

NMCA experience regarding coordination between data producers: examples of technical solutions for data interoperability

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Plan

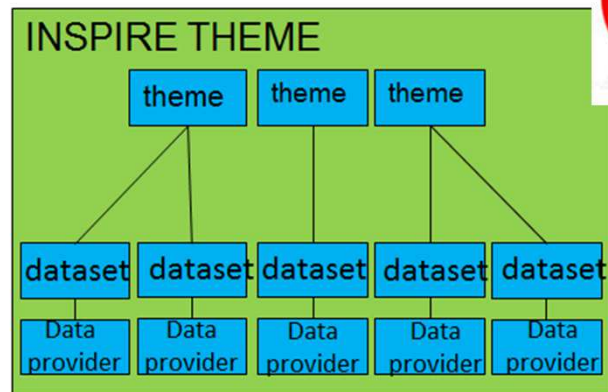
- Examples of good practice
 - Offer single access point
 - Make reference data
 - Improve data consistency

Examples of good practice

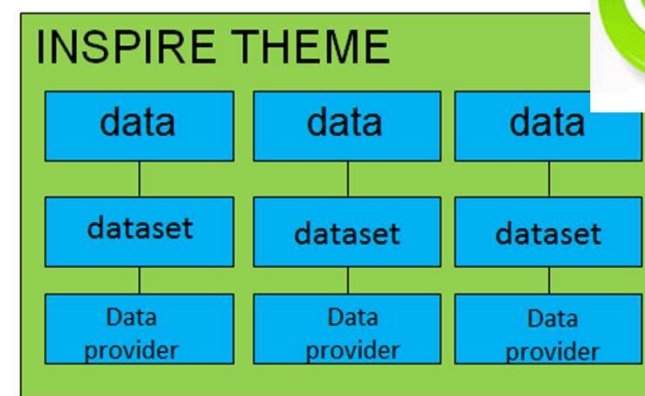
Offer single access point

Context: scattered data

- It is considered as acceptable
 - To have several data providers for same theme
 - That each producer documents, transforms and provides its data as long as **there is no duplication**



Situation looks like collective model



But in fact, situation is equivalent to basic model

Context: scattered data

- Examples
 - For data on different territories
 - Different countries
 - Land / Sea
 - For data at different scales
 - For data belonging to different INSPIRE application schemas
 - Road, rail, air, cable, water in theme TN
 - Gas, water, sewage, electricity, .. in theme US
 - For data belonging to same INSPIRE application schema but with independent content
 - Generic INSPIRE models (PS, AM, SD, ...)

Context: scattered data

- The situation is fine for data providers
 - No overlapping responsibilities
- But not for users: need to access many services to get whole theme

=> **solution: provide single access point**

Example 1: Urbanism Geoportal (France)

- Context:
 - existence of many restrictions and regulations on land
 - documented
 - in heterogeneous ways
 - from many actors
 - => very difficult to get whole information about what is allowed or not on a piece of land!
- **Political decision to launch the Urbanism GeoPortal**
 - Make easier the access to urbanism and public easements (servitude) documents:
 - Public at large
 - Professional users
 - To get legal status, from 2020, documents will have to be published on Urbanism Geoportal

Example 1: Urbanism Geoportal (France)

- Project co-funded :

- Ministry of Sustainable Development
- National Mapping Agency (IGN)



- IGN will host the urbanism GeoPortal and will ensure common developments

- In complement of the INSPIRE Directive

- Urbanism Geoportal calendar:

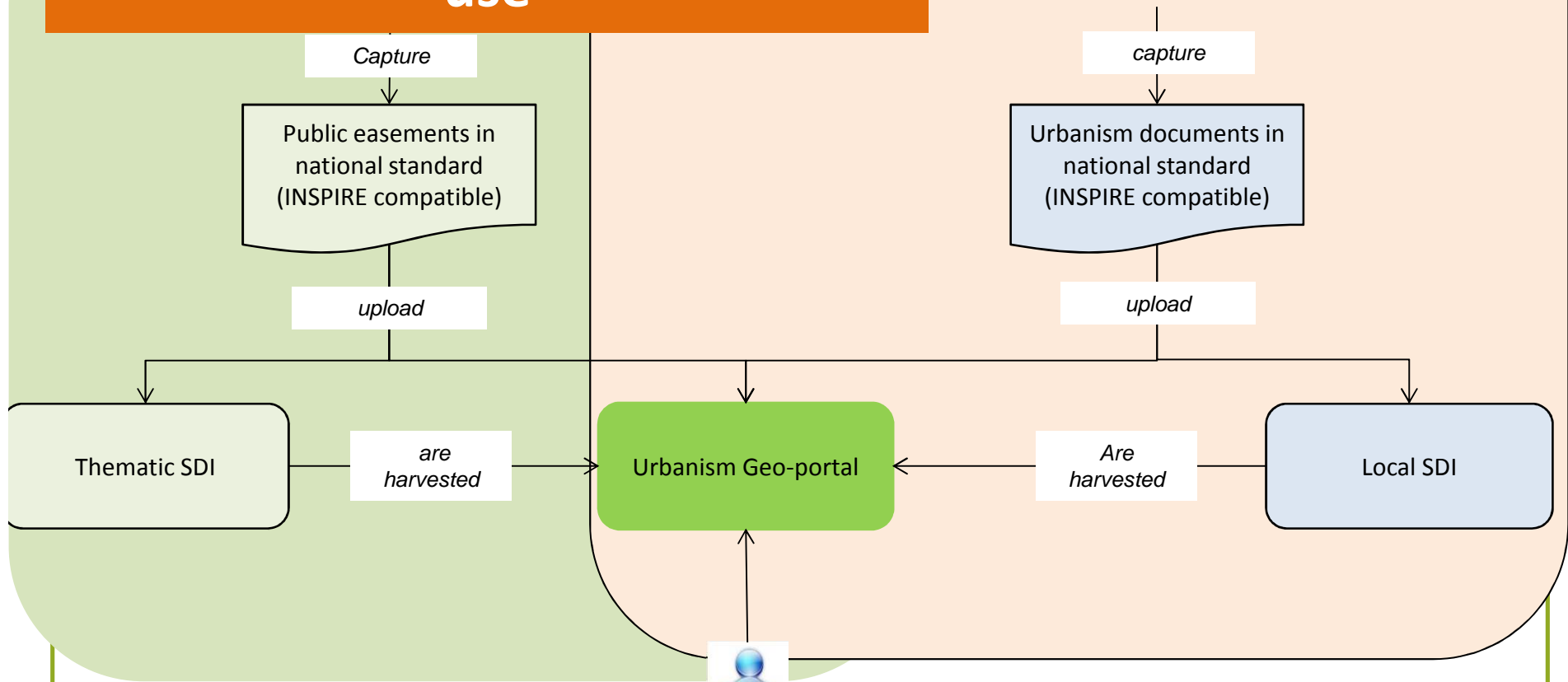
- Development: 2013 – 2014
- Exploitation: from 2015

PRINCIPLE 1

Make local actors

Make national actors aware of the local situation regarding land use

the many regulations



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Public at large, professionals

