



What is new in INSPIRE?

An organisational and technological perspective



JRC-EC INSPIRE Team

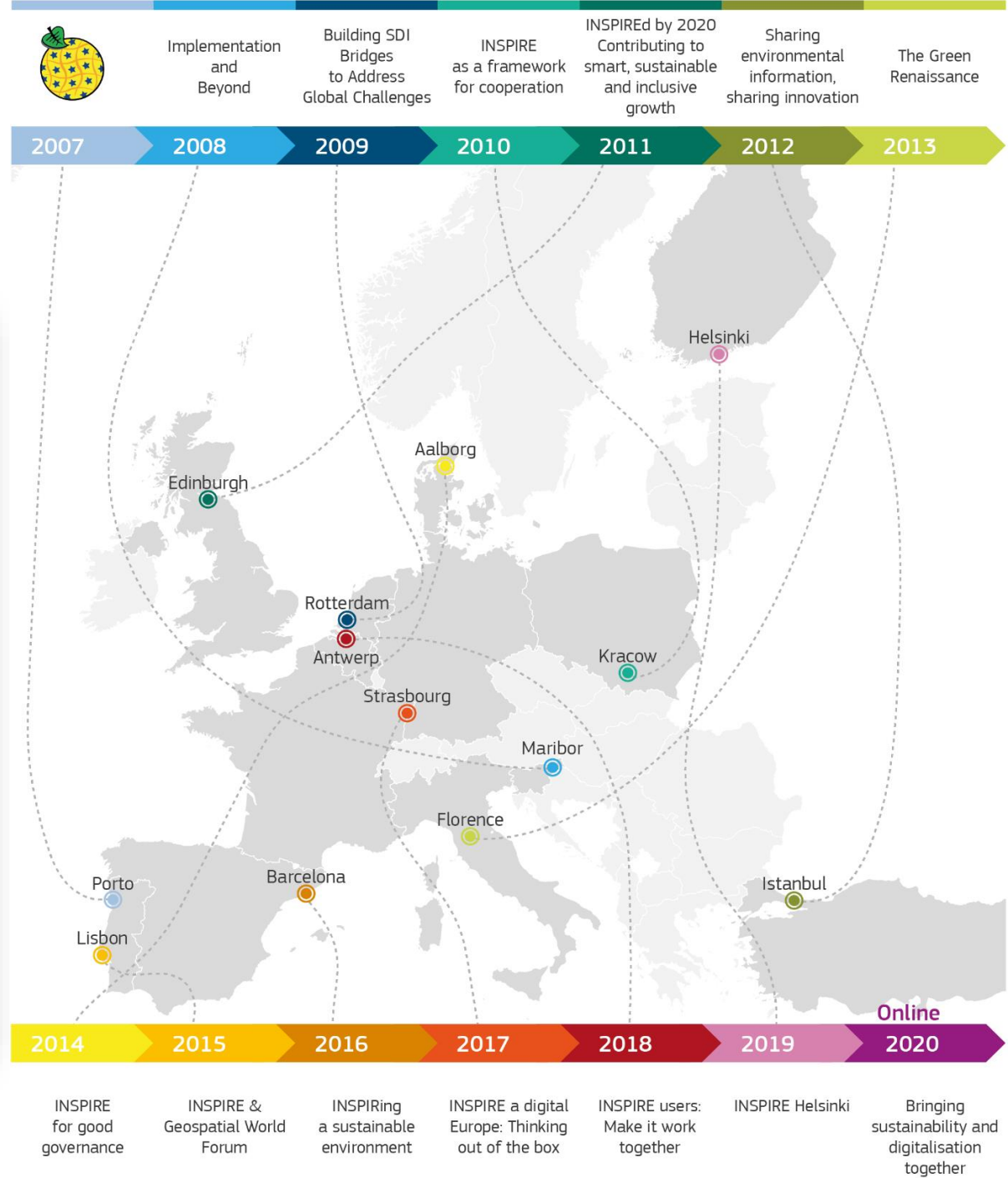
INSPIRE

The geospatial pineapple

- One of the biggest geospatial data sharing initiatives in the world (**7000+ providers**).
- **Multi-faceted Spatial Data Infrastructure** framework
 - **Legal:** Directive, Implementing provisions, transposition in MS.
 - **Organisational:**
 - Governance structure with National contact points / structures, Multiple Commission Services.
 - Maintenance and Implementation Work programme;
 - **Technical:** Reusing building blocks from standardisation bodies (OGC, ISO, etc.)
 - Full stack of guidelines for discoverability, metadata, data encoding and data sharing.
- **Status of implementation**
 - Directive entered into force in 2007 / Roadmap finished by December 2021.
 - **Lights and shadows.** Objectives partially achieved. Heterogeneity of implementations across EU. Pan European coverage yet to be achieved.



Lights - What works well Community



Lights - What works well

Data availability & E-reporting

- Discoverability and accessibility are improving.
- Use of INSPIRE in e-reporting.

The screenshot shows the INSPIRE Geoportal interface. At the top, there's a header with the European Commission logo and navigation links. Below the header, a map of Europe is displayed with a sidebar titled 'INSPIRE Geoportal Data Set Statistics'. The sidebar contains three boxes: '91433 Metadata records', '44789 Downloadable Data Sets', and '46451 Viewable Data Sets'. Below the map, there's a table titled 'Select a COUNTRY' listing various European countries with their respective data set counts. At the bottom, there's a button 'Select the whole EUROPE' and a 'Download stats' button.

