One view of the truth

Why robust location information improves performance on multiple fronts

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Introduction

Utilities and telecommunications companies depend heavily on location information. It is critical to the operations of both infrastructure-based network operators and those with retail operations. Businesses need to know where their customers, assets, facilities and people are, often in real time. In a survey[1] of IT and business professionals from UK utilities, 95% of respondents agreed that "Good quality address data is of utmost importance to the successful running of the business".

But address information is only one part of the picture. Assets, people and facilities don't have addresses and even where an address does exist it may be inaccurate, ambiguous or out of date. Within a typical business, location information exists in many different formats (coordinates, free text, addresses, and postcodes). And it's distributed across multiple databases within different departments of the business. Furthermore it is constantly being updated and evolving to meet changing business needs. Some of it is externally sourced, some of it is created by the business day-to-day, and all too often the different sources are hard to reconcile.

Whether seeking to increase competitive advantage or improve regulatory league table position, utilities and telecommunications businesses are constantly seeking to improve their business performance. Critically, research into master data management has shown that a 41% improvement in master data quality can mean the difference between top 20% performance and bottom 30% performance[2], as Figure 1 shows.
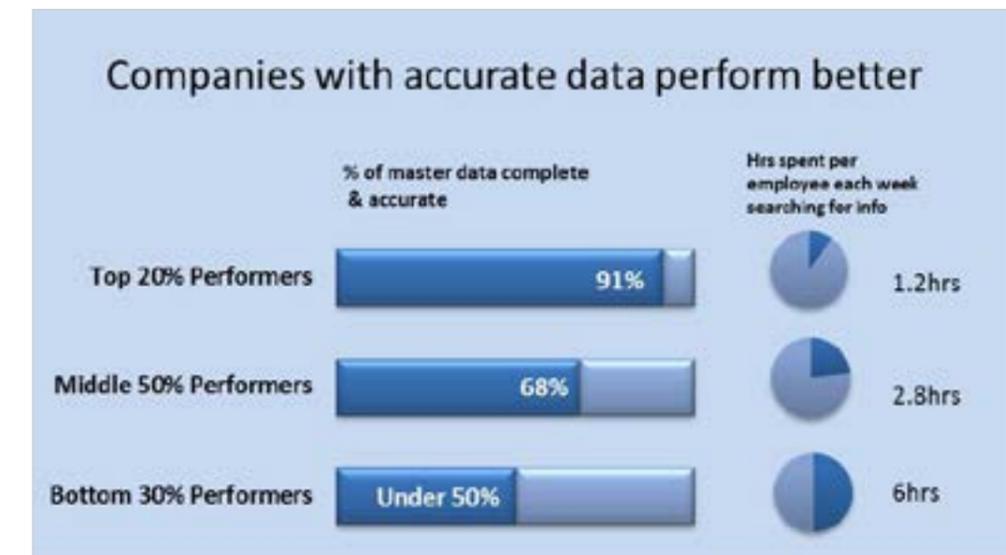

Figure 1. The impact of master data management

Often it all comes down to confidence. Confidence in data means that it gets used, and if it gets used correctly it is maintained. But a lack of confidence in the robustness of the information can lead to delays in decision making, or even the wrong decision being made. This hinders utilities companies and telecommunications businesses from delivering the fast, efficient service that is so essential for brand reputation and public safety. And, crucially, it can lead to the loss of millions of pounds in unbilled revenue.

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[1] Address Management Benchmarking Survey, Blue Donkey 2010.

[2] Microsoft analysis of a study by Aberdeen Group. For more information please go to aka.ms/12ofSQL2012, see page 7 of 12.

The location management challenge

As we have identified, location information is critical to operational effectiveness. But the typical utilities business faces a multitude of challenges, from asset management through to maintaining customer relationships, so the sharing of location information and data across multiple functions, from planning and analysis to operations and reporting, is critical.

Different ways of describing location

A location can be described in many different ways. Customers calling to report a gas leak, for instance, will use whatever description first comes to mind: "on the A41"; "in the middle of the high street"; "outside the supermarket"; "number 24 High Street". While utilities record customer premises by street number and postcode, details of assets – such as the network, street furniture, facilities and depots – do not have an address, and are typically referenced by coordinate.

