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eGovernment

Using technology to improve public services and democratic participation

IN-DEPTH ANALYSIS

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This publication provides an overview of eGovernment services and the various policies, programmes and funding mechanisms in the European Union supporting their development. It also summarises benchmarks of EU progress in this area, and describes future challenges in establishing open digital government.

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EXECUTIVE SUMMARY

eGovernment refers to efforts by public authorities to use information and communication technologies (ICTs) to improve public services and increase democratic participation. eGovernment aims to improve government efficiency through the reduced cost of electronic information management and communications, the reorganisation of government agencies and the reduction of administrative silos of information. Even more importantly, it can reduce administrative burdens on citizens and businesses by making their interactions with public authorities faster, more convenient and less costly, thereby spurring competitiveness and economic growth. More recently, open data and collaboration with third parties has offered governments new insights into issues and possible new services. In addition, the opportunities that eGovernment provides for citizens to dialogue with public authorities (to suggest, comment on and influence policies and policy agendas) can increase transparency and foster greater participation in democratic public life.

Much of the responsibility for implementing eGovernment practices rests with EU Member States. However the EU has a role to play in encouraging the exchange of best practices and technologies amongst Member States. Citizens who exercise their right to work or live in other Member States, as well as businesses that provide services across the EU, need to interact with governments in other countries. Ensuring efficient and effective cross-border services, including the interoperability needed to provide those services, is crucial to ensuring an efficient and effective single market. EU institutions themselves also communicate with citizens, businesses and Member States and need to make efforts to ensure that they make best use of ICTs in doing so.

For more than 15 years, the EU has supported the building of infrastructure, the sharing of best practices, and research into how eGovernment services can be delivered efficiently and effectively. Benchmarking at both the global and European level has shown that progress has been made: many services are now available electronically, and citizen use of eGovernment appears to have increased, with the goal set in the 2010 Digital Agenda for Europe – for 50% of citizens to be using eGovernment by 2015 – close to being achieved. However large gaps also remain between Member States, some of which are world leaders in digital services while others lag considerably behind. Moreover, services to businesses are more advanced than services to citizens.

Many other challenges and opportunities in creating true eGovernment remain. Governments must do more to create a sense of security and trust. They need to encourage interoperability to support the single market. They can try to develop electronic means for citizens to participate in public life while not excluding those who do not have the means, abilities or skills to do so. They have an opportunity to exploit open government data, to collaborate more with businesses and citizens in developing enhanced services, and to make effective use of new technologies such as cloud computing.

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1. Background

eGovernment and *digital government* are terms used to describe the application of information and communication technologies (ICTs) to improve public services and to increase citizen participation in democratic government.[1] *eGovernment* has been the dominant term used in policy-making in the European Union (EU); the term puts the emphasis on user-centric services that can be integrated to support easy and efficient use of public services by citizens and businesses. Recently however, commentators have also been talking about *digital government*, a concept which extends the eGovernment model by building on the notion of new services that public sector 'open data' can support, as well as the collaborative community of public authorities, businesses, citizens and civil society which can develop them. However in line with the European Commission's Digital Single Market Strategy for Europe,[2] the term eGovernment will be preferred here.

Different commentators have developed models of eGovernment interaction and service delivery. Some models have four different phases or types of interaction, some have five,[3] but there is a large degree of agreement at least on the initial three phases: (1) *informational* (in which information is delivered to citizens, such as through downloading reports and brochures from websites); (2) *interactional* (where citizens have the ability to ask questions, make complaints or search for information sources); and (3) *transactional* (where users can complete online all the different steps of a complex interaction). The one or two subsequent phases may either be deemed *participatory* (where citizens provide input to the formulation of policies); *transformational* or *integrated* (where government's internal organisation is modified as a result of the need to deliver services in an integrated, client-centric way); or *connected* (combining features of both).[4] In addition, eGovernment interactions are sometimes classified as government-to-citizens or G2C (such as when citizens file income tax declarations); government-to-business or G2B (such as when businesses seek permits); or government-to-government or G2G (as when different branches or levels of government exchange information).

These issues are important because as ICTs transform our society, future interactions with governments will increasingly take place online. Based on a survey of users in selected developed and developing countries in 2013-14, the Boston Consulting Group reports that one tenth of citizen transactions with governments was performed online; they predict that by 2020 one third of transactions will be done online.[5]

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1 'Government 2.0' is another term used to refer to 'more open, social, communicative, interactive and user-centred version of e-government' where services and policies are designed cooperatively by governments, citizens and civil society. See, for example, Government 2.0: key challenges to its realization / A. Meijer et al. Electronic journal of e-Government v. 10 no. 1, 2012, p. 59.

2 A Digital Single Market Strategy for Europe / European Commission, 6 May 2015. COM(2015) 192 final.

3 See, for example, Understanding e-Government in Europe / P. Nixon, V. Koutrakou, R. Rawal, 2010, p. 271-272; Understanding e-government / V. Homburg, 2008, p. 93; Ingredients for the Success of an e-Government website / S. Mellouli, Public administration review v. 74, no. 2, p. 283-284.

4 Social media and the next generation of e-services: 7 social media use cases for public agencies / M. Pellegrino, PWC, 2012.

5 Digital government: turning the rhetoric into reality / M. Carrasco, P. Goss, BCG perspectives, 2014.

2. The impact of eGovernment

2.1. Advantages

ICT provides tools for faster and more efficient processing of data within public administrations; efficient public services can result in significant **cost savings,** or the development of new kinds of services at the same cost. In 2012, the European Commission estimated that all EU public administrations using e-procurement procedures could save at least €100 billion per year and that e-government (online communication between citizens and governments) could reduce costs by 15 to 20%.[6] With a seamless electronic tax system, the Austrian tax authority is estimated to have saved €2 per transaction over the cost of conventional processing.[7]

Cost savings are increased by a strategy known as '**digital by default**'. Services that are 'digital by default' are designed from the beginning to be so compelling that everyone who can use them will choose to do so. This means that the vast majority of transactions will be handled electronically. Only a minority of citizens will still need to communicate with government via more costly channels, such as through mailed paper forms, face-to-face interaction in an office or over the telephone. For instance, in its Government Digital Strategy, the UK estimates that about 18% of its population will need help through an 'assisted digital service' where intermediaries act as an interface between the citizen and the digital service; moving a variety of services to digital channels is expected save the government £1.7 to £1.8 billion annually.[8] The European Commission estimates that at the EU level, a 'digital by default' strategy could save between €6.5 and €10 billion annually.[9]

More important than government cost reductions, however, is the opportunity to **reduce administrative burdens**. Administrative burdens are the costs that citizens and businesses bear to comply with information and registration requirements established by government regulation. These costs can be reduced by making it faster and less expensive for citizens to fulfil their obligations, such as applying for permits or paying taxes. Reducing time and effort is possible because of the convenience and rapidity of online provision of information, the integration of ICT tools and processes, and the repurposing of information supplied by citizens and businesses. In a 2012 Eurobarometer survey, more than two thirds of respondents had noted over the previous three years the introduction of an option for their company to complete government forms over the internet. Although not necessarily just because of online services, four out of 10 survey respondents said they had noted a reduction in the time and effort needed by their company to complete government forms, and one in four said that government services had responded faster.[10] The amounts saved through a reduced administrative burden can also be significant. For example, the SIMPLEX programme for administrative simplification and eGovernment in Portugal is estimated to

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6 Digital 'to-do' list: new digital priorities for 2013-14 / European Commission, 2012.

