Original Article

Smart utilities and CRM: The next phase of customer management in utilities

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ABSTRACT This article examines the potential effect on CRM of smart metering and smart networks in utilities. It examines the kind of interactions that will take place between suppliers and customers, and the likely change in the competitive situation. It concludes that utilities are on the verge of a data and customer management revolution of the kind that took place in the telecommunications industry in the late 1990s, and need to prepare for it.

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INTRODUCTION

In the next few years, utilities will face a period of radical change. There are several reasons for this:

- The advent of smart metering, the smart grid and associated technologies will change how customers are managed, mainly in the power rather than water industries.
- Increased pressure to improve customer service will result from rising customer expectations, in turn deriving from improved customer service in other sectors, particularly when those improvements arise from the deployment of web technology, and from regulatory pressure.
- Utilities in many countries are under strong pressure to encourage consumers to economise on energy and water.
- The inexorable pressure to improve productivity will expose inefficient ways

of managing customers. All these factors will create new competitive and efficiency pressures.

- The application of information technology to improve many aspects of human endeavour, particularly in relation to the environment, is increasing the pressure on utilities to translate ‘smarter planet’¹ initiatives into practical gains for utility customers and suppliers and for the environment.

The question this article explores is how far utilities are ready for these new realities, particularly where their customer management strategies, policies, processes, systems and data management are concerned.

This article forms part of a research and development programme sponsored by SAP and IBM. The programme extends beyond utilities into other industries, such as public

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services and financial services. The aim of the programme is to help management explore some of the difficult but resolvable issues they face in these challenging times, and find ways to meet their tough targets. The utilities programme research consisted of a number of in-depth e-interviews, combined with analysis of the article presented at four utilities conferences in 2009, and informal discussions with industry management.

BACKGROUND TO THE SITUATION

Smart metering and the smart grid are definitely on their way. Much documentation already exists about what they are and how they will work, what the different participants in the utilities market will need to do to deliver smartness, and their associated benefits for customers and suppliers. This article does not cover that ground. Rather, it focuses specifically on customer management issues beyond the delivery of smart metering and smart grids and other associated technical changes. It also focuses on how efficiency and quality pressures are changing how customers are managed.

The article does not address the issues of whether the water industry will embrace smart metering – the jury is out on this. The present consensus seems to be that in areas of water shortage, smart metering will be as useful as it is in managing power consumption. However, where water is not normally scarce, smart metering will have limited benefits, which may extend to meter reading through connection of the water meter to a smart meter used for monitoring power, though even here improved reading technology may mean that connection to a smart meter is unnecessary.

This article takes as its starting point the assumption that smart metering and smart grids are coming and in some countries are already in place, along with (eventually) the full panoply of changes on the customer

side – home automation services, smart appliances, remote management, and the associated changes on the network side that enable many of the gains on the customer side. It also takes as its starting point the fact that smart mobility will arrive through plug-in hybrid and straight electric cars. It investigates what utilities should be doing to prepare for this.

WHAT WILL THE SMART CHANGES MEAN FOR CUSTOMERS?

The smart world will change how consumers manage their use of utilities – primarily energy but also water – particularly in shortage areas. Different consumers will react in different ways. IBM's own research confirms this,² as does evidence from other industries that have moved from simple offers and simple but opaque pricing to complex offers with varying and transparent prices. I discuss this evidence later. The areas where we can expect change and the implications for suppliers are detailed in Table 1.

The phasing of the change

Of course, all this change will not occur at once. In Tables 2 and 3, I have suggested what the phases will be and how long they might take. I have identified two main stages – consumer as smart consumer, and consumer as power supplier.

These phases are suggestions, based on the speed with which similar changes have taken place in parallel industries, such as telecommunications, financial services and travel. They may be accelerated by regulators, competitive pressure and customer initiative – for example Web 2.0 and later versions, but they may also be slowed by lack of innovation, conservatism of suppliers and consumers, or regulatory obstruction.

