

EU-FarmBook

The EU-FarmBook platform

21/02/2023

Platform Day event – venue: Palace of the Belgian Academies, Brussels

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Outline

01 Overview of the EU-FarmBook platform

Presentation of features and functionalities of the EU-FarmBook platform

02 Useful facts

Drawing insights into what is currently available

03 The challenge

Need to address the heterogeneity of Knowledge Objects available from various sources

04 Potential collaboration schemes

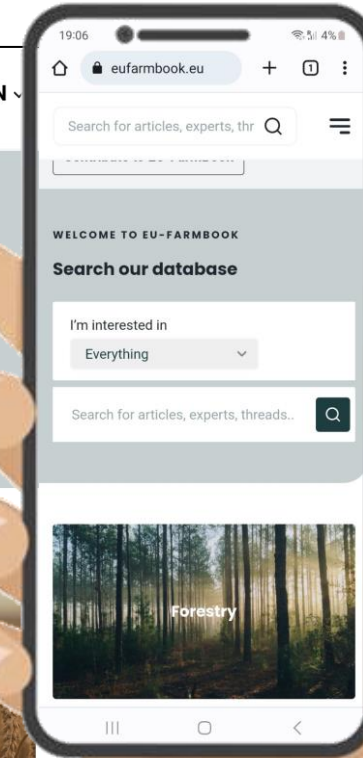
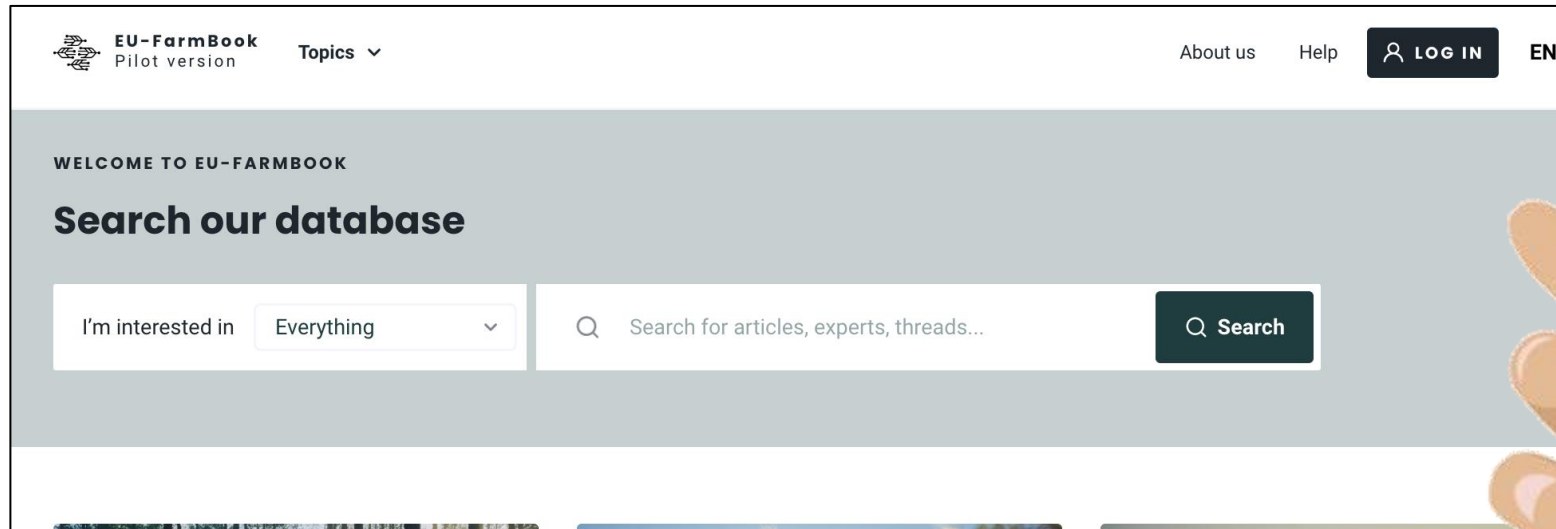
Need to address the heterogeneity of Knowledge Objects available from various sources

05 What lies beneath

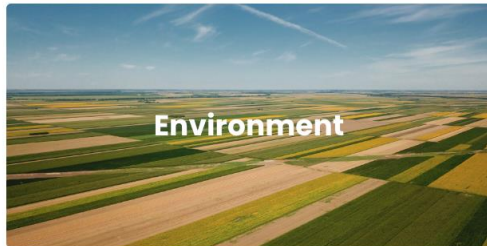
Enabling interoperability among projects

06 What comes next?

01 Overview of the EU-FarmBook platform



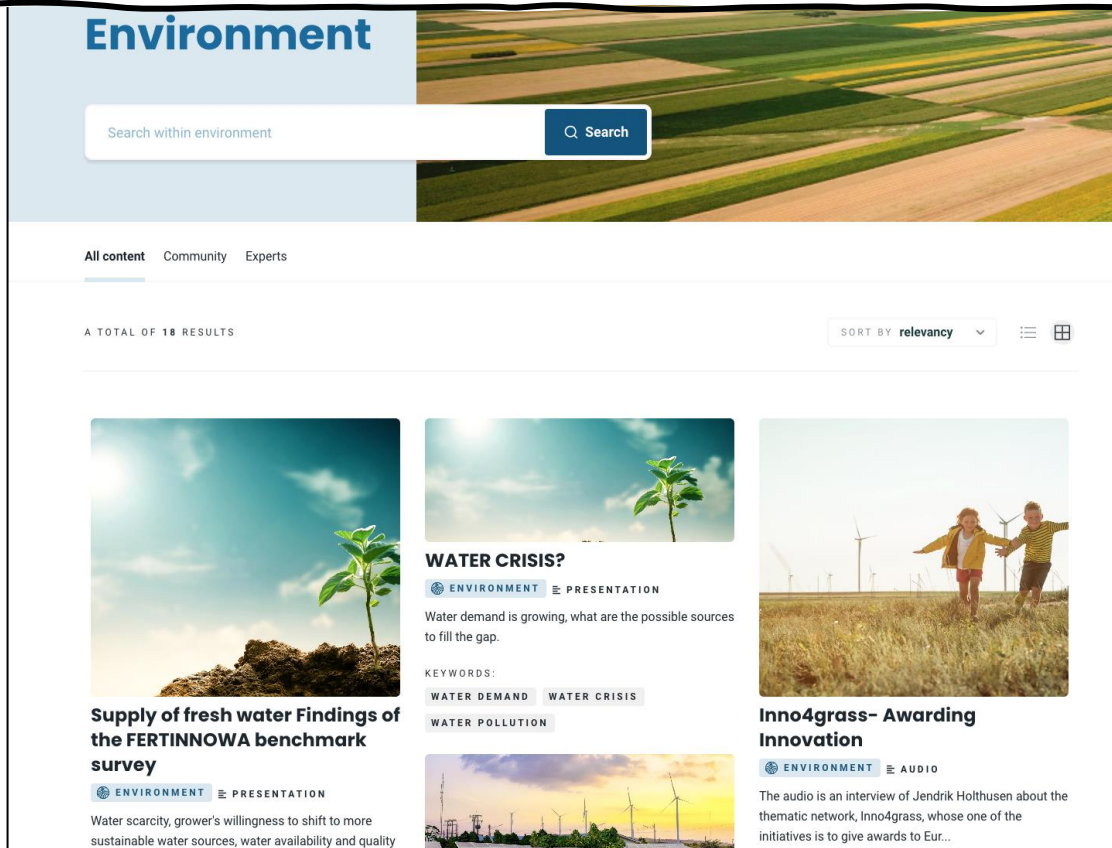
The EU-FarmBook is an **easily accessible** and **user-friendly EU-wide digital platform** for practitioners in agriculture, forestry and other rural sectors supporting the exchange of knowledge among all EU and national AKIS actors.



<https://eufarmbook.eu/>

01 Overview of the EU-FarmBook platform

Availability of a **broad range of Knowledge Objects** clustered into **thematic categories**.



