# INSPIRE Good Practice – Data-Service Linking Simplification

**MIG-T Sub-group 2.3.2**

Antonio Rotundo, Ine de Visser, Marie Lambois, Heidi Vanparys

**JRC INSPIRE Team**

Jordi Escriu, Davide Artasensi, Marco Minghini, Alexander Kotsev

*INSPIRE Good Practice – Data-Service Linking Simplification*

*16th MIG – 72nd MIG-T*

# Why simplification ?

Priority dataset provider announcing that he has successfully created a dataset metadata that fully validates against the validator.

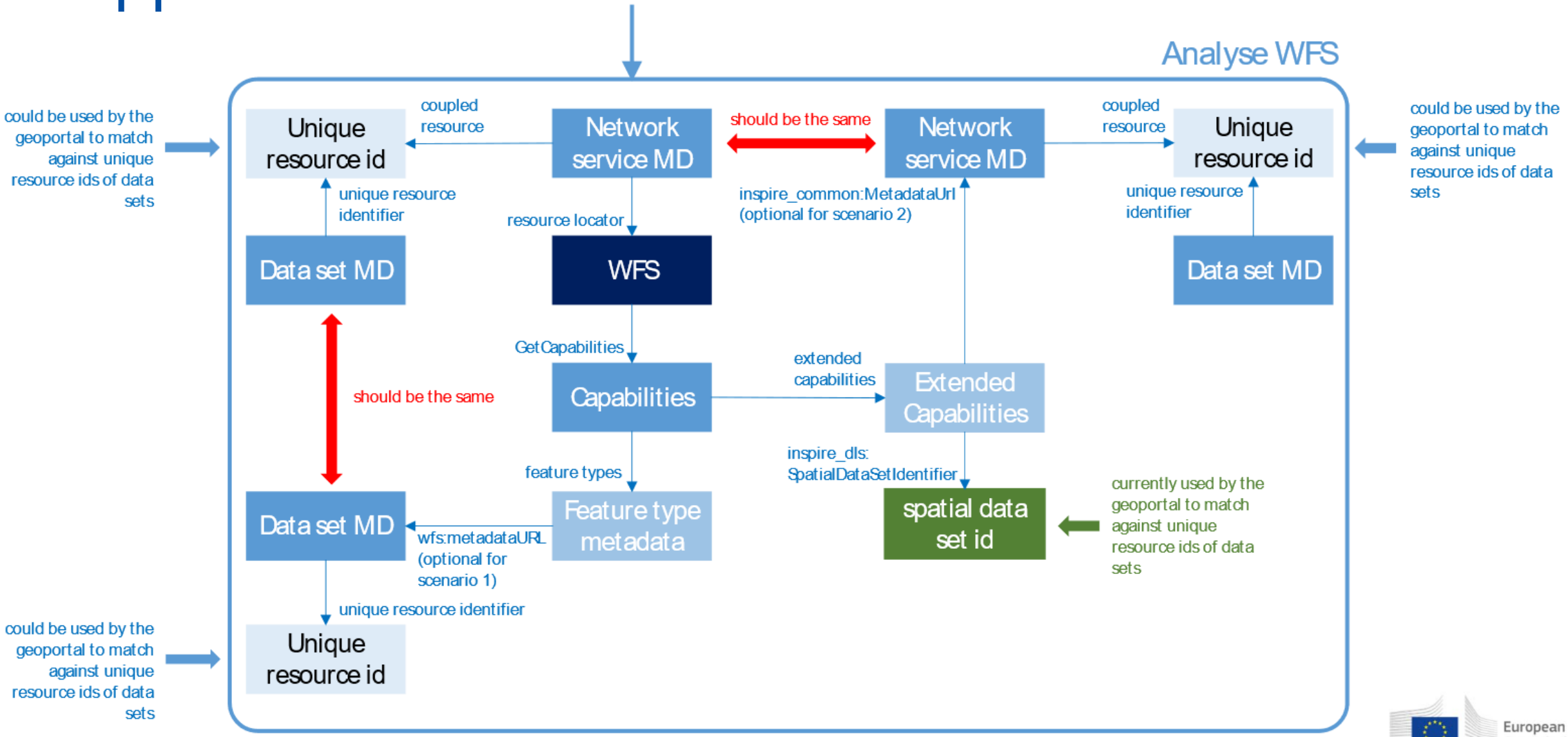
Image by wayhomestudio on Freepik

# Why simplification ?

Image by kues1 on Freepik

Same priority dataset provider when I announced him that now he has to create a download service with extended capabilities (so he cannot use his current software solution), a view service with extended capabilities and then he has to create a metadata for each service and in each metadata reference the dataset metadata so that the Inspire Geoportal understands that this service is serving this data and thus his data is advertised as downloadable/viewable.

# Why? The current data – service linking approach



# Why simplification ?

Why?

Low level of accessibility to Italian INSPIRE data sets with the current approach

**Complete overview of the harvest session**

| 6728 Data Set and Series records | 705 Downloadable Data Sets | 528 Viewable Data Sets |
|---|---|---|
| Last published harvest: 6498 | Last published harvest: 755 | Last published harvest: 487 |

But the number of services documented is relevant

**2115**

Services

CONCLUSIONS: with the simplification approach, a considerable increase in the level of accessibility is expected

# Why simplification ?

- While in the meantime:


- Data is shown as downloadable/viewable in the national data portal
  - Simplified approach has been used for years !

European Commission

# Context - the issues (52nd MIG-T meeting)

- the **level of data-service linking** in INSPIRE **is insufficient**, and many organisations seem to have difficulties to provide implementations in line with the current TGs (even though almost all MS provide at least some data sets with correct data-service linking);
- this already has **negative impacts** on the accessibility of INSPIRE data sets (through the INSPIRE geoportal) and hence the overall usability of the INSPIRE infrastructure;
- this will also lead to **poor indicators** in the future (metadata-based) approach for monitoring and reporting;
- the **current approach** for data-service linking described in the TGs for metadata and network services **is complicated**, and there are different interpretations of the related requirements, even by implementation/standards experts;
- the current approach for service metadata, which requires **extensions to base standards**, is posing **an obstacle to the implementation of** INSPIRE requirements for **network services** (because the required extensions are not widely implemented in off-the-shelf software); and
- there is a clear overlap / **duplication of data set and service metadata** (e.g. bounding box, INSPIRE theme), which in some cases leads to inconsistencies.

