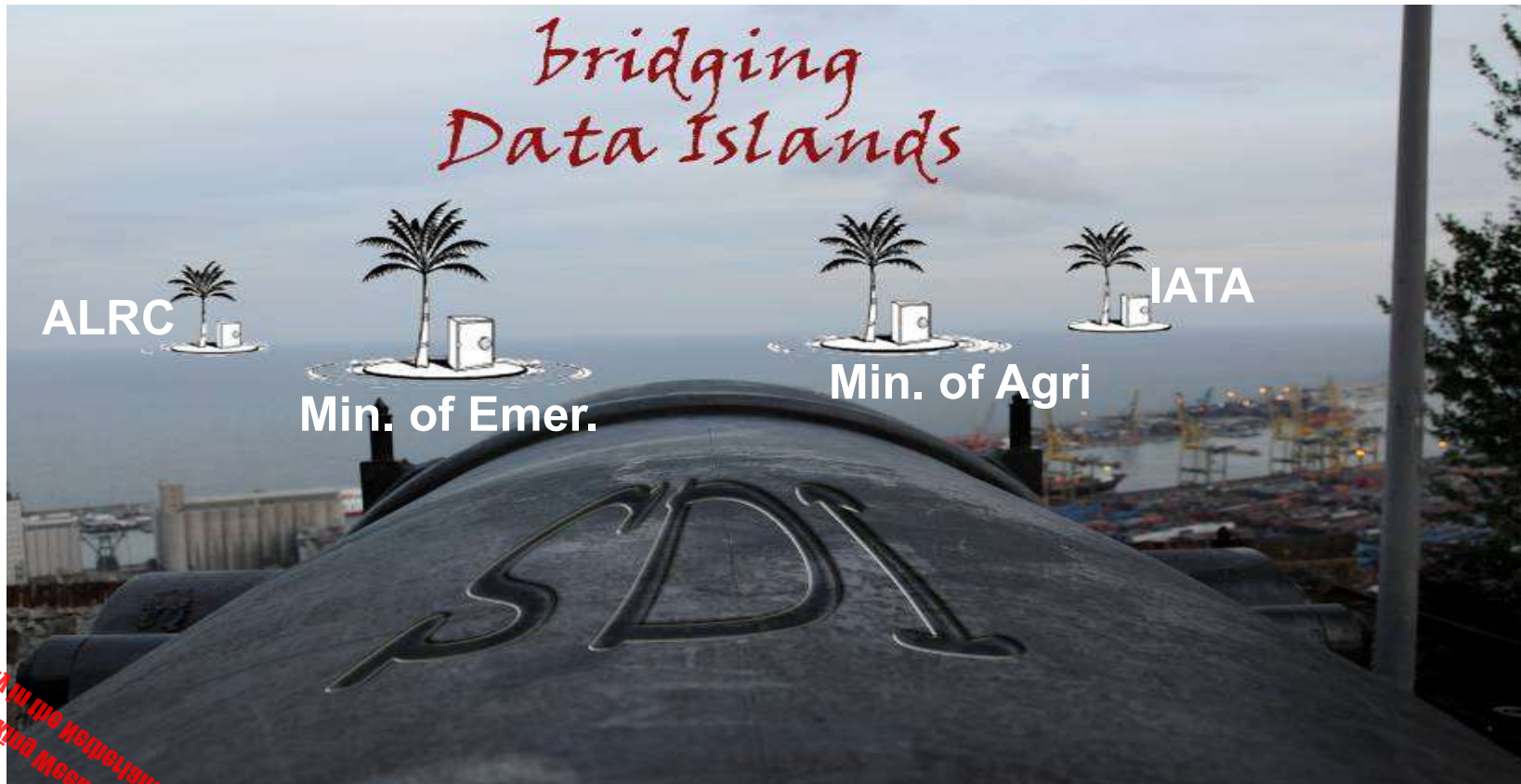


The development of NSDI – How to start it ?



The View on Number of Challenges and Solutions



AKADIS b.v.