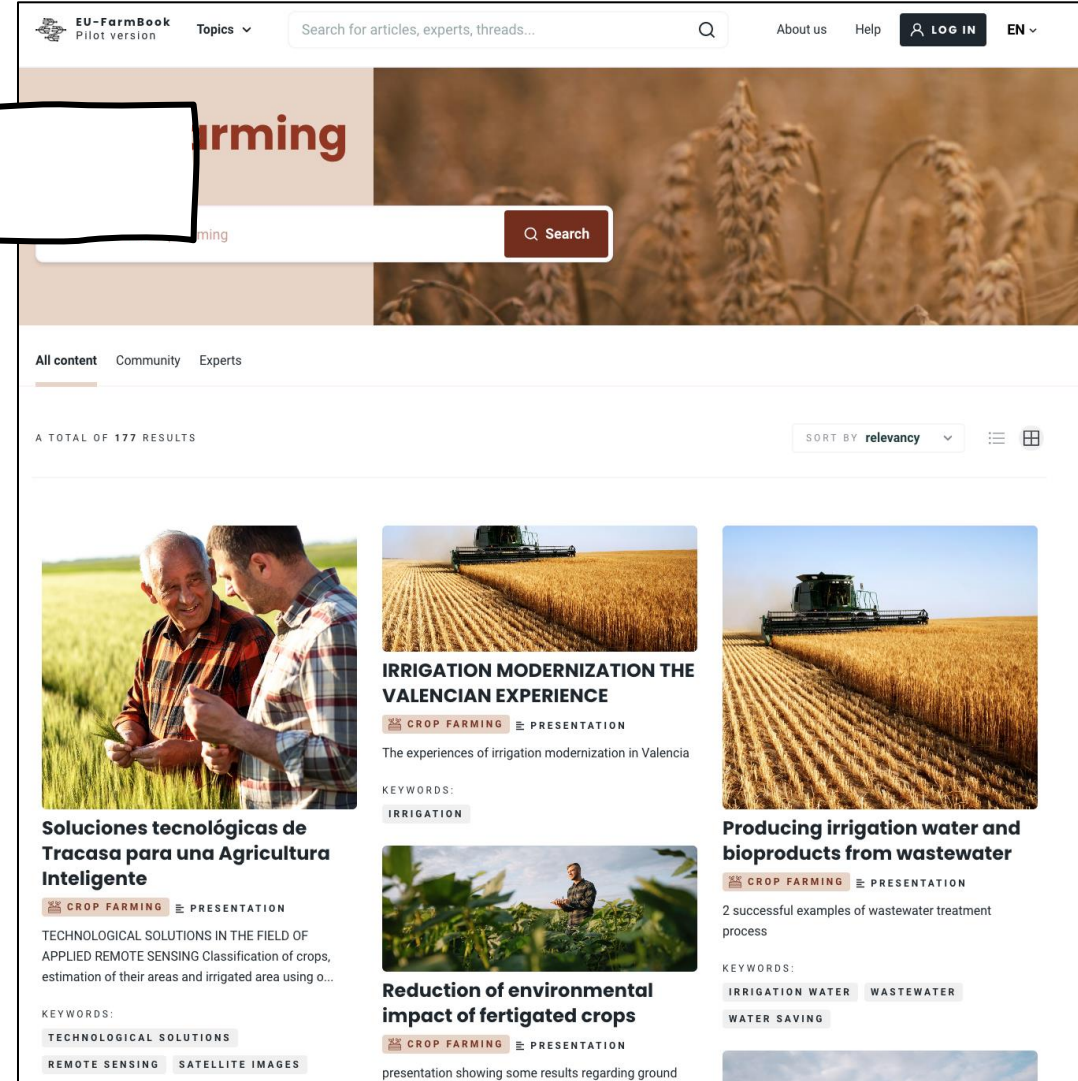
Environment

Search within environment

All content Community Experts

A TOTAL OF 18 RESULTS SORT BY relevancy

- Supply of fresh water Findings of the FERTINNOWA benchmark survey**
ENVIRONMENT PRESENTATION
Water scarcity, grower's willingness to shift to more sustainable water sources, water availability and quality
KEYWORDS: WATER DEMAND WATER CRISIS WATER POLLUTION
- WATER CRISIS?**
ENVIRONMENT PRESENTATION
Water demand is growing, what are the possible sources to fill the gap.
KEYWORDS: WATER DEMAND WATER CRISIS WATER POLLUTION
- Inno4grass- Awarding Innovation**
ENVIRONMENT AUDIO
The audio is an interview of Jendrik Holthusen about the thematic network, Inno4grass, whose one of the initiatives is to give awards to Eur...



EU-FarmBook Pilot version Topics Search for articles, experts, threads... About us Help LOG IN EN

Crop Farming Search

All content Community Experts

A TOTAL OF 177 RESULTS SORT BY relevancy

- Soluciones tecnológicas de Tracasa para una Agricultura Inteligente**
CROP FARMING PRESENTATION
TECHNOLOGICAL SOLUTIONS IN THE FIELD OF APPLIED REMOTE SENSING Classification of crops, estimation of their areas and irrigated area using o...
KEYWORDS: TECHNOLOGICAL SOLUTIONS REMOTE SENSING SATELLITE IMAGES
- IRRIGATION MODERNIZATION THE VALENCIAN EXPERIENCE**
CROP FARMING PRESENTATION
The experiences of irrigation modernization in Valencia
KEYWORDS: IRRIGATION
- Producing irrigation water and bioproducts from wastewater**
CROP FARMING PRESENTATION
2 successful examples of wastewater treatment process
KEYWORDS: IRRIGATION WATER WASTEWATER WATER SAVING
- Reduction of environmental impact of fertigated crops**
CROP FARMING PRESENTATION
presentation showing some results regarding ground

01 Overview of the EU-FarmBook platform

Managing understory in cork oak Montado

a year ago
by **AFINET**
AFINET

a video presenting various managing system of cork oak



Knowledge object metadata

Show more

Related content



Biodiversity in Agroforestry Systems

FORESTRY PRESENTATION

A presentation on biodiversity and its economic benefits in agroforestry systems

KEYWORDS:

BIODIVERSITY AGROFORESTRY
AGROFORESTRY SYSTEMS



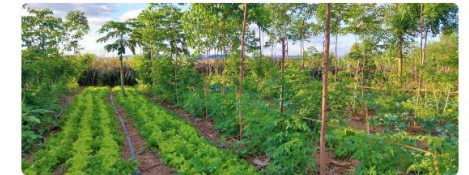
Agroforestry in the UK

CROP FARMING VIDEO

This video shows examples of farms in the UK, their soil types, water management, wind breaks and erosion hazards, specifically wind erosion...

KEYWORDS:

WIND EROSION SOIL IRRIGATION



Agroforestry in Europe (full film)

CROP FARMING VIDEO

Agroforestry (AF) is the practice of deliberately integrating woody vegetation (trees or shrubs) with crop and/or animal systems to benefit ...

KEYWORDS:

AGROFORESTRY INNOVATION WORKSHOP

Delivery of multi-modal content and suggestions for relevant Knowledge Objects to be further accessed.

01 Overview of the EU-FarmBook platform

Search results for 'pig farming'

A TOTAL OF 2 RESULTS

SORT BY **relevancy**

Search our database

I'm interested in

Everything



pig farming



Search



A closer look at the EU PIG TN with Ben Williams

LIVESTOCK AUDIO

EU PiG aims to raise the competitiveness of the European pig industry by linking producers and sharing tried and tested best practice and in...

KEYWORDS:

PIG **ANIMAL HUSBANDRY AND WELFARE** **BEST PRACTICE**



OK- Net Ecofeed- Increasing the use of Organic Feed for Monogastric

CROP FARMING AUDIO

This podcast presents the overall aim of OK-Net EcoFeed which is to help farmers, breeders and the organic feed processing industry in achie...

KEYWORDS:

ORGANIC FARMERS **THEMATIC NETWORKS** **ORGANIC FEED**

Subtopic

Search for Knowledge Object using **single- or multi-word queries** and potential to **filter** the search results using **various filtering options**.

- Landscape/Land Management
- Soil Management Functionality
- Climate And Climate Change
- Fertilisation And Nutrient Management
- Food Quality, Processing And Nutrition
- Genetic Resource
- Farming Practice
- Pest/Disease Control

01 Overview of the EU-FarmBook platform

Sheep production system in Romania

a year ago

by **Gavojdian Dinu** , **Padeanu Ioan** , **Cziszter Ludovic-Toma** , **Gautier Jean-Marc**
SheepNet

The presentations provides information about the sheep production system prevailing in Romania, the meat and milk production in the region, the selected races and their genetic structure, as well as the subsidies and an introduction to a stratified scheme.

 print  download

Alice a year ago

Great material!

Translate comment

↑ 0 likes ↓

 1 comment

eufarmbook a year ago

Thank you!

Translate comment

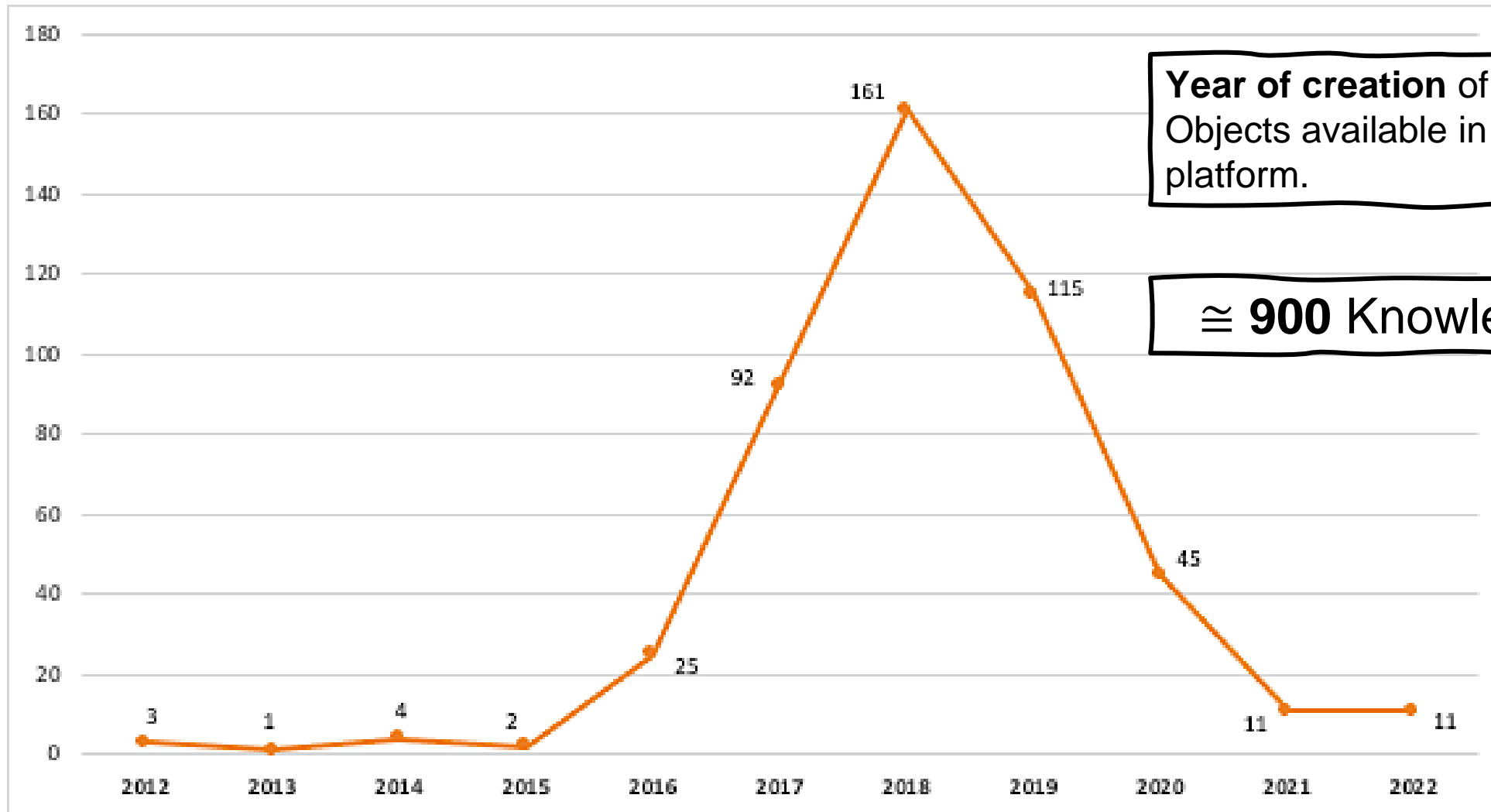
↑ 0 likes ↓

 no comments



Potential to comment on the Knowledge Objects available in the EU-FarmBook platform.