# Context – recommendations (52nd MIG-T meeting)

- The MIG-T **supports the new data-centric approach** (already underlying the new geoportal and the proposed revision of the M&R IRs), which focuses on data and how they can be accessed through network services rather than considering data and network services as stand-alone components of the infrastructure. However, it might still be useful for application developers to be able to access a directory/register of the services available in the infrastructure.
- The MIG-T further recommends that there should be **one "source of truth" for service metadata**, ideally as provided by the service itself (e.g. in its Capabilities document).
- The **alternative approach for documenting data-service linking** in the data set metadata (as proposed in the discussion paper) **should be further elaborated** and become the **preferred option in the Metadata TGs** (and/or in a stand-alone guidance document on data-service linking); this guidance should include an explanation how the IR requirements for network service metadata are mapped to the new approach;
- The **current approach should still be supported for a transition period** (to be determined by the MIG) as an alternative option that will be used by the geoportal if no links to network services can be established based on the data set metadata; at the end of the transition period the necessity to further support the current approach should be reviewed;

# Intended outcome

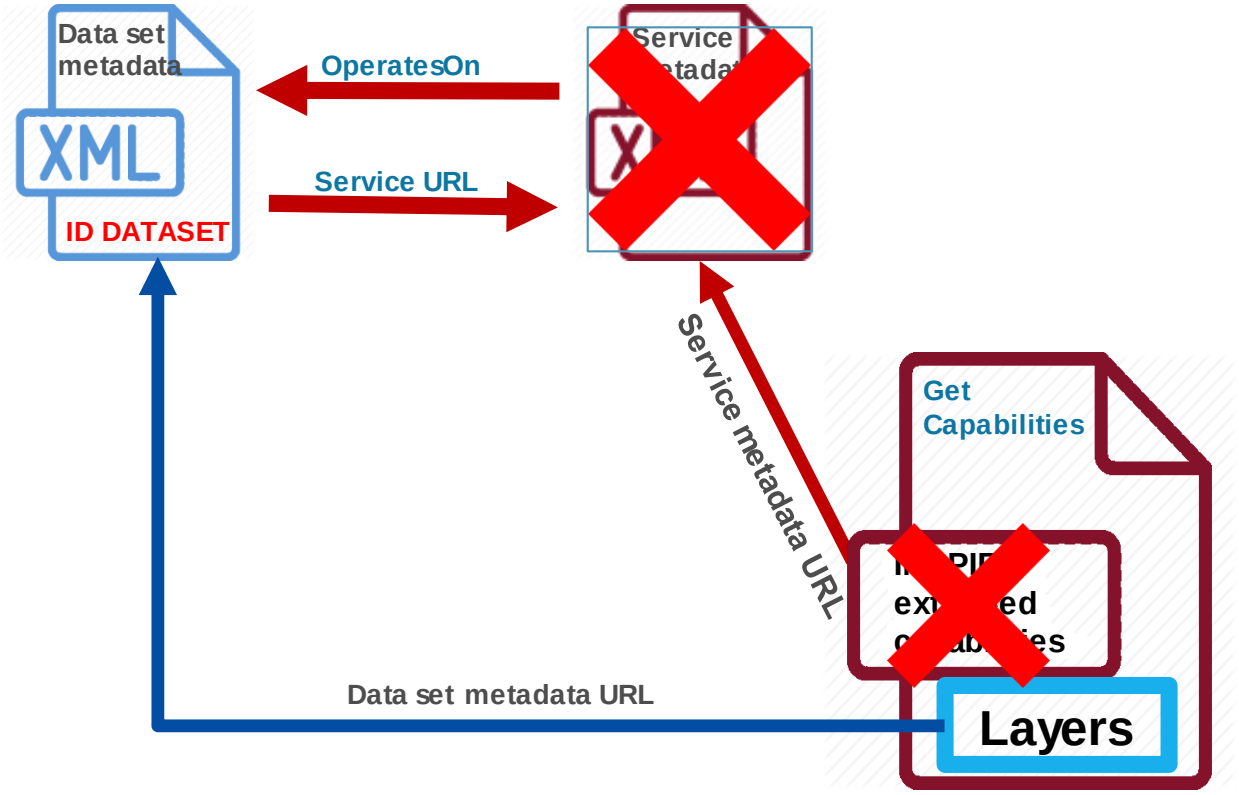
- **The users** of the INSPIRE infrastructure **can access all available data** via the view and download services.
  When using this GP, data providers are not experiencing difficulties anymore to establish downloadable and viewable data sets, because:
- The requirements described in this good practice for documenting these links are **easy to be implemented and understood**, and therefore widely used and correctly implemented by MS.
- INSPIRE-specific extensions to existing standards that are not widely supported by existing software products. This GP makes them unnecessary from now onwards, since it allows implementer's organizations to access **off-the-shelf software** without worrying anymore about compliance to INSPIRE-specific extensions.

# Summary of work

This good practice constitutes an alternative way to provide the data-service linking in INSPIRE - Optional, not mandatory.

- The data set metadata record shall include additional elements, already present in many national metadata profiles, related to view and download services;
- There is no need for view and download services to be documented through their stand-alone service metadata records. The metadata returned by the service itself, as a response to a Get View/Download Service Metadata request, is enough to provide the required information;
- The metadata returned by the OGC web services (OWS) can follow a structure supported by all implementing servers, no longer including the Extended Capabilities section (an optional element not supported by all implementing servers).

