Data management tool in Life Sciences: the FAIRDOMhub

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Data Steward at ELIXIR Belgium

Advancing Data Stewardship:
insights from environmental and life science research

28th February 2020, Oostende

Research data are often not informative

RDA Plenary Cartoons by Auke Herrema.

Research Data Management (RDM) transforms Data into Information

RDA Plenary Cartoons by Auke Herrema.

Knowledge

Information
- Findable
- Accessible
- Reusable

Data
- Unfindable
- Incomprehensible
- Not reusable

Researcher

Data management

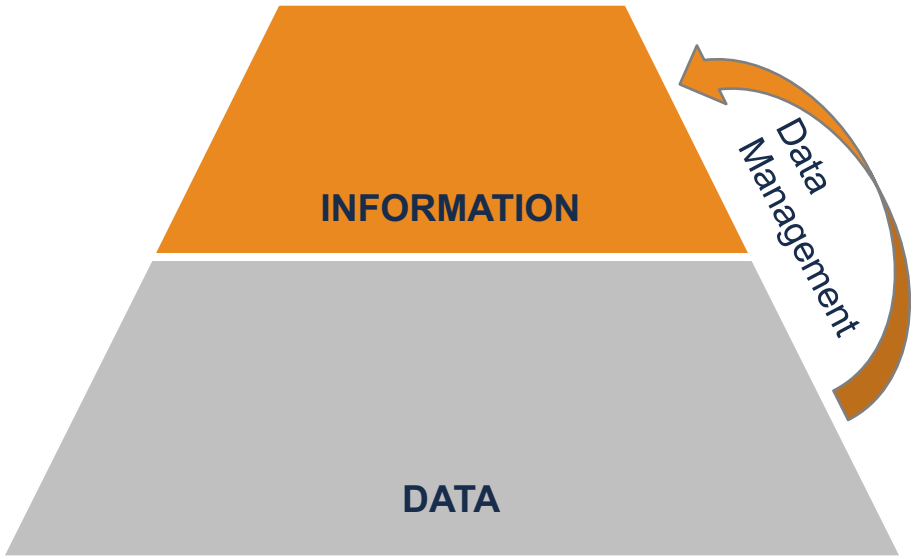
RDM transforms Data into Information, Information generates new Knowledge