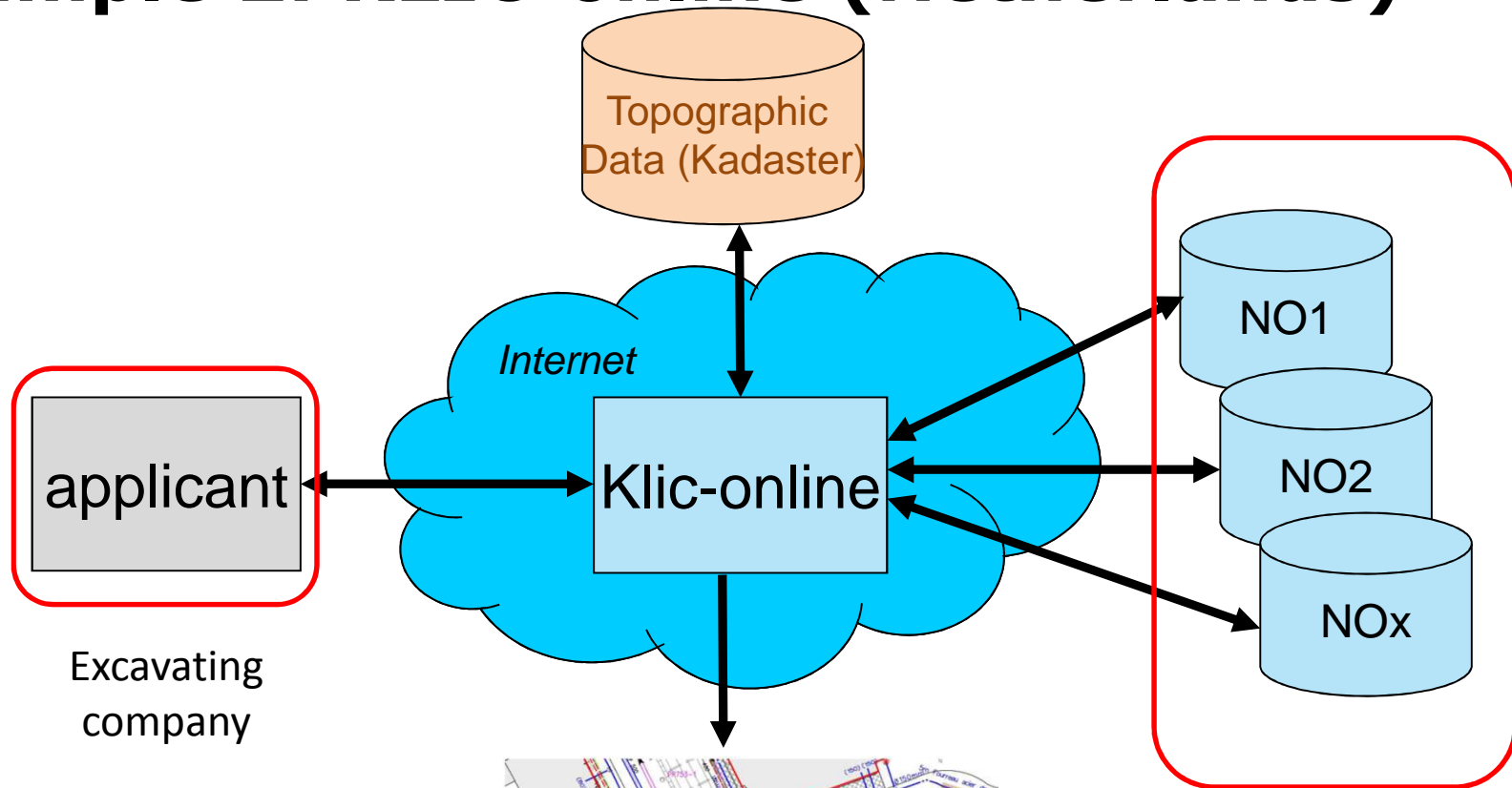
Example 1: Urbanism Geoportal (France)

- National standard
 - CNIG (National Council for Geographic Information) is the coordination structure for INSPIRE in France
 - CNIG has recently approved a national standard related to urbanism and public easements
 - This (recommended) national standard is compatible with INSPIRE specifications of themes LU and AM
 - => will allow some factorisation of work for transforming local urbanism data to INSPIRE

Example 2: KLIC-online (Netherlands)

- Context: utility networks information
 - Is difficult to be obtained
 - around 1000 utility managers (800 concerned by INSPIRE)
 - But is very necessary
 - Underground utility networks
 - By “digging” companies
- Kadaster runs the KLIC-on-line application
 - **Objective is to avoid the digging accidents**
 - Using the application is mandated by law
 - Common data models close to INSPIRE have been adopted
 - An excavating company makes request on its area of interest
 - The application gathers all relevant data and displays it on topographic background

Example 2: KLIC-online (Netherlands)



