The Scope of e-Government in the European Union and Potential Applications to the Water Framework Directive

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Avrupa Birliği'nde e-Devletin Kapsamı ve Su Çerçeve Yönergesi İçin Potansiyel Uygulamalar

Abstract

Governments are trying new systems to engage citizens and improve their trust. Electronic government (e-government) can reform public administrations by changing their organization, enhancing citizen services and information accessibility and reducing costs. The European Union because of its large population and cultural and linguistic diversity has recognized e-government utility with the eEurope 2005 Action Plan. The Internal Market Information is an e-government example. A sector of the European Union that could benefit from e-government is the environment (e.g. water resources). Applications to the Water Framework Directive are described that could help Member States meet the deadlines of the Directive.

Keywords	:	e-Government, European Union, Internal Market Information, INSPIRE Directive, Water Resources, Water Framework Directive.
JEL Classification Codes	:	Q25, Q58.

Özet

Çeşitli ülkelerde, hükümetler vatandaşın katılımı ve güveninin geliştirilmesi için yeni sistemler denemektedir. e-Devlet, kamunun kurumsal yapısını değiştirerek, vatandaşa yönelik hizmetleri ve bilgiye erişimi geliştirerek, maliyetleri azaltarak kamu yönetimlerini yeniden düzenleyebilir. Avrupa Birliği, büyük nüfusu, kültür ve dil çeşitliliği nedeniyle e-devlet kullanımını eAvrupa 2005 Eylem Planı ile kabul etmiştir. İç Piyasa Bilgisi bir e-devlet örneğidir. Avrupa Birliği'nin e-devletten yararlanabileceği bir alan da, çevre (örneğin su kaynakları) konusundadır. Açıklanan Su Çerçeve Yönergesi Uygulamaları ile Üye Ülkeler, Yönerge'nin öngördüğü sürede hazırlıklarını tamamlayabilir.

Anahtar Sözcükler	:	e-Devlet, Avrupa Birliği, İç Piyasa Bilgisi, INSPIRE Yönergesi, Su Kaynakları, Su Çerçeve Yönergesi.

1. Introduction

Governments in the twenty-first century are very interest in improving citizens' trust in governments (Torres et al., 2006). Citizens are feeling that the distance between government and citizens has grown (Noordhoek and Saner, 2004). Citizens are also feeling dissatisfied or disengaged by the public services because of their poor quality and as a result are failing to provide the appropriate help and support (Oakley, 2004). This has led governments to search and try to implement new systems of governance that will engage citizens in order to change their negative attitude and improve their trust in governments.

Countries are adopting the electronic government system, or e-government, to help improve public services, democratic processes and strengthen the support to public policies (Nogueras-Iso et al., 2004). e-Government is defined by the Division for Public Economics and Public Administration of the United Nations (2002) as "*utilizing the Internet and the World Wide Web for delivering government information and services to citizens*" while the European Union defines it as "*the use of Information and Communication Technologies in public administrations combined with organizational change and new skills in order to improve public services and democratic processes and strengthen support to public policies*" (I-WATS, 2003).

The large volumes of information that governments produce make it a necessity to find ways to have this information easily and readily available to its citizens. This will increase the transparency of government activities. An efficient and effective way to accomplish this is through the web or other electronic means. This also has the potential of altering the traditional relationship between government and citizens and creating a new virtual government and citizen interface (Torres et al., 2006). Using information and communication technology in public administrations will change the organization and structure of governments and will enhance the convenience and accessibility of government services and information to citizens. The idea behind the utilization of e-government is to improve the customer-to-government interactions by building services around citizens' choices, enhancing social inclusion of citizens, increasing convenience and accessibility of government services and overall providing better information distribution and availability (Craglia and Masser, 2003).

Specifically, e-governments will be able to offer online public services, 24 hours a day, seven days a week and year around, to its citizens in an easy to use manner form anywhere the customer chooses (Wimmer, 2002). This allows citizens to seek the information they need at their own convenience and not just when government offices are open (West, 2004). Citizens will have greater flexibility and this will also provide significant time-saving (Torres et al, 2006). This new government system completely

changes how citizen can receive government services compared to the established systems that are more bureaucratic.

