Henan University, Kaifeng.
December 1st. 2013

GEO INFO STRATEGY IN BIG DATA ERA

Milan Konecny
Masaryk University, Brno,
Henan University, Kaifeng????
Czech Republic

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500 km
AÇORES (P)
MADEIRA (P)
CANARIAS (E)
GUADELOUPE (F)
MARTINIQUE (F)
RÉUNION (F)
Paramaribo
SURINAME
GUYANE (F)
BRASIL
Reykjavík
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SVERIGE
SUOMI
FINLAND
NORGE
Oslo
Stockholm
Helsinki
Helsingfors
Tallinn
EESTI
Rīga
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Moskva
RUSSIJA
LIETUVA
Vilnius
Minsk
BELARUS'
UNITED KINGDOM
IRELAND
ÉIRE
Dublin
Baile Átha Cliath
DANMARK
København
NEDERLAND
Amsterdam
London
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POLSKA
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BELGIË
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Budapest
MOLDOVA
Chișinău
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LIECHTENSTEIN
ÖSTERREICH
Bern
MAGYARORSZÁG
SLOVENIJA
Ljubljana
Zagreb
HRVATSKA
ROMÂNIA
SAKARTVELO
Tbilisi
AZƏRBAYCAN
BOSNA I HERCEGOVINA
Sarajevo
Beograd
București
HAÏASTAN
Yerevan
PORTUGAL
ANDORRA
MONACO
SAN MARINO
SRBIJA I CRNA GORA
BĂLGARIJA
Sofija
Madrid
Lisboa
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ITALIA
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IRAN
Tiranë
PORANEŠNA JUGOSLOVENSKA REPUBLIKA MAKEDONIJA
SHQIPËRIA
Ankara
TÜRKİYE
ΕΛΛΑΔΑ-ELLADA
Athinai
Rabat
Alger
Tunis
IRAQ
SOURIYA
ΚΥΠΡΟΣ
KYPROS
KIBRIS
Λευκωσία
Lefkosia
Lefkosa
LIBNAN
Beyrouth
Dimashq
EL MAGHREB
EL DJAZÂIR
TOUNIS
Valletta
MALTA

Main catchment areas of the Czech Republic:
Labe (Elbe) - Vltava (Moldau) - Morava - Odra (Oder)

Praha – Vltava river

PRAHA – capital of Czech Rep.

57 districts

- **Area** 496 km^2
- **Amount of Inhabitants** 1,16 mil

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CONTENT

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2. What is it Geo Info Strategy and why we need it?
3. Where we are now?
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5. Spatially-Enabled Society
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7. Conclusions

1. Big Data: USA and EU

Obama Administration Releases Historic Open Data Rules to Enhance Government Efficiency and Fuel Economic Growth

- groundbreaking new steps to make information generated and stored by the Federal Government more open and accessible to innovators and the public, to fuel entrepreneurship and economic growth while increasing government transparency and efficiency.

President Obama said:

“One of the things we’re doing to fuel more private sector innovation and discovery is to make vast amounts of America’s data open and easy to access for the first time in history. And talented entrepreneurs are doing some pretty amazing things with it.”

“Starting today, we’re making even more government data available online, which will help launch even more new startups. And we’re making it easier for people to find the data and use it, so that entrepreneurs can build products and services we haven’t even imagined yet.”

European Union

Big Data is an emerging field where innovative technology offers alternatives to resolve the inherent problems that appear when working with huge amounts of data, providing new ways to reuse and extract value from information.

Three main dimensions characterize Big Data: huge variety of data format, often time-sensitive and large.

Big Data offers tremendous untapped potential value for many sectors but no specific intelligent-large-data-handling/brokering industrial sector exists.

2. What is it Geo Info Strategy and why we need it?

GeoInfoStrategy:

Complex system ensuring management of spatial (geographic) data and information and,

contemporary defining the position, tasks, methods of realization and specifications of geospatial community in the very wide ICT stream (visualization, standardisation, georeferencicing, object classifications,….)

Geo Info strategy of Czech Rep. should be based on 4 principles (Konečný, 2009)

Management:
Design of management structure necessary for optimization of the benefits of geospatial resources paid by the government.

Data:
to collect, maintain and protect fundamental (priority) geospatial datasets and create directives for non-fundamental (other) geospatial data.

Access:
ensure that geospatial information and services paid by the state were easily available , accesible, and evaluable;

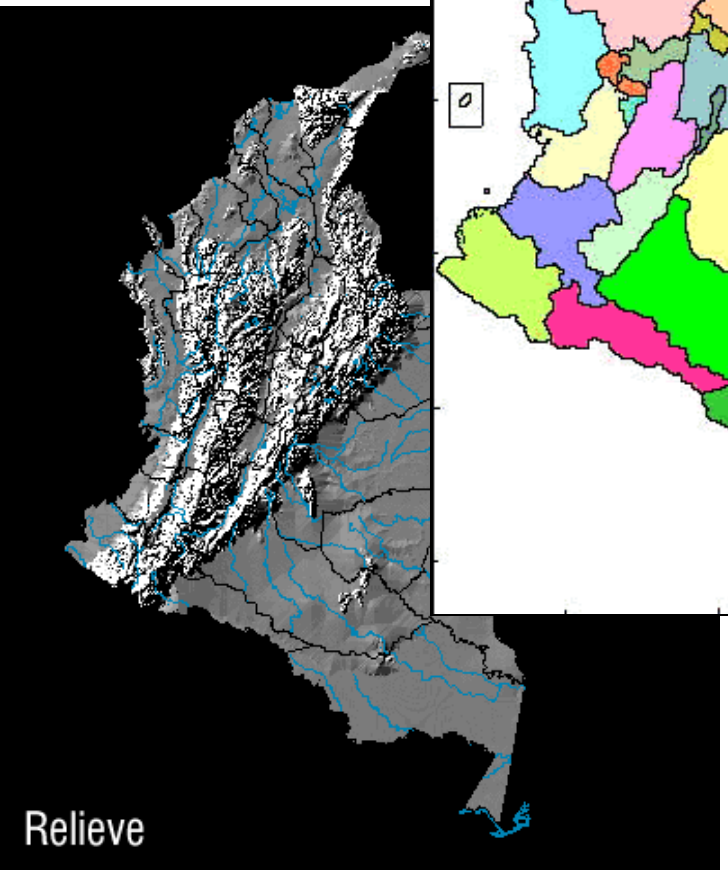
Interoperabilita:
Ministry of Interior should ensure continuity of Geospatial Strategy for the development of strategic plans in information, knowledge - based society.

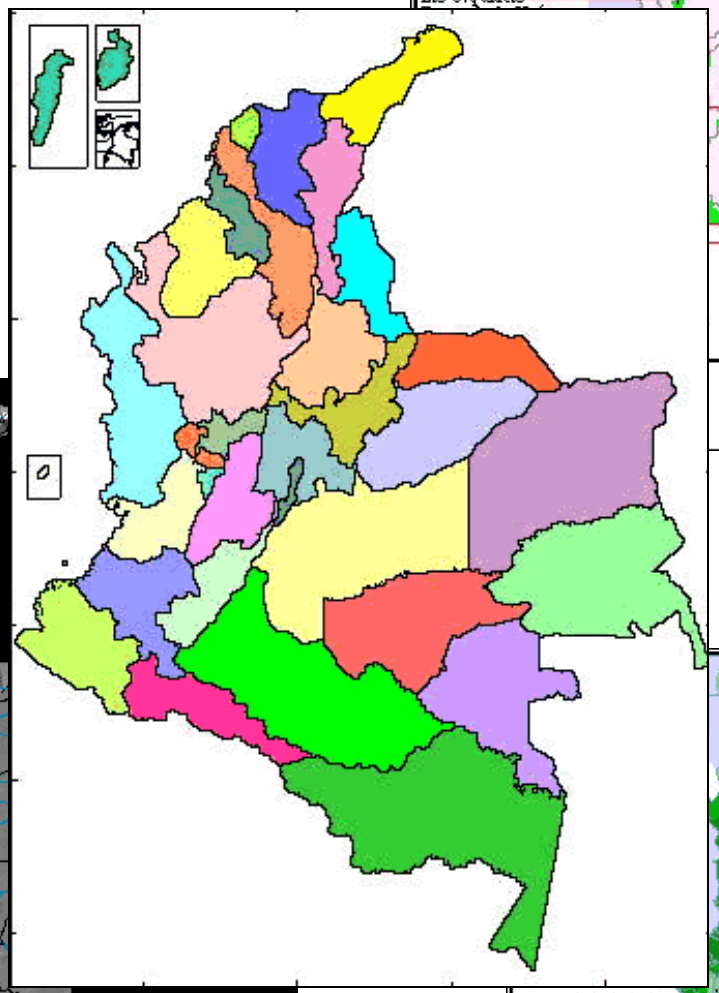
Creating a panel led by non-political expert.

