

Organisational Solutions for Overcoming Barriers to eGovernment

Progress towards realizing the full potential of eGovernment -using digital technologies to improve public services and government-citizen engagements- has been slower and less effective than the technologies' take-up in spheres such as eCommerce.

This paper, based on the Breaking Barriers to eGovernment Project, presents seven categories of barriers to eGovernment progression and identifies eight associated legal areas that underpin these barriers. The discussion then turns to four organizational solutions to overcome the top barriers to eGovernment as identified by an online survey of eGovernment stakeholders conducted by the Oxford Internet Institute, University of Oxford. These barriers are: coordination across central, regional and local levels of government; resistance to change by government officials; lack of interoperability between IT systems; low levels of Internet use amongst certain groups; and lack of political support for eGovernment. We make some explicit recommendations which aim to further the objectives of the European Commission's i2010 eGovernment Action Plan.

The four solutions discussed here are: creating a network of eGovernment champions, segmentation of citizens, working with chaotic co-ordination and encouraging an eLiterate workforce. It is worth noting that some of these solutions could be used to tackle more than one barrier. In this way, implementation of the proposed solutions can reinforce each other and have a generalised effect in promoting IT-enabled business change across a range of government activities



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“ Creating champions for eGovernment across public administration is one way to ensure that the objective of making efficiency and effectiveness a reality is achieved. ”

1 Introduction

The significance of implementing and successfully adopting digital information and communication technologies (ICTs) in public administrations has been recognized across the world¹. The European Union (EU) has acknowledged that eGovernment capabilities, together with associated organizational change and skills development, could make a significant contribution to fulfilling its strategic social and economic goals (European Commission, 2003). But in some European countries there is evidence to suggest that eGovernment lags behind other sectors (particularly eCommerce) in terms of usage and reaping the potential benefits of ICTs in terms of cost savings, efficiency, productivity and service quality improvements. For example, in the UK survey data illustrates that the level of eGovernment usage in the UK is low compared to other similar online activities. In 2007 the percentage of Internet users who have carried out at least one eGovernment activity is 46%². In comparison 90% of Internet users reported looking up product information on the Internet; 79% of users reported buying something online; and 53% of Internet users engaged in online banking (OxIS, 2007).

From 2000 onwards, most member states embarked upon some kind of eGovernment initiative. There are some indications that a degree of advancement has been made towards achieving the potential benefits of eGovernment reform (Cap Gemini, 2006; Cap Gemini, 2007). Progress has, however, generally failed to meet expectations and remains relatively slow compared to the uptake of digital networks in business and other fields. In addition, some research has identified a plateau of maturity for countries that initially led the way in eGovernment (Accenture 2004:6, Accenture 2006:5).

Early research drew attention to various constraints and blocks on eGovernment developments. For example, the Organisation for Economic Co-operation and Development (OECD) identified four external barriers to eGovernment (legislative and regulatory; budgetary; technological change; and digital divides) together with internal obstacles that may be tackled on a more local level (e.g. organizational change; leadership; central coordination; and monitoring and evaluation) (OECD, 2003a). A second example is the Public Online Services and User Orientation (eUSER) study³ that summarized the supply and demand barriers to eGovernment in each EU member state (e.g. in the Netherlands the eUSER team identified a sceptical attitude among citizens towards online transactions as a demand side barrier and, on the supply side, the reluctance of government agencies to give up their autonomy to co-operate across departments). Finally, a pan-European face-to-face survey of 150 high-level administration officials ranked barriers to eGovernment in the following order of importance: security and confidentiality; lack of access among citizens; high set-up costs; lack of co-operation among administration departments; and lack of political will and drive (Heinderyckx, 2002).

This paper aims to move beyond this earlier research in providing a comprehensive categorization of barriers to progress in eGovernment and proposing some organisational solutions to overcome them. It reports on research from a three year study (2005-7) funded by the European Commission, the Breaking Barriers to eGovernment project⁴, which systematically identified the barriers to eGovernment

¹ See, for example, the report by the Canadian Government last updated in 2004, Government Online: Serving Canadians in a Digital World, available at: (http://www.ged-gol.gc.ca/pub/serv-can/serv-can07_e.asp); the New Zealand 2006 updated eGovernment strategy, Enabling Transformation: A Strategy for eGovernment, available at: (<http://www.e.govt.nz/about-egovt/strategy>); and the United States 2003 eGovernment strategy, available at: (http://www.whitehouse.gov/omb/egov/2003egov_strat.pdf).