# MIWP Action 2.3.2
# Data Service Linking Simplification - Overview




**Section 8**

**Part A.** Data - service linking simplification
Good practice guidelines

**Section 9**

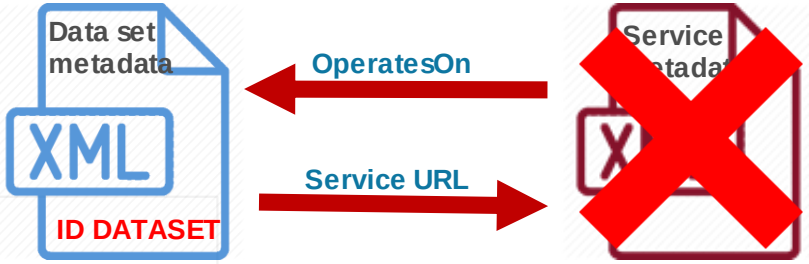
**Part B.** Data - service linking simplification
Use of INSPIRE conformant standard capabilities documents

**Final specification**:

https://github.com/INSPIRE-MIF/gp-data-service-linking-simplification/blob/main/good-practice/data-service-linking-simplification-spec.md

# Part A: Data-Service Linking Simplification

## Simplification approach (resource locator)




In case of **View and Download services**, for the resource locator:

- the element **gmd:URL** SHALL point to the response of the Get View/Download Service Metadata (GetCapabilities);
- the elements **gmd:protocol** and **gmd:applicationProfile** SHALL be present

| metadata element | Encoding |
|---|---|
| **<gmd:protocol>** | **gmx:Anchor** pointing to the URI coming from https://inspire.ec.europa.eu/metadata-codelist/ProtocolValue |
| | **gco:CharacterString** with the value of the label in the metadata language |
| **<gmd:applicationProfile>** | **gmx:Anchor** pointing to the URI https://inspire.ec.europa.eu/metadata-codelist/SpatialDataServiceType/view or https://inspire.ec.europa.eu/metadata-codelist/SpatialDataServiceType/download |
| | **gco:CharacterString** with the value of the label in the metadata language |

# Part A: Data-Service Linking Simplification

## Example for a view service

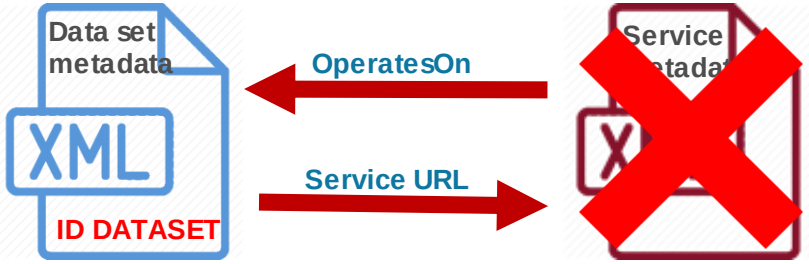
```
<gmd:transferOptions>
   <gmd:MD_DigitalTransferOptions>
      <gmd:onLine>
         <gmd:CI_OnlineResource>
            <gmd:linkage>
         <gmd:URL>https://geoservizi.regione.liguria.it/geoserver/M1743/wms?version=1.3.0&request=get
capabilities</gmd:URL>
            </gmd:linkage>
            <gmd:protocol>
               <gmx:Anchor xlink:href="http://www.opengis.net/def/serviceType/ogc/wms">OGC Web Map
Service</gmx:Anchor>
            </gmd:protocol>
            <gmd:applicationProfile>
              <gmx:Anchor xlink:href="http://inspire.ec.europa.eu/metadata-
codelist/SpatialDataServiceType/view">consultazione</gmx:Anchor>
            </gmd:applicationProfile>
         </gmd:CI_OnlineResource>
      </gmd:onLine>
   </gmd:MD_DigitalTransferOptions>
</gmd:transferOptions>
```

European Commission

# Part A: Data-Service Linking Simplification

## Simplification approach (coupled resources)

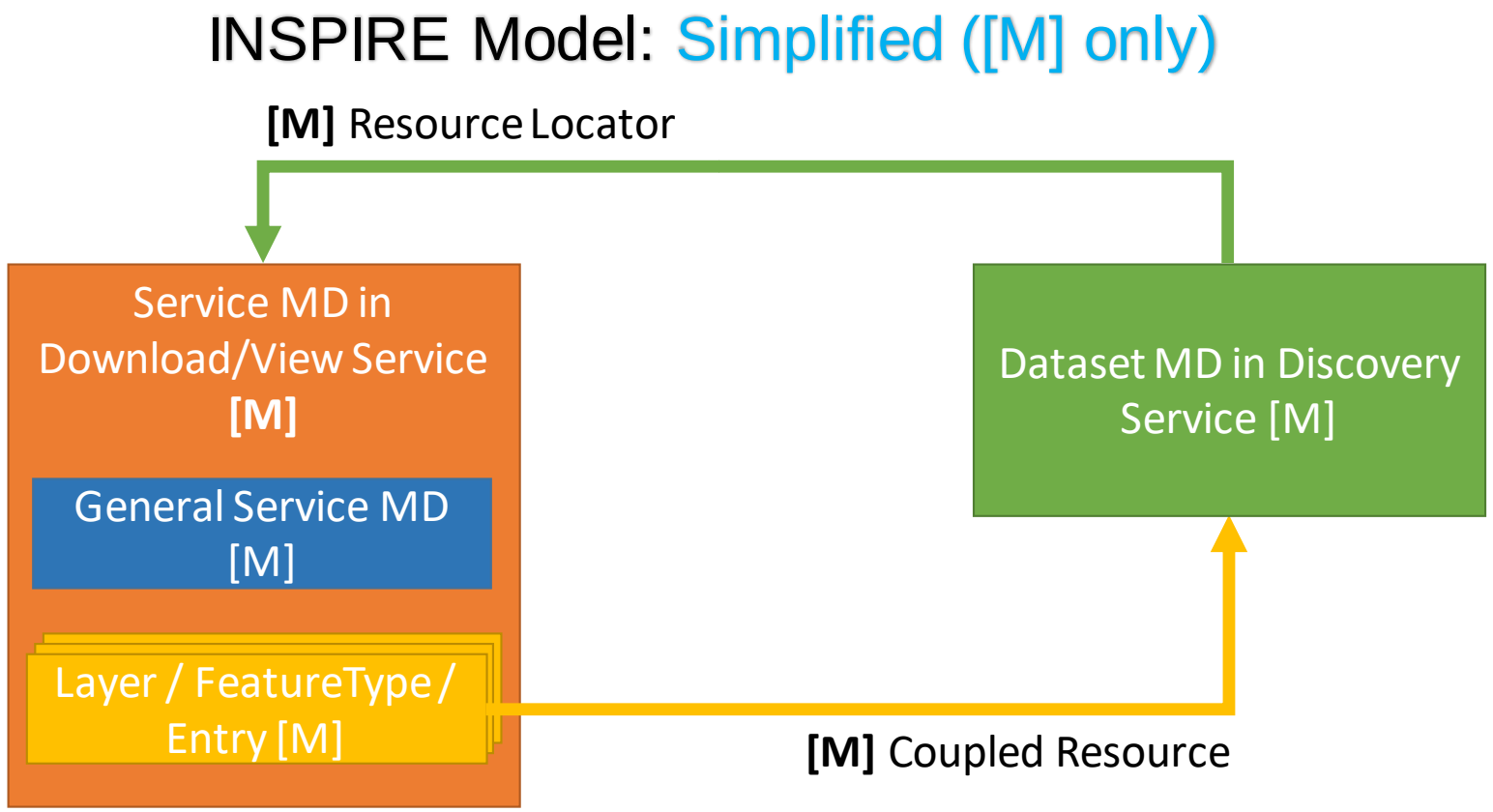
relax the implementation of the Coupled Resource by making the linkage to the <gmd:MD_DataIdentification> element of the data set metadata an optional feature, just **pointing to the URL of the metadata**



