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CENTRE DE DONNÉES SOCIO-POLITIQUES

Providing DDI metadata for OAI-PMH harvesting a Dataverse repository

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CDSP's research data repositories

The CDSP, a support unit for SSH researchers since 2005. As a CESSDA/Progedo partner, used Nesstar until 2020.

Responsible for the research data repository data.sciencespo (Dataverse) that serves:

- an institutional self-deposit collection
- the CDSP's Data Bank.

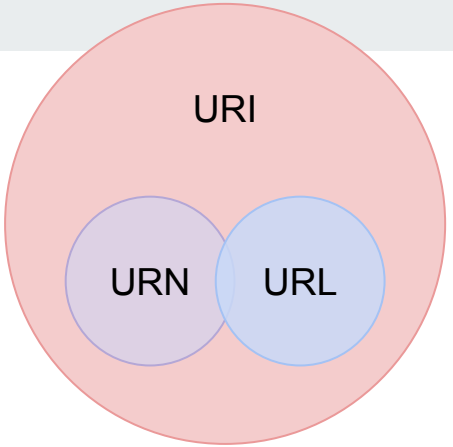
What is OAI-PMH?

- Open Archives Initiative **Protocol** for Metadata Harvesting
  - Generic and lightweight protocol
  - Only metadata are exchanged
- Standard for **interoperability**
  - Say-it-once approach
  - Several metadata harvesters (or reusers) can rely on a single data source
- A **wrapper** around a **metadata** <insert your **standard** name>
  - At the CDSP we use DDI, a rich and widely used standard, since 2006
  - We focused on OAI-PMH as a wrapper for DDI 2.5 metadata provided by Dataverse

Harvesting projects at the CDSP

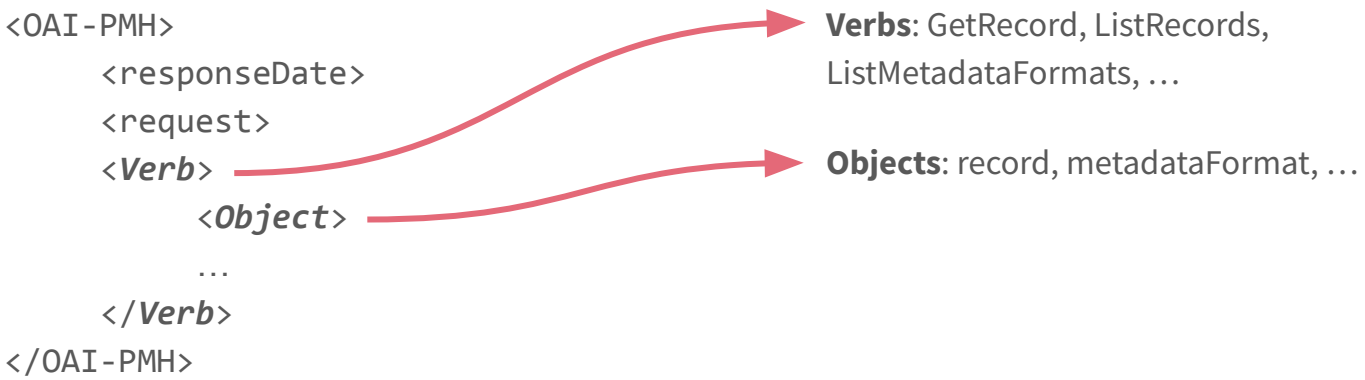
	Support Institution / Entity	Scope	Domains	Language(s*)
OpenAire	European Commission	all records	all	all
CESSDA DC	CESSDA	CDSP DataBank	social sciences	english
Isidore	RI* Huma-Num	CDSP DataBank	social sciences	french
Recherche Data Gouv	french ministry for higher education and research	all records	all	english, french

OAI-PMH unique identifiers and DOIs



- Every record must have a UID (Unique IDentifier)
- Must follow the URI (Uniform Resource Identifier) format
- DOIs are widely used PID (Persistent and unique identifiers) for DDI records (for datasets)
- Since a URL (Uniform Resource Locator) is an URI, we can use DOIs in an URL format, for instance: https://doi.org/10.21410/7E4/UQ55HB
- What a DOI allows / provides:
  - Link to a web landing page
  - Persistence (with curation)
  - Metadata (Datacite schema)
  - … FAIR

The structure of OAI-PMH

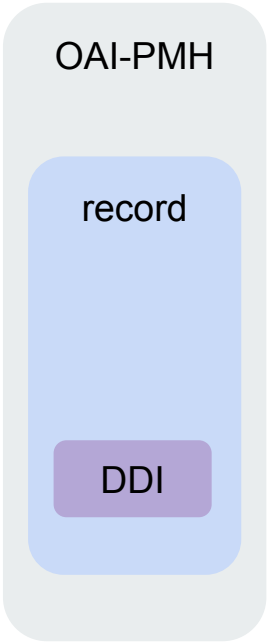


The structure of OAI-PMH

```
<OAI-PMH>
      …
      <ListRecords>
            <record>
                  <header>
                  <metadata>
                  <about>
            </record>
            …
      </ListRecords>
</OAI-PMH>
```

Contains information like the **unique identifier**.