Example

100

RDM transforms Data into Information, Information generates new Knowledge

Example

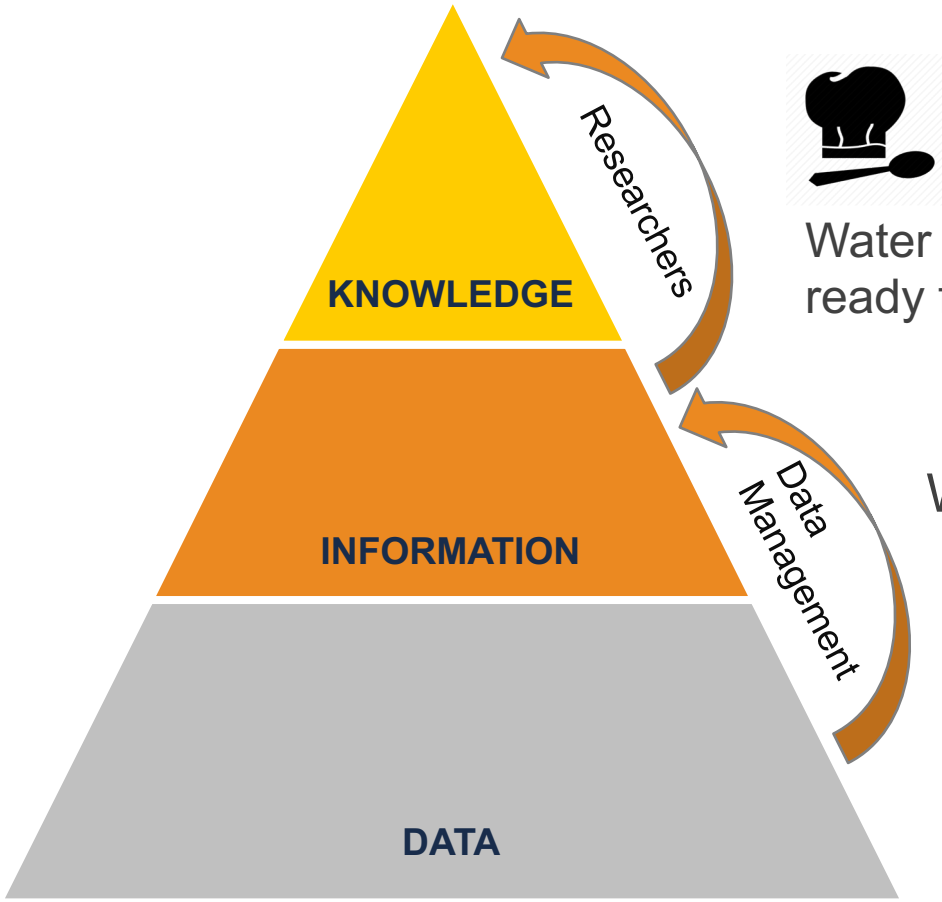


Water temperature (ºC): 100

100

RDM transforms Data into Information, Information generates new Knowledge

Example



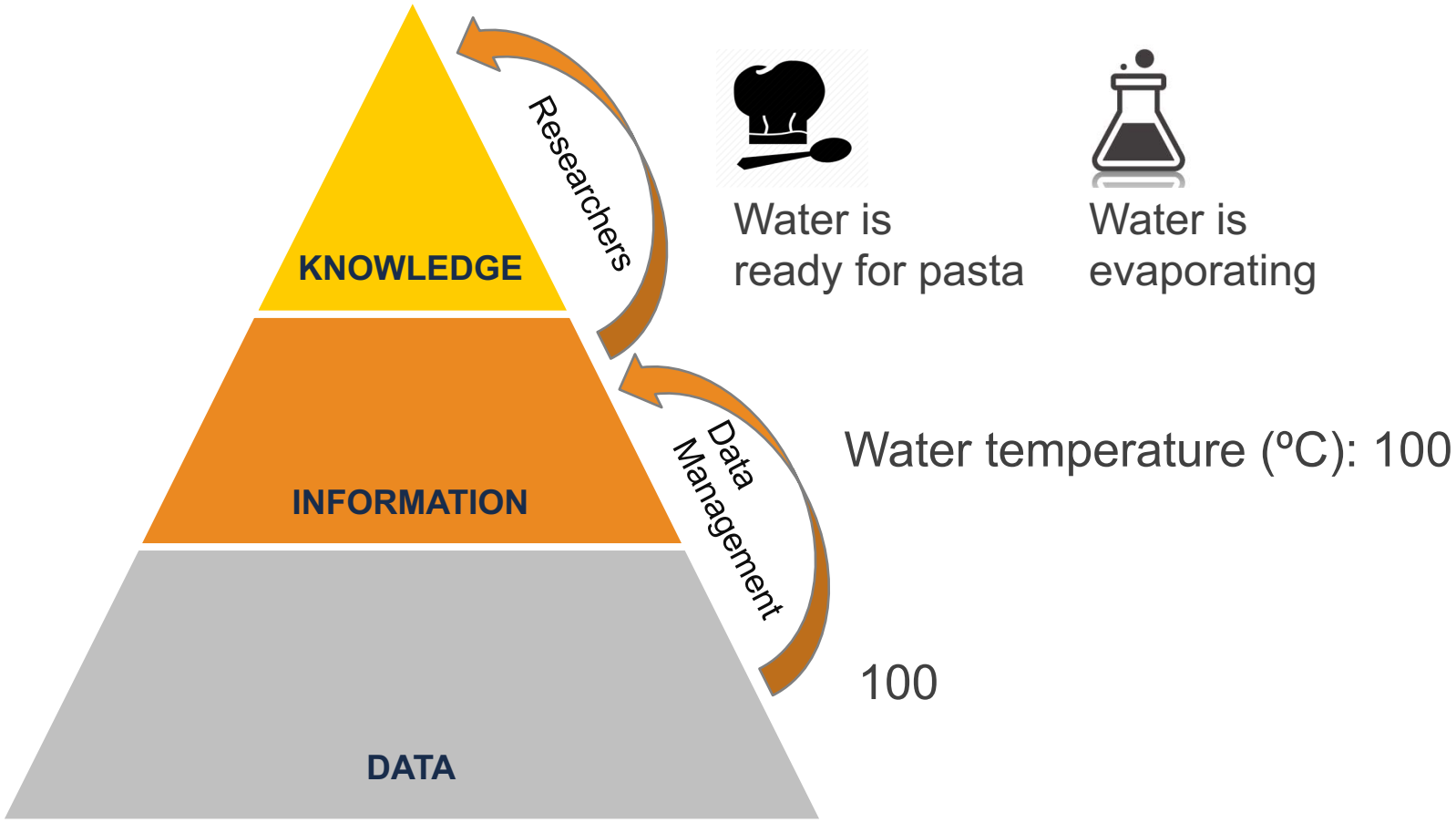
Water is
ready for pasta

Water temperature (ºC): 100

100

RDM transforms Data into Information, Information generates new Knowledge

Example



RDM transforms Data into Information, Information generates new Knowledge

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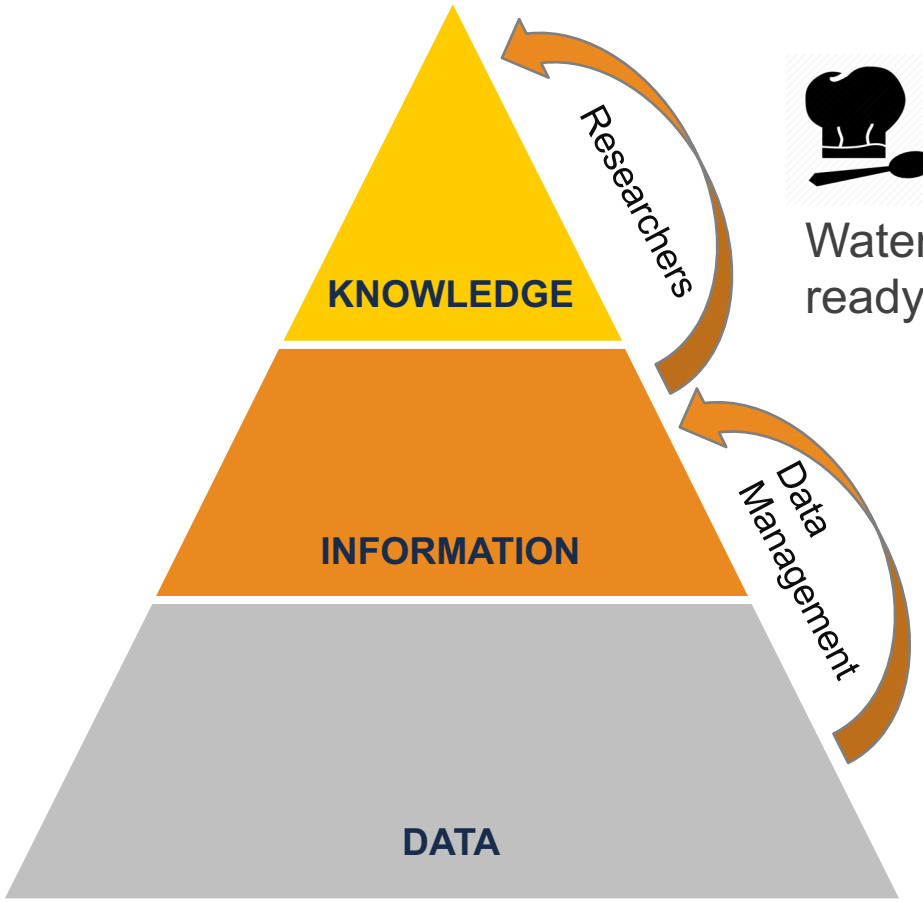

Water is ready for pasta

Water is evaporating

Water could burn someone

Water temperature (ºC): 100

100

Develop a RDM Platform for Researchers

FAIRDOMhub.be

Powered by FAIRDOM SEEK

© 2016 Sophie Klevenow

FAIRDOMhub.be will enable researchers to make their data **FAIR by design**

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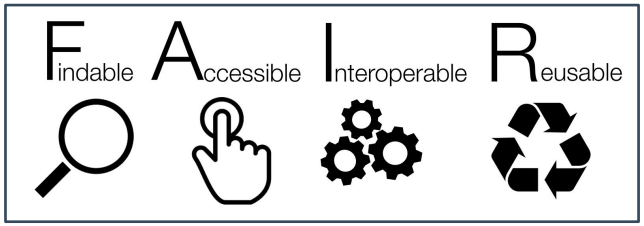
FAIRDOMhub.be will enable researchers to make their data **FAIR by design**



Important: FAIR data both for your future-self and society

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Outline

FAIRDOMhub.be as RDM tool

1. What is it?
2. What is it for?
3. How does it work?
4. What are the advantages for researchers?

FAIRDOMhub.be

What is it?

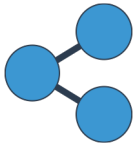
- Free web-based registry/platform for RDM (https://fairdomhub.be/test/)
- Based on the open source web platform SEEK, developed by the FAIRDOM initiative

FAIRDOMhub.be

What is it for?

Organise your project in a standard simple structure

Describe your experimental design and samples with metadata schemas and ontology



Share your (meta)data with colleagues by using fine grained sharing permissions

FAIRDOMhub.be

How does it work?

