

Smart Metering – Real-Time Data for Business & Consumers

Smart metering has captured the imagination of governments & consumers ...

By Andrew Beasley & Peter Franklin

Governments see smart metering technology making a significant contribution to meeting economic, energy, and environmental policy objectives, by enabling higher levels of energy efficiency. This is achieved through the provision of real-time information on energy consumption with cost being made available to energy users and the industry.

For consumers, smart metering offers the ability to budget more effectively (currently energy costs represent around 5% of total average household income in the OECD) and a means of reducing a substantial drain on personal disposable income through better energy efficiency.

For example, this has been a real motivator in Northern Ireland where a pre-payment meter replacement scheme, aimed at 80,000 households, resulted in over 175,000 households choosing to switch to smart meter technology – therefore displaying the real-time financial consequences of energy usage in the home.

The ‘centralised’ model assists the resolution of the inter-operability issue

In the UK, smart metering is already well established in the industrial commercial markets as firms have sought to tackle the imperative of restoring profitability following rapid rises in energy costs.

Smart metering in the residential and SME sectors is increasing. Trials are underway under the auspices of OFGEM and partially funded by the UK Department of Trade and Industry to test a number of alternative technologies.

However, the need to choose between two alternative information distribution architectures needs to be addressed.

THE ‘ON-BOARD’ MODEL:

Consumption data is processed in the meter itself and the processed information sent to a built-in or separate display unit in the home (the Northern Ireland model). A variant of this is a communications

capability built into the meter. The processed information can then be sent to the utility supplier who can make the data available to all parties for balancing and settlements.

THE ‘CENTRALISED’ MODEL:

The alternative centralised configuration has a communicating meter at its heart whilst the data processing is carried out centrally. In this situation a central data repository is created allowing the data to be available to all parties. The usage information is then fed back to consumers via existing information presentation technologies (i.e. PC, TV or mobile) or to a separate screen within the home.

FINDING THE OPTIMUM BALANCE

Both models give the consumer easy access to their energy consumption and cost information. This meets the customer’s desire for better budgetary control as well as assisting behavioural change which leads to significantly reduced energy bills. They also allow the adoption of time-based tariffs enabling consumers to change behaviour in line with the different costs of energy at different time of day.

In addition, both configurations can potentially remove the need for traditional utility billing and queries related to estimated meter reads. For suppliers this could lead to a 20-40% reduction in the costs of servicing customers.

The centralised model also has the ability for new consumer services to be created by companies in the ESCO (Energy Services Co) sector, both within and outside the traditional suppliers of energy.

Examples could include the banking sector where loans or mortgage supplements for energy efficiency investment are repaid through energy savings, or from companies linking appliance sales and usage to energy savings potential. Additionally, service providers could link consumption data to weather data enabling heating controls to be adjusted in the home to manage peaks of demand whilst helping households manage the temperature of their homes.

(e.g. staggering the turn-up of heating systems in the wake of a cold front).

The cost of the centralised model will be significantly lower than the on-board model as a complex processor in each and every meter is not required. More importantly, the centralised model removes the need for a separate VDU (visual display unit) in the home. Together this could represent a cost saving of £100-150 per household (£2-3 billion across the UK).

Furthermore, bringing the processing into the arena of the energy service provider (in the centralised model) allows for a competitive differentiation in how the information is delivered. Competition will then act as a spur to innovation and the achievement of the optimum cost benefit balance as companies vie with each other to produce the most useful information set.

The centralised model assists the resolution of the inter-operability issue. Having different meters in circulation creates a potential barrier to switching energy supplier – the more complex the metering technology, the more risk of such barriers coming into existence. The consequence may well be the ‘dumbing down’ of ‘on-board’ systems to meet a common capability standard agreed by the industry, therefore depriving consumers of services they would otherwise have had access to.

The centralised option involves installing meters which meet a common communication protocol, and have the capability to transmit a common set of consumption data. Providers can then use this data as a building block for the services they provide.

In summary, the centralised model has the advantage over the on board model from both the benefit and cost perspectives. However the central solution requires technologies that can:

- Deal with High Data Volumes
- Deliver in Real-Time
- Be Flexible to Changing Business Needs
- Be Robust & Secure

MICROGEN APTITUDE – BUSINESS PROCESS MANAGEMENT

Microgen Aptitude is a Business Process Management Suite (BPMS) that offers BPM, Business Rules, Integration and Web Services functionality in one truly integrated suite. Microgen Aptitude's technical architecture enables full Transaction Process Management and market leading levels of transaction throughput, in addition to decision based process management. Moreover, Microgen Aptitude is a single product that uses one language, one data model and one user interface, as opposed to a set of disparate parts and products loosely coupled together.