Country	Metadata records	Downloadable Data Sets	Viewable Data Sets
Austria	630	410	493
Belgium	577	377	408
Bulgaria	263	97	99
Croatia	146	10	22
Cyprus	42	32	34
Czech Republic	165	60	87
Denmark	207	113	99
Estonia	87	41	54
Finland	597	88	238
France	218	75	17
Germany	65383	41149	42184
Greece	59	59	59
Hungary	121	23	20
Iceland	147	7	0
Ireland	76	0	0
Italy	19470	528	668
Latvia	166	100	99
Liechtenstein	69	10	12
Lithuania	132	126	59
Luxembourg	304	283	243
Malta	150	149	150
Netherlands	220	126	146
Norway	161	71	28
Poland	163	109	97
Portugal	622	350	496
Romania	103	35	38
Slovakia	345	83	96
Slovenia	91	12	32
Spain	246	75	172
Sweden	245	189	217
Switzerland	218	2	4



The screenshot shows the European Data Portal interface. At the top, there's a header with the European Data Portal logo and navigation links. Below the header, a search bar is visible with the text 'inspire'. Below the search bar, there's a map of Europe and a table titled 'Countries' listing various European countries with their respective data set counts. To the right of the map, there's a section titled 'INSPIRE view service WMS on the issue of Nadia Grid (EL GRID)' and another section titled 'INSPIRE WMS View Service for the theme Geographical Names (GN)'. At the bottom, there's a section titled 'WMS DB-Netz rail network' and another section titled 'INSPIRE WMS Rail Network (INSPIRE TN-RA)'.

Country	Count
Czechia	38836
Germany	18130
France	18070
United Kingdom	4553
Belgium	2212
Spain	1079
Austria	546
Netherlands	441
Poland	437

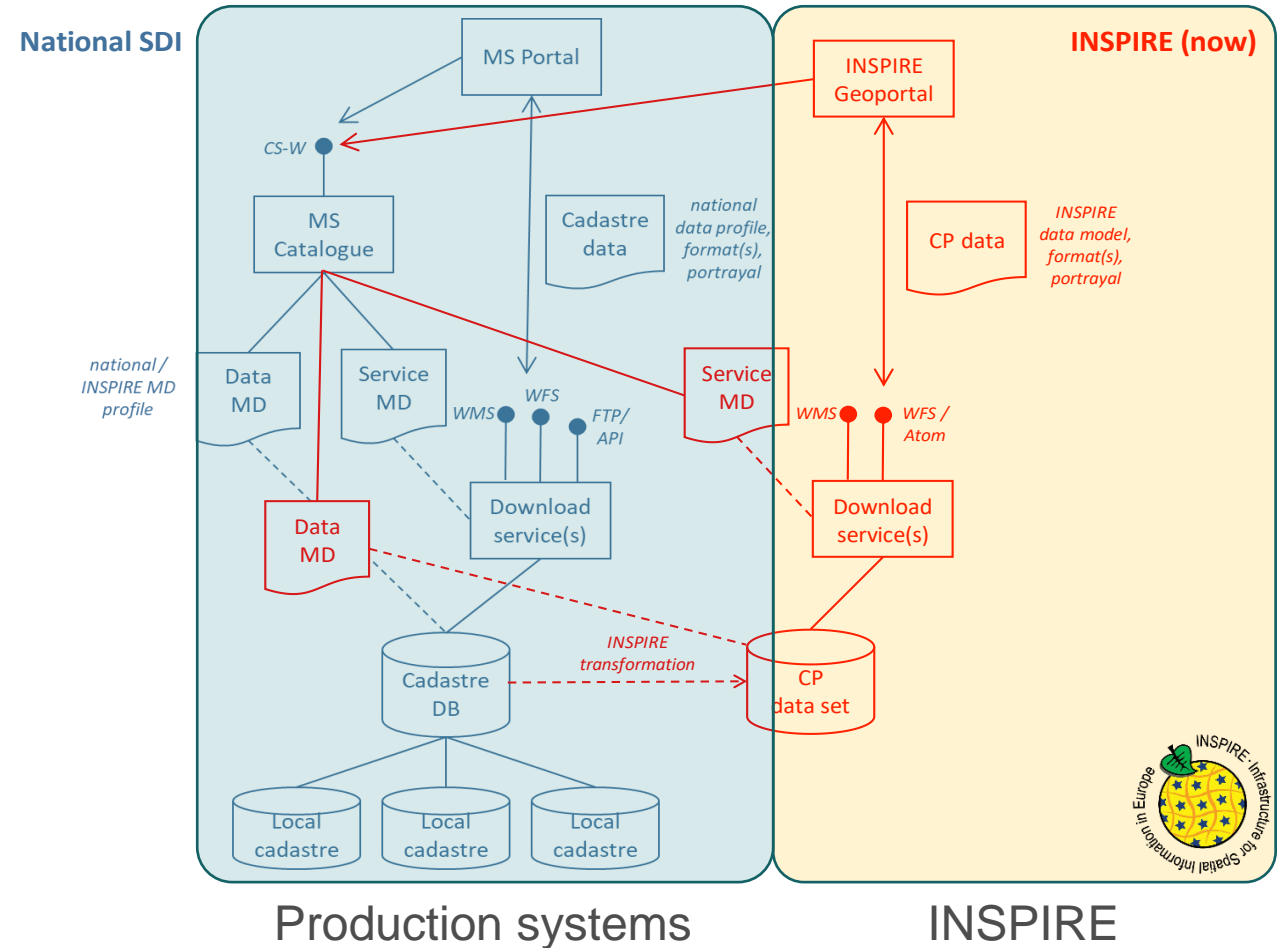
- Central INSPIRE components.
- Many client and server implementations.



