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Geography matters: a plan to underpin e-Government

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Abstract

The current pressures on central and local government organisations are immense. Departments are faced with major challenges on all fronts in a business and technological environment where the pace of change is faster than ever before. Such challenges include:

- Delivery of specific and non-specific targets set by many different parts of government for many other different parts of government. Examples include 100% Electronic Service Delivery and Urban and Rural Renaissance plans.

- Legislative and necessity pressures to participate in a whole series of initiatives aimed at triggering service improvement. These range from UK On-Line and Social Exclusion, to the National Land and Property Gazetteer and Digital National Framework

- Citizen expectations of government services being as flexible as those they receive from business, but that also bridge the 'Digital Divide'.

- Competition in the Information Age to deliver services that embrace exponential technology developments

- Instantaneous and planned reaction to solve and manage real world problems such as climate change and flood risk, foot and mouth outbreaks and transport disasters.

There is a danger that rather than being an opportunity to revolutionise government, the diverse pressures of e-Government targets and initiatives, as well as today's physical and technical environments will instead lead to fragmented and inefficient delivery of future services. This paper argues that more than ever before government organisations must recognise the GI content of their data as an underpinning enabler for successful, integrated and joined-up delivery of their e-Government agendas.

This paper discusses the need to push at the highest levels to ensure that GI becomes synonymous with e-Government and is a core component of all e-Government strategies, not something continuing to be pushed by an enthusiastic few. It describes what e-Government is and key components of it, the potential for GI within it, examples of e-Government GI investments and successful uses as well as identifying significant gaps. Most importantly the paper outlines key aspects of a plan for ensuring GI underpins future e-Government agendas.

1 Introduction

New Labour tells us that e-Government = Government, and that the government must lead the creation of the most e-Enabled economy in the world. Arguably Information Age Government will mean the most radical ever changes to the way it operates. The challenges and problems this presents for both central and local government are also a major opportunity to ensure geographic information realises its potential to underpin government business. Currently the predominant signs are that GI does not form a core part of department e-Business strategies and authority Implementing e-Government Statements. If in creating a

dynamic e-Enabled economy without GI as a core element, Geographic Information Systems (GIS) may be destined to be used only an enthusiastic few. The plan must be for all organisations associated with the AGI, (including the Intra Governmental Group for Geographic Information (IGGI)) and GIS to work together to lobby government to create the imperative for GI at the heart of e-Government. The potential alternative is to see GI on the margins of both government and business.

2 The Challenges for Government

The current challenges faced by both central and local government organisations are broadly recognized, significant and extremely diverse. Essentially these pressures could be seen to be coming from three key sources; government, technology and citizens.

Government

With the publication of the Modernising Government White Paper in March 1999, e-Government was born. Under Information Age Government, e-Government has 4 key themes-

Building services around citizens choices - *Convenient public services as good as commercial services*

Making government and its services more accessible - *Interact with government in the way you want to*

Making government more socially inclusive - *Everyone should have access*

Using government information better - *Joined-up integrated services*

Under these themes government have set a myriad of targets and objectives, Best Value Performance Indicators, performance measures and strategy statements for organisations to respond to. Mainly leading up to 2005 these are aimed at stimulating and triggering organisational change. In addition, initiatives including the National Land and Property Gazetteer (NLPG), PAT 18 - Social Exclusion and the National Land Use Database (NLUD) require resource commitment encouraged sometimes through legislation, but mostly through organisations being 'strongly advised' to contribute and participate.

Technology

Today, technology is part of almost everything we see, use or buy; from scanners to record the items we buy in supermarkets to interactive childrens toys or the methods we use to communicate. The challenge for government is to embrace the same technologies as other industries or business to enable them to be flexible and proactive to future demands and targets. The government drive for modernisation and e-Enablement is to use technology to stimulate departments into action. Images of Kiosks, Digital TV and WAP phones provide glamorous visions of the aspiration for the ways government can implement technology. These are all very well but it must be remembered that these Channels or front ends are not sustainable without the right business processes, data to deliver those business processes and flexible and maintainable information architectures sitting in organisations behind them.