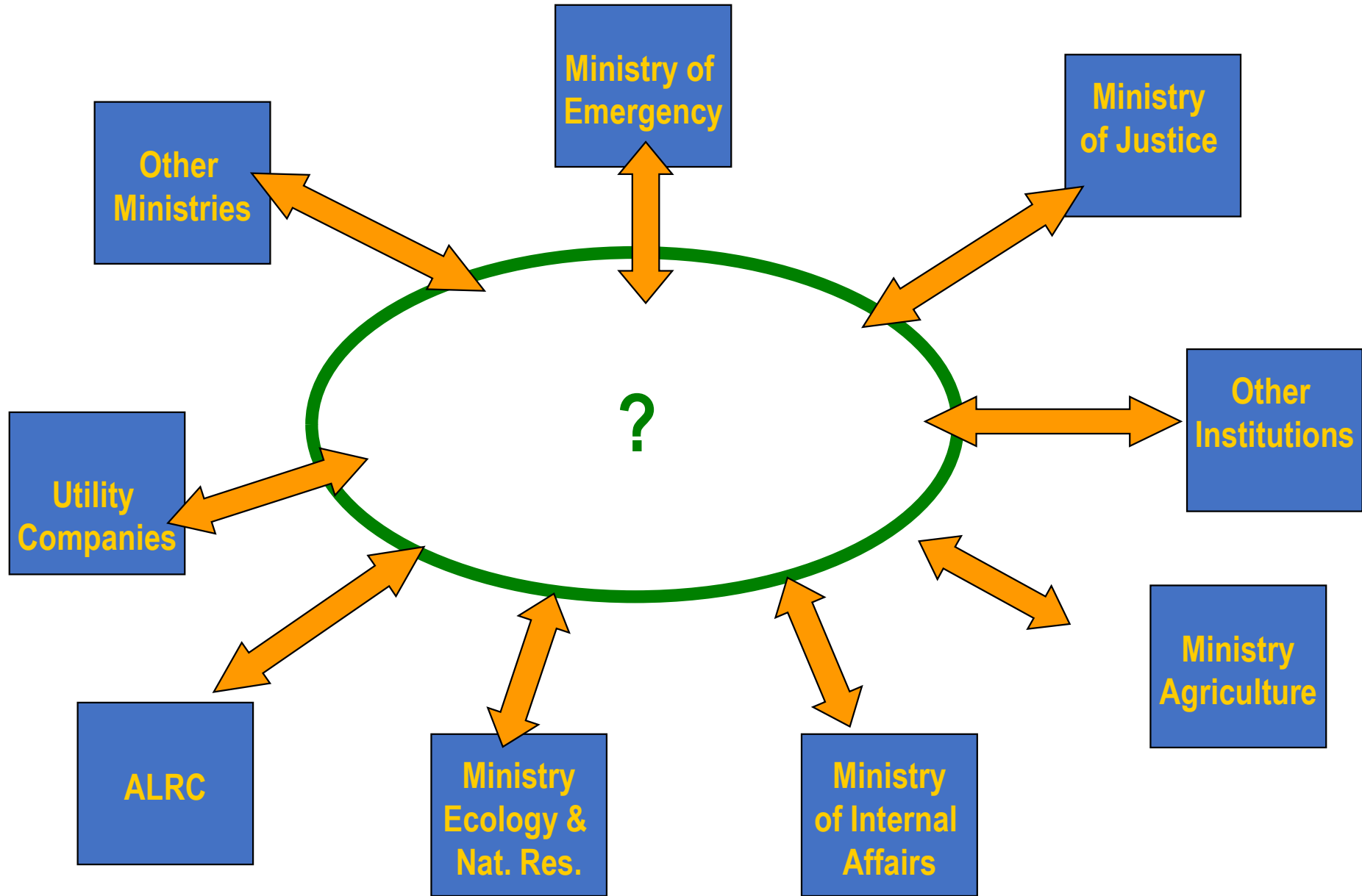


A.A. Kwitowski
The Netherlands



Amsterdam 22-06-2021

The need to share and integrate data