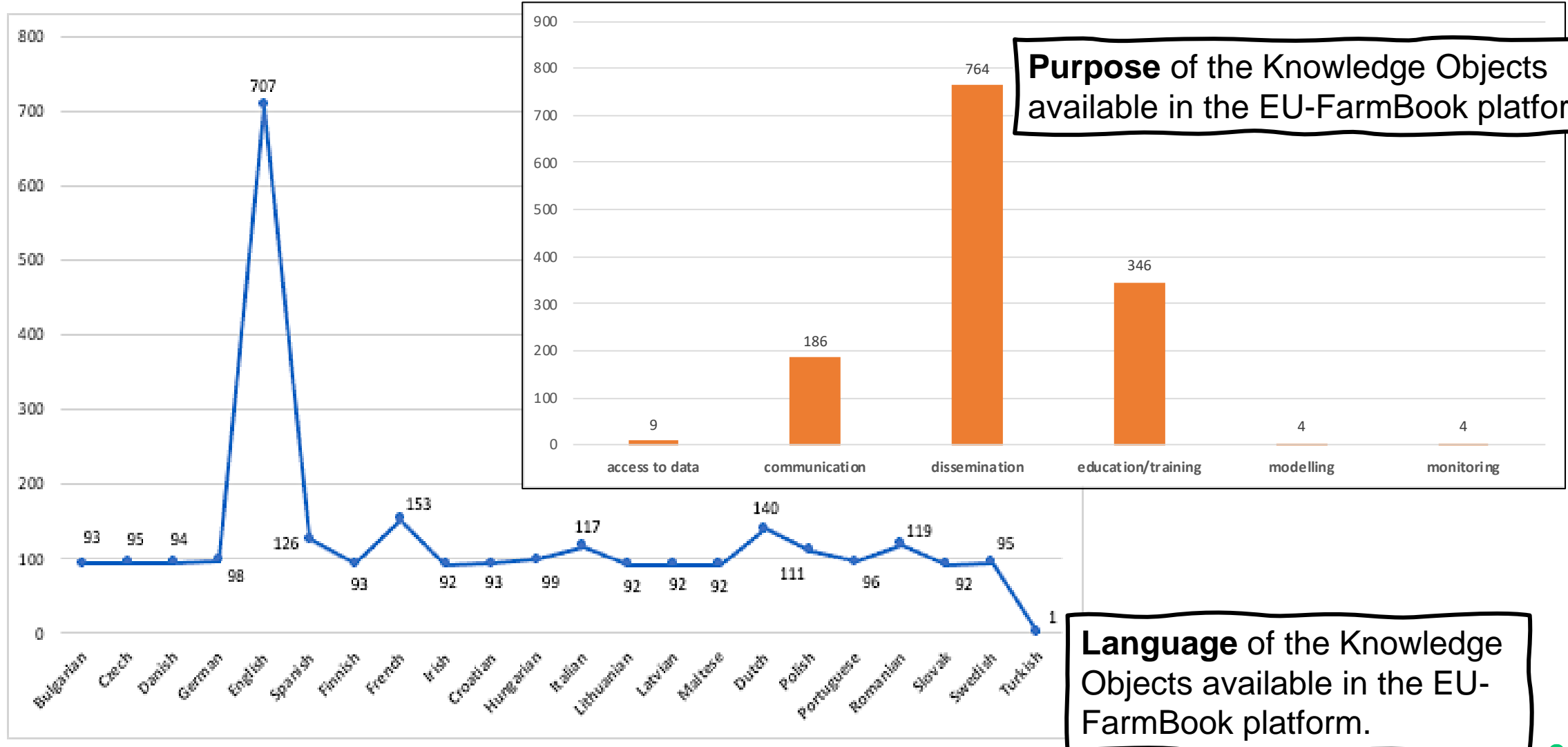
02 Useful facts



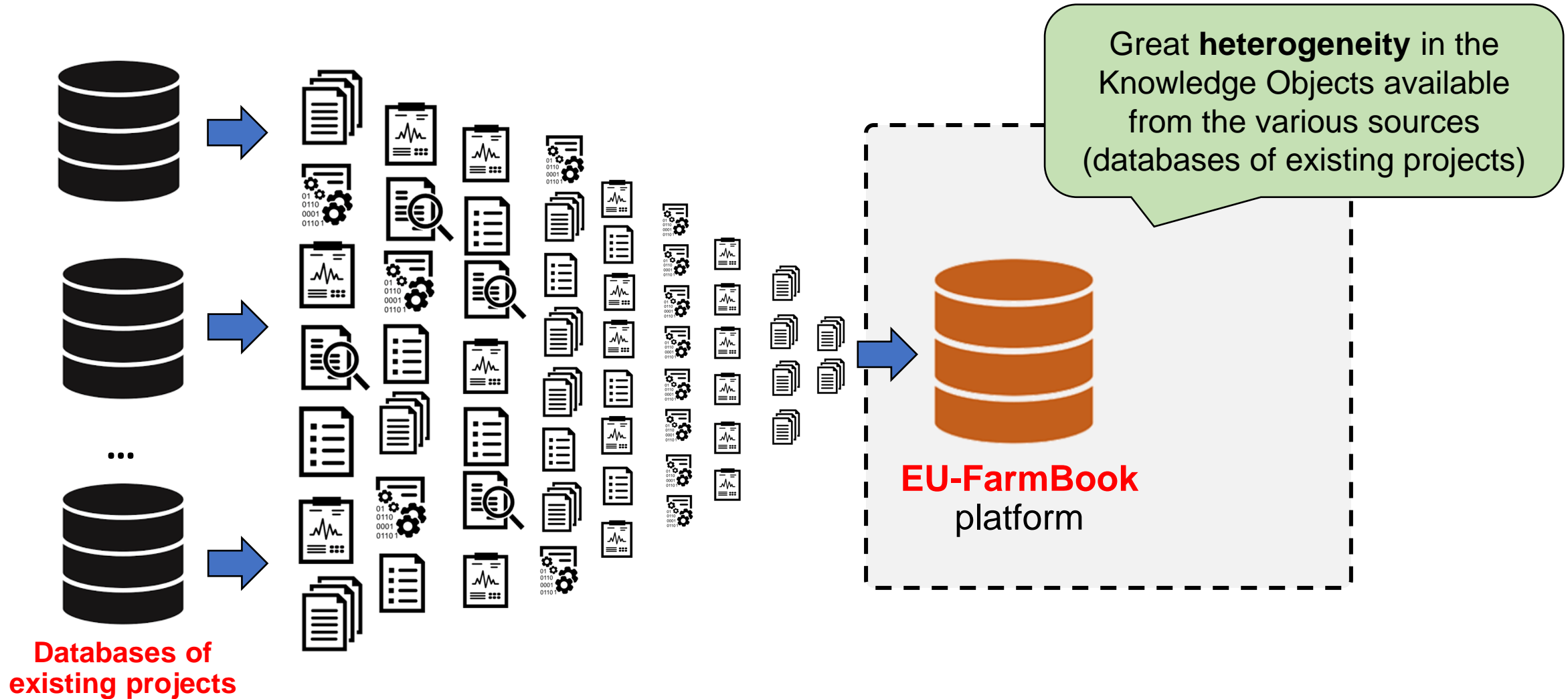
Year of creation of the Knowledge Objects available in the EU-FarmBook platform.