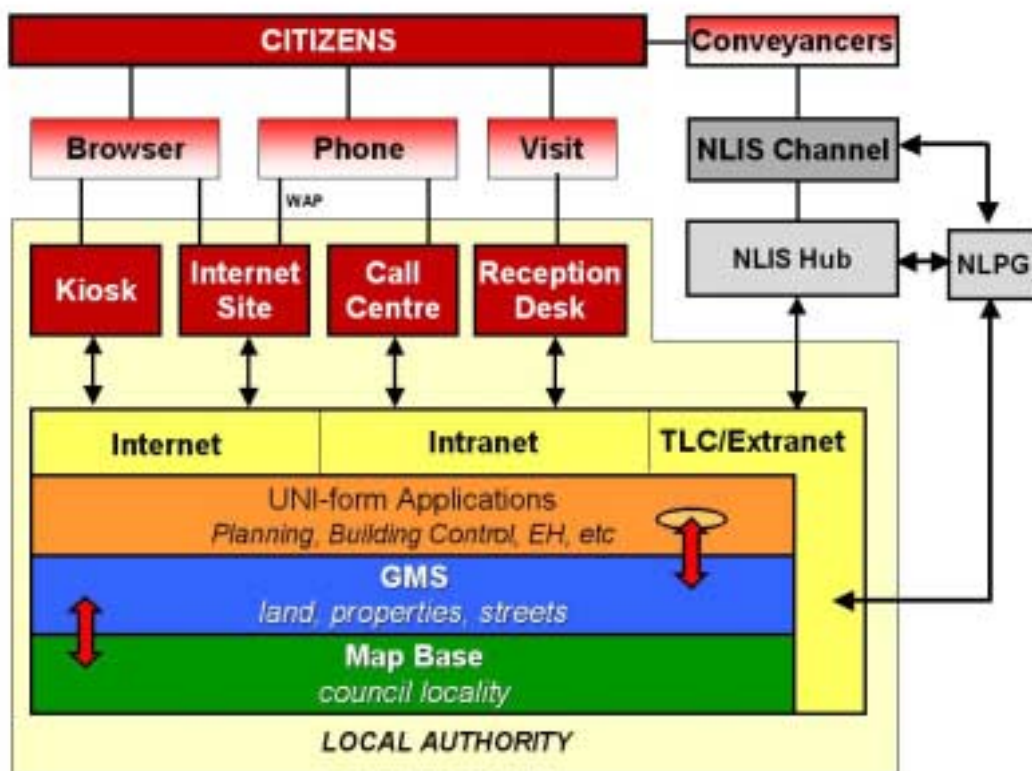*Figure 1 – A flexible information architecture for local authorities*

Figure 1 shows a multi-layered web-based architecture approach to e-Government for local Authorities designed to incorporate GIS, an underpinning gazetteer and integrate systems to reduce system management overheads and increase flexibility. In many ways the approach to e-Government should be to first consider business processes and data to support them, using these as requirements helps give a clearer understanding of the best option from a myriad of software, hardware and solutions available in the market place. For example a significant trend now is towards Spatially Enabled applications, which include mapping tools and facilities within applications. Ensuring these e-Government technology choices involve GI as a mandatory must be the challenge for the AGI and all organisations associated with it.

Citizens

We all have rising expectations of the flexibility, speed and ease in which we can interact to get the right responses from all services whether from the private sector or government. We expect to be able to buy or be able to access whatever services we want on the Internet, 24/7 i.e. in the way we want, when we want. Government's real objective of modernisation again incorporates through its focus on improving public services. As services become more streamlined the opportunity for GI can become even greater, for example with the demand for information about our local area. Wiltshire County Council for example have an interactive mapping website for reporting faults such as street lights out or block drains, or the Environment Agency's 'Whats in My Backyard' service to learn about clean beaches or pollution in your local area.

The goal for all central and local government departments under e-Government must be efficiency. The challenge is to avoid fragmented and inefficient responses to the challenges. This requires an enterprise wide and joined-up approach within and between organisations.

The danger is however that the many and varied demands from government, citizens and technology mean rapid and reactive responses leading to fragmentation and unsustainable services and delivery of objectives. Without a corporate approach, bought into by all parts of an organisation with plans and

programmes to support, government will lag behind with its targets and never deliver the services to the individual.

