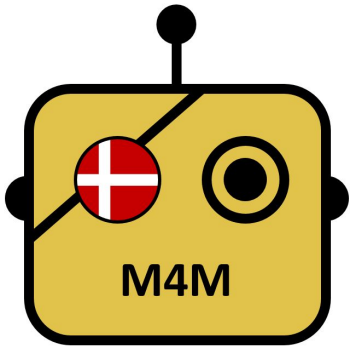
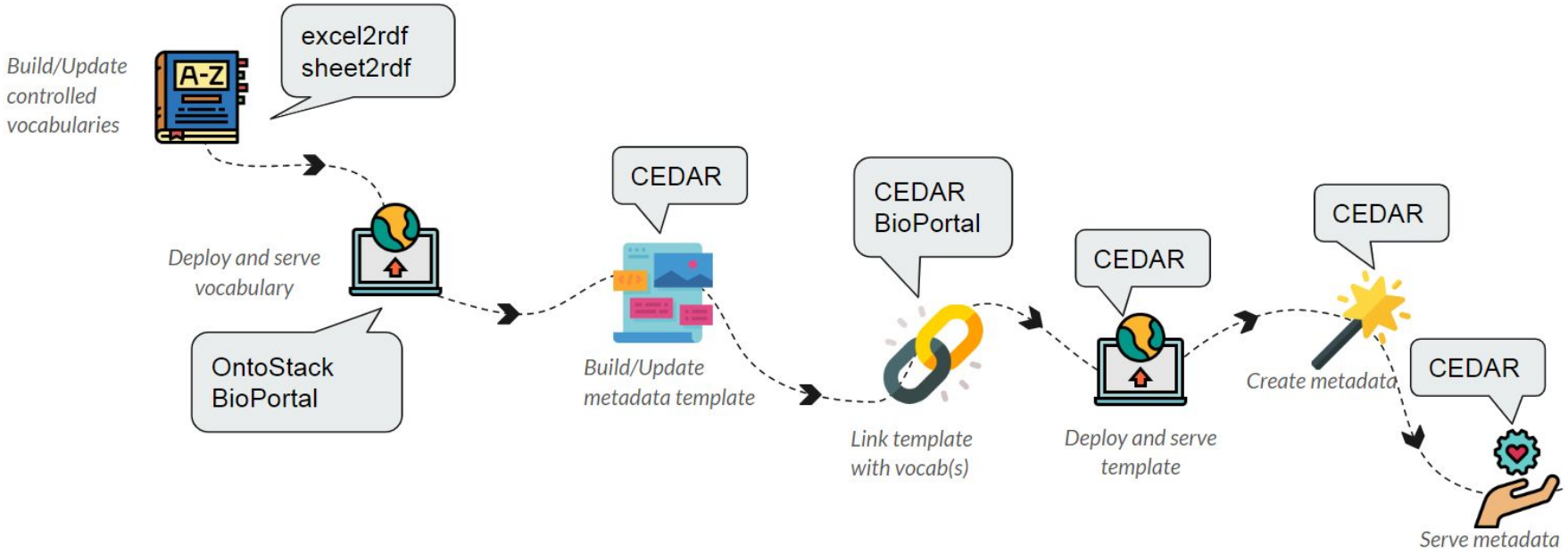
Metadata for Machines

