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INSPIRE AND THE DIGITAL AGENDA FOR EUROPE

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The INSPIRE Directive

The INSPIRE Directive 2007/2/EC[1], establishing an Infrastructure for Spatial Information for the European Community, was adopted in March 2007, after six years of sustained effort since its original inception. This lengthy period was necessary first to formulate the technical and policy framework in collaboration with leading experts from the Member States and relevant stakeholder community, and then for the political negotiations between the European Parliament and the Council to take place. The approval of the Directive sets a milestone for the development of SDI in Europe and acts as a model for other developments worldwide.

The INSPIRE Directive lays down general rules for the establishment of an infrastructure for spatial information in Europe based on infrastructures for spatial information established and operated by the Member States. The component elements of those infrastructures include: 1) metadata, 2) spatial data themes, 3) network services, 4) agreements on data sharing and 5) co-ordination and monitoring measures.

A key objective of INSPIRE is to make more and better spatial (geographical) information available for Community policy-making and implementation in a wide range of sectors, starting with environmental policy and later extended to other sectors such as agriculture, transport, etc.

INSPIRE envisages the establishment of integrated spatial information services, based upon a distributed network of databases, linked by common standards and protocols to ensure compatibility and inter-operability. It should be based on the infrastructures for spatial information that are created by the Member States and that are made compatible with common implementing rules and are supplemented with measures at Community level. These measures should ensure that the infrastructures for spatial information created by the Member States are compatible and usable in a Community and cross-border context.

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[1] Directive 2007/2/EC Final, 14.03. 2007 – OJ L 108/1 of 25.04.2007.

INSPIRE applies 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. Since the wide diversity of formats and structures in which spatial data are organised and accessed in the Community hampers the efficient formulation, implementation, monitoring and evaluation of Community legislation that directly or indirectly affect the environment, implementing measures are defined in order to ensure interoperability of across the Member States.

The Directive requires Member States to set-up network services that should make it possible to discover, transform, view and download spatial data and to invoke spatial data and e-commerce services. These services should work in accordance with commonly agreed specifications and minimum performance criteria in order to ensure the interoperability of the infrastructures established by the Member States.

Many national and regional SDIs across Europe have already started aligning themselves to the Directive, and the current challenge is to complete the development of all technical specifications that will ensure the interoperability of all National infrastructures across 27 countries and 23 official languages.

Europe 2020 strategy

The Europe 2020 strategy, as set out in the Communication from the Commission entitled *Europe 2020*: *A strategy for smart, sustainable and inclusive growth*[2], sets out a vision of Europe's social market economy for the 21st century enjoying the full economic and social benefits of a digital society.

One of the flagship initiatives of the Europe 2020 strategy, set out in the Communication from the Commission entitled *A Digital Agenda for Europe*[3], gives a prominent role to improved standard setting in the field of information and communication technologies (ICT) to ensure interoperability between ICT applications, services and products with a view to reducing fragmentation of the digital single market while at the same time promoting innovation and competition.

Another flagship initiative of the Europe 2020 strategy, set out in the Communication from the Commission entitled *An Integrated Industrial Policy for the Globalisation Era – Putting Competitiveness and Sustainability at Centre Stage*[4], calls on Europe to develop a standards system that meets the expectations of both market players and European public authorities while also promoting European influence beyond the single market in the globalised economy.

Finally the Communication from the Commission entitled *A strategic vision for European standards: Moving forward to enhance and accelerate the sustainable growth of the European economy by 2020*[5], states that in 2011, the Commission will create and chair a dedicated multi-stakeholder platform to advise it on matters relating to the implementation of ICT standardisation policy, including the work programme for ICT standardisation, priority-setting in support of legislation and policies and identification of specifications developed by global ICT standards development organisations.

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[2] COM(2010) 2020 final, 3.3.2010
[3] COM(2010) 245 final, 19.5.2010
[4] COM(2010) 614 final, 28.10.2010
[5] COM(2011) 311 final, 1.6.2011

Digital Agenda for Europe

The overall aim of the Digital Agenda is to deliver sustainable economic and social benefits from a digital single market based on fast and ultra fast internet and interoperable applications.

Implementing the DAE would contribute significantly to the EU's economic growth and spread the benefits of the digital era to all sections of society. The DAE has been set out to define the key enabling role that the use of Information and Communication Technologies (ICT) will have to play if Europe wants to succeed in its ambitions for 2020. Its objective is to maximise the social and economic potential of ICT, most notably the internet, a vital medium of economic and societal activity. Successful delivery of this Agenda will spur innovation, economic growth and improvements in daily life for both citizens and businesses.