² Where eGovernment includes the following activities: finding out information (i.e. about an MP, local councillor or politician, about local council services, about schools, and /or about central government services, contacting government (i.e. emailing an MP and / or a councillor (OxIS, 2005) or "contacting a politician online (OxIS, 2007) and conducting online transactions (i.e. paying central government tax and / or paying a local tax, fine or service.

³ See these eGovernment country reports at the eUSER project's website: (http://www.euser-eu.org/SearchSpecial.asp?IDFocus0=3&CountryID=* &MenuID=109).

⁴ This paper is based on the European Commission's three year research project, entitled 'Breaking Barriers to eGovernment: Overcoming Obstacles to Improving European Public Services'. It began in January 2005 and is supported by a grant from the European Commission's MODINIS study for the eGovernment Unit of the DG Information

progression in Europe (by measuring their salience to eGovernment practitioners in an online survey) and suggested organisational, technical and legal solutions to overcome these obstacles⁵. Here, we set out the seven key barrier categories to eGovernment and the eight legal areas that underpin these obstacles; and propose four solutions to the top barriers to eGovernment. We make some explicit recommendations which aim to further the objectives of the European Commission's i2010 eGovernment Action Plan: leaving no citizen behind; making efficiency and effectiveness a reality; implementing high-impact key services for citizens and businesses; putting key enablers in place; and strengthening participation and democratic decision-making (European Commission, 2006).

The remainder of this paper is structured as follows. First, the methods employed in the barriers project are discussed. Second, an overview of the barriers and related legal areas are summarized. Finally the four solutions that are the focus of this paper: creating a network of eGovernment champions, segmentation of citizens, working with chaotic co-ordination and encouraging an eLiterate workforce are analyzed.

2 Methodology

In order to comprehensively identify and explore the key barriers to eGovernment and their legal underpinnings; and to propose solutions to these obstacles the project team has utilized four main research approaches.

2.1 Review and analysis of existing research

The project partners have undertaken a critical review of a wide collection of existing work on eGovernment to assist in the identification and analysis of the key obstacles to eGovernment and their main legal dimensions. They have examined outputs from a number of European Commission initiatives, including the Information Society Technologies Programme (IST), the Interoperable Delivery of European eGovernment Services to Public Administrations, Businesses and Citizens (IDABC) and the deployment of trans-European eServices in the public interest programme (e-TEN)⁶. Other sources have included legal doctrine, case law, case studies, research by non-governmental organisations (e.g. the United Nations Educational, Scientific and Cultural Organization (UNESCO) and the United Nations Online Network in Public Administration and Finance (UNPAN)), companies (e.g. Accenture and the Economist Intelligence Unit), and legislation at national, supranational and international levels.

2.2 Online survey of eGovernment stakeholders

A non-probabilistic web-based survey was conducted between May and June 2006 by the Oxford Internet Institute, University of Oxford to provide a detailed picture of the perceived barriers to eGovernment in the EU, including how these perceptions might vary across stakeholders and between the regions and nations of the EU. The questionnaire asked participants to rate the relative severity of thirty barriers to eGovernment that had been identified by the project team. It solicited personal information (e.g. ICT skills, eGovernment experience, date of birth and country of residence) in order to explore the relationships between the respondents' individual experiences and characteristics and their

Society and Media (see <http://www.egovbarriers.org>). The authors are indebted to all members of the multinational project team, its expert advisors, the European Commission and participants in the project's online survey and case studies for their valuable contributions to the project that we have drawn on. In particular, we acknowledge the vital contribution of Dr Trond-Arne Undheim from the eGovernment Unit at the European Commission, our partners at: the Centre de Recherches Informatique et Droit (CRID), University of Namur, Belgium; Tilburg Institute for Law, Technology and Society (TILT), University of Tilburg, Netherlands; Department of Administrative Law, University of Murcia, Spain; and Gov 3 Ltd, a UK-based eGovernment Consultancy. Nevertheless, we take sole responsibility for the interpretation of the research as presented in this paper.