The consumer as supplier is likely to make a later start. These periods represent the beginning of a diffusion wave, based upon installation of the new technology. This means that it will be many more years

Table 1: How the smart utilities world will evolve

<i>Consumer change</i>	<i>Main implications for supplier</i>
1. Improved management of consumption (for example time/type of use)	This will lead to load shifting, combined with load reduction or increase according to whether consumers perceive the need to reduce consumption or use the opportunity to enjoy the benefits of consumption more. Consumers will take time (and education by utilities) to learn how to use the new technology to achieve their objectives
2. Move to self-service/online, for management of power and to check billing	This will lead to a large reduction in demand for call centres (much of their workload is billing queries)
3. Acceptance of remote management – by self and supplier	Customers will need to be educated about how to do this, and to understand how suppliers may be able to intervene for safety and financial reasons
4. Understanding the new (customised/ optional/modular) tariff types	Customer education will be required, as well as design of information presentation to ensure comprehension
5. Higher involvement – the new salience of utility services	Customers will become more conscious of/involved in their consumption decisions, and this may lead initially to a higher level of communication
6. Individual versus household/family behaviour (who is paying, for what?)	Customers may in the long run require billing that relates to particular usage times (and eventually particular appliance usage)
7. Use of different devices to monitor, pre- and post-pay, for example mobile	Customers may need help with setting these up
8. Getting used to In-home display unit and Home area network	Customer education will be required
9. Eventual smart appliances/home area networks	Customers will need to understand how these work, and how remote control of them may lead to reduced billing
10. Smart mobility will allow consumers to change how they power their cars and use batteries as storage devices and to supply electricity back to the network	Customers will need to understand how to use the new technology and how to manage relationships with supply companies in relation to charging and discharging of batteries and use of batteries of a power supply resource for the network
11. Microgeneration technology will allow consumers to meet some of their own energy needs and become suppliers back to the network	Consumers will need to understand how to install and use different power generation devices (for example windmills, solar energy, heat sink), how to have them connected to the network and how to become suppliers back to the network
12. Understanding the new supply situation – which companies do I deal with now?	Customers will need to be educated about the new supply situation, and the liability of different parties for the functioning of the new system

Table 2: Stage 1: The smart consumer

<i>Phase</i>	<i>Name</i>	<i>Outcomes</i>	<i>Year</i>
1	Basic learning	Get used to the basic idea/technology as well as self-service	1
2	Change begins	Get a good idea of what they use and when Learn that they can use and pay differently	2
3	Remote control	Some respond by changing usage and payment patterns Customers can see and control total usage remotely	3–4
4	Specific control	Some become advanced/power users Customers begin to use smart control for some individual (heavy usage) applications, appliances or areas	5–6
5	Advanced management	New appliance design helps customers understand possibilities Customers can use smart metering, in-home display and home area network, as a home control system, overall and for specific appliances. Its most advanced form involves complete automation, so that once programmed, the consumer does not need to get involved	7 +

Table 3: Stage 2: The smart consumer as supplier

Phase	Name	Outcomes	Year
1	Purchase and installation	The consumer buys and installs the technology and comes to grips with the basic idea/technology, both of the generation device and how invoicing and supply works	1–2
2	Learning begins	The consumer begins to understand how different ways of using the technology can improve their energy situation. Some respond by changing usage patterns	3–4
3	Remote control	Customers begin to make significant changes to life patterns to exploit smartness	5–6

before the diffusion curve reaches the same level as the smart consumer curve, and it may never do so, simply because of the initial costs involved on the consumer side, and the fact that many consumers do not live in buildings where they can avail themselves of all the technologies.

