

METADATA AND CATALOGUE SERVICES

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Agenda

□ Metadata

- ▣ Definition
- ▣ Metadata roles for data users and providers
- ▣ Metadata Standards

□ Catalogue Services

- ▣ Definition
- ▣ Standardization efforts
 - Open Geospatial Consortium (OGC®) Catalogue Service for Web (CSW)
- ▣ Distributed Queries in (distributed) catalogues



Metadata definition

- Data about data



Metadata is like onion....



DONKEY: They stink?

DONKEY: Oh, they make you cry?

DONKEY: ... You know, not everybody like onions.

Source: <http://www.the-ark.org>



Geographic Metadata

- ❑ Documentation of geographic resources (data and web services):
 - ❑ **What** – title, short description of the available geographic resources
 - ❑ **Who** – publisher, owner
 - ❑ **Where** – geographic coordinates
 - ❑ **Why** – data collection purpose
 - ❑ **When** – temporal information and maintenance
 - ❑ **How** – data access, data lineage



Metadata Roles

Providers

- ❑ Inventory role
- ❑ Documentation role
- ❑ Advertising role

Users

- ❑ Discovery Role
- ❑ Exploration Role
- ❑ Exploitation Role



“When a manager launches a new project, investing a small amount of time and resources at the beginning pay dividends in the future” (GSDI Association, 2009)





Metadata – characteristics

- ❑ A geographic resource should have one metadata record (1:1 rule)
- ❑ Metadata must be parseable and exchangeable
 - ▣ Encoded in Extensible Markup Language (XML)

```
<?xml version="1.0" encoding="UTF-8" standalone="no"?>
<gmd:MD_Metadata .....xsi:schemaLocation="http://www.isotc211.org/2005/gmd
http://www.isotc211.org/2005/gmd/metadataEntity.xsd">
  <gmd:fileIdentifier>
    <gco:CharacterString>{9833F6ED-9FA4-4CFC-9C49-6568F56CDB17}</gco:CharacterString>
  </gmd:fileIdentifier>.....
  <gmd:metadataStandardName>
    <gco:CharacterString>ISO 19139/19115 Metadata for Datasets</gco:CharacterString>
  </gmd:metadataStandardName>
  .....
</gmd:MD_Metadata>
```



Metadata – Standards

- ❑ **Dublin Core**
- ❑ **Federated Geographic Data Committee (FGDC)**
- ❑ **ISO* 19139/19115 (data)**
- ❑ **ISO 19139/19119 (web services)**
- ❑ **INSPIRE** Metadata Implementing Rules**
- ❑ **.....**

***International Organization for Standardization (ISO)**

****Infrastructure for Spatial Information in Europe (INSPIRE)**



Dublin Core (DC) metadata

- Dublin Core Metadata Initiative
- Simple DC: 15 metadata elements
- Qualified DC:

- Additional elements

- Audience
- Provenance
- Rights holder

- Qualifiers

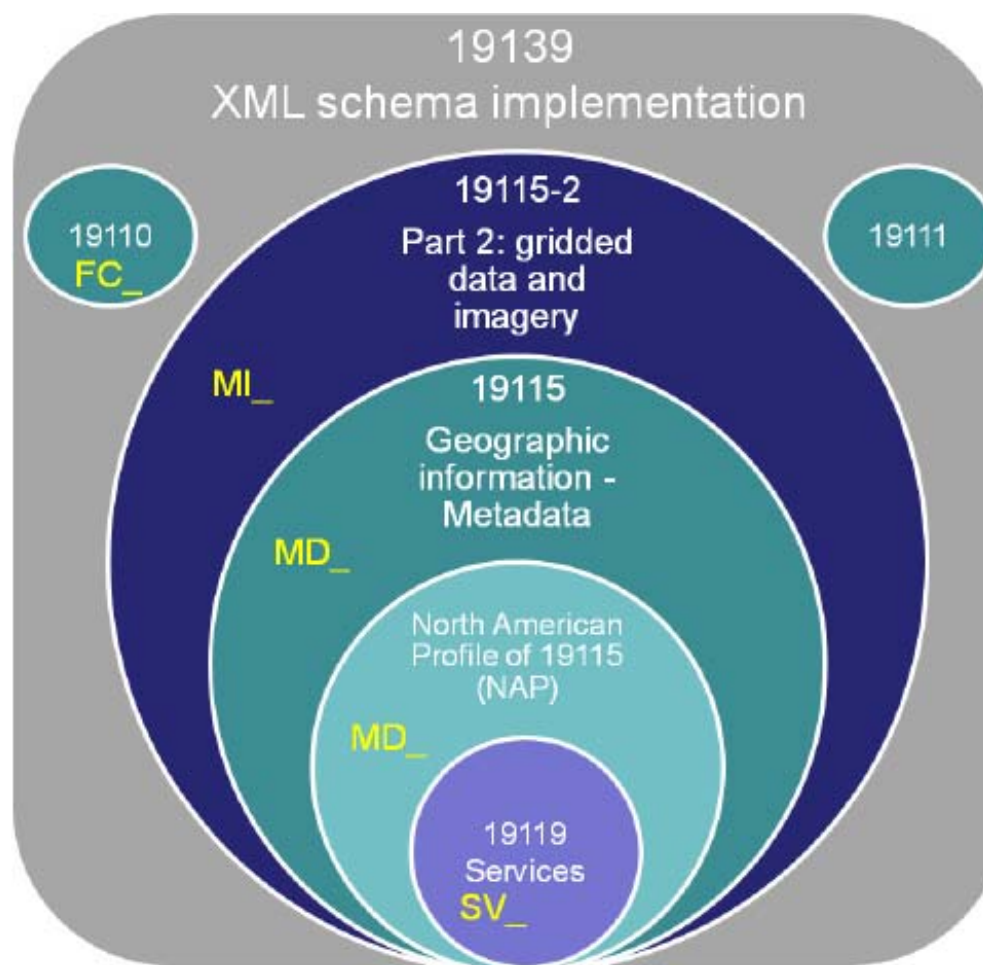
The fifteen basic elements of the Dublin Core metadata standard

1. **TITLE.** The name given to the resource by the CREATOR or PUBLISHER.
2. **AUTHOR or CREATOR.** The person(s) or organization(s) primarily responsible for the intellectual content of the resource.
3. **SUBJECT or KEYWORDS.** The topic of the resource, or keywords, phrases, or classification descriptors that describe the subject or content of the resource.
4. **DESCRIPTION.** A textual description of the content of the resource, including abstracts in the case of document-like objects or content description in the case of visual resources.
5. **PUBLISHER.** The entity responsible for making the resource available in its present form, such as a publisher, a university department, or a corporate entity.
6. **OTHER CONTRIBUTORS.** Person(s) or organization(s) in addition to those specified in the CREATOR element who have made significant intellectual contributions to the resource, but whose contribution is secondary to the individuals or entities specified in the CREATOR element.
7. **DATE.** The date the resource was made available in its present form.
8. **RESOURCE TYPE.** The category of the resource, such as home page, novel, poem, working paper, technical report, essay, dictionary.
9. **FORMAT.** The data representation of the resource, such as text/html, ASCII, Postscript file, executable application, or JPEG image.
10. **RESOURCE IDENTIFIER.** String or number used to uniquely identify the resource.
11. **SOURCE.** The work, either print or electronic, from which this resource is delivered, if applicable.
12. **LANGUAGE.** Language(s) of the intellectual content of the resource.
13. **RELATION.** Relationship to other resources.
14. **COVERAGE.** The spatial locations and temporal duration characteristic of the resource.
15. **RIGHTS MANAGEMENT.** The content of this element is intended to be a link (a URL or other suitable URI as appropriate) to a copyright notice, a rights-management statement, or perhaps a server that would provide such information in a dynamic way.