Shadows - What does not work so well

Inappropriate organisational approaches

- Parallel implementations.
- Duplication of efforts.
- INSPIRE sometimes implemented to only check a box.



Shadows - What does not work so well

Inflexibility in standardisation

- Adherence to specific technologies / encodings.
- Strictly following standards vs. Narrow use of standards.
- Custom extensions: Extending standards is problematic.
 - Extended capabilities.
 - GML attributes.
 - Nested structures.



Shadows - What does not work so well

Complexity

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<gn:NamedPlace gml:id="MIG20172_example_NamedPlace">
  <gn:beginLifespanVersion xsi:nil="true"/>
  <gn:geometry>
    <gml:Point gml:id="_d7180a8f-a590-44da-8b45-41d96d5cba5e" srsName="http://www.opengis.net/def
    <gml:pos>471979.2568 5564594.2444</gml:pos>
    </gml:Point>
  </gn:geometry>
  <gn:inspireId>
    <base:Identifier>
      <base:localId>NamedPlace_Example</base:localId>
      <base:namespace>https://www.examples.eu/</base:namespace>
    </base:Identifier>
  </gn:inspireId>
  <gn:localType xsi:nil="true"/>
  <gn:name>
    <gn:GeographicalName>
      <gn:language>deu</gn:language>
      <gn:nativeness xsi:nil="true"/>
      <gn:nameStatus xsi:nil="true"/>
      <gn:sourceOfName xsi:nil="true"/>
      <gn:pronunciation xsi:nil="true"/>
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        </gn:SpellingOfName>
      </gn:spelling>
    </gn:GeographicalName>
  </gn:name>
  <gn:type xsi:nil="true"/>
</gn:NamedPlace>
```

OpenStreetMap Modifica Cronologia Esporta

Tracciat GPS Diari degli utenti Copyright Aiuto Informazioni mingo23

