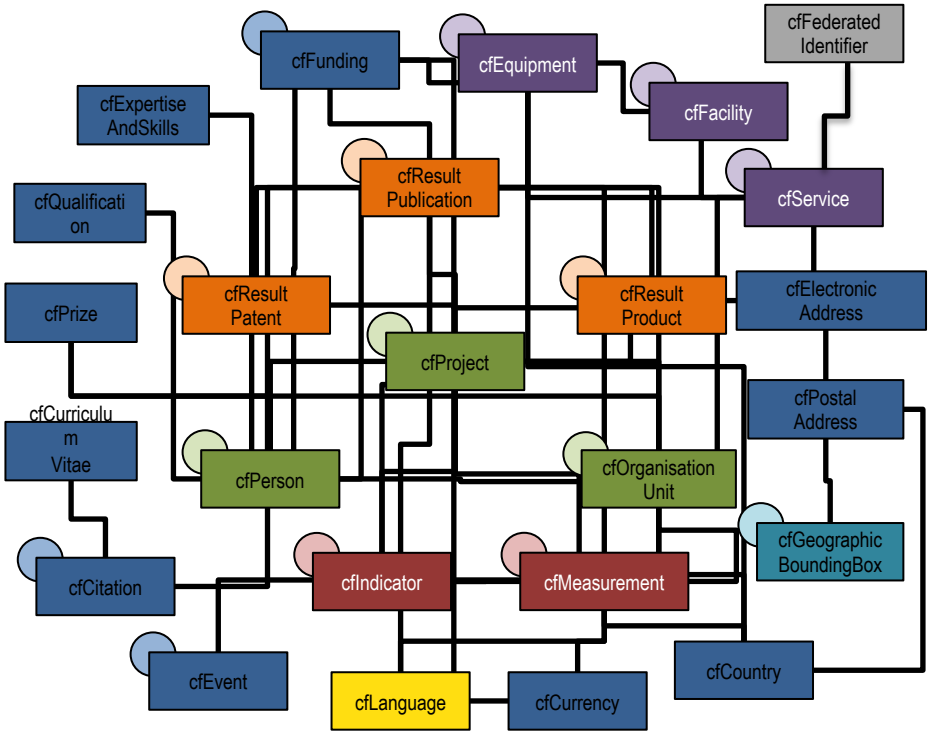
CERIF Tutorial



Jan Dvořák

November 30th, 2022

euroCRIS Strategic Membership Meeting
Nijmegen, the Netherlands

Jan Dvořák https://orcid.org/0000-0001-8985-152X jan.dvorak@ff.cuni.cz

euroCRIS

- CERIF TG Leader since 2013

Charles University, Institute of Information Studies and Librarianship

- Researcher & Lecturer

Czech Technical University in Prague, Computing and Information Centre

- IS Analyst: V3S+EZOP – the in-house built institutional CRIS

InfoScience Praha (2004–2016)

- Leader of the team: Research, Development & Innovation Information System (the national CRIS for [CZ])
- In other roles for the system since 1997

---

*This deck of slides is based on the CERIF Tutorial by **Brigitte Jörg**, CERIF TG Leader 2004–2012, and contains slides by **Valérie Brasse**, euroCRIS Executive for projects 2011–2015.*