7 Feasibility and scenarios for the long-term sustainability of the Large Scale Pilots, including ex-ante evaluation: executive summary / Deloitte, European Commission, 2013, p. 9.

8 Government digital strategy: December 2013 / Cabinet Office, UK, 2013.

9 Study on eGovernment and the reduction of administrative burden: final report / EY, Danish Technology Institute, European Commission, 2014.

10 Innovation in the public sector: flash Eurobarometer 343 / European Commission, 2012.

have generated €56.1 million in savings for citizens and businesses. eProcurement initiatives in Lithuania were expected to save businesses at least €1.2 billion over five years.[11]

In reducing administrative burdens, two commonly-discussed strategies are of particular relevance:

'**Once only**' **registration of data** means that businesses and citizens are required to supply common information only once. Information previously supplied is reused for other applications, reducing the amount of work that the citizen has to do. For example, a person's address data entered as part of a driving licence application could be used when they apply for social security assistance. When a citizen logs in to a public website, the information provided or the navigation facilities can be personalised, saving them time and effort. The European Commission estimates that currently in less than half the cases (48%) do public administrations re-use information they already have about citizens or companies. Of course public authorities need to take the steps necessary to protect personal data appropriately and to share data between different agencies, departments or levels of government in a secure fashion. However implementation of this approach at the EU level, with appropriate data protection, is expected to save around €5 billion per year by 2017.[12]

A '**whole-of-government**' **approach**[13] is a complement to the 'once only' strategy. In this approach, different public agencies work across their portfolio boundaries to create an integrated response to programme management and service delivery. For example, a citizen reporting a death may need to contact a wide variety of different government actors, potentially including the tax authority, the pension department, other social security administrations, the driver licensing agency, the passport office as well as local authorities. Similarly someone wanting to create a business may have to contact a range of public administrations to get the necessary registrations and permissions. A whole-of-government approach would aim to simplify these processes for end-users by coordinating the needs of the public authorities involved, reducing duplication and integrating ICT-based services.

While some countries have aggregated large amounts of information in central data stores, it is more common that different levels of government or agencies cooperate by sharing or exchanging the information that they hold. This means that different services need to be *interoperable*, in other words to have the technical infrastructure and informational capacity to exchange data between their different applications. The absence of a whole-of-government approach can undermine efficiencies in eGovernment services and inhibit progress in reducing administrative burdens.

For example, the Danish Basic Data Programme applies the 'once only' principle to personal, business, property, address, geographic and income data stored in 10 different electronic repositories across different levels of government. Public authorities share this data internally and in a secure manner so that the burden on citizens and businesses on supplying this data is reduced. The potential savings for municipalities, regions and central

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[11] Trends and challenges in public sector innovation in Europe: executive summary / European Commission, December 2012.

[12] Digital Single Market Strategy / European Commission, 2015. COM(2015) 192 final.

[13] A similar concept is that of 'joined up' government, where new methods or forms of organisation are developed to overcome traditional boundaries between government entities or information silos so as to work more efficiently and provide better services.

government amount to as much as €100 million per year by 2020. In addition, data are expected to be of higher quality (e.g. less risk that data will be outdated); making non-sensitive parts of this data available to other parties for commercial use can also create efficiencies, open the door to innovative applications, and stimulate economic growth. It is estimated that extending this 'once only' approach to the EU level could result in annual net savings of as much as €5 billion per year.[14]

Looking at a process through the eyes of a citizen or business also provides an opportunity for redesign or rethinking organisational structures and procedures so as to promote efficiency within public services. This is particularly true when different departments or agencies share data, services and resources in a more integrated way, and offer services that take the user seamlessly from the beginning to the end of a particular process. In this context ICTs provide an opportunity to re-examine and reform organisational structures. In fact, the online implementation of a public service is considered by the European Commission to be one of the most important stimuli for innovation in the public sector.[15]

Finally eGovernment can offer advantages by increasing **transparency**. Governments that put large quantities of data online provide citizens and enterprises with the opportunity to analyse that data, to ensure that government actions are well aligned with society's goals. By opening up channels for citizens to develop new services as well as to suggest, comment on and influence policy development, governments can encourage greater **citizen participation** in government. eGovernment services are also sometimes considered a way of **reducing corruption** through eliminating intermediaries between the citizen and the actual service provided.[16] They are also considered to contribute to reducing the **carbon footprint** of government, by reducing travel and paper-based processes.

2.2. Disadvantages

On the other hand, eGovernment presents a number of real or potential problems. Providing services that are digital by default may exclude those on the wrong side of the '**digital divide**', i.e. those in society who do not have easy access to the internet because of poverty, physical handicaps, age, limited digital literacy or residence in areas such as rural communities with little or no access to broadband connections. Maintaining alternate channels of communication, such as face-to-face or telephone service desks, acts against social exclusion but can cut into cost savings.

Governments may need to support **digital skills training**, not only as a way of supporting the labour market and helping citizens to improve their job prospects, but also to ensure that all citizens can use eGovernment services. Public officials may also need additional training and time to learn new skills so that they can adapt to support electronic service; others may need to be re-assigned to other roles.

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[14] Study on eGovernment and the reduction of administrative burden: final report / EY, Danish Technology Institute, European Commission, 2014, p. VI.

[15] Powering European public sector innovation / Expert group on public sector innovation, European Commission, 2013.

[16] See The strategy and the progress made on e-Government Services in the EU / L Protopappas, A. Sideridis In: E-democracy, security, privacy and trust in a digital world, 2014, p. 192-201.

Citizens' privacy can be compromised as governments collect and share more data in order to personalise services or support 'register only once' data registration. Personal data stored by governments may be exposed to risks of data theft. If particular care is not taken, providing open access to different sets of government-collected data may in some circumstances permit cross-referencing from one set to another in a way that allows the identification of individuals, even if the separate datasets have been 'anonymised'. Lack of trust in how the government manage their personal data, and fears about inadequate security and privacy safeguards, can discourage citizens from using electronic services. Publishing open government data while maintaining security and privacy also comes with **costs** to the governments providing that data.

Projects to introduce eGovernment services also face **risks related to introducing major changes** in complex and politically sensitive areas. Barriers include leadership failures, limited investment to develop new services, negative attitudes of civil servants, organisational inflexibility and difficulties in coordination across jurisdictional, administrative or geographic boundaries. Government's frequently top-down, hierarchical structure can also inhibit communication with citizens and the promotion of new electronic services. While many Member States are currently implementing the once-only principle, approaches vary due to regulatory complexity and different ways of thinking about organisational reform and collaboration across different organisational boundaries.[17]

3. eGovernment in the EU

For almost 15 years, the European Union (EU) has developed policies to foster the use of ICTs in the provision of government services to citizens. Whilst not explicitly mentioned by the Treaties, cross-border public services that support EU policies have become a necessary condition for a fully realised single market, supporting the rights of citizens to live and work anywhere in the Union and of businesses to offer services across the EU. As the 2006 Austrian Presidency of the EU succinctly stated, 'if [Member States] do not act in concert, we could face a potentially embarrassing irony: that we erect electronic barriers to the exercise of those EU-wide freedoms of movement because of an exclusively national focus on our eGovernment strategies, and this precisely in the one domain – Cyberspace – that knows no natural borders'.[18]

The e-Commission

In a 2012 Communication, the European Commission set out its plans for an e-Commission 2012-15. This programme, like a similar predecessor e-Commission programme, sought to apply eGovernment principles to the Commission itself; in other words, to use ICT to enhance the efficiency, effectiveness and transparency of the Commission by rationalising and modernising many of the IT infrastructures which underlie its policies and internal business. Targeted applications included public websites, procurement, machine translation, document management, open data portals and European Citizens' Initiatives.