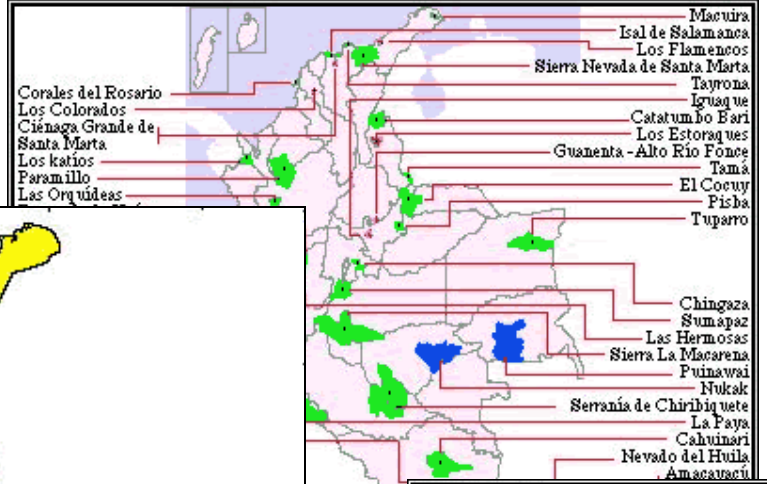
Ensure the sustainability of the processes in the GI **regardless of political changes.**

3. Where we are now?

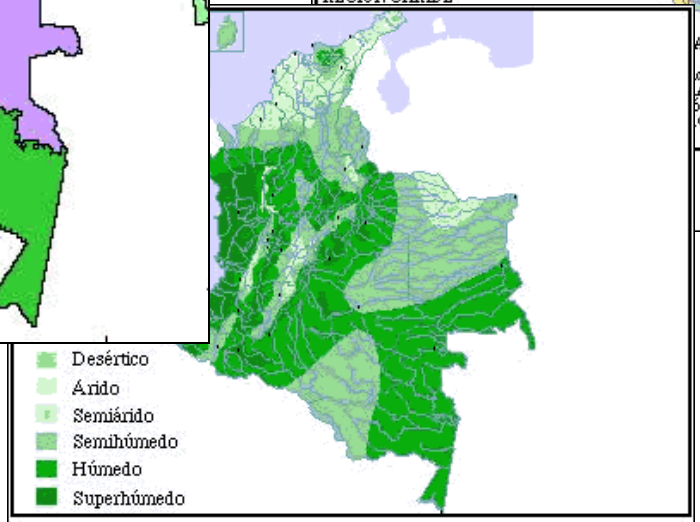
- Global Mapping
- GMES and INSPIRE: step ahead than GOOGLE, offering data (not only showing)
- GEO, GEOSS
- Digital Earth (Annoni and JRC)
- Concepts and strategies (Spatial-Enabled Society, e-Government, ….)
- But also privacy data problems