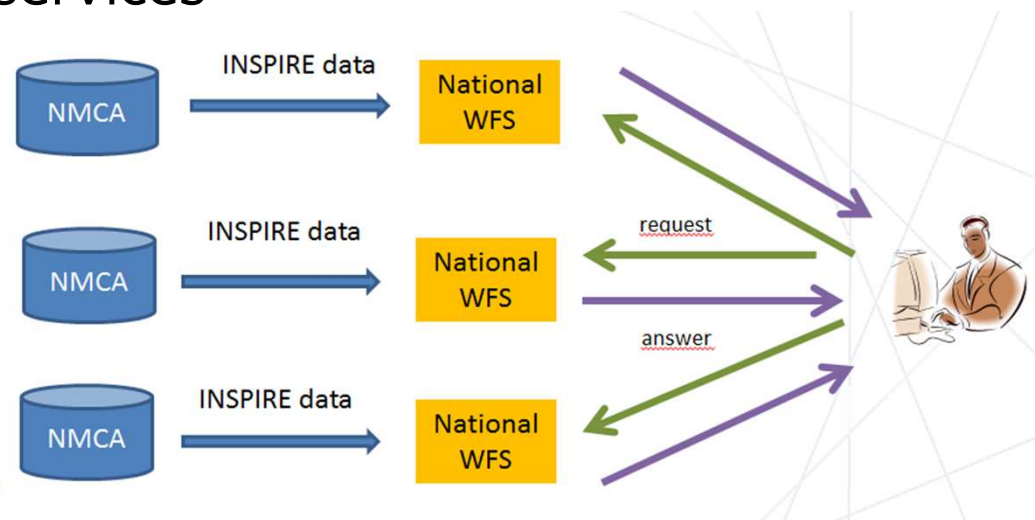
Excavating
company

Data
providers:
utility
managers



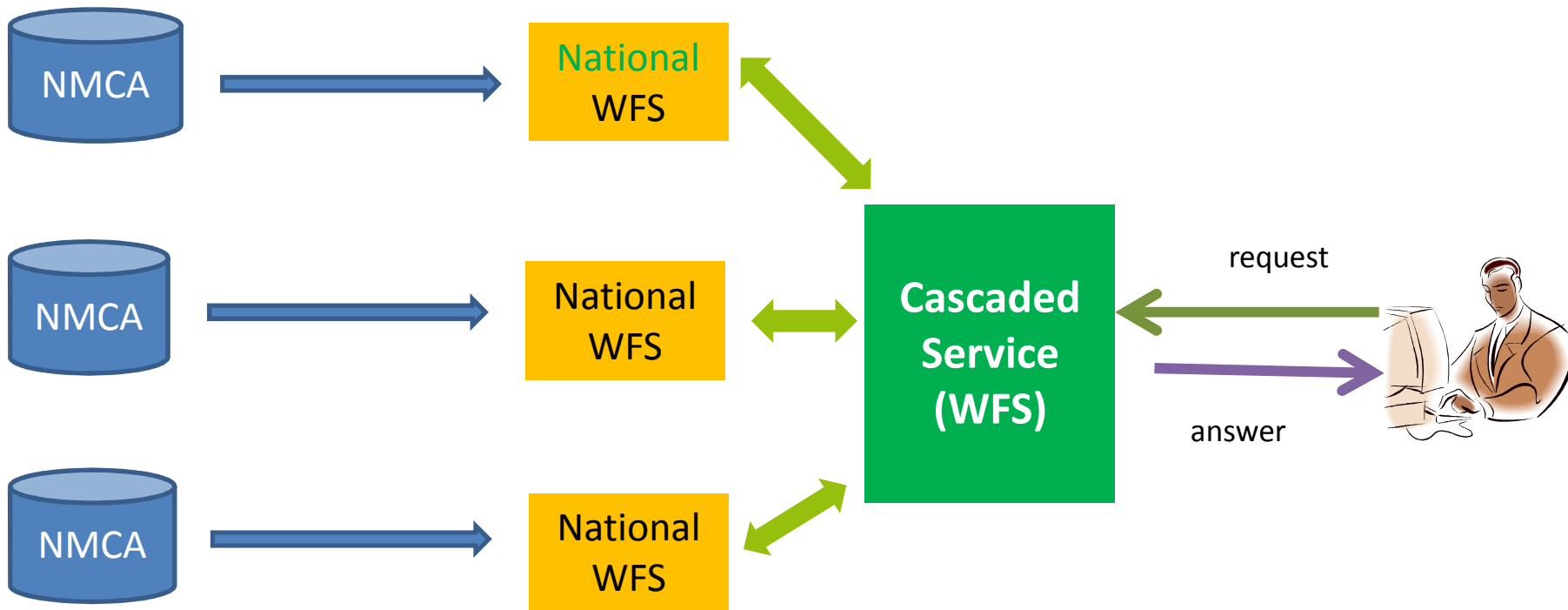
Example 3: ELF project (download)

- Context:
 - Many NMCAs partners of ELF (European Location Framework)
 - Each NMCA transforms its data to INSPIRE => user get harmonised data
- Objective
 - Avoid scenario where European or cross-border users must access many services



Example 3: ELF project (download)

- The ELF scenario

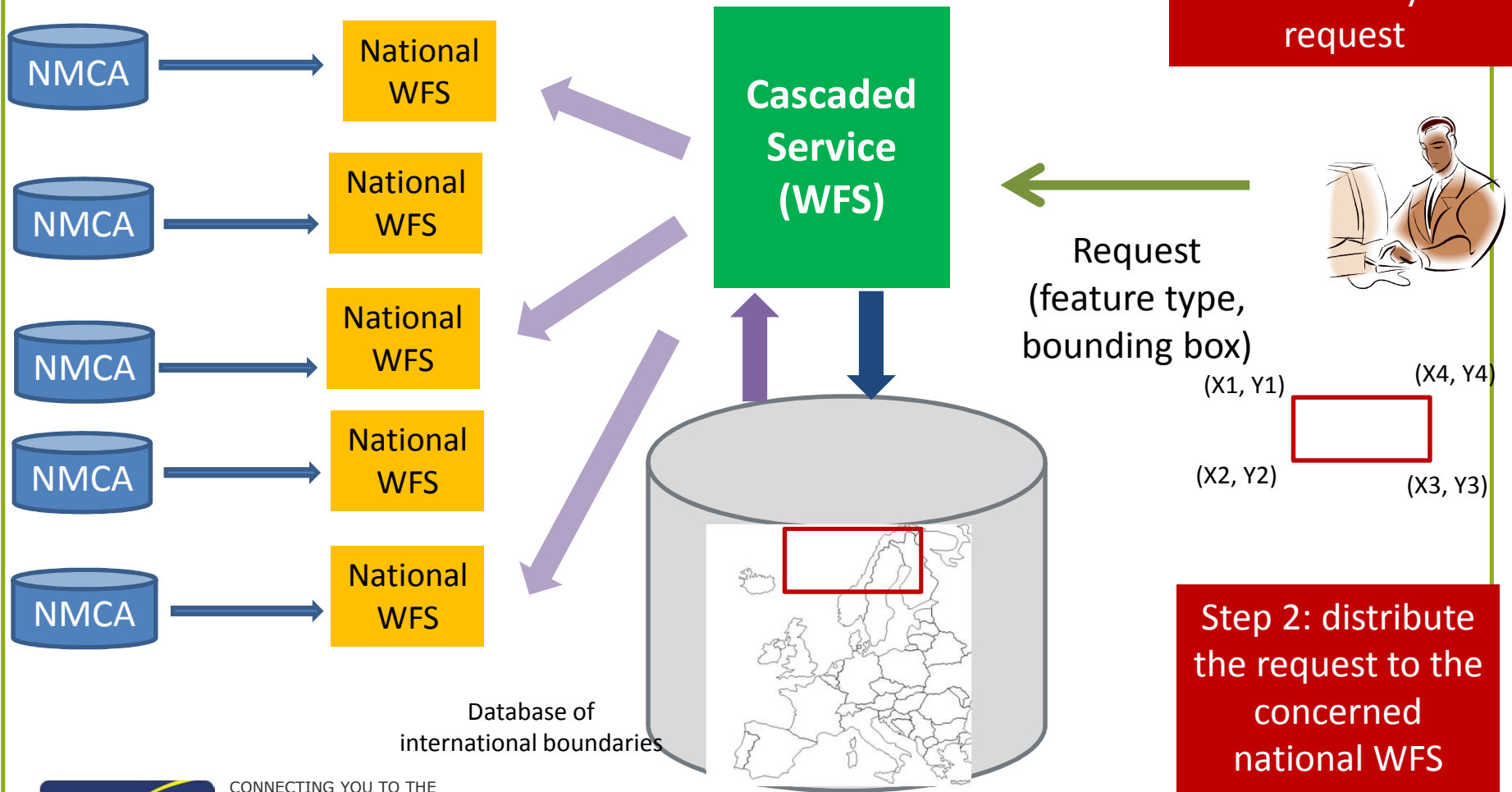


The user is offered a single access point through the cascaded service.

