential dysfunction of building water distribution networks
  - Invoicing and information sharing of consumption for each building
  - Consumption monitoring all year round (useful for secondary property owners)
  - Access to water meter data for diagnostics and solutions

**Management Challenges**

Veolia Water's metering program covers data acquisition from a variety of meters and sensors deployed in the field and data communication/carrier and data management, including integration with others systems, both upstream and downstream.

More than 15 meter and sensor manufacturers are involved in this program from a field apparatus development perspective, and it is fundamental for Veolia Water to manage reliability of the equipment.
In Veolia Water's experience, between six and 12 months are needed to approve any new device (test labs, field tests, audits, production control, etc.). Radio adaptation also needs to be tested with many partners.

From a communication perspective, a major challenge was interoperability, necessary to operate an open and durable standard communication protocol. This is a key point, as the smart metering business will remain locked in the absence of standards. Orange and Elster created the Wavenis alliance to establish a standard in 2008; Veolia Water joined the alliance in 2009, as did Cisco in 2010.

This standard communication protocol also had to comply with the forthcoming results of the EU mandate M/441 EN 13757.

From an IT perspective, the major challenge was the management of data, which will continue to increase in terms of quantity and variety. Management also needed to handle the data management issues while modernizing the existing IT applications portfolio in billing and CRM.

The following sections in this study will look at:

● A new meter data management solution development project

● The next steps to be taken in the communication area with the recent creation of the dedicated communication service company m2ocity.

THE BEST PRACTICES

Background and Objectives

Veolia Water's MDM project scope and objectives have evolved and expanded over time. The project was begun as part of an IT modernization initiative, starting in the Veolia Water East Region, and simultaneously implementing new applications for billing, CRM, MDM, and WOM. The objective was to restructure the IT architecture and reduce manual labor by introducing a higher level of automation. The first release of the MDM component was in November 2010. At present, the MDM solution is going through preproduction testing together with all the other systems involved in the whole customer information system (CIS) project. The "go live" is planned to be completed by the end of 2011.

In the meantime, the scope of the MDM project has expanded: in addition to its planned full release across all of Veolia Water's regions, the MDM solution is also going to support the needs of the new m2ocity metering service company.

The MDM solution will have to be integrated into m2ocity and will elaborate data to be sent to all the Veolia Water regions. The scope will also be extended beyond water to other municipalities' services for the environment and transport.
The goal is to become the single system for the management of all fixed network meters (about 300,000 at present but expected to increase to more than 5 million) across the French regions and to be extended to other businesses. The project is currently in the testing phase and is expected to "go live" by the end of 2011.

How Does It Work?

MDM Solution Description

The scope of Veolia Water’s MDM solution (see Figure 2) can be summarized as follows:

- Data collection from manual meters and the different automatic meter reading (AMR) technologies adopted by Veolia Water: Homerider Fixed Network, Homerider Walk-By, and Coronis (not yet deployed). Collected data is not only related to water quantity (including backflow and consumption profile), but also to meter malfunctioning, battery status, and other information related to service quality.

- Data validation through syntactic and semantic algorithms. The first validation is done on the format of the data received and the second (semantic) validation is based on the relevance of the data, and if necessary uses historical information in the repository. The validation process also includes management of rejected invalid data.

- Elaboration of validated data by performing specific algorithms for signal generation, alarm generation, and consumption aggregation.

- Data publication: through Web interfaces, work queues for alarms, manual, or scheduled reports (CSV/XLS formats and Crystal Report).

- Integration (service-oriented architecture and batch based) with:
  - Upstream systems: AMR high-end systems, WOM, and asset management
  - Downstream systems: billing, CRM, Web portals

Figure 3 shows the application and integration architecture.
FIGURE 2
Veolia Water Meter Data Management Solution Scope

Source: Veolia Water, September 2010
Selecting the Solution

From the MDM solutions available on the market (see IDC MarketScape: Meter Data Management in the EMEA Utilities Industry 2011 Vendor Analysis, IDC Energy Insights #EIOS02T, March 2011), Veolia Water selected the Oracle Utilities Meter Data Management solution. When the project was started in 2009, the available Oracle Utilities Meter Data Management solution was version 1.5.