DeiC Konferencen 2021, 4/11-2021

Hannah Mihai, DeiC



FAIRification roadmap



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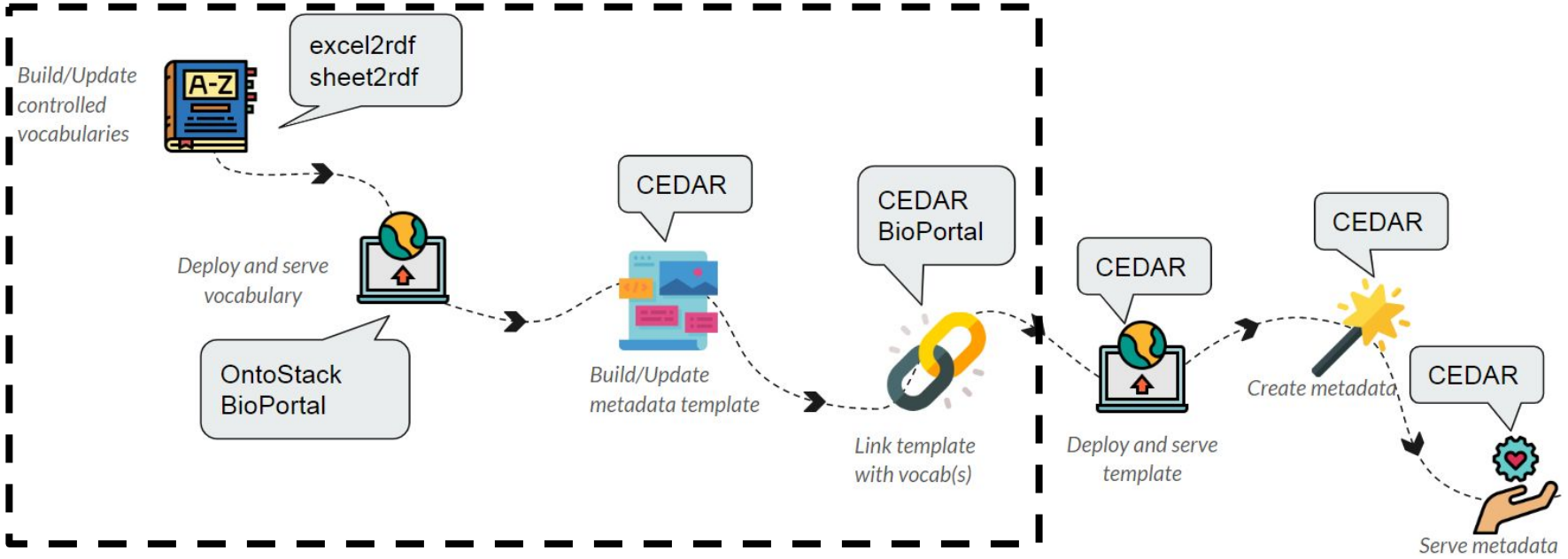
FAIRification roadmap



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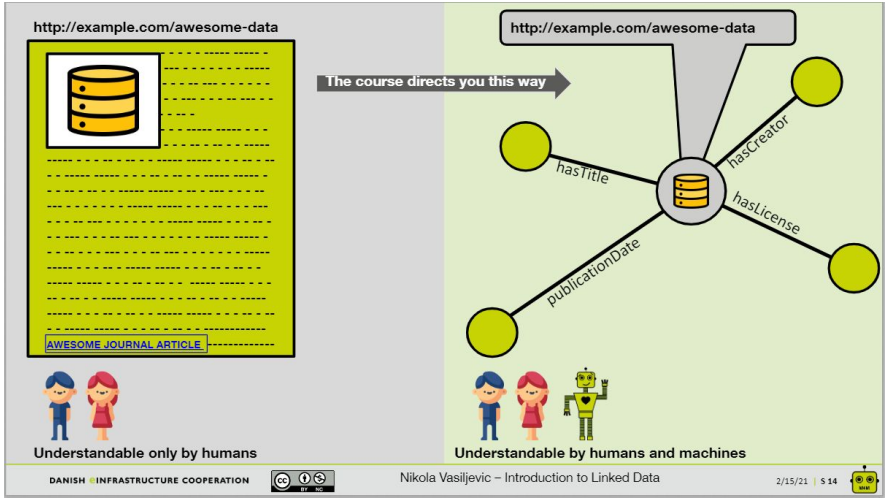
The reason for M4M workshops

Machine actionable metadata is important, because:

- You learn good data handling practices, which strengthens your data handling for yourself individually as well as with your collaborators
- It increases the impact of your research group's data by making more of your data discoverable and increase the number of citable outputs
- It can help you receive funding.



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The ‘rapid’ M4M concept - a collaboration with GO FAIR

- Homework before the workshop
  - Mainly consisting of getting the right accounts, finding a suitable dataset, familiarizing yourself with the concept of FAIR
- 1 hour pre-WS meeting
  - To avoid technical issues during the workshop and to assist with structuring the dataset
- 2 x ½ days online workshop or one full day physical workshop
- All information can be found here: https://m4m-dk.readthedocs.io/en/latest/

This collaboration was made possible by:

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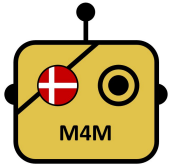