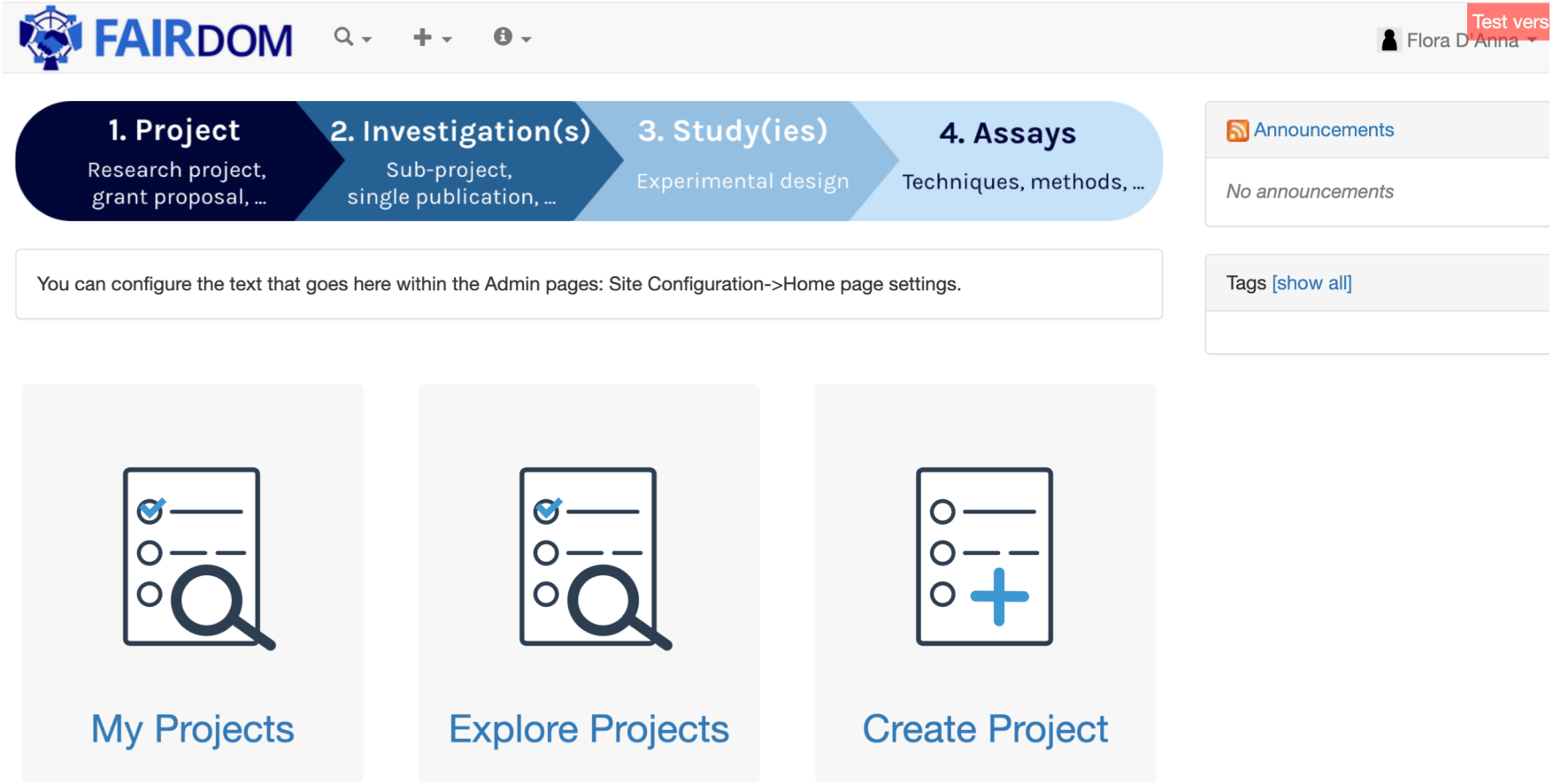
1) Group leader requests an account (or Programme) for the lab and create Project(s)

2) Researchers register in *fairdomhub.be* and join one or more Projects of the lab and/or create new project(s)

3) Researchers organise projects, describe experiments and share (meta)data

FAIRDOMhub.be

How does it work?



FAIRDOMhub.be

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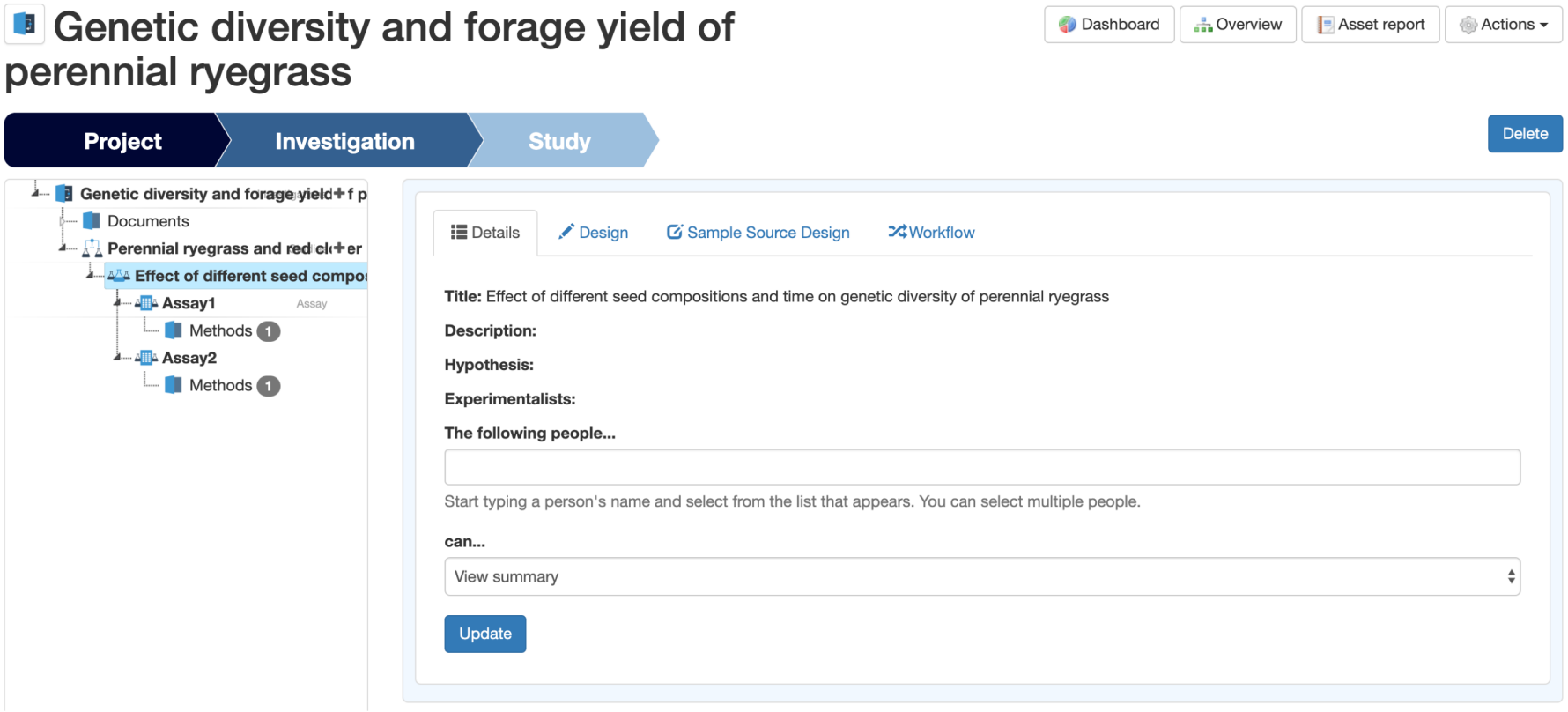

