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Paper Title: Will GIS Finally Deliver Smarter e-Gov Services?

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Paper Abstract: The paper will reflect on endeavours within the UK and Europe to promote and support electronic service delivery from central and local government. An increasing emphasis is now being placed on the fundamental importance of geographic information in supporting electronic public services. Various initiatives are being pursued at National and pan European level to conjoin data and service content, however are we being ambitious enough? This paper will argue that we need to challenge conventional wisdom and traditional responsibilities in favour of more streamlined and efficient public services. Rather than simply develop better means to share data we need to focus on adopting a capture once, maintain centrally, and use many times philosophy. Rationalisation of data in this sense could deliver significant economies and benefits. Logically it could lead to critical re-modeling of public service responsibility and delivery to align with actual data life cycles and focus more on user needs.

Will GIS Finally Deliver Smarter e-Gov Services?

1. Introduction

Many factors exist which are forcing us all to do business and go about our personal life in different ways. Prominent in these is of course is the continuing advance and development of information technology. In keeping with the commercial sector, Governments around the globe are eager to draw maximum advantage from this phenomenon in order to deliver much more effective and efficient public services. Imperatives to do the job smarter and cheaper are also being driven from increasing pressures on operational budgets. Through living in the information age the citizen is now accustomed to a diverse range of e-services and equally expects government to keep in step with the considerable attractions associated with this.

In advancing these principles many government inspired initiatives have tended to use Geographical Information without fully appreciating the true value and power of it, if employed in an informed manner. This can largely be attributed to the relatively poor understanding of this critical component in developing new solutions within the public sector. It also rather seems to contradict the fact that it is now widely recognised that over 80% of all data held by Government is already spatially referenced or is indeed capable of being made to be so.

A number of significant attempts have and continue to be advanced to heighten the profile and fundamental importance of geographic information. These have helped improve a wider understanding of how such data can directly support a more co-ordinated and intuitive approach to cost effective delivery of public services. Nevertheless much of the wisdom to date has largely been limited to linking and sharing data which is often still duplicated and held in separate repositories across government. As a result, only marginal savings are being achieved through making mediocre improvements to the way in which data is managed. Major economies in scale in data creation, maintenance and dissemination costs have so far escaped the wider public sector. Likewise service content or design often remains largely unchanged apart perhaps from benefiting from an electronic user interface.

Much more emphasis needs to be placed on a fundamental re-design of roles and responsibilities and concomitant custodianship of supporting data. In contrast with approaches in the recent past, technology, at least initially, needs to take more of a back seat and allow process re-modeling to take centre stage. In adopting such a methodology there is far greater scope to align the resultant solution with actual data life cycles and the corresponding needs of the citizen and society today and into the future. Traditional roles and responsibilities must be robustly challenged. Equally solutions must be more than a computerised

version of conventional practice and service. New service development must fully address requirements today and be equally capable of being flexible enough to incorporate future needs and new ways of supporting service delivery from Government.

The foremost challenge facing the public sector in the immediate future as we all move beyond the initial stages of e-government is ‘transformation’. This term can have many interpretations but critically it must involve collaborative working to carry out functions smarter and in contrast to many of the stovepipe efforts witnessed to date.

2. Background to E-Government:

The modernising government agenda in the United Kingdom can trace its roots to a Modernising Government White Paper in 1999. Seeking to utilise new technology to the full it was essentially aimed at

- improving the quality of public service,
- communicating better with the citizen,
- developing a partnership approach to service provision and
- making the entire experience much more transparent and accountable.

The overarching target aims to have all public services, which can be delivered electronically, on-line by 2005. A great deal of progress has been made but many services are just electronic replications of the conventional ‘over the counter’ service. The efficiency and content of services on offer have often failed to maximise the opportunity to smarten the overall experience for the citizen and business user alike. Some web sites are little more than ‘brochureware’ and only replicate hard copy literature as digital versions. As a result, apart from a significant minority of innovative applications, citizens often continue to be frustrated by the need to make contact with various levels of government when seeking advice, information or some level of public service.

This situation is typified during the present complex house buying process that can still involve the need to contact a range of public bodies in order to complete the necessary property checks prior to contracting on a sale. This may include searches with the Land Registry to confirm ownership and rights information; local government to obtain development constraint and planning intention information; utility companies to determine available services; financial services to acquire mortgages; environmental agencies to identify relevant encumbrances and legal services to advise on and complete the property transfer. Clearly this situation is not ideal as it is very fragmented and contributes to high transactional costs and avoidable time penalties.

