

The Impact of Spatial Information Provided by Land Administration Services in Europe

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SUMMARY

Economic performance indicators within international benchmarking studies are seeking for parameters which analyse factors like economic and social outcomes, such as productivity, informality, corruption, unemployment and poverty, and identify what reforms have worked, where and why.

The publication “Doing Business in 2005”, initiated by the World Bank, links the economic and social performance figures with Spatial Information and Providers of Land Administration Services. Over the last decade those Service Providers (a) launched mayor projects with the support of international and bilateral donors, (b) streamlined their internal procedures; (c) improved their service underplayed by revised business strategies; and improved their (d) cost / revenue ratio.

Which impacts have been achieved? What are the strength and weaknesses resulting from that processes? This paper discusses the challenges and socio-economic impact of Spatial Information provided by Land Administration Services in Europe on the example of ongoing and recent projects.

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1. THE GLOBAL DRIVERS FOR SPATIAL INFORMATION

Sustainable development provides a framework under which communities can use available resources efficiently, create efficient infrastructures, protect and enhance quality of life, and create new businesses to strengthen their economies.

Spatial information and GI tools are suitable means to optimise the sustainable use of resources within a given framework.

Government data access policy is an important aspect for improving the quality for services provided by public authorities and reducing the costs for administration aiming at increased economic performance of a country and increased tax revenue generation. Thus in many countries initiatives on e-Government, e-Citizenship, e-Signature and Spatial Data Infrastructure (SDI) have been introduced. Traditionally the triggers for economic performance are human resources, natural resources (land, water, energy) and the physical infrastructure like transportation and power supply.

1.1 Spatial Information as part of virtual infrastructure

Thus the focus is on **virtual infrastructure**, developed by a society over time, like administrative procedures ensuring efficient processes based on a well understood legal framework, improved inter-institutional cooperation for a sound economic and social interacting of a society. The Spatial Information Infrastructure became a part of that. Shall this virtual infrastructure (contributing on health, finance, telecommunication and on spatial information) be offered 'for free or for a fee'?

The different traditions in managing this virtual infrastructure lead to wide range of solutions. Shall access to information including TV, Internet and e-Services on spatial information be free of charge? Somehow the citizen has to pay anyway. The example of the physical infrastructure of the road network proves that a diversity of charging systems (through tax on gasoline, toll system or any other means) can solve the requirement with slightly different quality.

Is it really the question of costs vs. quality?

If different approaches lead to similar results it seems that we have to benchmark the performance of different approaches instead of assuming that a 'for free'-service leads to better results. Finally somebody has to pay for the virtual infrastructure anyway.

1.2 Mission for Spatial Information Infrastructure¹ (SII)

What are the goals of investing in SII?

The following example of a mission-statement on SII from Canada may serve as example for the goals to be achieved [Commonwealth Spatial Data Committee, 1999]:

- Provide easy, consistent and effective access to geographic information maintained by public agencies;
- Promote the use of geographic information in support of political, economic, social and personal developments

To support this, the following goals are identified:

- To improve the integration of major common geographic databases created and maintained by public sector agencies at the municipal, provincial and federal levels through the development of common standards for data content, data access and data exchange.
- To make available to the General public high quality, consistent geographic data at **minimal cost** to support the development of common applications
- To encourage data sharing such that spatial data is collected only once, as close to the source as possible.

1.3 The relevance of spatial information for business

The World Bank publication „**Doing business 2005**” (World Bank 2005) introduced six parameters of worldwide benchmark on economic framework provided by a country. Three out of these six parameters are directly linked with Land Administration Services (indicated in bold letters):

1. Starting a business
2. Managing human resources
- 3. Registering property**
4. Enforcing contracts
- 5. Getting credit**
- 6. Protecting investors**

This approach compares obviously business aspects between countries, related to services of rather different quality and extend. From that approach we can deduct that even a benchmarks between quite different procedures are reasonable. The World Bank compared well defined results of procedures like time span and costs. [Steudler 2004] introduced a framework for benchmarking Land Administration Services. Applying all that to the spatial information business leads to the assumption that different models of providing service regarding SI might lead to similar performance figures.

¹ The authors prefer the term ‘Spatial Information Infrastructure’ covering data, procedures and services instead of ‘Spatial Data Infrastructure’.

2. SPATIAL INFORMATION IN EUROPE

The European initiative on establishing a joint information infrastructure is a long-term process and may be compared with the long-term project on establishing an integrated economy in Europe. The decision on a common currency was made in the 1950'ies and needed 50 years for implementation. Another example is the strategy decision on the liberation of telecommunication which showed good results within 10 years. This is again a success story and a prerequisite for access to Spatial Information Infrastructure based on Telecommunication and wireless internet as tools needed to set up services like Telecartography and Location Based Services. The increasing integration of the European economies led to an increasing demand for pan-European information products.

The EU-DG Information Society is one of the drivers for a digital Europe referring to spatial information with interrelation to GMES (Global Monitoring for Environment and Security) and INSPIRE (Infrastructure for Spatial Information in Europe) and GALILEO.