Those departments that are responding well are using innovation and imagination to review business processes and identify data to deliver those processes, ensuring GI is recognised as core content. For LA's gazetteers and BS 7666 can provide an ideal starting point to coordinate processes and data and make efficiency savings, for the Office of National Statistics the same may be true of managing datasets for Neighbourhood Renewal. For other central and local government organisations the starting point may not be as immediately evident.

3 What is government itself doing to help ?

e-Government is an attempt to ensure departments take an enterprise-wide approach and make their focus business process change not just an IT change through financial incentives but best practise exchange, identification of specific milestones, as well as practical technical standards and methods.

There are a number of organizations whose remit it is to assist the development of and promote e-Government. For Local Authorities this includes the Local Government Modernisation team at the Department of Local Government, Transport and the Regions (DTLR) and particularly IDeA and the Local Government Information House (LGIH) as well as the Local Government Association (LGA). For the remainder of government key organizations include the ever-expanding e-Envoys Office, which reports regularly to the Cabinet and has real responsibility for e-Enabled the UK economy.

Over £3 billion has been made available for central and local departmental bidding initiatives under the Capital Modernisation Fund. For Local Government this has come through 'Delivering local e-Government' funding for which authorities have had to put together corporate Implementing e-Government (IEG) statements i.e. plans and milestones towards 2005 and transformation of services. In the first round 25 authorities were given money and identified as 'Pathfinder' authorities. These projects are intended as exemplars for other authorities.

For Central Government agencies the goal was to write e-Business Strategies by autumn 2000 and publish these on the Internet. In addition Invest to Save Budget funds gave £47 million for 'joined-up projects' in its third round in 2000/1. Incidentally, ISB was an important source of funding to kick start the National Land Information Service (NLIS). For LA's investing in NLIS and NLPG as well as modernization £220 million of funding under Local Authority Modernisation Programme (LAMP) is also available.

There are a number of e-Government initiatives to 'Bridging the digital divide' to ensure the 'have nots or cannots' in terms of Digital TV, mobile phones or the Internet can access e-Government services. UK Online is now appearing as a brand and has established 'drop-in' centres, kiosks and is working at a local level to give access in rural areas. UK Online is creating a one-stop-shop for citizens to make standard life processes far simpler. Initially these are 'Change or Residence', 'Having a Baby', and 'Reporting a Crime'. Progress on implementing these has been slow, at the time of writing they are simply making existing information more easily available rather than changing any processes. Figure 2 shows the front page of the UK Online website – www.ukonline.gov.uk.

In addition to setting targets and objectives under a range of initiatives, government are putting into place elements of infrastructure and complementary practical technical standards within UKGovTalk under the e-Government Interoperability Framework (e-GIF) (www.ukgovtalk.gov.uk). All central and local government departments are obliged to adopt the standards within the e-GIF. Figure 2 shows an overview of the architecture of the e-GIF.
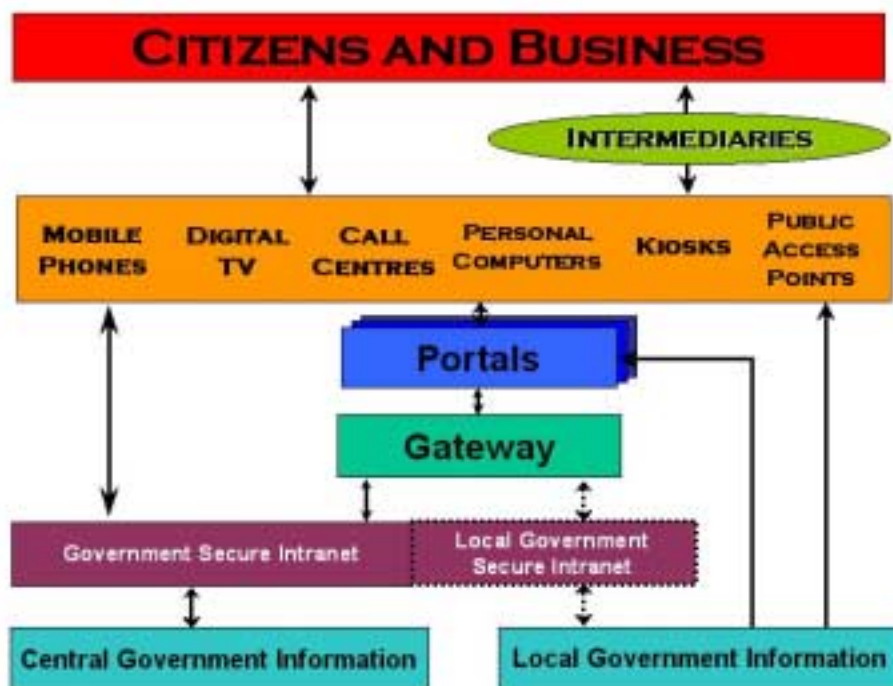
The e-GIF is now at version 2 with version 3 under review. It is aimed at making information flows across government seamless, principally so that business and citizens (at the top of figure 3) can get access to the value information assets (at the bottom of figure 3) that government organizations manage.

