



Powerful forces – why intelligent data management will form an essential part of the changing utilities landscape

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Unprecedented change in the industry is forcing utilities to fundamentally re-think the way they operate. They must reassess the capabilities required to cope with a multitude of pressures including carbon reduction targets, Regulatory change, overwhelming amounts of new data from smart meter rollouts and new expectations from 21st century media-savvy customers.

Of course, traditional pressures on the industry have not gone away. Many utilities must still solve the issues of an ageing workforce, archaic infrastructure and ever-increasing demand. Yet the challenges of keeping the lights on must be balanced against the pressing requirement to provide the best prices and service for customers at a time of tough economic austerity.

For these reasons, the new technological era being ushered in by smart metering and smart grid projects has come at a crucial time. Smart metering and smart grids are the principal drivers for technology investment in the industry and will remain so for the next decade at least¹.

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In particular, data management is fast-becoming an integral requirement for any strategy to leverage smart data and adapt to changing industry demands.

Industry pressures

As the UK utilities industry is all-too aware, urgent action must be taken to update the UK's stretched electricity networks. British Gas managing director Phil Bentley has estimated that between £80 billion and £100 billion of investment is needed over the next decade to upgrade the National Grid and other power networks in the UK².

As such, the most public aspect of the smart metering debate – giving customers better insight to help them

reduce home energy use – is just a small part of the journey. The real business case for the technology will be the ability to manage the network better and cope with future increases in load demand on a network that is stretched to capacity and is being presented with more complex requirements than ever before.

The Department of Energy and Climate Change's (DECC) 2011 white paper, *Electricity Market Reform*, sets out the extent of the challenge: “With quarter of the UK's generating capacity shutting down over the next ten years as old coal and nuclear power stations close, more than £110bn in investment is needed to build the equivalent of 20 large power stations and upgrade the grid. In the longer term, by 2050, electricity demand is set to double, as we shift more transport and heating onto the electricity grid. Business as usual is not therefore an option.”

Fulfilling the DECC's commitment to 15 per cent renewable energy and 80 per cent carbon reduction by 2050 through the roll-out of more intermittent and inflexible energy sources such as wind and nuclear has raised questions about the ability of the current grid and structure of the market to cope with these additions without costly blackouts³.

While proposed market reforms could and should contribute towards a more sustainable energy supply in future, addressing the operational requirements that will enable these reforms is likely to require fundamental changes to numerous existing regulations.

In the UK and other deregulated markets, for example, networks businesses are run independently of other businesses in the electricity value chain, such as generation and retail.

Even when there are contradictory requirements, both providers have a legal obligation to service the same customer. As a result, the easiest solution to service load growth at present is to simply put in a bigger cable, increasing capital investment and restricting the potential for distributed generation.

Smarter data, better customer service

It is early days in the data journey for utilities, particularly compared with rapidly-maturing industries such as telecoms, retail or banking. Yet most of the forward-thinking companies have begun to accept that data management will be an integral part of a new smart meter-enabled world, both in creating a new smart grid in the future to cope with fast-changing requirements and meeting the needs of the customer now.

¹ Ovum

² *The Telegraph*; 2 March 2012

³ Gillian Carr, *Risk.net*; 6 March 2012

Criticism from consumer groups that tariffs are too complex has compounded the requirement to act. In response – and ahead of a market reform proposal from Ofgem designed to increase transparency and liquidity – Scottish and Southern Energy announced in February that it would be radically simplifying the energy tariffs it offers to new customers.

While this move undoubtedly makes good business sense now, in the future a more simplified, consolidated set of tariffs will require considerable analysis of smart meter data to establish which offers will continue to best serve customers.

At present, it is relatively simple to add a new promotional rate. Under a tighter pricing structure, implementing a new tariff that will appeal to consumers and meet the needs of the business will involve much closer management of a range of information sets. This will only be achieved using comprehensive and intelligent data analysis.

If achieved, the ability to offer a tariff based on an accurate household or commercial usage profile could facilitate more targeted marketing and a richer experience for the customer. Using these capabilities will also generate more realistic prospects for automated demand-side management.