Activities for spatial information in Europe started with strategies, but focus more and more on a practical approach:

- The **EU-INSPIRE Initiative** is a triggering force for a joint European action on SII in practice. A coordinated decentralized approach should ensure a flexible solution based on information to be summarised for implementing and monitoring policies of decision-making (regional, national and community).
- The recently announced **eContentplus programme** will concentrate on those parts of the digital content market where there is clear fragmentation in Europe, and where market forces alone so far have been insufficient to drive growth. It targets three domains: spatial data, educational material and cultural content. The new programme will facilitate the production and distribution of online European content, thus stimulating innovation and creativity. There are already good examples within the eContent-programme like the **EU-EULIS project** which aims at establishing a **European Land Information Service** by accessing national land information across borders via the Internet.

2.1 INSPIRE Directive on Spatial Information Infrastructure

In the EU new instruments are about to be developed, in particular three directives

- (1) on public access to environmental information,
- (2) on the re-use of public sector information and
- (3) the establishment of an infrastructure for spatial information in the Community (INSPIRE-directive) as well as for GMES.

The overall goal is to give the European Union the appropriate infrastructure allowing for an efficient use of data already collected in the field of spatial information. The most important objective is to reduce obstacles between public authorities in sharing data. The initiative should reduce duplication, gaps in availability and lack of harmonisation, which constitute barriers to the efficient use of existing data. It is assumed that fragmentation arises because different Member States collect and store data in different ways. By tackling the fragmentation, the programme will facilitate the creation of EU-wide information services

derived from such data in areas such as transportation, navigation, emergency response and environmental management.

2.1.1 Which categories of spatial data shall be covered?

The Directive should apply to spatial data held by or on behalf of public authorities and to the use of spatial data by public authorities in the performance of their public tasks. The following dataset shall be covered in each Member State within a period of 2-5 years:

Reference data	Data related to environment
<ol style="list-style-type: none"> 1. Coordinate reference systems 2. Geographical grid systems 3. Geographical names 4. Administrative units 5. Transport networks 6. Hydrography 7. Protected sites 8. Elevation models 9. Identifiers of properties 10. Cadastral parcels 11. Land cover 12. Orthoimagery 	<ol style="list-style-type: none"> 1. Statistical units 2. Buildings 3. Soil 4. Geology 5. Land use 6. Human health and safety 7. Environmental monitoring facilities 8. Production and industrial facilities 9. Agricultural and aquaculture facilities 10. Population distribution – demography 11. Restriction/regulation zones 12. Natural risk zones 13. Atmospheric conditions 14. Meteorological geographical features 15. Oceanographic geographical features 16. Physical conditions of Sea regions 17. Bio-geographical, ecological regions 18. Habitats and biotopes 19. Species distribution

2.1.2 What kind of services can be expected?

Member States shall establish and operate a network of the following services:

- (a) **Discovery services** making it possible to search for spatial data sets;
- (b) **View services** making it possible, as a minimum, to display, or overlay spatial data sets;
- (c) **Download services**, enabling copies of spatial data sets,
- (d) **Transformation services**, enabling spatial data sets to be transformed;
- (e) **Invoke spatial data services**, enabling data services to be invoked.

Those services shall be easy to use and accessible via the Internet or any other appropriate means of telecommunication available to the public.

2.1.3 Free access to spatial information for everybody?

A frequently heard criticism is the (possible) loss of revenue for data providers. The directive has by no means the intention to saddle these organisations with financial problems. The directive

allows the Member States to address this issue. Only a) and b) of the above mentioned services shall be available free of charge. Where public authorities levy **charges for the c) and e)** of the above mentioned services, Member States shall ensure that **e-commerce services** are available.

3. COSTS OF SPATIAL INFORMATION

The following examples shall bring in mind again the different charging mechanisms for financing projects on establishing and maintaining virtual information infrastructure.

3.1 The INSPIRE approach

It can be concluded that the diversity within Europe based on traditions will continue. The INSPIRE- Directive ensures a common ground of harmonization including free services for basic information (including metadata), but allows to charging mechanism for data. It can be expected that the National Mapping and Cadastre Agencies as one major group of service providers on spatial information will get a push through promotion of wider use of their data.

3.2 The approach of ‘the taxpayer shall pay’

The World Bank is one of the main trigger for (re-)establishing services based on **Spatial Information Infrastructure** with focus on Land Administration Services. European countries like Bulgaria, Croatia, Romania, Serbia and Russia have ongoing projects on Land Administration co-financed by the World Bank. In these cases it is obviously that finally the taxpayer of that specific country pays for establishing the Spatial Information Infrastructure.

Even in countries with strong Freedom of Public Sector Information the user may eventually been asked to help pay for the cost of maintaining data and services [Longhorn, 2001]

3.3 The approach of ‘the users will pay’

In 1994 in the Netherlands the 'Cadastre and Land Registry Agency' was formed with the overall aim of acting as independent, cost recovering, customer oriented public body. A user-platform for umbrella organisations (like notaries, real estate agents, municipalities, consumers and banks) communicates with the Executive Board of the Agency regarding matters like efficiency and quality of the service and fees. From the following figure on cost recovery we could assume that the users fully cover the costs of the Land Administration Services provided.