Overall, the major benefits of e-government are a more efficient, timely, cost-effective government with increased government openness, transparency, accountability, effectiveness, coherence and greater public access to information and mechanisms for citizen consultation and participation (Carter and Belanger, 2005; Evans and Yen, 2005; Torres et al., 2006). Many strongly believe that e-government could revolutionize and reform the public sector, particularly the relationship between citizens and the government, in ways similarly to the changes brought by e-commerce and e-business (Metaxiotis and Psarras, 2004).

2. European Union and e-Government

e-Government could play an essential role and be a useful tool for the European Union. The European Union comprises of 27 different countries with a little more than 500 million people that speak 23 different official languages. Its large population, ethnic cultural and linguistic diversity leads to substantial challenges that consume significant time of political energy within the European Union. In addition, the European Union is active in many different policy areas that range from human rights to transport and trade.

The European Union has recognized the utility and applicability of e-government by making it a priority with the eEurope 2005 Action Plan. Through this Action Plan the Member States have a binding agreement to reach set targets for the delivery of public services on e-government and increased access to public sector information to all its citizens. The European Union hopes this will help modernize and reorganize public administrations with the development of an e-government for the entire European Union and the Member States (Centero et al., 2005; Nogueras-Iso et al., 2004). To speed up the innovative developments in this field, the European Commission has provided substantial funding (Wimmer, 2002).

The Digital Agenda for Europe[1] sets e-government within a comprehensive set of measures aimed at exploiting the benefits of information and communication technologies across Europe. At a time of highly constrained public resources, information and communication technologies can help the public sector develop innovative ways of delivering its services to citizens while enhancing efficiencies and driving down costs.

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[1]   COM (2010) 245.

The availability of innovative technologies such as social networks has increased the expectations of citizens in terms of responsiveness when accessing all kinds of services online. However, cross-border e-government services are few and, even where e-government services are offered, the majority of European Union citizens are reluctant to use them.[2] There is clearly a need to move towards a more open model of design, production and delivery of online services, taking advantage of the possibility offered by collaborations among citizens, entrepreneurs and civil society. The combination of new technologies, open specifications, innovative architectures and the availability of public sector information can deliver greater value to citizens with fewer resources and less cost.

The Commission is therefore proposing a second e-government Action Plan which aims to realise the ambitious vision contained in the Declaration made at the Fifth Ministerial e-government Conference the Malmö Declaration.[3] This was also supported by the industry[4] and by a citizens' panel.[5] According to this ambitious vision, by 2015 European public administrations will be "*recognised for being open, flexible and collaborative in their relations with citizens and businesses. They use e-government to increase their efficiency and effectiveness and to constantly improve public services in a way that caters for user's different needs and maximises public value, thus supporting the transition of Europe to a leading knowledge-based economy.*"

Given the central role of national governments in the implementation of this action plan the European Commission's main responsibility is to improve the conditions for the development of cross-border e-government services provided to citizens and businesses regardless of their country of origin (Pomportsis, 2006). This includes establishing pre-conditions, such as interoperability, e-signatures and e-identification. These services strengthen the internal market and complement European Union legislative acts and their effectiveness[6] in a number of domains where information and

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[2] *Europe's Digital Competitiveness Report 2010, p. 88, <http://intra.infso.cec.eu.int/C4/docs/main%20page/european_competitiveness_report_2010.pdf>, 12.01.2011.*

[3] *<http://www.egov2009.se/wp-content/uploads/Ministerial-Declaration-on-e-Government.pdf>, 21.01.2011. This action is defined in the Digital Agenda for Europe, and built on the previous bi-annual Ministerial meetings of Brussels in 2001, Como in 2003, Manchester in 2005 and Lisbon in 2007. See <http://ec.europa.eu/information_society/activities/egovernment/library/index_en.htm>, 11.01.2011. This also included the commitment on the part of candidate and EFTA countries.*