[17] eGovernment and reduction of administrative burden: applying the 'once only' principle / Deloitte, epractice.eu, 2014.

[18] E-Government in Europe: re-booting the state / P. Nixon, V. Koutrakou, 2007, p. 272.

eGovernment can also contribute to the Europe 2020 goal of making the EU a smart, sustainable and inclusive economy. Public authorities can use ICT to reduce expenses related to paper-based collection, filing, processing, storage and retrieval of information; to cut costs of printing and distributing of information; to streamline internal processes and improve data sharing; and to improve the efficiency of public administration through components such as integrated financial management systems.[19] Online services can reduce the administrative burden on European citizens and enterprises, making Europe more competitive and fostering economic growth. By creating a more open and transparent public administration, and opening the door to citizens' involvement in priority setting and policy making, it can also be possible to create a more open, inclusive and participatory democracy.

Digital Single Market Strategy

In May 2015, the European Commission unveiled its **Digital Single Market Strategy** which described 16 key actions, of which the final item promised, in 2016, a new eGovernment action plan for the period up until 2020. The action plan will include initiatives that aim to modernise administrations, increase interoperability and make it easier for citizens and businesses to interact with governments, in particular:

- Interconnecting business registers across the EU in order to allow businesses to launch cross-border services within a month of deciding to do so.
- A pilot project in conjunction with Member States to implement the 'once only' principle.
- Integration of EU and Member State portals, networks, and services in the Commission's planned new web presence so as to provide a more user-friendly 'one-stop shop' called the Single Digital Gateway.
- Speeding up Member States' implementation of e-procurement and e-signatures.

The European Parliament and Council have also been supportive of eGovernment initiatives. In 2011, Parliament financed a study on e-Public, e-participation and e-voting in Europe and in 2013, STOA issued a report on the security of eGovernment systems.[20] A report on the potential and impact of cloud computing and social networks also considered the impact on government services. For a number of years, the Presidencies of the Council have annually organised a ministerial meeting or other high-level conference bringing together experts from around the EU to discuss eGovernment issues.[21] Arguably the most important of these high-level meetings was that in Malmö in 2009 at which Ministers signed a Declaration which recognised that eGovernment was important for delivering European policy goals, and set goals for 2015 including citizen empowerment, increased availability of public-sector information, and better cross-border eGovernment services.[22]

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[19] See Introduction to e-Government / World Bank, 2011. The financial crisis has put greater pressure on government budgets, but post-crisis the majority of European countries did not decrease eGovernment spending, and some, like Estonia, Germany, the Netherlands, Slovakia and Slovenia, reported increased eGovernment investments (United Nations e-Government survey, 2014, p. 31).

[20] Security of eGovernment systems: final report / A, Jacobi et al., Science and Technology Options Assessment, European Parliament, 2013.

[21] Recent meetings have been held in Malmö, 2009; Grenada, 2010; Poznan, 2011; Nicosia, 2012; and Vilnius, 2013.

[22] Ministerial declaration on eGovernment, 18 November 2009, Malmö, Sweden.

The European Council

In the Conclusions from its October 2013 meeting, the European Council encouraged the modernisation of public services through swift implementation of public services such as eGovernment, eHealth, eInvoicing and eProcurement. In particular, the European Council highlighted the potential of open data to stimulate innovation and prosperity, said that public sector information and interoperability should be promoted, and called for efforts to apply the 'once only' principle in terms of data collection. In response to the European Commission's Digital Single Market Strategy, in June 2015 the European Council indicated that action needed to be taken on encouraging eGovernment.

According to a global UN survey, as a region Europe is in the forefront in terms of the potential for successful implementation of eGovernment. In particular, progress has been made in making use of eGovernment services. In 2010, the Digital Agenda for Europe set a target for 50% of citizens to use eGovernment services, and in 2014, levels were 47% for the EU as a whole. Despite a fairly slow rate of increase and some variation in measured levels over the previous few years, it now appears possible that this target will be reached in 2015.[23] However there remain great disparities between the levels of eGovernment provision, and use and progress in take-up of eGovernment services, in different EU Member States. The following sections discuss EU policies and programmes in regard to eGovernment, how they rank in terms of other countries, targets for eGovernment use, and future challenges in implementing effective eGovernment solutions.

4. Past and current EU policies and programmes

The European Union has long been involved in initiatives encouraging the application of ICTs to public administration. Currently support focuses on an interoperability programme, the Digital Agenda for Europe, an eGovernment Action plan, and the Horizon 2020 research programme. An eCommission programme applying eGovernment principles to the European Commission and support for eGovernment projects through the European structural and investment funds also contribute to eGovernment implementation in the EU.

4.1. The Digital Agenda for Europe

The Digital Agenda for Europe, the EU's digital policy for the 2010-15 period, contains a number of actions related to eGovernment, including creating and deploying digital services in key areas of public interest (Action 110); supporting seamless cross-border eGovernment services in the single market (Action 84); making eGovernment services fully interoperable (Action 89), with points of single contact functioning as eGovernment centres (Action 90); and exploring efficiency gains from moving public services into the Cloud (Action 122).

The ICT Policy Support Programme (ICT PSP), one of three specific programmes of the Competitiveness and Innovation Framework Programme (CIP) for the 2007-13 period, has supported the realisation of the Digital Agenda for Europe. By providing funding for innovations that have moved beyond the research phase, this programme put particular emphasis on efficient public administrations in the light of slow uptake of innovations in the

[23] Digital Agenda targets: progress report 2015 / European Commission, 2015, p. 8. eGovernment: Digital Agenda scoreboard 2015 / European Commission, 2015.

public sector. While some large-scale pilot projects (LSPs) are complete and some are still on-going, among the seven eGovernment-related projects that have received support since 2008 are:

- STORK (Secure Identity Across Borders Linked) and its successor STORK 2.0 aimed at creating a single European identification and authentication area by interconnecting systems for electronic identification of persons and legal entities.
- SPOCS (Simple Procedures Online for Cross-border Services) set up single contact points at Member State level to support contacts between enterprises and authorities and online completion of procedures.
- PEPPOL (Pan-European Public Procurement Online) sought to make it easier for companies to bid on public sector contracts throughout the EU.
- epSOS (European Patients Smart Open Services) was designed to create cross-border interoperability between health-record systems to help citizens needing medical assistance in another Member State.
- e-CODEX (e-Justice Communication via Online Data Exchange) aims to improve cross-border access to the judicial system of other Member States by establishing an interoperability layer for eJustice communication.
- eSens (Electronic Simple European Networked Services) will improve technical solutions for cross-border eGovernment services such as setting up a business or using electronic procurement, legal or health services.