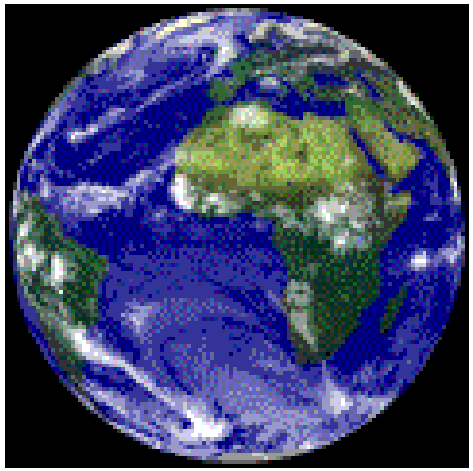
Regiones geográficas



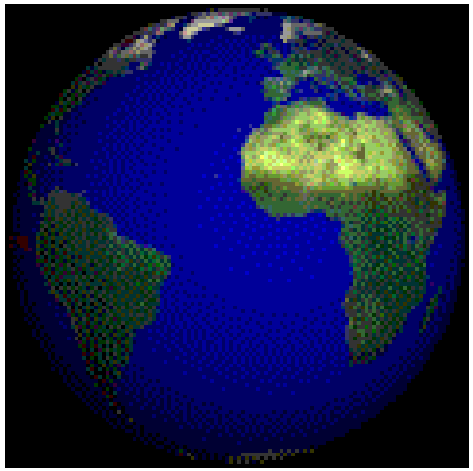
Colombia

Zonificación climática
Según el sistema de clasificación LANG

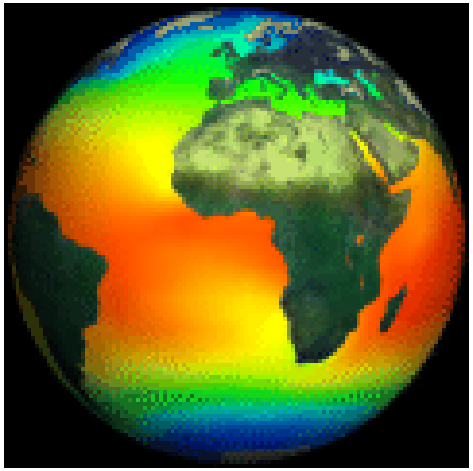
Understanding Digital Earth



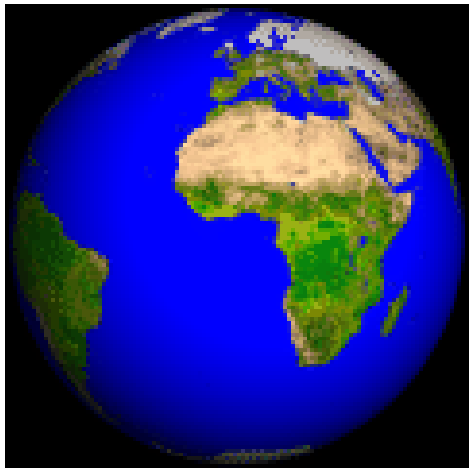
Cloud



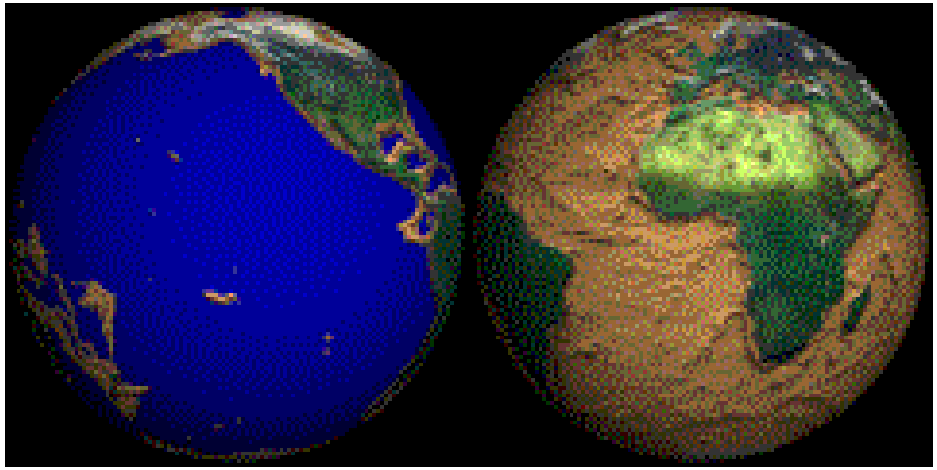
El Nino



Sea water temperature

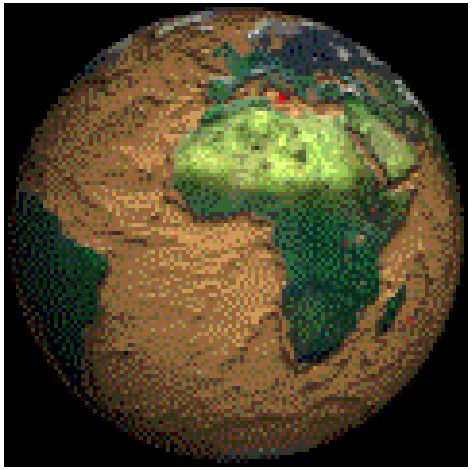


Vegetation



Earth Surface

Earthquake

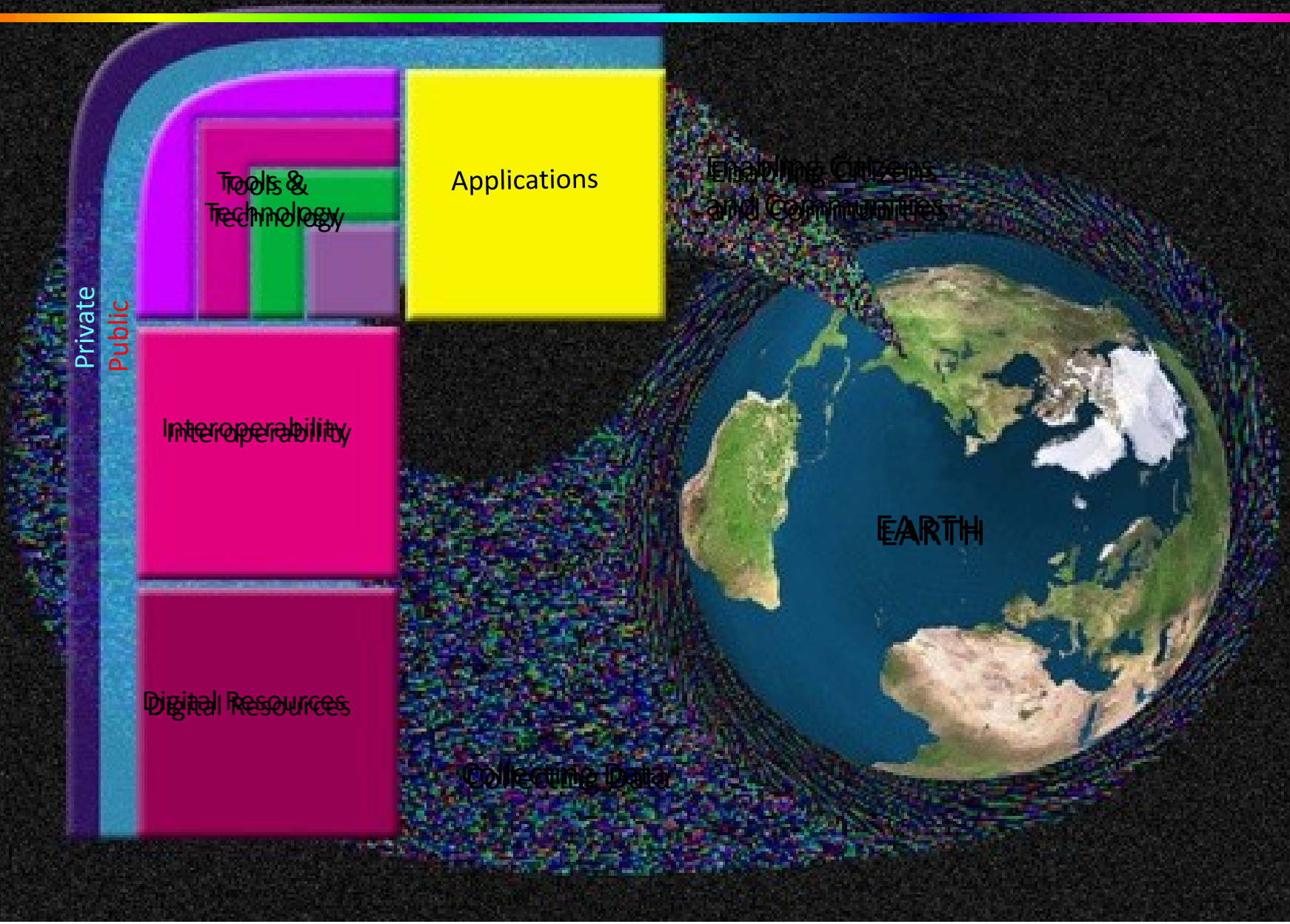


Volcano

Plate Boundary

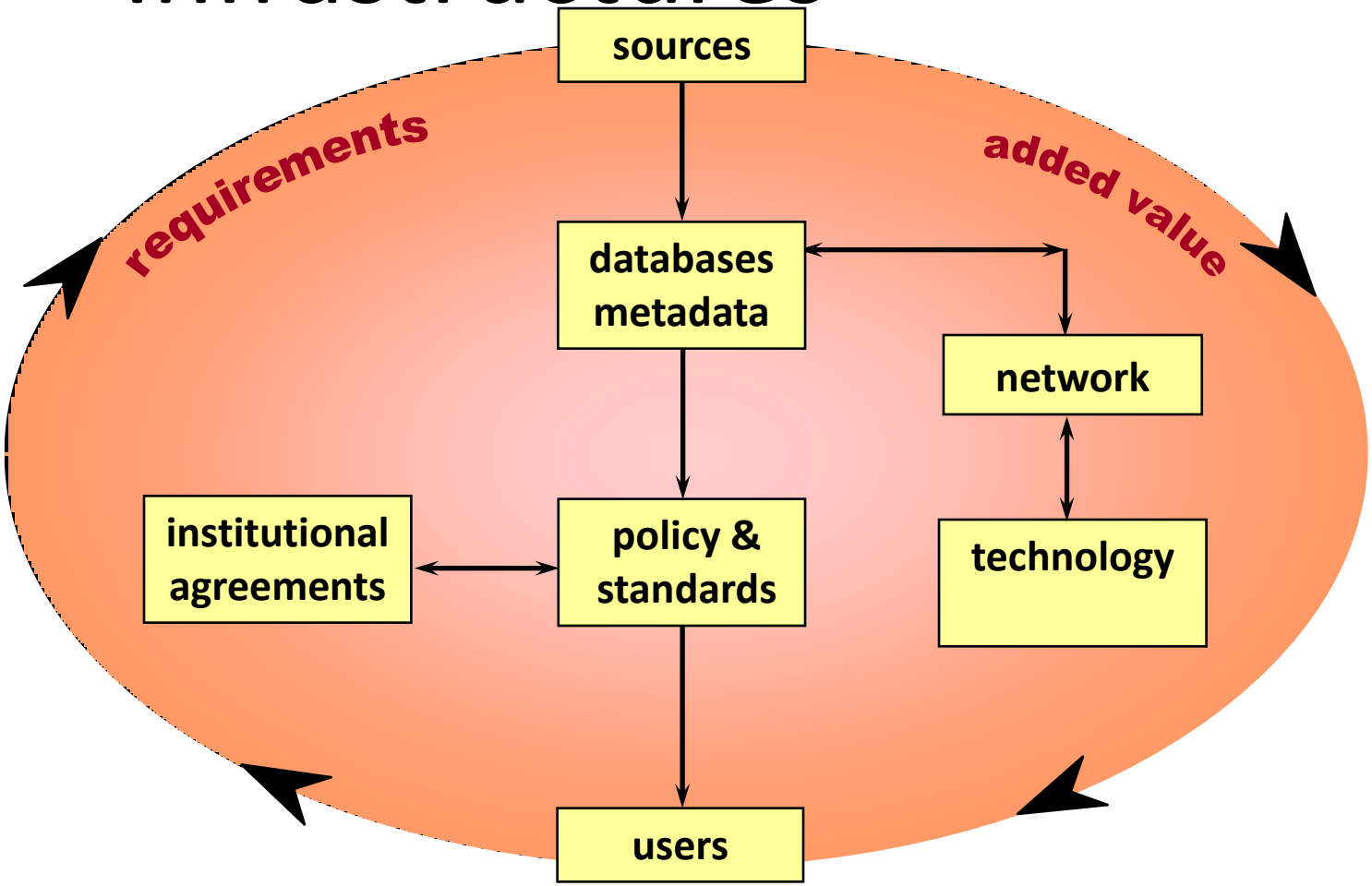
(http://www.nasm.si.edu/EarthToday)

Understanding Digital Earth



4. Spatial Data Infrastructure Concepts

Spatial Data Infrastructures



The term *Spatial Data Infrastructure (SDI)* is used to *encapsulate the technologies, policies, institutional arrangements, financial and human resources that facilitate the availability, access and effective usage of geographic data.*

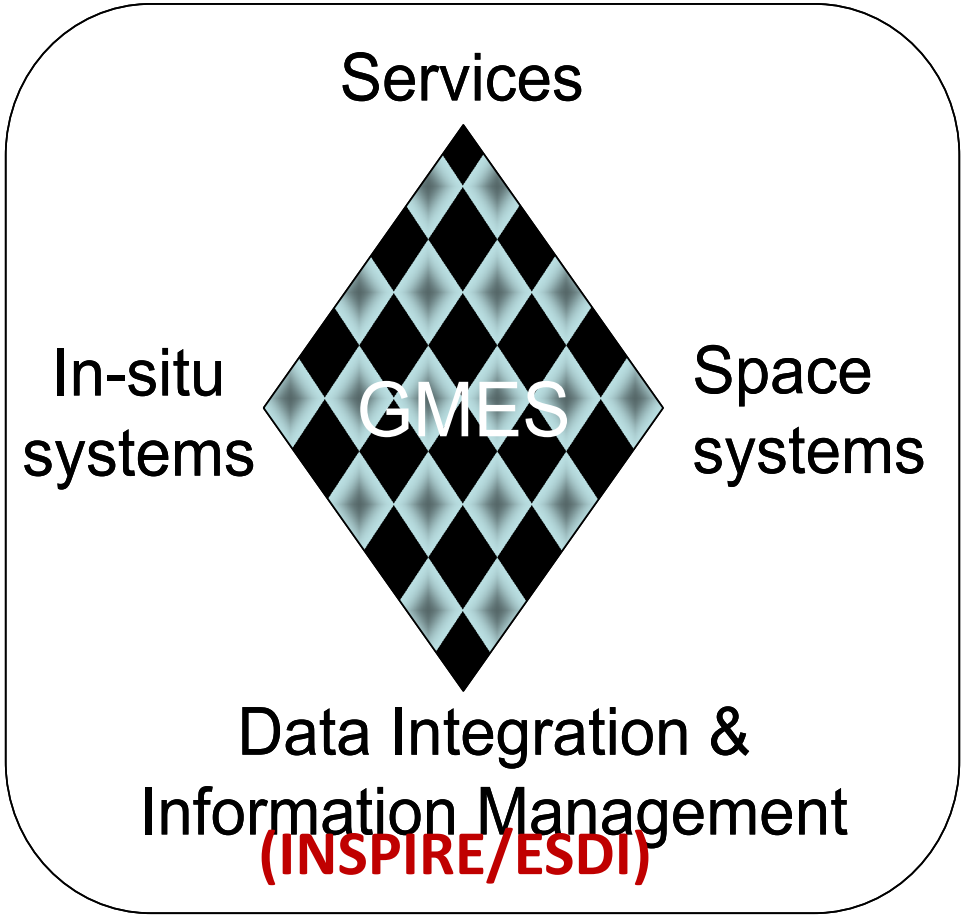
The SDI provides the means for *discovery, access and application* of spatial data for policy-makers, planners and managers, citizens and their organizations.

SDI technologies consist of *a set of data services* that provide geographic data and their attributes.

Services and data are documented with *meta-data* which that subsequently offer the means

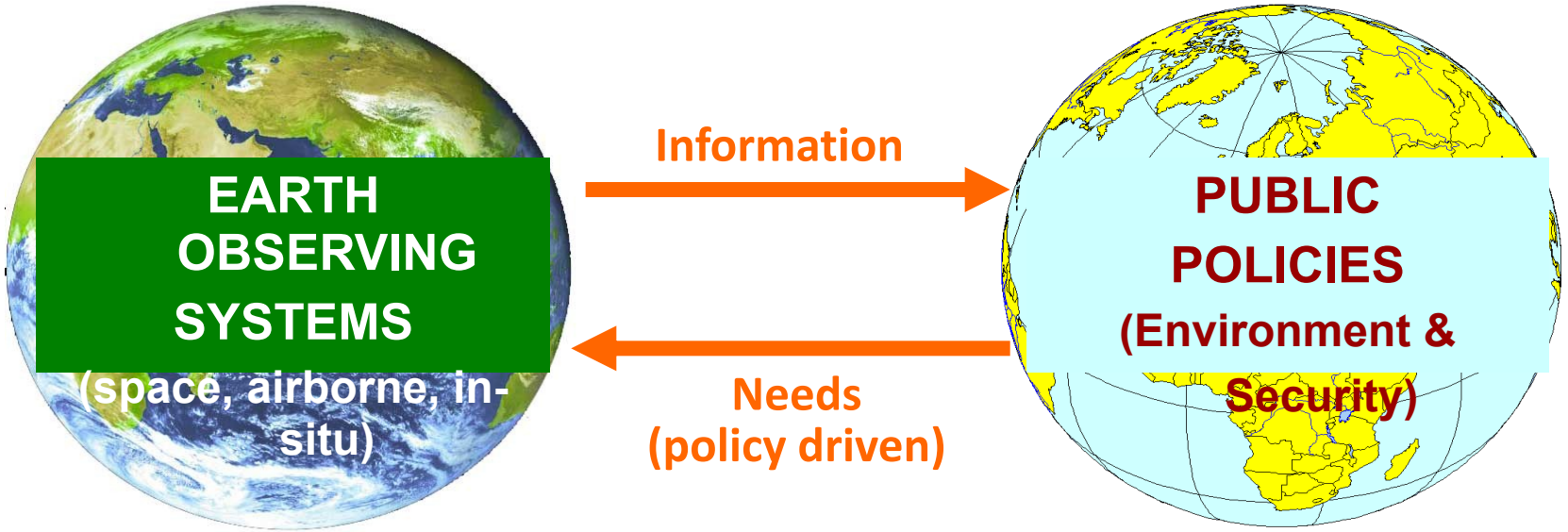
to discover, visualise and evaluate the data through the Web. Additionally, methods are provided to access the data. Applications are built to solve specific needs on the data service layer.