The main reasons for Veolia Water choosing this software were:

- Product capability to support high volumes of data
- A flexible model that covers Veolia Water's needs and its ambition to deliver services beyond water activities
- As its MDM application is a strategic product for Oracle, it will benefit from R&D investments in the future
- Financial strength of Oracle as a company
Oracle Utilities Meter Data Management is not the only Oracle product Veolia Water selected: it also adopted Oracle Utilities CC&B (Customer Care and Billing), Oracle DBMS (Database Management System), and Java.

For the turnkey implementation of the solution, Veolia Water selected Reply, a consulting, systems integration, application management, and business process outsourcing company headquartered in Italy and with operations in Europe (main offices in Germany, the U.K., and Italy). Power Reply, the group subsidiary specializing in the energy and utilities industry, is a strategic partner of Oracle, and its selection was motivated by:

- Robust skills in Oracle Utilities and specifically the Oracle Utilities Meter Data Management solution
- A proven track record in the implementation Oracle Utilities Meter Data Management (ACEA)
- A proven track record in the implementation of other Oracle solutions for many utility companies, including ENI, Italgas, ACEA, ESB, Centrica, EDF, GDF, and Luminus.

**Implementing the Project**

Project implementation has been carried out as follows:

- Feasibility study, to identify and define macro-functionalities and the business case
- Design and build of MDM Release v.0: implementation in nine months of the basic functionalities of the system, aiming to test the solution in all aspects in the Veolia Water architectural environment
- Tune, adapt, and deploy: implementation of MDM Release v.1, with full functionalities to manage the meters
- Application management, covering three main components:
  - Management of the release in production
  - Rollout of the system to other regions
  - Improvement and continuous evolution of the system

**Business Value**

Veolia Water's smart metering project is enabling the company to offer new or improved services to its customers, and the creation of m2ocity is a clear step toward the development of the new services offering.

From a service perspective, the project has helped improve customer satisfaction levels: actual meter reads reduce customer complaints and
billing inquiries, and customers do not have to be disturbed to make readings and can monitor their consumption for conservation programs. Also, by identifying theft, detecting malfunctioning meters at customer locations, and monitoring unoccupied properties, there are increases in water and revenue security/protection. Equally important is the improvement in water network performance enabled by network monitoring, real-time consumption follow-up, detection of serious or persistent leaks, and detection of backflows. Finally, with the extension of remote meter readings, processes will speed up and costs be reduced.

More specifically, the implementation of the new MDM solution has offered the following benefits:

- A single metering data repository
- The capability to handle a complex or extended data model view
- Business view access to advanced metering infrastructure (AMI) services
- Meter data cleansing and exceptions handling
- Support for fraud detection
- Support for customer and field services operations
- Traceability, security, and auditing of data
- Support for data operation including viewing and manipulating data and producing effective enterprise reporting
- Integration with downstream systems

Lessons Learned

The MDM project was started in a context of simultaneous evolution of downstream and upstream (work order management) IT systems, which introduced a higher degree of complexity in the detailed technical specifications design. The solution needed to be initially implemented to enable it to progressively evolve in terms of functionalities and integration capabilities. The decision, in fact, was to go with parallel implementations of other applications (MDM, billing, CRM, etc.), and then manage the final integration of all the systems involved.

Managing and storing substantial amounts of physical information (indexes, consumption, water quality, and temperature data) was also a critical step that required close attention to data modeling. The need to manage communication between the myriad systems and to support the requirements of different types of transactions was also addressed by adopting a balanced mix of real-time and asynchronous communication.
Project organization and the creation of a cohesive project team, continuously communicating and collaborating quickly to address emerging challenges, were critical to the success of the project. Additionally, the selection of the best suited system integrator, with a clear understanding of metering processes and deep product knowledge, proved to be a valuable choice.

From a broader perspective — looking at the entire advanced metering infrastructure and not just the MDM solution — communication and interoperability was a major challenge, as Veolia Water needs to operate an open standard and durable protocol, compliant with standards that are still being developed (mandate M/441). The need to combine utilities' competencies with communication network management skills also contributed to the strategic decision to create the new m2ocity joint venture.

**FUTURE OUTLOOK**

**m2ocity: An Innovative Business Model**

On March 28, 2011, Veolia Water and Orange announced the creation of the new m2ocity service company. The joint venture is built on the metering management expertise of Veolia Water and Orange's expertise as a telco in designing and operating networks, especially machine-to-machine (M2M) networks. Jean-Michel Herrewyn, Veolia Water's CEO, explained the rationale behind the venture as follows in a press release: "Combining the expertise from both of our groups, this company [m2ocity] is developing a new business, as a smart metering service operator benefiting sustainable towns and cities."

m2ocity offers a complete turnkey service, based on an ultralow consumption radio network (using the 868MHz waveband), to local authorities through their municipal agencies or agents for water services. In addition to information from water meters, the network will be able to collect data from environmental sensors (to manage noise or environmental pollution, for instance). Additional services will also be considered in the company's development.