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

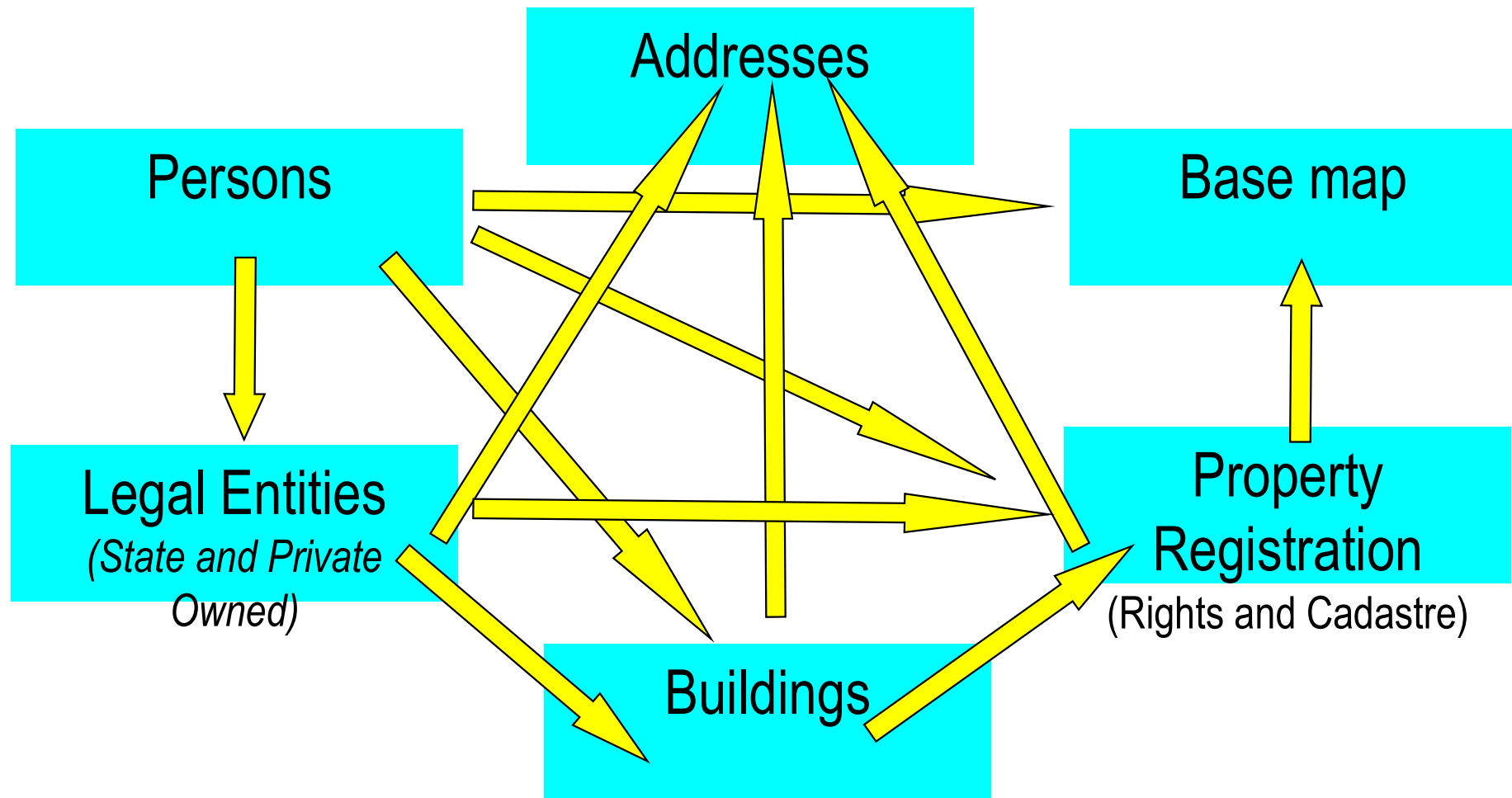


AKADIS b.v.



