



INSPIRATION – Spatial Data Infrastructure in the Western Balkans




**Implementing SDI**  
Status quo, lessons learned & the road ahead

**SDI Days, Zagreb Croatia**  
**25 – 29 September 2012**

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INSPIRATION – Spatial Data Infrastructure in the Western Balkans



**Agenda**

- Status quo & the wider context
- What do we observe?
- Strategic challenges
- Conclusion

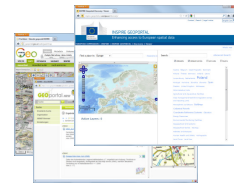
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## SDI implementation – Status quo

- **Spatial data infrastructures are being implemented on all governmental levels**
  - Extensive spatial data offerings are becoming findable and interoperably available across Europe
  - Geoportals are being implemented on EU, national and sub-national levels
  - Re-usable spatial information increasingly helps to reduce transaction costs and to improve business and governmental processes
- **INSPIRE is the driver for the most public SDI initiatives in Europe**
  - Interestingly it needed a legislative push to actively pursue well known and accepted goals



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## INSPIRE implementation – Status quo

- **INSPIRE Directive in force since 15 May 2007**
- **Transposed into national legislative systems since 2009**
- **Implementation phase effectively started in 2010**
- **Member states are progressing, but still a long way until full operation**
  - Example Germany (monitoring 2012)

Accessibility of spatial datasets via view services				Accessibility of spatial datasets via download services			
Spatial datasets	# accessible	# total	% accessible	Spatial datasets	# accessible	# total	% accessible
Annex I	429	769	56 %	Annex I	40	769	6 %
Annex II	353	487	72 %	Annex II	5	487	1 %
Annex III	598	1210	49 %	Annex III	36	1210	3 %



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## INSPIRE implementation – Roadmap



10 years! – that's geological timeframe for IT



15-May-2010	Implementation of provisions for monitoring and reporting
03-Dec-2010	<b>Metadata available</b> for spatial data sets and services corresponding to <b>Annex I and II</b>
09-May-2011	Member States shall provide the <b>Discovery and View Services with initial operating capability</b>
30-Jun-2011	The EC establishes and runs a <b>geo-portal at Community level</b>
19-Oct-2011	Implementation of Regulation as regards the access to spatial data sets and services under harmonised conditions for new arrangements
09-Nov-2011	<b>Discovery and view services operational</b>
28-Jun-2012	<b>Download Services with initial operating capability</b>
28-Jun-2012	<b>Transformation Services with initial operating capability</b>
23-Nov-2012	Implementation of Commission Regulation (EU) No 1089/2010 of 23 November 2010 as regards interoperability of spatial data sets and services for <b>Newly collected and extensively restructured Annex I spatial data sets available</b> <b>Today</b>
28-Dec-2012	<b>Download services operational</b>
28-Dec-2012	<b>Transformation services operational</b>
04-Feb-2013	Implementation of Commission Regulation (EU) No 102/2011 of 4 February 2011 as regards interoperability of spatial data sets and services for newly collected and extensively restructured Annex I spatial data sets
19-Apr-2013	Implementation of Regulation as regards the access to spatial data sets and services of the Member States by Community institutions and bodies under harmonised conditions for existing arrangements
03-Dec-2013	<b>Metadata available</b> for spatial data sets and services corresponding to <b>Annex III</b>
October 2015	<b>Newly collected and extensively restructured Annex II and III spatial data sets available</b>
23-Nov-2017	Implementation of Commission Regulation (EU) No 1089/2010 of 23 November 2010 as regards interoperability of <b>spatial data sets and services for other Annex I spatial data sets still in use at the date of adoption</b>
04-Feb-2018	Implementation of Commission Regulation (EU) No 102/2011 of 4 February 2011 as regards interoperability of spatial data sets and services for other Annex I spatial data sets still in use at the date of adoption
October 2020	<b>Other Annex II and III spatial data sets available in accordance with IRs for Annex II and III</b>



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## The wider context – overlapping trends

- **SDI / INSPIRE is not the only ecosystem for providing spatial information**
- **Open Data: “The idea that certain data should be freely available to everyone to use and republish as they wish, without restrictions from copyright, patents or other mechanisms of control.” (Wikipedia)**
  - Expectation: generate innovative solutions and societal/economic added value
  - EU Open Data Strategy part of the Digital Agenda for Europe
  - Expected update of the PSI Directive enforces the provision of public sector data free of charge or at low cost under attractive license terms
  - E.g. Germany adopted a new law for spatial data access, which makes all federal INSPIRE data available as open data



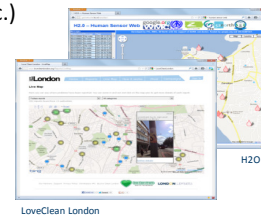
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## The wider context – overlapping trends

- **Open government**
  - Citizens are getting more and more involved into management & planning processes (i.e. they not only consume but also provide information e.g. for urban land-use planning, support management)
- **Sharing & collaboration becomes a widely spread culture**
  - Well known in private spheres (Flickr, facebook etc.)
  - Established in our daily business (Dropbox, CIRCA etc.)
- **Volunteered geographic information (VGI)**
  - VGI becomes a serious competitor for public and commercial products (e.g. Open Street Map)



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## What do we observe?

- **IT is evolving with fast pace – SDI roadmaps can hardly reflect the technological evolution**
  - Limited adaptability
    - Volume of documents in the INSPIRE library: about 15.000 pages (2002-2012)
    - Volume of documents published in the INSPIRE library 2011: about 4.680 pages (Monitoring and Reporting 41, Data and Service Sharing 122, Spatial Data Services 333, Network Services 484, Data Specifications 3700)
  - Examples:
    - Resource oriented architectures (ROA) not reflected yet (although widely being used in Mainstream- and Geo-IT)
    - Up to now no guidelines how to deal with access control and licensing technically



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## What do we observe?