[4] *Declaration by "DigitalEurope", <http://ec.europa.eu/information_society/activities/egovernment/events/past/malmo_2009/press/industry_declaration_on_egov_18.11.09.pdf.pdf>, 13.01.2011.*

[5] *Open declaration on public services 2.0, <http://eups20.wordpress.com/the-open-declaration>, 10.02.2011.*

[6] *Such EU legislative acts include: the Services Directive (2006/123/EC), the eSignatures Directive (1999/93/EC), the Procurement Directives (2004/17/EC and 2004/18/EC), the Data Protection Directive (95/46/EC), the Directive on the re-use of public sector information (2003/98/EC), the Infrastructure for*

communication technologies can improve delivery of services; such as in procurement, justice, health, environment, mobility and social security, and support the implementation of citizens' initiatives[7] with information and communication technologies tools (Bekkers and Homburg, 2005). The Commission's aim is to lead by example.

The public sector holds a gold mine of information.[8] Much of the data that public authorities gather are not used or serve only a limited purpose (Igglesakis, 2008). The release of non personal public data (geographical, demographic, statistical, environmental data etc.) in particular when provided in a readily and easily readable format allows citizens, and businesses to find new ways to use it and to create new innovative products and services.

Transparency in government decision making and in its use of personal data help build trust with citizens and improve the accountability of policy makers. Although many Member States have set transparency goals, no common European objectives exist yet.

Member States are committed to developing and promoting more useful and better ways, by relying on information and communication technologies solutions, for businesses and citizens to participate in public policy consultations, debates and policy-making processes. New tools for governance and policy modelling (currently being developed under the seventh European Union Framework Programme for research), technological development and demonstration activities,[9] will support governments in delivering smarter, targeted and adaptive policies, whilst better understanding of cost-effectiveness and impacts.

Businesses should be able to sell and provide services and products all across the European Union, through the easy electronic public procurement and the effective implementation of Services offering single points of contact to businesses for their interactions with the government. Two major initiatives have been set up in both areas over the last two years:

Spatial Information in the European Community (INSPIRE Directive 2007/2/EC), the public access to environmental information Directive (2003/4/EC).

[7] *Art. 11 of the Treaty on European Union and Art. 24 of the Treaty on the Functioning of the European Union.*

[8] *The Commission and MS have acknowledged this value for many years and have adopted the Directive on the re-use of public sector information (the PSI Directive).*

[9] *Seventh EU Framework Programme for research, technological development and demonstration activities <http://ec.europa.eu/informhttp://ec.europa.eu/information_society/activities/egovernment/research/fp7/index _en.htmation_society/policy/psi/index_en.htm>, 13.01.2011.*

- SPOCS "Simple Procedures Online for Cross-border Services"[10] aims at removing the administrative barriers that European business face when wanting to offer their services abroad, by supporting the implementation of next generation points of single contact and the associated e-procedures.

- PEPPOL "Pan-European Public e-Procurement On-Line"[11] aims to pilot an European Union wide interoperable public e-procurement solution allowing entrepreneurs to perform the full public procurement cycle online, from ordering to invoicing and accessing catalogues. This will reduce the administrative burden; increase transparency and potentially large cost savings are also expected gains from such implementations.

Based on the results of the above initiatives, the envisaged actions should be: a cross-border and interoperable e-procurement infrastructure based on the results of the PEPPOL large scale pilot; and the development of a 'second generation' of points of single contact along with an extension of the Services Directive to other areas of business. This would mean that by 2015 businesses in Europe will be able to sell goods and provide services to public administrations in other countries just as easily as they currently do to those in their home country. Expanding a business into other countries and registering can be done remotely (i.e. without leaving the office).

e-Government serves as an instrument of change to improve organisational processes in administrations and limiting cost. For example, the cost of invoicing can be decreased in electronic public procurement processes, while increasing effectiveness, for example through faster processing. Civil servants will benefit from enhancing their e-skills and from learning from experiences in other parts of Europe on ways to improve organisational processes. The ePractice.eu portal will play a pivotal role in this sector.