Global Monitoring for Environment and Security



Overall GMES objectives

to provide information services to policy-makers and other users

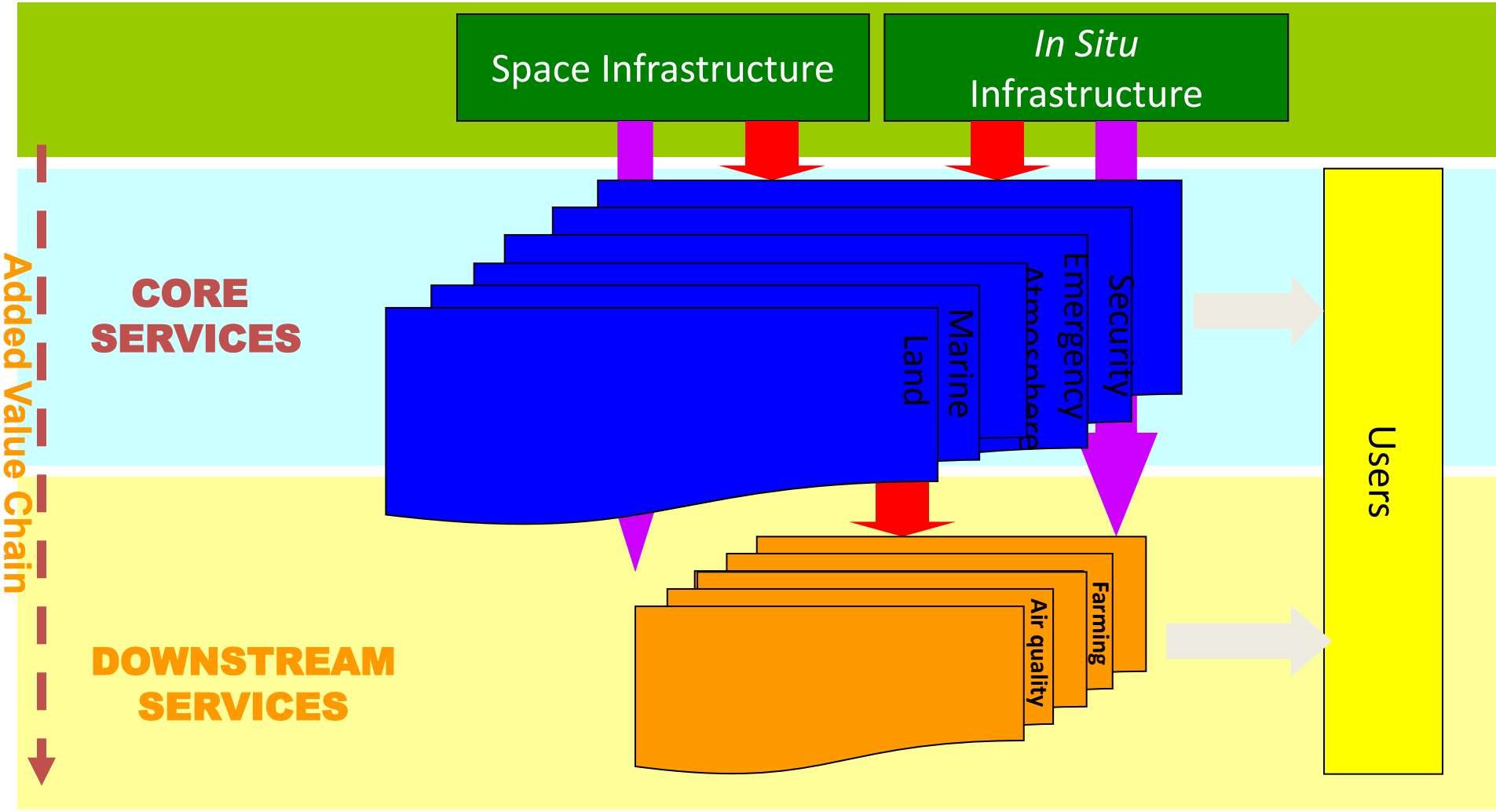


Space Agencies
In-situ Observing systems
Scientific Community
EO Value Adding Industry

National Governments and Agencies
European Union Institutions
Inter-Governmental Organisations (IGOs)
Non Governmental Organisations (NGOs)

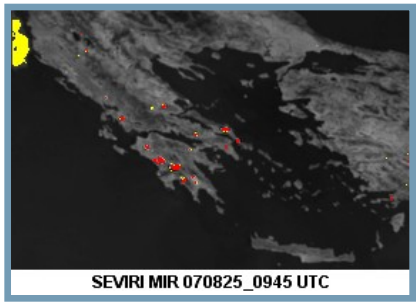
Virginia PUZZOLO, EC DG Enterprise-GMES
Burreau, Prague Symposium, 2009

Overall architecture



Four main types of products:

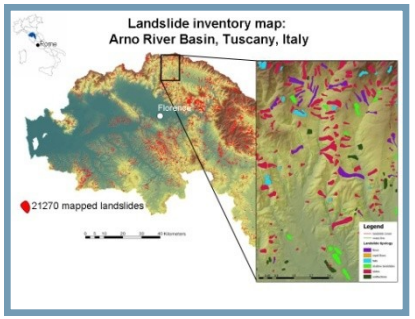
Early warning



Reference maps

Assessment maps

Thematic maps

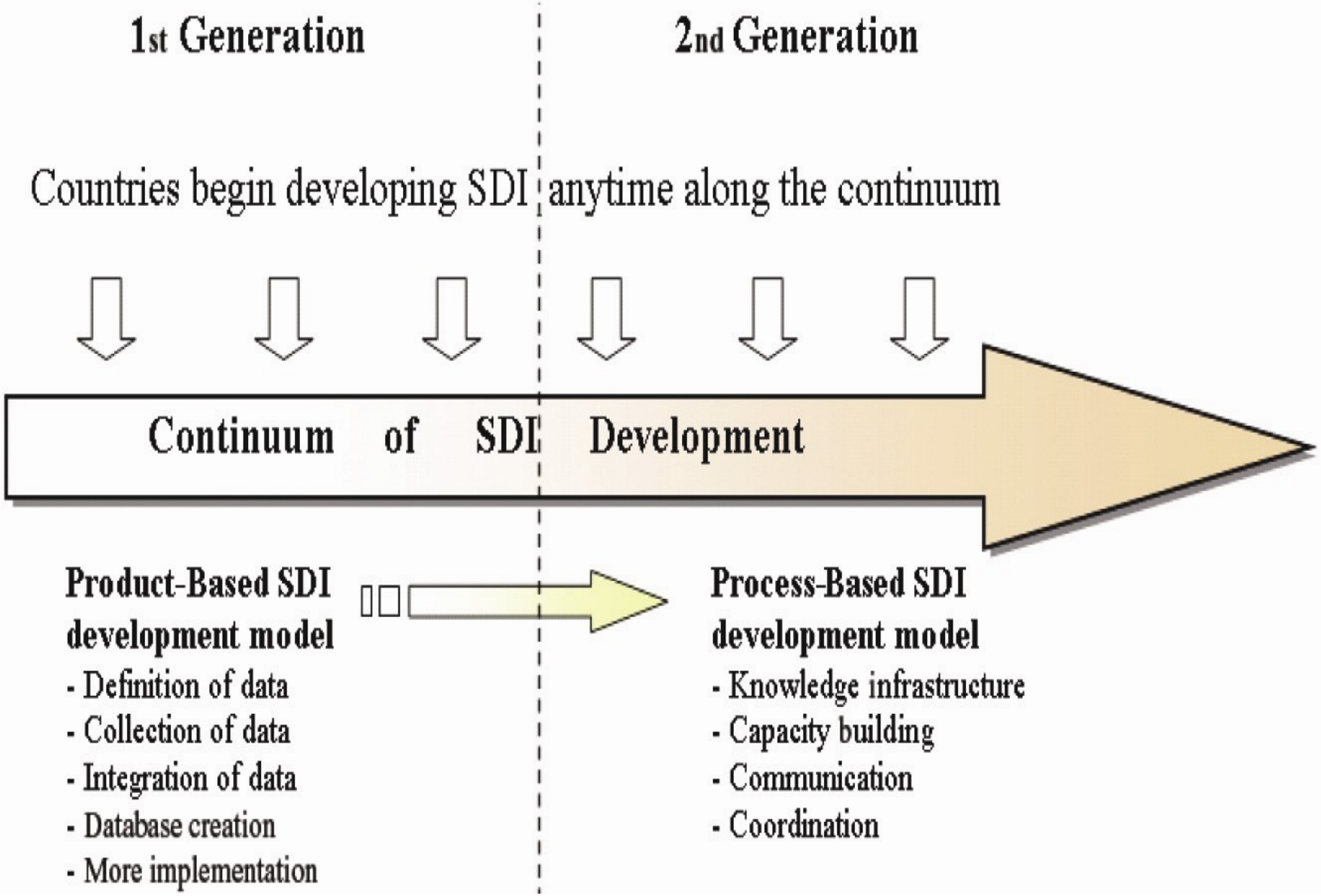


For headquarters, decision-makers and in-field operatives In Europe and worldwide