Example 3: ELF project (download)

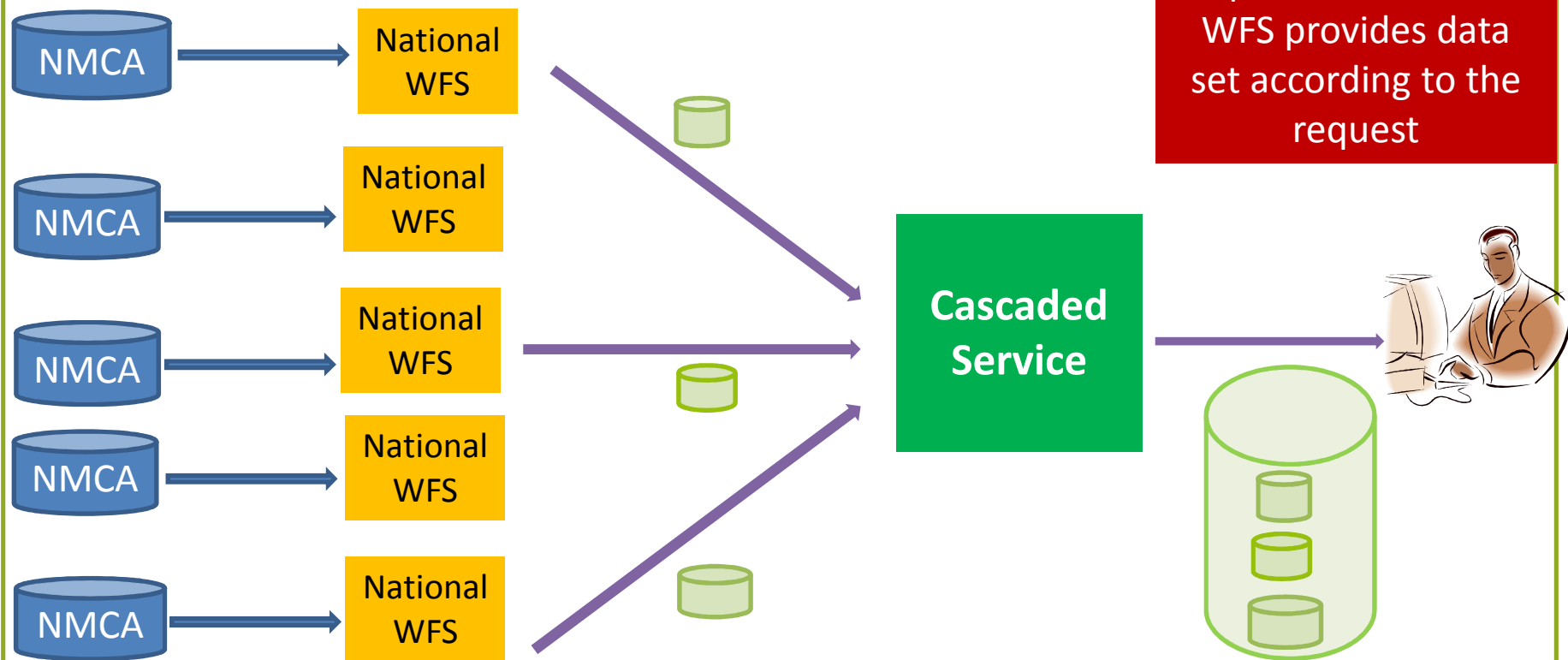
- Cascaded service: distribute request

Step 1: identify the countries concerned by the request



Example 3: ELF project (download)

- Cascaded service: aggregate answers



Topics for discussions

- Have you similar experience about single access point in your country or community?
- Have you also adopted “combined services” in your country or community?
 - What is main objective?
 - Which INSPIRE themes are involved?
 - Which data producers are involved?
 - What technical solution?
- How is INSPIRE influencing and helping?

Examples of good practice

Make reference dataset

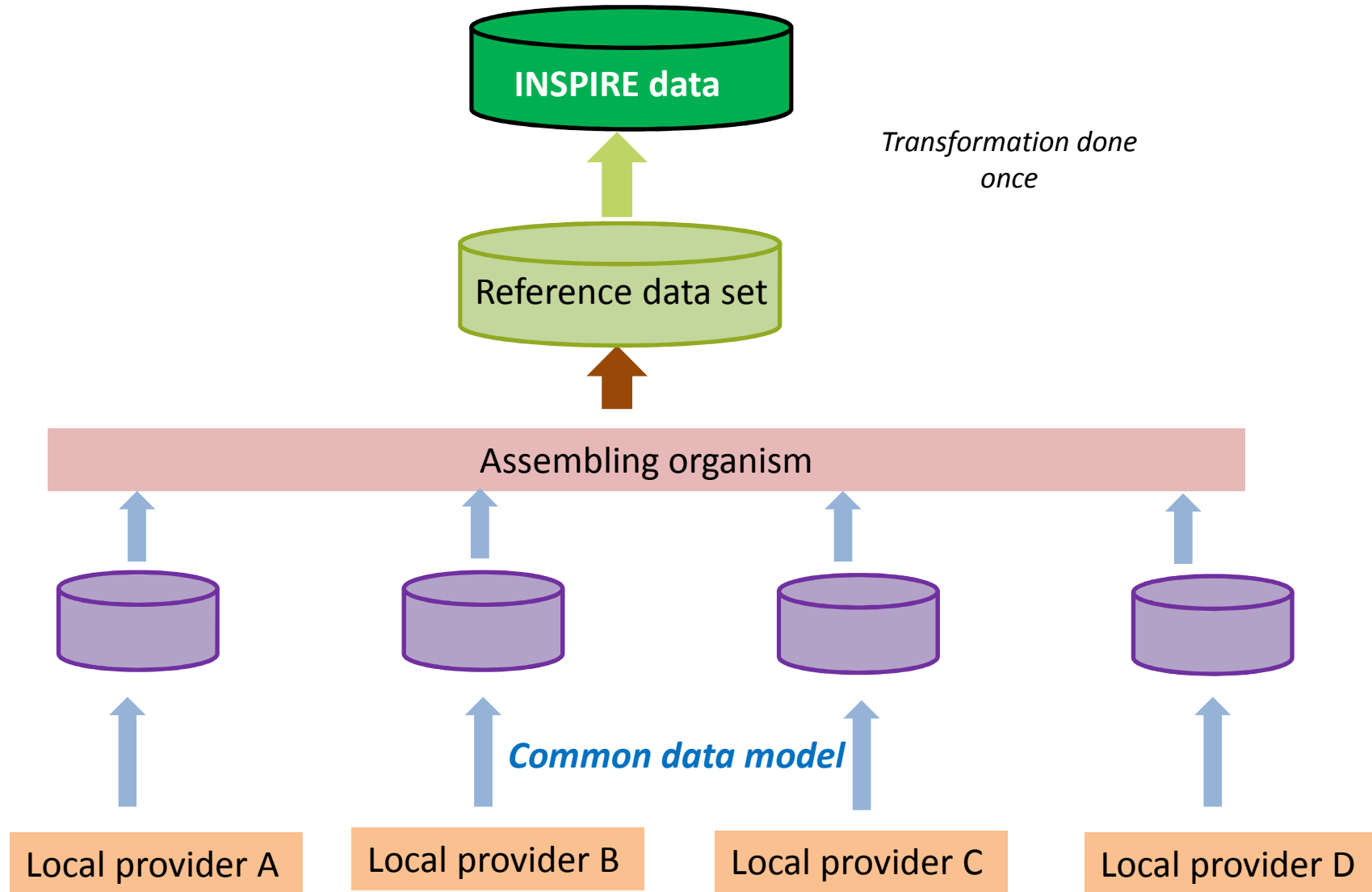
Context

- Legal background (INSPIRE Directive – article 4) :
 - Provides general rules about data sets being under INSPIRE scope
 - Allows to provide only reference version of data in case of multiple copies of same data set
- Data transformation for INSPIRE is heavy process
- => **push to build up “reference data” by assembling or by integrating existing data sets in order to factorise transformation process**