The Agenda frames its key actions around the need to systematically tackle seven problem areas (Figure):

1. creating a Digital Single Market,
2. improving the framework conditions for interoperability between ICT products and services,
3. boosting internet trust and security,
4. guaranteeing the provision of much faster internet access,
5. encouraging investment in research and development,
6. enhancing digital literacy, skills and inclusion,
7. applying ICT to address social challenges such as climate change, rising healthcare costs and the ageing population.

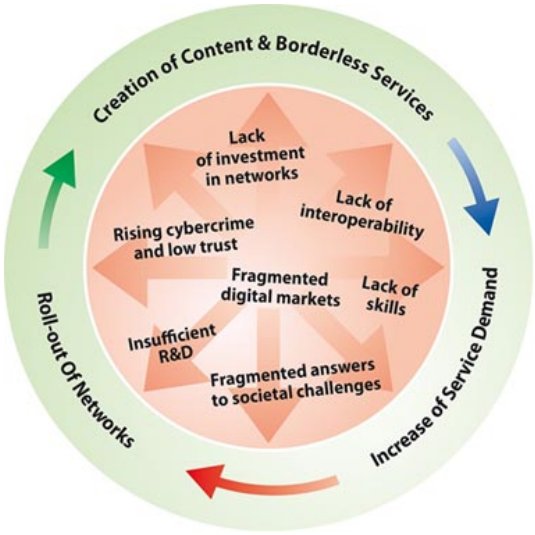

Figure.

Digital Single Market

It is time for a new Single Market to deliver the benefits of the digital era.

Europe is still a patchwork of national online markets, and Europeans are prevented from enjoying the benefits of a digital Single Market. Commercial and cultural content and services need to flow across borders; this should be achieved by eliminating regulatory barriers and facilitating electronic payments and invoicing, dispute resolution and customer trust. More can and must be done under the current regulatory framework to put in place a Single Market in the telecoms sector.

Interoperability and standards

We need effective interoperability between IT products and services to build a truly digital society.

The internet is the best example of the power of technical interoperability. Its open architecture has brought interoperable devices and applications to billions around the world. But to reap the full benefits of ICT deployment in Europe, it is essential to enhance the interoperability between devices, applications, data repositories, services and networks. The framework conditions for interoperability can be improved in various ways. One important means to that end is to ensure that good ICT standards are available and used, notably in public procurement and legislation.

Trust and security

Europeans will not embrace technology they do not trust – the digital age is neither „big brother" nor „cyber wild west".

Europeans will not engage in ever more sophisticated online activities unless they feel that they, and their children, can fully rely upon their networks. It is essential to address the rise of „cybercrime". In parallel, the multiplication of databases and new technologies raise new challenges. The right to privacy and to the protection of personal data are fundamental rights in the EU which must be effectively enforced online and offline.

Fast and ultra fast internet access

We need very fast internet for the economy to grow strongly and to create jobs and prosperity, and to ensure citizens can access the content and services they want.

Europe needs widely available and competitively-priced fast and ultra fast internet access. The EU aims to bring basic broadband to all Europeans by 2013 and to ensure that, by 2020, (i) all Europeans have access to much higher internet speeds of above 30 Mbps and (ii) 50% or more of European households subscribe to internet access above 100 Mbps.

Research and innovation

Europe must invest more in R&D and ensure our best ideas reach the market.

Given that ICT contributes to the total value-added in European industrial strengths such as automobile (25%), consumer appliances (41%) or health and medical (33%), the lack of investment in ICT R&D threatens the entire EU manufacturing and service sectors. Market fragmentation and widely dispersed research funding limit the growth and development of ICT innovative businesses and Europe is slow in the uptake of ICT-based innovations. While social changes like an ageing population or environmental crisis are major drivers of innovation, Europe makes little use of procurement of innovation and R&D to improve quality and performance of its public services.

Digital skills, literacy and e-inclusion

The digital era should be about empowerment and emancipation; background or skills should not be a barrier to accessing this potential.

ICT-enabled benefits for society

Smart use of technology and exploitation of information will help us to address the challenges facing society like climate change and the ageing population.

Using and applying ICTs is critical to help Europe face future challenges such as supporting an ageing society, climate change, reducing energy consumption, improving transportation efficiency and mobility, empowering patients and ensuring the inclusion of persons with disabilities.

INSPIRE and the Digital Agenda: relevant actions

The DAE identifies a raft of measures (101 Actions) that will be put into place or proposed over the next 2-3 years, leading to follow-up actions up to 2015. The DAE will then evolve and develop over the next 10 years, as a flagship of the Europe 2020 Strategy to reach the 2020 targets.