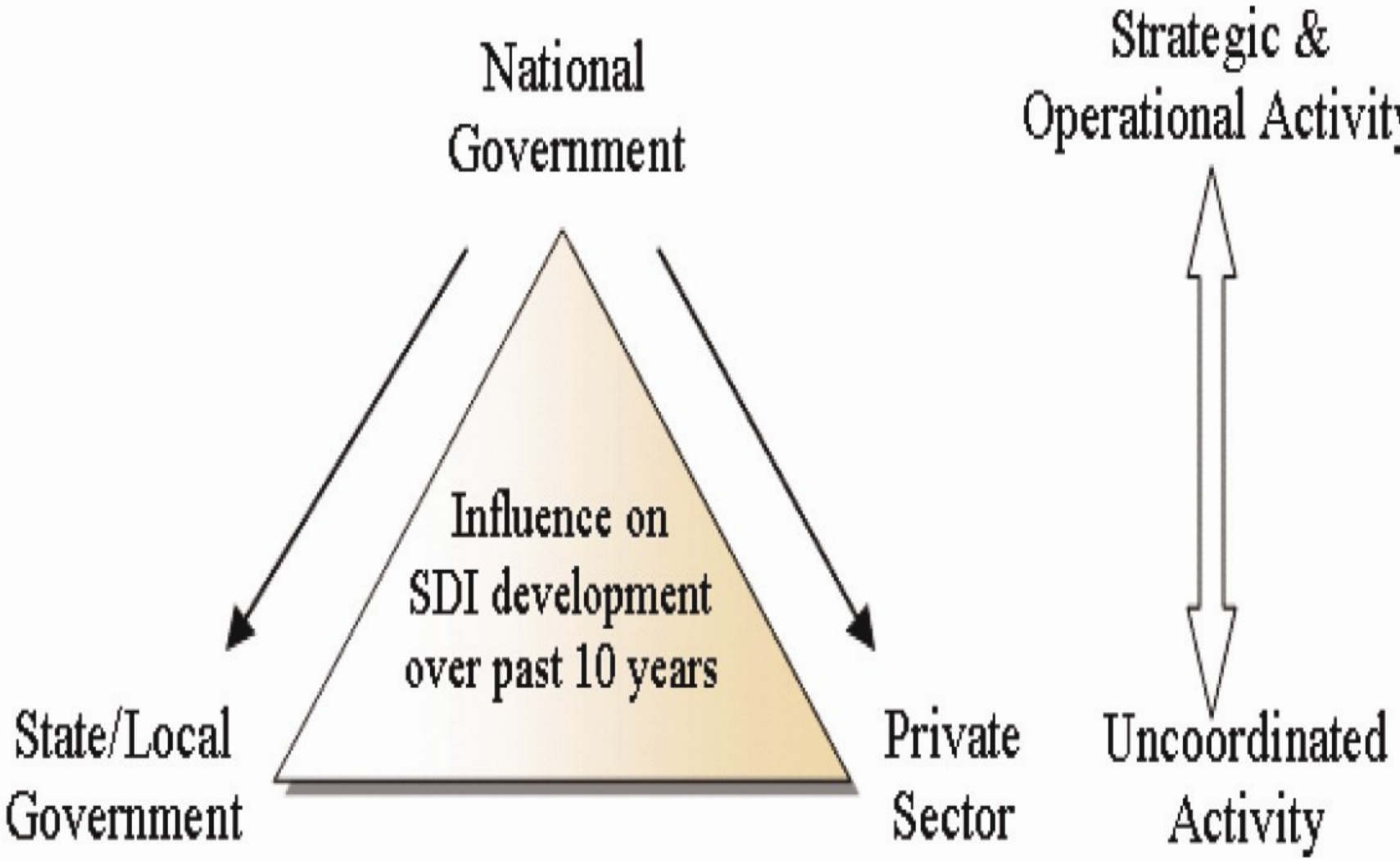
ERCS 1st priority

Rapid mapping on demand in case of humanitarian crises, natural disasters, and man-made emergency situations within & outside Europe

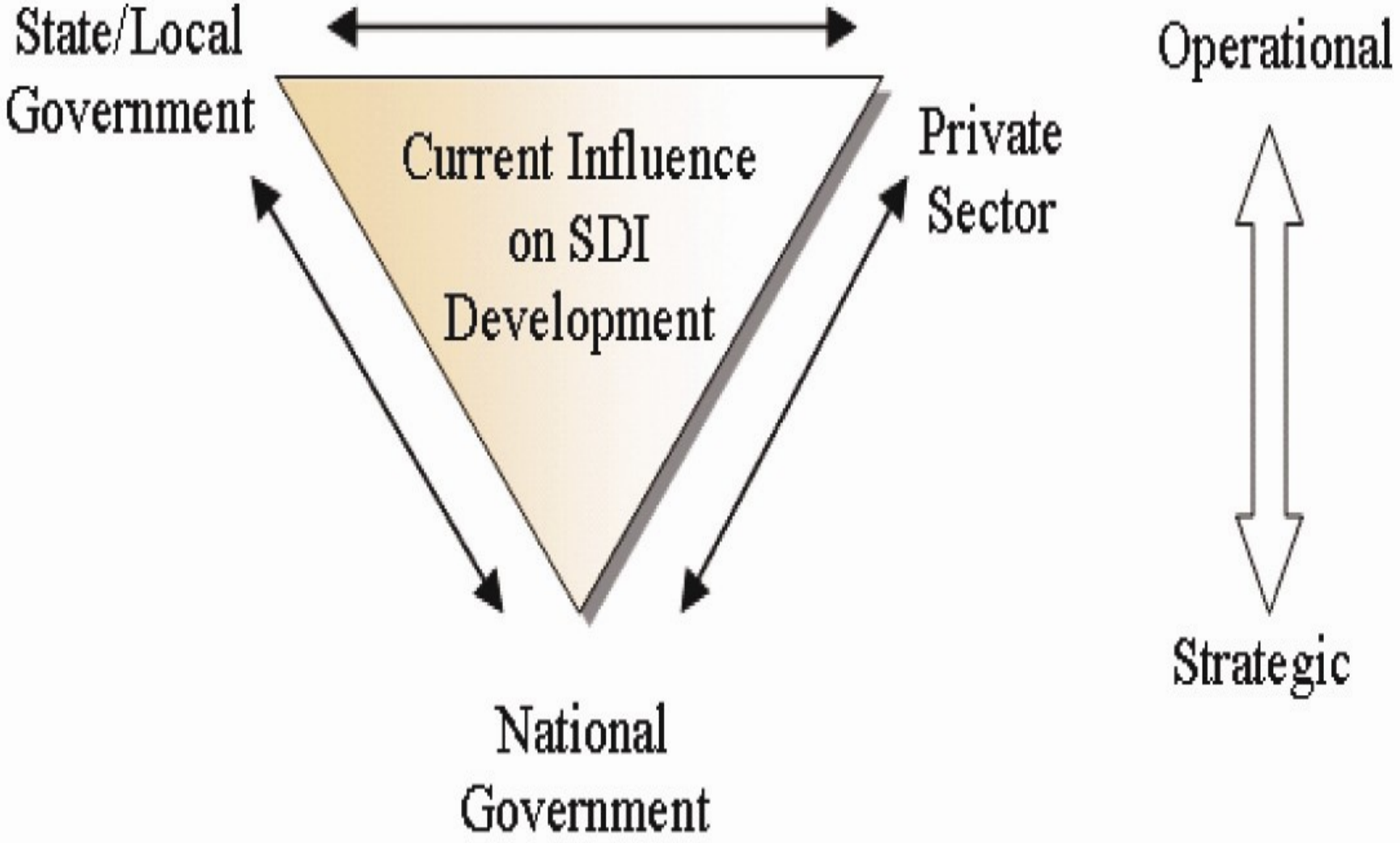
- **Reference maps** available within 6 hours over crisis area
- **Damage assessment maps** available within 24 hours & daily updated
- **Situation maps and forecasts** of evolution of situations within the few days-weeks after crisis



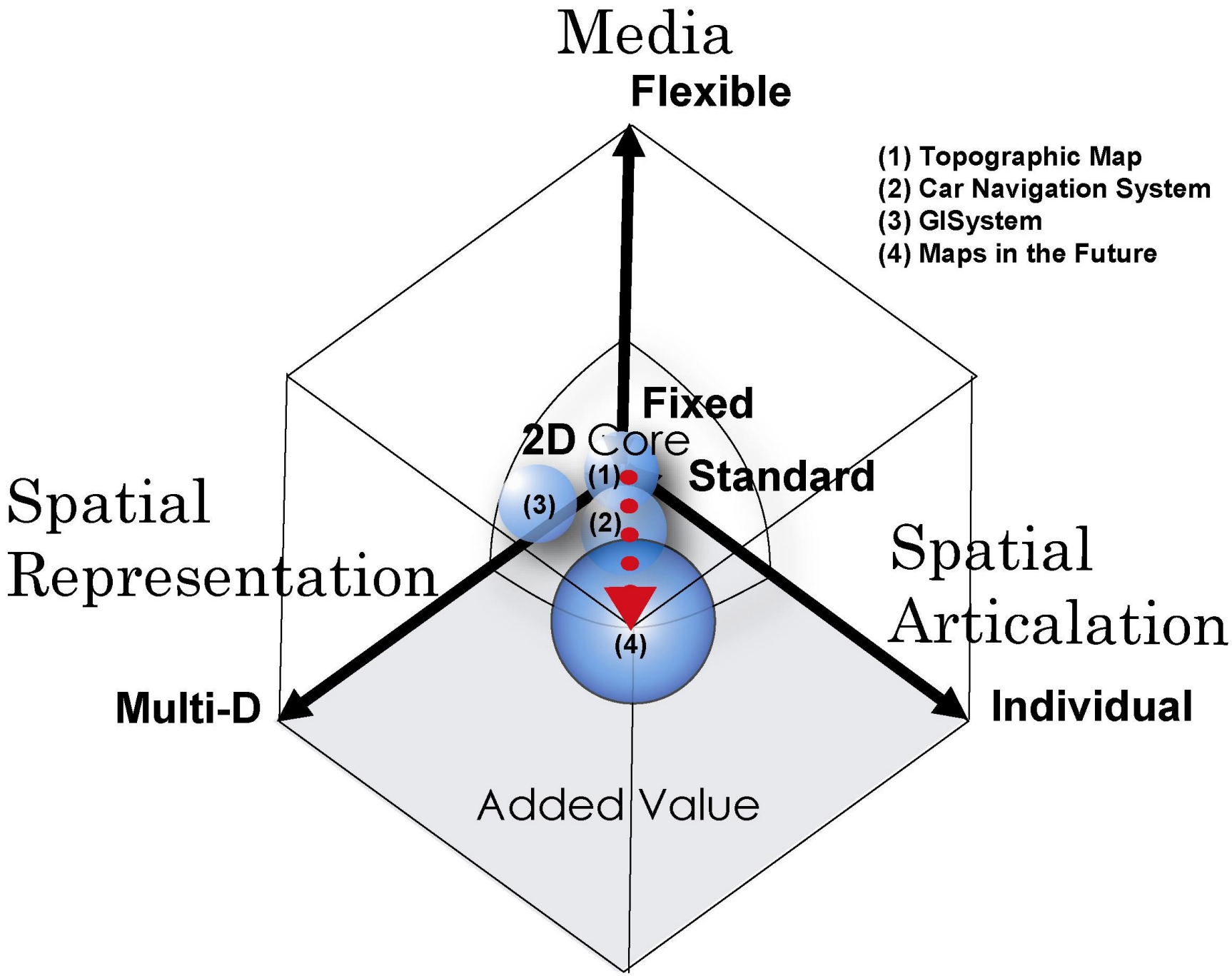
Relationship between the first and second generations of SDIs.
(by Williamson Rajabifard, Binns, 2007, reprinted from Rajabifard at al.2006 with permission of the International Journal of GIS)



Roles of national governments, subnational governments and the private sector in SDI development over the part decade.(by Williamson Rajabifard, Binns, 2007 reprinted from Rajabifard at al.2006 with permission of the International Journal of GIS)



Current roles of national governments, subnational governments, and the private sector in SDI development (by Williamson Rajabifard, Binns, 2007, reprinted from Rajabifard at al.2006 with permission of the International Journal of GIS).