Information from public authorities cannot be guaranteed to be consistent. Figure 2 illustrates how small differences in spelling or grammar can have a huge impact. Whilst a human immediately understands that a small difference does not mean an entirely different road, a computer needs additional intelligence to arrive at the same conclusion.

Figure 2. Two street signs, one road.

Customer service personnel need a way to translate often vague location references, in to precise location data that can be used to dispatch a field crew. If they cannot do this, service can be seriously disrupted. It is not uncommon for customer services to believe that data is missing from the system and enter a new record, resulting in duplicate entries. Once this has happened, the only recourse is for each subsequent user to make a judgement call as to which individual entry is correct.

Different data stores

The survey referenced earlier[3] also revealed that utilities typically store address information across as many as six to ten different systems , and other types of location information, such as coordinate references, in many more. The risk of duplicated and inaccurate entries is extremely high and the time spent by staff searching for the correct information they require is considerable. Duplicated information is time-consuming to source and maintain.

To add to the complexity, we have 'Shadow IT'. Finding that formal business systems do not do quite what they feel is needed – and that modification would cost too much or take too long – staff create workaround solutions based on spreadsheets or small databases used at a departmental level. None of the location data in these ad hoc systems will be party to any sort of validation or cleansing, and is typically not synchronised with the core IT infrastructure, all adding to operational risk.

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[3] Address Management Benchmarking Survey, Blue Donkey 2010.

The location management challenge

The address lifecycle

The ever-changing nature of an address also presents its own challenges. An address can go through multiple stages in its lifecycle, and utilities must keep it updated for service continuity. The typical address lifecycle is illustrated in Figure 3.

1. **Site creation**: A builder constructs a new plot and a temporary plot address is assigned.

2. **Official address**: The council assigns a postal address and Royal Mail assigns a postcode.

3. **Vanity address**: The official address can be given an alias, often called a 'vanity address' – such as 'River Cottage' or 'The Gherkin'. Often a property becomes best known by this address, making it vital that this change is recorded.

4. **Address changes**:
   - Sub-division of the property: A property is often sub-divided into different flats, creating more addresses at the same location.
   - New builds on site: New properties can be built on the land, creating more new addresses at the same location.
   - Re-grouping of properties: Further down the line, a property that had been divided into flats may be grouped back together as a single property.

5. **Demolition:** At the end of its lifecycle, a property is demolished and the cycle begins again. At this point, postcodes may be discarded and reassigned elsewhere.

Where there is no centralised store of information – and address data sets have differing formats, data structures and data models across a number of systems – managing this lifecycle across the business can prove virtually impossible.
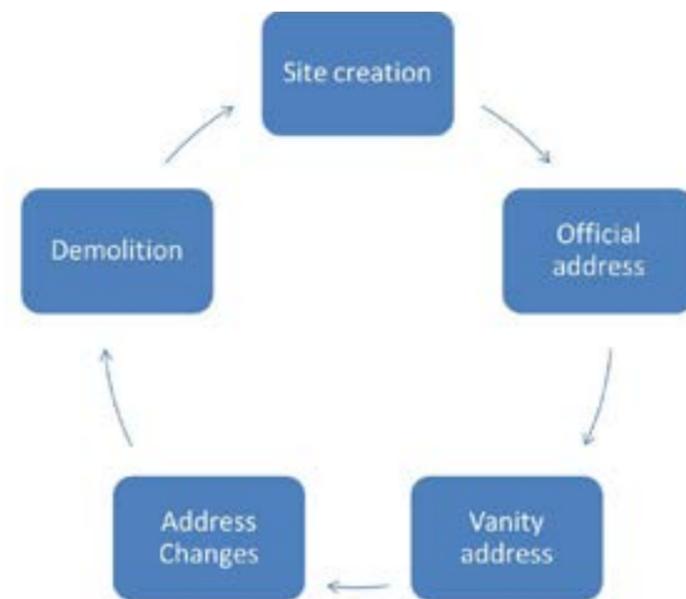

Figure 3. The address lifecycle

A single view of the truth

To help tackle these challenges, utilities companies are choosing to create a centralised hub of address information. By putting all location information into a single system, staff across the business – from the back office, to customer service, to field staff responding to an emergency – can work more efficiently, confident that the location information is validated and accurate. See Figure 4.