The principal language for the definition of the technical standards for the exchange of information within the e-GIF is eXtensible Markup Language (XML). As the new language of Internet, XML gives the flexibility to not only to enable new systems to exchange information but also to integrate legacy systems. Along with metadata this provides a potential mechanism for flexible, multi-layered connectivity between the distributed and hugely diverse systems within government. Government metadata requirements are defined under the new e-Government Metadata Framework (e-GMF). This aims to make finding government information online easier and the National Geospatial Data Framework (NGDF) has contributed to this.

It is worth noting that one of the first XML schema to be adopted as part of the e-GIF was for BS 7666, contributed by the Improvement and Development Agency (IDeA) and written under contract by ESRI (UK). This will form part of the requirement for the address and personal details service of the Change of Residence service and is perhaps one of the only aspects of GI currently included in e-Government.

At the core of the e-GIF is the Government Gateway. This is being developed as the mechanism to provide a level of control for private sector licensed service providers messaging to government systems. For services such as Change of Residence or Reporting a Crime, authentication of citizens and business and their enquiries will be needed and this is what the Gateway will provide. Authentication will be under Public Key Identification (PKI) although at the time of writing there are major concerns over the feasibility and practicality of this.

4 How far has central and local government got in meeting its challenges?

Although it is clear the challenges for government to overcome in the process of e-Business transformation are genuine, there is evidence to suggest that progress, for many, not all, has been slow. A number of recent studies and public sector commentators are showing concern that little real consistent progress is being made.

The July 2001 edition of Local Government IT Use featured an article that identifies many of these warnings. Reports such as the New Local Government Network report 'Winning the e-Revolution in local government' has found less than 30% of Local Authority Chief Executives have a good understanding of e-government. The EURIM (Cross-Parliamentary European Informatics Market) suggests while the 100% of service targets may be achieved by 2005, this will simply be 'brochure' or 'information' ware i.e. the conversion of existing practise and processes into an electronic delivery method. Technology may simply be used as a 'sticking plaster'.

Not all is bad news. All central government departments published their e-Business strategies last October and there are teams working extremely hard to ensure they are delivered, included are key GI users and managers such as Ordnance Survey and DTLR. For Local Government a July 2001 deadline for IEG statements is simply a starting point for on-going improvement and of course NLIS, NLPG and NLUD are being used at all levels within government as examples of how a vision can be put into place and organisations mobilised to deliver to a common vision (although this is not always an overnight process). To achieve these strategy targets a consensus view is needed and it requires joined-up thinking across and between organisations.

Generally those organisations that are succeeding are taking a simple approach. They have started with an overall vision that all internal departments and directorates can sign-up to (peer review may well have been fundamental in achieving common buy-in). Next the priorities can be identified and the issues broken down into small pieces, with 'killer applications' delivered first and used as examples.