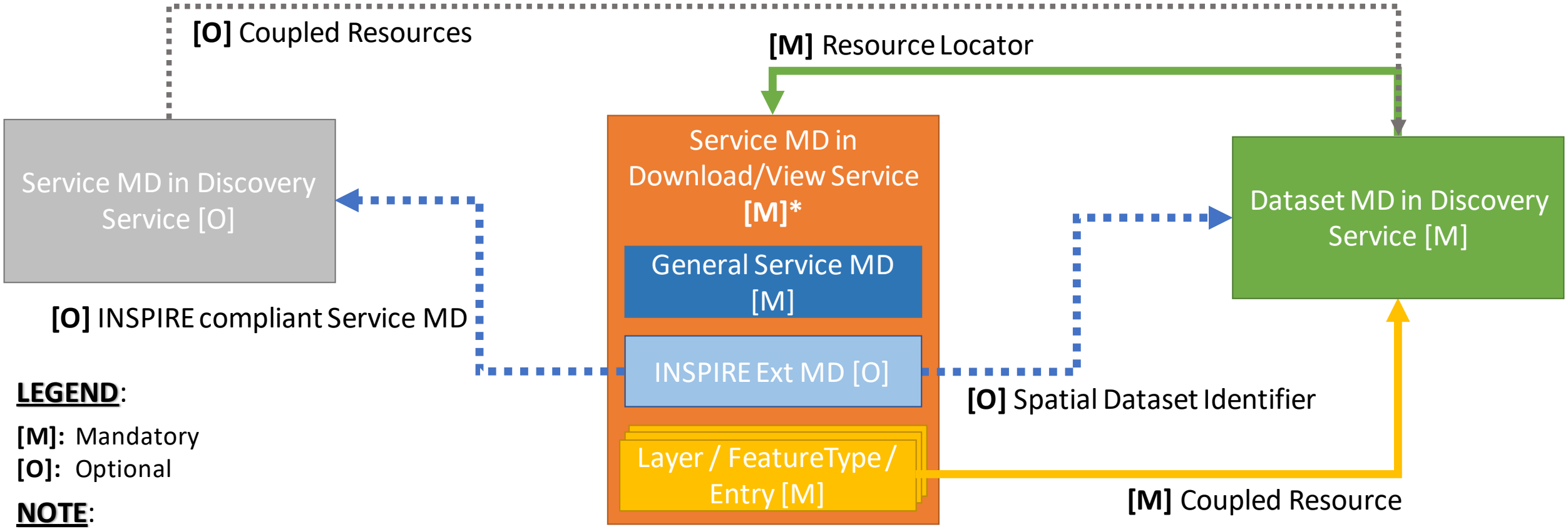

**New wording of the TG Requirement**

| metadata element | Encoding |
|---|---|
| **<wms:MetadataURL> (in Layer)** | pointing to the metadata record of the provided data set or data set series, available in a Discovery Service catalog |
| **<wfs:MetadataURL> (in Feature type)** | pointing to the metadata record of the provided data set or data set series, available in a Discovery Service catalog |
| **/feed/entry/link** | containing a link to a data set metadata record with attributes **@rel="describedby"** and **@type=«application/xml»** |

