The development of NSDI – How to start it?

The View on Number of Challenges and Solutions

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The need to share and integrate data

How to do it?
Efficient, successful, etc.

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How to do it then with help of NSDI?

The best conceptual model for share and integrate is the NSDI

- NSDI – is a broad term for systems that are designed to enable collaboration and wider sharing of spatial data.
- NSDI - enables data to be discovered and used seamlessly and without being tied to one or other GIS product.
- For NSDI best model/guidance is provided by EU INSPIRE Initiative as framework that obliges public sector organisations to:
  - publish key spatial data sets that support the discovery of the data and
  - provide access to these resources via product-neutral visualisation and
  - downloading services.
- The INSIRE themes are defined in 3 Annexes

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But also Data sharing / Data exchange is a fundament by E-government

What is then the difference with NSDI?
### Examples of legal topics

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### Spatial data infrastructure
Approach

1. *Data and its integration is a challenge!*

There are 4 basic principles for a common data integration concept:

1. to respect the legal/institutional independence of stakeholders
2. to use a standardized data modelling concept
3. no logic relations to objects in different topic except through geographic location
4. to use a common geodetic reference framework

2. *Also systems and connectivity is a challenge!*

3. But not only this! - *Even more important is the fundament: proper NSDI Governance model.*

*Do we know:* How much it will cost?; What we will save it? How it will be organised? Who and how will we manage it? Who will finance it? Who will benefit it? What are the CSF? etc., etc.

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NSDI Governance Approach

Based on few principles

1. Cooperation
2. Commitment
3. Ownership
4. Internal and external acceptance

Strategic Planning conform international recognised models (e.g. Kaplan’s Strategy Pyramid) and

Business Planning like European Foundation Quality Management

Strategy pyramid

Why we are here?
Primary function
Permanent assignment

What we wanted to be?
Ambitious shared view of the future
Values and rules of ethical compass

What we have to do, how to realise it
CSF’s and goals
Scenario’s, measures

Results People Resources Structure Culture Chains

Building blocks

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Going for Win – Win

**INSPIRE – the European way of SDI**

*Build data once and use it many times for many applications*

*Integrate distributed providers of data: Cooperative governance*

*‘Place-based management’*

*‘Share costs of data creation and maintenance’*

*Support sustainable economic, social, and environmental development*

**Key thoughts**

- We **need to have data** but we need **learn how to share it**
- We need to have/create the **cooperation & willingness** to do so
- We need to **combine the strengths of various organisations**
- We need to investigate the **advantages of Open data**
- We need to **explore the crowd sourcing possibilities**
- We need to **learn how to define better the end-users needs**
- We need to **learn to be realistic**
- We need to apply the **good guidance/best practices** that should be the rule and not exception:
  - EU Inspire directive
  - FIG- “Fit for purpose principle” – concept
  - **Solid Governance Model.**
Our Technical NSDI Concept is based not only on classical for NSDI Data Bridging contents like:

1. Data
2. Maps
3. Metadata
4. Discovery service
5. View service
6. Download Service but also on Data Sharing Service.

The model is based on a step-wise improvement of the data and services, aiming at increased sharing and linking of data sets. The model consists of the following levels (Inkdroid, 2011):

- Data must be available on the web (whatever format)
- Data must be available as structured data (e.g. shape files instead of image scan)
- Use non-proprietary formats (e.g. csv instead of excel, GML instead of shape files)
- Use URI’s to identify things, so that others can link to your data
- Link your data to other people’s data to provide context

The first 3 levels concerns Data Sharing, while the remaining 2 relates to Institutional Interoperability. Such an interoperability also requires that the data sets are harmonized.

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The present situation is called “The Island situation”: No Data Exchange, No Data Sharing, Very little cooperation

Ministry X

Ministry Y

Relevant Data / services related to:
- Topo maps
- Land Use maps
- Data bases
- Registers

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Relevant Data / services related to:
- Environmental Data
- Administrative maps
- (New) Orthophoto – imaginary
- Etc.