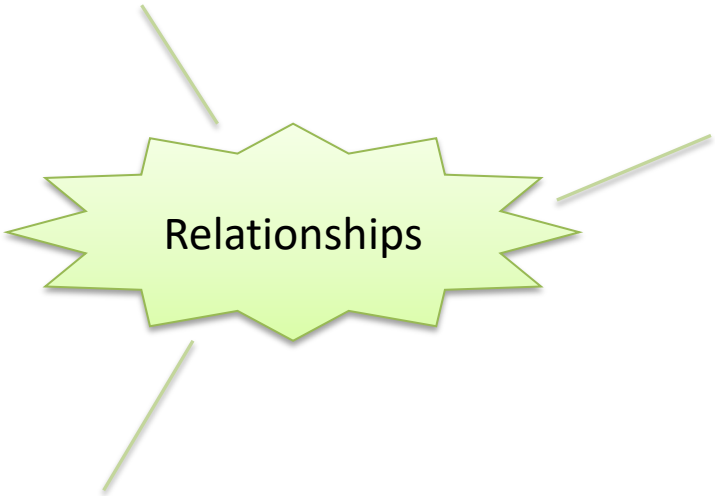
Research Information

The process of research

- Research projects
- Funding
- Research infrastructures

The research actors

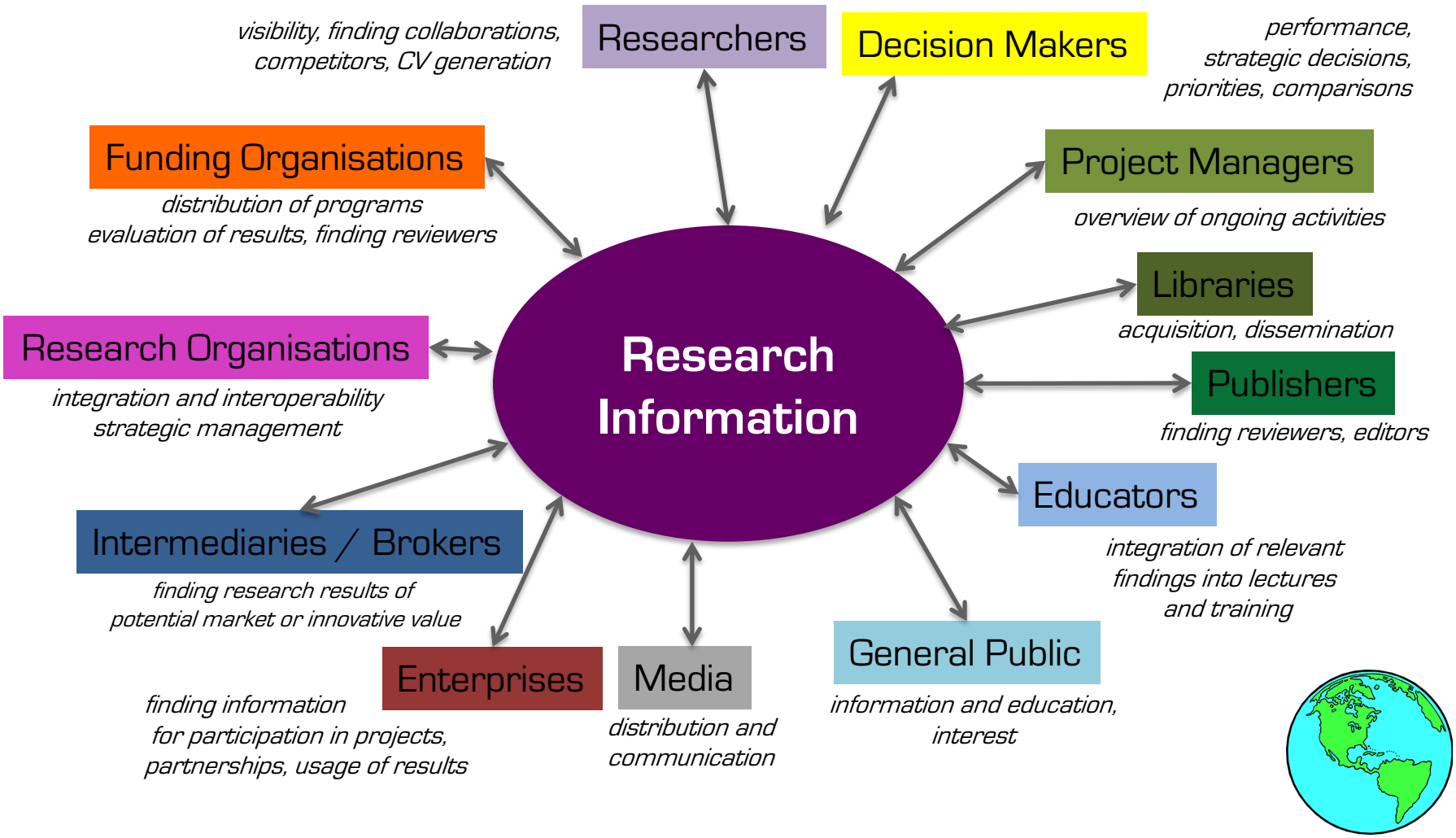
- Researchers
- Institutions
- Funders
- Publishers
- Facility operators
- Associations