This chapter takes into consideration some of the Actions (grouped by the respective pillar) that seem relevant for INSPIRE.

Pillar I: Digital Single Market

DAE Action 3: Open up public data resources for re-use

By 2012, review the Directive on Re-Use of Public Sector Information, notably its scope and principles on charging for access and use.

Public authorities produce large amounts of data that are relevant for new, innovative cross-border applications and services (e.g. weather forecasts, insurance services,..). PSI is the single largest source of information in Europe; its estimated market value is €27 billion. Re-used, this public data could generate new businesses and jobs and give consumers more choice and more value for money. Often the use of this information is restricted to governments or public bodies. Governments could stimulate content markets by making public sector information more widely available for re-use on transparent and effective terms. The PSI Directive was adopted in 2003 laying down basic principles of availability, transparency and cost limits to ensure a level playing field for commercial re-users of public sector information. In preparation for a review, the Commission held a public consultation and the next step will be to drawn up an impact assessment of the various options and, if appropriate, propose a revision of the Directive.

Relevance for INSPIRE

The INSPIRE Community should contribute in 2012 to the review of the PSI Directive which as will need to take into account the principles of the Shared Environmental Information System (SEIS) as it has a major impact on access and re-use of data and information for developing environment relevant information services. Meanwhile in 2014-15 the INSPIRE Community should contribute to review of INSPIRE DIrective including coherence with the possibly reviewed PSI Directive and Public Access to Environmental Information Directive.

Pillar II: Interoperability and Standards

DAE Action 21: Propose legislation on ICT interoperability

As part of the review of EU standardisation policy, propose legal measures on ICT interoperability to reform the rules on implementation of ICT standards in Europe.

Digital devices, applications and services should interact seamlessly anywhere, anytime. However, this is far from being the case in Europe. The fragmentation of the potential market for EU-produced technologies and services hampers growth in Europe's ICT sector. Better Europe-wide standards would enhance interoperability and ensure that digital applications and devices work across borders. Current standards issued by international organisations cannot be considered as European Standards according to the current legislation. These problems are addressed in the reform of the EU standardization framework, which is essential to keep pace with fast-moving international technology markets.

Action 22: Promote standard-setting rules

Promote appropriate rules for essential intellectual property rights and licensing conditions in standard-setting, in particular through guidelines by 2011.

The new technical standards are adopted without the consideration of the relative costs of the different technical alternatives. The implementation costs of technologies proposed as standards are frequently ignored. This can lead businesses into serious financial difficulties when relying on agreed standards where the costs of implementation are not clear. When adopting standards, different standardisation bodies currently adopt different approaches to the licensing. The Commission will work towards harmonising these divergent practices and will formulate minimum rules to be followed for a standard to be recognised across the EU.

Action 23: Provide guidance on ICT standardisation and public procurement

Issue a Communication in 2011 to provide guidance on the link between ICT standardisation and public procurement to help public authorities use standards.

Public authorities should make the best use of available standards when commissioning hardware, software and IT services from external suppliers. Yet, the practices of public authorities across the EU vary greatly when it comes to writing tender specifications for public procurement. In some cases, public authorities find themselves unintentionally locked into particular IT solutions for decades, simply because they failed to draft sufficiently flexible tender specifications allowing for open choices in technological evolution. The Commission will draw up detailed guidelines on how to make best use of ICT standards in tender specifications. For instance, public authorities should select standards which can be implemented by all interested suppliers, allowing for more competition and reducing the risk of lock-in. In 2012 The Commision will adopt a Communication on standardisation and public procurement and will make sure that the guidelines are practically applicable by all public procurers of ICT goods and services.

Action 24: Adopt a European Interoperability Strategy and Framework

Promote interoperability by adopting in 2010 a European Interoperability Strategy and European Interoperability Framework.

Europe does not yet reap the maximum benefits from interoperability. Weaknesses in standard-setting, public procurement and coordination between European public authorities prevent digital services and devices working across borders as well as they should. When establishing National Public Services, there is a risk that different Member States opt for solutions which are incompatible with one another. New electronic barriers, so-called „e-barriers", emerge – impeding the proper functioning of the internal market. Member Sta-

tes and the Commission should do more to pre-empt the emergence of these new e-barriers and the resulting market fragmentation by getting greater interoperability of public IT systems throughout the EU. To promote interoperability between public administrations, the Commission has adopted the European Interoperability Strategy and the European Interoperability Framework.

