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Assessment of the integration of geographic information in e-government policy in Europe

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Abstract

The integration of geographic information and services in a broader e-government context can be considered as a necessary condition for realising the full potential of Spatial Data Infrastructures (SDIs). In recent years, many European countries have started taking actions and initiatives to integrate geographic information in e-government policy. This paper provides an analysis of these actions and initiatives, focusing on the non-technological aspects, such as the development of strategies, the establishment of coordination structures and the implementation of data policies. The analysis shows that several European countries are aware of the need to integrate geographic information in e-government and are taking different types of actions towards a coordinated and integrated 'information' policy. However, in none of the European countries that were examined is geographic information fully integrated in e-government policy, and in some countries the integration of location information in e-government is even not considered as a priority.
Keywords: e-government, integration, strategies, coordination, data policies

1 Introduction

Over the past ten years significant efforts have been made to improve the access and sharing of geographic information, through the development of Spatial Data Infrastructures (SDIs) at European, national, regional and local level. It is often argued that the benefits of these infrastructures will only be realized once they are in place and are actually being used. A key challenge is to integrate geographic information with other types of information in the different types of processes supporting interactions between public administrations, businesses and citizens. The integration of geographic information and services in a broader e-government context is a necessary condition for realizing the full potential of SDIs. Initiatives to facilitate and promote the use and exchange of geographic information in the public sector will only be successful if they are well connected to e-government [1]. Conversely, initiatives to promote and facilitate the use of geographic information can play an important role in e-government [5]. In that way the relationship between e-government and the use and management of geographic information can be described as symbiotic: while e-government can provide a significant boost to the use of geographic information, the use of this geographic information can be an important enabler for e-government [4].

Despite the clear linkages between geographic information and e-government and the need to integrate both, most policies and initiatives related to the exchange and use of geographic information were originally situated outside the e-government area. While in many European countries the implementation of e-government is managed and coordinated by a separate e-government ministry or agency, the implementation of a coordinated approach on geographic information is often managed by national mapping agencies or Ministries for Environment. This is due to the fact that developments in the geographic information sector were strongly driven by organizations producing data. The involvement of Ministries of Environment on the other hand, is a phenomenon of the past ten years, driven by the emerging INSPIRE initiative aiming to establish an infrastructure for spatial information in Europe [2].

The objective of this paper is to analyze how European countries are taking actions and initiatives to integrate geographic information in e-government policy. The paper focuses on non-technological aspects, such as the development of strategies, the establishment of coordination structures and the implementation of data policies.

2 Methodology

The paper seeks to address the following research question: *What actions are taken at national level in Europe to stimulate and facilitate the integration of geographic information in e-government policy?* In order to answer this question, a survey-based research design was adopted to collect information on the initiatives and actions taken at

country level to support and facilitate the integration of geographic information in e-government.

The survey was targeted at both the public authority officials responsible for e-government (e.g. e-government coordination bodies) and those responsible for geographic information (e.g. INSPIRE National Contact Points) in each EU country. The aim was to collect information on the current status of the use and integration of geographic information in e-government in each Member State from both perspectives: the perspective of the Geographic Information (GI) community and the perspective of the e-government community. This approach also examined awareness levels and involvement of both communities in the use of geographic information in e-government. 23 countries responded to the survey between September and the November 2013. In 12 countries, a representative of the GI/INSPIRE community participated in the survey, in 7 countries the answers were provided by a representative of the e-government community. In 4 countries, both communities completed the questionnaire.

The survey provided information on the actions taken at Member State level to facilitate and coordinate the integration of geographic information in e-government, including development of strategies, establishment of coordination mechanisms, and implementation of data policies.

3 Results

Countries can take actions on several fronts to facilitate the integration of geographic information in e-government. This section analyses the experiences and actions of European countries, focusing on three non-technological aspects: strategies, leadership and coordination, and data policies.

3.1 Strategies

Previous analysis by the European Commission, documented in a series of ePractice e-government factsheets, demonstrated that all European countries have a national e-Government strategy or programme [3]. The degree to which the strategies also focus on geographic information is variable. Of the 23 countries examined in the survey, 4 countries reported that their national e-government strategy does not include any reference to geographic information. In the 19 other countries, the national e-government strategies deal with geographic information in varying degrees. In many cases, the reference to geographic information is relatively limited. For instance, in several strategies attention is only paid to the establishment of the national geo-portal, as a central access point to geographic information. In others, there are only indirect references to geographic information, while none of the objectives or actions in the strategy deal explicitly with geographic information.