A CIP call in 2013 led to funding for projects specifically looking at the application of cloud computing to public services:

- The Cloud approach for innovation in public services (CLIPS) focuses on a scenario of a family moving within Europe to demonstrate re-use of open data and services and interoperability so as to reduce costs and improve the customer experience.
- StormClouds defines guidelines, case studies of uses and best practices related to the shift of public-service provision to the cloud.
- CloudOpting contributes to strategies and standards by providing a shared platform for pilot projects that allows public authorities to migrate existing applications.
- Strategic will develop cloud infrastructures and tools that will help public-sector organisations migrate services to the cloud, as well as 'localising' services developed elsewhere.
- European cloud marketplace for intelligent mobility (ECIM) aims to use cloud computing to make transport services more innovative, cost effective and accessible.
- Virtual registry of the ('under-on-above') [sic] ground infrastructures (VirgoRegistry) project will create a cloud-based virtual registry of infrastructure, including maps and information on geographic coverage and types of utilities.

The **Connecting Europe Facility 2014-20**[24] **(CEF)** contributes to financing the basic infrastructure needed by eGovernment in the EU. The Telecom objective of the CEF provides funds for broadband networks but also invests in projects that fill in the missing links in Europe's digital infrastructures. In particular the CEF has been and will be used to finance 'mature' digital infrastructure such as eIdentification, eAuthentication, eProcurement,

[24] CEF Regulation, No (EU) 1316/2013.

eInvoicing and eDelivery (the secure delivery of documents) as well as Open Data and Cybersecurity. Anticipated funding in these areas in 2015 totals nearly €28 million.[25]

4.2. European eGovernment Action Plan 2011-15

In 2010, the European Commission adopted its European eGovernment Action Plan for the 2011-15 period. The plan contributes to achieving two important targets of the Digital Agenda in Europe: first, that 80% of businesses and 50% of citizens make use of eGovernment services; and second, that a number of key cross-border services be offered online by 2015. Priorities include empowering citizens and business; promoting mobility in the single market; making public administrations more efficient and effective; and aiding in the establishment of 'key enablers' for eGovernment services such as eIdentifiers and eSignatures. The plan seeks to reduce administrative burdens by 25% in each country and, in the longer term, across borders and at EU level.

In an own initiative resolution reacting to this plan,[26] the European Parliament supported the targets for increased use of eGovernment services, but called for a coherent EU legal framework for eAuthentication, eIdentification and eSignatures. It also stressed the importance of digital training; the need for increased use of electronic submissions for public procurement; and development of electronic invoices so that these become the dominant form of invoice in the EU by 2020.

In conjunction with this eGovernment Action Plan, the Commission proposed a **European Interoperability Strategy**[27] and a **European Interoperability Framework**. The **Strategy** provides guidance regarding cooperation between European public authorities in relation to delivering services across borders and sectors. It focuses on three 'clusters' dealing respectively with trusted information exchange (including eIDs and eSignatures), interoperability architecture and the assessment of the implications for ICT of new EU legislation. While promoting awareness and sharing of best practices, the Strategy is continually updated to take into account new developments and project progress. On the other hand, the **Framework** is an approach agreed with stakeholders that specifies common elements for interoperability and provides guidance to European public administrations in terms of stakeholder expectations, an interoperability model (including service components), and interoperability agreements.

4.3. Interoperability programmes

For nearly 20 years, the EU has supported a series of programmes promoting interoperability for European eGovernment Services. A 1995-99 programme, called the Interchange of Data between Administrations (IDA), sought to develop trans-European networks to allow the exchange of data between public administrations in the EU and Member States. Its successor programmes, IDA II (1999-2004) and IDABC (2005-09), extended the approach to the interoperability of services and included businesses and citizens (BC) as target clients; it also included sharing best practices among Member States.

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[25] Connecting Europe Facility, Trans-European telecommunication networks: work programme 2015 / European Commission, 2014.

[26] Competitive digital single market – eGovernment as a spearhead, 2011/2178(INI), resolution of 20 April 2012.

[27] European interoperability strategy / European Commission. COM(2010) 744 final Annex 1.

For the 2010-15 period, a programme on Interoperability Solutions for European Public Administrations (ISA) has given impetus to a number of initiatives, include ePrior (an IT system for procurement and e-invoicing documents), IMI (an internal market information system) and MT@EC (a machine translation system for the EU institutions and Member States), as well as a system for collecting signatures to support European Citizens' Initiatives, a mechanism introduced with the ratification of the Lisbon Treaty. A proposal for a continuation of this programme (ISA2) is currently being considered by Parliament and Council (see the section on 'Recent and ongoing legislative initiatives' below).

4.4. Research

As well as the above programmes, since 1998 the EU has funded more than 80 research projects in the area of eGovernment through its framework research programmes. For the period 1998-2002, the emphasis was on ICTs which could make services more user-friendly and accessible; for the subsequent framework programme, it was on services to business and citizens and encouraging organisational change; and for the 2007-13 period (the Seventh Framework Programme), eGovernment-related research focused mainly on ICT for governance and policy modelling.

Under the Horizon 2020 programme, innovation in applying ICTs to public sector services will be supported through three initial calls:

- 'Europe in a changing world – Inclusive innovative and reflective societies' (SC6) supports research into new technologies such as mobile access, personalised services and open data, the eParticipation of youth in decision-making and the creation of innovative mobile applications by small and medium-sized enterprises.
- 'Leadership in enabling and industrial technologies' (LEIT) focuses on the creation of services built on the 'cloud of public services' by public administrations, users and other stakeholders.
- 'Secure societies – Protecting freedom and security of Europe and its citizens' (SC7) will look at managing personal data and preserving privacy in an open government context.

Later calls will cover personalised public services that enhance transparency and increase trust and accountability; applying emerging technologies to improve the efficiency, effectiveness and quality of public services; and the design of innovative mobile applications to improve the interaction of citizens and businesses with public administrations.

4.5. Structural and investment funds

The EU also supports eGovernment projects through structural and investment funds such as the European Regional Development Fund (ERDF). One of the thematic priorities for the ERDF is enhancing access, use and quality of ICT, including strengthening ICT applications for e-government. Some recent projects:

- DLA aimed to create a common methodology for the implementation of a Digital Local Agenda.
- eCitizen II proposed facilitating citizen-centred eGovernment in European cities and regions.
- OSEPA sought to encourage the use of free and open source software in public administrations.
- I-SPEED demonstrated how ICT can be used in the tourism sector.

- PIKE sought to promote innovation and the knowledge economy through implementing successful approaches developed in other regions.
- IMMODI helped to implement eGovernment and eHealth services in mountain areas.