Source: Longley et al., 2005

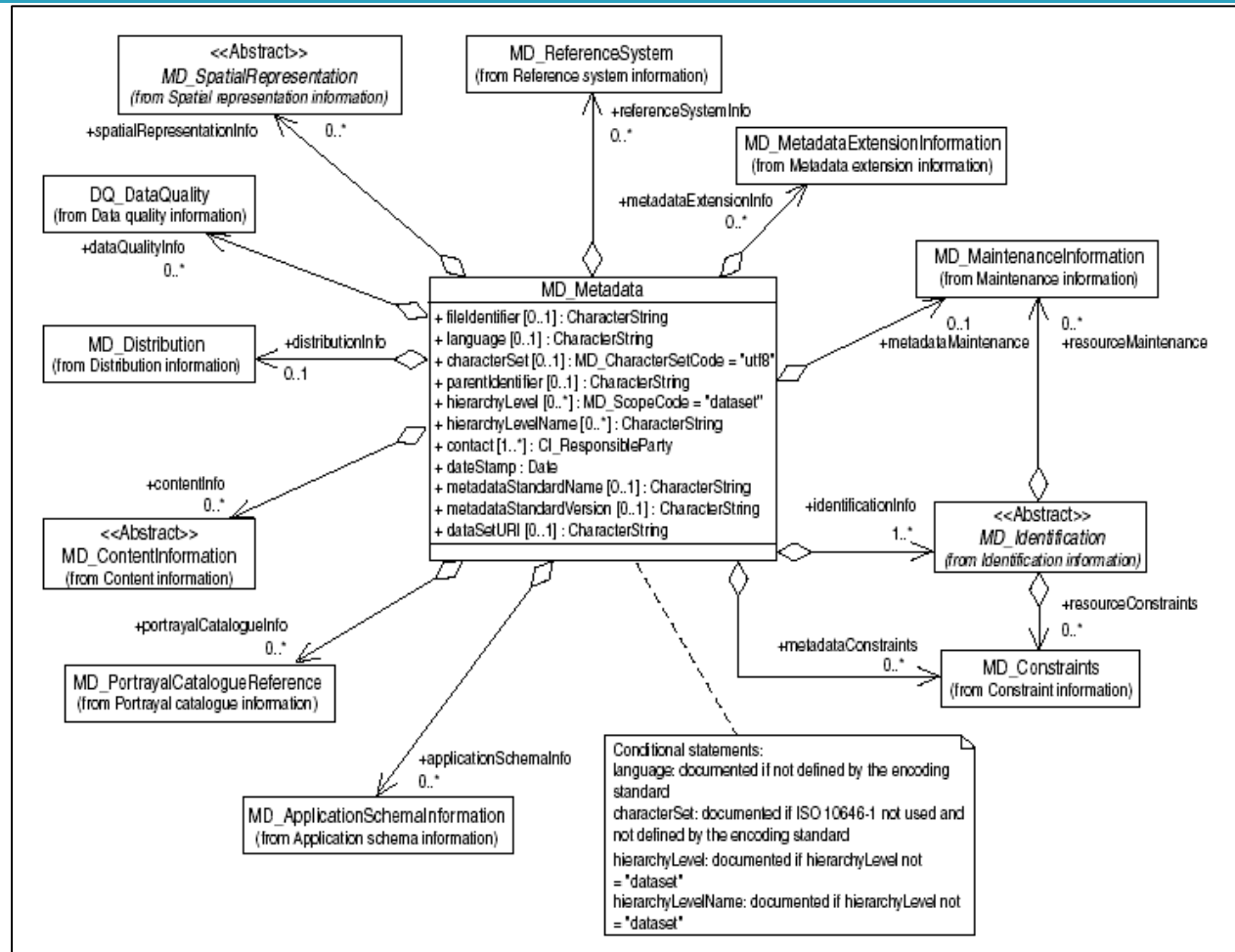


ISO 19139/19115



Source: Longley et al., 2005

ISO 19139/19115 – metadata elements

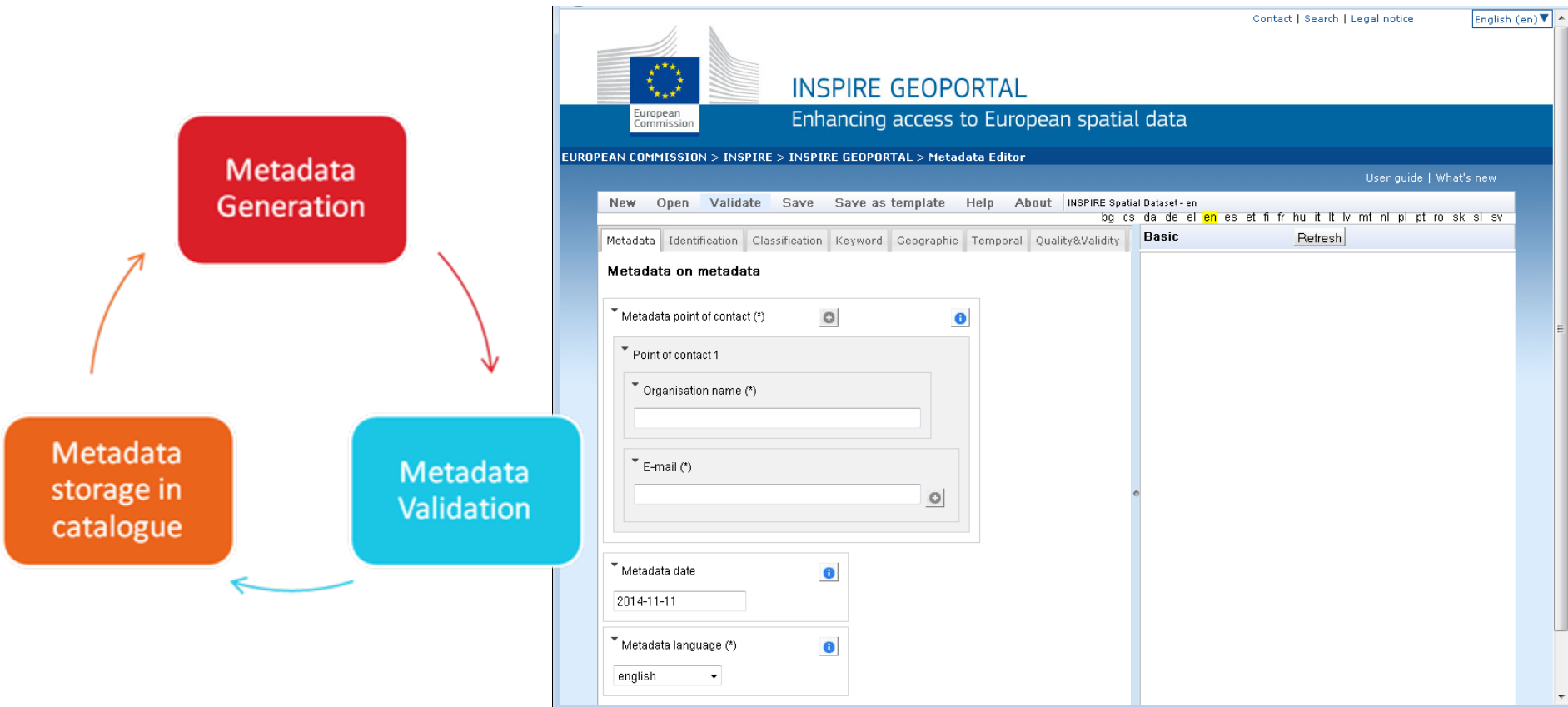


Source: ISO 19139/19115



Metadata Editors

- ❑ Desktop Editors
- ❑ Online metadata Editors





Metadata catalogues

- services for:
 - ▣ Storing and managing metadata
 - ▣ discovering documented web resources
- SDI* building-blocks
 - *Spatial Data Infrastructure