IDC Energy Insights believes that future development can also be expected in building energy management, having a company like Dalkia in the Veolia Environnement group.

m2ocity will leverage Veolia Water's IT infrastructure and Veolia Water will use the water metering service provided by m2ocity. The MDM solution will have to be integrated into m2ocity and will be a component of the m2ocity solution to elaborate data to be sent to Veolia's regions.
ESSENTIAL GUIDANCE

Project Impact Assessment

IDC Energy Insights believes Veolia Water's water metering transformation and the m2ocity joint venture are very interesting for a number of reasons. They are significantly contributing to change metering and water management operations with a strong positive impact on companies' effectiveness. There has also been significant technological innovation, but even more important is the impact on the company's business transformation and, simultaneously, on the industry's business models (see Figure 4).

FIGURE 4

Veolia Water Project Impact Assessment

Operational Effectiveness

Technological Innovation

Business Transformation

Industry Transformation

Source: IDC Energy Insights, 2011
**Actions to Consider**

To utilities that are considering adopting new IT solutions to manage MDM, IDC Energy Insights recommends the following:

- Clearly identify your business needs and priorities. Sometimes you cannot do it all at once, and road mapping is crucial.

- Push your vendor to provide a solution map that is tied directly to what you want to get. Do not assume that a function you consider typical will be included in the standard offering. Also, evaluate the quality of the solution you are implementing, from a scalability and flexibility perspective. The better it is, the easier it will be to maintain.

- Even best-of-breed applications need to be implemented by the right project team. Understand the strengths and weaknesses of parties involved in the implementation, and manage them accordingly. It is fundamental to create a well-balanced project team resources-wise.

- In the current tough economic times, look to vendors that provide an estimate of the total cost of ownership to support their software. This includes maintenance, major upgrade cycles, internal IT support required, and additional hardware.

- Evaluate the possibility of adopting the software-as-a-service/cloud option as a valid alternative to on-premises installation. Vendors' MDM cloud value propositions are steadily improving.

- An MDM solution is the workhorse of smart metering. The amount of work performed by the MDM application and the capacity required will depend on the rest of the smart metering technology stack — configurable meters, network bandwidth, and CIS and other back-end application capabilities. Select the MDM solution within the context of the stack.

- Do not forget analytics. Try to get the best from your AMI and sensing technologies. An abundance of data (consumption, voltage, alarms, and events among others) will be available to support better operational processes and decision making.

- Determine communication network selection by application needs, but focus on how that technology will lead to an open, standard, interoperable, scalable, secure, and easily managed network infrastructure.
LEARN MORE

References

- Interviews with:
  - Eric Magnaudet, CIO, m2ocity
  - Marie-Cécile Trompette, marketing director, m2ocity
- *Sharing a Network: Keys for a Reliable Smart Sensor System and the Role of MDM*, Fabrice Baron, technical director, Veolia Eau France; Metering, Billing, and CRM Europe, September 2010
- www.veoliawater.com

Related Research

To learn more about IT developments in utilities market or other case studies, please refer to the following IDC Energy Insights documents:

- *Best Practices: Palm Utilities Deploys Oracle Utilities Customer Care and Billing Solution* (IDC Energy Insights #EIOS08R9, October 2009)
- *Best Practices: Bringing Stakeholders Together — The Amsterdam Smart City Project* (IDC Energy Insights #EIOS07R9, October 2009)
**Synopsis**

This study provides an in-depth look at Veolia Water's overhaul of its water metering services by deploying smart water meters and field sensors and a meter data management solution that offers better customer service through more accurate billing and greater efficiencies through early loss and theft detection. The study analyzes the evolution from a smart metering project, including the selection of the Oracle Utilities Meter Data Management solution, to the creation of a metering service company by Veolia Water, m2ocity.

"Veolia Water's water metering transformation and the creation of m2ocity are significantly contributing to change metering and water management operations with a strong positive impact on companies' effectiveness. There has also been significant technological innovation, but even more important is the impact on the company's business transformation and, simultaneously, on the industry's business models," said Roberta Bigliani, research director for IDC Energy Insights EMEA.

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