Media
Flexible
(1) Topographic Map
(2) Car Navigation System
(3) GISystem
(4) Maps in the Future
Fixed
2D Core
Standard
(1)
(2)
(3)
(4)
Spatial Representation
Multi-D
Spatial Articalation
Individual
Added Value

5. Spatially-Enabled Society

Australian Government, Ministerial Online and Communications Council

8 September, 2006

"…spatially-enabled government is an exciting area for government. Spatially-enabled government uses place or location to manage and integrate government services and enhance business opportunities."

The Hon Gary Nairn MP, Special Minister for State, Australian Government

The answer: Provide the systems and people use them!!!

Consider: Google Earth merging with built and environment data. This unleashes the power of both technologies …

+

=

emergency response, taxation assessment, environmental monitoring and conservation, economic planning and assessment, social services planning, infrastructure planning, etc, etc

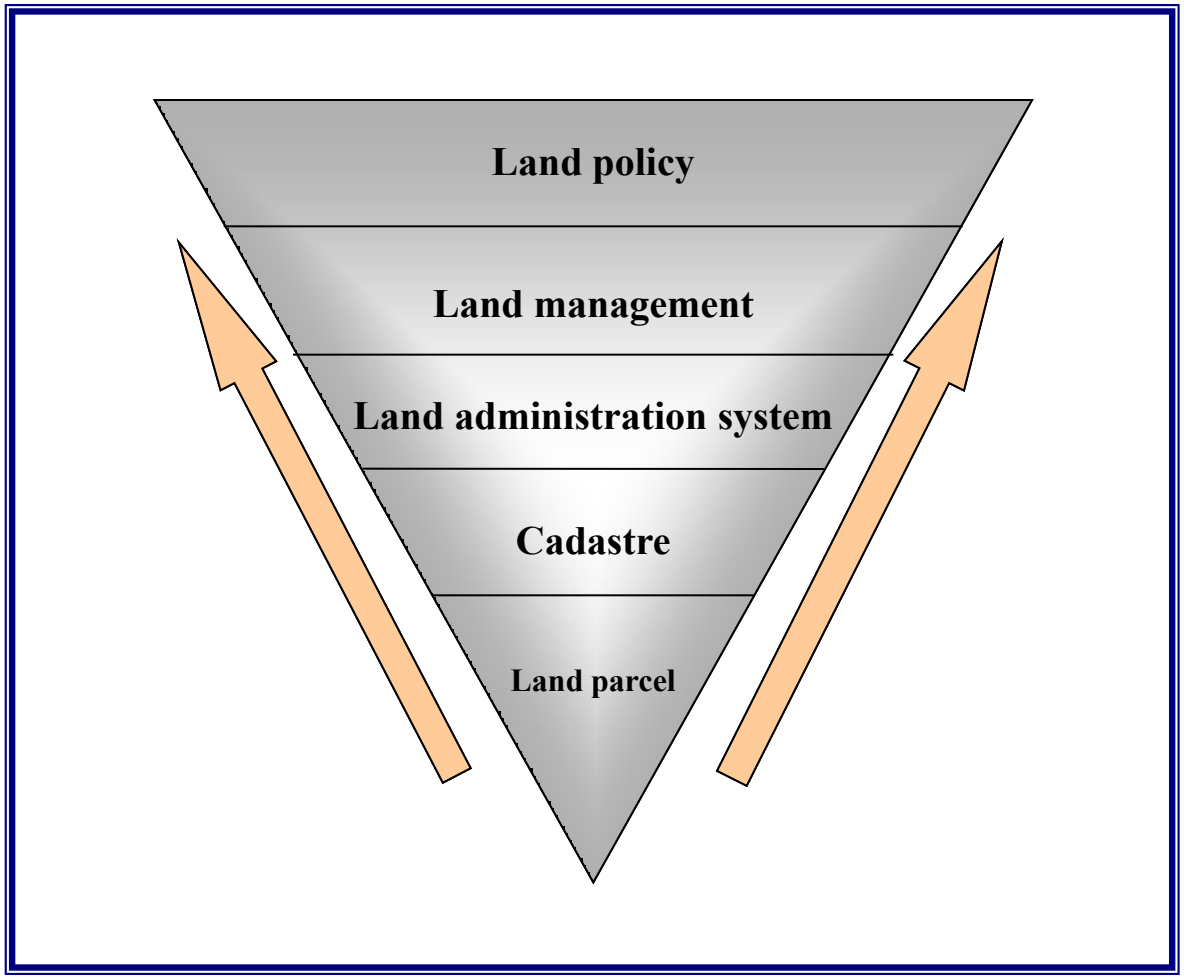
Three visions to support spatially enabled government as part of e-government

- A land management vision: incorporating spatially enabled land administration
- A spatial data infrastructure (SDI) vision: SDI as an enabling platform
- A vision for a spatially enabled society

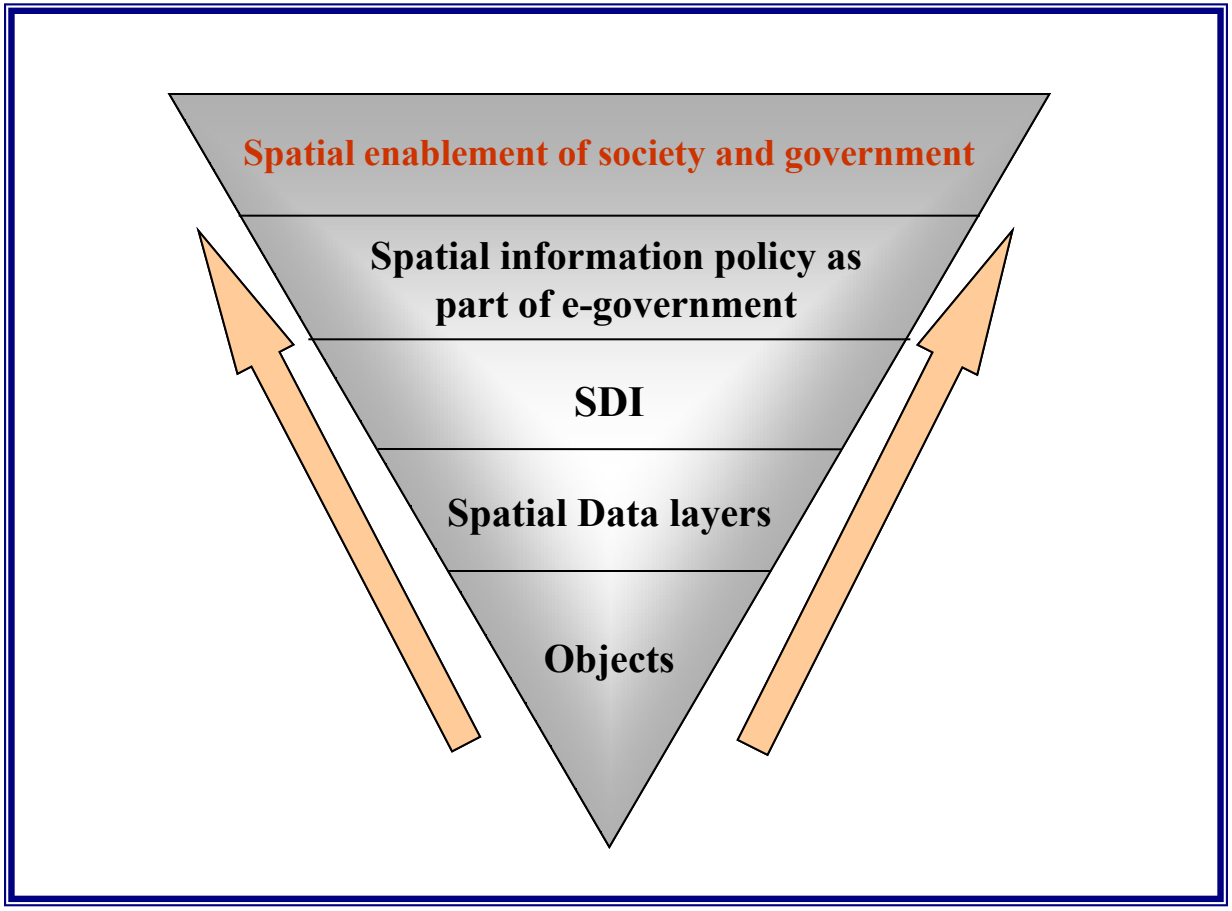
But first understand three fundamental concepts

- Land in society
- Spatial information in society
- Importance of integration of natural and built environment in delivering sustainable development

Land in Society

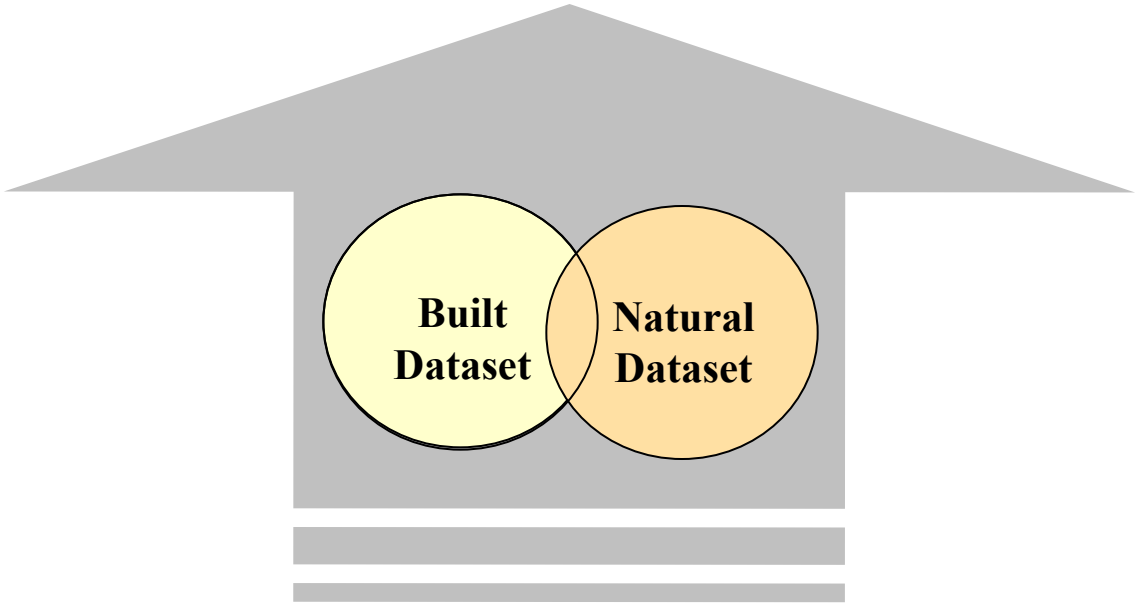


Spatial Information in Society



The challenge is the relationship between Built (cadastral) and Natural (topographic) Environmental Datasets

Sustainable Development



Vision of
spatially enabled government

Governments are spatially enabled when -

Location is used to organise their information

and

Location and spatial information are common goods available to citizens and businesses to encourage creativity and product development.