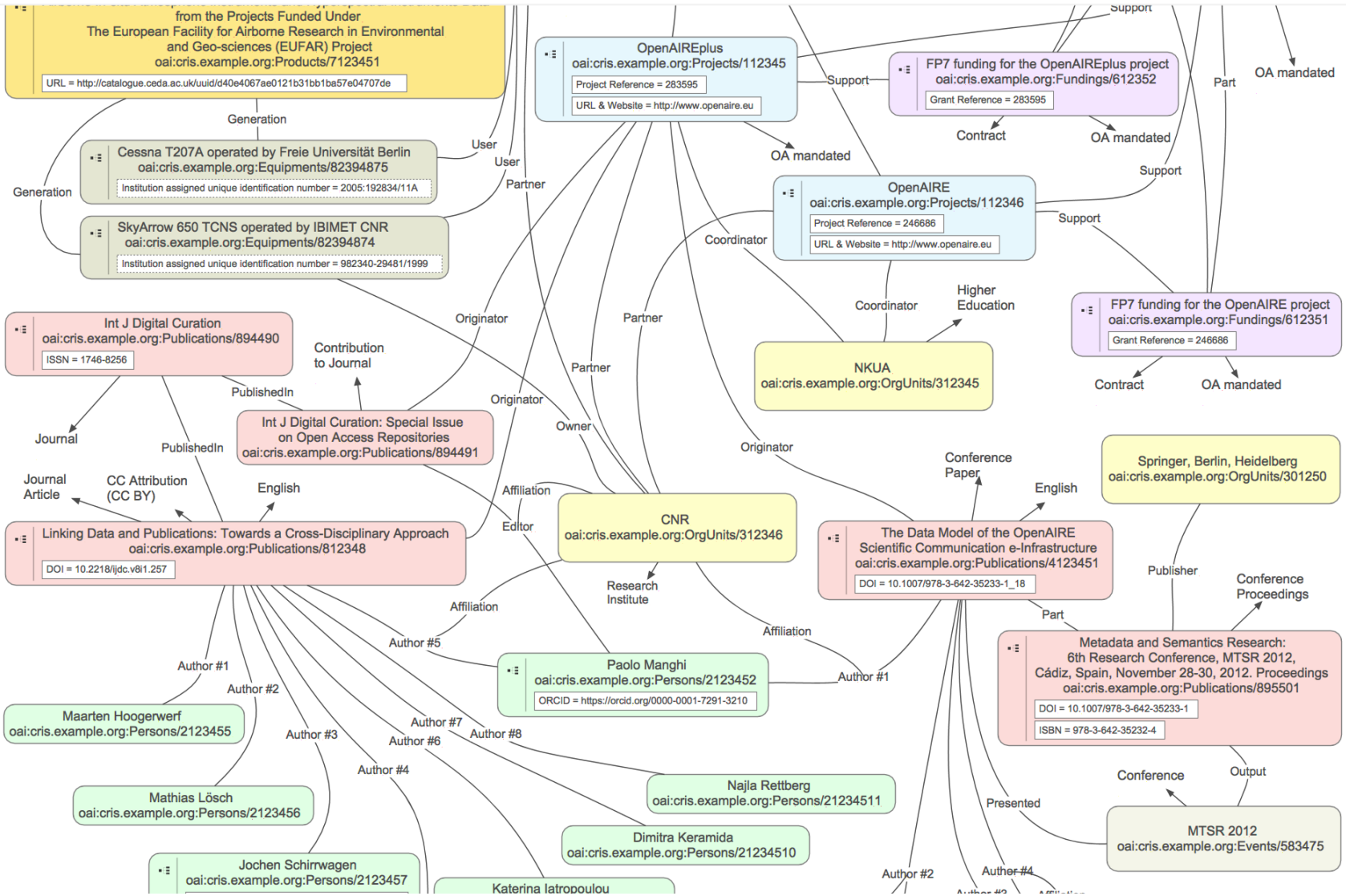
Research results

- Outputs (Publications, Research Datasets, Patents, ...)
- Outcomes, Impacts

Who needs Research Information?



Research Information is heavily interlinked



Different viewpoints on Research Information

Information perspective	Useful for
Researcher, his/her activities, results, …	Researcher profile / CV system
Research Project, its consortium, team, funding, results, …	Project webpage / report
Organisational Unit, its activities, results, ...	Unit webpage / report / evaluation report
Publication	Bibliometrics / panel evaluations
Research Facility	Tracking & reporting usage

What characterises a research project?

An acronym

A code (identifier), for ex a Grant number

A name or title

A (planned) start date

A (planned) end date or duration

[A source of funding]

A short or long description (abstract)

[A few scientific publications]

[A project coordinator]

[A research domain]

A web page (URI)

Source: http://cordis.europa.eu/project/rcn/106635_en.html

SEQSEL

Project reference: 317697
Funded under: FP7-PEOPLE

Global cooperation to develop next generation whole genome SEQuence SELection tools for novel traits

From 2012-05-01 **to** 2016-04-30, ongoing project

Project details

Total cost: EUR 126 000	**Topic(s):** • FP7-PEOPLE-2012-IRSES - Marie Curie Action "International Research Staff Exchange Scheme"
EU contribution: EUR 126 000	**Call for proposal:** FP7-PEOPLE-2012-IRSES
Coordinated in: Ireland	**Funding scheme:** MC-IRSES - International research staff exchange scheme (IRSES)

Objective

"The objective of this project, SEQSEL, is to build upon, solidify, formalise and condense the recently initiated, but as yet informal, relationships between several world-leading research partners in the EU (Ireland, The UK, and the Netherlands) and Oceania (i.e., Australia and New Zealand) in order to conduct joint research and participate in knowledge exchange and to identify regions of the bovine genome associated with feed intake and efficiency. The study will be undertaken in dairy cattl...

Related information

Result In Brief
- Mining the genome of dairy cattle

Report Summaries
- Periodic Report Summary 1 - SEQSEL (Global cooperation to develop next generation whole genome SEQuence SELection tools for novel traits)

Open Access
via OpenAIRE
- **Imputation of genotypes from low density (50,000 markers) to high density (700,000 markers) of cows from research herds in Europe, North America, and Australasia using 2 reference populations**
  Pryce, J. E.; Johnston, J.; Hayes, B. J.; Sahana, G.; Weigel, K. A.; Mcparland, S.; Spurlock, D.; Krattenmacher, N.; Spelman, R. J.; Wall, E.; Calus, M. P. L.
  2014

Coordinator

TEAGASC - AGRICULTURE AND FOOD DEVELOPMENT AUTHORITY — Ireland

Participants

THE SCOTTISH AGRICULTURAL COLLEGE — United Kingdom

STICHTING DIENST LANDBOUWKUNDIG ONDERZOEK — Netherlands

Subjects

Life Sciences

A name or title

A short or long description (abstract)

A (planned) start date
A (planned) end date or duration

A code (identifier), for ex a Grant number

A web page (URI)

Source: http://gtr.rcuk.ac.uk/project/A49CA721-687A-4D55-8FDF-9B60375B6EA8

Home | About this system | Case Studies | Contact us

RESEARCH COUNCILS UK — Gateway to Research — Innovate UK Technology Strategy Board

Social Media Analysis for Social Geography

Lead Research Organisation: Newcastle University
Department Name: Computing Sciences

[A project coordinator]

Go back

[A source of funding]

Overview | Organisations | People | Outcomes

Abstract

Many believe that social media data has the potential to give real insights into communities. However, there is a real challenge in unlocking this knowledge due to the enormous size and speed with which the data is generated, and a lack of understanding of issues such as ethics and the validity of conclusions drawn from the skewed sample of the population that social media users represent.

