Democratizing INSPIRE: INSPIRE as a Service

24.05.2016

Thorsten Reitz

Geospatial World Forum 2016, Rotterdam
About Us

Thorsten Reitz
Founder/CEO

Previously:
Lead Product Engineer, Esri R&D Center Zurich
Department Head GEO, Fraunhofer IGD

Company Offerings:

- Software as a Service Solutions for agile standardisation (hale connect) and spatial data infrastructures (inspire gis)
- Professional support and consulting for data harmonisation with hale studio
- Research Data Management

*We support INSPIRE since 2006.*
What will we address in this talk?

1. What are the main **cost drivers** behind providing INSPIRE services?

2. Are INSPIRE services **more expensive** to provide than other types of spatial data services?

3. How can we **reduce the cost** of INSPIRE services to make them much more accessible?
What about the Benefits?

1. **Not in scope of this talk**
2. Most research found that benefits "vastly outweigh costs"
3. Benefits occur in the future, **costs occur now**
4. Often, Benefits don't occur where the costs occur
5. A common view is that INSPIRE implementation is complicated and thus expensive, **which hinders adoption**

![Costs vs Benefits Chart](chart.png)

*Source: ECORYS Nederlands, INSPIRE Cost Benefits Analysis, 2009*
Cost Drivers

Methodology
Regulatory Requirements
Service Types
Service Deployment Models
Methodology

1. Collect real-world INSPIRE/SDI implementation cost data points
   - Publicly available reports 11 data points
   - Internal and external projects 48 data points
   - Tendering data bases 51 data points
   - Other cost studies 3 data points
   - Survey 14 data points

2. Normalize information to a baseline scenario for comparison
   1. Functional normalization (linear)
   2. Data size normalization (fitting function)
   3. Time normalization (linear)

*Note: Data is sparse, interpolation not very reliable*
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02.06.2016

Geospatial World Forum 2016, Rotterdam

www.wetransform.to
The Baseline Scenario

— One-time costs
  — Licensing
  — Initial implementation/customisation/configuration, deployment and systems integration
  — Data harmonisation and integration

— Recurring costs (for four years)
  — Licenses, Subscriptions
  — Hosting (ISO27001 or higher compliance, EU only)
  — Application Management
  — Application Maintenance (Keeping up with source/target environment changes)

— Data volume and interfaces:
  — 100 data sets @ 50MB, bandwidth 10GB/month
  — Published via WMS, WMTS, Predefined Dataset Download Service, Direct Access Download Service (Basic WFS and Transactional WFS)
Low cost, medium-sized projects are most efficient
Little gains through large projects
Small projects all over the place
Cost Factors: Category

Note: For Harmonisation, Integration and Deployment, insufficient data is available.
Cost Factors: License Type

Note: Removal of two outliers reduces the factor to 2.8.
Cost Factors: Download Service Type

- Atom
- WFS-B
- WFS-T
Cost Factors: Hosting and Operations Model

Note: There are only four confirmed Software as a Service projects.
Cost Factors: INSPIRE or not?

Not significant at all!
Cost Reduction Potentials

Service Deployment Models
Service Types
Shared Software Maintenance
Service Deployment Models

Separation of Responsibilities

- Move to SaaS/PaaS has highest overall cost reduction potential
- SaaS/PaaS data protection regulations and security can be problematic
- Compliant hosting is >3x expensive as basic hosting
- INSPIRE data is meant to be published!
Service Types

— Main potential in WFS-T implementation as SaaS
  — https://github.com/georocket/georocket

— Example potential for a Transformation Service SaaS:

[Bar chart showing Amazon Lambda, Sloppy.io Container Service, and Dedicated Root Server]
Shared Software Implementation and Maintenance

*High percentage of GI systems is custom-built or heavily customised*

**Approach 1: Open Source Tools**
- Data indicates Open Source to be effective for INSPIRE implementation
- Concentrate resources on core projects

**Approach 2: Commercial Products**
- Allows more attractive business models, leads to more investment
- Higher investment enables better User Experience
Outlook

Provider and Consumer Markets

INSPIRE as a Service
Phases in the INSPIRE Data Provider Market

- **Early Adoption Phase**: 2010 to 2012
- **Experimental Phase**: 2012 to 2014
- **Hot Adoption Phase**: 2014 to 2018
- **Late Adoption Phase**: 2018 to 2020
- **Maintenance Phase**: 2020 to 2024

- Market Size
  - 2% of 10M€ in 2010
  - 10% of 200M€ in 2014
  - 40% of 400M€ in 2018
  - 40% of 800M€ in 2020

- Timeline:
  - 2010: 2% of 10M€
  - 2012: 10% of 200M€
  - 2014: 40% of 400M€
  - 2018: 40% of 800M€
  - 2020: 40% of 1600M€
  - 2022: 40% of 3200M€
  - 2024: 40% of 6400M€

- Data sources:
  - Geospatial World Forum 2016, Rotterdam
  - www.wetransform.to

- Data points:
  - 2010: 2% of 10M€
  - 2012: 10% of 200M€
  - 2014: 40% of 400M€
  - 2016: 40% of 800M€
  - 2018: 40% of 1600M€
  - 2020: 40% of 3200M€
  - 2022: 40% of 6400M€
  - 2024: 40% of 12800M€
Phases in the INSPIRE Data Consumer Market

- **Experimental Phase**
  - 2010-2014
  - 1% Market Share
  - 10M €

- **Early Adoption Phase**
  - 2016-2020
  - 5% Market Share
  - 500M €

- **Hot Adoption Phase**
  - 2022-2024
  - 50% Market Share
  - 5B €
The Platform

Transform
Author with real-time feedback

Explore
Understand even the most complex data models

Analyse
Learn how data models are used

Manage
Integrated workflow from data modelling to transformation and sharing

Design
Create your information model from scratch or start from one of the 3,000+ supported schemas

Publish
Provide data as services and exchange models with your community
inspire»gis

— Software as a Service solution to fulfill INSPIRE obligations
— Complies with INSPIRE Performance rules, European Data Protection Guidelines and ISO 27001
— Constantly updated with new INSPIRE versions
— Metadata integration and publishing
— Highly Cost Effective
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