The envisaged actions should help Member States eliminating unnecessary administrative burdens.[12] This can be achieved, e.g. through smart use by public authorities of citizens' available information and by applying the principle of 'once-only' registration of data whereby the information needed from citizens is only collected once, on condition that data and privacy protection requirements are met.

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[10] *SPOCS (Simple Procedures Online for Cross-border Services), <http://www.eu-spocs.eu>, 22.01.2011.*

[11] *PEPPOL (Pan-European Public Procurement Online), <http://www.peppol.eu>, 12.01.2011.*

[12] *COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS The European eGovernment Action Plan 2011-2015 Harnessing ICT to promote smart, sustainable & innovative Government SEC(2010) 1539 final, Brussels, 15.12.2010, COM(2010) 743 final.*

A number of technical and legal pre-conditions need to be put in place to enable the implementation of the actions that will enhance e-government services in Europe. These include the promotion of interoperability across borders, which would allow - among others - sharing of information, deployments of one-stop-shop approaches, Europe wide use of (national) electronic identity solutions and payment schemes. Interoperability is supported through open specifications and the development of key enablers such as electronic identity management and stimulation of innovation in e-government.

For many online services it is essential to identify and authenticate the person or legal entity to whom/which a service will be delivered. Electronic identification (e-identification) technologies and authentication services are essential for the security of electronic transactions (in both the public and private sectors). Today the most common way to authenticate is by means of passwords, but more secure solutions protecting privacy are increasingly needed. Europe needs better administrative cooperation to develop and deploy cross-border public online services, including practical e-identification and e-authentication solutions. Initiatives have already been started such as the STORK Large Scale Pilot which aims to establish a European e-identification Interoperability Platform that will allow citizens to access e-government services inside and outside their home country by using their national e-identification.

The envisaged actions will contribute to build a Pan-European framework for mutually recognised e-identification,[13] allowing citizens and businesses to identify themselves electronically throughout Europe. The approach should build on the results of the above initiatives, in particular STORK, relying on authenticated identities, compliant with data and privacy protection provisions. This work will complement and take into account the existing European Action Plan for e-signatures and e-identification[14] and the revision of the e-signature Directive planned in 2011.

3. Internal Market Information

European citizens and businesses benefit every day from the opportunities offered by the Single Market. To ensure that the market functions smoothly, Member State administrations need to work closely together by providing mutual assistance and exchanging information. The benefits of the single market will not materialise unless European Union law is correctly applied and the rights it creates are upheld. Administrative cooperation between Member States is essential to create a truly borderless Single Market.

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[13] This action is defined in the Digital Agenda for Europe.
[14] COM (2008) 798.

In this frame the Commission[15] announced its ambition to achieve a 'face-to-face' electronic network for European administrations by setting out a strategy for extending the Internal Market Information system. Developing Internal Market Information is one of the keys to promoting better governance of the Single Market since it facilitates efficient and day-to-day cross-border cooperation between national public authorities at all levels of government.

It is evident that administrative cooperation could only work if supported by a modern, multilingual information system.[16] The European Commission, in partnership with Member States, developed the Internal Market Information system to support administrations in fulfilling their mutual assistance obligations.