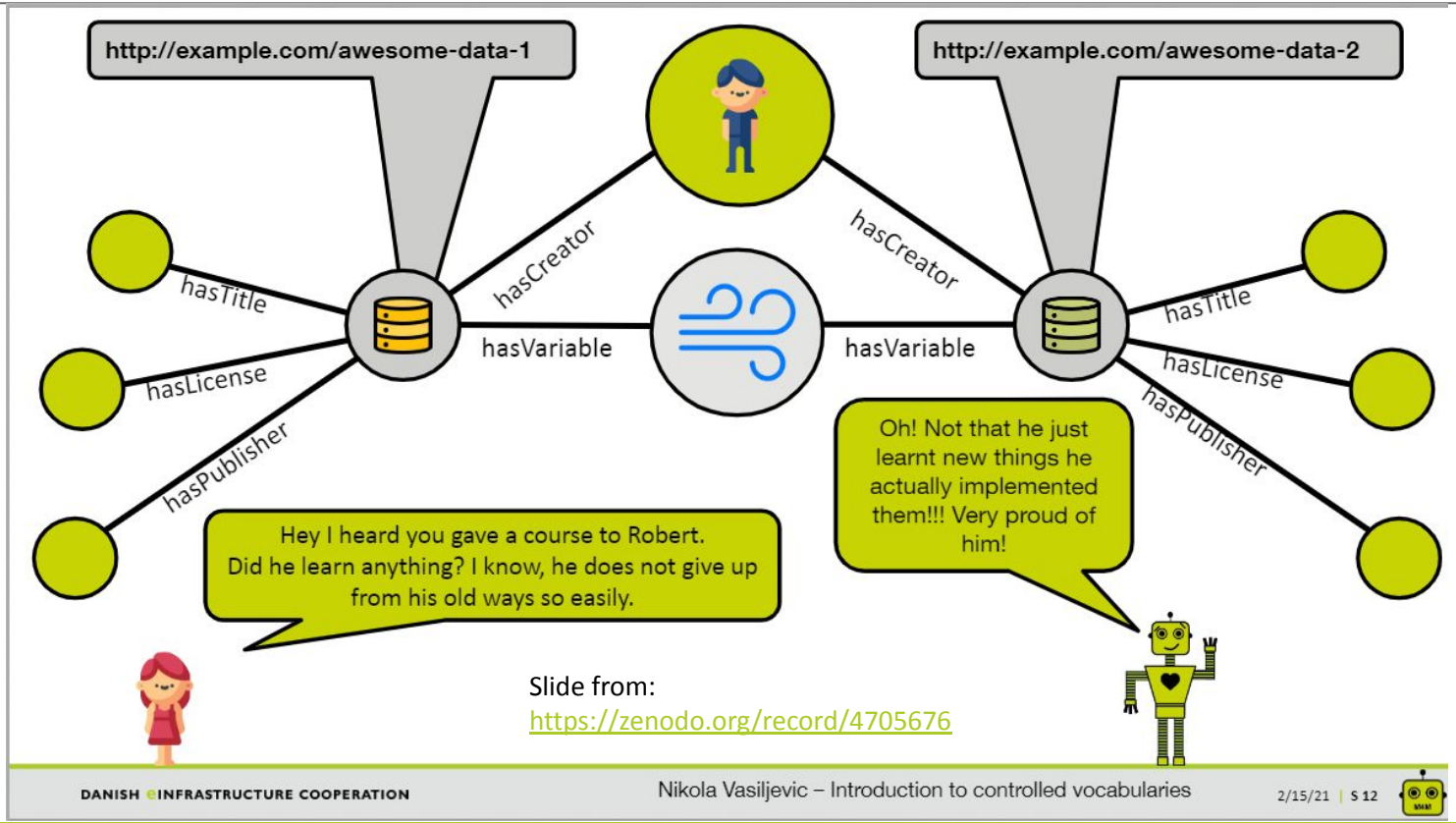

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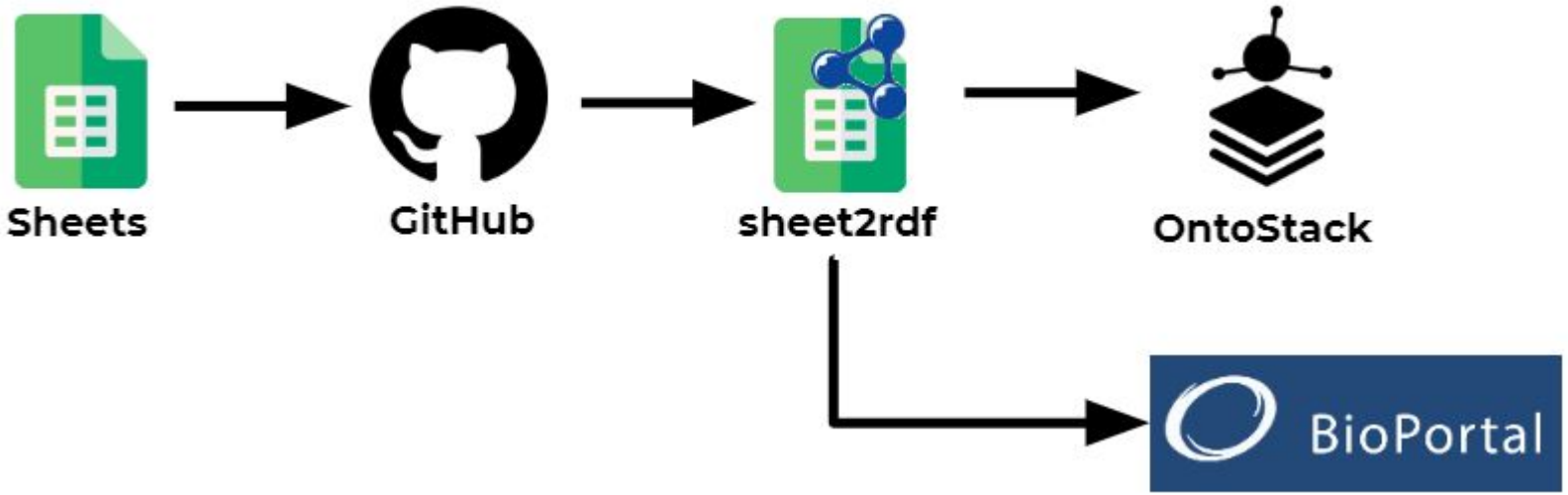
The workflow