The converging forces of ICT, the web and e-business ambitions are increasingly providing the platform upon which governments can now radically re-think how they deliver services to the citizen.
With the technology capability now available these emerging services should be able to provide the following advantages:

- Single point of entry to government services ;
- 24/7 access to the services;
- Integration of services to provide a cohesive
- On-Line transactions reducing the time and costs for processing the transactions;
- Easier access to government held information leading to greater transparency and accountability in decision making
- Opportunities for citizens to participate in decision making / e-democracy; and
- Opportunities to leverage finance and know-how through partnerships with the private sector in delivering services.

There are presently three basic forms of e-government that are described in the following sections:

- Access to information ;
- Transaction services; and
- Citizen participation.

The significance of spatial information in supporting the delivery of e-government services is being increasingly recognised and acknowledged. It is seen as the ‘silver bullet’ to enable the integration of the many disparate datasets which exist across government and it provides the logical conduit to making e-government an effective and efficient reality. This style of integration is best supported through the establishment of a National Spatial Database Infrastructure that provides each arm of government with a definitive, national, spatial data framework to manage their data within. This is especially pertinent for postal address based information. Spatial information is also a significant communication tool in the delivery of services and is an essential component in supporting a consultation process, for example in seeking views on proposals for new building developments.

2.1 Access to Information

Acknowledged as probably the most common and basic form of e-government, this level of e-service involves the simple dissemination of government held information. Numerous examples already exist in the UK, Europe and the remainder of the world. Generally these sites provide citizens and business users with the ability to query an enormous range of records and information that are in the public domain. However these sites seldom conform to any agreed national

standards which can often prevent or hamper any attempt to integrate data from various sources. In the absence of the ability to merge data in this way some commendable attempts have been made to brigade separate information services and partially integrate others through a single portal to varying levels of success.
The government gateway in the UK www.direct.gov.uk is one fairly basic example, whereas MAGIC offers a slightly better level of sophistication www.magic.gov.uk

Of course not all government held information is available for free and many users need to pay for the privilege. This is especially relevant when sourcing information from self-financing arms of government such as the national mapping agency and land registry functions.

2.2 Transaction Services

Through employing web based solutions the citizen and business user can benefit from transacting electronically with government. These transactions can range between simple notification of certain events or for ordering services to be delivered off-line to fully chargeable services. Typical examples of the basic offering can include personal tax returns, booking a driving test or submitting a planning application. These examples constitute the simple supply of information to improve existing back office processes which largely remain unchanged and usually only involve one part of government. Far greater benefits for all concerned, but in particular the public purse, can be achieved where more complex transactions, involving cross agency activities at all levels of government, are pursued. A notable example of this is the National Land Information Service which helping greatly to improve the process for buying and selling properties. www.nlis.org.uk

2.3 Citizen Participation

Possibly the most controversial and certainly the least developed application in government is direct citizen participation in the government decision making process. This level of participation at its most basic includes the potential for e-lobbying through to commenting on government policy making then perhaps developing the means for e-voting.
In our modern society, the public is now accustomed to being consulted regularly, and generally when given the chance, most people will give a view on almost anything. This level of e-government is still to be fully developed but has the obvious potential to advance considerable changes in our representative style of democracy.

1. Targets set by Government for the UK / Scotland

The initial agenda for e-government set by the Office of the e-Envoy (OoE) (now superseded by the Office of e-Government) and the Office of Government Commerce (OGC) aimed to focus on accessibility and meeting the needs of citizens and business. It was felt that there had to be wider choice on how public services should be provided and that competition could be encouraged by reducing the barriers to the government market. The initial target to have all services available on-line by 2008 was advanced to 2005.

Despite Scotland now having its own parliament, e-government intentions are in concert with the rest of the UK.

3.1 Governance set up by Government

In order to monitor and measure the progress towards e-enablement of the UK the government established the UK online programme (recently superseded by Direct Government www.direct.gov.uk). Since its inception this programme has been underpinned by challenging targets in the key areas of Business, Government and People. Progress towards targets in all areas continues to be reported on a regular basis. This has not only allowed the government to chart advances and improvements it has also provided the means to continually sharpen and refine the direction of the overarching strategy. In essence the transformation of public service delivery and corresponding efficiency gains.