E-government is fundamentally about streamlined and efficient business processes. This is often matched by the right data for the right process with an integrated systems approach to reduce overheads. The Royal Borough of Kingston Upon Thames (www.kingston.gov.uk) provides an excellent example of the application of an integrated approach through its ISIS on-line service (see figure 4)
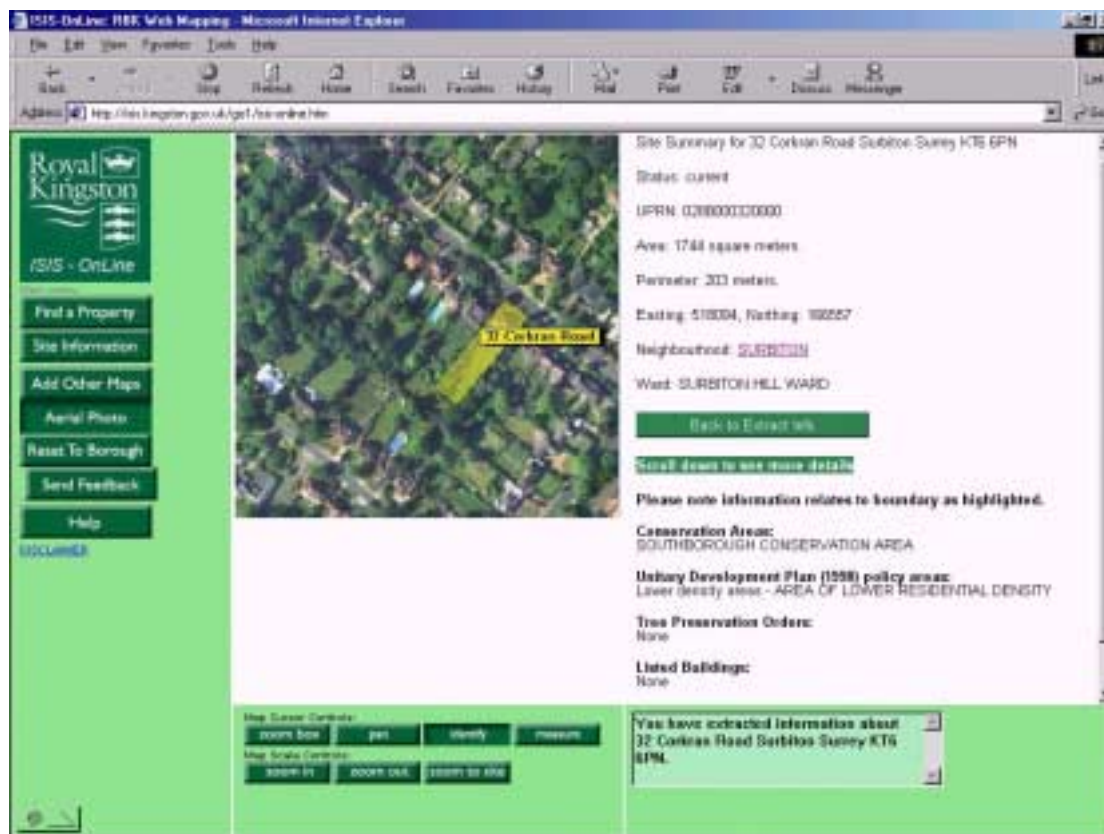
Much of the challenge for change by government has traditionally been culture; 'legacy staff' and 'legacy attitudes' are often at the heart of slow delivery. Key to e-government success are individual visionaries who believe in the value of what they do and are able to take others with them. In many respects it is only through the commitment of such individuals that initiatives like the MAGIC (Multi-Agency Geographic Information for the Countryside), the IDeA's ESD Toolkit and NLIS have delivered.

5 Potential for GI in gov

The potential for GI to underpin UK government has long been recognised and discussed amongst those who have been advocates and users of it for many years. High proportions of government information certainly have a geographic content. The Chorley Report and numerous papers at past AGI conferences document excellent examples of diverse applications of GI. Projects like Domesday 2000 and the National Geospatial Data Framework (NGDF) have tried to stimulate the recognition of the value of land and property related information and spatial information by government. However the enormous potential still remains unrealised.

(Incidentally the visions of Domesday 2000 in small part realised through the conveyancing channels being implemented by NLIS are now being re-expressed as the National Spatial Data Infrastructure (NSDI) for the UK and have a vision of core infrastructure datasets, incorporating a national cadastre and flexible interchange between data and systems.)