Slide from: https://zenodo.org/record/4705676

ConceptScheme URI	http://ontology.deic.org/cv/vocab-name/	
PREFIX	vocab-name	http://ontology.deic.org/cv/vocab-name/
PREFIX	pav	http://purl.org/pav/
PREFIX	dct	http://purl.org/dc/terms/
PREFIX	owl	http://www.w3.org/2002/07/owl#
PREFIX	xsd	http://www.w3.org/2001/XMLSchema#
PREFIX	skos	http://www.w3.org/2004/02/skos/core#
dct:title		
dct:description		
dct:creator		
dct:rights		
pav:version		
pav:createdOn		
pav:lastUpdatedOn		

Identifier	skos:prefLabel@en	skos:altLabel(separator=",")
vocab-name:		
vocab-name:		
vocab-name:		
vocab-name:		
vocab-name:		
vocab-name:		
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Slide taken from:
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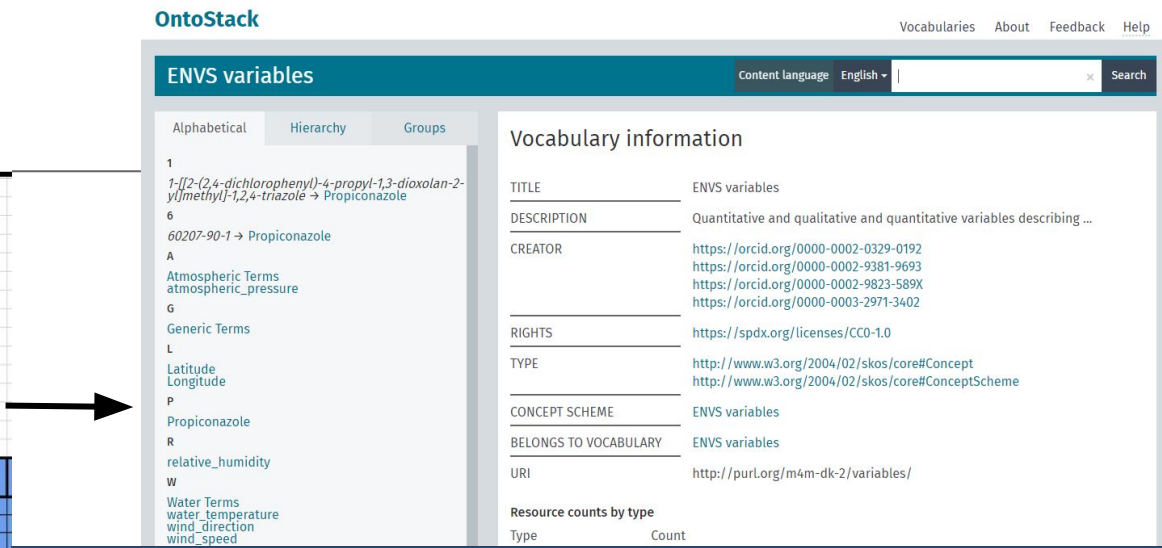
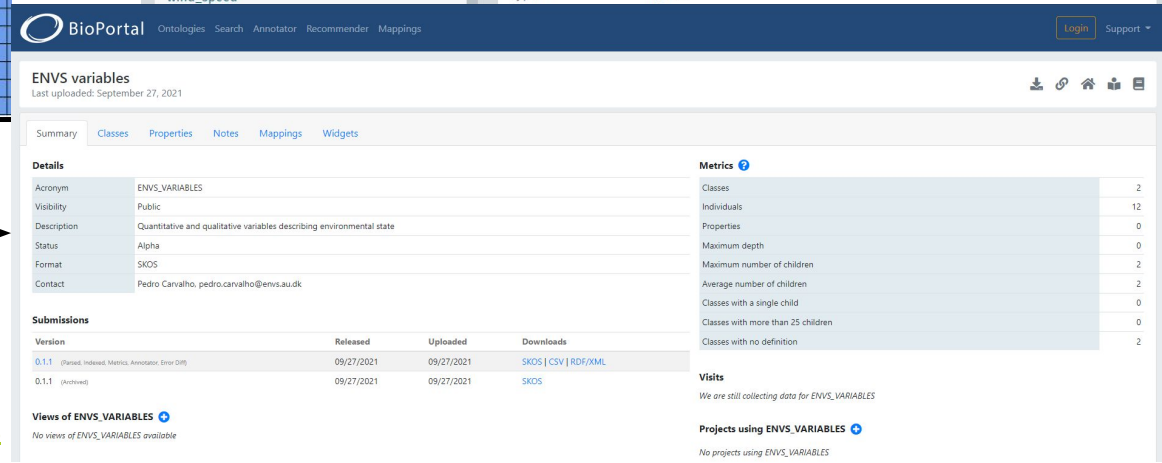