Progress against the specific targets can be summarised as follows:

Transforming Business

Obviously British business needs to recognise and fully utilise ICT if they have any hope of competing in the home, European or World markets. Increasingly this can be the difference between staying in business or not. The government cannot realistically set any targets here as they have no direct control on how the commercial sector go about their business.
Instead the government continues to provide the necessary transition support to e-business through their online strategy, encouraging the expansion of the broadband market and modernising the regulatory, legal and fiscal framework in the UK.

Transforming Government

The UK government is committed to a fundamental reform of public services. The citizen and business customer must increasingly be able to deal with all levels of government when they want, where they want and how they want through a range of highly reliable service channels. Presently over 71% of existing services are now available electronically.

In addition to improving front office services, ICT is actively being used to improve general efficiency of the public sector machine. Commendable attempts are being made to re-think and improve matters across various disciplines.

Transforming Opportunity for People

Clearly if everyone is to benefit from new improved service delivery then they need to have access to the underpinning technologies through which they are delivered. Accordingly the goal here is to ensure everyone who wants it has access to the Internet by 2005. Presently 60% of the population are deemed to be active users.

3.2 Funding / Programmes Initiated by the Government

Successive government spending reviews have reflected a substantial financial commitment to the development of e-service delivery. Generally access to such funding has been made available through a Modernising Government Fund and is gained through open competition. Public sector bodies have to bid for cash to support innovative projects or new service applications. The merits of each individual bid is assessed on the expected level of service improvement and fit with the overarching e-strategy. Increasingly, bids need to promote a more holistic approach to conjoining ‘silo’ services and re-engineering conventional practices and process. A key theme here of course is to develop a clear citizen-focused approach to all such activities.

3.3 The European Dimension

Very much in keeping with ambitions in the UK, the European Union is equally anxious to encourage member states to develop similar approaches in public service improvements and is working towards a directive agreed in 2002 by the European Commission on the re-use and commercial exploitation of public sector information. It is also anxious to establish more pan European initiatives to converge the availability and delivery of public services across Europe.
The main objective here is a market oriented e-Content programme that aims to support the production, use and distribution of European digital content and to promote linguistic and cultural diversity on global networks.

It is acknowledged that the public sector collects and produces vast amounts of information, much of which is of interest to individuals and businesses, and which can be the raw material for value-added information services produced by the content industries. There are however, many barriers in converting this potential into usable products and services. These barriers lead to uncertainties, which in turn result into a lack of investment from both the public and the private sectors, degrading the level of services for users. The public sector element of the e-Content programme seeks to overcome these issues and develop new services to support a wide range of activities for Europe and its citizens.

Significant funds have also been made available to financially support cross border co-operation in the development of joined up services with some notable successes.

2. What has been delivered then?

4.1 An expose of significant initiatives in the UK and Europe

As noted earlier in the paper there is a vast array of examples in existence that can largely support the main thrust of e-government. It is without doubt that many of these have delivered noticeable improvements to the way in which certain public services are delivered. There a few though that can claim to have fundamentally altered the way in which the public sector executes its responsibilities and is in tune with the growing demands and expectations of the information society. As noted earlier, in endeavouring to advance innovative solutions for systematically overhauling and improving public services we are now witnessing a long overdue recognition of the critical role geographic information has to play.
In order to rehearse and support this viewpoint it is worth reflecting on a couple of prominent efforts in the UK.

4.2 The UK and Scotland

4.2.1 The Acacia programme

In recognition of the considerable duplication in address based (spatially referenced) information held and managed by a number of key government departments and other public sector bodies efforts were initiated to determine how this data might be better managed for mutual benefit. The Acacia programme which reported its findings in June 2004 was a collaborative project run by a partnership of key government agencies to investigate and define the requirements for a single national infrastructure of joined-up, consistent, high quality, well-maintained addresses and property information.

The Acacia partnership comprised Ordnance Survey (National Mapping Agency), Land Registries for England /Wales and Scotland, Valuation Office Agency (Property Valuers for Local Tax), Local Authorities and the Royal Mail.

The Acacia vision

The Acacia vision was one of an infrastructure of joined-up consistent, maintained address and property information. The Acacia Memorandum of Understanding describes the aim of the Acacia work programme as

> *"… to co-ordinate the development and maintenance, and promote the use, of a definitive, consistent and joined-up national infrastructure of*

property addresses and related data with the related mapping so as to facilitate major economies, efficiencies and service improvements both in the public sector and throughout the economy."