Relevance for INSPIRE

INSPIRE is a major milestone for promoting data sharing and data interoperability across Europe.

As recognized in the recent Communication from the Commission entitled *Towards interoperability for European public services*[6] action on interoperability is essential to maximise the social and economic potential of information and communication technologies (ICT). This Communication introduced the European Interoperability Strategy (EIS) and the European Interoperability Framework (EIF) for European public services to promote interoperability among public administrations. Two approaches have been proposed:

- **Top-down (or global) approach:** 1) The political context and its evolution are taken into account EU 2020 DAE, 2) Development of various frameworks such as EIS and EIF, architecture guidelines and other methods and guidelines, 3) Assessment of the ICT implications of new EU legislation proposed.
- **Bottom-up (or sectoral) approach:** 1) Working via sectoral projects on relevant specific topics providing an opportunity to tackle real interoperability challenges, 2) when developing new services and tools in a specific sector, **the potential for reusing such solutions** in other sectors should be kept in mind.

This Communication recognizes that ... *EU initiatives in many sectors have also stressed the importance of interoperability....*

> *Regarding the **environment**, the INSPIRE Directive 2007/2/EC establishes an infrastructure for spatial information in Europe for the purposes of EU environmental policies and policies or activities which may have an impact on the environment. To ensure that the spatial data and services are accessible in the Community and cross border context in an interoperable* way, *the Directive requires that technical implementing rules are adopted for the elements necessary for the interoperability of the infrastructure: metadata*[7]*, interoperability of spatial* data and services[8], *network services*[9]*, data and service sharing*[10] *and monitoring and reporting*[11] *and National Infrastructures are adapted accordingly.*

The INSPIRE legal acts and their associated guidelines foster interoperability of the Member States INSPIRE network services and as well the interoperability of spatial data sets and services.

According to Article 20 of the INSPIRE Directive

> *The implementing rules referred to in this Directive shall take due account of standards adopted by European standardisation bodies in accordance with the procedure laid down in Directive 98/34/EC, as well as international standards.*

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[6] COM(2010) 744 final, 16.12.2010
[7] Regulation (EC) No 1205/2008, 4.12.2008
[8] Commission Regulation (EU) No 1089/2010, 23.11 2010
[9] Regulation (EC) No 976/2009, 20.10.2009
[10] Regulation (EU) No 268/2010, 30.3.2010
[11] Decision No 2009/442/EC, 11.6.2009

As foreseen in the Communication by developing technical standards for INSPIRE and tackling real interoperability challenges the INSPIRE Community will develop new services and tools that could be reused in other sectors dealing with location and geo-information services (not only for environment).

For these reasons it is crucial to ensure that new standards to be developed within the DAE must take into account all INSPIRE specifications and guidelines. Meanwhile the INSPIRE architecture could be revised if new more powerful standards will be adopted by the market. Ideally we should make efforts to promote the adoption of INSPIRE specifications as international standards for location services.

INSPIRE work should also contribute to the content of the guidelines for public procurement for geospatial components of e-government systems, which should be finalized in 2012.

Pillar VII: ICT for Social Challenges

Action 84: Support seamless cross-border eGovernment services in the single market

The European Commission will support seamless cross-border eGovernment services in the single market through the Competitiveness and Innovation Programme (CIP) and Interoperability Solutions for European Public Administrations (ISA) Programme.

eGovernment can support the further construction of the internal market by facilitating entrepreneurs to set up and run a business anywhere in Europe independently of their original location, and allowing citizens to study, work, reside and retire anywhere in the European Union through the delivery of seamless, interoperable and sustainable cross-border services. The Commission supports the piloting of cross-border eGovernment services through the ICT Policy Support Programme under the CIP, in particular via Large Scale Pilots. The Interoperability Solutions for European Public Administrations (ISA) programme is an important instrument that could analyse and suggest ways to ensure the sustainability of common services and generic tools developed and demonstrated in the Large Scale Pilots. The Commission will adopt the eGovernment Action Plan 2011-2015, calling also on cross-border services.

Action 85: Review the Public access to Environmental Information Directive

To review by 2011 the Public access to Environmental Information Directive (Directive 2003/4/EC on public access to environmental information).

eEnvironment services, as a category of eGovernment services, are either still underdeveloped, or fragmented along national borders. Community law in this area should be reviewed and modernised. eGovernment services offer a cost-effective route to better services for every citizen and business and participatory, open and transparent government. eGovernment services can reduce costs and save time for public administrations, citizens and businesses. They can also help mitigate the risks of climate change, natural and man-made hazards by including the sharing of environmental data and environment-related information. The Commission will analyse the national reports on application of the Directive on public access to environmental information and, if necessary, will present proposals for its amendment. Otherwise, the Commission will continue to gather information necessary for possible amendments in the future.