⁵ For more details about why the study was launched and how it contributes to the efficiency and effectiveness strand of the i2010 eGovernment action plan please see <http://www.epractice.eu/document/3253>.

⁶ For more information about these programme please see http://ec.europa.eu/information_society/activities/egovernment/programmes/index_en.htm

perceptions of eGovernment barriers. It was available in four languages (English, German, French and Spanish) and was advertised widely via numerous eGovernment lists, websites and personal contacts. The survey was completed by 996 public administration, business and expert stakeholders who are engaged in eGovernment activities at local, regional, national or Pan-European levels. The results complement previous online and offline surveys examining barriers to eGovernment and related areas.

2.3 Case study research

Case study research was carried out to provide an in-depth understanding of practical examples of barriers to eGovernment and their legal foundations, and to assist with the development of the solutions to these obstacles. Five broadly defined case studies were examined. They were selected in order to enable the project to cover a range of eGovernment applications (eDemocracy, ePublic Services, eCommerce and eAdministration) and to address the policy objectives of the Commission as set out in the 2006 eGovernment action plan.

For each of the five cases the research was carried out in two phases. In the first the research team examined the case study area across Europe (i.e. by trawling, collating and analysing all material that was available at a distance and canvassing the views of the expert group (see below) for views and any insider knowledge of individual initiatives). This process provided an overview of each of the five cases across Europe and assisted in the selection of the embedded cases in phase 2 of the research. The embedded cases were selected across a range of indicators: geographical location, level of government, administrative law, culture, and level of sophistication of the service; and included examples of relative success and relative failure. These in-depth cases involved further analysis of documents specific to the case and interviews with key stakeholders. The case studies were eConsultation, Public Registries, Digital Citizen Rights, Cross Border eProcurement and Employment Mobility.

2.4 Consultation with eGovernment stakeholders

Interaction among a range of eGovernment stakeholders has been encouraged in order to obtain informed feedback on the research findings, via the project website, six-monthly workshops, and the creation of an expert group. These activities are essential to ensure that the research is targeted appropriately and is of value to stakeholders in this field. A broader objective is to raise discussion and awareness of potential difficulties in this area, as failures in eGovernment are not generally discussed openly.

Three key research reports have been produced by the project team: a legal and institutional analysis of barriers to eGovernment (deliverable 1b); a case study report (deliverable 2); and a solutions report (deliverable 3)⁷.

The next section provides an overview of the seven categories of barriers and the eight associated legal areas.

3 Seven Categories of Barriers to eGovernment

The following definition of an 'eGovernment barrier' was adopted by the project:

Characteristics - either real or perceived - of legal, social, technological or institutional contexts which work against developing networked governments because they: a) impede demand, by acting as a disincentive or obstacle for users to engage with eGovernment services; or b) impede supply, by acting as a disincentive or obstacle for public sector organizations to provide eGovernment services; or c) constrain efforts to reconfigure access to information, people and public services in ways enabled by ICTs.

⁷ Copies of all these reports are available on the project website (<http://www.egovbarriers.org>).

The project team developed the barrier categories via an iterative process informed by reviews of existing work, the online survey and discussions with eGovernment experts.

All the barriers identified have been assigned into seven categories to provide a comprehensive and analytically useful grouping of the barriers to which cross-cutting themes can be anchored, as there are many issues that embrace different categories.

Developing these clear-cut barrier categories was a complex but important process. For example, 'lack of appropriate skills' was initially considered as a category on its own, but further analysis revealed important distinctions between inadequate ICT skills among the general public ('digital divides and choices') and among those who design, develop, manage and deliver public services ('workplace and organizational inflexibility'). Financial inhibitors is an issue that cuts across many categories (e.g. in addressing the needs of minority groups or improving trust by creating more secure systems), however it is such a fundamental issue that it was identified as one of the key categories ('financial inhibitors').

In summary, the seven categories are:

Leadership failures resulting in slow and patchy progress to eGovernment.

Financial inhibitors limiting the flow of investment to eGovernment innovation.

Digital divides and choices, where inequalities lead to differences in motivations and competences that constrain and fragment eGovernment take-up and fail to address particular user needs.

Poor coordination across jurisdictional, administrative and geographic boundaries that holds back eGovernment networking benefits.