FAIRDOMhub.be

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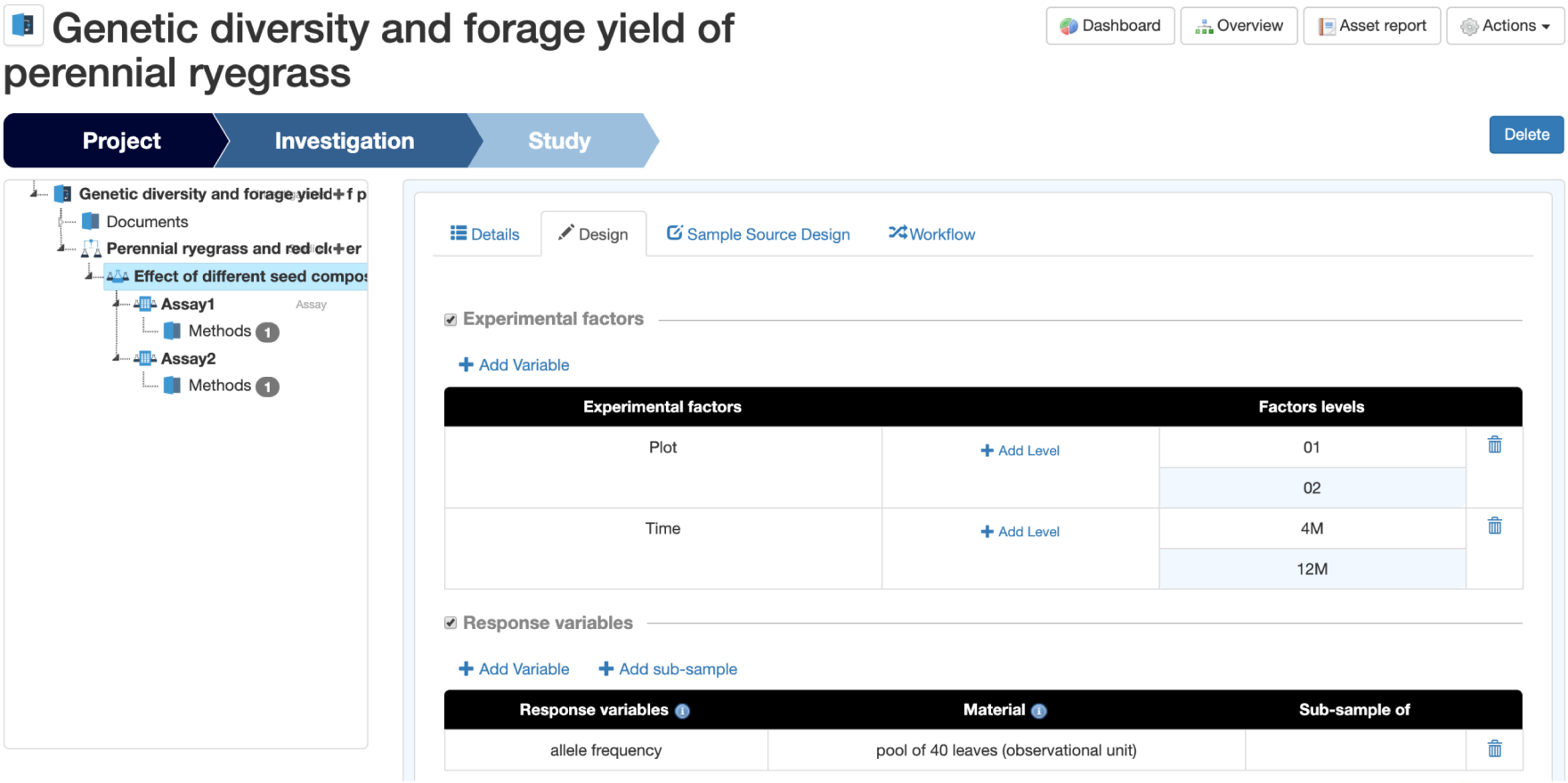

FAIRDOMhub.be

How does it work?

Response variables	Material	Sub-sample of
allele frequency	pool of 40 leaves (observational unit)	

Blocking variables

Covariates

Confounding variables

Replicates

+ Add Variable

Replicates	Number	Description
Sample	1	one leaf of perennial reygrass from a random plant
Observational Unit (pool)	4	1 pool of 40 leaves (sample), from each plot at each time point
Biological Replicate	2	Each plot is in 2 blocks
Sub-Unit	2	2 replicate tissue pools created from each sample by weighing 5mg from each leaf sample of the respective plots
Technical Replicate	3	3 libraries from each sub-unit
Sequencing replicate	2	2 parallel lane, in the same flow cell, per technical replicate