For these reasons, demand for analytics technology is now greatly increasing as utilities providers start to realise that, if they are to maximise the potential of smart meters, they will need data analysis capability that supports targeted campaigns; matches new tariffs with likely customers and significantly improves customer experiences, as they interact with their utility through all the channels available to the 21st Century connected consumer.

Greater intelligence, greater control

Many utilities companies have installed meter data management systems to capture and store smart meter data. Yet if meter data is simply accumulated in the meter data management system (MDMS), rather than integrated with other business data already available, it is likely to be of little real value to the business.

MDMS vendors have begun to propose ways to exploit the data in their systems through meter data analytics (MDA). Yet this is not a strategic solution. Rather than simply bolting on business intelligence (BI) capabilities to another silo of data, utilities should first assess their new business objectives and then consider how new data from sources such as smart meters (or MDM systems) and the smart grid could be best utilised to meet these needs.

It will soon become clear that the best solution will be found in combining these new data sets with data they already have – such as geospatial information, asset information and customer information: data they will not find in a meter data management system.

To integrate data from across the business, a new platform is required: an Integrated Data Warehouse. With such a platform in place, the business can deliver quick-wins integrating a few data sources to answer previously unanswerable business questions, hitting the most urgent pain points first. From there, additional data sources can be integrated incrementally to meet further project requirements, extending the value of the investment in data to realise the potential of the smart utility.

In future, serving the increasingly complex needs of the utilities market will require ever-more accurate operational decisions based on near-real-time status information, combined with historical benchmark and trending information. Strategically, utilities will need ever-more accurate demand forecasts for the short and long-term.

Network optimisation will be carried out in near real-time to accommodate load from electric vehicles, demand-side management and distributed generation without having to resort to the traditional “we’re going to need a bigger cable” answer. Advanced analytics including forecasting and predictive modelling has a critical role to play in meeting these challenges.

Without these capabilities, the industry will miss the opportunity to defer capital investment, become more efficient, provide better value for customers and reduce carbon emissions. Integrated Data Warehousing and analytics isn’t the whole solution, of course. But it’s just as critical a part as automated low voltage switchgear or enhanced telemetry.

Crucially, network operators able to demonstrate to the regulator that they have the capability to truly measure and understand network hotspots, accurately highlight where investment is needed and suggest alternative methods of reducing demand, will also have a more compelling argument for their regulatory settlement. And they’ll also have the arguments to change the regulation holding them back from delivering on the promises of the smart grid.

A new data model for utilities

Xcel Energy in the United States is a good example of what can be achieved. By integrating meter reading, meter inventory and customer billing data

for analysis, Xcel quickly created a 360 degree view of meter operation.

Within the first two weeks of implementation, the utility found \$1.3M of unbilled revenue. Xcel also implemented new processes for dealing with non-recording meters – generating a year one saving of \$13.6 million – and has reduced analysis time from one week to less than one day.

In the future, their strategic approach to data warehousing, backed up by the huge value delivered in their first project, is expected to enable Xcel to use smart meter data for better customer segmentation and relationship management. By segmenting consumers based on the way they use power, Xcel also plans to target certain customers to show them how to be more efficient at times when their energy usage peaks. This will benefit the consumer, help Xcel manage their network and, crucially, impress their regulator.

These are precisely the kind of results that UK utilities need to achieve. Yet they will only do so by taking a more enlightened approach to data and continually evolving their investment. In this way, data warehousing and advanced analytics will be the fundamental enabling technology that makes the current vision of the smart grid a reality.

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Centrica Builds Enterprise Data Warehouse with Teradata

Centrica, the UK's leading utility group, recently chose the Teradata Data Warehouse Appliance platform, the Teradata Logical Data Model for the Utilities Industry and Teradata Analytical Applications for Customer Management and Data Mining to enable it to integrate and centralise its growing data volumes.

“New data sources such as web and smart meter data will enable new insight,” said Centrica chief information officer, David Cooper. “It is vital that Centrica have a technology partner who is proven in this field. We are therefore delighted to announce Teradata as our enterprise data warehouse provider and business partner and we are looking forward to developing our relationship together.”

Using the new analytical applications and services, Centrica will migrate data from its many existing databases to the enterprise data warehouse hosted on the Teradata Data Warehouse Appliance. As a result, Centrica will save money by consolidating its management information databases. Centrica will also utilise the new applications to better understand its customers.

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