Uniform Data Access Layer: Advancing Data FAIRness in FAIR-EASE

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https://meetingorganizer.copernicus.org/EGU25/EGU25-15569.html

Sharing is encouraged

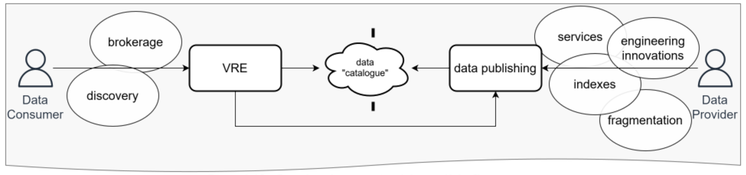
The Uniform Data Access Layer (UDAL) is designed to revolutionize how researchers access, integrate, and utilize diverse scientific datasets. It is a central component of the FAIR-EASE project, which prioritizes FAIR (Findable, Accessible, Interoperable, Reusable) principles to ensure that data becomes a powerful enabler of scientific discovery and informed decision-making.

The UDAL concept brings a modular and re-usable approach to choosing and using data in data processing workflows.

It materializes as a software package that users can use in their pipelines. UDAL serves as a middleware layer, offering a standardized, user-centric framework for data access.

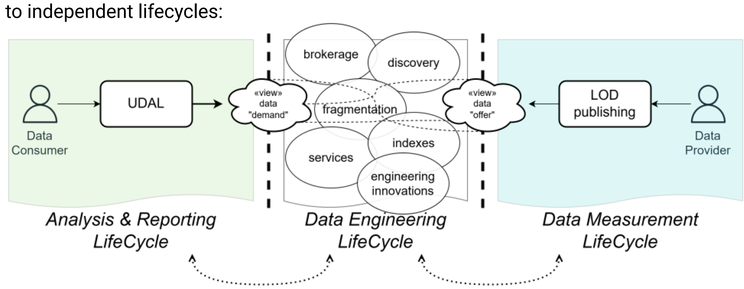
UDAL simplifies data retrieval, integration, and usage. This solution decouples data usage from technical complexities, ensuring that researchers can focus on analysis without needing detailed knowledge of access protocols or data formats.

Let's decouple and go from:



One LifeCycle, impacted by all influences:
Analysis, reporting, engineering, measurements, ...

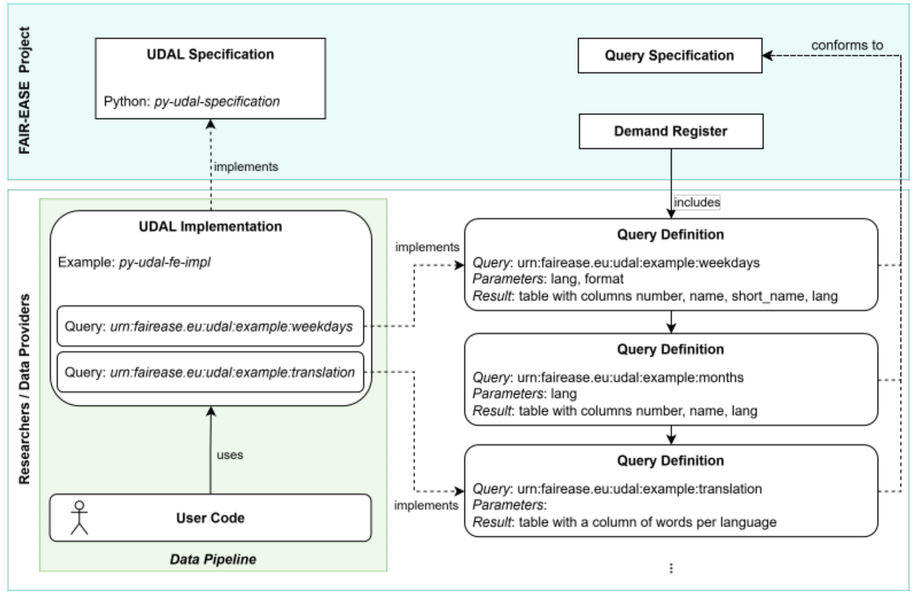
to independent lifecycles:



Useful links:

FAIR-EASE Lab
https://lab.fairease.eu

FAIR-EASE GitHub
https://github.com/fair-ease



Named Queries

Standardizes and reuses specific data requests
- Enhances reproducibility
- Shields users from the intricacies of data filtering and retrieval
- Promotes efficiency

Technology agnostic
- Accommodates centralized and distributed data architectures
- Supports innovation in data management and usage strategies

Example query specification
- Name: `urn:fairease.eu:udal:example:weekdays`
- Description: Name of weekdays in different languages
- Parameters:
  - `lang` Language selection (e.g., *en*, *{en, fr}*)
  - `format` *long* (full weekday name, e.g., *Monday*) or *short* (abbreviation, e.g., *Mon*)
- Result:
  - `number` Number from 1 (Monday) to 7 (Sunday)
  - `lang` Language of the data in the row
  - `name` Weekday name (when no format is selected or when format is *long*)
  - `short_name` Abbreviated weekday name (when no format is selected or when format is *short*)

Dataset Demand Register

Centralized repository containing descriptions of UDAL queries specifications, for:
- Data providers to implement
- End users to use in their data pipelines

FAIR-EASE Dataset Demand Register
https://lab.fairease.eu/dataset-demand-register/

Getting data using a UDAL implementation

Find a UDAL implementation (e.g., from FAIR-EASE Lab)

```
from fairease.udal.udal import UDAL
```

Create a UDAL object

```
udal = UDAL('https://www.wikidata.org/')
```

Execute a query

```
query_name = 'urn:fairease.eu:udal:example:weekdays'
query_params = { 'lang': 'en' }
result = udal.execute(query_name, query_params)
```

Get the data

```
data = result.data()
```

which should contain something like

number	name	lang
1	Monday	en
2	Tuesday	en
3	Wednesday	en
4	Thursday	en
5	Friday	en
6	Saturday	en
7	Sunday	en

FAIR-EASE
https://fairease.eu

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