Etichette

alt_name:la	Monachium,Monachum
capital	4
ele	519
int_name	Munich
is_in_country_code	DE
is_in_iso_3166_2	DE-BY
name	München
name:als	Münche
name:ar	ميونخ
name:az	Münhen
name:bar	Minga
name:be	Мюнхен
name:be-larask	Мюнхэн
name:bg	Мюнхен
name:ca	Munic
name:cs	Mnichov
name:da	München
name:de	München

<https://www.openstreetmap.org/node/1700534808#map=12/48.1332/11.6462>

What is ahead

New Policy context

- **“Europe fit for the Digital Age”** priority of the new European Commission:
 - Data-driven innovation.
 - Adding value to Europe’s economy and society.
- **European Strategy for Data:**
 - Establishment of a single market for data through sector-specific data spaces.
 - Different actors interplaying in the data economy (public sector, businesses, citizens, and academia)
- **Open Data Directive** (and forthcoming Implementing Act):
 - Provision and sharing of public sector High-Value Datasets (many of them geospatial).
- **INSPIRE:** Public-sector contribution to the **Green Deal data space**.

What is ahead

Technological trends

- New data sources:
 - Internet of Things (IoT).
 - Citizen-generated geospatial data.
 - Open research data.
 - Private data.
- APIs – From data collection to data connection.
- Novel architectures.
- Agile standards.
- Mature tools.



INSPIRE Evaluation & Future

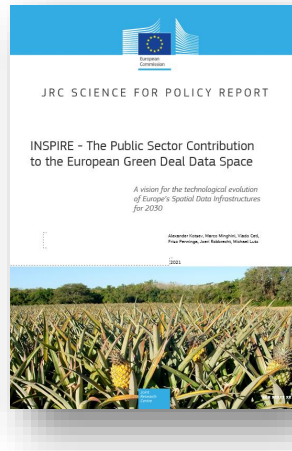
Forthcoming JRC Science for Policy Report

- Prepared with Geonovum and DG ENV.
- Sneak peek:
 - Overview of the status
 - Policy and technological context
 - Lessons learned
 - Vision for the technological evolution
 - Actions and roadmap
 - Prototype reference framework