Catalogue service standardization

- Examples

- ▣ ISO 23950 Search and Retrieve Protocol

- ▣ Open Geospatial Consortium (OGC®) Catalogue Service

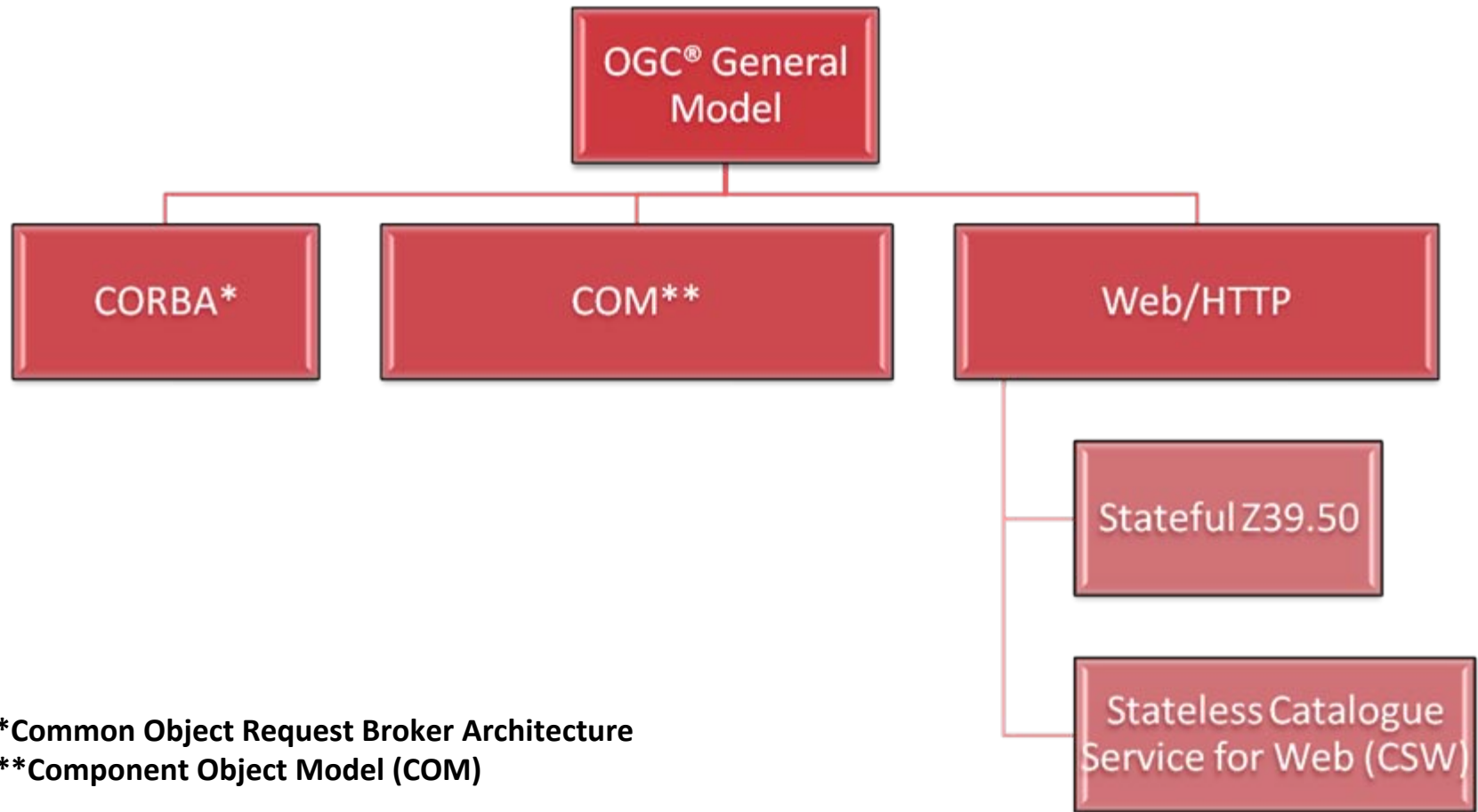


OGC[®] Catalogue Service

- search, management and access of machine readable metadata about available data and services
- Registered metadata adhere to metadata standards



OGC® Catalogue Service - General Model





OGC® Catalogue Service for Web (CSW)