# Proposed data – service linking approach



# INSPIRE Model: Simplified



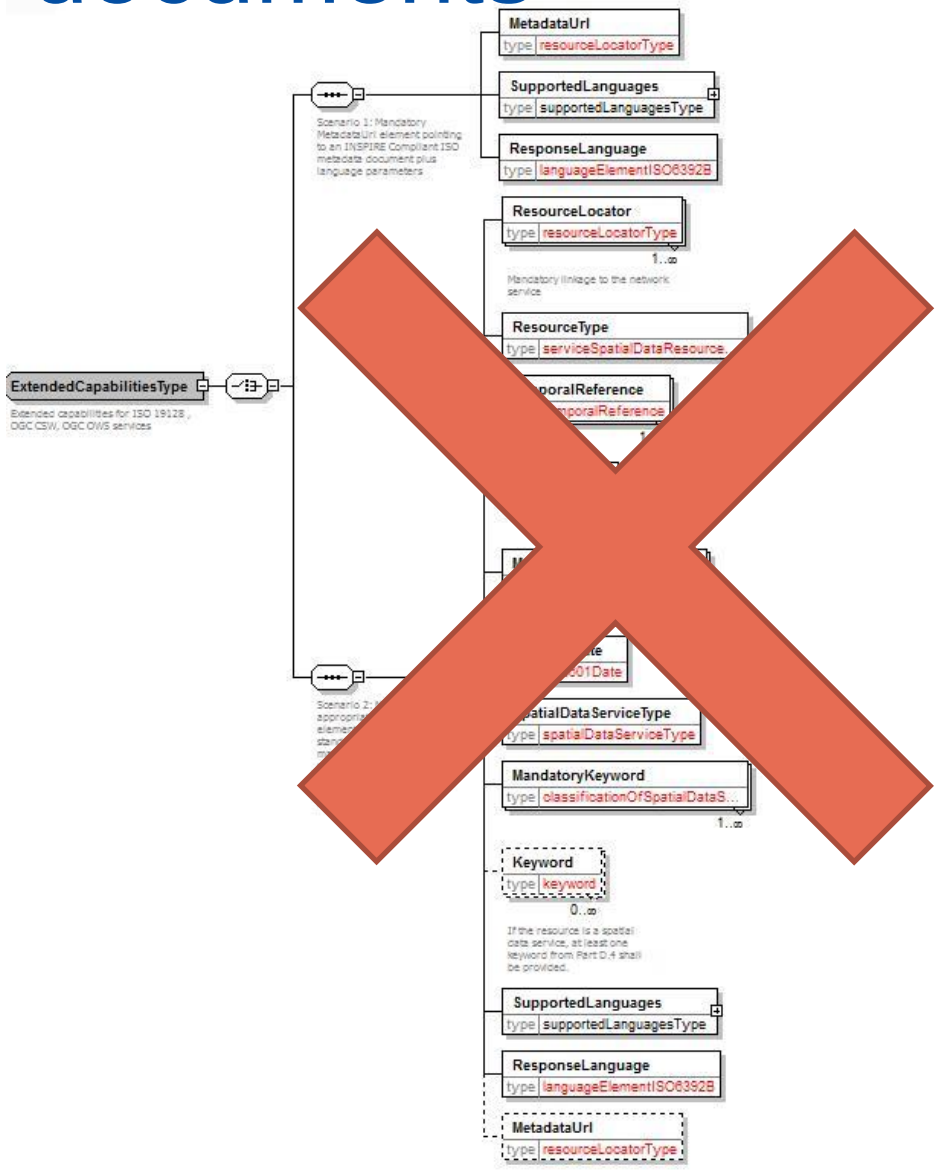

**LEGEND**:

**[M]:** Mandatory
**[O]:** Optional

**NOTE**:

- Regarding the INSPIRE compliant Service MD - In an INSPIRE Network Service Scenario 1 implementation, the Service MD will not contain all INSPIRE metadata elements but contain a link to the Service MD in the Discovery Service; An Scenario 2 implementation have no separate Service MD in the Discovery Service. Instead, all metadata elements are provided in the extended capabilities section of the capabilities document of the service; An Scenario 3 implementation (new scenario considered if the good practice candidate on Data-Service Linking Simplification is endorsed) also have no separate Service MD in the Discovery. Instead, the metadata elements are remapped to existing elements in the capabilities document of the service and in the dataset metadata.
- Regarding the Spatial Data Set Identifier - The IR on Metadata is not including the Unique resource identifier as a required metadata element to be applied to services. The TG for Download and View services specify a WxS/Atom metadata element that contains the Unique Resource Identifier of the Spatial Data Set. In the current INSPIRE Geoportal this is used, in some cases, to establish a link between data and service for quality control purposes. The Coupled resource would be enough for data-service linking purposes, as is used e.g. in case of a WMS in the current INSPIRE Geoportal.

# Part B: Use of INSPIRE conformant standard capabilities documents




European Commission

# Part B. Remapping of Extended Capabilities Aim of the work

- Define an alternative mapping of INSPIRE service metadata elements to elements available in the Capabilities document of OGC OWS standard services (WMS, WFS) and Atom feeds.
- Avoid (as an option) the need for the INSPIRE Extended Capabilities section.
- Remove remaining obstacles in the implementation of INSPIRE requirements for network services due to the extensions required to software tools available in the market.

# Part B. Remapping of Extended Capabilities

## Metadata point of contact

- Current mapping (in **INSPIRE NS - View/Download Service TGs**)

| INSPIRE metadata elements | Elements of INSPIRE Extended Capabilities/Atom feed | Applicable on Service type |
|---|---|---|
| Metadata Point of Contact | inspire_common:MetadataPointOfContact | WMS - WFS |
| Metadata Point of Contact | not mapped | Atom |

- **Agreed new mapping**

| INSPIRE metadata elements | New allocation | Applicable on Service type |
|---|---|---|
| Metadata Point of Contact | **WMS_Capabilities/Service/ContactInformation/ContactPersonPrimary/ContactOrganization** and **WMS_Capabilities/Service/ContactInformation/ContactElectronicMailAddress** | WMS |
| Metadata Point of Contact | **WFS_Capabilities/ows:ServiceProvider/ows:ProviderName** and **WFS_Capabilities/ows:ServiceProvider/ows:ServiceContact/ows:ContactInfo/ows:Address/ows:ElectronicMailAddress** | WFS |
| Metadata Point of Contact | **<feed><author><name>** and **<feed><author><email>** | Atom |

S

S

S

# Part B. Remapping of Extended Capabilities

## Unique Resource Identifier (referring to data set)

- Current mapping (in **INSPIRE NS - View/Download Service TGs**)

| INSPIRE metadata elements | Elements of INSPIRE Extended Capabilities/Atom feed | Applicable on Service type |
|---|---|---|
| Unique Resource Identifier | `inspire_dls:SpatialDataSetIdentifier/inspire_common:Code`<br>`inspire_dls:SpatialDataSetIdentifier/inspire_common:Namespace` | WFS |
| Unique Resource Identifier | *spatial_dataset_identifier_code* and *spatial_dataset_identifier_namespace* | Atom |

- **Mapping proposed**

| INSPIRE metadata elements | New allocation | Applicable on Service type |
|---|---|---|
| Unique Resource Identifier | **not mapped** as Unique resource identifier is not relevant for services | WMS - WFS - Atom |

The IR on metadata is not including the Unique resource identifier as a required metadata element to be applied to services.