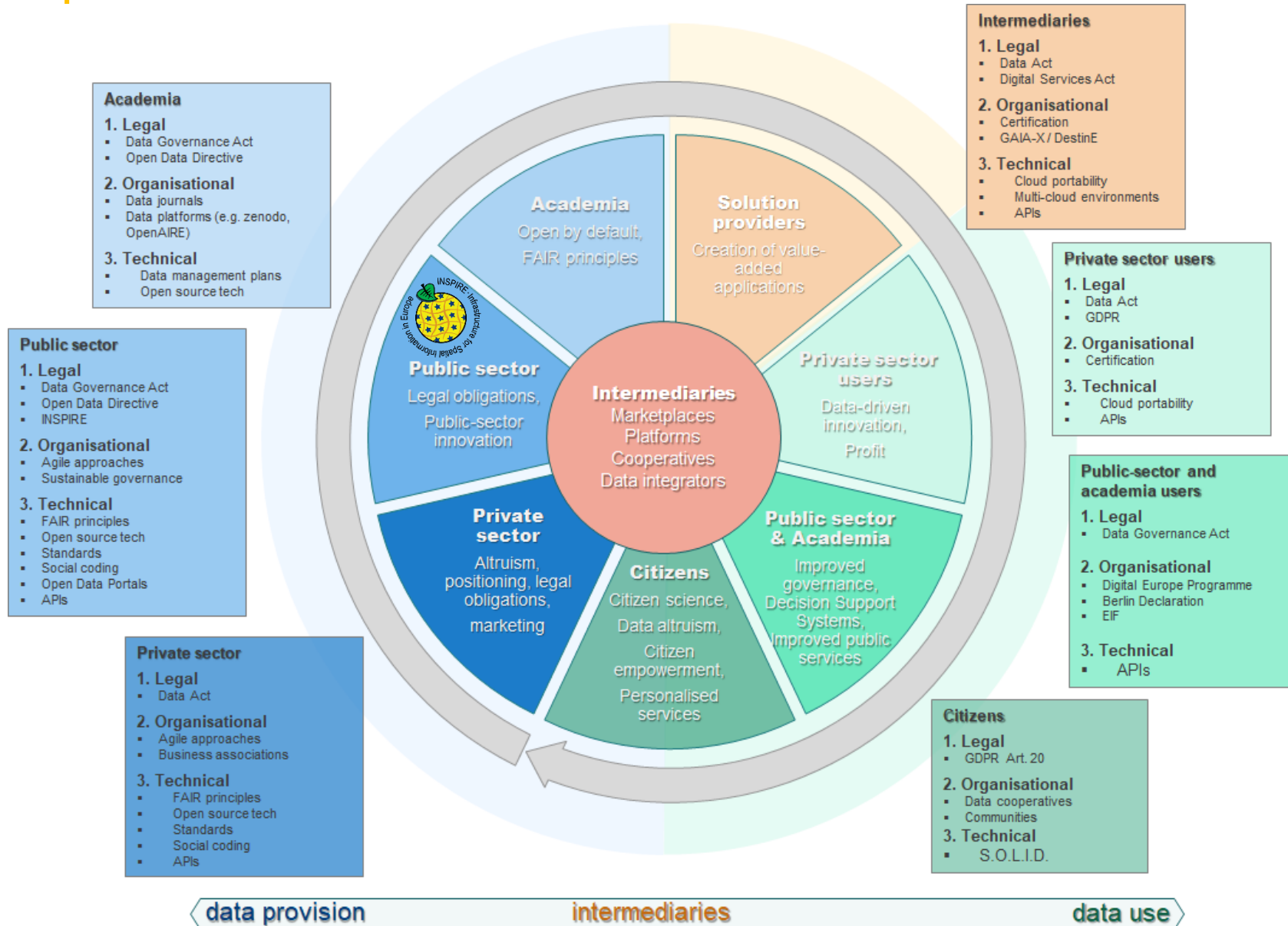
INSPIRE Future

Vision (work in progress)



- INSPIRE should **‘blend in’** with the **broader ecosystem** of spatial and non-spatial data, infrastructures, technologies and policies.
- This will mean **opening up to a broader community** of implementers and users, and to a wider range of applications and use cases.
- Making the INSPIRE framework more **flexible and agile** will significantly lower the entry level to the sharing and utilisation of data.
- Technical **approaches need to be simplified** by reusing well-adopted standards and technologies.

INSPIRE In a broader data ecosystem



- From a linear approach to a data ecosystem:
 - Cross-sectoral.
 - Creation of value.
 - Sustainable governance model.



Addressing the challenge

Maintenance and Implementation Work programme (MIWP 2021-2024)

Context for modernising the technological framework of INSPIRE.

6 core actions

- 1.1 Towards a digital ecosystem for the environment and sustainability
- 2.1 Need-driven data prioritisation
- 2.2 Roadmap for priority-driven implementation
- 2.3 Simplification of INSPIRE implementation
- 2.4 Central infrastructure components
- 3.1 GreenData4all initiative

MIWP 2021-2024 Examples

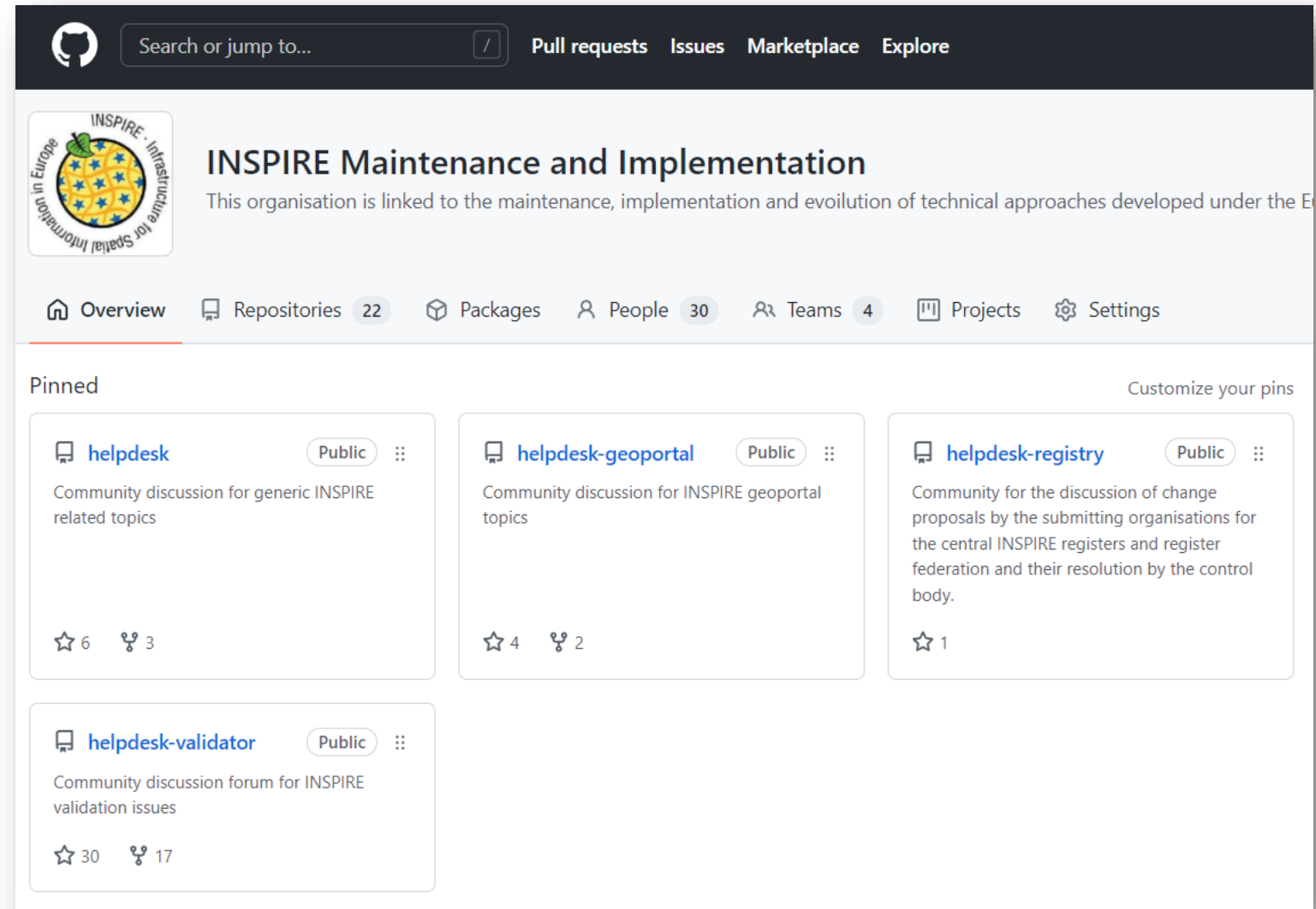
‘Mainstreaming’ INSPIRE - GitHub

- GitHub works well!

2 Levels of support:

Level 1 – General support that includes checking, immediate answering and moving questions to the right Level 2.

Level 2 – Provision of concrete solution.

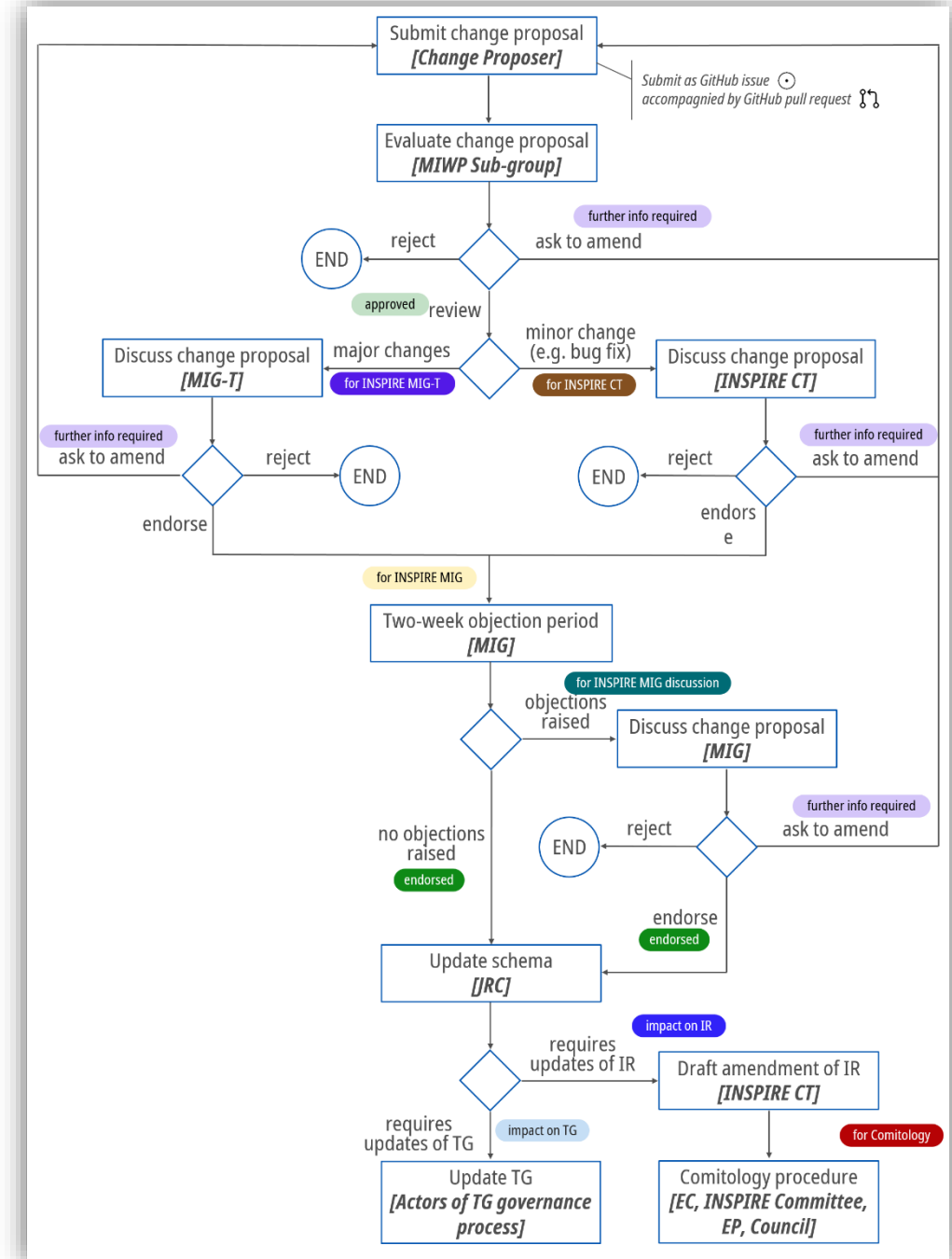


<https://github.com/INSPIRE-MIF>

MIWP 2021-2024 Examples

Governance of artefacts