Microgen Aptitude's user interface provides icons that link together to create a complete process flow. The resulting graphic representation of a business process is executed without requiring the creation of any source code. This architecture provides users with a high level of flexibility and transparency in both development and ongoing support of their customised applications. As such, Microgen Aptitude enables organisations to generate and manage Composite Applications and Solutions that specifically address their current and future business needs.

More complex business applications will require a BPM product that does more than orchestrate service calls using Business Process Execution Language (BPEL), as this alone will not meet the needs of most commercial environments. Using Microgen Aptitude, a BPM project can combine, integrate and orchestrate business processes with other legacy systems, external libraries/DLLs, Document Management Systems, externally developed processes, and web services. This provides a true SOA environment where the reuse of technology is not restricted to just one method of integration.

Microgen Aptitude is also not confined to the use of one type of messaging format as many other products are, providing translation among different messaging formats, including SOAP, MQ Series, SWIFT and Reuters, so that systems not exposed as web services can fully participate in a SOA context.

DEALING WITH HIGH DATA VOLUMES

The widespread use of smart meter technology will clearly cause a step-change in the volumes of data needing to be handled. This presents a real challenge to the utility industry which has had difficulty dealing with high data volumes in the past, such as when gas and electricity competition was first introduced to the UK Industrial Commercial markets.

How can a repeat of this be avoided? The answer is to adopt the mechanisms and approaches taken by the banking and financial services industry where high data volumes and the need for data integrity are well established.

The widespread use of smart meter technology will clearly cause a step-change in the volumes of data needing to be handled

Microgen's approach to tackling this challenge is to deploy its Aptitude Information Management Application Builder – an advancement of proven and reliable solutions in the highly demanding banking environment (such as within the BAC's clearing system).

DELIVERING IN REAL-TIME

To deliver benefits, the system needs to be able to react quickly to the data provided to it and in a way that adds real value to customers on an individual basis.

Data needs to be cleansed, validated, and potentially combined with other data sources (such as time of day tariffs or weather data). It can then be transformed into either a stimulus for behavioural change or an automated feed to a control system facilitating better use of energy in the home. This could lead to amending the time of use of appliances or controlling heating systems ahead of weather changes, reducing the peaks in the use of

distribution networks and generation and bring substantial cost savings.

A system that allows this needs rules-based processing at the front end as well as a traditional ability to analyse large amounts of data at a later stage. This capability is critical if smart metering is to deliver the desired benefits. Microgen Aptitude is designed to provide the microsecond responses needed to assure real-time operations in financial market transactions.

BEING FLEXIBLE TO CHANGING BUSINESS NEEDS

The products and services which smart metering can enable will evolve over time. Innovation is key to creating and sustaining competitive advantage, with any solution needing to evolve to match innovation rather than the speed of traditional utilities systems development.

Microgen Aptitude enables innovative businesses to design new systems and then transform them into a production environment at the flick of a switch. This not only brings with it business agility but also vastly reduces systems development expenditure.

BEING ROBUST & SECURE

The credibility of any IT solution relies on consistent performance, control and audit of the development, testing and production

environments. In a high profile market such as energy, it is vital that the practices of 'good governance' are strictly adhered to. Having been extensively used within the financial sector, Microgen Aptitude meets both the FD's and the CIO's desire for stringency in an arena where audit and control are of critical importance.

THE STEP CHANGE IN INTELLIGENT ENERGY USAGE

Smart metering offers society the opportunity to make a huge step towards the intelligent use of energy.

To reap the full benefits of smart metering will require the adoption of the centralised model of data processing, together with a robust means of transforming the data into usable information, which allows for innovation and behavioural change in the use of energy in the home.

Microgen Aptitude can deliver the ideal combination of business agility and robust performance, previously unknown in the utilities market. This will enable the entire sector to reap the benefits from the adoption of this new technology ■

Andrew Beasley is a Utility Market consultant with Microgen plc. Peter Franklin is a Director of Enstra Energy Strategies.
E: marketing@microgen.co.uk
www.microgen.co.uk

microgen

Information Management Solutions

**Microgen pla
Fleet House
3 Fleetwood Park
Fleet
Hampshire
GU51 2QJ**

T: + 44 (0) 1252 772 300

E: marketing@microgen.co.uk

W: www.microgen.co.uk