≈ **900** Knowledge Objects

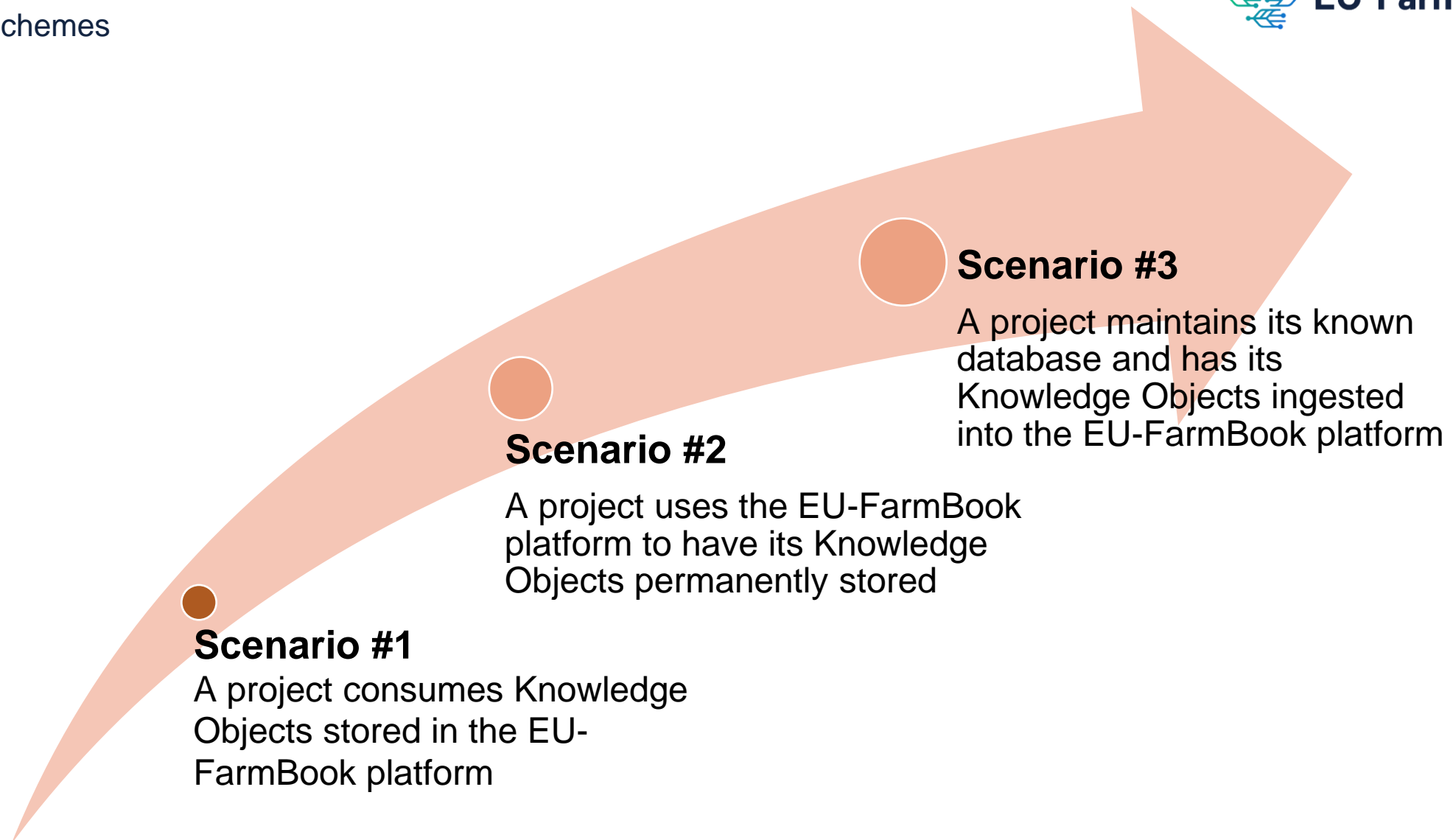
02 Useful facts



03 The challenge



04 Potential collaboration schemes

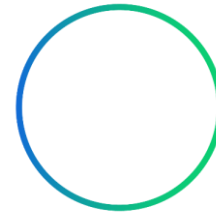


05 What lies beneath



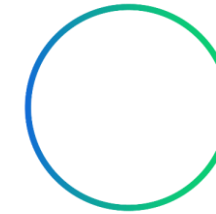
Knowledge Objects

Practice-oriented digital materials generated by EU-funded and national research and innovation (R&I) projects.



Metadata

A **set of metadata** to describe a Knowledge Object which will help connect users (farmers, foresters, policy makers, advisors etc.) with information specific to their needs and challenges.



User Content

- Community and message board
- Comments/flags posted against a knowledge object
- Analytics monitoring search terms, impressions, clicks/views etc.

05 What lies beneath

Practice-oriented materials result from **research** in which the **objectives** are drawn from professional **practice**, and in which the **knowledge created** in the research contributes directly to this **practice**.



Text documents



Videos



Presentations/slideshows



Podcasts



Software applications



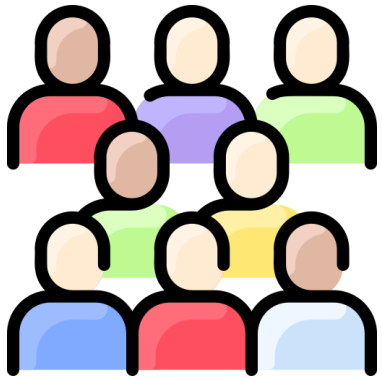
Datasets



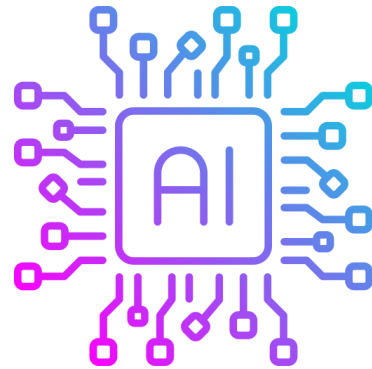
Images

05 What lies beneath

Metadata = “A set of data that describes and gives information about other data” (i.e., a Knowledge Object)



Individuals, projects and networks can provide key metadata properties related to the source, content and geographical information related to their knowledge object.



Metadata properties will be generated automatically using techniques such as Deep Learning / Natural Language Processing (NLP)



Language translation software and tools will support the EU-FarmBook to present information in multiple languages, regardless of the original language of a Knowledge Object and its metadata.



The EU-FarmBook itself will continually generate metadata for Knowledge Objects, based on user content and interactions.

05 What lies beneath



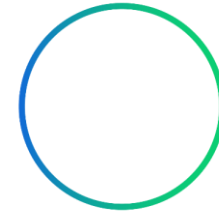
Standards

Data is available in accepted open source standards (e.g. XML, JSON, CSV, RDF) and accessible through standard well-documented interfaces (e.g. web services and APIs)



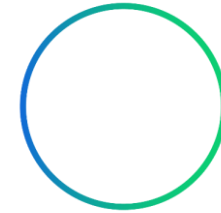
Metadata

Data (e.g. a Knowledge Object) is supported by rich and descriptive metadata.



Semantics

Data and metadata is semantically rich and uses a common vocabulary or ontology



Governance

Adhering to data management and security guidelines (e.g., GDPR) ensures that data is accurate, consistent of high quality and can be trusted.

What is **interoperability**?

“The ability of different systems and applications across multiple organizations and entities to connect, communicate and share data and information in a coordinated way, without effort from the end user.”

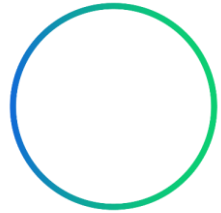
05 What lies beneath

Why is **interoperability** important?



- Enables:
 - Data Sharing
 - Needs based access
 - Multi-Language
- Supports:
 - Collaboration and upscaling
 - Decision-making
 - Findability (e.g., via Google search)
 - Understanding context and content
- Reduces:
 - Costs
 - Repetitive / manual work
 - Risks

05 What lies beneath



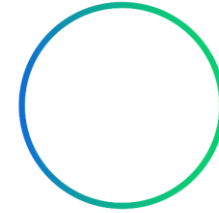
Generic Properties

Widely used vocabularies and ontologies are used to define and label metadata properties of a more generic nature (e.g., schema.org/ Dublin Core)



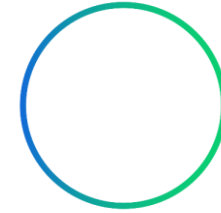
Domain Properties

Domain specific vocabularies and ontologies used to label metadata properties including “keywords” and “subject” (e.g., EIP-AGRI broad topics and keywords)



Data Types

Defining and enforce data type standards to ensure accuracy of metadata properties (e.g., date and numerical formats).

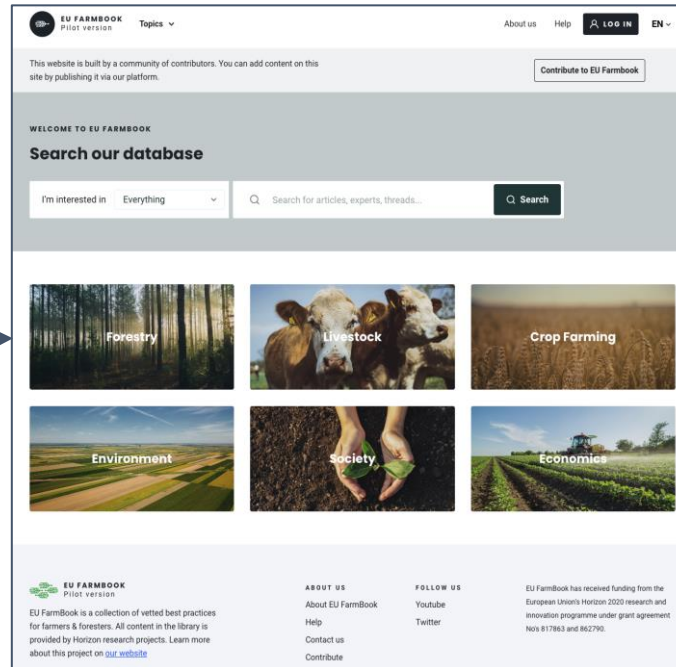
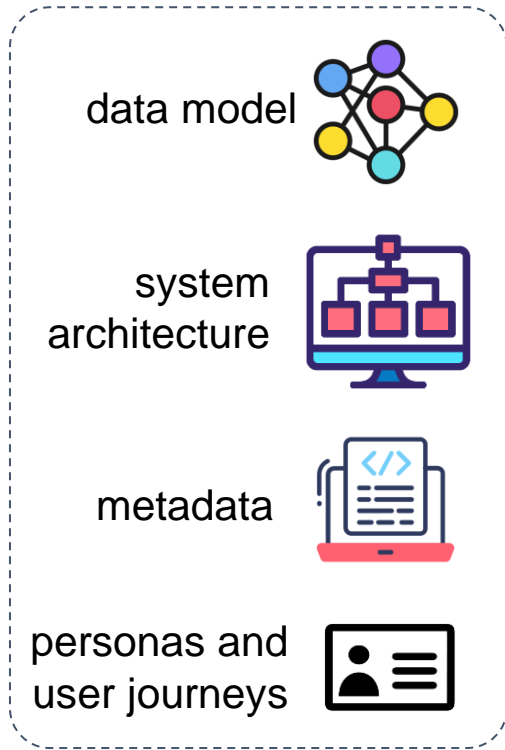