Workplace and organizational inflexibility impairing adaptability to new networked forms of information sharing and service provision.

Lack of trust heightening fears about inadequate security and privacy safeguards in electronic networks.

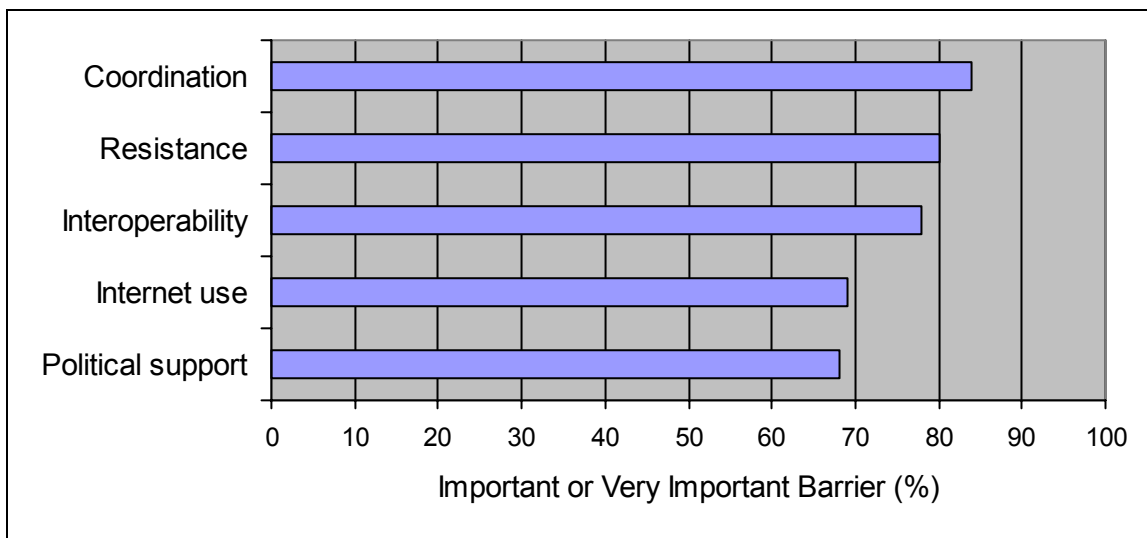
Poor technical design leading to incompatibilities between ICT systems or difficult-to-use eGovernment services. Where such services lag behind innovative applications used by society more generally, government organisations will find it increasingly difficult to address issues of interest to online communities, which will tend to have different communication channels and mechanisms for producing content.

The seven categories are intentionally broad and tied to a multitude of more specific barriers relevant at different governance, institutional and jurisdictional levels.

In addition to the seven barrier categories the project team explored eight legal areas that provide important foundations for examining and identifying key barriers to eGovernment. These areas were selected on the basis of the project team's expertise, informed by previous work in this area and the views of eGovernment stakeholders. Seven of the eight legal dimensions explored were of general applicability: authentication and identification in online identity management; Intellectual Property Rights (IPR) and copyright in eServices; liability arising from a malfunction or inaccuracies in eGovernment services; privacy and data protection; public administration transparency through the wide availability of public sector information and open eDemocracy processes; reuse of public sector information; and relationships between public administrations, citizens and other actors with a stake in eGovernment services. The other category of administrative law is specific to those European countries where the common law 'Anglo-Saxon' legal model does not apply and where certain formal guarantees are provided for citizens in activities where public bodies have significant power (see Eynon, 2007).

4 Solutions for eGovernment

The project team has proposed a range of organizational, technical and legal solutions to the barriers to eGovernment summarized above. Due to space limitations it is not possible to present all of these in this paper. Here we focus on four solutions for eGovernment: creating a network of eGovernment champions, segmentation of citizens, working with chaotic co-ordination and encouraging an eLiterate workforce. We have chosen to focus on these four as they offer a solution to one of the top five barriers to eGovernment identified in the online survey. These barriers are: coordination across central, regional and local levels of government; resistance to change by government officials; lack of interoperability between IT systems; low levels of Internet use amongst certain groups; and lack of political support for eGovernment as illustrated in Figure 1⁸. Each of these individual barriers forms part of one of the four barrier categories: leadership failures, digital divides and choices, poor coordination and workplace and organizational inflexibility.