Internal Market Information is a secure, reusable, multilingual, online electronic application developed by the Commission in partnership with the Member States. It allows national, regional and local authorities throughout the 30 European Economic Area Member States to communicate quickly and easily with their counterparts across borders. This system helps its users to (i) find the right authority to contact in another country, (ii) communicate with them using pre-translated sets of standard questions and answers and (iii) follow the progress of the information request through a tracking mechanism. Internal Market Information is designed as a flexible system that can easily be customised to support different areas of Single Market legislation which contain administrative cooperation provisions. The whole idea behind Internal Market Information is to replace the very high number of bilateral relationships linking European Union Member States with a single interface, the Internal Market Information network.[17]

One of the key advantages of this system is to successfully overcome the main obstacles to cooperation, such as uncertainty about whom to contact, language barriers,

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[15] *Commission Communication – Towards a Single Market Act for a highly competitive social market economy – 50 proposals for improving our work, business and exchanges with one another. COM (2010) 608, 27.10.2010.*

[16] *At the Internal Market Advisory Committee (IMAC) meeting of Member States Director-Generals on 18 November 2003, the following operational conclusion was adopted: 'The Chairman noted that it was agreed that there was a need to develop an information system to improve the exchange and management of internal market information, given that such a system is required to support the enhanced cooperation that will be necessary in an enlarged Single Market.'*

[17] *COMMISSION STAFF WORKING PAPER Background information related to the strategy for expanding and developing the Internal Market Information System ('IMI'). Accompanying document to the Communication on better governance of the Single Market through eater administrative cooperation: A strategy for expanding and developing the Internal Market Information System ('IMI' Text with EEA relevance (COM(2011) 75 final) SEC(2011) 206 final Brussels, 21.2.2011.*

different administrative and working cultures and a lack of established procedures for cooperation.

The result must be the cross-border administrative cooperation in the internal market in a decisive manner. In particular, this potential lies in the possibility to (1) add new policy areas, (2) develop new functions and (3) use existing informations for new purposes. In this way, Member States will have a flexible instrument at the service of administrative cooperation, contributing to the improved governance of the Internal Market, in particular legislative areas, where no information system exists to support administrative cooperation in the internal market.

All that communication system about information's transfer must offer an online environment whose security and data protection safeguards, including purpose limitation and access controls, have proven reliable in practice. Valuable practical experience has also been gathered in organising the roll-out of modules to the end user, including organisational set-up, registration etc.

A final and important advantage of a ready-made system of e-government is that it provides the possibility to test the operational feasibility of a proposed solution without needing to invest time and resources in a prototype which may later be discarded. Even in areas where stakeholders agree on the need for an Information Technology tool, the threshold for launching a 'proof of concept' pilot is relatively low. A pilot could be set up without Information Technology development costs, reusing existing functionality within the system.

For administrative cooperation to work smoothly, it is necessary to tackle, at an early stage in the legislative process, the practical implications for national, regional and local authorities in implementing new legislation. Requirements for administrative cooperation should be sufficiently clear and operational and the need for an Information Technology tool to support the process should be analysed.

Security is a major aspect of the design, maintenance and daily operation of the e-government system as it stores and processes personal data and other data that is not intended to be publicly available. A comprehensive security plan drawn up in accordance with European and international security standards, defines the security requirements for the system and how they should be met.

4. e-Government and the Environment; Emphasis on Water

While the numbers of e-government services that are offered to citizens and companies in the European Union have increased substantially in the last decade, the e-

government services related to the environment are among the least developed (Latre et al., 2010). The "environment" is one of the major policy areas of the European Union (Koutoupa-Regakou, 2008) that was recognized initially with the 1993 Maastrich Treaty. In this policy area the European Union wants to protect, preserve and improve the world around us. To accomplish this goal the European Union has many different initiatives and pieces of legislation relevant to the environment (Latre et al., 2010). These initiatives and legislations address a wide range of issues from how to deal with climate change, improve biodiversity conservation and preservation, reduce health problems from pollution and use its natural resources in a more responsible and environmentally friendly way. A key factor for their success is the need and focus for environmental data. Protecting the environment is a priority of the European Union but it must be done in a manner that sustains and promotes the economic growth of the region through innovation and enterprise.