The programme aimed to promote the development and maintenance in the national interest of definitive national databanks of addresses (including postal and other elements), streets, non-addressable properties and in due course property ownership and occupancy parcels, together with the related definitive mapping, all linked together and held as a land and property layer within the framework of OS MasterMap (National Mapping), and all continuously updated and readily accessible to users.

This exercise proved to be a considerable undertaking with each organisation coming at the proposition from a slightly different business and technical perspective. Over the course of the programme tensions surfaced which highlighted diverse views and positions on the potential technical solutions and corresponding business relationships. Nevertheless progress was made and the following lessons were learned and conclusions drawn:

- The pilot and associated research work has strengthened earlier beliefs that a national infrastructure as envisaged in the Acacia vision is feasible in technical terms.

- Non of the existing address products currently meets all the needs of the proposed national infrastructure.

- The key issue is to ensure a robust and maintained national infrastructure of addresses can facilitate the linking up of application datasets, based on different business requirements and views of the world.

- A proper governance structure under a lead-Department, working to a defined remit, with suitable empowerment and dedicated staff resources, will be critical to success.

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- The solution adopted should apply nation-wide alongside initiatives in Scotland and Northern Ireland.

- The roles and responsibilities of all partners in address creation and maintenance should be defined; A clear allocation of responsibilities for individual elements in the addresses and other data and in the development and maintenance processes is essential.

- The first stage of a joined-up national address infrastructure is the linking of source datasets. Such an infrastructure requires selection of the best quality source for each category of data, matching source data and resolution of matching failures.

- Address data matching is important in order to eliminate duplication, facilitate ease of future use and ensure that new records are properly recognised. Such matching is best done once rather than by all partners.

- It is not sensible to try to match all data with all. The minor errors, omissions, duplications and discrepancies in the source datasets mean that it is not possible to match them entirely. Matching rates can be deceptive if the matching criteria are too loosely set and erroneous matches are thereby produced. Resolution of matching issues requires a major effort involving local knowledge and may necessitate inspection on the ground.

- Maintenance is all-important. A centralised change information model, with close involvement of the data suppliers, is needed. Data suppliers and users should obtain new addresses from the definitive source, where possible, rather than create their own. Responsibilities for core components should be clearly allocated to the appropriate organisations. Alternative models for a national system should be evaluated.

- The technical requirements include a definition of categories of addressable objects, adoption of core-address components, a clear address life cycle, a rule-base to manage other aspects and data and quality management.

- The address life-cycle model should be further developed. A national infrastructure needs to recognise the needs of individual stakeholder organisations for change information at different points in the address life-cycle, especially in the early stages of a new address, while also enabling them to avoid the clutter of unwanted information.

- Local authorities, with their local knowledge and statutory obligations, have a key role to play in the national infrastructure and in resolution of

anomalies. The naming and numbering function needs to be integrated with the street and land and property gazetteer functions. LLPGs need to be completed and maintained to a very high standard.

- Rigorous processes should be established to ensure that local authorities, Royal Mail and others notify each other of approved addresses and changes, or proposed changes, without fail and in an agreed format, and that change information is shared as required with other players in the co-operative maintenance process.

- The importance of accurate mapping co-ordinates in checking addresses (especially of objects without postal addresses) remains undiminished

- Stakeholders and users need to adapt their processes and extend their data quality and management functions, with changes as required to business processes.

- Improved and extended guidelines, more effectively disseminated, covering the practical application of the BS 7666 standard, the rule-base, data and quality management and other issues, are needed for local authorities working on local land and property gazetteers and for others working on addresses. The guidelines and the revised standard need to take account of the findings from the Acacia work.
- The key categories of object that need to be included in the addresses infrastructure have been identified. At the highest level these are residential buildings, commercial properties and public buildings and facilities. The initial classification proposed in the Acacia work should be further developed.

- The National Street Gazetteer in its current form is inappropriate for addressing purposes. The 'New NSG' process, used to provide street names to NLPG, appears to offer a viable feed of street name information.

- Further consideration is needed of the best technical approaches to linkages and cross-referencing, bearing in mind processes, costs, practicability and time-scales, without forgetting that hybrid approaches may work best in practice.

- An independent data quality audit should be carried out on the NLPG and on other datasets as necessary.