What happens when customers start to understand usage

We are now seeing the first evidence of how ordinary consumers react to the smart world, as opposed to those who are involved in the smart world because of their professional or personal interest.³ However, the latter are relevant and demonstrate the following:

- increased awareness of the overall cost of energy or water;
- simple tactics to reduce usage, for example, saving power by switching off instead of leaving appliances on stand-by, economising on water by recycling or saving more rainfall;
- purchase of A-rated energy-saving appliances;
- variation in responsiveness according to the type of space and water heating used (how controllable it is) and according to whether energy-saving lighting has been installed;
- a variation according to whether the customer is in a water shortage area; and
- the tendency for the consumption of customers who initially react by reducing their consumption to revert to their previous consumption levels.

The experience of ordinary users is encouraging, demonstrating that if consumers can be involved in saving energy, and encouraged to take an interest in it – in short, if energy saving can be made more salient for them – the savings are high. For example, SEAS-NVE in Denmark, through its Family Challenge, helped customers save a high proportion of their energy bills.⁴

There is now a growing body of research into how consumers change behaviour and what suppliers can do to change it. One of the leaders in this field of research is the Energy Research Centre of the Netherlands (ECN), which has produced several reports, covering experience all over Europe. The results show convincingly that consumers are quite responsive to efforts to change behaviour in relation to energy saving.⁵

Of course, we are still at an early stage, and therefore once the introduction of the new technology takes place, suppliers will need to invest in enhanced programmes of research and analysis.

COMPARISON WITH PARALLEL INDUSTRIES

I believe that there is merit in examining other service industries where consumers have faced changes such as

- more explicit and varied tariff types, accompanied by clearer billing; and
- a consequent greater variety of products, often differentiated primarily by tariff.

In my view, there are (at least) three relevant comparisons:

- telecommunications (initially land line, then mobile/cell, then broadband);
- satellite TV (from analogue, to digital, through to high definition/multi-room/interactive/remote programming); and
- bank accounts/credit cards/loyalty cards.

The nearest analogy is telephony, a network business similar to utilities (and of course originally defined as a utility, although few who work in the privatised area of the industry would like it to be so classified today). Obviously, telecommunications has benefited from an enormous improvement in electronic technology, in terms of what can be done with telephony by ordinary users, but of course this applies to electric power, as it underpins most home automation systems.

The fall in the unit price of telephony combined with the technological and product/tariff developments has resulted in a large increase in the use of and revenue from telephony, measured either by units or revenue. Consumers can now see where they spend their money and understand where and when they get value. Productisation (for example by usage type – voice, text, data – and by tariff type) has helped consumers find new ways to buy/spend. Consumers have developed a general higher awareness of/responsiveness to tariffs, charges and offers.

In financial services, where banks are increasingly putting together packaged services for fixed prices, moving away from charging by item (often on a penalty basis), customers are responding by taking up such packages. In other words, increasing the salience of charging does not lead to the reduction in the amount paid, but instead a more mature discussion between customer and bank about what services are necessary and worth paying for.

Finally, in satellite TV, new services (high-definition, multi-room access, remote access for programming, web access and pay per view) have produced large additional revenues and greater awareness of the low cost of television-based entertainment, compared with other sources. This of course has been helped by developments in display technology, turning many homes into cinemas.

How have telephony suppliers changed marketing, service and tariff strategies?

It is instructive to see how the companies concerned have altered their approach to marketing and customer relationship management (CRM) to accompany the changes described above. They have developed a strong, integrated approach to CRM strategy and delivery, including systems. They have become strongly focused on churn management and up/cross-sell, customer life cycle management and stronger contractual lock-in approaches. The best companies have developed strong skills/partnerships in insight and systems. They have used the most advanced segmentation techniques to analyse customers and develop segmented offers. Their senior managers have stayed close to all these areas. Today, their CRM approach is transferring successfully to a real-time and/or self-service environment. The strongest companies have balanced strong technical positions with large investments in marketing and service, and have taken a strongly competitive stance towards ownership of value-added – from generation, through distribution, to metering and billing. The ownership of the basic physical networks have become less important. Despite the regulatory freeing-up that has taken place (for example number transfer), which allowed customers to switch more easily, churn has stayed manageable, and in some cases well managed.