All being part of one government ...
Essential Difference between Data Exchange vs Data Sharing

Organisation 1

Data Exchange: In fact transfer of (copy) full data set (semi ownership transfer) with status on specific Cut-off day

Organisation 2

Data Sharing - Key Register principle: usage of specific small data sets from each other via Web-Services based on specific need. The ownership, responsibility, maintenance remains still by the Owner. Data usage is pre-defined in dedicated agreement conditions.

No ownership change! Nothing to loose!
NSDI concept is realised with help of Web Services - what are these?

Web services are loosely coupled, contracted components that communicate via XML-based interfaces [Schmelzer 2002]

- loosely coupled: they can be changed independently
  - platform independent
- contracted: in and output are publicly available
- components: interface encapsulates the code
- XML-based interfaces: human readable
  - firewall friendly
  - self-describing (allows for discovery of their functionality)

•Examples of GIS Web services:
  • Web map service; Geo-name service; Geo-referencing service;
  Weather data services; Route service; National atlas services;
  • Google maps, Google earth
CSF’s and Key Tasks

CSF’s for services

- **Fast.** The delivery of the service to the recipient shall be fast.
- **High quality.** The provided information shall be correct, relevant, and up-to-date.
- **Flexible.** The service should be customizable to the needs of the customer.
- **Low Cost.** The service should be cheap, that is, provided at a low cost.
- **Convenient.** The service shall be provided with high convenience.
- **Reliable.** The service shall be provided with a consistency, that is, it should be always completed.

Key Tasks

1. Implement Fundamental Datasets
2. Apply and Enforce International Standards
3. Implement a Single National Platform
4. Develop the Private Sector
5. Establish Leadership, Governance and Funding
6. Develop and Implement Legislation, Policies, and Guidelines
7. Build Capacity
8. Communications and Awareness
9. Provide Support for Utilization and Innovation

- Often countries started with establishing Working Groups (WG) dealing with specialized tasks:
  - WG for NSDI Data Sharing
  - WG for linking the programs of NSDI and e-Government
  - WG for NSDI Technical Standards
  - WG for NSDI Capacity Building
  - WG for Construction of the NSDI Business Model
  - WG for NSDI spatial data

- But all countries have started with preparing of Strategic Analyses and Plans usually with help of experienced international experts
Possible steps

A. AS-IS analysis of the present situation regarding the current
   • Institutional structure,
   • Legal framework, Analysing legislation
   • Governance model, incl. mapping the exiting tasks, roles, responsibilities, financing methods, status of National Strategy, organizational structure and resources of NSDI, the exiting users, etc.)
   • Technical aspects (type and format of data, the accuracies, frequency of updates, applied methodologies, processes, used ICT/GIS systems, ICT infrastructure, etc.)

B. Developing TO – BE model – wherein support the NSDI Committee in implementing the national policies for infrastructure program, development of mission, vision, goals and strategies, standards, technical specs, piloting etc. including:
   • Defining target operating model/concept for NSDI
   • Defining target business processes as well as roles and responsibilities in the organizational structure of NSDI
   • Defining target standards of geospatial data
   • Proposing necessary changes in legislation required for successful implementation of the new NSDI
   • Developing the concept of ICT system and required infrastructure, followed by defining requirements for the IT system (specs)

C. Development of Governance for the Geospatial information sector – including:
   • Establishing the roles of supervising, producing, maintaining and disseminating geospatial information,
   • Defining marketing, data sharing and financial plans and budgets of NSDI
   • Development of various Strategic Plans

D. Implementation – including:
   • Capability building and training
   • Developing change management and communication strategy
   • Designing of awareness program for the public sector, private sector, civil society and the general public needs
   • Development of Technical specs, RFP’s, etc.
   • Tendering, Supervision, monitoring the results, Intervention, etc. – then is coming the tendering of data and System but it should not be a first step.

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Example of cost saving from the NL

**Main goal:** “Collect data once use it many times”
Going for Win – Win

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Let’s do it well, not only concerning the data and systems but also based on best governance model and international practices!
Questions?

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Thank you for your attention!

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