Design of experiment

RCBD | Randomized complete block design with two biological repli

Save Design or Generate Sample

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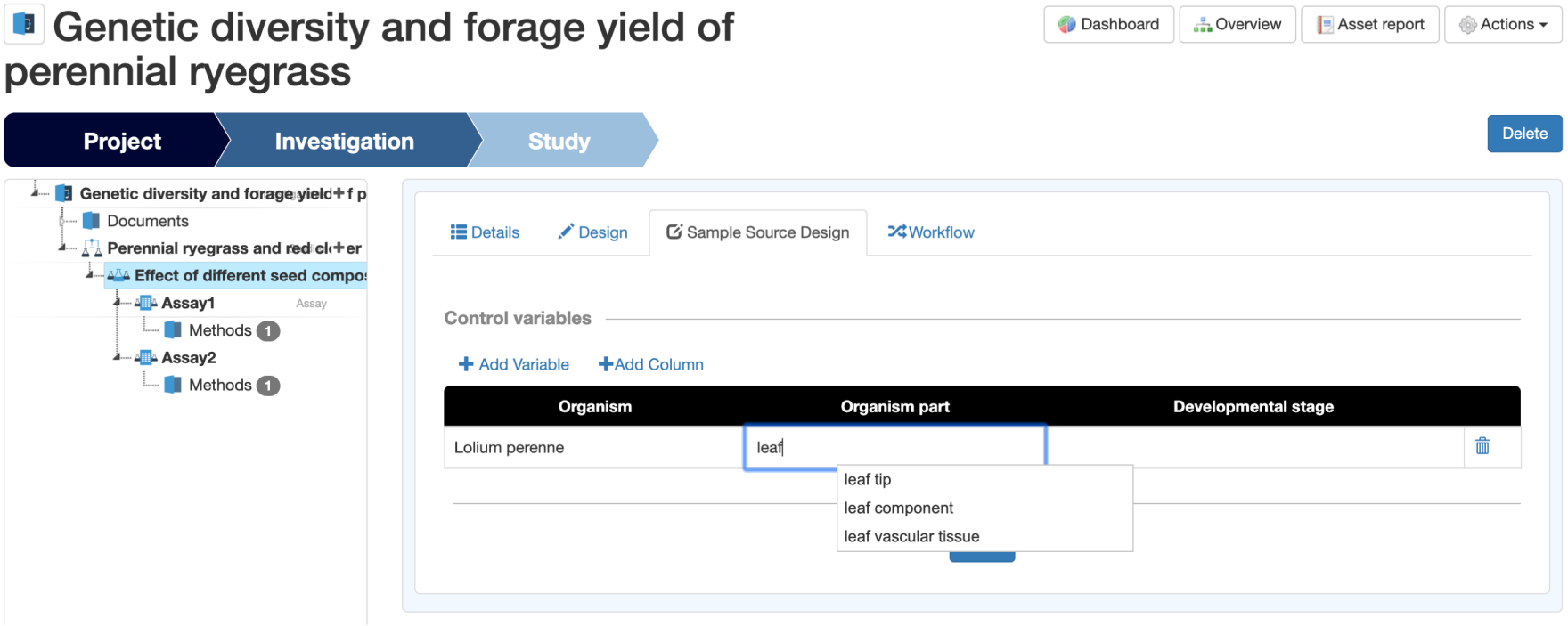
How does it work?



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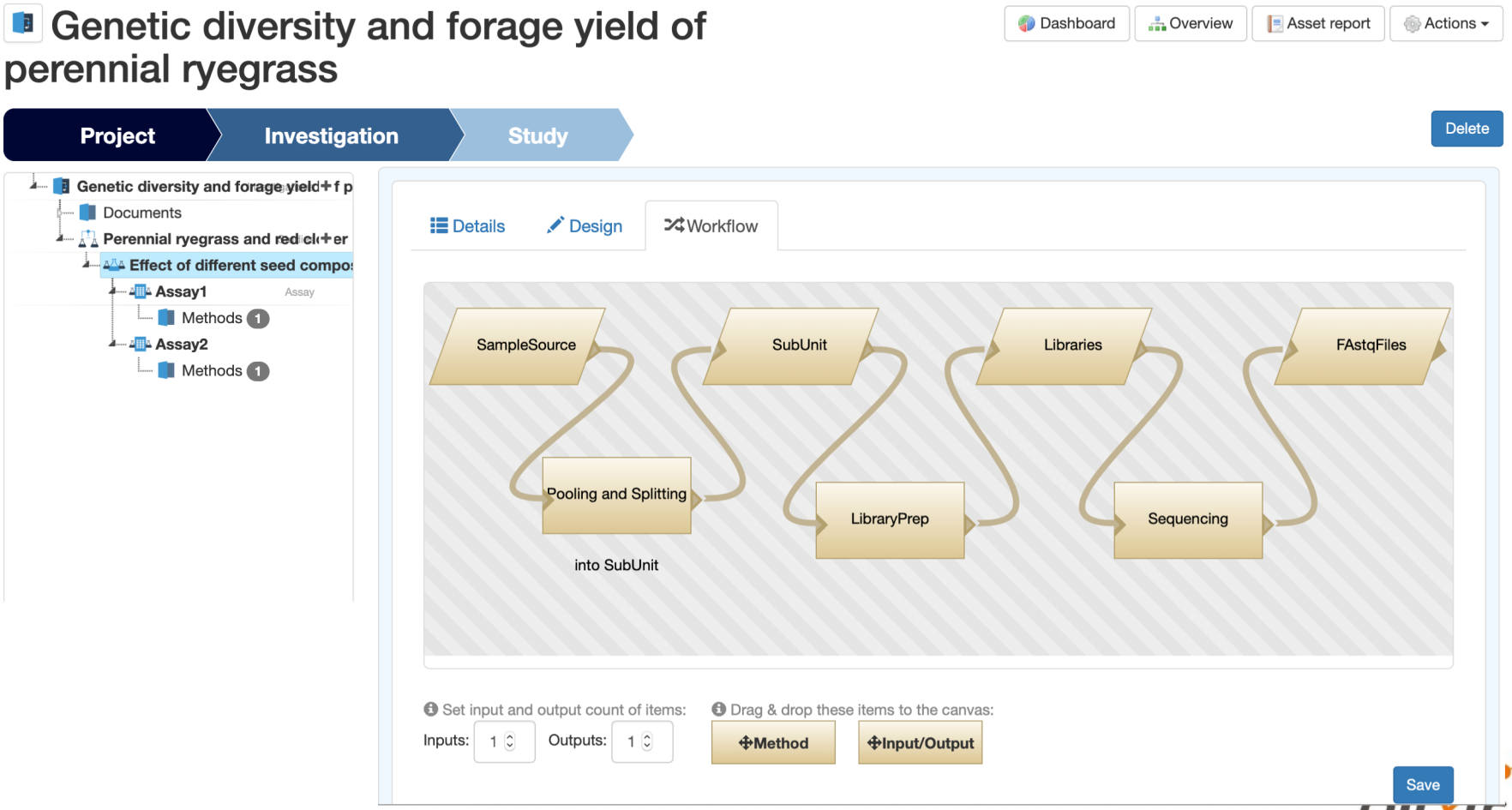

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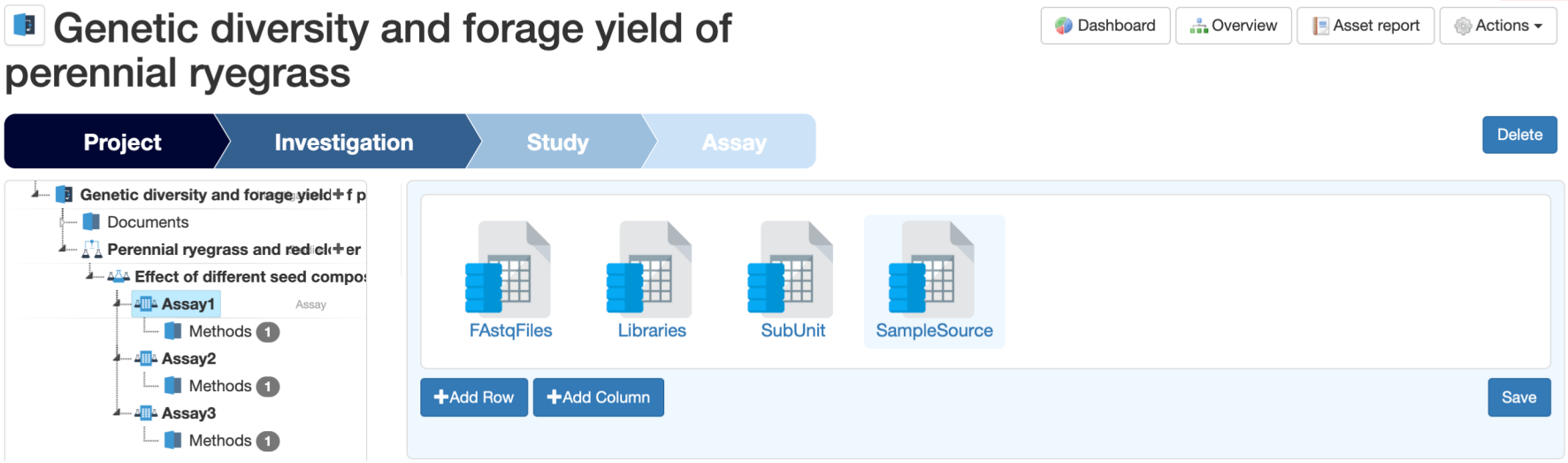