Option 1: assembling data sets

- Typical scenario
 - National standard for **common data model**
 - Production done at local level
 - A national organism responsible for the reference data set
 - Often used for AD, BU, planned LU, ...
- Advantages
 - Transformation and publication for INSPIRE done only once, by one stakeholder
 - Users may easily get dataset on whole country

Option 1: assembling data sets



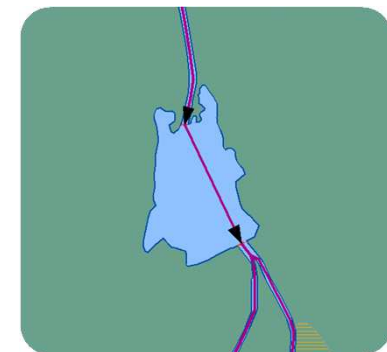
Option 2: integrating data sets

- Typical scenario
 - Several producers for same theme => several data sets
 - Each existing data set having
 - Advantages /Drawbacks
 - Gaps/Overlaps with the others
 - Example:
 - National Mapping Agencies: good geometry
 - Other authorities: additional semantics
 - => No obvious existing reference data set
- Potential solution:
 - Make reference data set by **integrating the best of each existing data set**
 - Various starting points => various technical solutions
 - Significant effort for data producers but great benefit for users



Integrating data sets: example 1

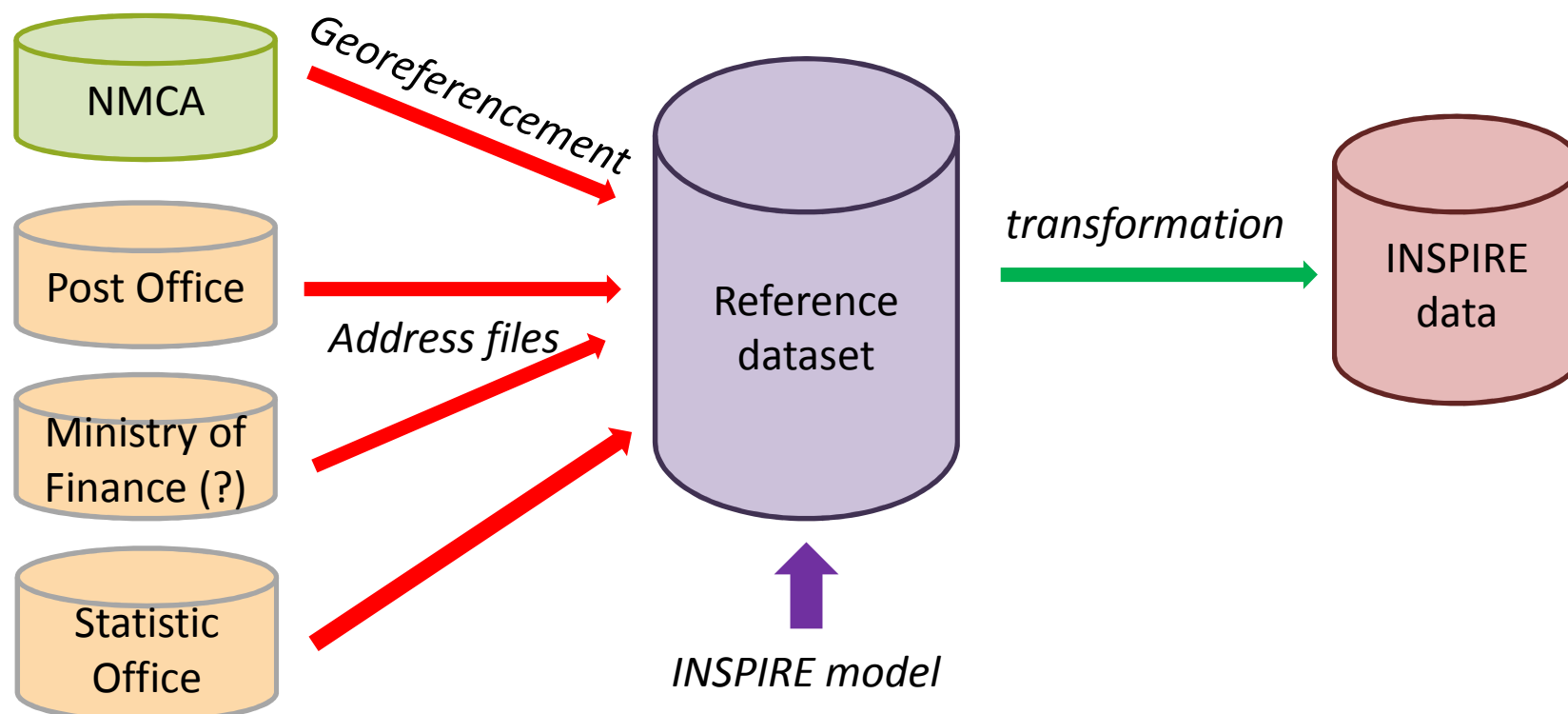
- The Swedish experience
 - Water Authority has hydro network at scale 250K
 - Good semantic (hydro codes)
 - National Mapping Authority has detailed hydro physical waters (with most watercourses as surfaces)
 - Good geometry (accuracy)
 - During a project, Lantmateriet created hydro network at scale 10K
 - Getting hydro identifiers from Water Authority
 - Extracting centre lines from surfaces
 - This integrated product is good candidate for INSPIRE reference data



Integrating data sets: example 2 (AD)