Managing the customer experience and journey

One area of strong focus in telecommunications, financial services and satellite television has been management of the 'customer experience' and the 'customer journey'. These have moved from being clever theoretical ideas to ideas that are achievable in practice. You cannot manage customers' experiences and journeys properly with limited information about what the customer is experiencing or doing; or indeed about what the member of staff handling the customer is seeing or doing; or, in the case of self-service, how your system is interacting with the customer. At the same time, you cannot collect all the data you might need in theory, and thus companies have learnt to prioritise their information-gathering, to ensure that they collect only what they need to manage most situations.

Companies that have invested in and successfully implemented modern CRM systems have a much better (though of course never perfect) idea about what happens with customers. They can see more clearly which moments of truth determine whether a customer will stay, buy more, recommend or buy less or leave, and why these moments of truth arise. They can also see how journeys develop from a series of interactions, and, by analysing some journeys, infer what might happen with others. They can also analyse complex cases, using information drawn from several operational and analytical systems, to derive conclusions as to where problems lie and what can be done to solve them. Then, as cases are managed using workflow processes and systems, data on the outcomes can be analysed together with data on the work required to achieve those outcomes, so as to identify the most efficient approach to case management.

All this has produced benefits not only on the more tactical side of contact management, but also on the strategic side,

in terms of how services are specified or defined, which channels are chosen to deliver them and how these channels are managed. This analysis will need to be applied to utilities.

Creating and managing expectations and behaviour

A particularly important part of learning in this area relates to the idea that you get the customers and the behaviour that you deserve. Customers welcome fast, neat processes, if they can see the benefit to themselves. It is wrong to think that modern system-based processes somehow shoehorn customers into behaviour patterns with which they are unhappy – this is quite the opposite in fact. Anyone who remembers the complex, manual and often time-intensive and usually retail processes associated with buying motor insurance or airline tickets understands immediately why consumers are so happy with being able to buy both over the web, at their own speed, with so many web-based services ensuring that they get the best value for money. Perhaps most importantly, these services are now provided at a much lower cost to customers, because so much unnecessary cost has been removed by better service and channel design and by tough prioritising of resources to manage out complexity. These are excellent and highly relevant lessons for utilities.

Finally, these companies have come to understand how fast customers learn. They learn what they like, and what they do not like. They learn to comply when it suits them, to avoid compliance when it does not, and when they can expect not to be disadvantaged by failure to comply. The speed of learning is astonishing, increasingly so as customers communicate learning to each other. Once a better way of doing things is discovered, it takes minutes before it is communicated to others via the Internet, whether by e-mail or social networking.

Companies have learnt that if they make it easy for customers to get discounts, the number of customers seeking the discounts will explode. When discounts are cancelled, the number of customers applying for them collapses. If a company applies a 'three strikes and you're out' policy to a particular set of rules, customers learn to manage within the three strikes. The idea of 'creating and managing expectations' was never more needed.

Implications of the comparison

Much of the above will be highly relevant to the smartness utility world. In many cases, the migration of staff from telecommunications, financial services and media companies to utilities will act as the main skills-transfer mechanism (in some cases this has already taken place).

Of course, the change in customer behaviour will not be overnight, as highlighted earlier. New consumption technologies can take 10–20 years to settle in. Customers are strongly influenced by what suppliers say and by the products and tariffs that suppliers make available. Competitive pressures tend to accelerate their pace of development, but at the beginning, there may be a period when companies take their time to absorb the impact of the change and focus on getting the basics of technology and customer service right.