An analysis of these ERDF-funded projects found that digital policies needed to be more connected to 'mainstream' policies; it also stressed the need to redesign public organisations and processes in order to deliver effective eGovernment services, while calling for a more 'open government' approach with citizens more involved in the development of new services.[28] In a review of an earlier (2000-06) group of ERDF-funded eGovernment projects in four Member States, the European Court of Auditors found that benefits were not always well defined and often ended up being much lower than could have been expected; according to the Court, eGovernment projects needed clearer objectives and should have been selected for funding on the basis of anticipated costs and benefits.[29]

4.6. Recent and future legislative initiatives

Directive 2014/55/EU on **electronic invoicing in public procurement** was adopted by Parliament and Council in 2014. It calls for the development of a European standard for eInvoices and mandates that public governments accept eInvoices in a new European eInvoice standard when dealing with public procurement. This addresses the problem that national standards adopted by some Member States are not compatible with one another. Thanks to this Directive, businesses will have the assurance that if their e-invoicing process supports the European standard, their e-invoices will be accepted throughout the EU.

In June 2014, the outgoing European Commission adopted a proposal for the above-mentioned new **programme on interoperability solutions** for European public administrations, businesses and citizens known as ISA2. This programme would extend the current ISA programme. The aim of the programme, which is intended to run from 2016 to 2020 with a financial envelope of €131 million, is to help Member States modernise their legislation and provide interoperable digital services at the European level as well as at that of the Member States. In particular, it aims to cut costs for public administrations and to reduce administrative burdens for businesses and citizens, while avoiding barriers hindering citizens and businesses that need to use public services across borders. The proposal affects a number of different EU policy areas including the internal market, public procurement, customs and taxation, health and the environment.

The ISA2 proposal is currently being considered by Parliament and Council. In June 2015, Council adopted a general approach (including new measures not in the Commission's proposal) in preparation for an informal trilogue and eventual first-reading agreement. The report of the Industry, Research and Energy Committee (ITRE) of the European Parliament which was adopted in June 2015 is scheduled for consideration at the October 2015 plenary.[30]

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[28] E-government services: analysis report / INTERREG IVC, 2014.

[29] Have the e-Government projects supported by ERDF been effective? / European Court of Auditors, 2011.

[30] Programme on interoperability solutions for European public administrations, businesses and citizens (ISA2). 2014/0185(COD). The rapporteur for the ITRE Committee is Carlos Zorrinho (S&D, Spain). For Council, see its general approach (ST 9366/15 INIT) and preparation for the first informal trilogue (ST 10240 2015 INIT).

Other eGovernment-related legislation that was given a first reading by the EP prior to the 2014 European election but which is not yet adopted, as of July 2015, includes a directive that aims to ensure the **accessibility of websites of public sector bodies** (2012/0340(COD) and a directive on a high common level of **network and information security** across the Union (2013/0027(COD) for which informal trilogue discussions with the Commission and Council were on-going.

As part of its **Digital Single Market Strategy**, the Commission has also promised to introduce a new eGovernment action plan covering the period 2016-20. This initiative will include the interconnection of business registers in Member States by 2017, launch a pilot 'once only' project with Member States, extend and integrate EU and Member State portals to create a better 'one stop shop' and accelerate the move to full electronic procurement and interoperable electronic signatures.

The OECD recommendation on digital government strategies

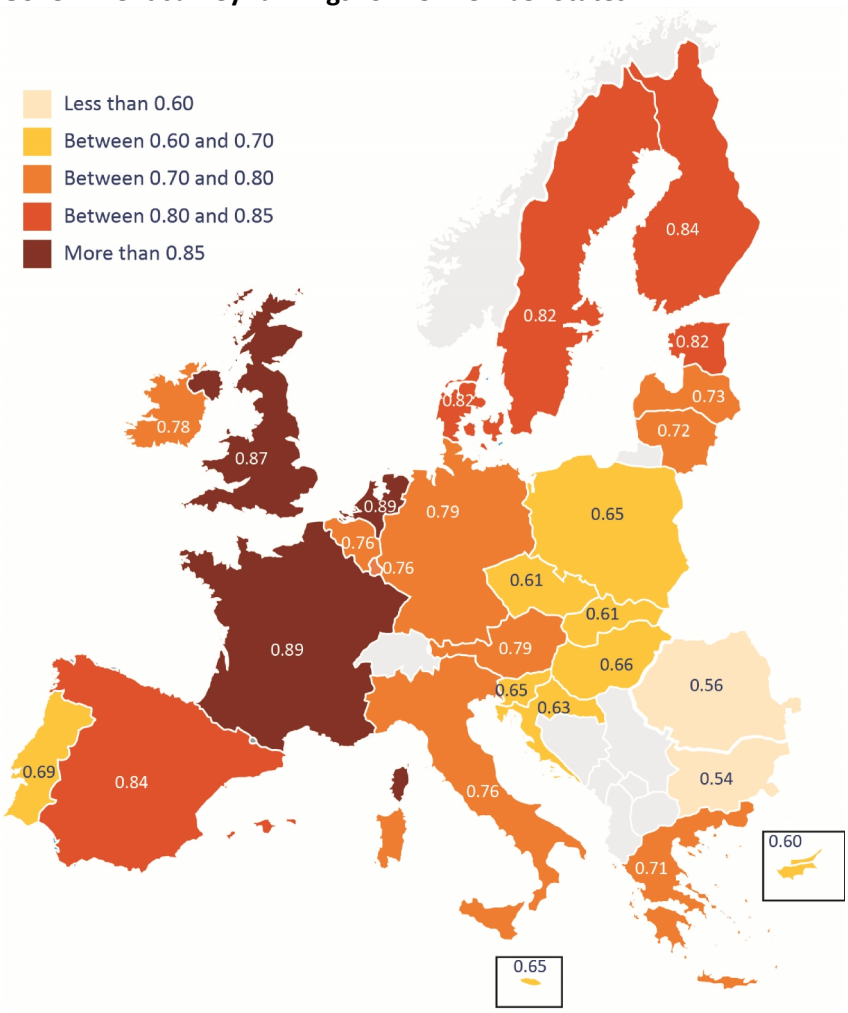
In July 2014, the Council of the Organisation for Economic Co-operation and Development adopted what is said to be the first international legal instrument on digital government. The recommendation is not legally binding, but the 21 EU Member States who are members of the OECD (Austria, Belgium, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Luxembourg, Netherlands, Poland, Portugal, Slovak Republic, Slovenia, Sweden, Spain and the UK) are expected to implement it. Taking a whole-of-government approach, the Recommendation mandates that governments develop strategies that ensure greater transparency, openness and inclusiveness; that they encourage the participation of public, private and civil society stakeholders in policy-making as well as service design and delivery; and that they create a data-driven culture in the public sector. Of particular relevance to the EU, it also calls on member countries to strengthen cooperation with other governments in order to serve citizens and businesses across borders, and to share knowledge and coordinate digital government strategies.

5. Benchmarking eGovernment in the EU

5.1. UN eGovernment survey

The United Nations sponsors a bi-annual survey of eGovernment in the world. The survey includes a composite index that ranks countries based on three very broad dimensions: the provision of online services, the presence of telecommunications infrastructure and available human capacity. (The latter two aspects are seen as measures of potential or 'readiness' for eGovernment rather than an evaluation of actual eGovernment performance). The actual benchmark values change from one report to the next as ICTs and services evolve, which means that this report is useful for comparing different countries in a single report, but not for measuring progress in absolute terms over time.