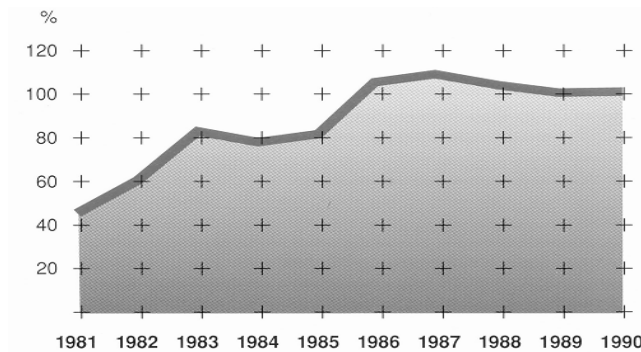


Figure 1: Revenue as a percentage of expenditures at Kadaster of NL [Molen, 2002]

3.4 The approach of Co-financing by partners

There is the interesting example of co-financing coming from Serbia and Montenegro. The Republic Serbia - Republic Geodetic Authority (RGZ) as the National Mapping and Cadastre Agency and the municipality administration are co-financing projects of joint interest e.g. the introduction of the Real Estate Cadastre including Orthophoto-Mapping.

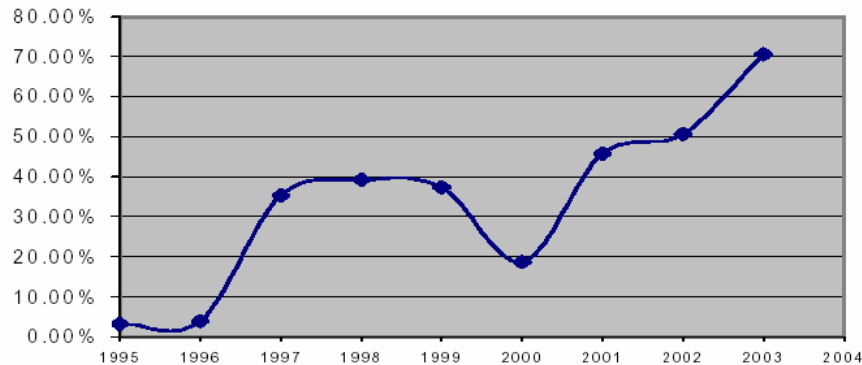


Figure 2: Percentage for Self financing of RGZ in Serbia [ALEKSIC, 2004]

4. KNOWLEDGE IS INFORMATION IN ACTION

The question is about combining multi-source **spatial data with processes** into usable **information products**. It is all about **maximising the economic, social and environmental** benefits from investment already having been made in spatially referenced information. The realisation is based on at least three components: data, processes and knowledge. Progress has been made to improve the procedures of spatial data acquisition, but the real challenge is the workflow:

- to organise business processes that support the availability of, and accessibility to geo-information in the right place, at the right time and for the right person;
- to create and maintain data models and databases from which information can be extracted, processed and shared by many stakeholders at any given time.

How can we deliver the right information to the right people at the right time, if the right information must be derived from here-and-now parameters that change daily? The answer comes from business model innovation. In other words: the result of human activities on different locations is an integral part of information required and should be considered as part of our modelling processes.

5. CHANGING ROLE FOR SURVEYING PROFESSION

Finally the role of the National Mapping and Cadastre Agencies (NMA and NCA) will not stay untouched by the modern information management including data acquisition methods and distribution technologies for streamlining inter-organizational workflows. NMA have to develop to become **Service providers** integrating **spatial information based on inter-institutional cooperation and strong partnerships**.

In the past very often paradigm changes in our geodata business were results from technological innovations. In the meantime however changes are more and more caused by improved **business processes** with a sever impact on our surveying business. Some National Mapping Agencies started innovative reorganization processes, which however has also some drawbacks:

1. Reorganization takes time and resources – during that time customer contacts are weakened.
2. The renewed organization may again not fit because the business world is changing constantly.

Even running the traditional “change script” faster **does not work**. The reaction to increased business pressure with organizational changes often is the wrong way. The most dynamic firms shift **business models** without organizational changes. Instead of shifting organizational blocks we have to shift mindsets!!!!

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BIOGRAPHICAL NOTES

Gerhard MUGGENHUBER has some 20 years of professional experience in management of Cadastre and Geo-Information from projects in Austria as well as from consultancy abroad with recent project involvements in Serbia and Hungary.

In his present function as Vice-head of international affairs of BEV – Federal Office of Metrology and Surveying - he contributed to international initiatives in Eastern- and Central Europe like the World Bank “Initiative on Real Property Rights”. Gerhard Muggenhuber is elected Chairman of FIG-Commission3. From 1996-2001 he was member of bureau of the Working Party on Land Administration, an advisory body to the UN-ECE in Geneva.

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