Continual Improvement

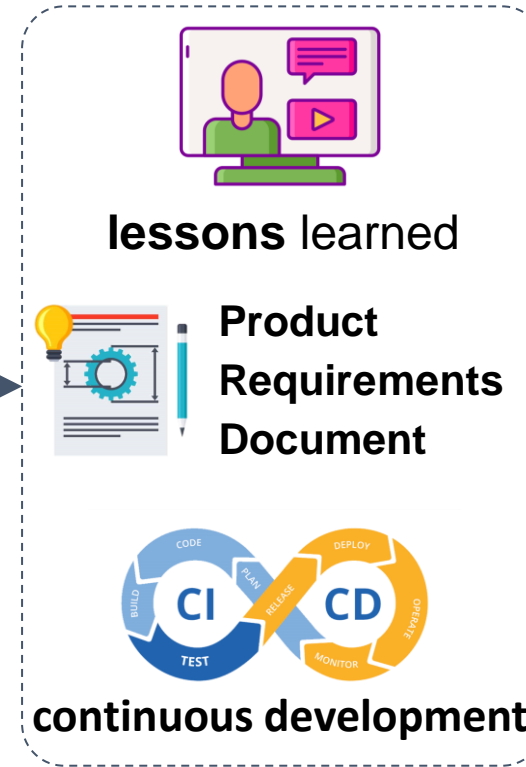
Test, refining and updating the EU-FarmBook platform and its content overtime as standards, vocabularies and ontologies evolve.

06 What comes next

EURAKNOS & EUREKA legacy work

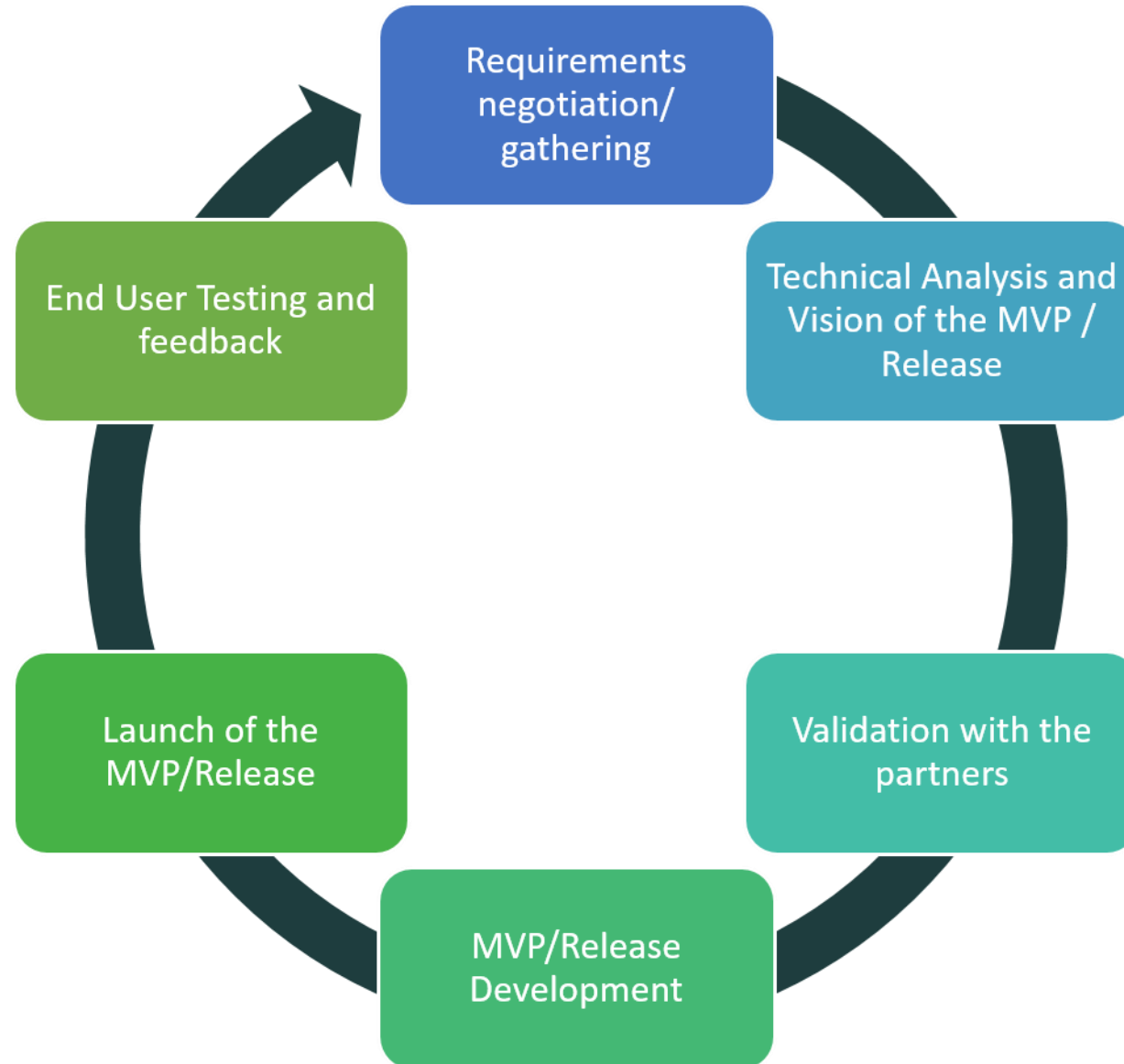


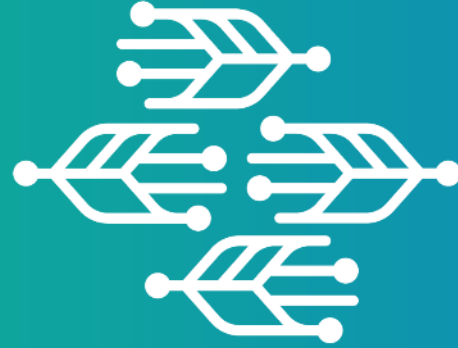
EUREKA pilot platform version



MVP platform version

06 What comes next





EU-FarmBook

FAIR data principles and Metadata

Christopher Brewster (University of Maastricht and TNO):
Christopher.Brewster@maastrichtuniversity.nl



Funded by the
European Union

Of metadata, of ontologies, and of FAIR data Principles

- Strange terms, strange concepts for most people
- Why are we interested in this in the EU-FarmBook?
- What is this?
- How do we do it?
- Why do we do this?
- ... but first a little story ... almost a history lesson

The time has come,' the Walrus said,
To talk of many things:
Of shoes — and ships — and sealing-wax —
Of cabbages — and kings —
And why the sea is boiling hot —
And whether pigs have wings.'

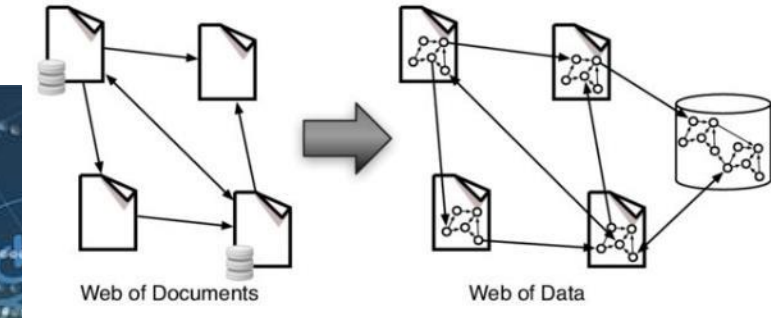
-- Lewis Carroll



Story 1 The Web of Data



- 1992 Tim Berners-Lee invents the World-Wide-Web. This was designed as a web of documents.
- TBL realises that a web of documents was insufficient and what was needed was a “web of data”.
- From this realisation rose a series of technologies we generally call "**semantic web**" - to gradually turn a web of documents into a web of data
 - Includes standards such RDF, RDFS, OWL, SPARQL, and lots more under the aegis of W3C
- In 00s, TBL proposed the idea of "Linked Data":
 - One ★ for online in any format – “open data”
 - Two ★★ for online in machine readable format e.g Excel
 - Three ★★★ for online, in non-proprietary format e.g. csv
 - Four ★★★★ for online, non-proprietary format, use open standards to identify stuff (i.e. use URIs, RDF etc.)
 - Five ★★★★★ for online, non-proprietary format, use open standards, link to other data sets