The ontology can be found on our local instance of OntoStack:
http://ontology.deic.dk/envs-vars/en/
And publicly on BioPortal:
https://bioportal.bioontology.org/ontologies/ENVS_VARIABLES

Definition of terms (optionally properties)					
Identifier	**skos:prefLabel@en**	**qudt:unit(separator=",")**	**skos:altLabel(separator=";")**	**skos:definition@en**	
vars:AtmosphericTerms	Atmospheric Terms			This is a parent concept containing controlled terms representing a	
vars:WaterTerms	Water Terms			This is a parent concept containing controlled terms representing w	
vars:GenericTerms	Generic Terms			This is an overarching concept containing variables that are not fiel	
vars:wind_speed	wind_speed	unit:M-PER-SEC		Speed is the magnitude of velocity. Wind is defined as a two-dimer	
vars:wind_direction	wind_direction	unit:Degree			
vars:Latitude	Latitude			Latitude is positive northward; its units of degree_north (or equivale	
vars:Longitude	Longitude			Longitude is positive eastward; its units of degree_east (or equivale	
vars:relative_humidity	relative_humidity				
vars:atmospheric_pressure	atmospheric_pressure	unit:MilliBAR,unit:HectoPA		Air pressure is the force per unit area which would be exerted wher	
vars:water_temperature	water_temperature				
vars:Propiconazole	Propiconazole		60207-90-1;1-[[2-(2,4-dichlorophenyl)-4-propyl-1,3-dioxolan-2-yl]methyl]-1,2,4-triazole		
vars:					
vars:					

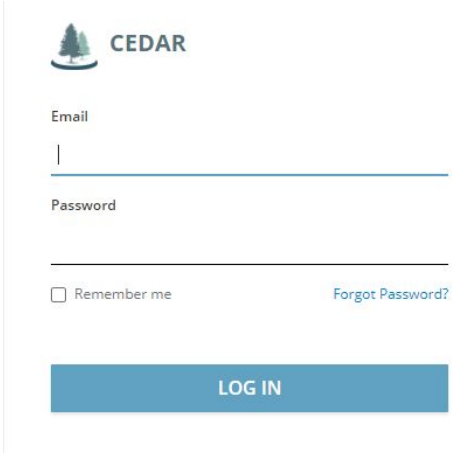
```
<?xml version="1.0" encoding="utf-8" ?>
<rdf:RDF xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#"
         xmlns:skos="http://www.w3.org/2004/02/skos/core#">

  <skos:Concept rdf:about="http://purl.org/m4m-dk-2/variables/relative_humidity">
    <skos:prefLabel xml:lang="en">relative_humidity</skos:prefLabel>
    <skos:broader rdf:resource="http://purl.org/m4m-dk-2/variables/AtmosphericTerms"/>
  </skos:Concept>

  <skos:Concept rdf:about="http://purl.org/m4m-dk-2/variables/AtmosphericTerms">
    <skos:topConceptOf rdf:resource="http://purl.org/m4m-dk-2/variables/"/>
    <skos:narrower>
      <skos:Concept rdf:about="http://purl.org/m4m-dk-2/variables/atmospheric_pressure">
        <skos:prefLabel xml:lang="en">atmospheric_pressure</skos:prefLabel>
        <skos:broader rdf:resource="http://purl.org/m4m-dk-2/variables/AtmosphericTerms"/>
      </skos:Concept>
    </skos:narrower>

    <skos:narrower rdf:resource="http://purl.org/m4m-dk-2/variables/relative_humidity"/>
    <skos:narrower>
      <skos:Concept rdf:about="http://purl.org/m4m-dk-2/variables/wind_direction">
        <skos:prefLabel xml:lang="en">wind_direction</skos:prefLabel>
        <skos:broader rdf:resource="http://purl.org/m4m-dk-2/variables/AtmosphericTerms"/>
      </skos:Concept>
    </skos:narrower>
```