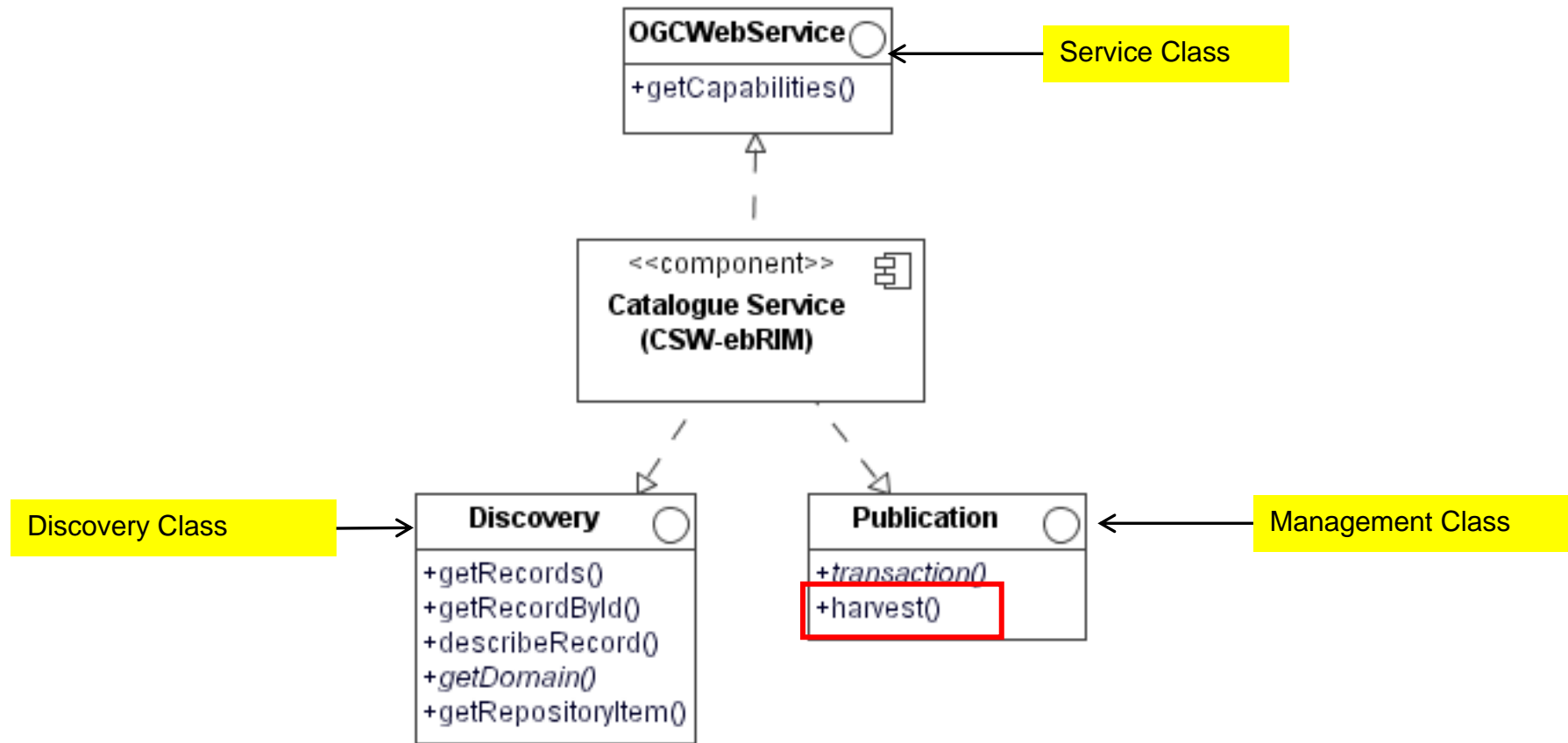
- ❑ Expose geospatial catalogs on the Internet
- ❑ OGC® CSW types:
 - ▣ Transactional CSW
 - ▣ Read-Only CSW

OGC queryable term	Dublin Core element name	XML element name
Title	title	dc:title
	creator	dc:creator
Subject	subject	dc:subject
Abstract	description	dc:description
	publisher	dc:publisher
	contributor	dc:contributor
Modified	date	dc:modified
Type	type	dc:type
Identifier	identifier	dc:identifier
Source	source	dc:source
	language	dc:language
Association	relation	dc:relation
BoundingBox	coverage	ows:BoundingBox
	right	dc: rights