<https://5stardata.info/en/>

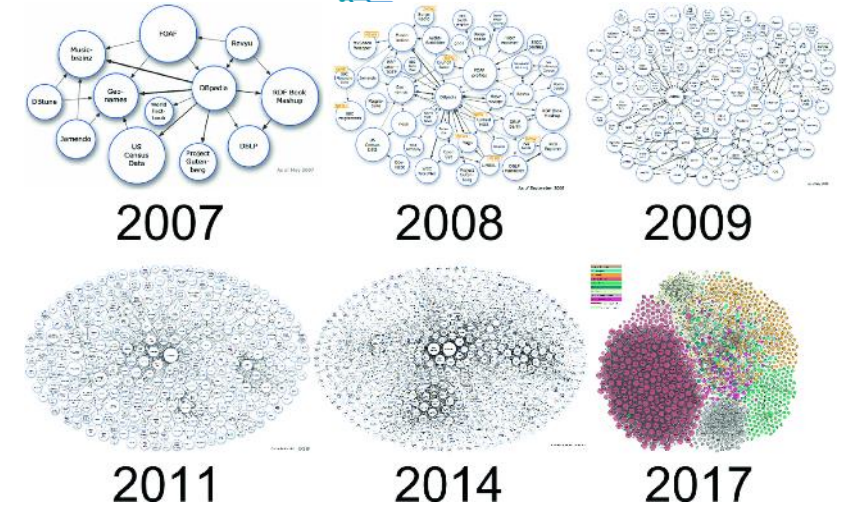
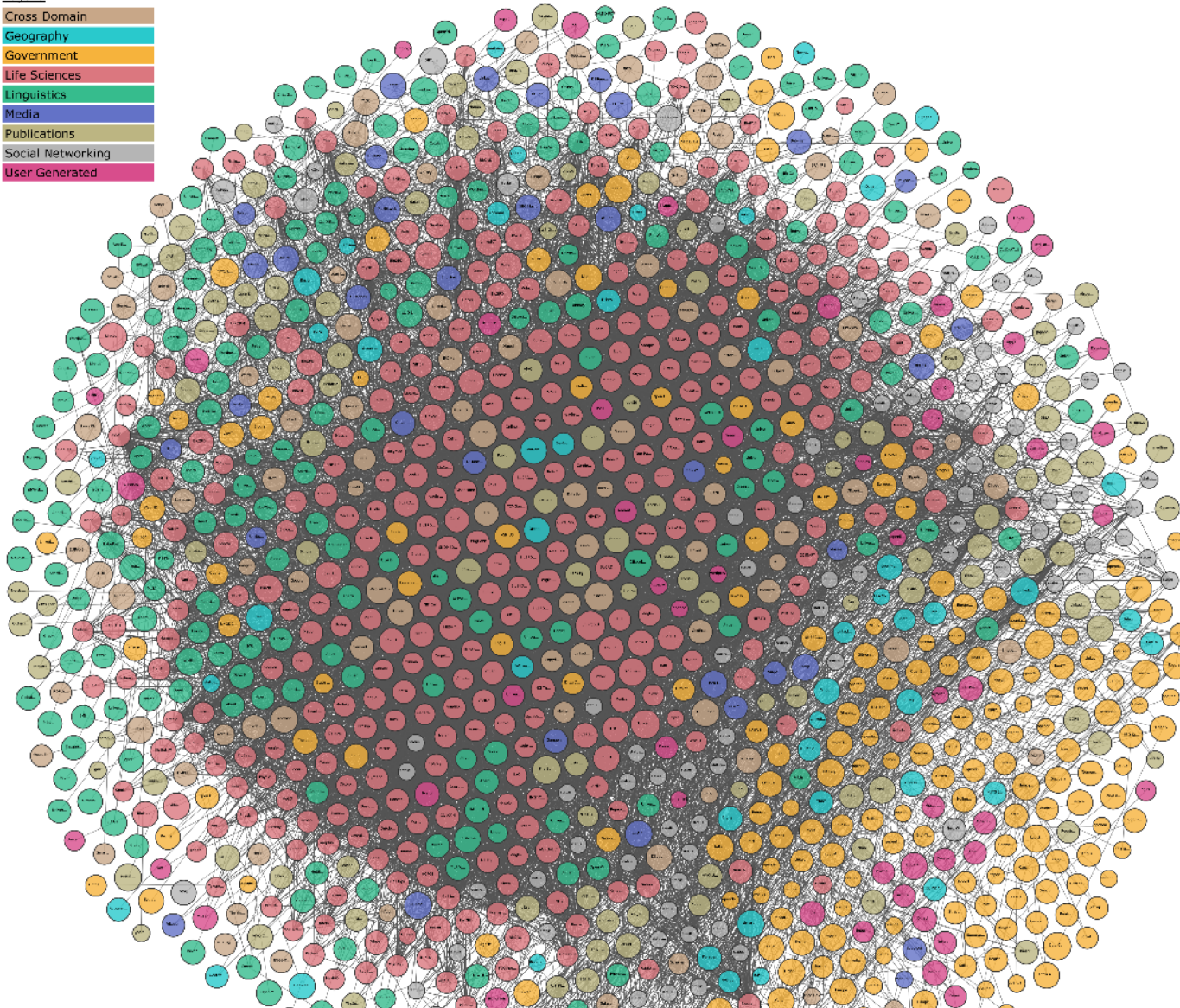
Story 2 Linked Open Data Cloud



Legend

Cross Domain
Geography
Government
Life Sciences
Linguistics
Media
Publications
Social Networking
User Generated

<https://lod-cloud.net/>

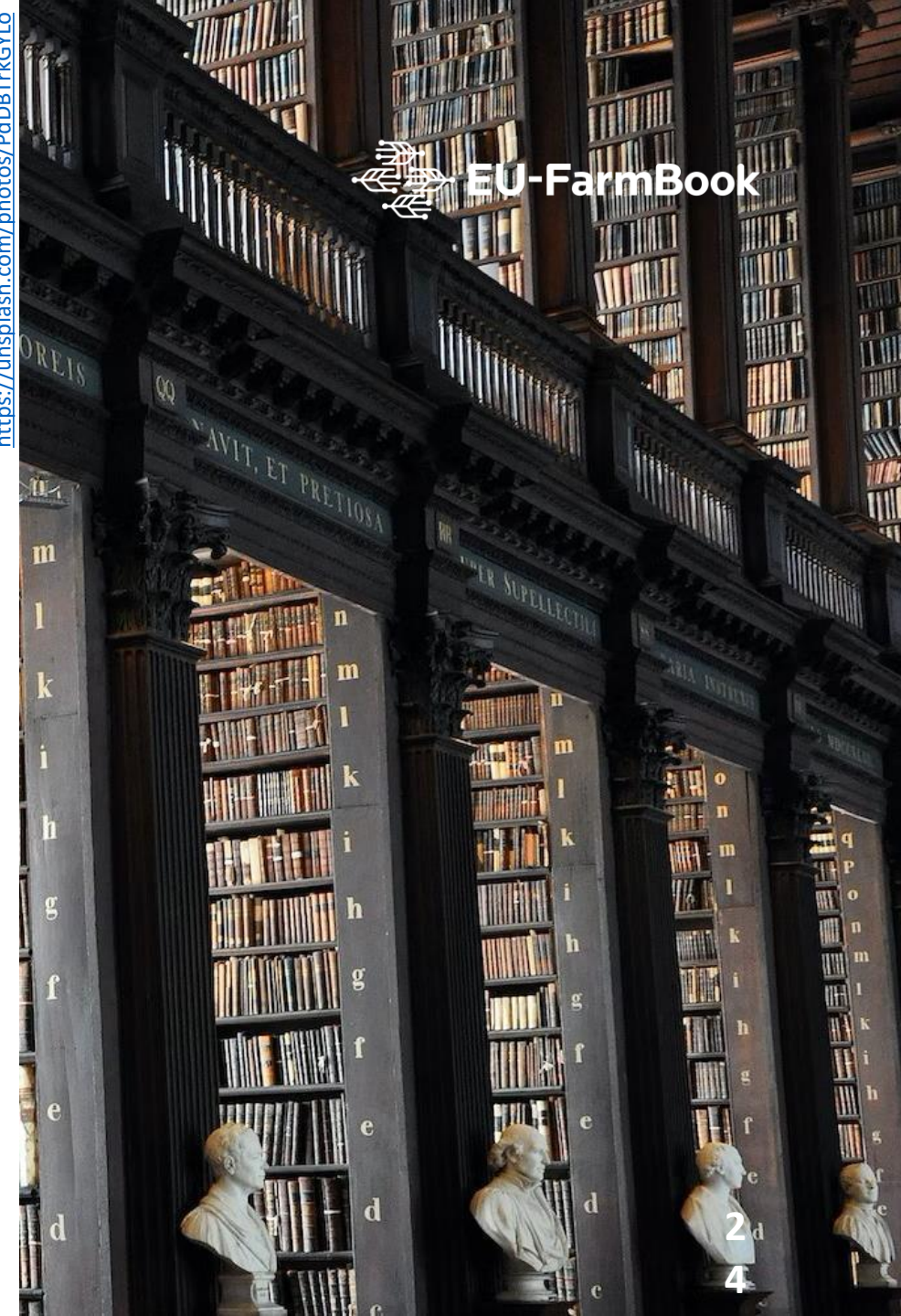


```
{
  {
    "@id": "http://dbpedia.org/resource/Bob_Marley",
    "@type": ["http://xmlns.com/foaf/0.1/Person"],
    "http://www.w3.org/2000/01/rdf-schema#label": [
      { "@value": "Bob Marley", "@language": "en" },
      { "@value": "Bob Marley", "@language": "fr" }
    ],
    "http://www.w3.org/2000/01/rdf-schema#seeAlso": [{"@id": "http://dbpedia.org/resource/Rastafari"}],
    "http://dbpedia.org/ontology/birthPlace": [{"@id": "http://dbpedia.org/resource/Jamaica"}]
  },
  {
    "@id": "http://dbpedia.org/resource/Jamaica",
    "@type": ["http://schema.org/Country"],
    "http://www.w3.org/2000/01/rdf-schema#label": [
      { "@value": "Jamaica", "@language": "en" },
      { "@value": "Giamaica", "@language": "it" }
    ],
    "http://www.w3.org/2003/01/geo/wgs84_pos#lat": [
      { "@value": "17.9833", "@type": "http://www.w3.org/2001/XMLSchema#float" }
    ],
    "http://www.w3.org/2003/01/geo/wgs84_pos#long": [
      { "@value": "-76.8", "@type": "http://www.w3.org/2001/XMLSchema#float" }
    ],
    "http://xmlns.com/foaf/0.1/homepage": [{"@id": "http://jis.gov.jm/"}]
  },
  { "@id": "http://dbpedia.org/resource/Rastafari",
    { "@id": "http://jis.gov.jm/" },
    { "@id": "http://schema.org/Country" },
    { "@id": "http://xmlns.com/foaf/0.1/Person" }
  ]
}
```