European Commission

# Limitations

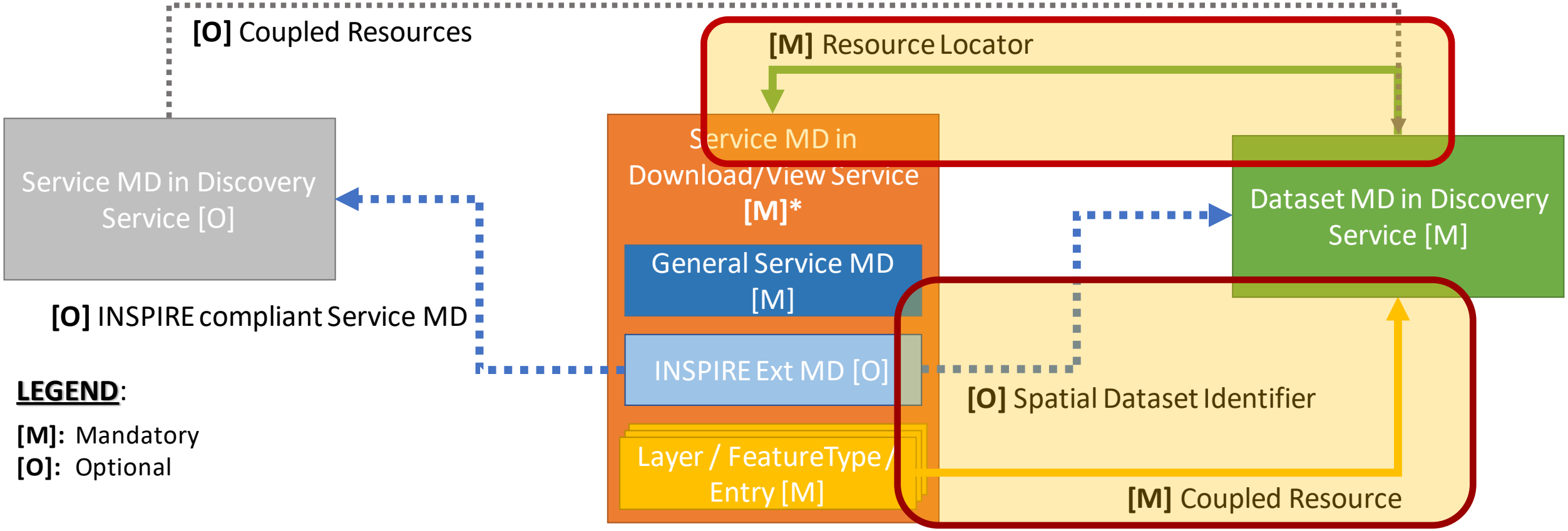
- This GP is not yet applicable for services based on the OGC API family of standards.
  This is because a mapping between the INSPIRE metadata elements and the OpenAPI Specification has not yet been agreed. See also the Technical guidelines for setting up an INSPIRE Download service based on the OGC API-Features standard.
- Complying with this GP and providing metadata for services in the discovery service will result in the duplication of certain INSPIRE metadata elements, which can lead to inconsistencies if the metadata elements are not kept in sync by means of automated processes.

# Implementations and support evidences

- The Netherlands, Italy and France
- Part A implemented in:
  - National metadata profiles
  - Codelist
  - Validation
  - Guidelines
- Revamped INSPIRE Geoportal (GeoNetwork)

# Revamped INSPIRE Geoportal (GeoNetwork)
## Data-Service Linking Simplification Implementation

### INSPIRE Model: Simplified




European Commission

Quick search

- 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
- Spatial Data Services
- Use

# INSPIRE Good Practice – Data-Service Linking Simplification Webinar

**Date:** Monday, November 21, 2022 - 16:00 to 17:30

Online **INSPIRE Webinar** on Data-Service Linking Simplification good practice, presenting the outcomes and implementation evidences as a result of the work performed under INSPIRE MIWP 2021-24 Action 2.3 Task 3.

Webinar Details

Webinar Recording

**Webinar Presentations**

| | |
|---|---|
| Integrated Presentation | MIG-T Sub-group 2.3.2: Antonio Rotundo, Ine de Visser, Marie Lambois, Heidi Vanparys<br>JRC INSPIRE Team: Jordi Escriu, Davide Artasensi, Marco Minghini, Alexander Kotsev |
| INSPIRE Good Practice – DataService Linking Simplification | |
| Simplification implementation in the Netherlands | Ine de Visser |
| Simplification implementation in Italy | Antonio Rotundo |
| Simplification Implementation In France | Marie Lambois |
| Revamped INSPIRE Geoportal (GeoNetwork) | JRC INSPIRE Team |

opean
nmission

Open text poll

Action 2.3.2 GP (1/11)

0 1 2

## 1. Please, specify your country

- n/a
- NL
- Germany
- Catalunya
- Germany
- Italy
- Netherlands
- Denmark
- France
- NL
- Italy
- Denmark

Action 2.3.2 GP (2/11)