Figure 1 - UN eGovernment survey rankings for EU Member States



Source: United Nations e-Government survey 2014, p. 34

In the 2014 survey, Europe was the highest-ranking region overall for eGovernment.[31] France, the Netherlands, the United Kingdom (UK) and Finland were the highest ranking EU Member States, but 11 other Member States were also in the top 30 countries worldwide for eGovernment. In specific areas such as eParticipation, France, the Netherlands and the UK were also world leaders. Spain, Ireland, Italy and Latvia were highlighted as countries that had risen quickly in the rankings compared to the previous survey. The survey also notes general progress in eParticipation, the use of mobile technology, the increased role of social media, and greater availability of government Open Data. A new UN survey will be published in 2016.

5.2. EU eGovernment benchmarks

As promised by the Commission in its Communication, progress in the EU's eGovernment Action Plan is regularly measured by a series of annual eGovernment Benchmark reports, although not all aspects are measured in each annual report. Recent reports use a framework to evaluate how well Member States' systems respond to a series of 'life events'

[31] This regional ranking is somewhat misleading, in that highly ranked United States and Canada were not considered part of a 'North American' region but instead were taken together with lower ranked Latin American countries in a region called 'the Americas'.

(e.g. starting a new business, finding a job or moving); this 'life events' evaluation tests how well eGovernment services are integrated (i.e. rather than just being made available in a separate, unconnected way). The benchmark also relies on a survey that asks citizens across the EU about their experience and reactions to eGovernment services.

Whilst recent top-level benchmarks[32] have shown progress in achieving eGovernment, a closer look reveals mixed results. Tests of 'user centricity' (to what extent a service is provided online and how it is perceived) show good results (73%) across the EU28, although specific ratings for ease and speed of use trail badly behind the online availability of services and the number of usability features. While availability was up six points in 2014, ease and speed of use did not change between 2012 and 2014. Governments are not highly rated (51%) for transparency in relation to their own responsibilities, performance, service delivery and personal data. Whilst cross-border mobility (international services) has improved steadily over time, scores are still low with 16 Member States below 50%; across the EU, online services across borders are only available in 48% of cases, compared to 72% when citizens request the same services within their country, and cross-border transactional services (where a citizen can complete an entire process online) are very rare. In addition, the benchmark notes that services to citizens suffer from a significant gap (on average about 10 or 11 percentage points) below the level of services offered to businesses, across all countries and all indicators.

Europe has also been very slow in terms of adopting five key enabling technologies (technical elements which are essential to supporting public online services). Some Member States (e.g. Malta, Estonia, Portugal, and Spain) provide good examples and others, like France, score well with some technologies but poorly for others. However most individual countries showed almost no progress from 2012-13 to 2013-14, and even the most common of these technologies (eIdentification) was only deployed in 63% of the cases examined in 2014.

According to the 2014 benchmark, citizens who used online public services most often saw the perceived benefits to be in time saved, flexibility in terms of time and place, money saved and a simplified process for getting service. They saw the most important barriers to using eGovernment services to be a preference for personal contact and the expectation that a personal visit or paper was required anyway. Other barriers were not being aware of the service or expecting that other channels would be easier. Concerns about data protection and security, lack of skills or technical difficulties in accessing the service were much less important. The survey component also showed that more than one third of EU citizens (38%) refuse or choose not to go online to use public services.[33]

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[32] Future-proofing eGovernment for a Digital Single Market: final insight report / D. Tinholt et al., European Commission, 2015.

[33] Delivering on the European advantage? How European governments can and should benefit from innovative public services: eGovernment benchmark / D. Tinholt et al., European Commission, 2014.

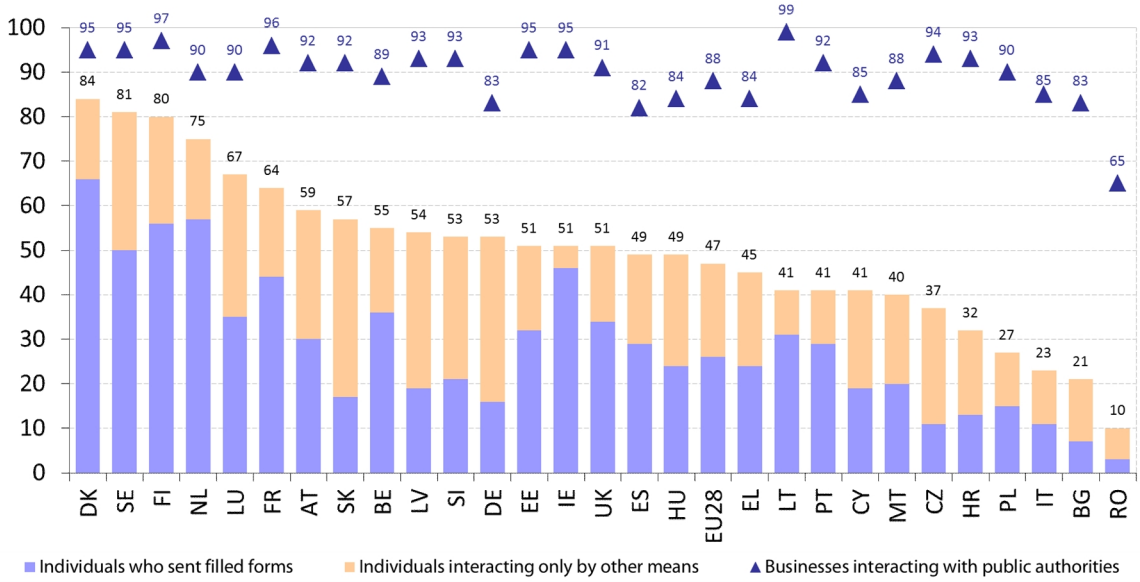
5.3. Digital Agenda scoreboard

The Digital Agenda for Europe (DAE) includes actions and targets related to eGovernment. Like other DAE targets, these are regularly measured and communicated through a Digital Agenda Scoreboard. One of 13 specific goals of the DAE is that half of EU citizens should use eGovernment services by 2015, with more than half of these returning digital forms. After decreasing in 2013, usage rebounded in 2014 when 47% of the population used eGovernment services, leading the Commission to predict that the goal would be met. In 2014, 26% of the EU population used interactive eGovernment services, meaning that target has been achieved. Some Member States have very high levels of citizens submitting filled-in forms over the internet (50% or more in Denmark, the Netherlands, Finland and Sweden) but some Member States have low levels and have shown little progress in terms of catching-up (Italy, Bulgaria and Romania).

In all EU countries, scores have been much better for businesses, both in terms of the proportion of businesses that interact with government and the greater degree of interactivity.

Based on 2013 data, citizens who use online public services are usually highly satisfied with the experience (75%). They appreciate most frequently the usefulness of the information (87%), the ease of finding it (84%) and the ease of using online services (79%). However citizens who do not submit official forms online tend to do so because they miss personal contact; they trust sending paper more; they feel that the services will require paper or a personal visit anyway; or they are concerned about protection of personal data.[34]

Figure 2 - Individuals/businesses interacting online with public authorities in past 12 months (% of population or businesses), 2013-14



Data source: Eurostat isoc_bde15ei, isoc_bde15ee, 2014.Business interactions are derived figures for 2013.