"Tweet My Street" is tackling these problems with the overall goal of understanding how the knowledge gained can benefit socially excluded communities. It is a multi-disciplinary collaboration involving social geographers, computer scientists and statisticians, which aims to:

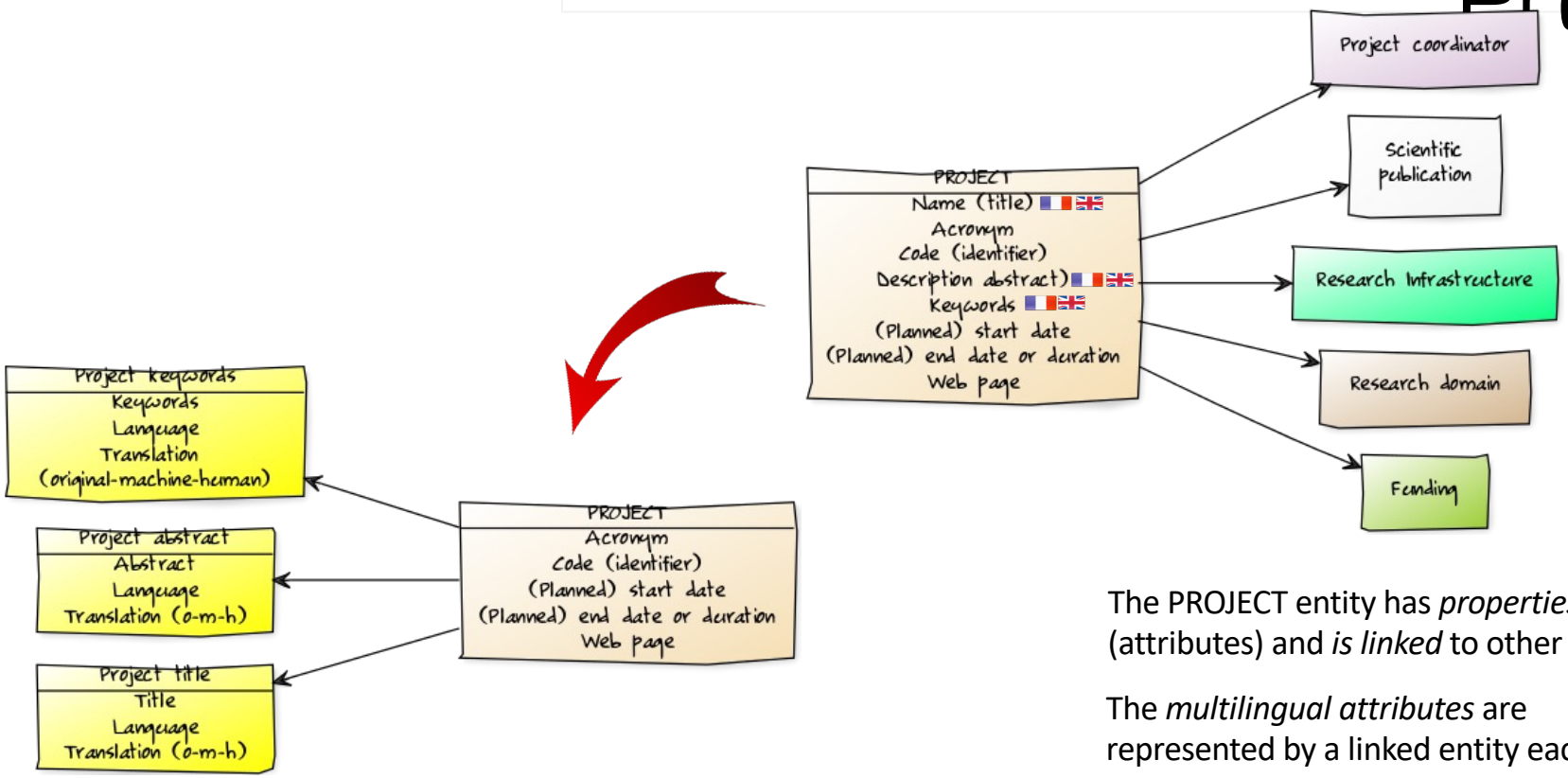
- design a scalable system for social media data analysis
- create a tool that makes it easy for social scientists to ask questions and visualise results
- explore the use of modern statistical techniques to derive understanding from the data
- drive and evaluate the system through case studies, including the use of the new tools to augment existing social science methods, and to understand the way third sector organisations can make effective use of social media
- explore how the use of the tools can help the private and public sector to make key decisions.