The remainder of the section is divided into four main parts. We outline the four categories of barriers most relevant to this paper, and for each category, we nominate a key barrier – and identify a solution to that barrier. For each solution that we propose, we give some examples of where it has been used and make a recommendation to the Commission in terms of encouraging its take-up across member states.

4.1 Leadership Failures

eGovernment progression can be limited by failures in political and management leadership (e.g. OECD 2003b, United Nations 2003). Successful leadership requires an ability not only to manage complex ICT projects but to motivate and support sustained commitment to eGovernment within public administrations and the use of eGovernment services by citizens. There is also a need to effectively manage differences in interests; perceptions and understanding among different stakeholders to ensure such conflicts do not become blockages to eGovernment. Leadership failure can lead to low prioritization of eGovernment in public policies and resource allocation; lack of integration of the eGovernment agenda with mainstream strategies for public sector reform; poor senior management understanding of eGovernment; and poor strategic vision and planning.

Basically, eGovernment needs champions. As noted above political support from the top is an important issue (identified as such by 68 % of participants in the Breaking Barriers project online survey) yet it is not a sufficient condition to overcome leadership failures; it may indicate the presence of a champion at the highest levels of government, but it can be difficult to sustain or to feed down to other tiers of

⁸ For the survey report please see: http://www.egovbarriers.org/?view=project_outputs. All further references to this survey will be indicated by the phrase “project survey”.

government without a seam of personnel throughout departments and agencies who prioritise eGovernment issues. Lack of sustained leadership for eGovernment will lead to cycles of attention and inattention that lead to patchy, stop-go progress.

Key Solution: Creating a Network of eGovernment Champions

One way of sustaining attention to and prioritisation of eGovernment is the creation of a Chief Information Officer (CIO) role throughout government organizations, as in most private companies and as (for longer than in any European country) in US federal departments and agencies. Such a role should not be restricted to one per department, but should also be created in agencies and public bodies and even, for very large departments, at division or bureau level, so that there is a 'seam' of eGovernment champions throughout public administration, ready to promote eGovernment initiatives. CIOs were introduced in many US federal government agencies from the early 1990s and the Clinger-Cohen Information Technology Management Reform Act of 1996 mandated provision for CIOs as information change agents and 'technology watchdogs' across the federal government (Buehler, 2000). Their creation was aimed at ensuring that 'a CIO has a powerbase as a major participant in agency management', arising from concern over the earlier practice of Information 'Resource Management (IRM) officials acting as top information persons in the majority of agencies and departments, who were essentially "techies" who held the philosophy of 'IT for IT's sake' (Buehler, 2000).

Strong and competent leadership by CIOs has a positive influence on the success of eGovernment (Seifert and McLoughlin, 2007). However the effectiveness of the implementation of CIOs as a consequence of the Clinger-Cohen Act has varied from agency to agency. One key issue to explain this diversity is the specific role the CIO has within the agency (e.g. Kost, 2005; Liu and Hwang, 2003). Indeed, a lack of clarity regarding the CIOs role, the relationship of the CIO to other existing IT management initiatives at that time, the placement of the CIO in the agency hierarchy and uneven budget allocations have all been identified as potential brakes on the establishment and impact of CIOs in federal government when the act was first implemented (McClure and Berot, 2000). A related issue is the importance of the CIO having support from the agency head and the senior management team (Moore, 2004). Thus, the effectiveness of the CIO position is not just about the competences of the individual, but their place with the government agency and the resources they have at their disposal.

Mechanisms should also be put in place for communication between those championing specific eGovernment initiatives, therefore increasing the likelihood of 'joined-up' or 'seamless' government. In the UK from 2004, the CIO Council was set up to ensure that CIOs 'operate on a "collective responsibility" basis to steer, own and deliver agreed strategic actions' (www.cio.gov.uk). It meets for a minimum of three full days a year, with CIOs attending in purpose, thereby ensuring that the CIOs of major departments meet on a regular basis and facilitating the discussion of common issues. It plays a role in consolidating the public sector IT profession, particularly through contributing to the Professional Skills for Government agenda, thereby reinforcing the concept of a network of IT professionals across UK government. But most importantly, it facilitates communication and discussion between IT divisions of departments that formerly were unlikely to do so, giving rise to cross-departmental eGovernment initiatives and strategies.