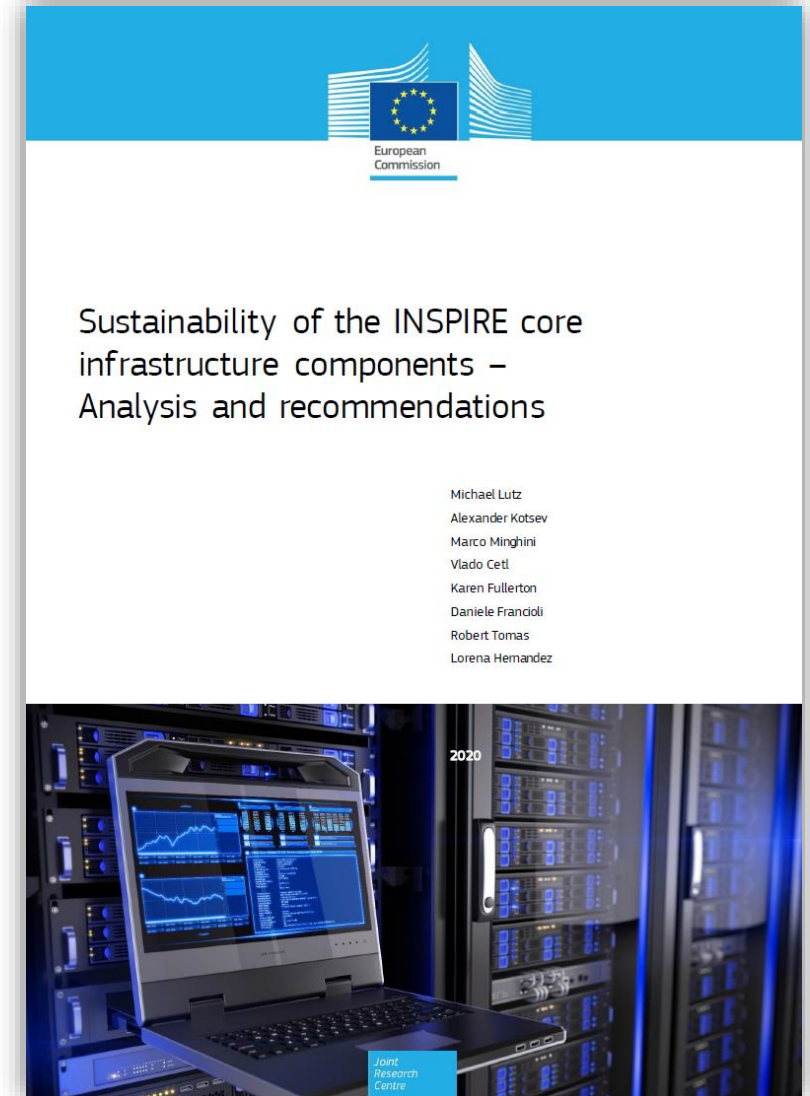
- Open the floor to proposals from the community.
- Transparent approach for governance of the artefacts:
 - Sub-group and facilitators.
 - Decision tree and release plan:
 - Know how to approach each issue.
 - 2 Releases are planned per year, aligned with the MIG-T Meetings.



MIWP 2021-2024 Examples

The Toolbox

- Support by tools is the default.
- Build strategic partnerships with communities:
 - GeoNetwork as geoportal backend.
 - Registry in OSGeo.
- Focus on the INSPIRE-specificity and not on mainstream tool development.
- Harmonise the approaches for helpdesk.
- Decouple tools from infrastructure.
- Extensive use of the cloud.




MIWP 2021-2024 Examples

Modernise the technological stack of INSPIRE within the remit of legislation

- **Good practices.**
- Updated Good Practice library available.
- Procedure for endorsement:
 - *Step 1. Initiation.*
 - *Step 2. Submission as good practice candidate.*
 - *Step 3. Outreach.*
 - *Step 4. Submission.*
 - *Step 5. Legal scrutiny.*
 - *Step 6. Feedback.*

<https://inspire.ec.europa.eu/portfolio/good-practice-library>



The screenshot displays the INSPIRE Knowledge Base website. At the top, there is a navigation bar with links for About, Contact Us, Terms of use, Privacy Policy, Legal Notice, and Cookies. The language is set to English (en). The main header features the European Commission logo and the text "INSPIRE KNOWLEDGE BASE" and "Infrastructure for spatial information in Europe". Below this, a breadcrumb trail reads "European Commission > INSPIRE > Toolkit > Good Practice Library". The main content area is titled "Good Practice Library" and