[34] eGovernment: Digital Agenda scoreboard/ European Commission, 2015.

6. Future challenges and opportunities

6.1. Electronic identification, security and trust

Various commentators have highlighted the disparity between the 'supply side' and the 'demand side' of eGovernment; that is to say, the gap between the availability of eGovernment services and their actual uptake and use. For example, Austria has almost 100% of common public services available online, but actual usage by individuals is only slightly over 50%.[35] One of the problems depressing demand is that users do not trust eGovernment services, particularly those more sophisticated, transactional services that require that they identify themselves and reveal private or personal data;[36] they have doubts about the security of their access and the degree to which their data are protected. For example, a Boston Consulting Group study found that 47% of users of government digital services want greater assurance that their data are private.[37] Denmark, Finland, Sweden and the Netherlands were frequently among the Member States where trust in public authorities was the highest.

Trust is difficult to establish in an online environment, where the competence, benevolence and honesty of the different interlocutors is more difficult to evaluate than in face-to-face interaction. Trust online depends on electronic identity information, which may vary in completeness depending on the environment. The EU is making efforts in this regard. At the sixth Ministerial eGovernment Conference in Poznan in 2011, Ministers concluded that an electronic identity issued by one Member State to citizens and businesses should be able to be used in all public and private transactions in other Member States through a process of mutual recognition. In 2014, the EP and Council adopted Regulation 2014/910 on **electronic identification and trust services** that provides for mutual recognition of electronic identification to facilitate greater interoperability in cross-border services.

Yet security cannot be looked at in isolation. In 2011 the EP's Science and Technology Options Assessment service looked at security issues related to three cross-border applications, highlighting the trade-offs that existed between privacy and security on the one hand, and usability, interoperability and the cost of eGovernment systems on the other. Greater security may make a service more difficult to use, and differing security systems can impede interoperability, particularly in cross-border applications.[38] Similarly, citizens have the right to be informed when personal data are being collected, and of the purpose for which this is being done. But these privacy requirements can conflict with the 'government as a whole' strategy and the desire to share information between different agencies, or different levels of government, so as to avoid entering data multiple times or to provide

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[35] Perspectives on e-government in Europe / S. Archmann, J. Iglesias in: Information communication technologies and the virtual public sphere: impacts of network structures on civil society / R. Cropf, W. Krummenacher, 2011, p. 195-206.

[36] It is interesting to note, however, that a Flash Eurobarometer in 2008 showed that more citizens trusted the data protection policy of organisations like the police (80% of respondents), social security (74%), tax authorities (69%) and local authorities (67%) than trusted banks and financial institutions (66%) (although medical services and doctors were trusted by more, 82%).

[37] Governments are going digital / BCG, 2014.

[38] Borderless eGovernment services for Europeans / sixth European Ministerial eGovernment Conference, Poznan, 1-18 November, 2011.

efficient, personalised services. If citizens are unsure what other parts of government may have access to the information they provide online, trust in the service and in the government as a whole may suffer.

6.2. Cross-border services and interoperability

Citizens and businesses that want to take advantage of the European single market to travel, work, live or provide services in other Member States also need to use online public services in those Member States. Businesses want to register, obtain permits, pay value added tax (VAT), and trade across borders without experiencing problems. A student wishing to study in a foreign university wants to be able to follow the same online enrolment procedures as a student in that country. Interoperability (not just compatibility in the technical infrastructure or in the format of data sent and received, but also compatibility of legal framework and organisational structure) is critical to overcoming barriers to citizens wishing to use those services from anywhere in the EU.

However the need for interoperability may not be evenly distributed across the population. One study found that incentives for cross-border services are most often found in big cities with a mobile international population, small countries with an open international economy, and regions with a lot of cross-border activity, as well as international public-sector organisations;[39] but outside those confines, incentives are not necessarily widespread. In a similar vein, a Slovenian study showed that those who had lived abroad had a stronger interest in pan-European eGovernment services than those who had remained in Slovenia.[40] Perhaps this constrained demand (it has been estimated that there are in the EU only 1.2 million users of online cross-border services per year[41]) has led to suggestions that Member States do not give a high priority to interoperability.[42] On the other hand, the additional costs for enabling cross-border usage of an online service are not high, representing on average less than 5% of the total implementation cost of a new service. However a study on the sustainability of the digital infrastructures developed by the large-scale pilots that fell under the ICT programme of the CIP found that further investments at European level would be required in the future, starting with the development of a political vision and the recommended creation of a suitable agency to ensure stakeholder engagement.

6.3. eParticipation

Electronic participation, or eParticipation, is the use of ICT to facilitate political participation by enabling citizens to communicate with each other, civil society, their elected representatives and their government. Much more than government simply consulting citizens through surveys and petitions, eParticipation actively involves citizens in the policy process so that they can raise issues, modify agendas and change government initiatives.

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[39] Pan-European eGovernment services study / Euregov, 2007 as quoted in Best practices in eGovernment: on a knife-edge between success and failure / T. Undheim, European Journal of ePractice no. 2, 2008.

[40] Pan-European services in Slovenia / J. Berce et al. Electronic journal of e-government v. 9, no. 2, 2011, p. 122-131.

[41] Study on analysis of the needs for cross-border services and assessment of the organisational, legal, technical and semantic barriers: final report / Capgemini et al., European Commission, 2013, p.3.

[42] Delivering on the European advantage? How European governments can and should benefit from innovative public services: eGovernment benchmark / D. Tinholt et al., European Commission, 2014.

Stronger online participation through technology has the potential to improve the quality of political decisions and to increase the perceived legitimacy of the decisions taken. Some commentators see this aspect of eGovernment as ushering in a new era of democratic involvement, greater transparency and accountability; others note that governments have given little priority to technologies that enable citizens to contribute to decision-making, going so far as to call digital democracy and eParticipation the 'myths of e-government'.[43]

A variety of different technologies can contribute to eParticipation, including web-streaming, social media (especially Facebook and Twitter), blogs, discussion forums, decision support systems and electronic voting systems. In particular social media can be useful because of the potential for interactive, two-way communication and the very strong network effects, and its tendency to blur public and personal domains. However a 2010 survey of European eParticipation projects found that, mostly, general-purpose ICT tools were used, rather than specific eParticipation applications. The internet was the dominant medium (in particular portals, discussion forums, and newsletters), although some special consultation software was also used. The project also identified a number of success factors for eParticipation projects, including strong government support (including a commitment to act on input received); a user-friendly interface; the use of different channels of communication (offline as well as online); appropriate security and privacy provisions (ranging from anonymous responses to fully identified participants); and a political issue that can be addressed in a way understandable by non-experts.