Story 3 Open Science

- Two contrary movements
 - Panic about "open data", problem especially in health but general move towards respecting privacy, ownership etc.
 - Frustration with research being paid for but not open, accessible, frustration both from scientists and funding agencies, some parts of general public/politicians
 - Frustration also research gets lost, inaccessible, loss of context etc.
- Result (cutting a long story short)
 - European Open Science Cloud - from the EC
 - FAIR Data Principles - from the Life Science community

<https://unsplash.com/photos/PdDBTrkGYLo>



 EU-FarmBook

The FAIR Data Principles

- Important paper laid the foundations: Wilkinson, M. D., et al. (2016). The FAIR Guiding Principles for scientific data management and stewardship. *Scientific Data*, 3, 160018.
<https://doi.org/10.1038/sdata.2016.18>
- Has had a huge impact ... generally adopted by the EC and many other funding agencies
- What does it mean?



Box 2 | The FAIR Guiding Principles

To be Findable:

- F1. (meta)data are assigned a globally unique and persistent identifier
- F2. data are described with rich metadata (defined by R1 below)
- F3. metadata clearly and explicitly include the identifier of the data it describes
- F4. (meta)data are registered or indexed in a searchable resource

To be Accessible:

- A1. (meta)data are retrievable by their identifier using a standardized communications protocol
 - A1.1 the protocol is open, free, and universally implementable
 - A1.2 the protocol allows for an authentication and authorization procedure, where necessary
- A2. metadata are accessible, even when the data are no longer available

To be Interoperable:

- I1. (meta)data use a formal, accessible, shared, and broadly applicable language for knowledge representation.
- I2. (meta)data use vocabularies that follow FAIR principles
- I3. (meta)data include qualified references to other (meta)data

To be Reusable:

- R1. meta(data) are richly described with a plurality of accurate and relevant attributes
 - R1.1. (meta)data are released with a clear and accessible data usage license
 - R1.2. (meta)data are associated with detailed provenance
 - R1.3. (meta)data meet domain-relevant community standards

FAIR consequences

The **FAIR** data principles



To identify data for both humans and computers by computerising metadata that facilitate searching for specific datasets.



Data is stored properly -for long term- so that it can easily be accessed and/or downloaded with well-defined access conditions. These could be access to the metadata (only) or getting access to the actual data.



The ability to combine different datasets either by humans or by computers. Therefore multiple agreements have to be made with respect to the terminology used to prevent ambiguities of the meanings of these terms.



Data should be ready to be used for future research and to be further processed using computational methods. This requires adequate information about how the data were obtained and processed (provenance), and an appropriate license.

<https://www.dtls.nl/fair-data/data-stewardship/>

Steps how to make data **FAIR**



- select a data repository at an early stage and check out its data format and metadata requirements
- make sure the data can get a persistent identifier so that it can be cited
- select a catalogue to make your data more findable, especially if the repository is more generic in nature



- guarantee longevity of the data (i.e., by submitting it to a repository that has a certification like e.g. ISO)
- check and describe the legal conditions under which the data can be made available
- establish an embargo period if necessary
- make sure your ICT infrastructure will keep the data available even in case of equipment failure or human error



- select commonly used data formats
- select commonly used vocabularies for data items



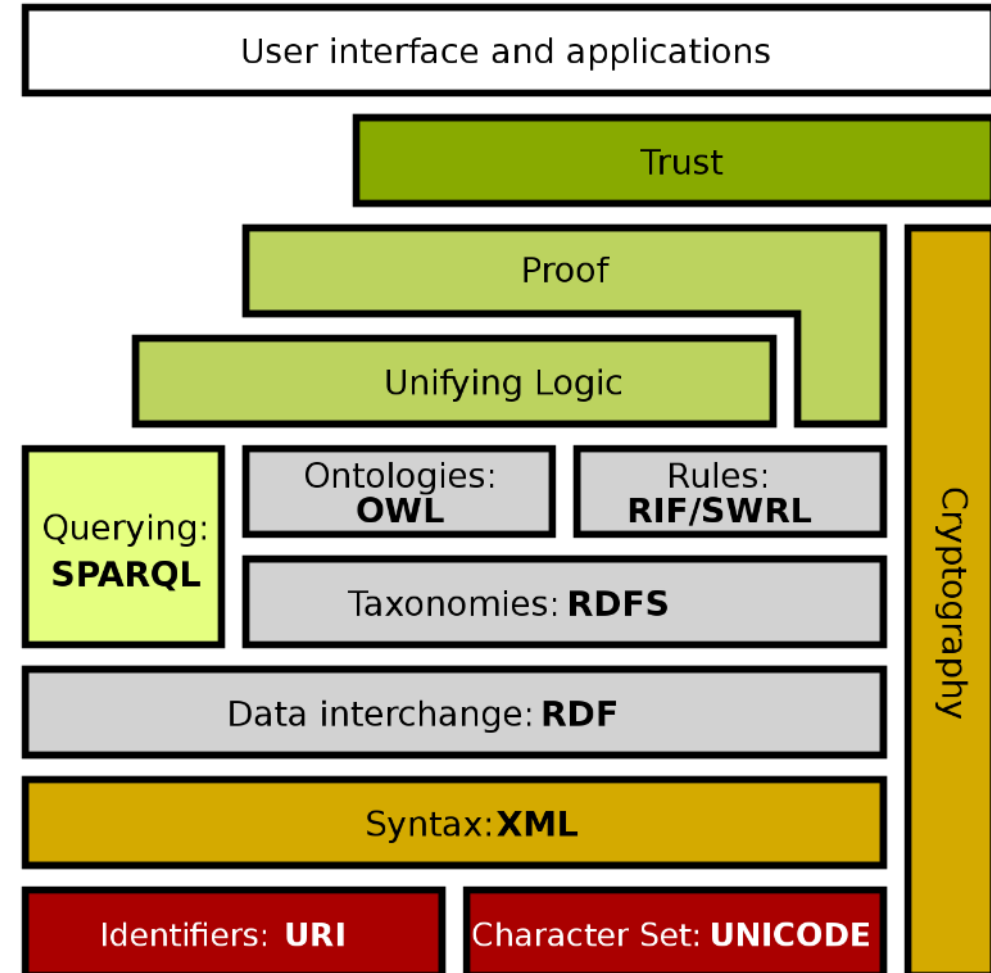
- make sure you keep proper provenance information (i.e., details about how and where the data was generated incl. machine settings, details about processing steps: the software tools with their versions and parameters)
- select the right minimal metadata standard and collect the necessary metadata (many minimal metadata standards are included in ELIXIR's biosharing.org repository)
- select a license for the data (preferably an open license) and the associated software tools
- make sure the important conclusions of your study will not only be available in a paper in a narrated form, but also in a digital file (e.g., a nanopublication)

<https://www.dtls.nl/fair-data/fair-data-knowledge-expertise/>

FAIR consequences – semantic technologies



- Metadata for a KO to be findable
 - Need to use an ontology/taxonomy/vocabulary that is widely used to label the KO/data with appropriate keywords/concepts
 - Need have unique identifiers
- Metadata for KO to be accessible
 - Need to use a commonly used protocol to access the KO/data
 - Need to have access controls – who is allowed to have access to that data?
- Metadata for a KO to be interoperable
 - Need to agreed ontology to describe the KO/data, even more important if data is to be machine readable
 - Ontology must be following FAIR principles as well
- Metadata for a KO to be reusable
 - Need for provenance data – where did this KO come? Who made it?
 - Need for suitable machine readable licences



Example Metadata

Zenodo – some article - DC format

```
<?xml version='1.0' encoding='utf-8'?>
<oai_dc:dc xmlns:dc="http://purl.org/dc/elements/1.1/" xmlns:oai_dc="http://www.openarchives.org/OAI/2.0/oai_dc/" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xsi:schemaLocation="http://www.openarchives.org/OAI/2.0/oai_dc/ http://www.openarchives.org/OAI/2.0/oai_dc.xsd">
  <dc:creator>Marutsov, Plamen Dimitrov</dc:creator>
  <dc:date>2014-01-14</dc:date>
  <dc:description>Mycotoxins are toxic compounds (secondary metabolites) produced by various saprophytic living mold fungi belonging to genera Aspergillus, Fusarium, Penicillium, Claviceps, Alternaria, and others. They are formed and accumulated as a result from proliferation of molds on a variety of food substrates under favorable environmental conditions, including a suitable temperature and humidity. The term 'mycotoxin' is a combination from the Greek word mykos - fungus, mold, and the Latin word 'toxicum' - poison. For the first time, the term mycotoxins was used in England in 1960 after detecting of high mortality in young turkeys in a turkey farm close to London ('Turkey-X disease'). After the tests that were carried out, high contents of aflatoxins were found out in the peanut butter originating from Brazil that was added to the feed. (Blount, W. P. 1961, Allcroft et al., 1961). By now, the number of the mycotoxins known is over 400, and generally are identified more than 30 000 different metabolites produced by molds.</dc:description>
  <dc:description>BG; en; EFSAfocalpoint@mzh.government.bg</dc:description>
  <dc:identifier>https://zenodo.org/record/826599</dc:identifier>
  <dc:identifier>10.5281/zenodo.826599</dc:identifier>
  <dc:identifier>oai:zenodo.org:826599</dc:identifier>
  <dc:relation>doi:10.5281/zenodo.826598</dc:relation>
  <dc:relation>url:https://zenodo.org/communities/efsa-kj</dc:relation>
  <dc:rights>info:eu-repo/semantics/openAccess</dc:rights>
  <dc:rights>https://creativecommons.org/licenses/by/4.0/legalcode</dc:rights>
  <dc:subject>Bulgaria</dc:subject>
  <dc:subject>Opinion</dc:subject>
  <dc:subject>mycotoxins</dc:subject>
  <dc:subject>molds</dc:subject>
  <dc:subject>agriculture</dc:subject>
  <dc:subject>mycotoxins</dc:subject>
  <dc:subject>molds</dc:subject>
  <dc:subject>agriculture</dc:subject>
  <dc:title>Epidemiological and social aspects of mycotoxins in dairy agriculture</dc:title>
```