Figure 4. A centralised hub for location information

A central hub brings together three main types of information within the enterprise:

1. **External location information**
Organisations such as the Royal Mail and Ordnance Survey provide master address information that acts as a common reference. Public sources of customer information will include identity records, credit check and references, demographics and other external sources all of which are often tied to location.

2. **Internal location information**
Often the enterprise will store and maintain its own additional information that contains updates, additions or changes to public external data eg temporary addresses. Internal sources of customer information will include billing records, payment details and history, contact history and maintenance records. Typically, the enterprise will give its own information priority over public sources. Details of network, street furniture, facilities and depots are typically referenced by coordinate.

3. **Non-spatial Information**
Location can be used as the 'glue' that brings together non-spatial information across the enterprise, making more sense of it by applying much needed context to ensure decisions are made using all relevant information. Questions such as "what is nearby?", "who is affected?" and "who should we inform?" can be simply answered, with a single query.

The benefits of a single view of location information

Through a single, accurate view of all location information within the business, utilities can improve customer service, enhance their emergency response rates and boost regulatory performance – all while reducing costs and increasing revenue. With regulators focused on passing efficiency improvements through the supply chain, this can mean lower bills for customers too.

The business benefits of this are far-reaching. Below we identify some of the advantages of putting location information at the heart of utility operations.

> Finance, planning, emergency management, customer care, network maintenance, technicians in the field – every department can have access to the same, accurate set of data to make more precise and effective decisions, throughout each and every day.

More efficient, cost-effective operations

The disadvantages of using often incorrect, multiple data sources have been outlined above. Maintaining the status quo means employing teams of people to manually update data and correct errors. Without this approach, there is the risk of further costs to the utilities provider through eg fines for incorrect street works notifications, or providing poor emergency response times.

Through a single, centralised hub of location information, these issues can be avoided. Storing, validating, cleansing, finding and maintaining data becomes far simpler; dramatically reducing operational costs, while helping to avoid fines altogether.

Increased billed revenue

Without an accurate repository of address information in the business, suppliers are also at a high risk of missing out on billed revenue. This can happen for a number of reasons. It may be that a temporary address at a new site has not been updated to a permanent address, meaning there is no record of a billable customer at a property. Alternatively, it could be that the different systems used across the business do not correlate correctly, and that customer data has not been linked with meter information – so no bill is sent.

Whatever the reason, the consequences are costly. One UK-based supplier has estimated that as many as 20,000 addresses on its system are unbilled. Another has estimated that 5%-10% of meters are 'ghosts', ie meters that are known to exist, but are not associated with a customer. All of these sites will be using electricity, gas or water.

By using a single source of location information, unbilled revenue can be dramatically reduced. The centralised hub brings together all information about a site – customers, meters, billing data and more – joined up information preventing gaps appearing in billed revenue.

> Even at a conservative estimate of 2.5% unbilled revenues, the issue is costing UK industry in the region of £1bn per annum. [4]

Better customer service

With competition between utilities companies at an all-time high, and regulators increasing the pressure to boost performance, delivering good customer service is business-critical. UK regulators create league tables in order to compare the service performance of different utilities. Improvements are encouraged through incentives and penalties - both of which can be financial.

Relying on disjointed sources of location information can be a barrier to effective service. For example, a customer service operative may be unable to find a caller's address without asking a barrage of questions. The operative may then, unwittingly, give out an incorrect address or meter number to field teams, slowing down response times and even causing potential problems with billing. Inaccurate location information can also cause mail to be sent to the wrong address, or for customers to be telephoned unnecessarily. All of these issues can be frustrating to customers, while potentially pushing utilities companies down in the regulator's rankings.