One way of drawing attention to and incentivizing champions at any level of administration is to introduce prizes for eGovernment development. In Denmark, for example, the "Best on the Internet" initiative gives ratings of public homepages and thereby encourages authorities to prioritize usability of their websites; and secondly the "Prize of eGovernment" is given to public institutions in three categories "Efficient eGovernment and service to citizens", "Coherence of IT Infrastructure" and "Good eGovernment Leadership". In Germany, the BundOnline Star is awarded twice a year to recognise excellence of a service and its implementation in three categories (G2C, G2B, G2G) by the Ministry of the Interior following a vote by the Institute of Electronic Business in Berlin. The Federal Ministry of the Interior awards annually a set of prizes within its eGovernment competition. Participants come from all levels of the administration (federal, regional and local) and prizes are assigned in four categories (G2C, G2B, G2G and G2E). The competition is organized together with partners (Cisco, BearingPoint) and

prizes are awarded during the CeBIT fair. Italy also has a number of awards, for example I Successi di Cantieri, organized by the Department of public administration, (<http://www.cantieripa.it/inside.asp?id=204>); COMPA assigns awards to administrations in the innovation area of citizen-administration relationships including on-line communication (www.compa.it); and EuroPA assign awards to best websites of local administrations (www.euro-pa.it).

Recommendation: Creating champions for eGovernment across public administration is one way to ensure that the objective of making efficiency and effectiveness a reality is achieved, through the prioritisation of eGovernment issues at the highest levels of public organisations' strategies. In future guidance to member states on the development of eGovernment, the European Commission could recommend the creation of CIOs, at least at departmental level.

4.2 Digital Divides and Choices

Social and economic divides demarcated by wealth, age, gender, disability, language, culture, geographical location, size of business and other factors – can mean eGovernment resources are used in very different ways (or not used at all) by different individuals, groups and organizations. Indeed, addressing the challenges of digital divides is highlighted as a key objective of the 2006 eGovernment Action plan in the goal: 'no citizen left behind' (European Commission, 2006). Without a more nuanced understanding of user needs and choices, uptake of eGovernment will remain limited and the potential benefits (e.g. cost reductions or greater user satisfaction) will not be realized. Two particularly important barriers of this kind are that citizens can lack strong motives to use eGovernment services (considered an important or very important barrier by 61% of project survey participants) and low levels of Internet use amongst certain groups (considered an important or very important barrier by 69% of project survey participants). Governments need to accept that there is no simple divide between internet access versus no internet access, but rather a segmented citizenry with quite different eGovernment needs.

Key Solution: Segmentation

A key way to overcome divides in digital access and choice and to increase take-up of eGovernment is to segment users of eGovernment services into specific groups and treat them in distinctive ways. Survey research suggests that in the UK, the majority of internet users now go to the internet first if they want to find out something they don't know already, like the name of their MP (64%) or information on their taxes (55%) (OXIS, 2007). For these most ardent internet users (which we might estimate at around a third of the population), everything should be available on-line – that is where they will expect to deal with government. They are likely to be skilled internet users and are likely to use search engines rather than portal sites, so eGovernment information and services need to be easily visible, appearing near the top of search engine results. Other internet users need to be persuaded that eGovernment can provide the same benefits as eCommerce or eBanking, so a targeted advertising campaign for eGovernment services could have pay-offs for this group. A significant proportion of non-internet users know someone or some organisation that can use the internet for them if they need it; 88% of ex-users and 73% of non users in the 2007 UK Oxford Internet Survey replied positively to this question. For this group, government needs to identify the relevant intermediaries for particular sub-groups and target them in eGovernment initiatives. They should also consider formalising on-line channels of communication for intermediaries such as Citizen Advice Bureau and Non-governmental Organisations dealing with specific groups such as the elderly.

Examples of successful segmentation include:

Lewisham has a number of successful initiatives which have been developed alongside analysis of customer views (e.g. phone and exit surveys, annual surveys, focus group meetings and visits to community groups) See <http://www.idea.gov.uk/idk/aio/87366>.

In 2004 the Office of the Deputy Prime Minister in the UK launched the eCitizen Project that aimed to explore the motives and incentives to use eGovernment services by different target

groups in order to increase eGovernment take up. As a result of this research a series of best practice examples are available online for use by local authorities as to how to target and market their eServices (see <http://www.e-citizen.gov.uk>).