Cedar



Cedar is a service that enables:

- Creation of and collaboration on metadata templates
- Define metadata for single datasets
- Access and search other's metadata to find useful datasets

"The CEDAR platform provides an easy-to-use solution for creating and reusing FAIR metadata. CEDAR's metadata modeling, flexible but rigorous semantics, and ability to quickly produce structured metadata makes it perfect for ongoing Metadata 4 Machines workshops and emerging FAIR training courses."

Erik Schultes
International Science Coordinator, GO FAIR International Support and Coordination Office (GFISCO) – GO FAIR

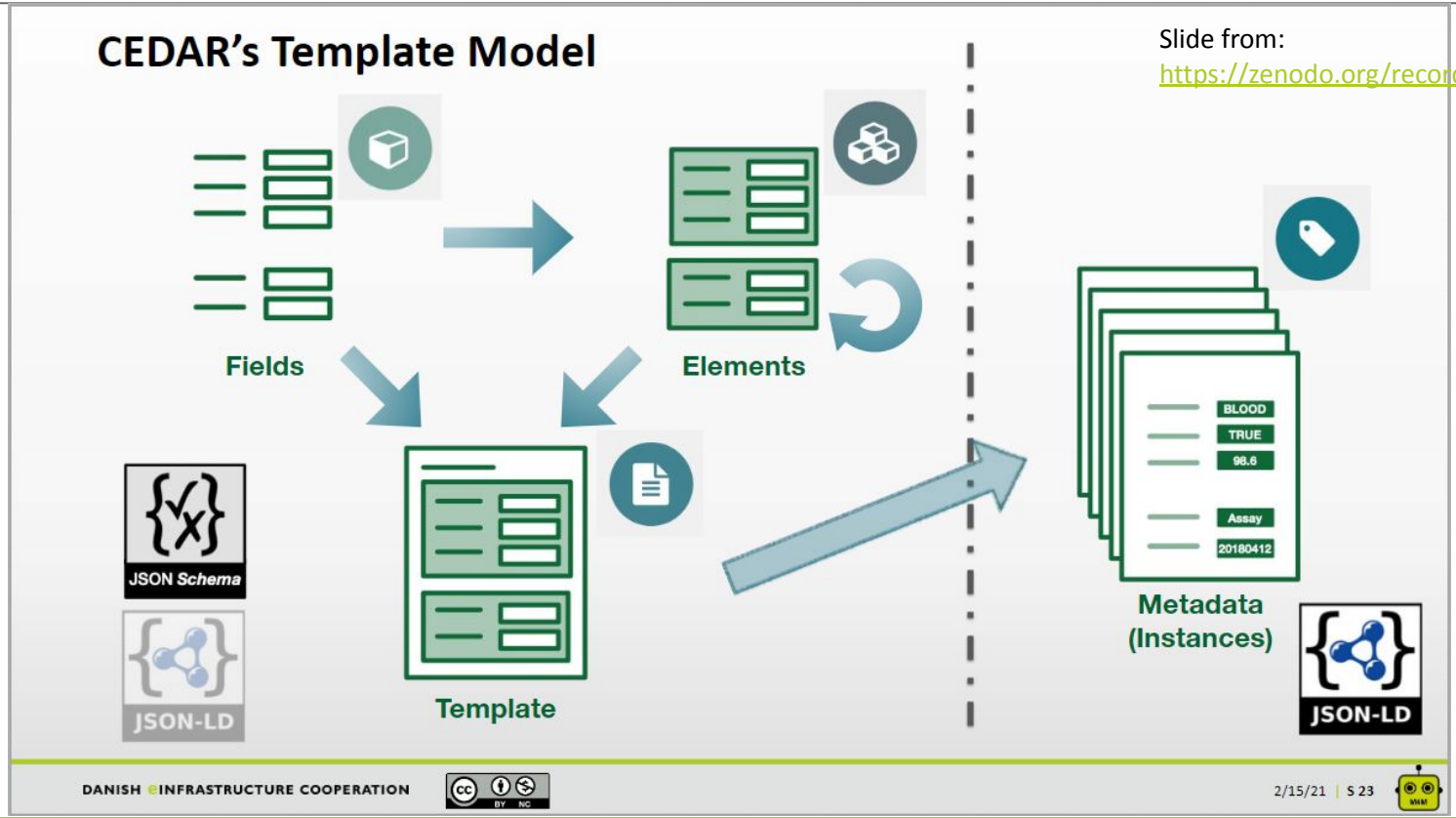
https://metadatacenter.org/

Slide from:
https://zenodo.org/record/4621141#.YUBd_Z37SUk

CEDAR artifacts

- Metadata template **fields** (e.g., *title*, *description*, *start date*)
- Metadata template **elements** (groups of fields and/or elements) (e.g., *Creator*)
- Metadata **templates** (e.g., *GDMT*)
- Metadata (aka template **instances**)

Slide from:
https://zenodo.org/record/4621141#.YUBd_Z37SUk



M4M

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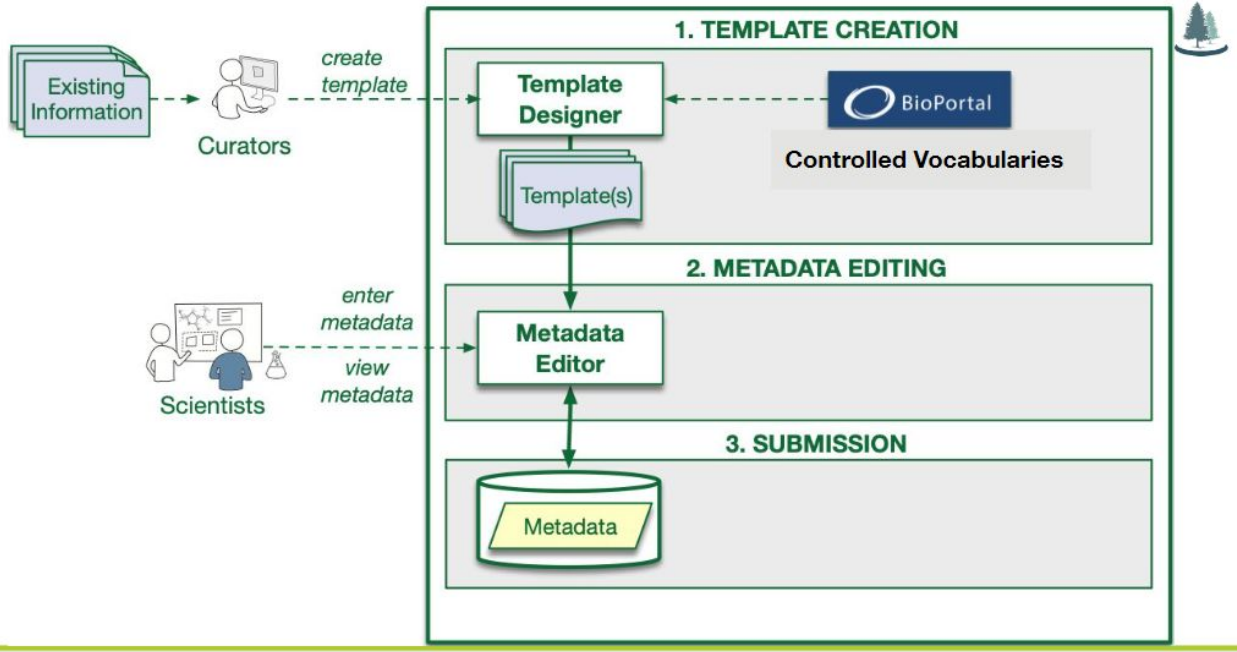
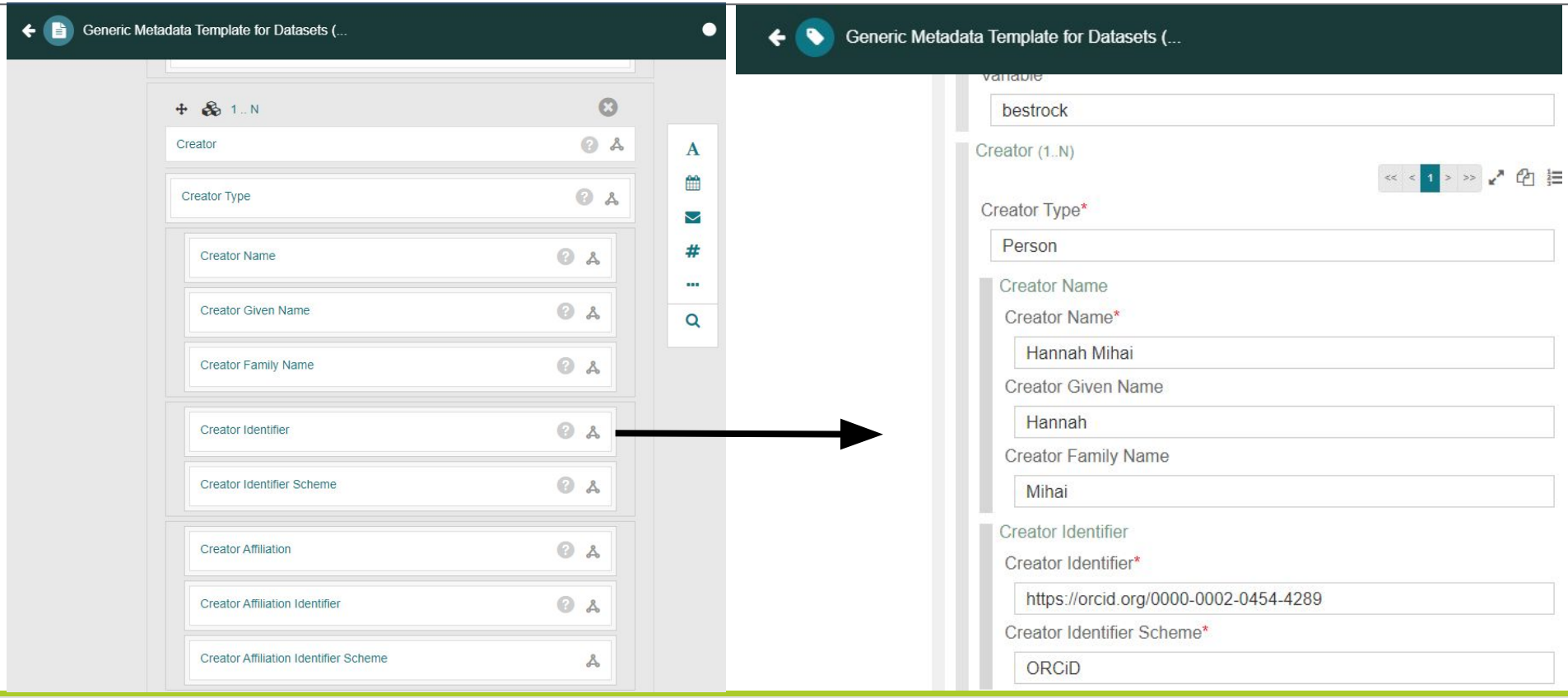
CEDAR-Only Workflow