WHAT THE RESEARCH SHOWS

The main conclusion emerging from the research is that thinking about the CRM implications of smart metering and smart grid is at its earliest stages. Some salient conclusions are as follows:

- Most utilities are still coming to grips with the implementation of 'classic' CRM, particularly if deregulation is recent or (even more so) if deregulation has yet to take place. This includes integration with billing systems.
- Advanced analytics are beginning to make their appearance in utilities, along with a much more refined approach to market segmentation and associated customisation of tariff and other offers.
- Complete optimisation of communications designed to achieve customer recruitment, retention and up/cross-sell is beginning to appear.
- Integration of channels is already well underway in most companies, particularly of web and call centre, but also SMS and face-to-face channels.
- In some companies, experience will be transferred from the B2B to the B2C sector, because smart metering is already a reality in the former. However, the arrival of the smart grid will increase complexity in both sectors.
- Many companies are already experiencing clear benefits from their investment in CRM – improved customer profitability, increased customer satisfaction, improved efficiency in customer acquisition, retention and development, and improved up/cross-sell rates.
- Countries where deregulation has been slow will be most disadvantaged here – there is nothing like competing for customers to stimulate CRM activity and the development of a strong CRM capability.

All the above developments mean that some companies are putting in place key elements of the infrastructure required for CRM in the smart era. However, none of my respondents were confident that they would be able to apply it smoothly to the smart era – with its much increased volume of data, complexity of products/tariffs and a complete change in the nature of the interaction, which will include generation devices and the emergence of the customer as supplier.

Some companies are focusing primarily on technical issues, rather than on customers. Some utility companies have a

tendency to be introverted, with little thought about the parallels discussed earlier. Water companies are in any case uncertain about the benefits of smart metering, and are still unsure whether metering is appropriate (for some/all customers). They are strongly focused on customer service.

Managers in all sectors are agreed that major savings will eventually take place in billing and billing query costs. It is not uncommon for between half and two-thirds of the contact that a utility has with customers to concern billing. The increased transparency of costs that is expected to result from smart metering and smart grids will eventually have a major impact on reducing billing queries and re-issues, though there may be an initial rise in queries as consumers learn what smartness involves.

Energy (especially electricity) companies do see the opportunities and risks, especially in relation to value-chain transformation and competitive invasion (in particular from parallel markets such as telecommunications), but they recognise that they are at the earliest stage of the learning curve. Energy companies seem to demonstrate a weakness in detailed understanding, investigation or scenario development in the areas of competitive action. In particular, they are vulnerable to possible re-ordering of the value chain and the development of new marketing and service policies by companies operating outside the traditional utilities paradigm. This echoes what has happened in telecommunications, relating to the ownership, control and influence of what occurs with links to and within the home. Network competition is a phenomenon that takes many different forms – competitors become allies and vice versa. Supplier-agent-customer definitions change and multiple roles are taken. Competitors exist in different parts of the value chain.

Leaving aside the issue of smartness, some companies are implementing much

improved CRM systems, in some cases fully integrated with their operational management or enterprise resource planning (ERP) systems. This has produced great benefits where query resolution and service call management are concerned – for the full cycle, from the time that a customer calls with a query or a problem, to scheduling and completing a service visit. For utilities, scheduling a visit and finding that a customer is not in to admit the customer service representative or engineer is expensive. Improved CRM and scheduling systems, which allow utilities to promise a much more tightly defined time slot – combined with improved messaging and improved CRM processes – has allowed companies to transmit or receive customer messages by any medium, and to achieve much higher first-time resolution rates in contact centres and a much higher completion rate of service visits. Customers' satisfaction with calls and with service resolution processes is being recorded, and remedial action is taking place to reduce dissatisfaction.

These improved and integrated systems for managing customers have necessitated significant changes in the way staff are managed – one company stressed that culture change was central to how it had changed its customer management, a culture change that extended from frontline staff in call centres and in the field through to general management. Business readiness training was also considered important. Multi-skilling in call centres is becoming more common – as a route to contain costs and improve customer service.