Funded Value:
£449,388
Funded Period:
Feb 14 - Feb 16
Funder:
ESRC
Project Status:
Active
Project Category:
Research Grant
Project Reference:
ES/M001636/1
Principal Investigator:
Paul Watson
Research Subject:
Human Geography
Research Topic:
Social Geography
Urban Geography

[A research domain]

A few keywords

Metadata for a Research Project



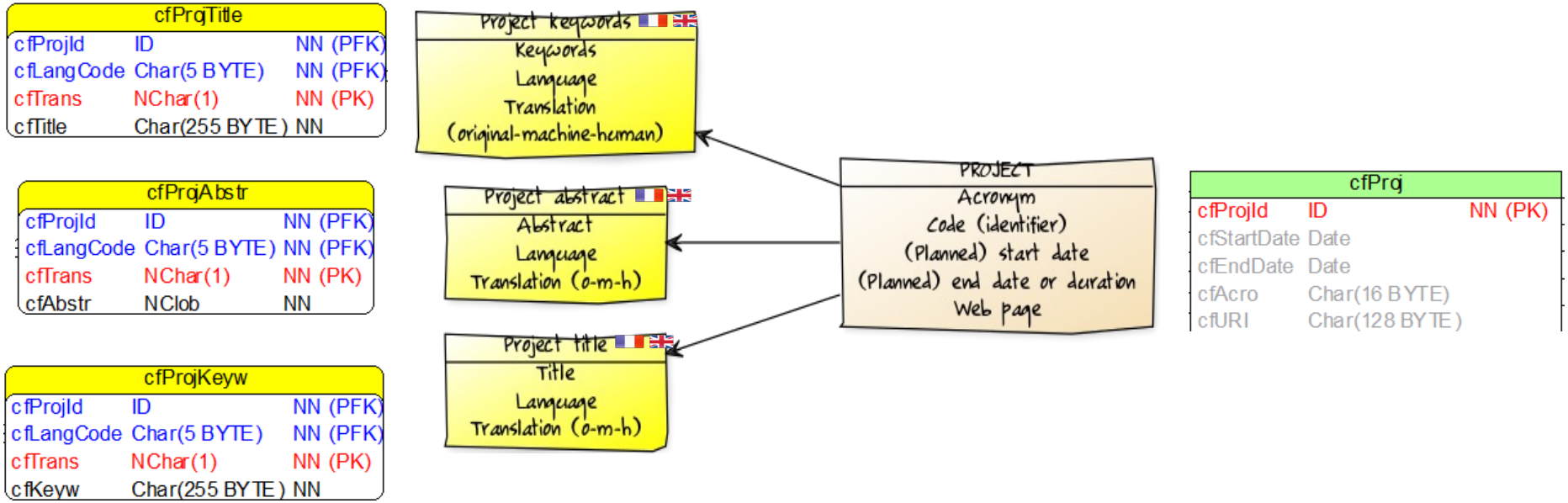
The PROJECT entity has *properties* (attributes) and *is linked* to other entities.

The *multilingual attributes* are represented by a linked entity each.

* “start date” and “end date” are deprecated in v1.6

Metadata for a Research Project

CERIF naming rule: in English, abbreviated, starting with *cf*
Example: Project title = cfProjTitle



Example in DB

CERIF Project example database record			
Data	**Attribute**	**Table**	**Type**
project-ist-world*	**cfProjId**	**cfProj**	**base**
IST World	**cfAcro**	**cfProj**	**base**
http://www.ist-world.org/	**cfURI**	**cfProj**	**base**
2005-04-01	**cfStartDate**	**cfProj**	**base**
2007-11-30	**cfEndDate**	**cfProj**	**base**
Knowledge Base for RTD Competencies in IST	**cfTitle**	**cfProjTitle**	**lang[en,o]**
Wissensbasis für RTD Kompetenzen im Bereich IST	**cfTitle**	**cfProjTitle**	**lang[de,h]**
IST, Research Information, NMS, Portal,	**cfKeyw**	**cfProjKeyw**	**lang**
The objective of the project is to set up and populate an information portal with innovative functionalities …	**cfAbstr**	**cfProjAbstr**	**lang**

cfProj

cfProjId (PK)	cfAcro	cfURI	cfStartDate	cfEndDate
project-ist-world	IST World	http://...	2005-04-01	2007-11-30

cfProjTitle, PK = cfProjID + cfLangCode + cfTrans

cfProjID (FK)	cfLangCode	cfTrans	cfTitle
project-ist-world	EN	O	Knowledge Base for RTD Competencies in IST
project-ist-world	DE	H	Wissensbasis für RTD Kompetenzen im Bereich IST