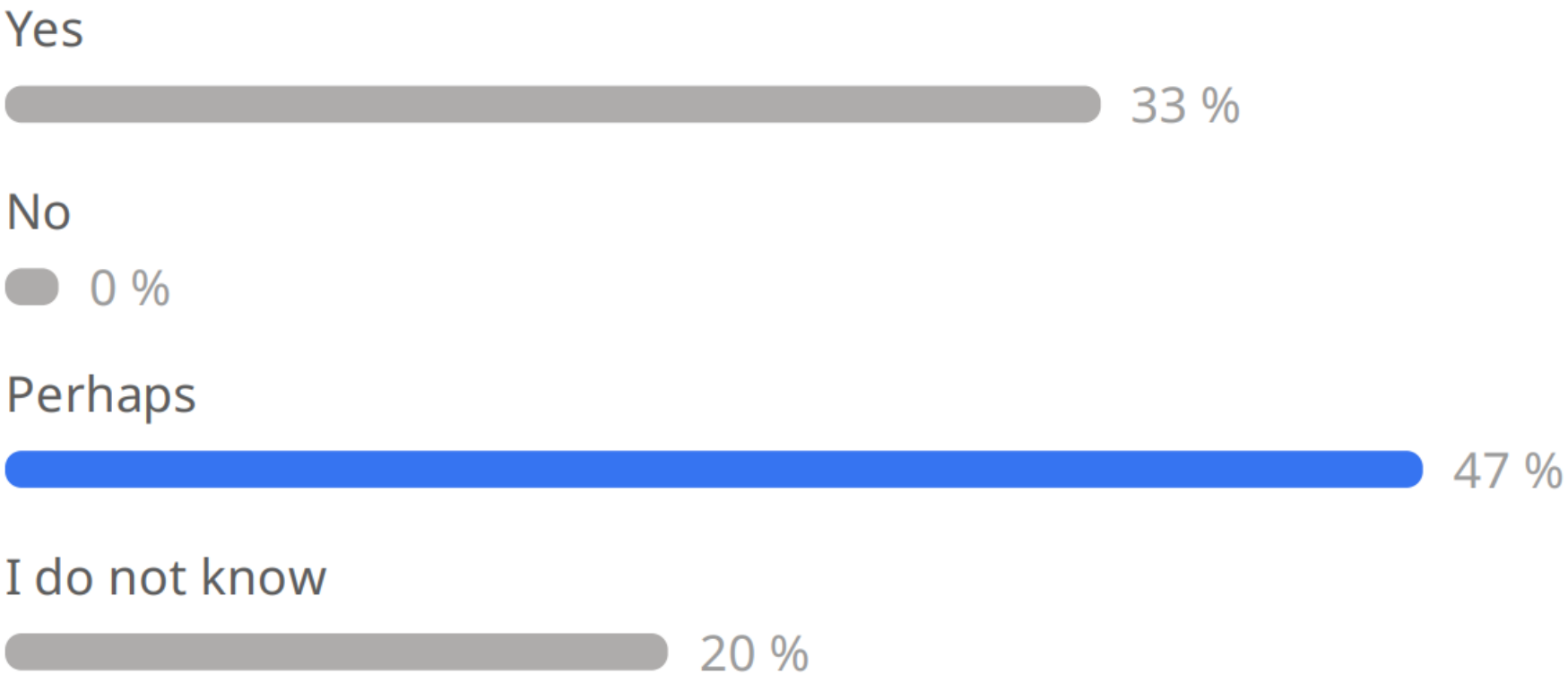
0 1 4

## 2. Do you think this good practice candidate is useful and/or necessary?

Action 2.3.2 GP (5/11)

0 1 5

## 5. Are you willing to support the implementation of Part A of this good practice candidate?

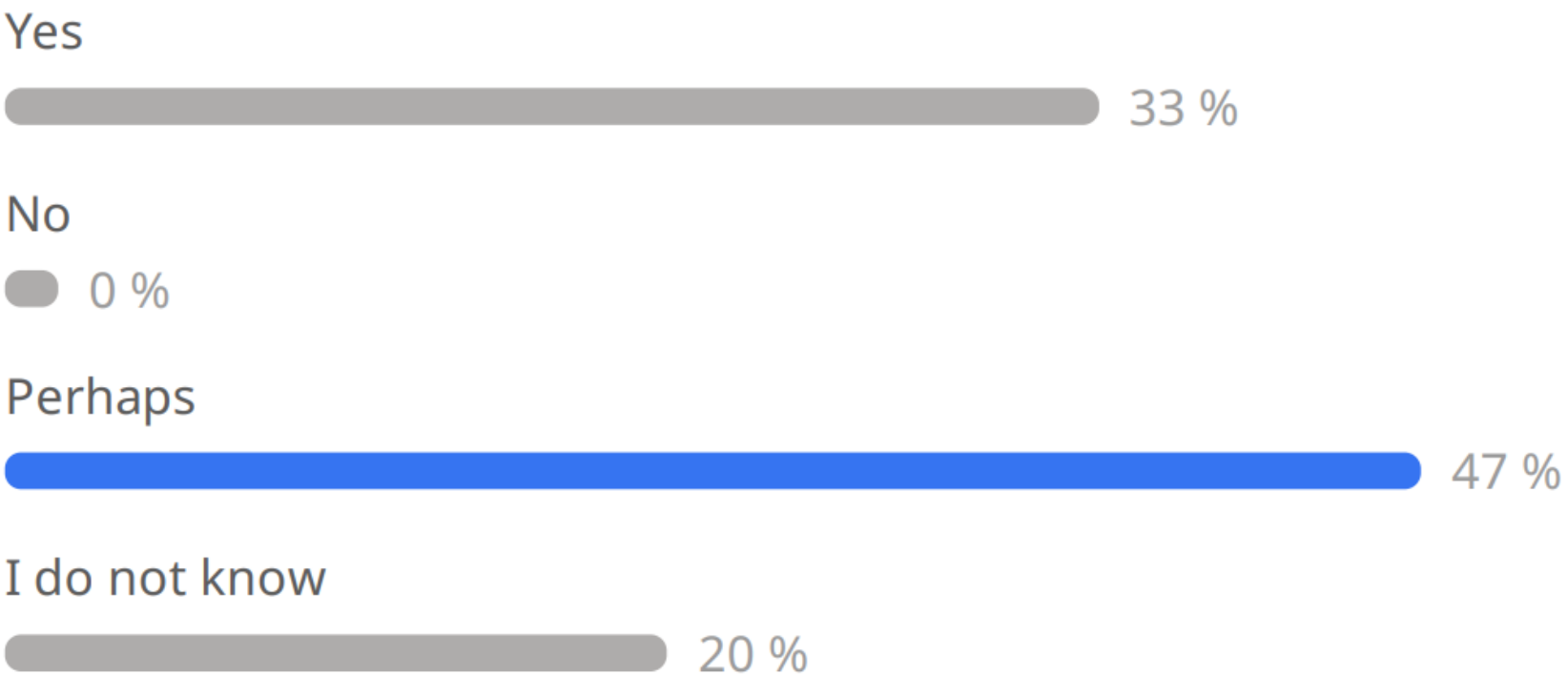



European Commission

Action 2.3.2 GP (5/11)