- Issues of access, pricing, intellectual property rights and licensing, which were set aside to enable the pilot work to proceed, will need to be resolved alongside the issues of future governance.

The proposals and findings are presently being considered by central government and have also been issued to the wider Geographic Information community for comment and opinions.
Many of the conclusions perhaps raise more questions than providing any definitive answer. One thing is for sure however if we really are intent on making a noticeable difference to the way in which public services are delivered we desperately need to develop much more lateral thinking. We need to challenge conventional wisdom and break down entrenched views on how a role should be performed and who should do it. This is about process inspired solutions and not simply technology. We have to begin to think about doing the job smarter, more logically and in step with customer expectations first and then worry about the supporting technology. This will undoubtedly involve comprises across the public sector and possible mergers of functions.

4.2.2 A Scottish National Data Infrastructure

Very much in keeping with the other countries which make up the UK, Scotland is developing plans to establish a geographic information strategy labeled ‘One Scotland –One Geography’. This initiative recognises the value of geographic information and the advantages of using it for the benefit of Scotland’s economic and social development, health, justice, transport, education, environment and culture.
It proposes to ‘Link Places and Spaces to connect the Faces of Scotland’ and by definition is based on three main types geographic information.

- **Physical and map-based data.** This is information about the physical land surface and the boundaries that can be drawn upon it. Further data can be added to describe the areas so defined. For example, a local authority has a physical boundary that can be drawn on a map. Associated with the local authority is a huge range of information, which can range from the simple (eg its name and standard code), to complex statistical data summarising social and economic activity. This information has traditionally been collected and managed using Geographic Information Systems (GIS).
- **Address-based data.** This is information about addresses and the people who live there. This includes all information collected about people, including socio-economic and health data. The basic units of information are the postal address and postcode, together with any information that can be associated with them, describing the property or the people who live there. Information about addresses is aggregated in various ways for statistical purposes, into wider classifications of area, known as "higher geographies". These include census output areas,

data zones and the European statistical classification hierarchy known as NUTS (Nomenclature for Units of Territorial Statistics). This information has traditionally been managed by statistical analysis and presentation techniques. Increasingly GIS is used to analyse and present this information.

- **Name-based data.** Most, if not all, geographic features and places have a name. This might refer to a town, hill or river. These names allow us to catalogue and retrieve information about the place and the people who live there. This is one of the basic elements of library and archive catalogues, and traditionally such information has been managed by library and archive systems. Such name-based archives are not an immediately obvious source of geographic information, but in fact provide an enormous background source of information about Scotland's places and people. Increasingly names are used as the first element in searching for information about places, using the computer technique known as the “gazetteer” (simply a search tool using the name of the place as the key to the archive). Such techniques have the potential to unlock Scotland's "hidden wealth" of archived information about its places and people.

Firm proposals for the establishing strategy are close to being agreed by the Scottish Executive. These plans are to be widely circulated during the latter part of this year to seek further comments before the scheduled implementation takes place shortly thereafter. This framework is now recognised as a major component in assisting with the overhaul and modernisation of public service in Scotland. It will not only help to inform better policy making but offers clear opportunities to allow a more effective partnership approach to holistic service design and provision.

4.3 Europe

The desire to link up and do business smarter across the public sector in Europe is equally as strong as it is in the UK. Attracted by the funding opportunities within the e-Content programme of the European Commission a number of land registry organisations within Europe met to explore how a collaborative on-line service might be built. This consideration and funding opportunity centred on improving the financial competition in the mortgage markets of Europe.

Eight countries, viz., Austria, Finland, England, Lithuania, Netherlands, Norway, Sweden and Scotland eventually decided to participate in a joint venture to provide a reliable, efficient, ‘one-stop’ access to information on interests in land and property across Europe. The project was entitled the European Land Information Service (EULIS).

The main objectives of this effort was to:

- Investigate user needs;
- Consider the implications of the underpinning legislation;
- Develop a unified approach to information provision;
- Establish a joint 'infrastructure';
- Assess the effect of the service on real estate markets.