Action 86: Implement cross-border eEnvironment services

Implement eEnvironment information services, including monitoring, notably through advanced sensor networks.

With continuous advances in Information and communication technologies making ICT solutions more cost-efficient, the opportunities to use them in support of achieving EU environmental policy objectives become increasingly evident. Throughout the 6th Environmental Action Programme 2002-2012, the Commission has been committed to strengthening the evidence base for policy making, increasingly emphasising the importance of implementation and impact assessment. With this and several other aims in mind, an EU *Shared Environmental Information System* (SEIS) is being developed to deliver on three main streams of action: The streamlining of legal requirements; building the data and information infrastructure; and constructing the monitoring infrastructures (including sensors) and protocols. By the end of 2011 a SEIS Implementation Plan will outline the priorities and improved co-ordination and planning of mutually supportive activities. By the end of 2016 eGovernement ′eEnvironment′ services will be available and interoperable across administrative and jurisdictional boundaries and by 2020 the quality and availability of data will be sufficient to support EU policy objectives related to the environment achieved at pan-European level.

Relevance for INSPIRE

In 2011 we started the operations of the INSPIRE geo-portal providing interoperable access to the Member States spatial data sets and services in compliance with article 15 (1) of the INSPIRE Directive 2007/2/EC.

INSPIRE is asking Member States to set-up interoperable eGovernment services (for the environment) and by promoting the use of common standards is facilitating cross-border applications. Some Member States already envisaged the integration of INSPIRE services as key element of eGovernment (e.g. Digital Norway). In this case adopted standards should be common to ensure interoperable full interoperability of public services.

By contributing to INSPIRE services development the DAE will accelerate and facilitate the implementation of INSPIRE.

The review of the 2003/4/EC *Public Access to Environmental Information Directive* in 2013 could complement INSPIRE provisions with a focus on information services, including non spatial data and documents

Conclusions

The INSPIRE Directive has been designed to facilitate access and promote interoperability of spatial data and services that are relevant for environmental policies and policies that affect the environment.

It is by definition a multipurpose infrastructure because most of the its data themes are relevant for other policies such as Agriculture, Transport, Spatial Planning.

Building and sustaining INSPIRE is not an easy task and requires a combination of technical, financial, human, political resources and a cultural attitude to address the additional levels of European complexity. In fact the richness and diversity of Europe make this task all the more challenging, and the only way forward is to involve as much as possible all the

relevant stakeholders so that the process of building and maintaining the infrastructure is shared and "owned" across all the constituencies.

It is so crucial to maximize the benefits of INSPIRE implementation by proposing INSPIRE as a model and/or basic layer to build eGovernment services as envisaged by the Digital Agenda of Europe.

This paper has shown possible synergies to leverage investments. By aligning some actions of the DAE Action Plan and the INSPIRE roadmap it will be possible to extend the INSPIRE infrastructure to be beneficial for other domains and deploy operational solutions in a quicker and more efficient way.

Internet sources

The paper is based on information published on the DAE website that is regularly updated by the Commission (http://ec.europa.eu/information_society/digital-agenda/index_en.htm). Please always refer to this web site for more updated information about progress made in DAE implementation.

Abstract

There are similarities and synergies to be exploited related to the implementation of INSPIRE and some actions envisaged in the Digital Agenda for Europe (DAE).

The DAE is Europe's strategy for a flourishing digital economy by 2020. Among others it outlines policies and actions to maximize the benefit of the Digital Revolution for eEnvironment services. eEnvironment can be described as the use and promotion of ICT for the purposes of environmental assessment and protection, spatial planning, and the sustainable use of natural resources, and it includes public participation. eEnvironment services are closely connected with building SEIS, GMES and INSPIRE.

The DAE also covers open access to data (including the review of the Public Sector Information (PSI)). PSI is the single largest source of information in Europe, produced and collected by public bodies and includes digital maps, meteorological, legal, traffic, financial, economic and other data. Most of these data could be re-used or integrated into new products and cross-border services related the Environment such as weather forecasts, insurance services, ... and Open Government is transforming the way organizations across the world handle data and make it available to citizens and communities. Better access to PSI can improve people's quality of life and make how they interface with government much easier in environmental protection and sustainable development.

This paper shortly introduces the INSPIRE Directive and the DAE and analyses possible synergies.

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