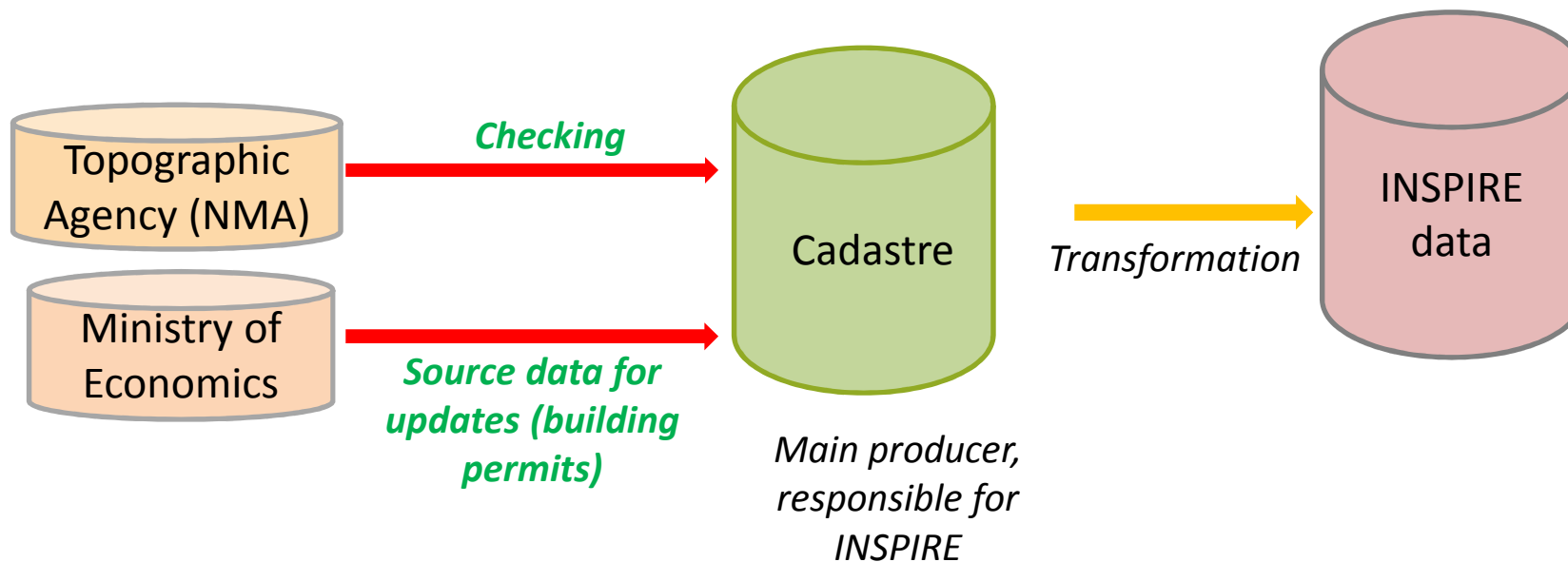
The Hungarian experience

Project for AD database



Integrating data sets: example 3 (BU)

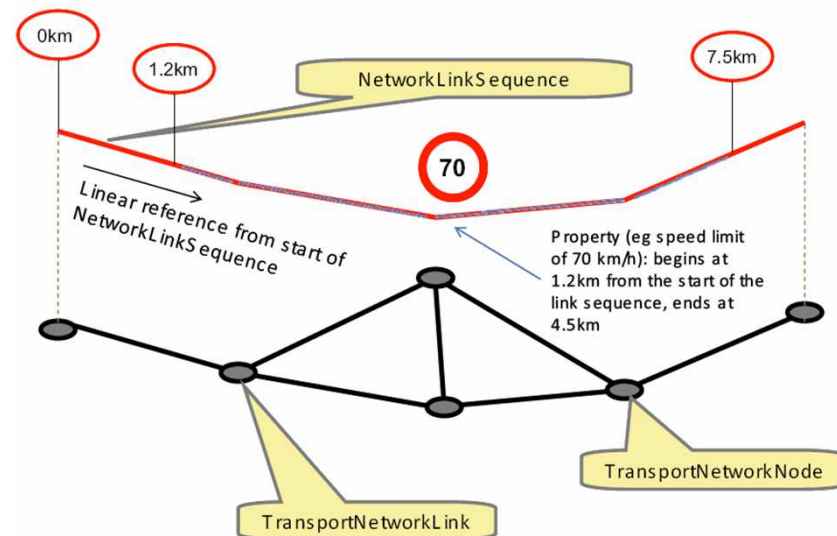
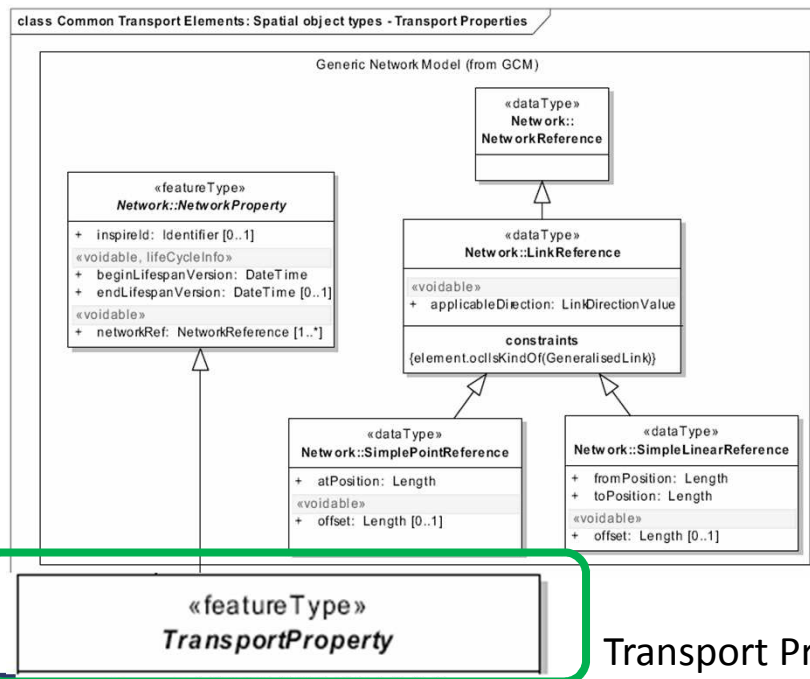
The Latvian experience:
Shared responsibility



Which organisational model for theme TN?

- Context

- Data producers
 - National Mapping Agency: geometry
 - Transport Authority: semantics
- INSPIRE model allows loose relation between geometry and semantics by linear referencing

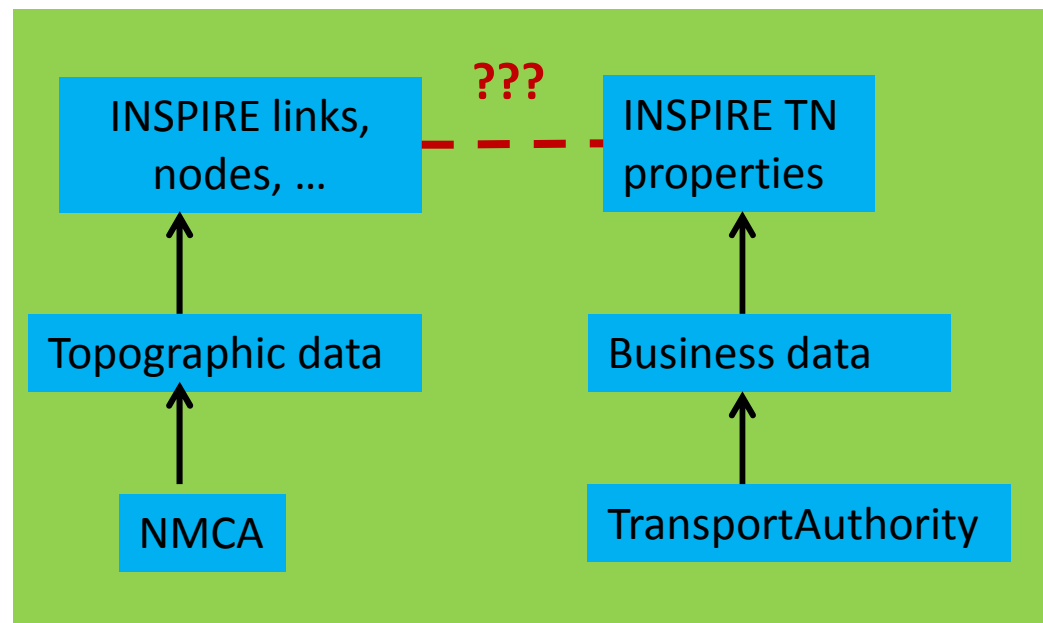


Transport Properties are (relatively) independent feature types

Which organisational model for theme TN?