The reality is that although GI is used and managed in government, this is not commonly recognised. GIS is often used only to solve specific problems in an evolutionary way, for example to solve environmental issues such as the location of wind farms or land fill sites or to deal with flooding incidents. Perhaps the real value of GIS is only recognised in genuine times of crisis. For example, GIS was used heavily during foot and mouth but only rolled out countrywide reactively, so widely in fact that GIS skilled resources became a premium. If government GI infrastructures had already been in place huge resource savings could potentially have been made.

There are, however, some excellent examples of how government is working together to release the power of GI. Figure 5 shows how DTLR (DETR at the time) have brought local authorities (Previously Developed

land sites), Environment Agency (flood plains), Ordnance Survey (topographic information) and the Boundary Commission (Boundaries) information together to help influence government Planning Policy Guidance and new house building targets.

Figure 5 – The application of GI for house policy making
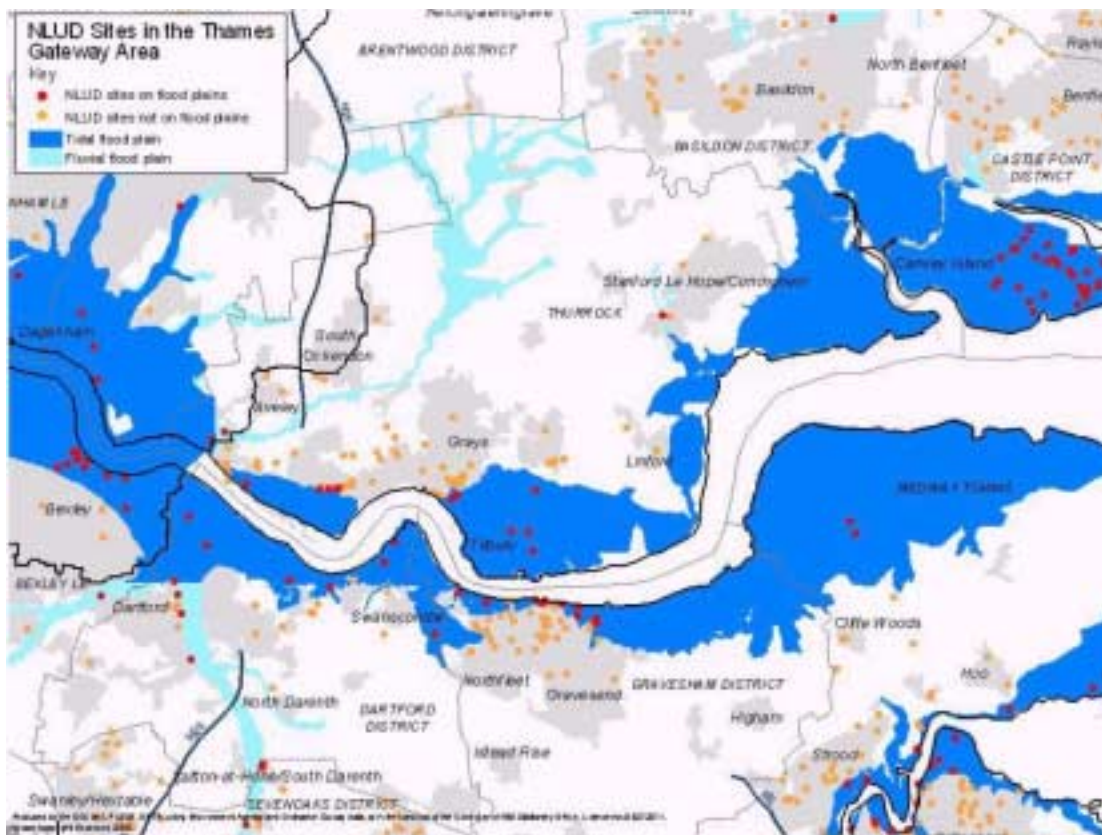
## 6 e-Government an opportunity not to be missed by GI

The process of e-Government change creates challenges and problems for departments to overcome. For those involved and knowledgeable of the potential that recognition and management GI data assets have to join-up government and so provide an exemplar to business, it is disappointing that few government e-Business strategies have singled out its importance. Again of course there are exceptions, but again they are the same departments such as DTLR, DEFRA and OS as well as many Local Authorities who have at a minimum included NLPG as well as NLIS and NLUD within their IEG statements.