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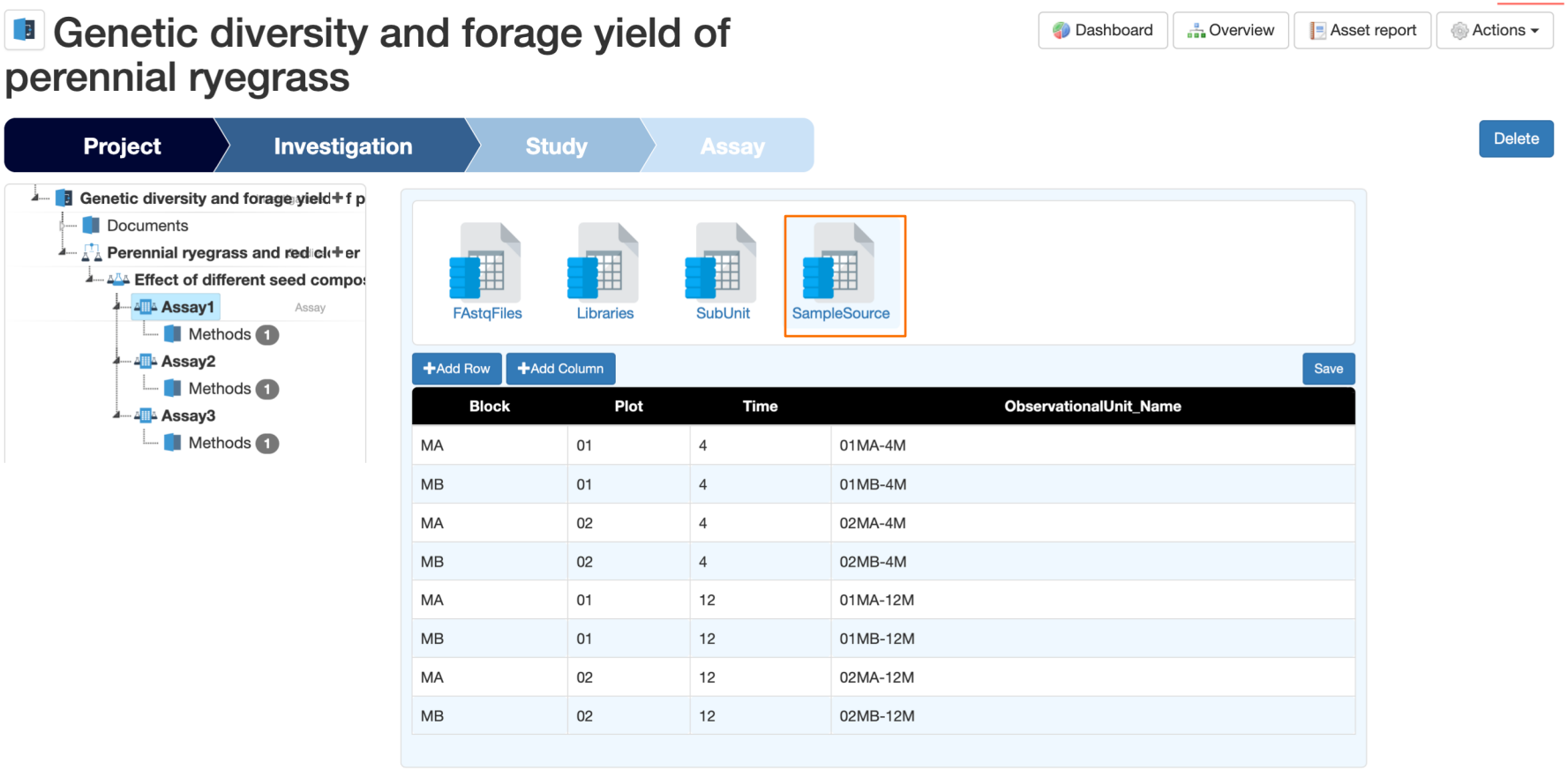

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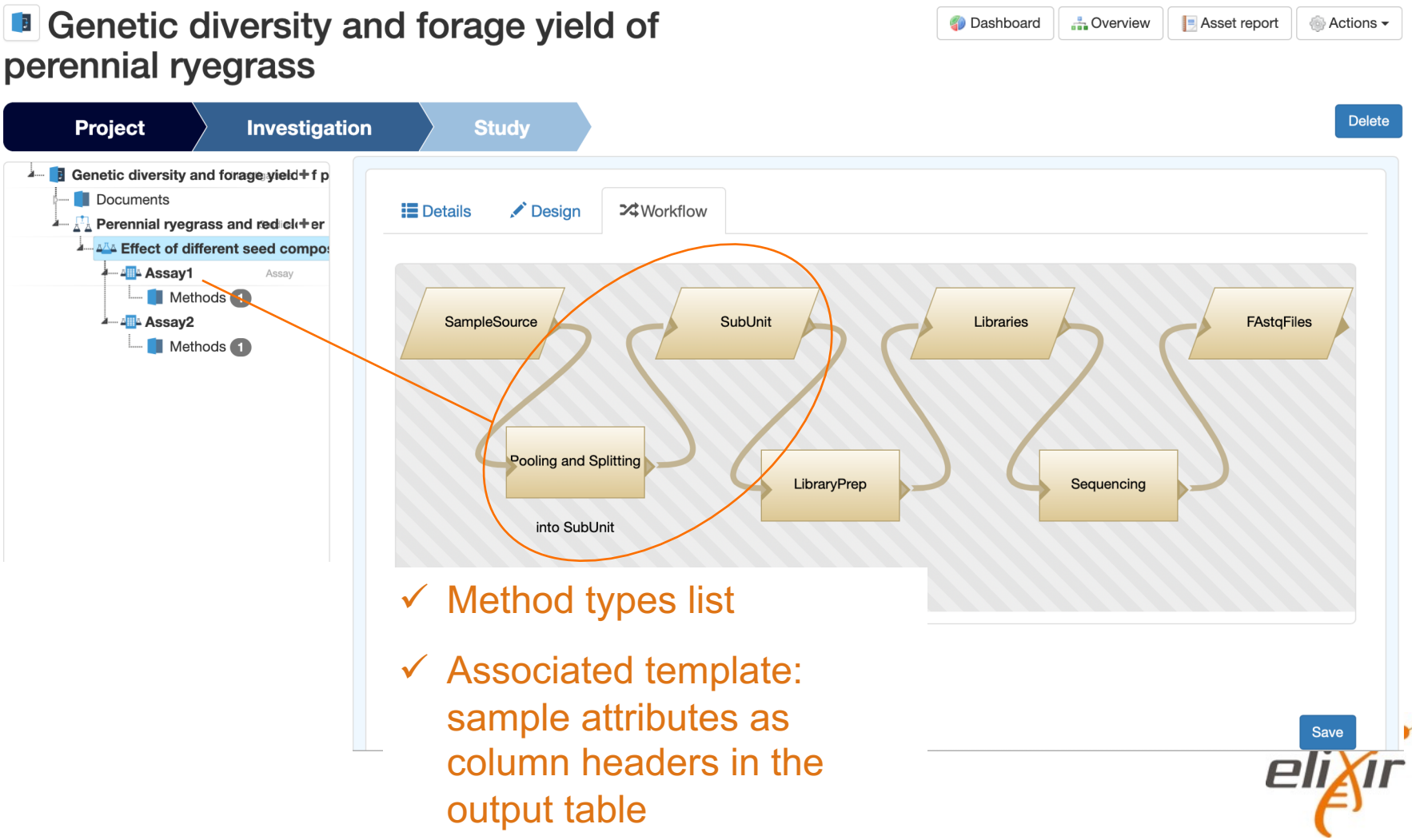