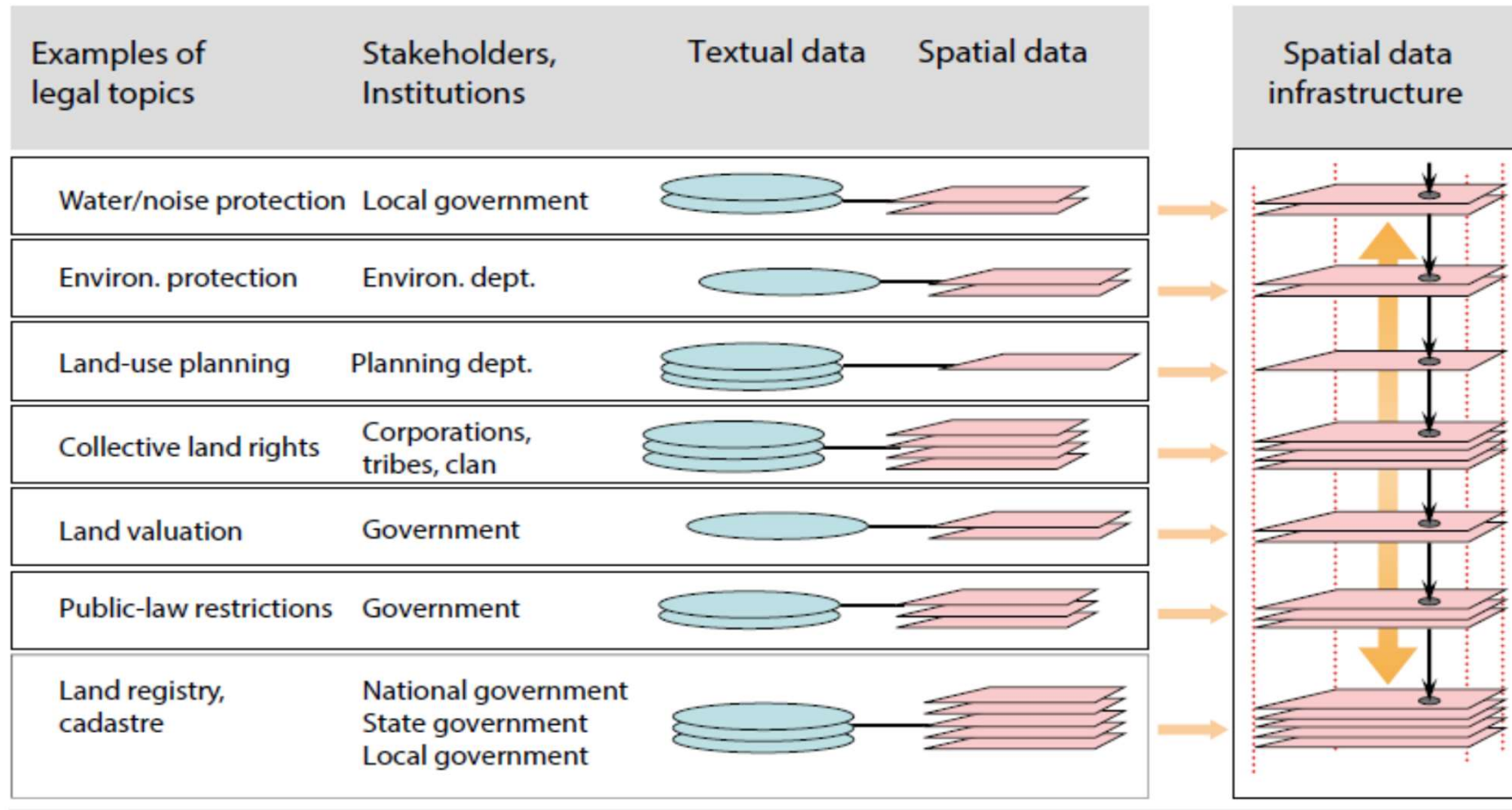
Annex I
Coordinate reference systems
Geographical grid systems
Geographical names
Administrative units
Addresses
Cadastral parcels
Transport networks
Hydrography
Protected sites
Annex II
Elevation
Land cover
Orthoimagery
Geology
Annex III
Statistical units
Buildings
Soil
Land use
Human health and safety
Utility and governmental services
Environmental monitoring facilities
Production and industrial facilities
Agricultural and aquaculture facilities
Population distribution and demography
Area management/restriction/regulation zones and reporting units
Natural risk zones
Atmospheric conditions
Meteorological geographical features
Oceanographic geographical features
Sea regions
Bio-geographical regions
Habitats and biotopes
Species distribution
Energy resources
Mineral resources

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



What is then the difference with NSDI?

E-Government & NSDI



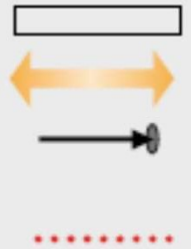
Approach

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

There are 4 basic principles for a common data integration concept

Four 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.