Currently only a handful of over 800 central government departments have access to the OS Service Level Agreement (SLA) and although all LA's have access often the usage is limited to selected teams within organisations, perhaps Planning or Local Land Charges. With the introduction of Intranet infrastructures, database technologies and products like Arc Internet Map Server (ArcIMS), there is the potential to make full use of GI right across organisations. The DTLR Maps-On Tap project is just such an example giving online access to all scales of OS mapping for potentially up-to 15,000 users.

It was noted that in the Unitied States the largest sector for GIS is central government and industry conferences regularly have well over 10,000 attendees. The fear in the UK must be that if government is not fully alerted to the potential of GI during the e-Government revolution then it will remain as a sideline to mainstream IS (Information System, Service and Solutions). Surely the e-GIF and UK Online should be making full use of GI ? Figure 6 shows an example of how a Change of Residence Service could be improved through the use of GI.

Figure 6 – How UK Online could look with mapping and NLPG incorporated
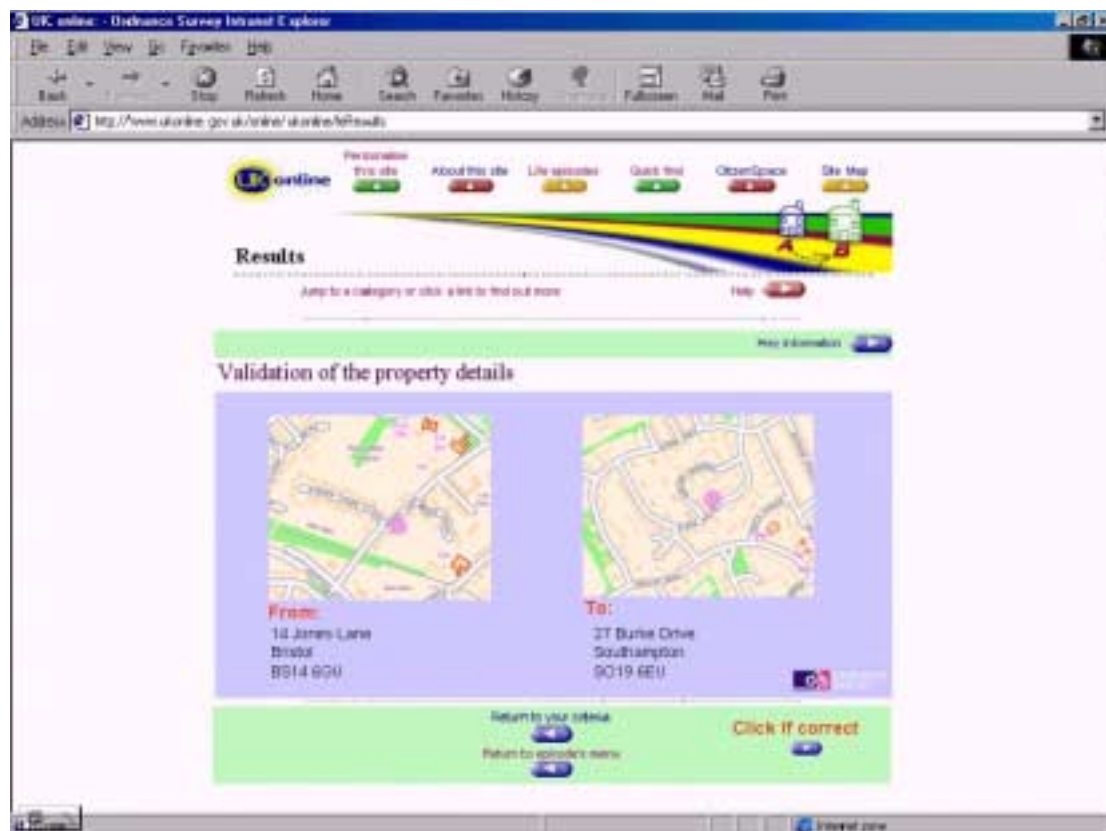
Ordnance Survey, IDeA, DTLR and vendors including ESRI (UK) are currently the only organisations attempting to influence and alert government to the value of GI. They are working with the e-Envoys office, Cabinet Office and at ministerial levels, but more support is required in order to expand the GI market place. This support is needed to encourage e-Champions as well as work on technical XML specifications for the exchange of data.