Metadata can be of any format, generally Dublin Core. For example Dataverse supports multiple formats here, such as DC and **DDI**.




```
▼<OAI-PMH xmlns="http://www.openarchives.org/OAI/2.0/" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
 xsi:schemaLocation="http://www.openarchives.org/OAI/2.0/ http://www.openarchives.org/OAI/2.0/OAI-PMH.xsd">
   <responseDate>2022-11-22T13:36:16Z</responseDate>
   <request verb="GetRecord" identifier="oai:fsd.uta.fi:FSD0153"
   metadataPrefix="oai_ddi25">https://services.fsd.tuni.fi/v0/oai</request>
  ▼<GetRecord>
    ▼<record>
      ▼<header>
         <identifier>oai:fsd.uta.fi:FSD0153</identifier>
         <datestamp>2022-11-09T23:09:02Z</datestamp>
         <setSpec>language:en</setSpec>
         <setSpec>language:fi</setSpec>
         <setSpec>study_groups:wvs</setSpec>
         <setSpec>data_kind:Kvantitatiivinen</setSpec>
         <setSpec>data_kind:Quantitative</setSpec>
         <setSpec>openaire_data</setSpec>
       </header>
      ▼<metadata>
        ▶<codeBook xmlns="ddi:codebook:2_5" version="2.5" xsi:schemaLocation="ddi:codebook:2_5
         http://www.ddialliance.org/Specification/DDI-Codebook/2.5/XMLSchema/codebook.xsd">
         ...
         </codeBook>
       </metadata>
     </record>
   </GetRecord>
</OAI-PMH>
```

OAI-PMH GetRecord sample from Aila (Finnish Social Science Data Archive):
https://services.fsd.tuni.fi/v0/oai?verb=GetRecord&identifier=oai%3Afsd.uta.fi%3AFSD0153&metadataPrefix=oai_ddi25

OAI-PMH DDI implementation in Dataverse

OAI-PMH and Dataverse

OAI-PMH server is available by default in Dataverse.

Out of the box feature that serves all records / datasets.

DDI metadata provided by Dataverse OAI-PMH incomplete and to a certain extent, flawed.

Harvesting metadata with OAI-PMH

Repository (Server) = OAI-PMH Data Provider

1. Identify which records to "serve" for harvesting by clients
2. Create a **set** containing the metadata
3. Communicate the set URL to clients or publish it openly
4. Handle the requests

Harvester (Client) = OAI-PMH Service Provider

1. Identify which records set is to be harvested on the repository
2. Obtain the set URL
3. Send a request to the given URL, specifying a **set** and a **verb**
4. Handle the response

record - **A record is metadata in a specific metadata format.** A record is returned as an XML-encoded byte stream in response to a protocol request to disseminate a specific metadata format from a constituent item
(in "The Open Archives Initiative Protocol for Metadata Harvesting, Protocol Version 2.0 of 2002-06-14, Document Version 2015-01-08, http://www.openarchives.org/OAI/2.0/openarchivesprotocol.htm")

Using OAI-PMH with Dataverse

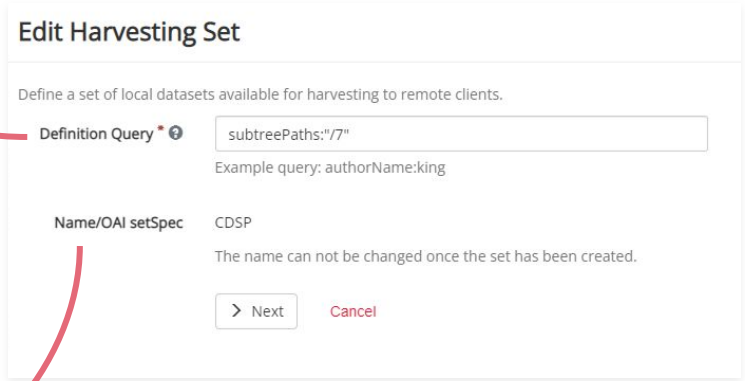
1. Create a **set** (in Dashboard → Harvesting servers). You can specify filter criterias to feed your set, or include all datasets.
2. Run the export (index datasets in the set).
3. Make a request to the set with its URL and by specifying a metadata "flavor". Example: https://data.sciencespo.fr/oai?verb=ListRecords&metadataPrefix=oai_ddi&set=CDSP.

Flavors:

- oai_ddi (DDI 2.5)
- oai_dc (Dublin Core)
- oai_datacite (Datacite)
- oai_json (JSON)

set name

CDSP collection set on data.sciencespo:



OAI-PMH ListRecords sample from data.sciencespo:
https://data.sciencespo.fr/oai?verb=ListRecords&metadataPrefix=oai_ddi&set=CDSP

Issues with OAI-PMH implementation of DDI in DV

While using OAI-PMH on Dataverse, we contributed to some issues that are now solved.

- Distributor tag automatically added in the OAI-DDI and DDI export #7387
- Internationalization
  - Language attribute missing in the OAI-DDI #7388
  - Include translation of a controlled vocabulary in the oai_ddi #6751
- No URI in OAI-PMH records (with oai-ddi metadata prefix) #7786

Benefits

- For a repository maintainer
  - **Control**: no compromise on your documentation: harvesters will get your DDI metadata as you intended
  - **Efficiency**: say it once
  - **Consistency**: up-to-date metadata are disseminated at no cost
- For re-users
  - **Discoverability and Reusability**
    - PIDs included in DDI metadata: Cross-references between all research outputs

      explorable research graph
    - Data source still one click away

Shared responsibilities

- From the metadata "client" (harvester) side
  - The OAI-PMH **protocol** must be supported by the harvester,
  - The metadata **format** encapsulated in the record must also be supported,
  - The harvester should understand the metadata **version** used by the repository.
- From the metadata source
  - DDI metadata should be **valid!**
    - Useful tool provided by CESSDA metadata validator
  - Each harvester may bring additional requirements (i.e. CESSDA metadata profiles)

Thank you

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