Water is one of the most valuable environmental resources that should be considered as an irreplaceable inheritance and be protected and managed not just for this generation but also for future generations. Still, water also has many commercial values. In the European Union, water resources have remained the same or one could say have become less (because of pollution). At the same time the demand for "good" quality water in larger quantities for its many diverse uses has increased adding more pressure to this limited resource. This is leading to water scarcity problems throughout the European Union. However, different initiatives and solutions should be applied for the variety of needs and conditions existing in the European Union in order to be effective and efficient. To deal with all these water issues, the European Parliament and the European Union Council enacted a directive, "the Water Framework Directive" in 2000, for the protection of the inland surface, coastal and ground waters, which is considered by many to be the most important environmental piece of legislation in Europe and worldwide (Vogt, 2002).

This directive institutionalizes the river basin as the basis for water resource management. The fulfillment of its ultimate objective of a ''good'' overall quality of all waters might be questionable, but this directive has change the planning processes and requires the generation of new information in order to ensure no further deterioration of water resources. Basins do not follow national boundaries, so consequently the Water Framework Directive will affect not only the national water policies of the Member States but also candidate European Union Member States and even non-Member States, especially when dealing with transboundary basins. Transboundary river basin management issues (Uitto and Duda, 2002) have caused controversy among countries (Haddadin, 2002) as well as successful cooperation (Sadoff and Grey, 2002). The European continent has the most transboundary river basins of all continents (Mylopoulos and Kolokytha, 2008).

5. The Water Framework Directive

The main objective of the Water Framework Directive is to achieve an accurate and effective management of all water bodies in the European Union and it is expected that the water bodies will reach a "good" status by 2015. In other words the purpose of this Directive is to establish a framework that will provide provisions that will enable the European Union to have a sufficient supply of "good" quality of surface water and groundwater as needed for sustainable, balanced and equitable water use. The European Union directive 2000/60 (European Union Parliament, 2000) in general:

- Protects all waters (inland surface, coastal and ground waters).

- Develops a management plan at the basin scale that recognizes that the water bodies do not stop at national borders.

- Connects the protection of biodiversity with integrated water management.

- Demands transboundary cooperation among Member States and promotes cooperation among non-Member State countries.

- Ensures active participation of all organizations including non-government and local communities in the activities of the development of a water management plan.

- Decreases and controls water pollution from all sources (agriculture, industrial, municipal etc) through the definition of emission limits values and environmental quality standards.

- Demands policy on water-pricing.

- Ensures the protection and improvement of the quality of the environment, based on preventive actions taken at the sources, to avoid environmental damage, and by polluters being accountable and paying for their actions.

- By 2009 all the Member States should have prepared a complete management plan for all their basins. Each plan should include a number of "basic" measures in addition to any "supplementary" measures that may be implemented. Currently, most Member States have not completed this management plan.

- The management of transboundary basins shall be based on international agreements, such as the United Nations Convention on the protection and use of transboundary water courses and international lakes. This is known as the Helsinki Rules that were established during the Helsinki Convention (Council Decision 95/308/EC, 24th of July 1995).

-   Obligations of monitoring and assessment of data in a systematic and comparable base for the entire community.

The Directive has also defined a specific timetable for the implementation of the requirements. In addition, an evaluation system has been developed that ranks the performance of Member State countries in the fulfillment of their obligations and harmonization of their national legislation with the directive. The Water Framework Directive is one of the most ambitious environmental legislation of the European Union that will require the Member States to change their entire national water policies to meet the goals it has set (Liefferink et al., 2011). The lack of fulfilling most of the objectives and goals up till now indicates that other tools (e.g. e-government) should be utilized to enhance its effectiveness.

6. Applications of the e-Government to the Water Framework Directive

Surface and ground water are public in most European Union Member States. When these resources are intended to be used for private purposes a governmental authorization is required. As a result citizens, companies and other organizations have to make an application in order to obtain the authorization, by providing certain information to the appropriate administration that needs to evaluate it and based on their evaluation they approve or reject the authorization (Latre et al., 2010). e-Government could speed up this process since citizens, companies or other organizations could apply any time they would like instead of being constrained by when the appropriate government office is open.