includes a "Quick search" sidebar with a list of topics: Data and Service Sharing, Data Specifications, Implement, INSPIRE, INSPIRE in your Country, Learn, Maintenance and Implementation, Metadata, MIG Work Programme, Monitoring and Reporting, Network Services, Participate, and Spatial Data Services. The "Good Practice documents" section is divided into "Candidate" and "Endorsed" categories. The "Candidate" list includes links for "Building one access point to dispersed data sources", "Making spatial data downloadable via WMS services", and "OGC compliant INSPIRE Coverage data and service implementation". The "Endorsed" list includes links for "GeoDCAT-AP", "SDMX for Human Health and Population Distribution", "OGC API - Features as an INSPIRE download service", and "OGC SensorThings API as an INSPIRE download service". Below this, there is a "Good Practice Template" section with a "Download Template" button. The "Context" section provides background information on the development of INSPIRE, mentioning the creation of legally-binding Implementing Rules (IRs) and Technical Guidelines (TGs), and the need for new TGs as technology evolved. It also mentions the development of related tools to maximise the benefits of the implementation process. The text concludes by stating that at least three types of good practice can already be observed: 1. Good practice related to INSPIRE implementation, where practitioners are extending and evolving the key elements of INSPIRE to support their communities' needs, such as extended data models.

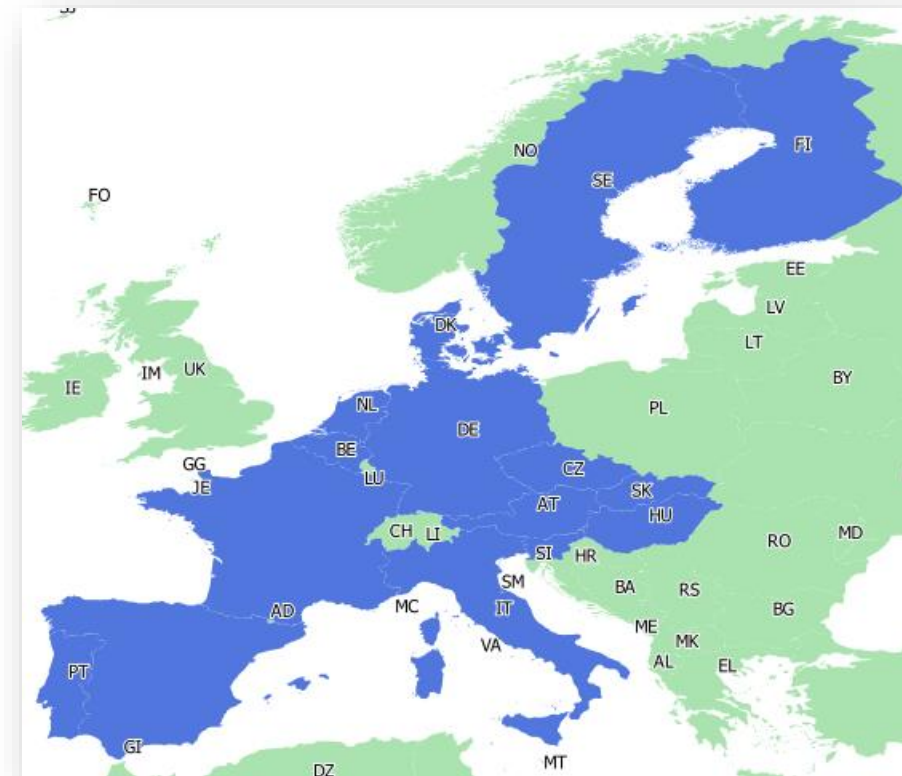
MIWP 2021-2024 Examples

OGC API – Features in INSPIRE