However, with an accurate, centralised repository of location information, customer service activities across the business – from the call centre, to field work, to billing – can be far more efficient and costs of customer care can be reduced by 25% to 30%.

[4] Esri UK analysis of domestic energy bills, 2013.

The benefits of a single view of location information

Enhanced emergency response

Rapid emergency response is critical to a utilities business. Being able to quickly despatch emergency service teams to an incident, locate the issue, and resolve it swiftly, is vital in order to minimise disruption to service while maintaining public safety.

This can be challenging without access to accurate location information. Callers reporting an emergency often struggle to describe the precise location. They often expect the emergency responder to be using a map – which is not usually the case. Address errors can result
in sub-optimal scheduling of crews, or cause them to take inefficient routes to a destination. Such errors also make it time-consuming for field teams to pinpoint the precise location of the problem. In an emergency, delays such as these can have serious consequences.

By centralising location management practices, however, emergency teams can be strategically located, valuable time can be shaved off routes, and anything from minutes to hours can be saved in isolating the source of the issue. Vulnerable individuals can also be identified, and their needs prioritised.

Case Study: National Grid

National Grid plc is one of the largest investor-owned energy companies
in the world delivering energy to millions of homes and businesses across Great Britain.

Within National Grid's UK Gas Distribution business, maintaining reliable location information was challenging. The staff relied on a variety of systems to do their jobs; each system used different sources of address data, referenced and searched in different ways.

As part of its ambitious Gas Distribution Transformation Programme, National Grid adopted a Geographic Information System (GIS) from Esri UK. Built into this system was Esri UK's innovative LocatorHub solution.

In the first 12 months of operation National Grid completed 1.5m jobs using LocatorHub to precisely identify properties or gas sites. It also verified more than 60,000 gas site locations. The business now has one point of reference, for all activities, at any individual site.

"This helps our engineers deliver better service. And it's easier to get the business intelligence to make more informed strategic decisions," commented John Turner, Project Manager for National Grid. *"The Esri system is a core part of our business."*

Better incident investigation

When investigating incidents at a customer premises, operational site or network asset, the information requirement is both broad and deep – from a site's repair history, to reports made by customers and the public, to activities at nearby premises. But when this information is scattered between a number of different systems, collating it can take anything from weeks to months.

By using a central hub of location information, location becomes the context for all other operational data within the business. This makes it possible for all information about a site and its surrounding area – customers, landlords, occupiers, utility usage data, repair history and more – to be drawn together very quickly. As a result, incident investigation can now be completed in just a few days.

Better business intelligence

One of the most powerful advantages of a single view of location is the ability to create new business insight from existing information. If location is put at the heart of business operations, it can act as the context for all operational data – making it possible to cross-reference information. Patterns, trends and other previously unseen relationships can be revealed, while questions such as "what is nearby?", "who is affected?" and "who should we inform?" can simply be answered with a single query.

Case study: Northern Gas Networks

Northern Gas Networks (NGN) distributes gas to 2.7m homes and businesses across the north of England. Its 37,000km network extends south from the Scottish border, covering a significant rural area as well as a number of large cities. This mix of dense urban areas and highly remote rural populations makes it vital for NGN to have accurate address data, to keep network maintenance and management as efficient and cost-effective as possible.

NGN now relies on Esri UK's LocatorHub platform. *"Every department consults the same, accurate set of data to make decisions daily, which helps us to stay efficient,"* explained Pete Crosier, GIS Data Integrity Assistant for NGN. *"When we first implemented LocatorHub, we didn't know how powerful it was and how much we would use it. But it's become absolutely central to everything we do."*

About Esri UK

Esri UK is part of Esri, the world's leading provider of Geographic Information Systems (GIS) technology, helping businesses become more profitable through a better understanding of location-based information.

Esri UK offers an extensive range of GIS technology and professional services and is the only company in the UK providing a complete and entirely integrated solution.

Esri UK's customers include National Grid, Severn Trent Water, ScottishPower and Northern Gas Networks. Over 60% of UK utilities now rely on Esri solutions to run their daily operations.

For more information and case studies, visit www.esriuk.com/utilities.

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