Reducing implementation and maintenance costs through INSPIRE as a Service

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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**

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**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
### The Data

<table>
<thead>
<tr>
<th>Company Name</th>
<th>Contact Name</th>
<th>Contact Email</th>
<th>Contact Phone</th>
<th>Company Size</th>
<th>Industry</th>
<th>Region</th>
<th>Data Quality</th>
<th>Data Privacy</th>
<th>Data Access</th>
<th>Data Use Case</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acme Corp</td>
<td>Jane Smith</td>
<td><a href="mailto:jane.smith@acme.com">jane.smith@acme.com</a></td>
<td>123-456-7890</td>
<td>1,000 employees</td>
<td>Technology</td>
<td>North America</td>
<td>Good</td>
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<td>Yes</td>
<td>Business Intelligence</td>
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<tr>
<td>Beta Corp</td>
<td>John Doe</td>
<td><a href="mailto:john.doe@beta.com">john.doe@beta.com</a></td>
<td>987-654-3210</td>
<td>500 employees</td>
<td>Healthcare</td>
<td>Europe</td>
<td>Excellent</td>
<td>Excellent</td>
<td>Yes</td>
<td>Customer Analytics</td>
</tr>
<tr>
<td>Gamma Corp</td>
<td>Mary Brown</td>
<td><a href="mailto:mary.brown@gamma.com">mary.brown@gamma.com</a></td>
<td>456-789-0123</td>
<td>2,500 employees</td>
<td>Manufacturing</td>
<td>Asia</td>
<td>Fair</td>
<td>Fair</td>
<td>Yes</td>
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</table>

- **Data Quality**: Based on self-assessment.
- **Data Privacy**: Confidential data marked with an asterisk (*)
- **Data Access**: Access granted to specific teams.
- **Data Use Case**: Project title or description.
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)
Normalized Costs Distribution

Low cost, medium-sized projects are most efficient
Little gains through large projects
Small projects all over the place
Cost Factors: Category

Commercial License

Open Source License

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
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
- Move to SaaS/PaaS has highest overall cost reduction potential

- SaaS/PaaS data protection regulations and security can be problematic

- Compliant hosting is more 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](https://github.com/georocket/georocket)
– Example potential for a Transformation Service SaaS:
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

- **Experimental Phase** (2010-2012): 2% market size
- **Early Adoption Phase** (2014): 10% market size
- **Hot Adoption Phase** (2016): 40% market size
- **Late Adoption Phase** (2020): 40% market size
- **Maintenance Phase** (2022-2024)

Market Size:
- 10M€
- 200M€

Years:
- 2010
- 2012
- 2014
- 2016
- 2018
- 2020
- 2022
- 2024

Inspire conference 2016, Barcelona
Phases in the INSPIRE Data Consumer Market

- **Experimental Phase**
  - Start: 2010
  - 1% Market Size

- **Early Adoption Phase**
  - Start: 2016
  - 5% Market Size

- **Hot Adoption Phase**
  - Start: 2022
  - 50% Market Size

Market Size:
- 2010: 10M€
- 2024: 500M€

Dates:
- 04.10.2016
- Inspire conference 2016, Barcelona
The Platform

Transform
Author with real-time feedback

Explore
Understand even the most complex data models

Manage
Integrated workflow from data modelling to transformation and sharing

Design
Create your information model from scratch or start from one of the 5,000+ supported schemas

Analyze
Learn how data models are used

Publish
Provide data as services and exchange models with your community
- 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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