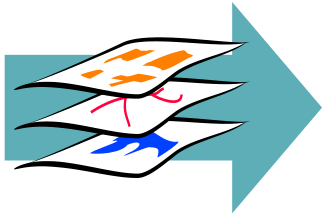
Challenges and Issues for spatially enabled society

- SDI to facilitate spatially enabled government as part of an e-government strategy
- SDI to facilitate integration of natural and built environment datasets
- Development of SDI vision, mission and road map – where are we heading?
- Role of government, private and academic sectors
- Capacity building

Conclusion

- SDI is a new and evolving concept
- SDI development is multi-disciplinary with policy, legal, institutional and technical dimensions
- SDI will be a *virtual environment* supported by an *enabling platform* - spatially enabling society and government within an e-government environment
- Innovations in use of information will involve private and government sectors.
- Research is central to SDI development

5. GeoInfoStrategy- - Integral Component of Czech eGovernment



Eva Kubatova, M. Rada, M. Konecny
Ministry of the Interior of the Czech Republic

Content

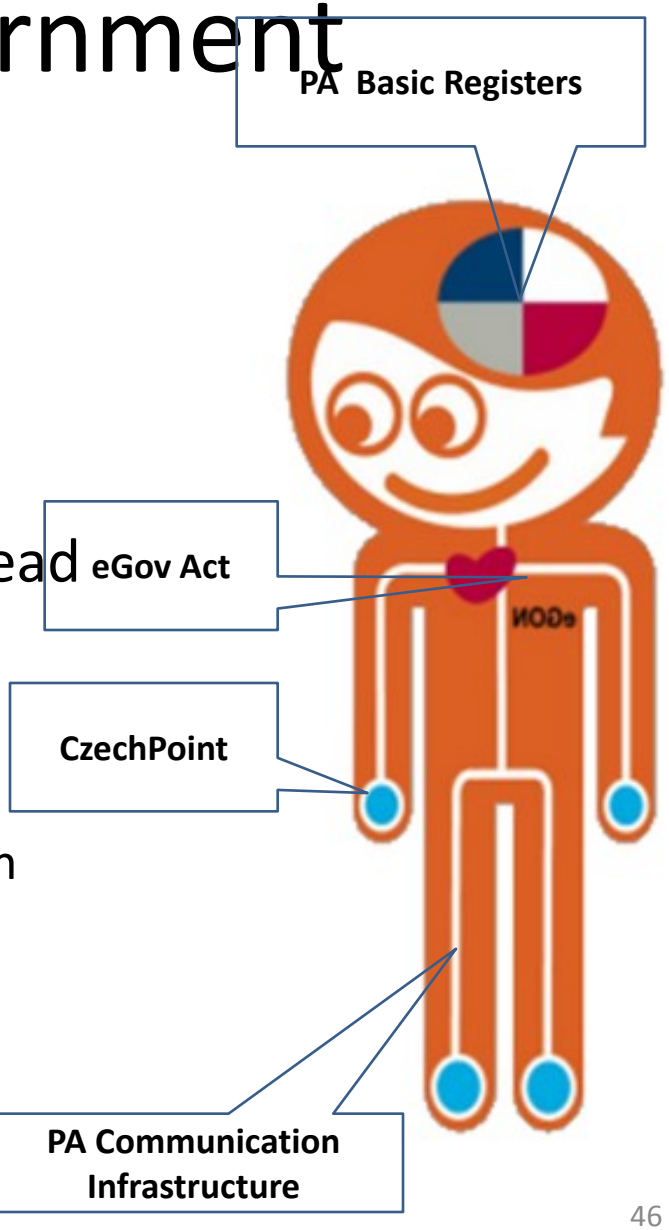
- Czech MoI Role in ICT
- Czech eGovernment
- System of PA Basic Registers - RUIAN
- Czech NSDI
- Towards Geoinformation Strategy
- Key PA Authorities Agreement
- GeoInfoStrategy
- Project of GeoInfoStrategy
- Conclusion

Czech MoI Role in ICT

- since 2007
  - central state administration body in charge of public administration information systems
  - coordination body for information and communication technologies
- fundamental objectives
  - modernization of public administration
  - reaching an efficient public administration by use of ICT
    - ✓eGovernment

Czech eGovernment

- smart public administration
  - better laws
  - functional authorities
  - professional public servants
  - effective information technologies
- „the document has to circulate instead of the citizen“
- four measures
  1. Czech Point
  2. Public Administration Communication Infrastructure
  3. eGovernment Act (2008)
  4. Public Administration Basic Registers (2012)



Czech eGovernment Strategies

- Smart Administration (2007 – 2013)
  - definition of the process of Czech PA modernization and improving
    - by effective use of ICT
    - via provision of high-quality public services
- eGov 2014+ (2014 – 2020)
  - strategic framework for the development of public administration and eGovernment 2014+
    - modern PA is designed as **transparent** and **efficient** „service to the citizen“
    - the main principle is **„sharing“** data and services

PA Basic Registers System

- Act No. 111/2009 Coll., on basic registers
- 4 basic registers of public administration
  - Register of Inhabitants (MoI)
  - Register of Corporations (Czech Statistical Office)
  - Register of Rights and Obligations (MoI)
  -
- Basic Registers Information System (MoI)
- ORG (The Office for Personal Data Protection)
- fully operational in July 2012

RUIAN

- Basic Register of Territorial Identification, Addresses and Real Estates (RUIAN)
- content of RUIAN
  - administration units (country, regions, …cadastral units, parcels, buildings)
  - entities of land administration (municipality districts, streets, …)
  - addresses
  - location data (centroids of parcels, buildings, …)
  - other data (building features, …)
- no personal data
- the crucial pillar of the Czech NSDI
- administrated by Czech Office for Surveying, Mapping and Cadaster (COSMC)
- edited by Municipal and Building Authorities, Czech Statistical Office (CSO) and Local Cadastral Authorities

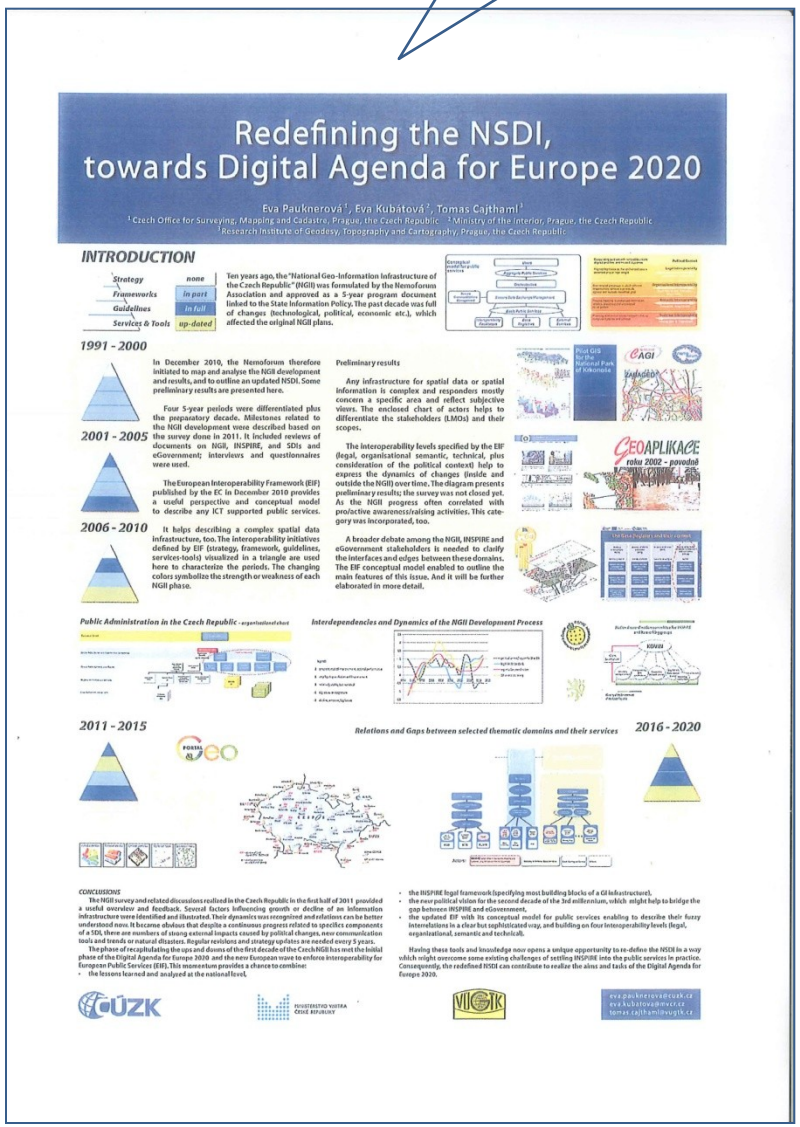
The Czech NSDI

- (reference) spatial data on territory (COSMC)
  - RUIAN
  - cadastral maps, state maps, Fundamental Base of Geographic Data, …
- thematic spatial data (both public and private)
    - national INSPIRE infrastructure (MoE)
    - statistical spatial data (CSO)
    - spatial data on technical infrastructures
    - …
- systematic, transparent and formal determination of the Czech NSDI is missing up to now
- lack of
  - coordination of PA authorities activities

National Geoinformation Strategy

Conference INSPIRE 2011, Edinburgh

Towards Geoinformation Strategy



Redefining the NSDI, towards Digital Agenda for Europe 2020

Eva Paulknerová[1], Eva Kubátová[2], Tomas Cajthaml[3]

[1] Czech Office for Surveying, Mapping and Cadastre, Prague, the Czech Republic [2] Ministry of the Interior, Prague, the Czech Republic
[3] Research Institute of Geodesy, Topography and Cartography, Prague, the Czech Republic

INTRODUCTION

Strategy — none
Frameworks — in part
Guidelines — in full
Services & Tools — up-dated

Ten years ago, the "National Geo-Information Infrastructure of the Czech Republic" (NGII) was formulated by the Nemoforum Association and approved as a 5-year program document linked to the State Information Policy. The past decade was full of changes (technological, political, economic etc.), which affected the original NGII plans.