Transport for London redesigned their website on the basis of usage statistics to meet different Internet users needs. See <http://www.tfl.gov.uk/>.

Recommendation: Effective segmentation is going to be a key way of ensuring that 'No citizen is left behind'. The European Commission should build segmentation into their European Initiative on eInclusion, scheduled for 2008.

4.3 Poor Coordination

Emerging forms of eGovernment service delivery and ways of working often cross traditional government jurisdictions and administrative and departmental boundaries, as well as having the potential to overcome geographic distance. Variations in legal, regulatory and administrative regimes on different sides of those boundaries can inhibit and block the flow of information and services through new networked governance channels at EU, Member State, regional and local levels (OECD 2003a). A lack of coordination across central, regional and local levels of government was considered an important or very important barrier by 84% of project survey participants, while co-ordination between member states and the European Commission was considered an important or very important barrier by 61% of project survey participants. Government agencies should find ways of using the benefits of developments in the internet and WWW to overcome coordination problems.

Key Solution: Working with Chaotic Coordination

As the internet and associated technologies and applications have developed, there are new ways to mitigate against coordination problems across fragmented organisational arrangements. The simplest example is a web site which directs the user to a range of other sources via hyperlinks, thereby bringing together diverse information resources from different organisations in one virtual location. More recently, 'Mashup' applications have made it easier for users to be presented with a far more coherent package of information deriving from disparate sources. They can even allow field workers from different organisations on the ground to update centrally held information resources, such as the UN Refugee Agency's Google map of the disaster-torn Darfur region, which can be updated by aid agency workers and other actors in the region⁹. Such applications can be used for officials working within organisations at different levels of government, simplifying their administrative environment and creating a kind of virtual service chain for information delivery. Within web sites, effective internal search engines can make a huge difference to how officials find their way around inter-organisational networks. Portals which really link up and search across tiers of government can make uncoordinated government look coherent both from inside and outside governmental organisations.

However, this type of web-enabled 'chaotic coordination' is not an automatic by-product of developing a web presence. Organisations must think about how officials use their web sites (or protected subsections of them) as information sources, just as they do for citizens using eGovernment. Their needs must be built into the design of 'portal' or intranet sites and considered when assessing the navigability of sites. Good navigability can be aided by the optimisation of key metrics (such as maximising the size of the 'strongly connected component' and minimising the path length between any two nodes on a site, see Escher et al, 2006 for a full discussion). But for larger sites (for which it is inherently more difficult to preserve navigability) extensive usability testing will be necessary for users from a range of organisational contexts. Second, if external search engines are used then the extent to which users can find the information they need will depend on the extent to which the relevant information is held on a web site that appears high up in search engine results. So optimisation for

⁹ See <http://www.ushmm.org/googleearth/projects/darfur/>

search engines, via the creation of links and data-tags for example, is an essential part of web site development. Third, organisations of all kinds have experienced major difficulties with internal search engines, which often return irrelevant or spurious results, even where (for example) the application is 'powered by Google'. Research suggests that search algorithms that work well for the internet as a whole do not work well when used within sites, as pages cannot be ranked so effectively (Dmitriev et al., 2006). Internal search engines must be custom built for the organisation whose web site is being searched, and can require a good deal of extremely skilled resources, so good internal search engines are expensive.

These are some examples of successful initiatives where the focus was on the web-front end with limited changes to organisational structures or where effective search and subsequent 'joining-up' of information provision has been prioritised:

Austrian customs declaration for out-of-EU trade where there was digitisation of existing workflows and architectures and the addition of a web-based front-end;

Public libraries in Denmark where new flexible and highly compatible eSystems have been laid on top of existing software which varies from library to library;

The US federal government portal, usa.gov (formerly firstgov.gov) has developed a reputation as a world leader in internal search. Its search engine, custom built by MSN and Vizimo, searches the entire federal, state and local governments of the US¹⁰ in contrast to many other government sites (such as the UK www.direct.gov) which searches only its own content).