In some national e-government strategies a more prominent position has been given to geographic information. Examples of such strategies can be found in Germany, the Netherlands, Switzerland, Finland, Denmark and Sweden. The national e-government strategy of Germany states that available, up-to-date and area-wide reference data are essential for location-based e-government and therefore, spatial data services need to be integrated into e-government applications. The Dutch implementation agenda for e-government services sees geographic information as an important subset of the basic registrations of the country. According to the e-government strategy of Switzerland, geodata should be made available for general use to the authorities of the Confederation, the cantons and communes, the private sector, the public and to academic and scientific institutions in a sustainable, up-to-date, easy-to-use manner, at the required quality and at reasonable cost. In Denmark, shared core data for all authorities, including geographic data, is one of the twelve focus areas of the national e-government strategy, reflecting the strategic objective to integrate geographic information in e-government at all administrative levels. In Finland, the national e-government strategy states that the use of geographic information will improve the quality of services and decision-making and will make public administration more efficient. Therefore, the terms and conditions for governing geographic data should be clear and harmonized and widely used in the public sector. According to the Swedish e-government strategy, the structured management of geographic information is an essential requirement in developing e-services in society. The Swedish public sector must use geographic information that is described in nationally determined references based on international agreements.

In their approach to geographic information, many countries have defined a strategic government framework on geographic information (table 1) Three of the countries examined do not have a strategic document regarding the use of geographic information. In most other countries, a strategy dealing with geographic information in an e-government context is in place. In one of the countries, the strategy only addresses technological issues, in three countries the focus is on organizational issues. The majority of the countries reported that they have a strategy dealing with both organizational and technological issues.

Table 1: Development of a geographic information strategy

Geographic information strategy	Frequency
On organizational and technological issues	14
Only on organizational issues	3
Only on technological issues	1
No	3
No answer/ don't know	2

There are however important differences between these strategies with regard to their content and their focus on the issue of integrating geographic information in e-government. Many national geographic information strategies strongly focus on the development of the national spatial data infrastructure and the implementation of the different components, and pay little attention to the integration and use of geographic information in an e-Government context. Only a few countries have developed a strategy that recognizes the significance of geographic information for realizing the objectives of e-government and defines requirements and actions for raising awareness and extending its use. Interesting examples of strategies dealing with the role of geo-information in e-government can be found in the Netherlands, the United Kingdom, Sweden, Germany and Finland.

One of the key challenges of the geographic-information strategy of the Netherlands was to further develop a geo-information facility in order to give geographic information a prominent place within e-services and e-government. Existing key information facilities, that were created to improve services, enforcement, policy preparation and other processes in government, strongly focused on the creation, management and use of personal data. The same observation is made in the UK Location Strategy, stating that most data in the public sector are related to two aspects: the identification of individuals and companies ('who') and the location of communities, assets, events or environmental conditions ('where'). While the importance of information about citizens and businesses is widely recognized, geographic information is often overlooked. As many areas of policy and service delivery require information on both issues, the UK Location Strategy wants to "complement the focus already being given to 'who' by introducing a parallel focus on 'where'". According to the Swedish SDI strategy, the national spatial data infrastructure should support the development of Swedish e-governance, the Swedish business community and international competitiveness. Improved access to geodata is considered as a precondition for expanded e-governance, and should result in a more efficient administration and a range of new e-services to citizens and businesses.

In Germany, the integration between the national e-government strategy and the geographic information strategy happens at the level of the objectives, as both strategies share the same goals/key objectives: orientation and benefits to citizens, cost-effectiveness and efficiency, transparency, data protection and data security, social participation, future viability and sustainability. Finland is a good example of the shift in focus of the geographic information strategy and activities from data production and availability to the use and integration of geographic information in e-government. According to the Finnish strategy, spatial data services should support people in their everyday activities and during their leisure time, spatial data should be widely used in decision making, should support the participation of citizens, and should be used for managing a large number of functions essential for society.

3.2 Leadership and coordination

Another important dimension in the approaches towards the integration of geographic information in e-government relates to leadership and coordination. Respondents were asked which body or organization was taking leadership in realizing the integration of geographic information in e-government. As shown in table 2, one of the countries indicated a lack of leadership for making geographic information a part of e-government. The other countries have different approaches with regard to the organization(s) responsible for stimulating the integration. Three main groups of countries can be distinguished: countries where the lead is taken by the authority responsible for the Geographic Information policy, countries where the national or regional e-government organization is taking leadership, and countries where leadership is exercised by both the GI and the e-government organization(s). Most of the European countries belong to the first category, and can be considered as 'GI-driven' countries. In almost half of the examined countries, it is the organization or body responsible for GI that takes leadership in the integration of geographic information in e-government. Four countries belong to the second group, as in those countries leadership is provided by the national e-government body or ministry. In six of the countries, leadership in integrating geographic information in e-government is a shared responsibility of the GI and e-government body.

Table 2: Organization leading the integration of geographic information in e-government

Organization taking leadership	Frequency
GI-organization or body	11
E-government organization or body	4
Both organizations	6
Lack of leadership	1
No answer/ don't know	1

Another important organizational dimension of the integration of geographic information in e-government is the establishment of a coordination structure in which members of the e-government community and members of the geographic information community take key decisions. In almost all of the countries, a coordination structure or body involving the e-government community and the geographic information community has been established, and only two countries indicated that they do not have a coordination structure or dedicated body. There are however significant differences in the composition, the role and the tasks of these coordination bodies, which have an impact on their contribution to the integration of geographic information in e-government.