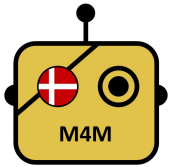

Generic Metadata Template for Datasets (...
1 .. N
Creator
Creator Type
Creator Name
Creator Given Name
Creator Family Name
Creator Identifier
Creator Identifier Scheme
Creator Affiliation
Creator Affiliation Identifier
Creator Affiliation Identifier Scheme
Generic Metadata Template for Datasets (...
bestrock
Creator (1..N)
Creator Type*
Person
Creator Name
Creator Name*
Hannah Mihai
Creator Given Name
Hannah
Creator Family Name
Mihai
Creator Identifier
Creator Identifier*
https://orcid.org/0000-0002-0454-4289
Creator Identifier Scheme*
ORCiD

What happened so far...

- Workshops with 2 research groups have been conducted in 2021
  - One online event with NeiC - PaRI (Nordic Pandemic Research Infrastructure / Bioinformatics)
  - One F2F event with a Danish research group from Aarhus University (Department of Environmental Science)

Pedro Carvalho 4:05 PM

Thank you @Nikola Vasiljevic for guiding us through an excelent workshop yesterday. and thank you for all the participants - AU and external - all discussions elevated the work being done. I think this short and focused 5h were great to show what needs to be done, but that it can also be done. there are several steps that need to be taken to fully implement all these tools and a big work to be done in terms of culture in our workplaces on how data and metadata is handled. I know that I will not look at data and metada the same way as before.



The way forward

- Workshop with 1 more research group is planned for December 2021

- Concept planning for a Train the Trainers Event
  - Training people (research support staff, data stewards) within the Danish Universities
  - Expanding the reach and flexibility to the benefit of researchers
  - Collaboration with FAIR Data Collective

Any questions or comments?