0 1 5

## 5. Are you willing to support the implementation of Part A of this good practice candidate?



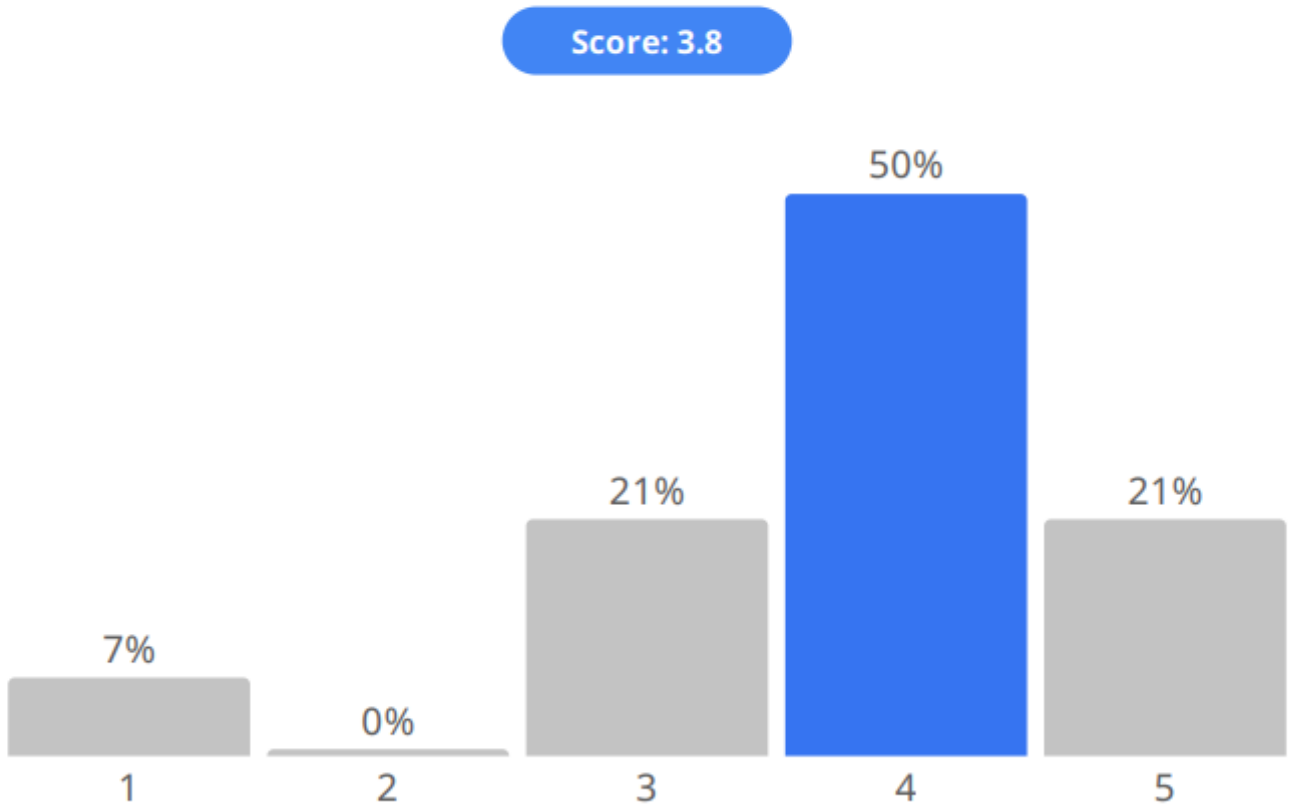

European Commission

Action 2.3.2 GP (11/11)

0 1 4

## 11. Is the approach of this good practice candidate compatible with your national metadata profile?

# 4. Provide an overall rate for this good practice candidate



# Conclusions and next steps

Data-Service Linking Simplification good practice candidate

- Ready for MIG-T / MIG endorsement.
  - November 25th 2022

Procedure for proposing & endorsing good practices and progress overview
https://inspire.ec.europa.eu/portfolio/good-practice-library

| The procedure includes the following six steps | Progress until 21.11.2022 |
|---|---|
| Step 1. Initiation | **GitHub:** https://github.com/INSPIRE-MIF/gp-data-service-linking-simplification<br>**Collection of issues:** https://github.com/INSPIRE-MIF/gp-data-service-linking-simplification/issues<br>**Support organisations and proposals:** https://github.com/INSPIRE-MIF/gp-data-service-linking-simplification/tree/main/proposals<br>**Initiation fiche:** https://github.com/INSPIRE-MIF/gp-data-service-linking-simplification/blob/main/good-practice/good-practice-fiche.md<br>**Final good practice specification:** https://github.com/INSPIRE-MIF/gp-data-service-linking-simplification/blob/main/good-practice/data-service-linking-simplification-spec.md |
| Step 2. Submission as good practice candidate | **Data Service Linking Simplification** https://inspire.ec.europa.eu/good-practice/data-service-linking-simplification |
| Step 3. Outreach | **Webinar 21.11.2022 16:00 – 17:30 (CET)** https://inspire.ec.europa.eu/events/inspire-good-practice-data-service-linking-simplification-webinar |
| Step 4. Submission | **Scheduled:**<br>– 16th INSPIRE MIG - November 24.<br>– 72nd INSPIRE MIG-T - November 25. |
| Step 5. Legal scrutiny | |
| Step 6. Feedback | |

# Thank you!

JRC-INSPIRE-SUPPORT@ec.europa.eu



European Commission