- ✓ Method types list
- ✓ Associated template: sample attributes as column headers in the output table

FAIRDOMhub.be

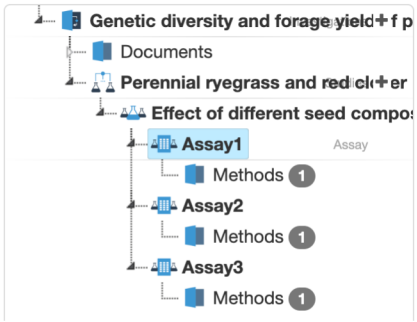
How does it work?

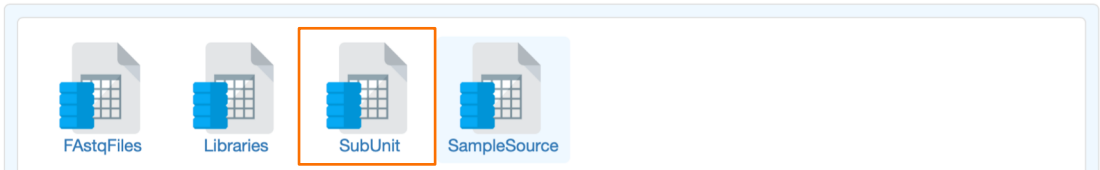
Genetic diversity and forage yield of perennial ryegrass

Dashboard | Overview | Asset report | Actions

Project | Investigation | Study | Assay

Delete





+Add Row | +Add Column | Save

Block	Plot	Time	ObservationalUnit_Name	SubUnit	SubUnit_Name
MA	01	4	01MA-4M	1	01MA-4M-pool1
MB	01	4	01MB-4M	1	01MB-4M-pool1
MA	02	4	02MA-4M	1	02MA-4M-pool1
MB	02	4	02MB-4M	1	02MB-4M-pool1
MA	01	12	01MA-12M	1	01MA-12M-pool1
MB	01	12	01MB-12M	1	01MB-12M-pool1
MA	02	12	02MA-12M	1	02MA-12M-pool1
MB	02	12	02MB-12M	1	02MB-12M-pool1
MA	01	4	01MA-4M	2	01MA-4M-pool2
MB	01	4	01MB-4M	2	01MB-4M-pool2
MA	02	4	02MA-4M	2	02MA-4M-pool2
MB	02	4	02MB-4M	2	02MB-4M-pool2

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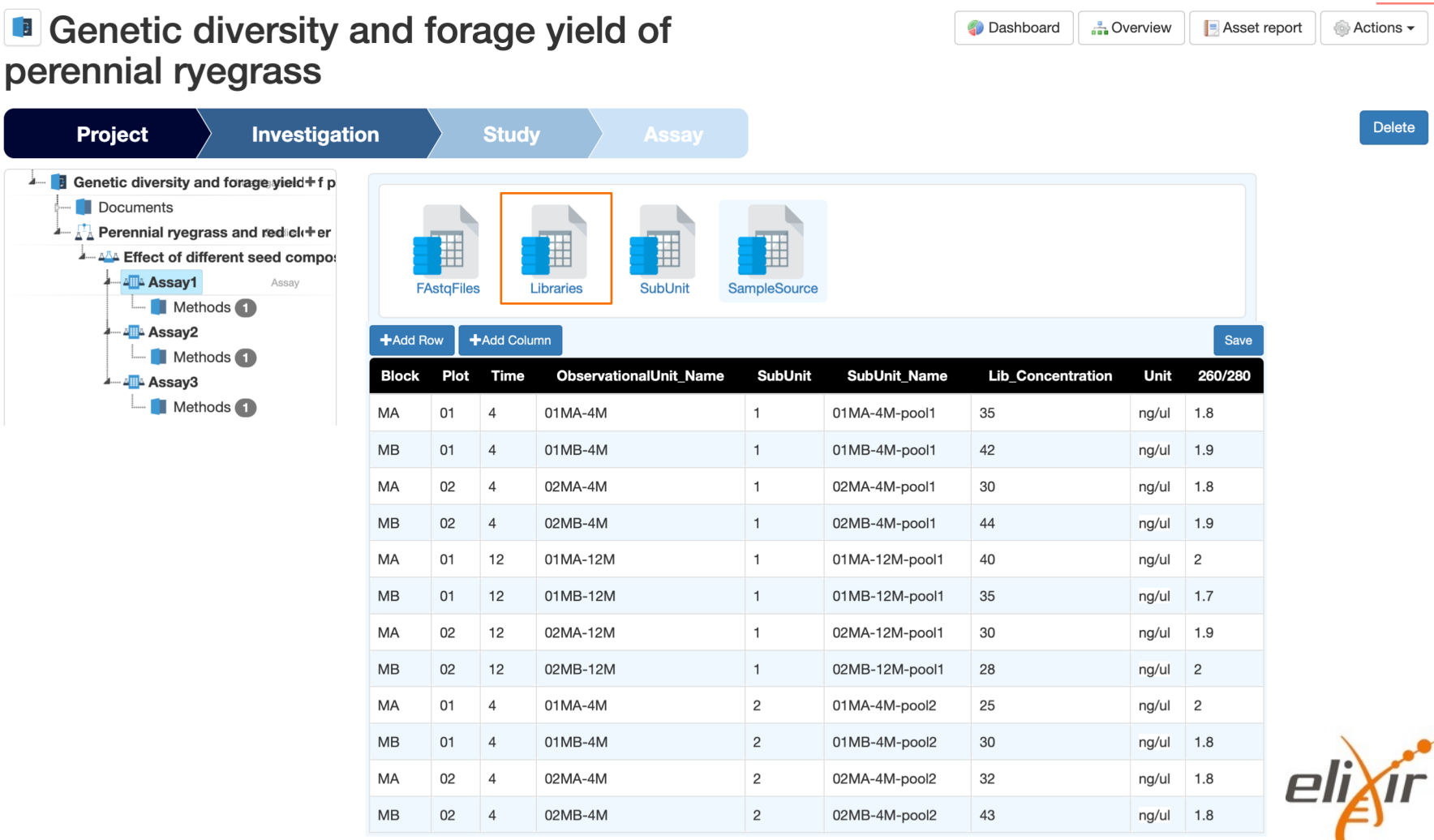
How does it work?