The Water Framework Directive stated that all decisions on policy and measures dealing with water resources need to be (i) based on the best available scientific and economic information, (ii) taken using an unbiased, independent and logical methodology but also (iii) taking into account all stakeholders concerns, both quantifiable and non-quantifiable, in a transparent manner (Bruen, 2007). This means that active participation of all organizations including non-government and local communities is a priority in the development of policy and measures. This leads to substantial planning and legal challenges that will include consultation, negotiation, compromise and refinement of the policy and measures based on stakeholders input. For example in 2015, the Water Framework Directive requires every country to introduce measures to improve and sustainably maintain "good" water quality status. By this year, in addition to the scientific and economic justification of all proposed measures and policies, these also need to be acceptable by all stakeholders.

The consultation and active involvement of the general public, stakeholders and other authorities in the management of river basins can be best achieved and allowed by

supplying these groups the appropriate information in a timely manner. In addition the Guidance on Public Participation in Relation to the Water Framework Directive (European Commission, 2002 and 2009) but also the Water Framework Directive itself in the 14th article (European Union Parliament, 2000) imposes to the water authorities' public participation.

The Water Framework Directive also requires water management plans based on the natural river basin districts instead of administrative and political regions. This will require a number of different regional and/or national agencies even from different countries to coordinate their work and data (Uslander, 2005). This will lead to the exchange of a large amount of data among the agencies in the river basin that also needs to be supplied to the stakeholders and the general public. The large scale of the river basins will involve a wide range of objectives, problems, benefits and impacts (Bruen, 2007). These basins also typically have a large number of stakeholders that also see the value and importance of water differently that could lead to conflicting and contrasting opinions on what the management plans should be.

The fact that the level of management will be the basin could lead to the issue of centricity (Marche and McNiven, 2003). When dealing with citizen transactions centricity could lead to the exact opposite of what is wanted by the Directive (involvement of all stakeholders). This is something that should be carefully considered in order to be avoided. In addition, because of the international, interdisciplinary, and interactive nature of the transboundary basins its stakeholders' communities are going to communicate primarily virtually. This virtual communication can lead to an "uncontrolled environment." Not all stakeholders have the same accessibility to internet and consequently to e-government (de Moor and Weigand, 2006). Significant differences in the use of internet have been found among people of different ages, educational background, income and nationality. These two issues (centricity and uncontrolled environment) could lead to "ignoring" some of the critical sites or issues during the environmental impact assessment of the transboundary basin. By ignoring these critical sites and issues the whole idea of transparency and increased stakeholders participation is negated. This could consequently lead to controversial and/or non-sustainable transboundary basin management plans. This is a delicate issue that needs to carefully be taken in consideration and thought through in advance.

A large amount of data at the transboundary basin level needs to be diffused among a large number of agencies, organizations and stakeholders that are involved and/or have an interested in the river basin. e-Government with the appropriate use of technology can provide the platform and supply this information for decision making in a timely manner and cost-efficiently way to all the interested parties.

An e-government model that could be used as a prototype for the Water Framework Directive, particularly for transboundary basins, is the Internal Market Information. This electronic application developed for the economic sector by the Commission in partnership with the Member States could allow national, regional and local authorities to communicate quickly and easily with their counterparts across borders. This will be essential for the development and adoption of effective management plans for transboundary basins. The adoption of a similar application could provide citizens, companies or other organizations the information on the right authority to contact in other countries, pre-translated sets of standard questions and answers and follow the progress of the information requested through a tracking mechanism. In other words it can help overcome the uncertainty about whom to contact, language barriers, different administrative and working cultures and a lack of established procedures for cooperation when trying to develop management plans for transboundary basins.

The concept of managing water resources at the transboundary level is a key for the developing the most sustainable management plans. Even though the Water Framework Directive has established the ground rules still it is important to understand and evaluate the potential drivers or obstacles on intergovernmental collaborations (Norman and Bakker, 2005).