NSDI Governance Approach

Based on few principles

- 1 Cooperation

- 2 Commitment

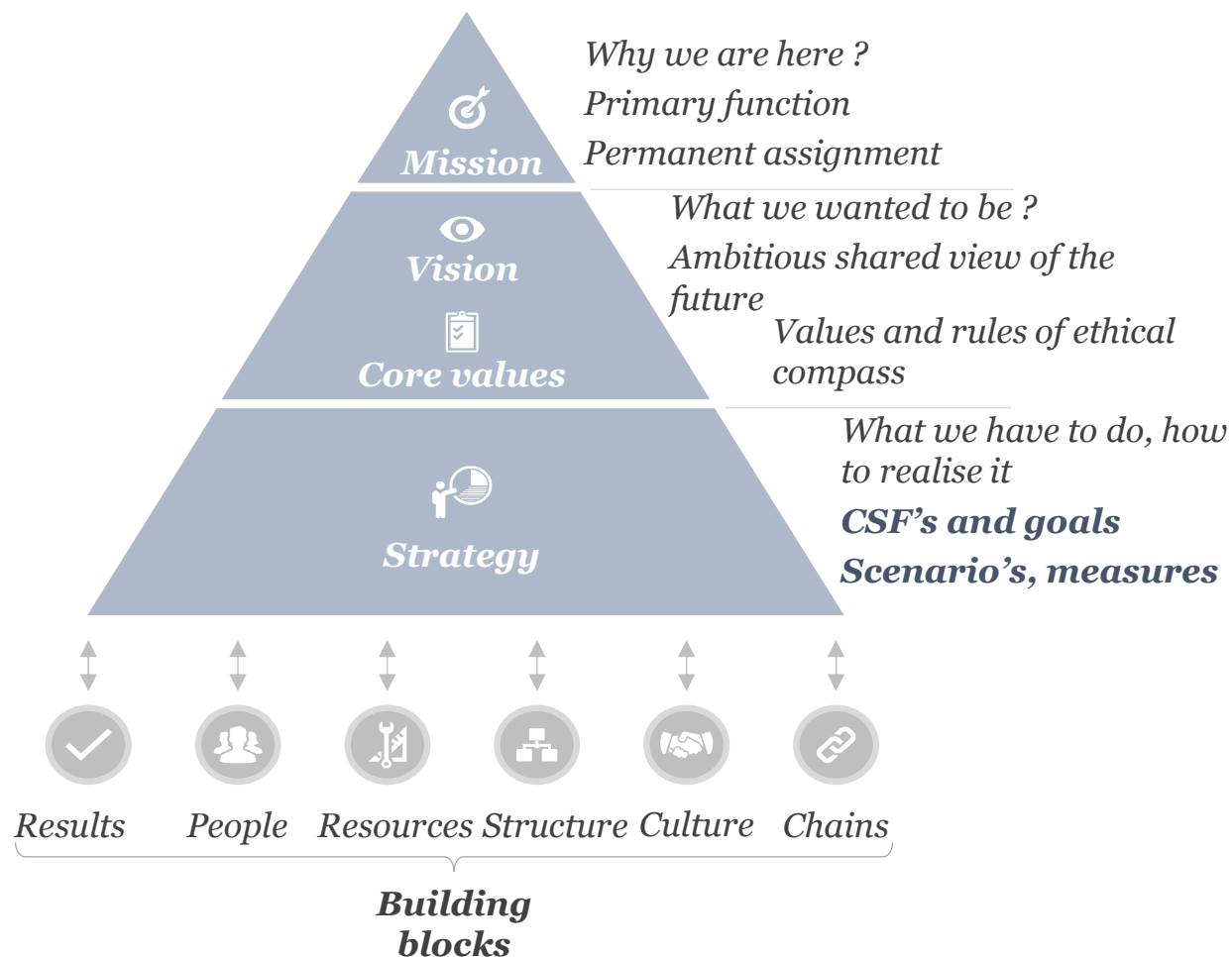
- 3 Ownership

- 4 Internal and external acceptance

- 5 **Strategic Planning** conform international recognised models (e.g. Kaplan's Strategy Pyramid) and

- 6 **Business Planning** like European Foundation Quality Management

Strategy pyramid



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



AKADIS b.v.