Source: OGC, 2007



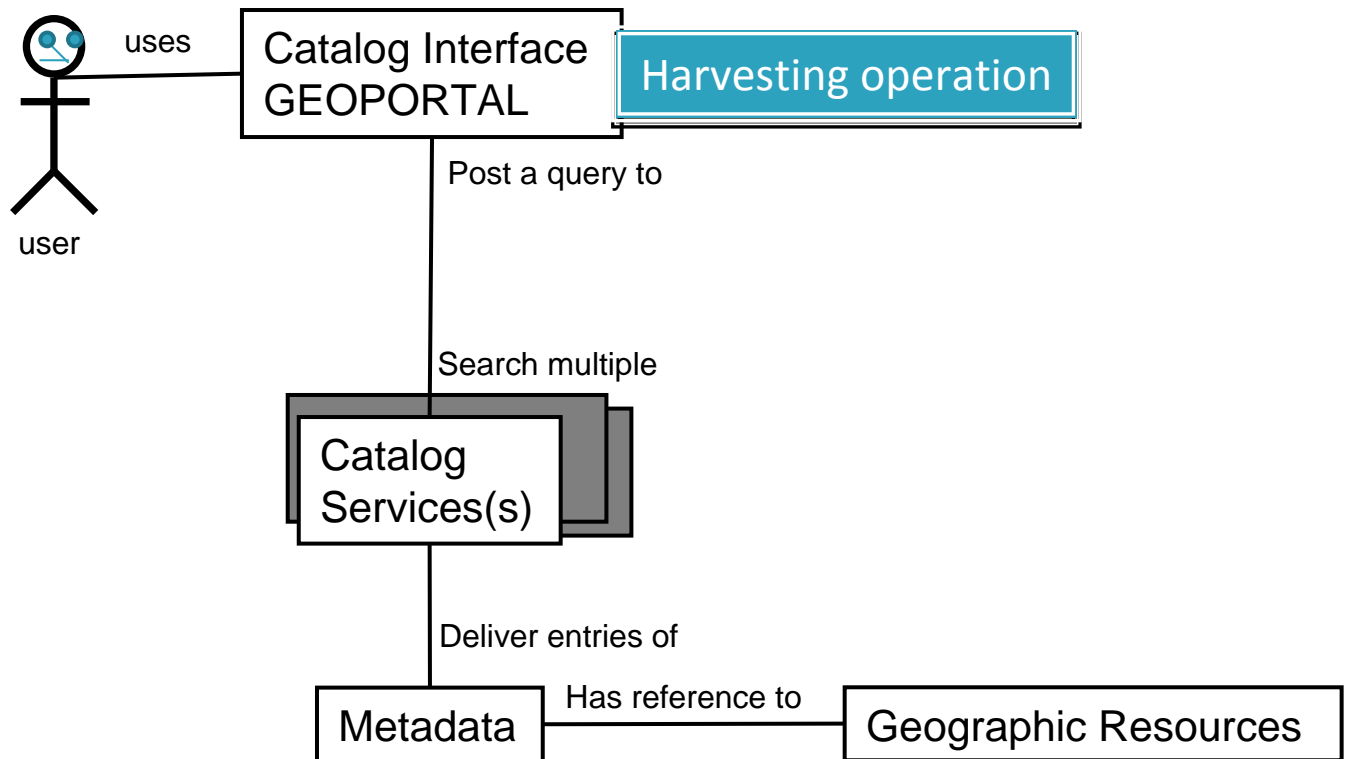
OGC® CSW - operations




Source: Lieberman, 2008



Searching in distributed catalogues



Metadata catalogue -searching technique



INSPIRE GEOPORTAL
Enhancing access to European spatial data

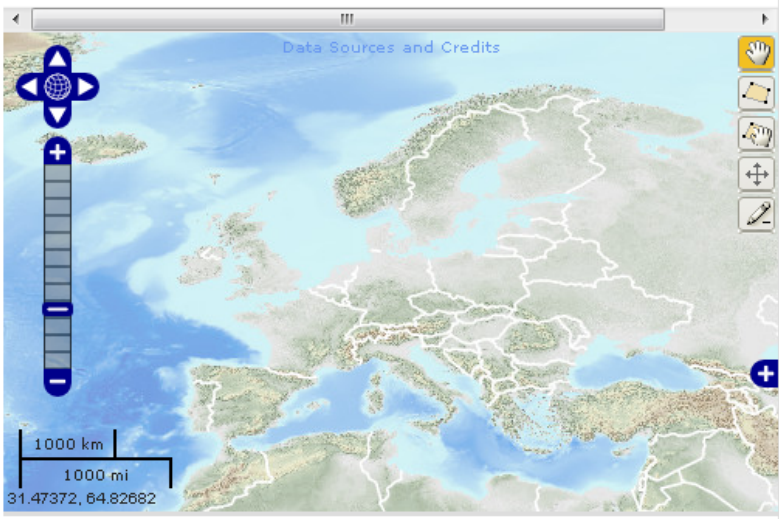
EUROPEAN COMMISSION > INSPIRE > INSPIRE GEOPORTAL > Discovery / Viewer

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Find a place in: Europe ▼

Powered by



1000 km
1000 mi
31.47372, 64.82682

Active Layers: 0

Search: [Advanced Search](#)

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Austria Belgium
Croatia
Czech Republic
Denmark
Estonia Finland
France Germany
Greece Iceland
Ireland Latvia
Luxembourg
Netherlands
Norway
Poland
Portugal
Romania
Slovakia
Slovenia Spain

Active Search Criteria
Bounding Box Restrictions
None applied.

Active Search Filters
None applied

Refine search by

- Origin
- Metadata Language
- Spatial Data Theme
- Topic Category
- Service Type



Summary

Metadata

- Metadata Definition
- Geographic metadata
- Metadata roles
- Standardization efforts
- Metadata editors

Catalogue Service

- Standardization Efforts
- OGC Catalogue Service Specifications
- OGC Catalogue Service for Web (CSW)

Querying metadata catalogue

- Distributed Queries & Harvesting
- Searching techniques

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