cfProjKeyw, PK = cfProjID + cfLangCode + cfTrans

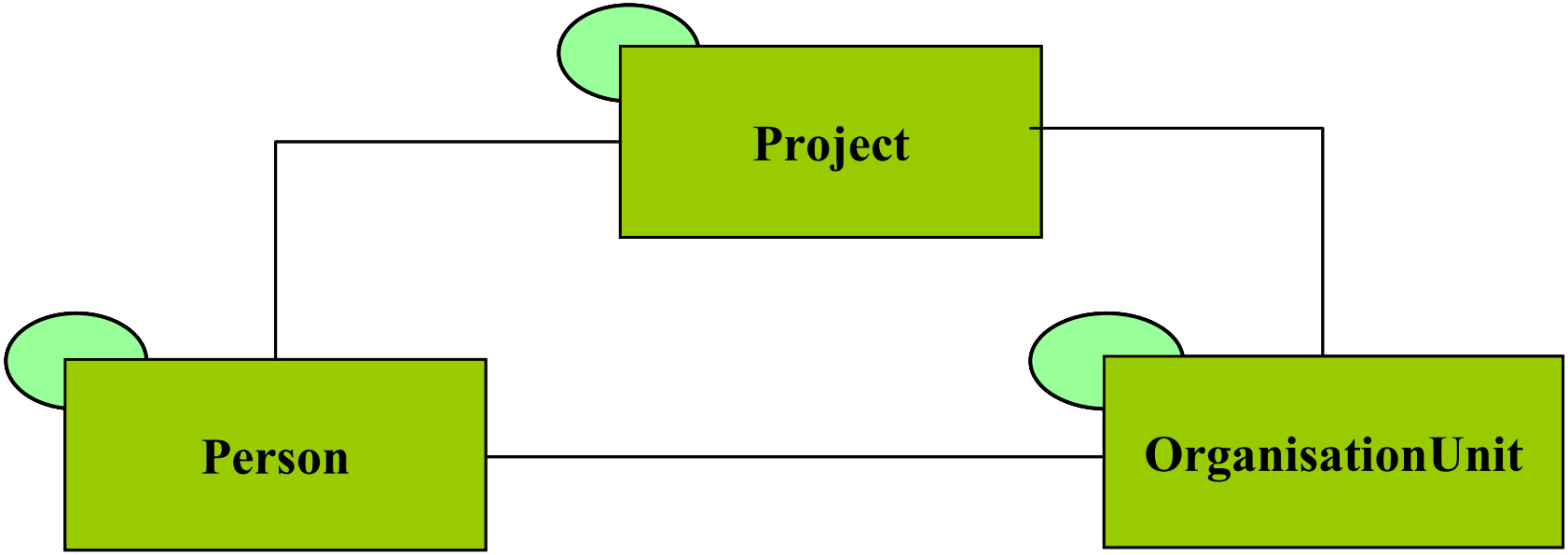
cfProjID (FK)	cfLangCode	cfTrans	cfKeyw
project-ist-world	EN	O	IST, Research Information, NMS, Portal

cfProjAbstr, PK = cfProjID + cfLangCode + cfTrans

cfProjID (FK)	cfLangCode	cfTrans	cfAbstr
project-ist-world	EN	O	The objective of the project is to set...

Source: http://www.eurocris.org/Uploads/Web%20pages/CERIF-1.3/Specifications/CERIF1.3_FDM.pdf

CERIF Base Entities



Project definition

A temporary endeavor undertaken to create a unique product, service or result.
Source: the Project Management Institute, https://www.pmi.org/about/learn-about-pmi/what-is-project-management

In the research information domain, one typically tracks:
(1) **research** projects, where the result is an addition to the body of knowledge of the mankind,
(2) technology **development** projects, where the result is a particular technology or product,
(3) **innovation** projects, where the result is an improvement of a product or process, and
(4) projects that **create or enhance infrastructure** for research, technology development or innovation.

Depending on the scope one can also track finer levels of granularity: stages, work packages, sometimes even down to individual tasks. All such activities are also modelled using the Project entity and linked using the recursive link relationship.

The Project entity only captures details of the project scope and plan. Information about the resources needed to execute the project such as the funding (i.e., the grants received), the people and organisations involved, the supporting infrastructures, the outputs produced, etc. is contained in separate entities (the Funding entity, the Person entity, the OrgUnit entity, the infrastructure entities, the result entities respectively) and is linked to the Project.

OrgUnit definition

Organisation Unit: an organisation, a unit therein, a committee or any other group of people that has a collective goal. Organisation Units are not necessarily formalized as legal entities.

In the research information domain Organisation Units typically represents:
(1) organisations that **perform research** (universities, research institutes, corporations) and their subdivisions (faculties, schools, departments, research groups) and other associated bodies (boards, advisory bodies);
(2) organisations that **fund research** (funders, their divisions and evaluation panels);
(3) scientific **associations and networks**;
(4) **publishers**, facility **operators** and other **service providers** in the research space;
(5) **authorities**, such as patent offices and standardization or supervision bodies; and
(6) other bodies: editorial **boards**, evaluation **panels**, or **committees** of all kinds.

Person definition

A human being as an individual.
Source: https://en.oxforddictionaries.com/definition/person

The kind of involvement of a Person in the research ecosystem is specified in the links with the organisations, the services, etc. This typically includes:
(1) **researchers** (Persons performing research in an Organisation Unit as employees or students);
(2) **authors** and **contributors** (Persons signing a publication, creators of data sets, software developers, etc.);
(3) **investigators** and project **participants** (Persons involved in a Project as principal investigators, co investigators, project managers, consultants, etc.);
(4) **management** (directors, rectors, deans, department heads, etc.);
(5) **support** staffs (technicians, responsible for Equipment, librarians and digital asset curators, administrative staff, etc.).
One Person typically has many of these relationships.