7 Planning for GI to underpin e-Government

In planning to ensure GI does not miss the e-Government opportunity, it becomes synonymous with e-Government and corporate strategies, it is important to identify why it has not so far. Reasons may include:

- There has been no opportunity as significant as e-Government or trigger to change the way processes 'have always been done'.

- There have always been questions over price, particularly in proportion to its value to the end-user of Ordnance Survey data. Central Government departments commonly have little feel for how much OS data would cost for their usage or even what is available and for what purpose.

- Insufficient lobbying at the highest levels of government in order to bring on-board GI champions with real influence. Too often perhaps the torch has been carried by the same few, without practical examples of success to hand.

- In many cases GIS has been developed in an evolutionary rather than revolutionary way for specific projects or needs, rather than for a whole organisation. This leads to low penetration and awareness of availability of GI information particularly to those organisations currently peripheral to the GI story.

- Insufficient marketing of success in a co-ordinated way to potential new users – solving problems and especially policy e.g. flooding, foot and mouth

8 The plan

Establishing an imperative must be at the centre of any plan to ensure GI becomes synonymous with e-Government and is a core component of all e-Government strategies. It is important to recognise that the development of an e-Enabled economy will take time and that it is not too late to include GI data management within it. The aspects of the plan proposed here are for further debate and discussion, but focus on raising profile through examples, using high profile contacts and lobbying to get specific individuals on board. All of them relate to organisations and individuals associated with the AGI.

Lobbying at the highest levels of government

Contacts and networks within government at the highest levels must be alerted to the potential of GI. Specifically, government needs a GI Strategy of its own to cover all departments. Disjointed reaction and responses to recent crises such as foot and mouth, flooding and rail and fuel incidents provide potential evidence of how a more strategic GI based approach could have led to more efficient responses. In particular OS, DTLR and others must be given support in lobbying the e-Envoys office.

A GI strategy for government

To speed-up the process of creating a GI strategy for government a commonly agreed draft is required for the lobbyists to deliver. NSDI datasets such as NLPG, DNF, NLUD, Boundary Datasets and the organisations responsible for them will form a core part of this. The datasets and the messages about them must be joined-up rather than on-going topics for debate.

Development of examplars

There is a need to develop an industry approved set of case studies as a common resource to illustrate the breadth of application of GIS across central and local government. Organisations submitting examples for industry awards could be put into such a pool. Examples must focus on success in delivering effective policy making, resolution of problems and incidents and how GI can help satisfy the e-Envoys drive for innovative change and application of technology.

Specifically, the application and demonstration of GI within new technologies is key. Showing how Spatial tools can be enabled within almost any application for data capture or mobile working, to Kiosks and Digital TV. Tools must be simple to use this will extend the use of GI and not just for experts.

High profile government media events

The potential of GI to helping government delivery needs to up front. Hosting seminars that enable heads of industry to inform heads of government of this need is key. This could include individuals from other countries, including the US where GI plays a far more fundamental part in government. These events must appeal to organisations not commonly associated with the AGI.

Ready and simple access to OS data

Government, IGGI and Ordnance Survey must be given as much support as possible to put into place whereby all of government has access to the National Topographic Database. This was an important step for LA's but alone is insufficient; it must be support with mechanisms and web based technologies that roll GI out to whole organisations at a time. A try before you buy approach could be instrumental.

Influence the e-GIF

The e-GIF and UKGovTalk are fundamental to the future of a joined-up systems model for government. More influence and involvement in the associated infrastructure and technical forums must take place from GI related organisations. One example would be to ensure that OpenGIS standards are adopted as part of the e-GIF. The aim must be to ensure the e-GIF contains direct reference to the importance of GI.

Conclusions

The key issue in delivering the elements of this plan is organizations working together rather than in isolation for their own ends. Organizations and individuals who can work under an alliance and commit time and resources giving greater strength to its arguments must take on the aims of the plan. Such a group must be supported by the AGI as the goal of better and wider use of GI in government is core to ensuring it is part of future mainstream IS.