- Strong interest by Member States.
- Close collaboration between OGC, MS, EC, software vendors and projects.
- Extensive sandboxing.
- Approach confirmed through deployments.
- Validation in the ETF validator (working prototype).
- Iterative process.

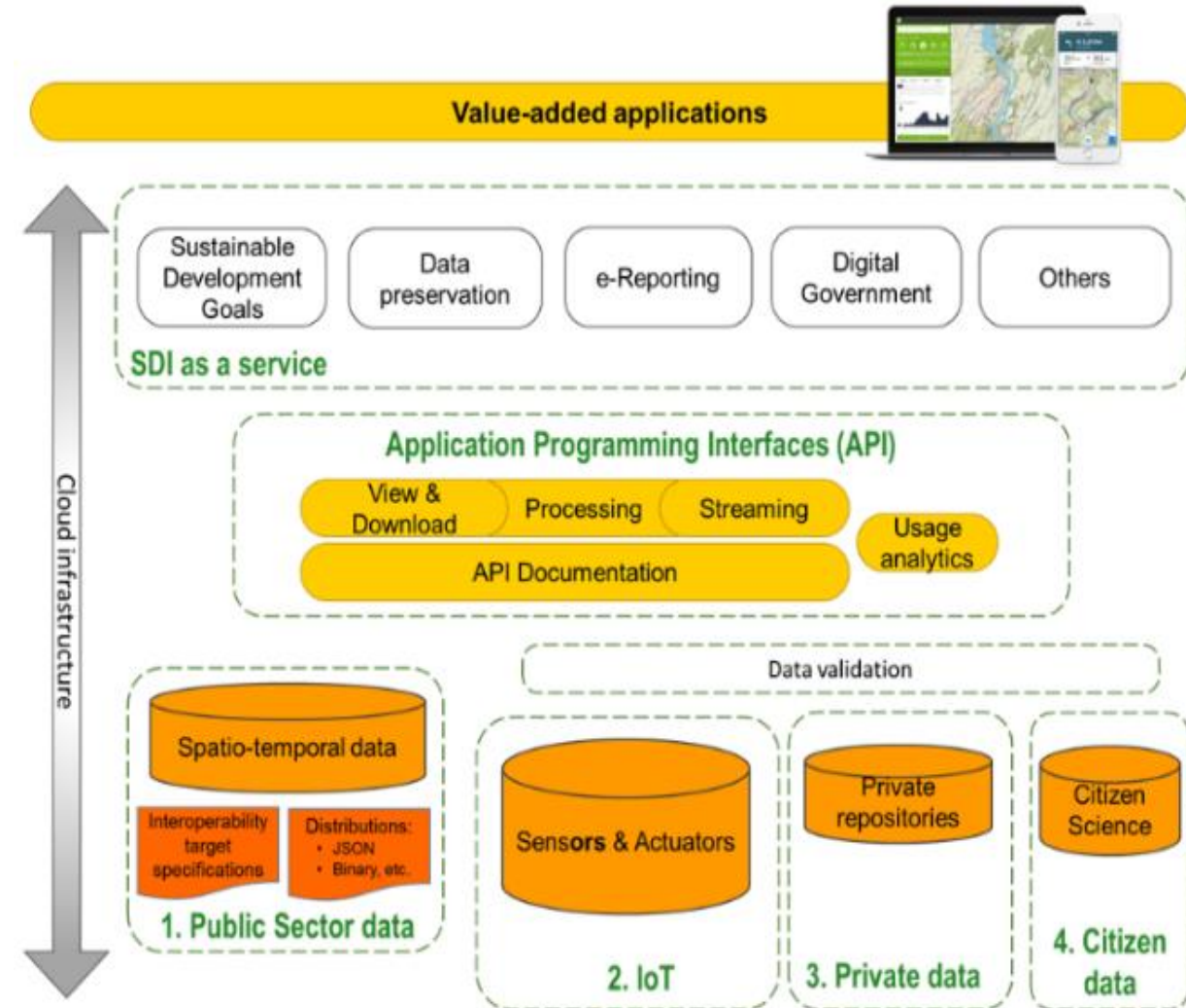
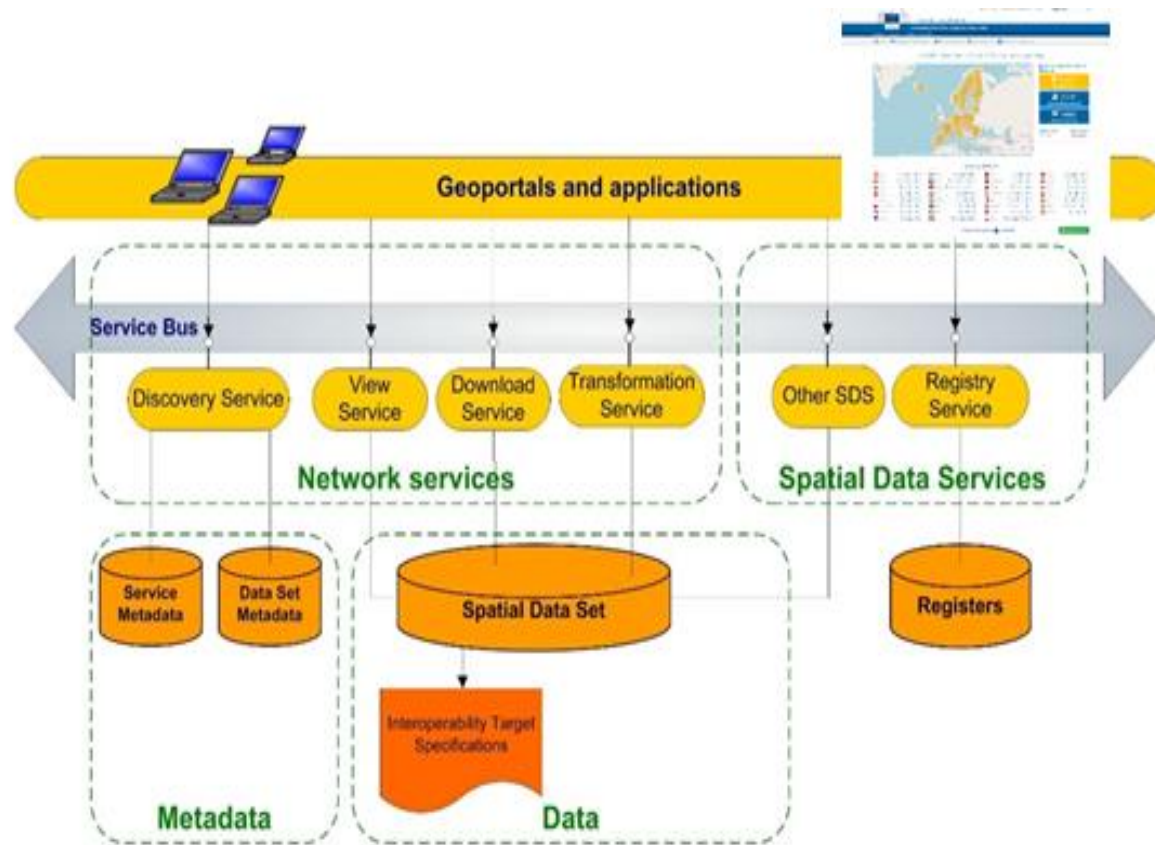
What is the impact of OGC API – Features so far?

With just over a year since the release of Part 1 of OGC API - Features, the standard has already begun to have an impact globally. For example, the International Organization for Standardization (ISO) has approved Part 1 under the name **ISO 19168-1:2020** Geographic information — Geospatial API for features — Part 1: Core. Further, the community of more than 30 states that are implementing the INSPIRE Directive has endorsed the API as a **Good Practice** for an INSPIRE download service. The INSPIRE Directive aims to create a European Union (EU) spatial data infrastructure for the purposes of EU environmental policies and policies or activities which may have an impact on the environment. Part 2 of the standard is expected to have even greater utility in geomatics due to its support for a variety of CRS. As with any OGC standard, this OGC standard is free to download and implement. Interested parties can view and download the standard from the OGC API - Features Page at <https://ogcapi.ogc.org>



MIWP 2021-2024 Examples

A new technical framework is needed...



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[EU Spotify](https://open.spotify.com/playlist/37i9ZQZPXYWlqUgOYUgUgU)

Thank you



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