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.**

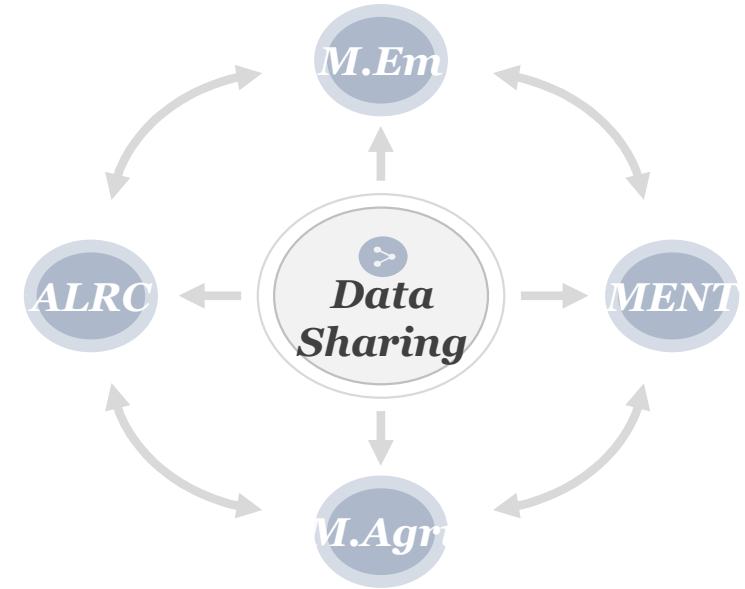
Technical NSDI concepts

NSDI Technical Contents/Components Concept

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.*

NSDI Technical Concept



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.

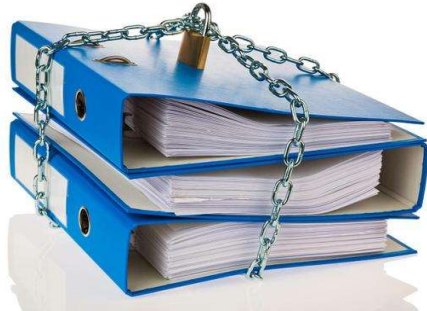


The present situation is called “The Island situation”:

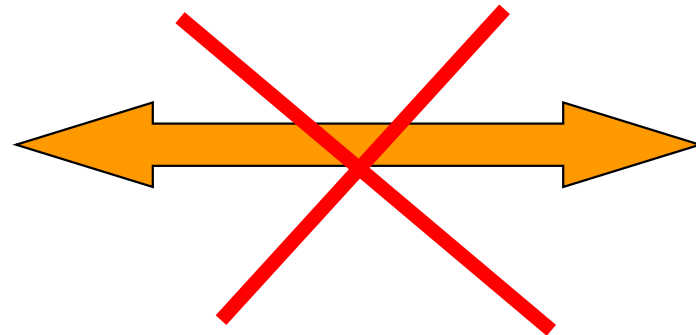
No Data Exchange, No Data Sharing, Very little cooperation

Ministry X

Ministry Y



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



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



AKADIS b.v.

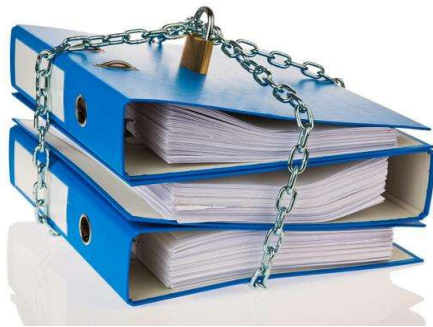
All being part of one government ...Etc.

Essential Difference between Data Exchange vs Data Sharing

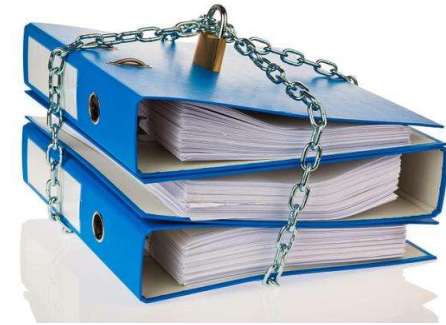
Organisation 1

Organisation 2

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



Transfer Copy of
Data = ownership
change



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 existing tasks, roles, responsibilities, financing methods, status of National Strategy, organizational structure and resources of NSDI, the existing 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.**

Can we start the bridging Data Islands



Example of cost saving from the NL

Main goal: “Collect data once use it many times”