A driver that would promote intergovernmental collaborations is when there are specific issues/problems that exist in the basin. For example such issues are disaster mitigation (e.g. floods), protection of endangered species or water scarcity. Another key driver is the leadership. If there is strong leadership nationally, regionally and locally this could help in the easier establishment of these collaborations. If successful collaborations pre-exist this would make the transitions and acceptance of the transboundary management plans also more easily. Finally with the use e-government, transparency would substantially increase while once the stakeholders are familiarized with the system it would increase practicality and easiness of use. Increased transparency and practicality would increase the feeling of respect, fairness and trust among the collaborating nations. In addition, these feelings are easier to establish when there is a history of favourable and successful past interactions among the stakeholders because the stakeholders expect positive future interactions (Preece, 2002). Trust is an essential social capital when trying to build a community (especially when virtual) among the stakeholders of the basin.

Still many negative issues could arise during intergovernmental collaborations at the transboundary basin level. This could be first of all because of the differences at the government level. Governance structures could be mismatched; cultures and mandates could differ substantially while there could also be a lack of institutional capacity from some of the countries. Of course another major obstacle would be the lack of financial resources even from one of the participating countries. Similarly the lack of data and gaps

in knowledge of the 'other' country would be restricting. An asymmetrical level of participation in cross-border management (significantly more or less participation of stakeholders of one country) could also cause serious problems to these international cooperation's. Finally the feeling of mistrust or inequality among the participating countries can be detrimental in any management plan.

When dealing with environmental issues such as water resources a large amount of the data and information involved is geographic compared to other sectors. This is why management plans for water resources are optimized with the use of geographic information and spatial data infrastructures. In some countries and institutions they are becoming a legal obligation for environmental management plans (Latre et al., 2010). This is recognized in the Water Framework Directive that has a Guidance Document on Implementing the GIS Elements of the Water Framework Directive. This guidance document recommends the use of spatial data infrastructures mechanisms in order to communicate data among the Member States and the European Commission and to disseminate this information to the public (Vogt, 2002).

The European Commission enacted the legislative directive INSPIRE (INfrastructure for SPatial InfoRmation in Europe).[18] The Directive's goals are to create a European spatial information infrastructure. Through this infrastructure integrated spatial information services will be delivered, based on a hierarchy of national, regional and local spatial data infrastructures. The first area INSPIRE will be implemented in, is the environment.

Spatial data infrastructures can be considered a basic level of e-government services (Nogueras-Iso, 2004). They provide standardized, organized core services at the public administration level such as web presence (Siau and Long, 2005) or information dissemination (Moon, 2002). Of course e-government has the potential to provide services of a much higher level of sophistication, as have previously been described. These include increased user-administration interactions (Siau and Long, 2005) where governments provide assistance to citizens (e-mail, official downloadable fill-in forms downloads and help guides), although paperwork is needed to finalize any application; or user-administration transactions (Siau and Long, 2005; Moon, 2002) where users can perform complete, legally valid, online transactions.

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[18] *Directive 2007/2/EC of the European Parliament and of the Council of 14 March 2007 establishing an Infrastructure for Spatial Information in the European Community (INSPIRE). Official Journal of the European Union (Mar 2007), <http://eur-lex.europa.eu/JOHtml.do?uri=OJ:L:2007:108:SOM:EN:HTML>, 17.01.2011.*

Despite the many potential benefits of e-government there is a lot of scepticism on e-government because much of the work that has been presented is theoretical (Heeks and Bailur, 2007). There are certain issues that should be considered when applying the e-government model to the Water Framework Directive because these could reduce the effectiveness of the e-government. These include initial citizen resistance because of social and/or cultural adaptation issues, additional development expenses and implementation issues (Evans and Yen, 2005).

Still with most Member States lagging to meet the Water Framework Directive deadlines of the designated timetable some new approaches are required. In addition, most Member States are notoriously individualistic with few coordinated projects with other Member States (Strejcek and Theilb, 2003). The application of e-government to the Water Framework Directive might provide the tool that will increase the number of projects developed among Member States and help meet the Directive's deadlines.

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