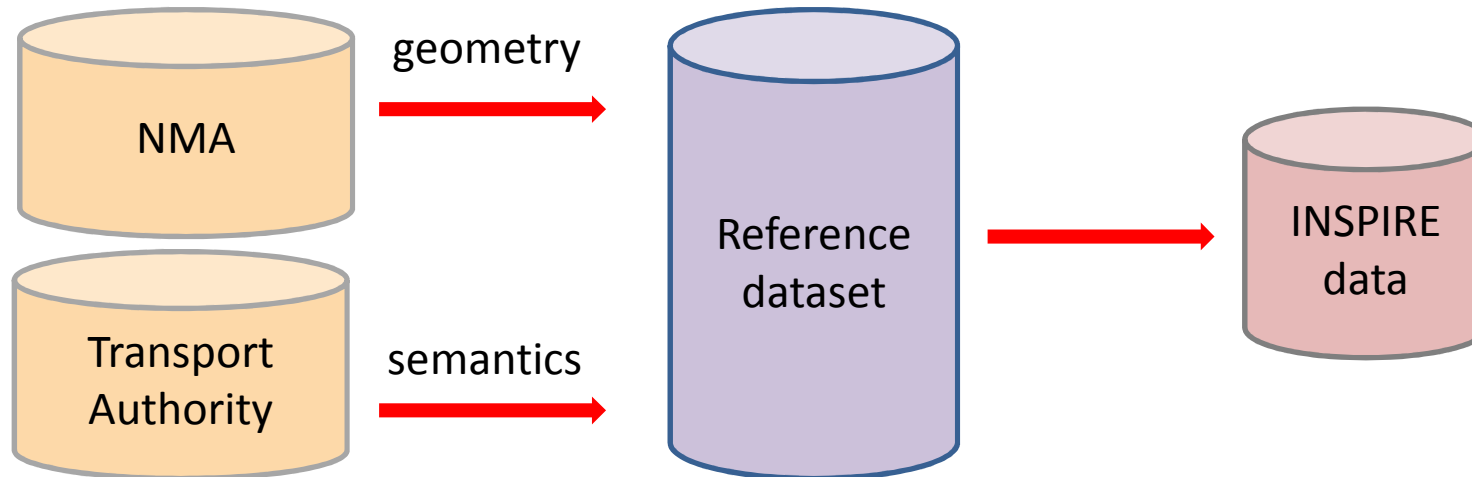
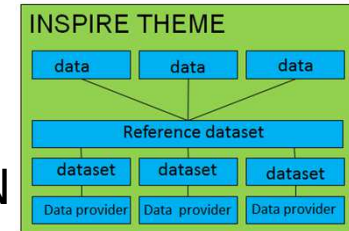
- Solution 1 : basic model

- Data producers
 - National Mapping Agency: responsible for features with geometry
 - Transport Authority: responsible for features Transport Properties
- However, some **coordination required to define the links between geometry and semantics**, e.g.
 - Agree on common reference objects (NetworkLinkSequence)
 - Ensure persistent identifiers
 -



Which organisational model for theme TN?

- Solution 2: node model
 - One data producer gets responsibility for theme TN (or sub-theme Road, Railway, ...)
 - Example: the Swedish experience



The Transport Authority is responsible for the data integration in the reference data set

Topics for discussions

- Generic topic: reference data sets
 - Do you have such issues and examples in your country or community?
 - How is INSPIRE influencing?
- Specific topic: organisational model for theme Transport Network
 - Which model in your country or community?
 - Main difficulties? Envisaged solutions?

Examples of good practice

Improve data consistency



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Context: requirements

- **Directive** : *The implementing rules shall be designed to ensure **consistency** between items of information which refer to the same location or between items of information which refer to the same object represented at different scales.*
- **Generic Conceptual Model**

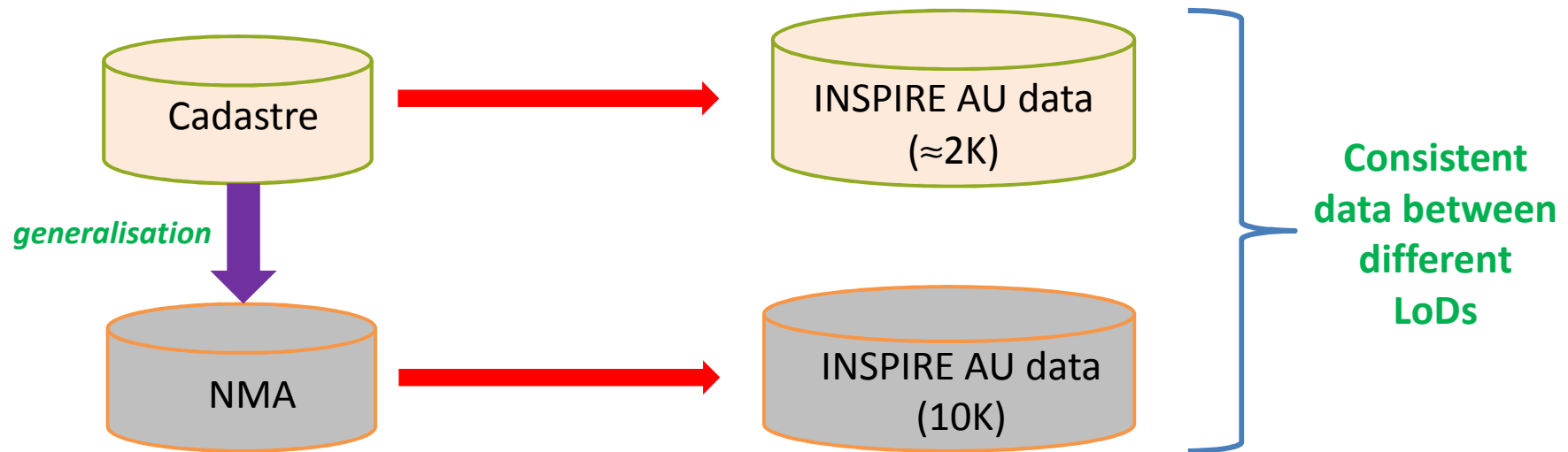
(A) INSPIRE Principles	(B) Terminology	(C) Reference model
(D) Rules for application Schemas and feature catalogues	(E) Spatial and temporal aspects	(F) Multi-lingual text and cultural adaptability
(G) Coordinate referencing and units model	(H) Object referencing modelling	(I) Identifier Management
(J) Data transformation	(K) Portrayal model	(L) Registers and registries
(M) Metadata	(N) Maintenance	(O) Quality
(P) Data Transfer	(Q) Consistency between data	(R) Multiple representations
(S) Data capturing	(T) Conformance	

Data consistency is an interoperability component; it is required :

- Between levels of detail
- Across borders
- Between themes (or sub-themes)

Consistency between LoD: example (AU)

- Ensured by :
 - Common data model (INSPIRE)
 - Improvements, e.g. generalisation
 - Belgium experience:

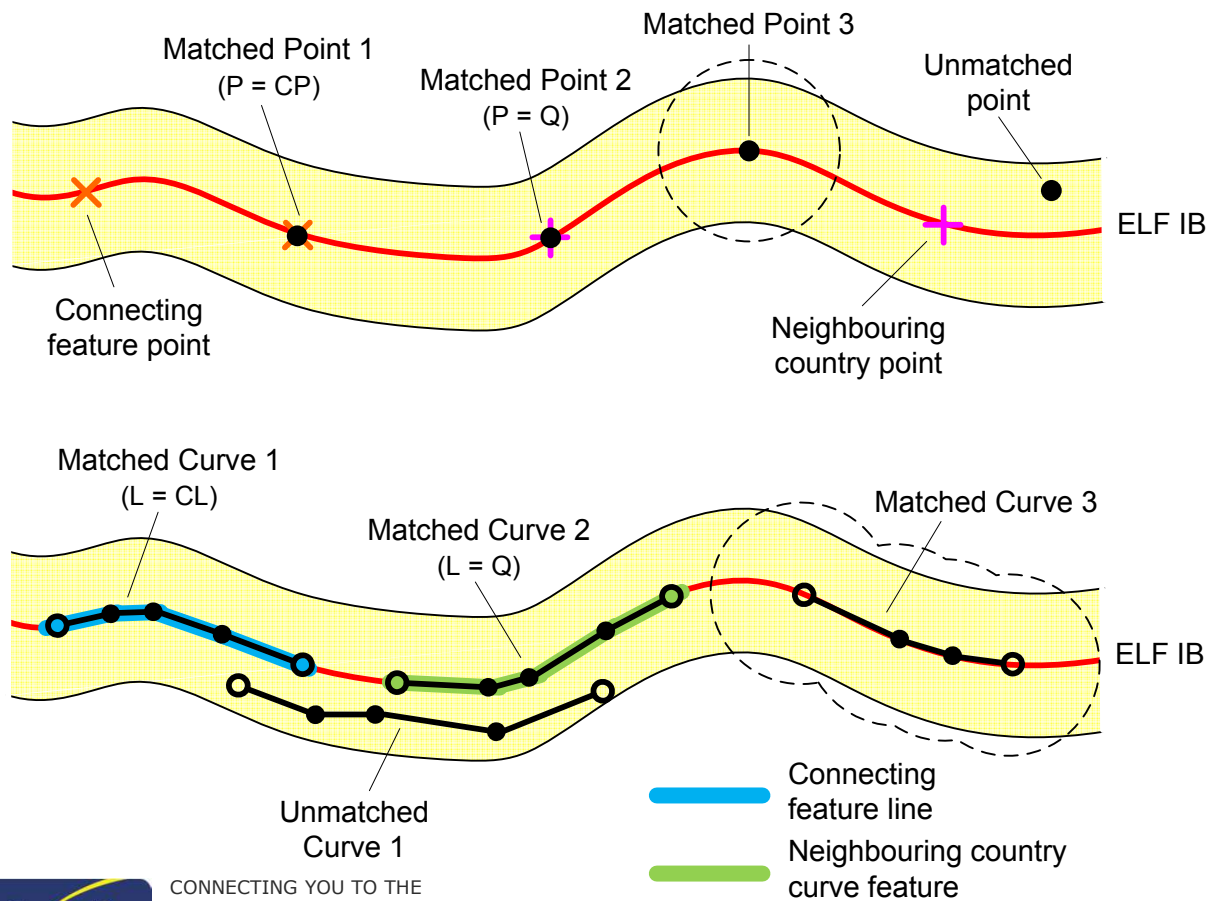


Consistency across borders: ELF example

- First step: knowledge about **international boundaries**
- ELF aims to provide a set of common international boundaries at different LoDs
 - Global (1M)
 - Regional (250K)
 - Master level 2 (50K)
 - Master level 1 (10K)
 - Master level 0 (2K)
- Ideally, coming from legal agreement between countries (from the EuroGeographics long term project SBE: State Boundaries of Europe)
- If not possible, NMCAAs may just technically agree on common representation

Consistency across borders: ELF example

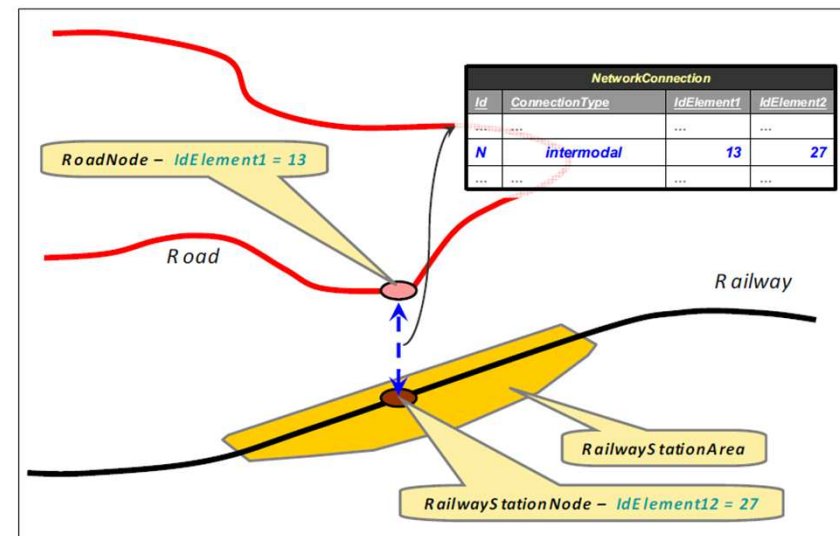
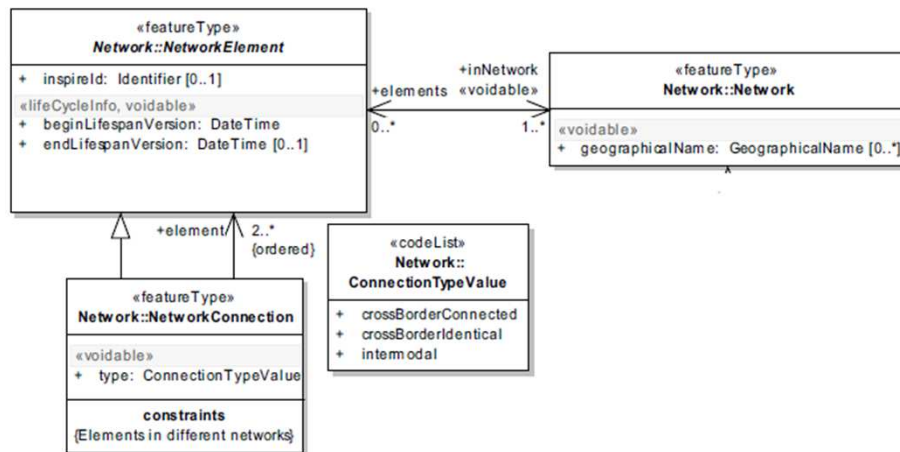
- Second step: ensure **edge-matching** (especially for themes HY and TN)



ELF is developing a set of rules, methods and tools to facilitate the edge-matching process

Consistency between (sub)themes

- Context
 - INSPIRE TN is subdivided into 5 sub-themes
 - Road
 - Railway
 - Air
 - Water
 - Cable
 - Intermodal connections are documented very simply



Consistency between (sub)themes

- Swedish case:
 - 5 different authorities responsible for TN
 - Project about intermodal points
 - To supply data for INSPIRE
 - To describe more in detail connections between transport networks
 - Data model based on standard: Transfer Nodes ISO/TC211 - ISO 19147 (DIS)



Transfer node



Access point



Stop point

Topics for discussions

- What are the most frequent or most significant consistency issues?
- Does INSPIRE push you to improve data consistency?
 - How?
 - For which themes ?
 -