Sluizen
pilot Tiel

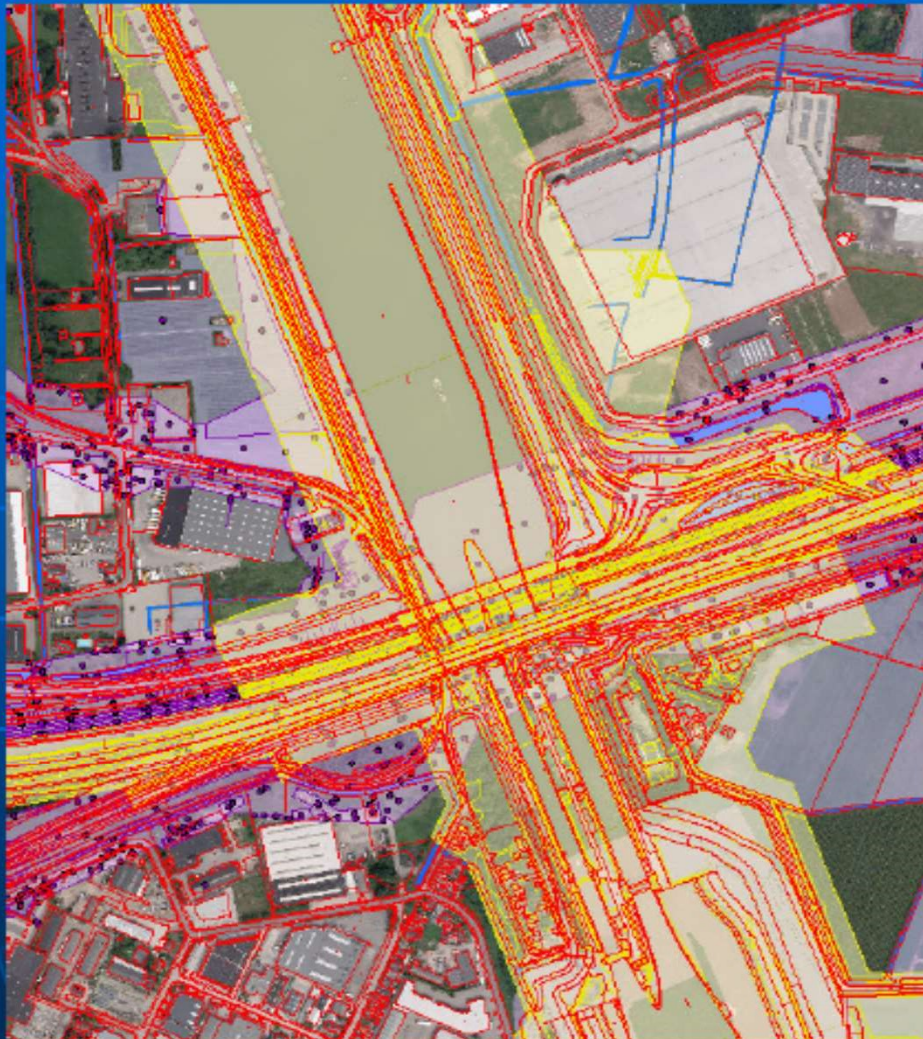
Gemeente

E,L&I

Waterschap

Prorail

RWS



Measurable outcomes

Outcomes	by
• Reduction of Foundation Data duplication	50% reduction in 8-12 months
• Reduction in cost of Foundation Data provision	40% reduction in 2 years
• Increase in number of Geospatially enabled services across government sectors	100% in 2 years
Impact on strategic objectives	
• Improvement of public sector services	High
• Improving Efficiency	High
• Creating more Jobs for Saudis	Medium
• Diversification of the Economy	High

Going for Win – Win



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.



Why not build then NSDI in AZ?

- 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



AKADIS b.v.

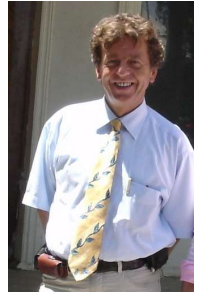
Let's do it well, not only concerning the data and systems but also based on best **governance model** and international practices !

Questions?

Contact info:

A.A. Kwitowski

- andre.kwitowski@telfort.nl
- Tel. (+31)651553658



Thank you for your attention !