Certainly problems remain in terms of involving EU citizens in eParticipation. The digital divide (in terms of income, digital skills or place of domicile) means that some citizens have a limited ability to participate while others (e.g. young 'digital natives') may feel much more at ease. Not wishing to identify oneself online may inhibit some citizens from participating freely and openly.[44] In addition, only 35% of government websites inform citizens about their ability to participate in policy-making.[45] Governments may have a public service culture that discourages innovation by punishing mistakes more than rewarding innovations, and they have to accept the cost of monitoring and replying to social networks or the overhead of technical setup for one-off interventions such as public meetings. While social networks would seem to be an ideal medium for encouraging transparency, increased engagement and citizen empowerment, an EP STOA study concluded that such expectations are likely to be misleading and the effects are mostly over-estimated.[46] Finally, at least for discussions of policy at European level, managing a discussion in a multilingual community can be a challenge. In part because of these problems, there is as yet no strong consensus that eParticipation is really effective in reinforcing democratic participation. Nevertheless, eParticipation is seen as an area for both further research and experimentation.

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[43] See for example, The Fifth Estate / W. Dutton in Nixon, Kouttakou, Rawal, op. cit, p. 10; The myths of e-government: looking beyond the assumptions of a new and better government / V. Bekkers, V. Homburg, The information society v. 23, 2007, p. 373.

[44] Towards e-ECI's European participation by online Pan-European mobilization / S. Carrara, Perspectives on European politics and society v. 13, no. 3, p. 252-369.

[45] Future-proofing eGovernment for a Digital Single Market: final insight report / D. Tinholt et al., European Commission, 2015, p. 12.

[46] Potential and impacts of cloud computing services and social network websites / Science and Technology Options Assessment, European Parliament, 2014, p. 105.

6.4. Public sector information and open data

Open data are data that are freely distributed to everyone in a convenient and modifiable form under terms that allow for their use, reuse and redistribution. Open government data are a particularly important resource for two reasons: first, the very large quantity of data of information that governments hold and that can be mined and analysed to provide insights and support decision-making; and second, the fact that their collection has been paid for with public funds. Making government data 'open' is considered by many to provide greater returns on public investment, help policy-makers address complex problems, improve public policies and the efficiency of public services, create economic growth and wealth through new downstream applications, and involve citizens in policy development and service delivery while increasing transparency and democratic control. For example, the high-level conference on eGovernment held under the Lithuanian presidency in 2013 stated that 'open data is an untapped resources with a huge potential for building stronger, more interconnected societies which satisfy the needs of citizens better and allow innovation and prosperity to flourish'.[47]

Yet as some European researchers have pointed out, there has been little systematic research into the costs and benefits of open data.[48] Much of the focus of current discussions is on the supply side (getting governments to publish data), rather than how or for what purpose the data can be used, and there has been little consideration of barriers such as changing government culture, filtering data to eliminate sensitive or personal data, the complexity of using large quantities of data, lack of information on data quality or significance, or the absence of standard formats and metadata. Simply publishing open data will not necessarily result in a more open, transparent government. The most commonly mentioned problems related to open government data include data not being easily or freely available, insufficient description of data or lack of metadata, insufficient knowledge about the data, their provenance or how to use them; the effort needed to correctly link data; and different policies, definitions and terminology.[49] Though open data proponents argue that costs savings can result through improved services developed by citizens, businesses and civil society, the need for improving the quality of government information, changing government culture and responding to questions related to data interpretation and re-use may also create additional costs.

6.5. New technologies

ICTs change rapidly, and governments must keep up to date with those changes. Increasingly citizens and businesses are using **mobile technology** such as smartphones and tablets to interact with digital government. For example, in 2013, more than 300 000 French citizens used smartphones to make tax payments via a mobile app.[50] While offering new opportunities to look at how technology can offer functionality such as location-related

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47 The Presidency report on High level eGovernment conference and exhibition on 14-15 November 2013, Vilnus / Lithuanian Presidency, 2013.

48 Benefits, adoption barriers and myths of open data and open government / M. Janssen, Y. Charalabidis, A. Zuiderwijk, Information systems management v. 29, no. 4, 2012, p. 258-268.

49 Socio-technical impediments of Open Data / A. Zuiderwijk et al. Electronic journal of e-Government v. 10, no. 2, 2012, p; 156-172.

50 Impôt sur le revenu: dernier délai ce lundi pour payer le troisième tiers / BFM Business, 2014.

services, mobile computing will require new and on-going investments to exploit mobile applications and to ensure that services are being delivered in an effective manner for all types of devices. Currently only 1 in 4 public service websites in European countries is mobile-friendly.[51]

Another technology with potentially huge impact on eGovernment is **cloud computing**. Cloud computing is a model for using configurable pools of computer resources (such as networks, servers, storage and applications) that are accessible through the internet. Cloud computing can be used in different configurations (e.g. private, public or hybrid clouds) and in different ways (e.g. with the capability delivered to the customer at the level of infrastructure, platform or software). Cloud computing offers the prospect of reducing the cost of ICTs for public authorities through economies of scale (estimates range widely, from 10-30% according to some sources to as much as 25-50% according to others[52]), while at the same time supporting rapid deployment of new and innovative public services. In 2011, Digital Europe, representing the digital technology industry in Europe, recommended that cloud computing should be a crucial element of the eGovernment Action Plan. The organisation also recommended that Member States' experiences with cloud computing be shared through a portal, and that public sector cloud computing should be given prominence for funding from the Connecting Europe Facility.[53]

While the potential is great, there are many issues that confront public authorities wishing to use cloud computing. The EP's STOA Unit has highlighted in particular the need to guarantee security, protect privacy and ensure interoperability between systems in different Member States. (The importance of security was very publicly highlighted by news reports in August 2014 that private photos of celebrities stored in the cloud were stolen and published on various Internet sites, although in this particular case it has been suggested that access was gained through user names, passwords and security questions rather than hacking a specific technology.[54]) Other issues include specifying legal and procurement terms, mandating technical standards (e.g. to facilitate shifting services from one cloud provider to another) and establishing trust in government services delivered through the cloud. To address some of these issues, the first work programme for the Horizon 2020 research programme includes an activity aimed at boosting public sector productivity and innovation through the use of cloud computing (ICT8 – 2015). This activity will define common terms of reference for public procurement of cloud computing services, and will organise joint procurement for public administrations. Increasingly as businesses move their applications to the cloud, governments will follow, but there are a number of challenges to resolve.

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51 Future-proofing eGovernment for a Digital Single Market: final insight report / D. Tinholt et al., European Commission, 2015, p. 8.

52 The lower figures come from Potential and impacts of cloud computing services and social network websites / T. Leimbach et al., Scientific and Technical Options Assessment, European Parliament, 2014, p. 4; the higher estimate is reported in Building a long-term strategy for growth through innovation [meeting proceedings] / Brookings Institution, 2011.

53 Cloud computing: DigitalEurope's perspective / DigitalEurope, 2011.

54 Update: what Jennifer Lawrence can teach you about cloud security / S. Gallagher, ars technica, 1 September 2014.

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Governments implement eGovernment and digital government policies with the aim of introducing efficiencies, reducing administrative burdens on citizens and businesses, stimulating economic growth and fostering public participation in democratic public life. The European Union facilitates cross-border services for mobile citizens and businesses that offer services across the single market and encourages the exchange of best practices between national, regional and local authorities in Member States.

While Europe has made progress over the past 15 years, this has not been enough to meet its own targets for the uptake of digital government services. Much remains to be done, including building up security and trust, promoting interoperability for cross-border services, encouraging citizens to engage with governments through digital channels, exploiting open data, and ensuring the effective use of technologies such as cloud computing.

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