1991 - 2000

In December 2010, the Nemoforum therefore initiated to map and analyse the NGII development and results, and to outline an updated NSDI. Some preliminary results are presented here.

Four 5-year periods were differentiated plus the preparatory decade. Milestones related to the NGII development were described based on the survey done in 2011. It included reviews of documents on NGII, INSPIRE, and SDIs and eGovernment; interviews and questionnaires were used.

2001 - 2005

The European Interoperability Framework (EIF) published by the EC in December 2010 provides a useful perspective and conceptual model to describe any ICT supported public services.

2006 - 2010

It helps describing a complex spatial data infrastructure, too. The interoperability initiatives defined by EIF (strategy, framework, guidelines, services-tools) visualized in a triangle are used here to characterize the periods. The changing colors symbolize the strength or weakness of each NGII phase.

Preliminary results

Any infrastructure for spatial data or spatial information is complex and responders mostly concern a specific area and reflect subjective views. The enclosed chart of actors helps to differentiate the stakeholders (LMOs) and their scopes.

The interoperability levels specified by the EIF (legal, organizational semantic, technical, plus consideration of the political context) help to express the dynamics of changes (inside and outside the NGII) over time. The diagram presents preliminary results; the survey was not closed yet. As the NGII progress often correlated with pro/active awareness/raising activities. This category was incorporated, too.

A broader debate among the NGII, INSPIRE and eGovernment stakeholders is needed to clarify the interfaces and edges between these domains. The EIF conceptual model enabled to outline the main features of this issue. And it will be further elaborated in more detail.

Public Administration in the Czech Republic

Interdependencies and Dynamics of the NGII Development Process

2011 - 2015

Relations and Gaps between selected thematic domains and their services

2016 - 2020

CONCLUSIONS

The NGII survey and related discussions realized in the Czech Republic in the first half of 2011 provided a useful overview and feedback. Several factors influencing growth or decline of an information infrastructure were identified and illustrated. Their dynamics was recognized and relations can be better understood now. It became obvious that despite a continuous progress related to specific components of a SDI, there are numbers of strong external impacts caused by political changes, new communication tools and trends or natural disasters. Regular revisions and strategy updates are needed every 5 years.

The phase of recapitulating the ups and downs of the first decade of the Czech NGII has met the initial phase of the Digital Agenda for Europe 2020 and the new European wave to enforce interoperability for European Public Services (EIF). This momentum provides a chance to combine:

- the lessons learned and analyzed at the national level,
- the INSPIRE legal framework (specifying most building blocks of a GI infrastructure),
- the new political vision for the second decade of the 3rd millennium, which might help to bridge the gap between INSPIRE and eGovernment,
- the updated EIF with its conceptual model for public services enabling to describe their fuzzy interrelations in a clear but sophisticated way, and building on four interoperability levels (legal, organizational, semantic and technical).

Having these tools and knowledge now opens a unique opportunity to re-define the NSDI in a way which might overcome some existing challenges of settling INSPIRE into the public services in practice. Consequently, the redefined NSDI can contribute to realize the aims and tasks of the Digital Agenda for Europe 2020.

ČÚZK

- first analysis of NSDI in 2001 (Nemoforum)
- then the Ministry of Informatics tried hard to go on but with no success
- first turning point was 2007
  - INSPIRE adoption
  - MoI assumed the responsibility for ICT
- INSPIRE transpozition in the course of 2007 and 2009

INSPIRE

- INSPIRE transposition and implementation is in responsibility of Ministry of the Environment (MoE)

MINISTERSTVO ŽIVOTNÍHO PROSTŘEDÍ
Ministry of the Environment of the Czech Republic

  - transposition was executed by updating of Act No. 123/1998 Coll., on right of environmental information
  - www.geoportal.gov.cz
  - INSPIRE coordination body (KOVIN)

- INSPIRE becomes real MoI inspiration in the way towards national geoinformation strategy

Key PA Authorities Agreement

- after election in 2010 unstable political situation
- second key point in mid-2012
- agreement on cooperation in the process of national geoinformation strategy drawing up
    - under MoI coordination
    - without any public money

MINISTERSTVO VNITRA ČESKÉ REPUBLIKY

ČÚZK

MINISTERSTVO ŽIVOTNÍHO PROSTŘEDÍ
Ministry of the Environment of the Czech Republic

MINISTERSTVO PRO MÍSTNÍ ROZVOJ ČR

Ministerstvo obrany České republiky

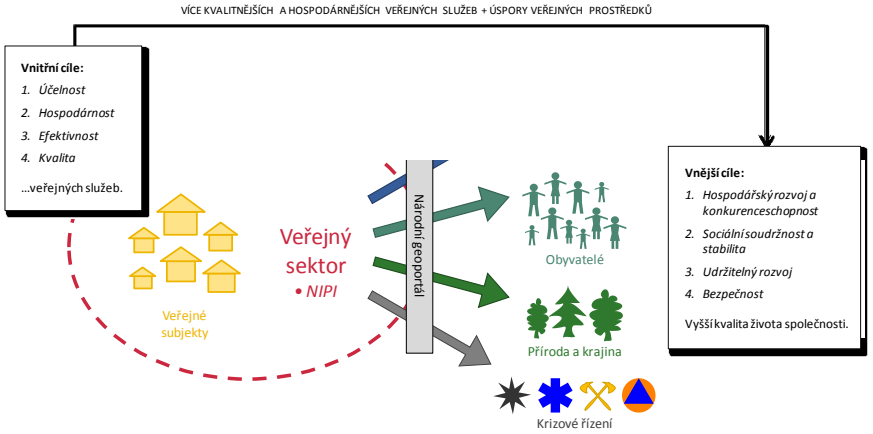
Ministerstvo dopravy

– Minister of the Interior submitted the joint proposal for Czech Government s approval in October 2012

GeoInfoStrategy

- Czech Government
  - approved the proposal of working out of the *„Strategy of spatial information infrastructure development in the Czech Republic up to 2020“* (GeoInfoStrategy) by Resolution No. 837 on the 14th November 2012
  - ordered to submit the GeoInfoStrategy draft for approval to the end of February 2014
  - ordered to cooperate to all central state administration bodies
  - recommend to cooperate to regions and cities

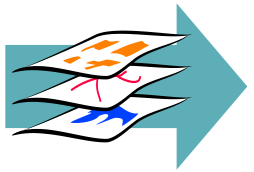
GeoInfoStrategy Main Goals



- to set up effective coordination and integration of public bodies and commercial sector activities in the field of spatial data
- to help to set up conditions for
  - major improvement of eGovernment services regarding spatial data
  - reduction of costs of public administration
  - enhancing of the overall competitiveness of the Czech economy

GeoInfoStrategy Inspiration

- European
  - INSPIRE
  - existing geoinformation strategies (Wales, Netherland, Sweden, Nothern Ireland…)
- National
  - development eGovernment strategy
  - INPIRE Implementation Strategy
  - existing departmental development strategies
  - points of view of
    - relevant PA bodies
    - professional associations
    - …



GeoInfoStrategy Content

Implemetation Plan

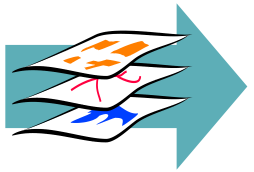
- description of NSDI current state, list of key problems and analysis of their causes
- setting up target state that contains clear priorities and measurable goals (SMART)
- proposal of concrete arrangements and tasks to reaching target state
  - Legislative and organization arrangements
  - Arrangement administrators
  - Time schedule of future tasks performance
  - Costs and Benefits of the arrangement realization
- specification of roles of relevant PA bodies and user groups
- institutional designation of suitable coordination structure

Project of GeoInfoStrategy

- project GeoInfoStrategy has been set up
  - Administrator is MoI
  - Managing Committee (COSMD, MoE, MoLD, MoD, MoT)
  - Processing Team (experts from PA and academic sphere)
  - Consulting Team (PA bodies, professional associations (Nemoforum, CAGI, …, universities)
  - Working Groups
- http://www.geoinfostrategie.gov.cz
- geoinfostrategie@mvcr.cz

Project Rough Time Framework

Period	Phase
01 – 02 / 2013	Project Setting up
03 – 05 / 2013	Analytic and Prognostic Phase
06 / 2013	Vision, Global Goal and Strategic Goals Proposal
07 – 11/2013	Start of working on GeoInfoStrategy Draft
12 / 2013	Proposal of Implementation Plan
01 – 02 / 2014	Consulting of the GeoInfoStrategy Draft



GeoInfoStrategy – Where we are

- Working and Organisational Plan is approved by Managing Committee
- work in compliance with Cooperation and Communication Plan (workshops, presentations, articles in specialized magazins, …)
- collection of
  - information for analysis
  - impulses for proposal
- worked out
  - document structure
  - vision and global goal
  - strategic nd specific goals

6. Conclusion

- important is
  - intention to work out the national geoinformation strategy (GeoInfoStrategy) has governmental support
    - Governmental Resolution No. 837/2012
  - future GeoInfoStrategie is seen as the eGov 2014 + subsequent strategy
    - GeoInfoStrategy is going to be an integral component of Czech eGovernment
  - Czech Republic makes efforts to
    - coordinate national geoactivites
    - activate huge spatial data economic potencial

Thanks for your attention!

http://www.geoinfostrategie.gov.cz

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PRAGUE

BRNO

Welcome to the
Entertainment
Beer Hall!

Xie, Xie!!!!!

Bardzo Dziekuje

Chvala

THANK YOU

Muchas Gracias

Terima KasimO Brigada

Kammsa Hamida

Aligator

SHUKRAN

BLAGODARJA

DĚKUJI (in Czech)