INTERMEDIATE SUMMARY

- CERIF is:
  - A conceptual model
  - A storage format in relational database
  - A set of exchange formats (XML, Linked Data)

CERIF

Common European Research Information Format

- CERIF supports multilingual data, storing the original value of a literal attribute, and for any other language, a value translated by a machine and/or a human
- So far, we have seen the CERIF Entity "PROJECT" (cfProj)

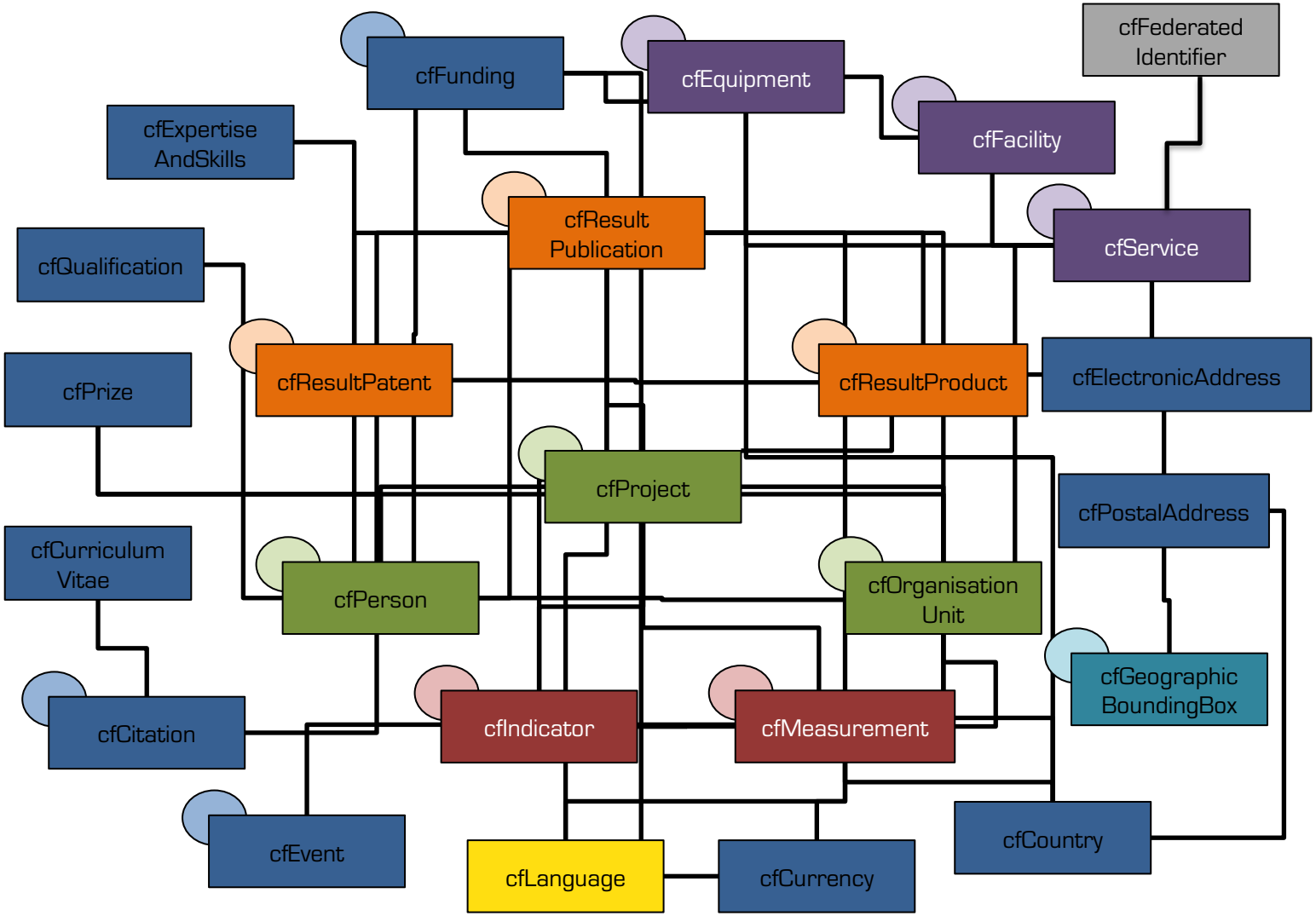
We have seen how to represent, store or exchange metadata about research projects.

Similarly:

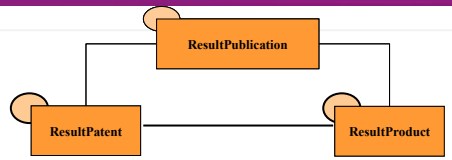
- What characterises a person (researcher, Ph.D.,…)?
- What characterises an organisation (research laboratory, institute,…)?