Wikidata – Maastricht – in RDF

```
<rdf:RDF>
  <rdf:Description rdf:about="https://www.wikidata.org/wiki/Special:EntityData/Q1309">
    <rdf:type rdf:resource="http://schema.org/Dataset"/>
    <schema:about rdf:resource="http://www.wikidata.org/entity/Q1309"/>
    <cc:license rdf:resource="http://creativecommons.org/publicdomain/zero/1.0"/>
    <schema:softwareVersion>1.0.0</schema:softwareVersion>
    <schema:version
      rdf:datatype="http://www.w3.org/2001/XMLSchema#integer">1831142180</schema:version>
    <schema:dateModified rdf:datatype="http://www.w3.org/2001/XMLSchema#dateTime">2023-02-10T18:20:04Z</schema:dateModified>
    <wikibase:statements
      rdf:datatype="http://www.w3.org/2001/XMLSchema#integer">178</wikibase:statements>
    <wikibase:sitelinks rdf:datatype="http://www.w3.org/2001/XMLSchema#integer">121</wikibase:sitelinks>
    <wikibase:identifiers
      rdf:datatype="http://www.w3.org/2001/XMLSchema#integer">51</wikibase:identifiers>
  </rdf:Description>
  <rdf:Description rdf:about="http://www.wikidata.org/entity/Q1309">
    <rdf:type rdf:resource="http://wikiba.se/ontology#Item"/>
  </rdf:Description>
  <rdf:Description rdf:about="https://af.wikipedia.org/wiki/Maastricht">
    <rdf:type rdf:resource="http://schema.org/Article"/>
    <schema:about rdf:resource="http://www.wikidata.org/entity/Q1309"/>
```

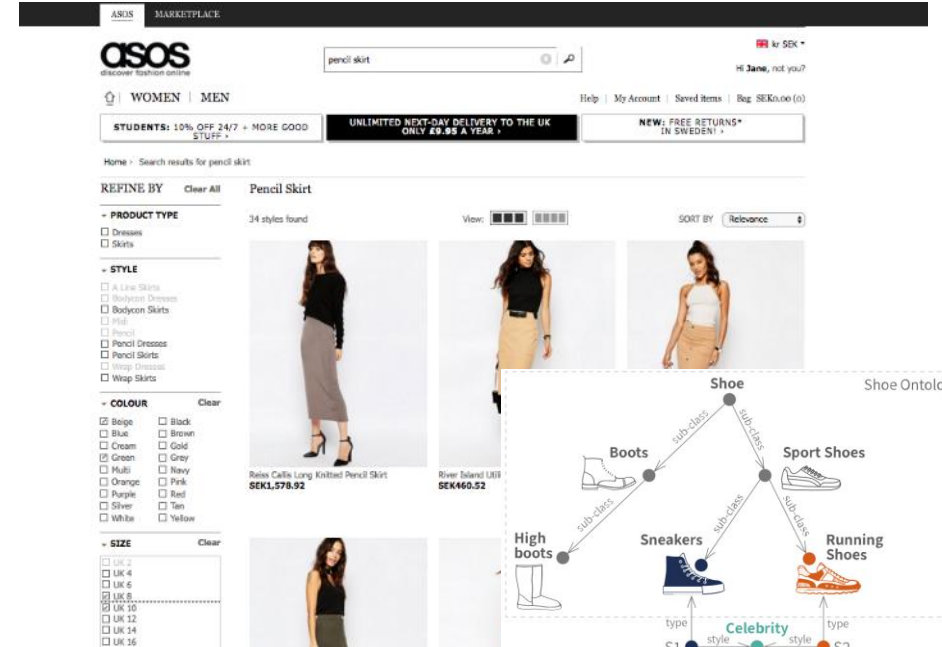

URIs and Unique Identifiers

- URI = Uniform Resource Identifier ... different from URL and URN
 - Necessary for proper indexing and search, citation
- Important to identify people, projects, papers, outputs
- **Published Papers** – usually have DOI these days
 - Other papers, some may have an identifier e.g. from Zenodo, or Arxiv or ...elsewhere
- **Deliverables** – often if not always lack identifiers
 - Videos – no obvious way, Youtube dominates but is not a guarantee
- Practice Abstracts – perhaps EIP-AGRI URIs
- **People** -- various including ORCID, or Google Scholar ... but lots of people do not have these identifiers
- **Projects** -- we could use Cordis identifiers
- Lots more work to be done in this area
- EU-FarmBook will probably have to be able to “mint” identifiers for a variety of project outputs.

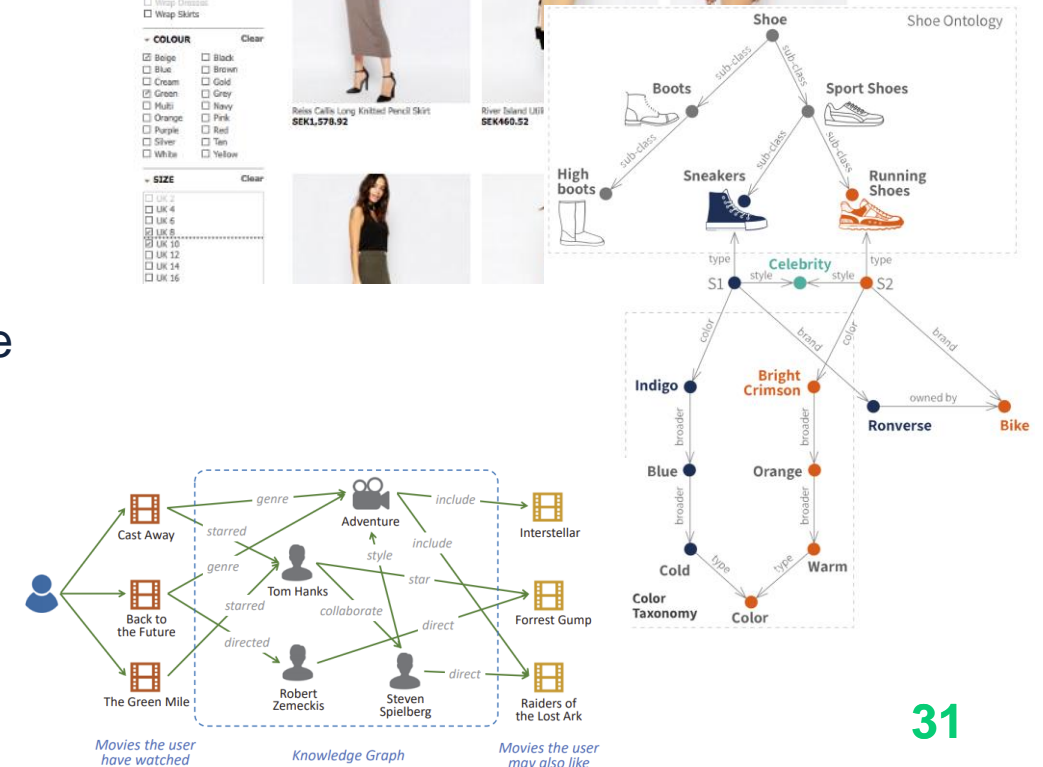


Why do we do this?

- Enables better search interfaces e.g. **faceted search**
 - easier to find knowledge
 - easier to know what you can do with it
 - easier to connect it to other useful knowledge
- Enables the extraction of structured knowledge into a **knowledge graph**
 - This works well with providing **recommendations**
 - This works well with a future **chatbot** to ask/answer questions
- Enables project impact over time to be more visible, more understandable
- Enables certain kinds of open science to be undertaken
- **ALSO** enables the creation of distributed networks of knowledge object databases/platforms around Europe.



The screenshot shows the ASOS marketplace interface. At the top, there's a search bar with 'pencil skirt' entered. Below the search bar, there are navigation links for 'WOMEN' and 'MEN', and a user profile for 'Jane'. A promotional banner offers 'UNLIMITED NEXT-DAY DELIVERY TO THE UK ONLY £9.95 A YEAR' and 'NEW: FREE RETURNS* IN SWEDEN'. The main content area is titled 'REFINE BY' and shows 'Pencil Skirt' with 34 styles found. There are filters for 'PRODUCT TYPE' (Dresses, Skirts), 'STYLE' (A-Line Skirts, Bodycon Dresses, etc.), and 'COLOUR' (Beige, Black, Blue, etc.). Product listings include 'Raisa Calla Long Knitted Pencil Skirt' for SEK1,578.92 and 'River Island L88' for SEK460.52.





EU-FarmBook

Thank You!



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