- **SDIs do not support an individual's culture of sharing**
  - Sharing information in an SDI is more an organisational than an individual task
  - SDI development is still very much provider centric
  - No convergence with social media (patterns)
    - Our thinking still: publishing a map = administer a mapping service (or even deploy it), author the map, create and publish metadata



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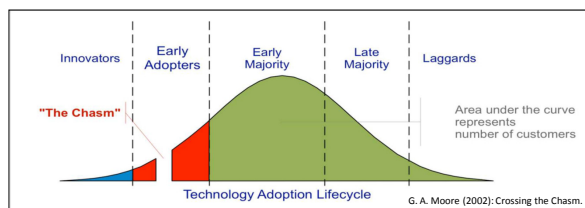


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## What do we observe?

- **Early majority behaves different from early adopters**



- In the early days:
  - Expect real business advantage,
  - ready to be the first mover,
  - accept shortcomings in the product
- Now:
  - Want productivity improvement
  - minimize discontinuity
  - evolution not revolution
  - technology has to work and to integrate appropriately with existing tech base



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## Challenges

- **Continuous improvement**

- Keep track with changing stakeholder's demands
- Adapt the benefits of new Technologies
  - Introduce new architectural styles, lightweight protocols etc. (REST, JSON, ..)
  - Reduce costs for integrating SDI components and for building smart applications
  - Use technology as is – avoid modifications, which need to be implemented by both users and providers
- Design for adaptability
  - Allow partly overlapping IT capabilities instead of exclusive ones (e.g. service interfaces)
  - helps to quickly integrate offerings into existing workflows
  - leads to potential de facto standards, which support the users' real needs



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## Challenges

- **Reflect the new role of user**

- More than 2 billion people getting connected through mobile devices, location based services, smart apps ...
- **Participative platforms** and volunteer geographic information are widely emerging
  - Strengthen the role of individuals / citizens as SDI stakeholders
  - Means for complementing and improving authoritative data
  - Integrate SDI into daily business and workflows



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## Challenges

- **New deployment models**
  - Public sector data centers act more and more as service providers for SDI stakeholders
    - Cost efficiency
    - Guaranteed SLAs
  - Increased provision of multi-tenant solutions and SaaS offerings deployed in private clouds



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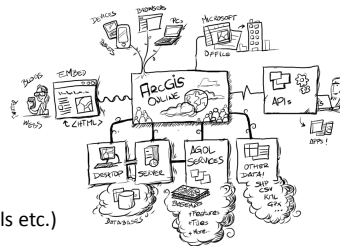


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## Cloud-based Web GIS

- **Ecosystem for sharing and collaboration**
  - Software as a Service
    - provision of end-user applications as a service
  - Platform as a Service
    - provision of middleware
    - Allows the development and deployment of applications and services (APIs, templates, tools etc.)
  - Infrastructure as a Service
    - IT infrastructure as off-premise, on-demand services
  - Open
    - Interoperable services
    - Integration into business systems



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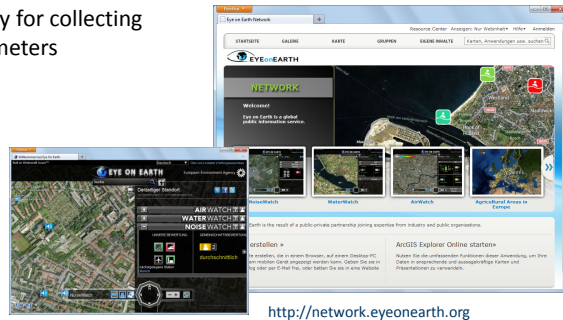
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## Cloud-based Web GIS – An example

- **Eye on Earth**
  - Online service for hosting, sharing and finding environmental data
  - Cooperation of EEA, Esri and Microsoft
  - Promotes Open Data and Citizen Science
  - Building a community for collecting environmental parameters



<http://network.eyearth.org>



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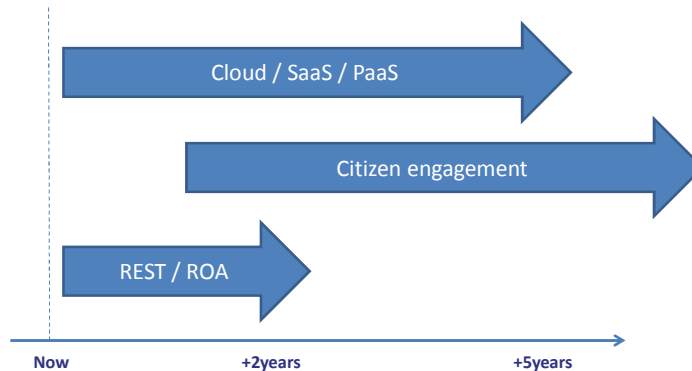
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## When do we benefit?



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## Conclusion

- **SDI / INSPIRE is entering the operational phase and needs to design and organize its adaptability**
  - Simplification and providing alternatives are key to fast adoption of new technologies
- **Reflect the user's culture of sharing and collaboration**
  - Make SDI a part of the daily business
- **It's all about cultivating and engineering**
  - The dynamic complexity of an SDI / INSPIRE requires a design process, which is also about cultivating a self-organizing system than about a straight forward engineering approach



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## We can learn a lot from II design theory

- **Hanseth, O and K. Lytinen (2010): Design theory for dynamic complexity in information infrastructures: the case of building internet.**  
Journal of Information Technology (2010) 25, 1–19. JIT Palgrave Macmillan.



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