Recommendation: Most of the solutions involving chaotic co-ordination are a question of 'best practice' web development which should be a normal part of an organisation's strategy. It is difficult therefore, for the Commission to offer guidance in this area. However, the specific issue of internal search engines (or 'enterprise search' as they are known in the industry) emerges as a particular problem for governments and the European Commission could consider commissioning some best practice research into this particular issue, possibly drawing on the experience of the usa.gov site in the US. Effective search engines are vital enablers for eGovernment development.

4.4 Workplace and organizational inflexibility

Resistance to innovation by public administration management and staff can slow down, impair or prevent the necessary redesign of organizations and their processes required to deliver effective eGovernment. Such inflexibility can set up barriers to the creation and delivery of efficient and effective eGovernment services that could meet changing citizen and business needs (Margetts and Dunleavy, 2002; Remmen, 2006). However, prevailing practices can be difficult to change as they are designed to support certain patterns of communication and information exchange, while discouraging others. eGovernment initiatives often blur these boundaries and require appropriate changes to take account of the new methods of operating and managing public services. Key barriers relating to workplace and organizational inflexibility identified in our survey were the lack of ICT skills among government officials (considered an important or very important barrier by 61% of project survey participants) and resistance to change by government officials (considered an important or very important barrier by 80% of project survey participants). Government organizations need to be agile in the way they deal with new technologies and face the resistance of those staff who have considerable organizational learning invested in off-line channels.

Key Solution: Encouraging an 'eLiterate' Workforce

The Internet and related technologies and their widespread societal use have brought a major change to government; an injection of technology into areas of bureaucracy traditionally viewed as 'technology

¹⁰ Please see <http://en.wikipedia.org/wiki/USA.gov>

free'. This change has taken place at all levels of government, as even policy-makers accustomed to view information technology as a policy-neutral administrative tool are realising that policy innovation often rests on some kind of technological innovation. eGovernment development therefore will be greatly aided by a workforce trained and practised in building electronic solutions into everyday working life. This can involve training in internet and web-related issues, as well as more innovative solutions to ensure that staff is encouraged to incorporate technological innovation into all aspects of their work. Even encouraging staff to 'play' with the internet can have an important effect on cultural resistance to eGovernment, but can also be a difficult concept for organizational cultures rooted in hierarchy and solemnity (see Margetts and Dunleavy, 2002, for a full discussion of cultural barriers to eGovernment). As noted above, the creation of networks of CIOs across governmental organizations can play a role in encouraging training and professionalism in IT, but changing the organisational culture will involve lower level initiatives that penetrate areas traditionally viewed as non-technical. Some examples of attempts to bring about cultural change are as follows:

In 2003 the French government launched an eChallenge where all government employees were invited to assess their degree of understanding of ICTs. The eChallenge website (Démarche d'Evaluation du Fonctionnaire Internaute, DEFI) contained an eAssessment which tested practical skills including Internet navigation, e-mail, online discussions and web publishing and their understanding of issues such as information systems security or data protection.

In 2006 the Hungarian government organised eGovernment training courses for 4 500 civil servants from 700 offices. The online course was organised by the Ministry of Informatics and Communications. The design of the course was informed by prior needs analysis and learner preferences and included various eGovernment topics, such as eAdministration, electronic signatures, tools for improving the e-efficiency of local government, communication and broadband.

The 'Plan Concilia' was an attempt to reconcile personal, work and family life in Spanish central administration. It was also adopted as a pilot-project including tele-working with a selected group of senior civil servants¹¹.

Recommendation: An eLiterate workforce is going to be vital in the future to maximise the benefits of eGovernment and make efficiency and effectiveness a reality. It can only really happen at the organizational level, but if guidance is being issued by the Commission, the need for staff to have internet access and be encouraged to use up-to-date applications in an unrestricted way should be built into any organizational best practice.

5 Conclusion

This paper has provided an overview of the key barriers to eGovernment and their legal foundations and identified four possible solutions to some of the most important barriers to progress in eGovernment as identified by an online survey to eGovernment stakeholders. It is worth noting that some of the solutions put forward could be used to tackle more than one barrier. For example, giving sustained attention to eGovernment issues by creating a network of Chief Information Officers is also likely to engender cultural change, a good way to tackle workplace inflexibility. In this way, implementation of the proposed solutions can reinforce each other and have a generalised effect in promoting IT-enabled business change across a range of government activities

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