Water companies exhibit some key differences from power companies in some countries, generally being more regulated and less able to choose whether to serve customers or to differentiate between customers in terms of tariffs or other elements of the marketing mix. For this reason, water companies tend to focus even more strongly on efficiency and customer

service, particularly where meter reading, billing and service visits are concerned. Because of strong regulatory involvement, performance in these areas is a strong focus at board level, with frequent reporting. To achieve improvements in these areas, water companies have placed strong emphasis on staff motivation and reward.

Where the proportion of metered customers is rising (as in the United Kingdom, but generally not in countries with water shortage, where a high proportion or all customers are already metered), companies are coping with the rising number of contacts induced by metering. They hope to contain this partly by encouraging increased usage by customers of web-based meter-reading registration.

WHAT WILL CHANGE FOR SUPPLIERS' MARKETING AND CRM IN THE SMART ERA?

The main changes for suppliers will be as follows:

- The kinds of data used will change, in both quality and quantity. A much enhanced, more accurate and frequent data flow brings both benefits and costs, and managing this balance will be key. Business intelligence systems will need to cope with what has been estimated as a many thousand-fold increase in the quantity of data.
- The relationship will become more complex, particularly when the two-way flow of energy becomes a reality for consumers.
- Some customers will take on fully the idea of 'total energy data', with usage of all the main energy-using appliances and lighting being tracked separately. Some of these customers will be prepared to supply these data to their utility (or utilities, as they will be able to work with more than one) if the latter can help them optimise their use of energy.

- Standardisation of data definitions for inter-company use will be essential.
- Segmentation approaches will need to change, with new dimensions being used, for example control, desire for economy/green, position as a consumer-supplier.
- Real-time marketing will need to be applied, to match real-time metering and real-time changes in demand and supply.
- Staff knowledge and skills will need to greatly improve, to match the new data and technology and their use.
- Customers will be faced with an enormous variety of new propositions, some from utilities and some from new entrants aiming to capture part of the household market for energy management. These entrants may come from parallel sectors (for example telecommunications or media), or even apparently unrelated sectors (for example automotive). Utilities will need to do an enormous amount of work on their propositions, moving beyond trust and simple energy-saving ideas to much more advanced ideas based on trust and deep customer involvement.
- There will be a reduction in debt and theft as an issue – customers whose consumption suddenly rises, or who seem to be consuming without paying, will be much more readily identifiable.

IMPLEMENTATION

Moving towards a smart energy world implies a step-change in how customers are managed, using new data sets, propositions and ways of communicating. This requires a professional approach to change management, covering the areas listed below:

1. Objectives and strategies must be set taking into account the likely phasing of changes in customer behaviour.
2. Marketing, sales and service staff must be trained and briefed about the likely changes in customer behaviour and about

the company's policies on moulding this behaviour and responding to it, how this differs from the existing approach, and must be encouraged and motivated to use new processes and policies, and be trained to apply them.

3. A complete re-evaluation of CRM approaches is needed – covering propositions, strategies, analysis, planning, including new approaches to segmentation, systems, data, customer experience/journey management (through recruitment, retention, development and so on, including the new moments of truth), performance targets and measurement. In particular, a culture of enhanced segmentation and targeting must be created.
4. Management at all levels must understand and use these ideas.
5. Customers must receive new types of communication, explaining the benefits of smartness and how to use it to achieve what they want (savings, better value).
6. Systems must be designed and implemented to sustain the approach – in particular CRM, service case management (particularly customer feedback and complaints), Internet/web-based systems and business intelligence systems.
7. Customer data analysis must focus on the issues covered in this article, and must also be predictive, to ensure that

potential problems are identified and solutions prepared. More frequent use should be made of more advanced analytical techniques, whether statistical correlation or data mining, to explore the emergence of new patterns in the data as management improvements are made.

8. A more data-intensive approach requires a highly refined reporting system.
9. Processes must be improved, using the principles of lean design and quality management, in all areas from service design through to delivery and impact measurement, to allow the increased complexity of customer management to be handled efficiently. Complexity generates cost, unless it is well managed.

REFERENCES AND NOTES

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