Although not entirely unexpected it was found that:

- numerous forms of land transactions were in use;
- many types of processes exist
- roles/ responsibilities vary considerably;
- various different data formats / content / management are employed;
- different levels of data access and pricing mechanisms are supported;
- obvious differences in terminology exist;
- many functions under a wide range of operational and business models

Nevertheless the project which has only recently concluded its efforts, has managed to create a demonstrator service which pragmatically links the various on-line services from each of the participating countries as they currently exist. The development of the EULIS portal www.eulis.org meets the obvious lack in information, knowledge and understanding on interests in land and property across Europe. It offers a simple solution which directly connects to national land information services, describes the legislative framework, business processes and conditions in each of the countries involved. Remarkably this has been achieved by respecting data, operation and legislation in place and has obviated the immediate requirement to re-engineer processes or re-format data to make the service an attractive proposition. Plans are now afoot to further develop the demonstrator service into a live service and offer membership to other countries.

While the service clearly does not promote a homogenous template approach to accessing information on interests in land and property it does represent an extremely useful first step for an integrated Pan European service. Through adopting an innovative design the exercise has not been constrained by the need to harmonise data content, business operations and legal systems as a first endeavour. In the past these issues have often conspired to seriously impinge any advances for similar multi stakeholder projects. The convergence of these aspects may well be approached over time but this has not prevented a commendable effort to collaborate and design a useful service, which can be further refined with direct and informed user input.

1. What's Next?

Several attempts have been made and continue to be pursued to link up many data types as part of the modernising government agenda. Some may argue though that little sustained success has been achieved. The primary reason for this can be attributed to the fact that there is limited recognition of the need to adopt common referencing systems and universally accepted data standards conventions. Datasets continue to be duplicated when we should be rationalising many and recognising the benefits of respecting the 'hold and maintain once but use many times' philosophy. Technically and operationally these are all major obstacles in re-thinking the design and content of innovative service development.

The other significant issue in limiting the introduction of radical new service development is the cultural or institutional resistance to change. Even when new styles of working are perhaps considered they are often limited to the traditional responsibilities of the organisation in question. Government both at local and central government level needs to become much more strategic in advancing new structures, roles and responsibilities if tangible improvements and returns on substantial investments are to be realised.

It is perhaps interesting to note that as we approach the deadline for 100% availability of on-line services in the UK the policy focus already has organisational transformation in its sights. Obviously, in view of experience to date, this underlines a shift in emphasis away from sourcing technology solutions first and then considering process improvements. This style of 'transformation' aims to centrally set priorities, rationalise and improve internal processes and make a concerted effort to drive organisational culture change. In doing so society as a whole can draw maximum benefit from noticeable improvements in the way the public service does business.

Geographic Information is now firmly on the radar screen for playing a pivotal role in transforming the way in which public services are supported and delivered. Our challenge in the immediate future is to learn to use this data and associated technologies in collaboration with others to reshape back office processes across the public sector to become more intuitive and in step with the needs of the citizen - the customer. E-services have to become more interactive and capable of allowing multi channel on-line citizen and business transactions. We need to step up a gear and move away from one way 'grudge services' such as tax returns, and identify 'killer' applications which make a real difference to public and business life.

Simply computerising conventional methods of working is no longer acceptable. Change needs to be accepted and actively embraced at all levels of the public sector and viewed as a continuous journey, which we all have to buy into. There is perhaps a greater sense of urgency required at a strategic level where we

need to see more of a revolution in the discharge of roles and responsibilities than one of evolution. In turn the user community should be more readily able and willing to identify with the benefits of on-line service and naturally opt to use this medium.

With anything new, users need to be enticed through value-added services that make a noticeable improvement to the quality of life and the world we live in.

Readers of the E-Government Bulletin were recently asked “If you could suggest one priority action for the newly created Office of E-Government, what would it be?”

The following is a selection of the replies, which were received:

“To use e-government to promote re-engineering, not just web sites.”

“The priority action has to be to maximise the sharing of applications, processes and learning experiences –too much duplication still exists.”

“Focus more on take-up messages, to encourage users to use system we design.”

“A new central budget to stimulate cross-departmental working to provide joined – up working.”

“Give the Head of E-Government real teeth and aggressively drive change.”

References

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Biographical Note

Mike Traynor is director of Customer relations and Business Development of Registers of Scotland, Executive Agency. The Agency is the statutory body responsible for creating and maintaining a range of public registers. The principal registers hold information about ownership of land and property in Scotland. He played a key role in advancing the electronic map element of the registration of title system introduced in 1981. The entire operation is now fully supported by ICT and this has allowed the Agency to develop a host of e-information services. He continues to participate in the advancing plans for full e-business services between the customer, the Agency and other arms of Government.

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