In most countries, consultation and cooperation between representatives of the e-government community and representatives of the GI community takes place in the coordination structure of body that was established to implement the NSDI and/or INSPIRE. In some countries, consultation and cooperation is organized in e-government coordination bodies or groups. In other countries, there is a clear link between the coordination structure for e-Government and the coordination structure for GI/SDI. For instance, in Ireland there is a spatial information subgroup under the Government Offices of the Chief Information Officer. In Sweden, many of the members of the Geodata advisory board are also members of the e-government Delegation.

In Germany, the e-government community and the geographic information community are both represented in the Steering Committee GDI-DE, the coordination and decision-making body for the development of the national SDI. The Steering Committee GDI-DE has been assigned to the IT Planning Council, which constitutes the Central Steering for the Information Technology of the federal and Länder (States) governments. Both bodies, the SC GDI-DE and the IT Planning Council, consist of representatives from federal, provincial and municipal governments. In Switzerland and Germany, joint meetings are regularly organized between representatives of both communities, in addition to consultation and coordination in existing bodies.

3.3 Data policy

A third dimension in which geographic information can be considered as a part of e-government is in the definition and execution of a data policy. The survey focused on two key factors: the presence of an integrated data policy and the presence of a single access point for all data. Table 3 presents the results about the presence of an integrated data policy. In this context, an integrated data policy can be defined as a common data policy that covers all governmental data, i.e. both geographic and non-geographic data of the public sector. It can be concluded that many European countries do not have one common data policy for all their data. From the 23 countries 5 countries indicated that separate policies existed for each dataset or each data provider in their country. In 6 countries, there exists a common policy for multiple datasets, but this policy is limited to only some datasets. While some countries already have an integrated data policy for all geographic data, other countries go further and have an integrated data policy for all their data, both geographic and non-geographic data. In 4 of the countries an open data policy for all data is in place.

Table 3: Presence of integrated data policy at country level

Data policy	Frequency
Open data policy for all data	4
Integrated data policy for all data	4
Integrated data policy for geographic data	4
Common policy for several datasets	6
Each dataset has its own policy	5

Another relevant aspect of the data policy of countries that might stimulate the use and integration of geographic information is the implementation of a single access point for data. Such an access point provides users access to all data sets and services, but also all the relevant information for access and use. Although most countries have at least one access point where several data sets are made accessible, in many countries this access point only provides access to a selection of – geographic - data. In Germany and Poland, all INSPIRE-thematic data are accessible through one single access point, in Switzerland, the Czech Republic and Sweden non-INSPIRE data are also made accessible through this access point. Three countries (Estonia, the United Kingdom and Slovakia) have a single access point for all data, geographic as well as non-geographic data. In the Netherlands, a single access point is under development.

3.4 Discussion

A general conclusion of the analysis is that in none of the European countries surveyed is geographic information fully integrated in e-government policy, in the sense that integration is achieved at the strategic level, at the organizational level and at the level of the data policy. It should however be noticed that several countries (such as Denmark, the Netherlands, Germany and the United Kingdom) are successful in integrating geographic information at several of these levels. Most of these countries already have a well-developed SDI in place, and the challenge for them is to integrate the data and services provided by this SDI in different e-government processes. Many others countries are still in the process of setting up their national SDI. For them, the focus now is on the development and implementation of typical SDI components, and the integration of location information is not considered as a priority

4 Conclusions

The study presented in this paper was designed to explore how European countries are taking actions at national level to stimulate and facilitate the integration of location information in e-government. The focus of this study was on different non-technological measures to align the activities of the GI-community and the e-government community. The evidence from this study suggests that several European countries are aware of the need to bring both communities together and are taking different types of actions towards a coordinated and integrated 'information' policy, considering location information as one of the many types of government information. However, in none of the European countries such a 'fully integrated' information policy already seems to be in place. In many countries the integration of location information in e-government is even not seen as a priority.

A number of important limitations of this study needs to be considered. To begin, the focus of the study was on the non-technological side of integrating location information, although there are also many important technological aspects that should not be neglected. In addition, the study had a strongly explorative character, combining both quantitative and qualitative methods of data collection and analysis, in order to get a first general overview on the state of play in Europe. Additional research is needed in order to gain insight in two crucial areas. First, further investigation is needed to identify the determinants of a certain approach for integrating location information in e-government. Second, and probably most important, further research is needed to better understand which models for integrating location information in e-government are most successful, and lead to an optimal use and integration of location information in e-government services, and better service delivery to citizens and businesses.

At this stage, there doesn't seem to be a "right answer" to how things are organized and different approaches have produced successful results. Often existing organizational responsibilities have played a key role in shaping the way these opportunities are addressed. Nevertheless, there is an increasing trend towards convergence, spurred on by recognition of the contribution that this will make to wider policy objectives of efficiency, growth and better services.

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