Block	Plot	Time	ObservationalUnit_Name	SubUnit	SubUnit_Name	Lib_Concentration	Unit	260/280
MA	01	4	01MA-4M	1	01MA-4M-pool1	35	ng/ul	1.8
MB	01	4	01MB-4M	1	01MB-4M-pool1	42	ng/ul	1.9
MA	02	4	02MA-4M	1	02MA-4M-pool1	30	ng/ul	1.8
MB	02	4	02MB-4M	1	02MB-4M-pool1	44	ng/ul	1.9
MA	01	12	01MA-12M	1	01MA-12M-pool1	40	ng/ul	2
MB	01	12	01MB-12M	1	01MB-12M-pool1	35	ng/ul	1.7
MA	02	12	02MA-12M	1	02MA-12M-pool1	30	ng/ul	1.9
MB	02	12	02MB-12M	1	02MB-12M-pool1	28	ng/ul	2
MA	01	4	01MA-4M	2	01MA-4M-pool2	25	ng/ul	2
MB	01	4	01MB-4M	2	01MB-4M-pool2	30	ng/ul	1.8
MA	02	4	02MA-4M	2	02MA-4M-pool2	32	ng/ul	1.8
MB	02	4	02MB-4M	2	02MB-4M-pool2	43	ng/ul	1.8

FAIRDOMhub.be

What are the advantages for researchers?

- Organizing your experiments will be straightforward. You will always know “what file is what” and “where it is” (even after many years)
- You will not have to worry about backup and README file anymore: everything is safely stored and well described
- Collaboration with colleagues and data sharing with technical core facilities will be easier
- Submitting your data from *fairdomhub.be* to repository will be fast and easy

FAIRDOMhub.be

What are the advantages for researchers?

DMP ONLINE .BE

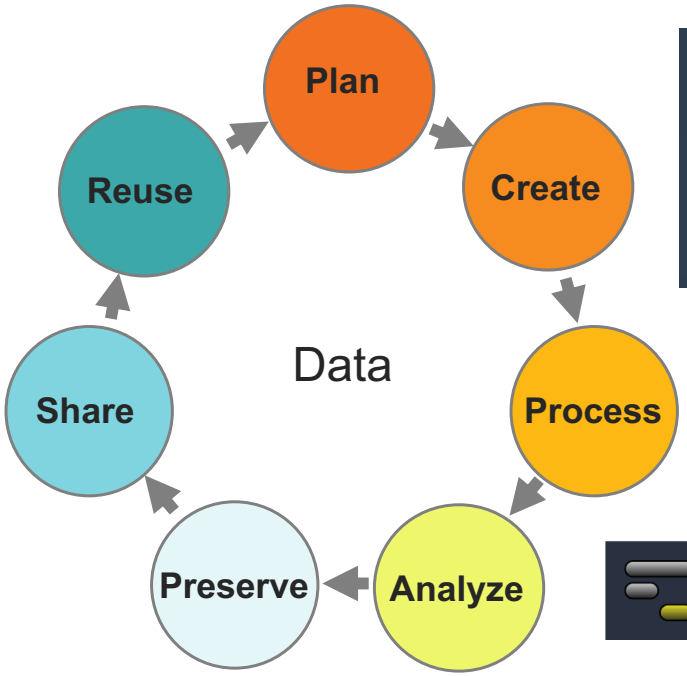
ELIXIR Deposition Databases list

ENA European Nucleotide Archive

PRIDE

IntAct

Other…



FAIRDOMhub.be

FAIRDOM

Powered by SEEK

Galaxy

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Summary

FAIRDOMhub.be as RDM tool

1. What is it?
    - Free, intuitive and “researcher” friendly web based platform for RDM
2. What is it for?
    - Organize, describe and share (meta)data according to standards
3. How does it work?
    - Based on the general workflow “Input samples” → Method → “Output samples”
4. What are the advantages for researchers?
    - Efficient data management and data sharing

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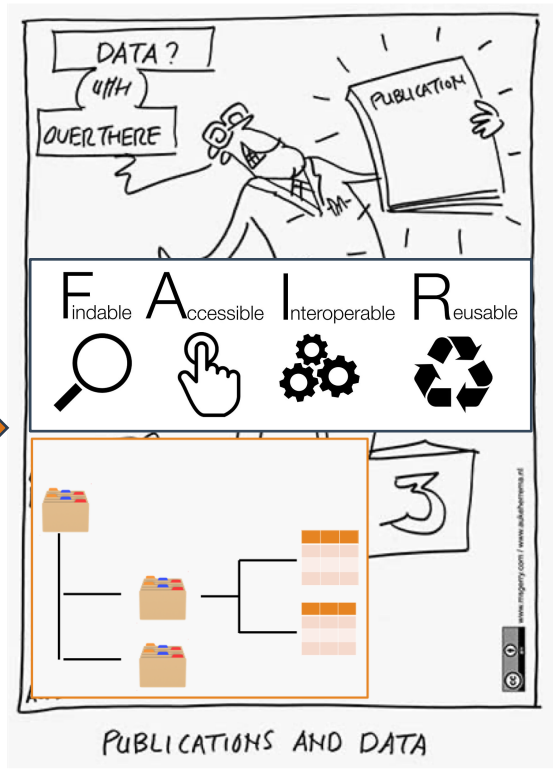
Conclusion

RDA Plenary Cartoons by Auke Herrema.



RDA Plenary Cartoons by Auke Herrema.

Acknowledgements

Vahid Kiani, Software Developer at ELIXIR Belgium

Links

ELIXIR Deposition Databases list

https://elixir-europe.org/platforms/data/elixir-deposition-databases

FAIRDOM SEEK

https://fair-dom.org/platform/seek/

DMP ONLINE .BE

https://dmponline.be/projects

Galaxy

https://usegalaxy.be

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