Source: https://pixabay.com/en/chemistry-teacher-science-1027781/

Common European Research Information Format



CERIF Result Entities

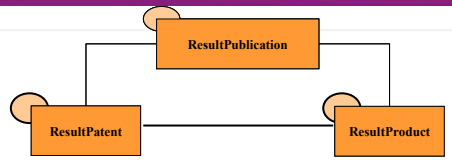


CERIF Result Entities

ResultPublication
ID
URI
Title
Subtitle
Abstract
Bibl. Note
PublicationDate
TotalPages
StartPage
EndPage
Keywords
Type
Status
Subject

ResultProduct
ID
URI
Type
Status
Subject

ResultPatent
ID
URI
PatentNumber
Title
CountryCode
RegistrationDate
ApprovalDate
Description
Keywords
Type
Status
Subject



CERIF Result Entities

cfResultPublication
cfID
cfURI
cfNumber
cfPublicationDate
cfStartPage
cfEndPage
cfTotalPages
cfEdition
cfSeries
cfIssue
cfVolume

cfBibliographic Note
cfVersionInfo
cfAbbreviation
cfTitle
cfSubtitle
cfAbstract
cfKeywords

Type
Status
Subject

cfResultProduct
cfID
cfURI

cfName
cfDescription
cfKeywords
cfVersionInfo

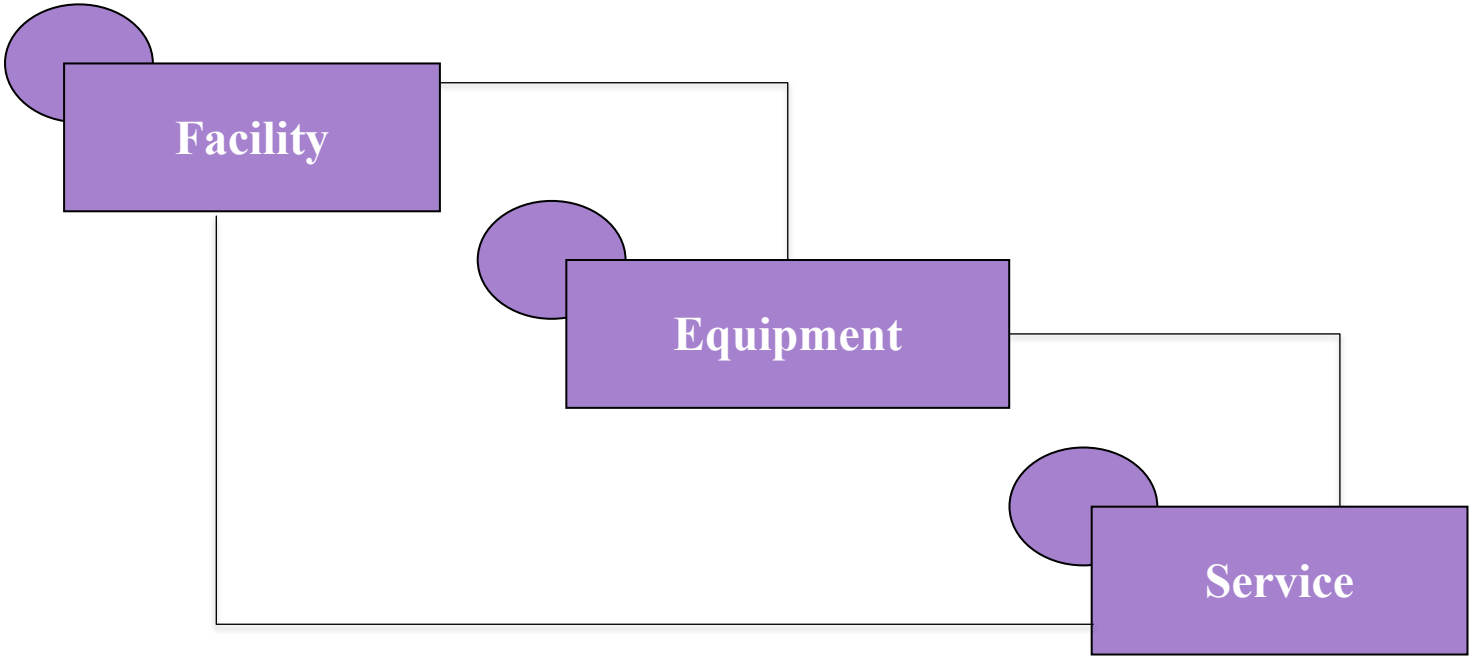
Type
Status
Subject

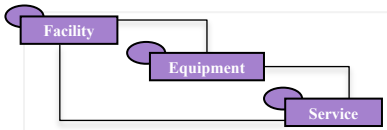
cfResultPatent
cfID
cfURI
cfPatentNumber
cfCountryCode
cfRegistrationDate
cfApprovalDate

cfName
cfAbstract
cfKeywords
cfVersionInfo

Type
Status
Subject

CERIF Infrastructure Entities



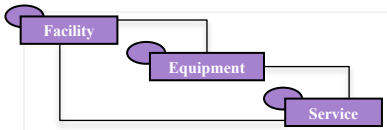


CERIF Infrastructure Entities

Facility
ID
Acronym
URI
Title
Description
Keywords
Type
Status
Subject

Equipment
ID
Acronym
URI
Title
Description
Keywords
Type
Status
Subject

Service
ID
Acronym
URI
Title
Description
Keywords
Type
Status
Subject



CERIF Infrastructure Entities

cfFacility
cfID
cfURI
cfAcronym

cfName
cfDescription
cfKeywords

Type
Status
Subject

cfEquipment
cfID
cfURI
cfAcronym

cfName
cfDescription
cfKeywords

Type
Status
Subject

cfService
cfID
cfURI
cfAcronym

cfName
cfDescription
cfKeywords

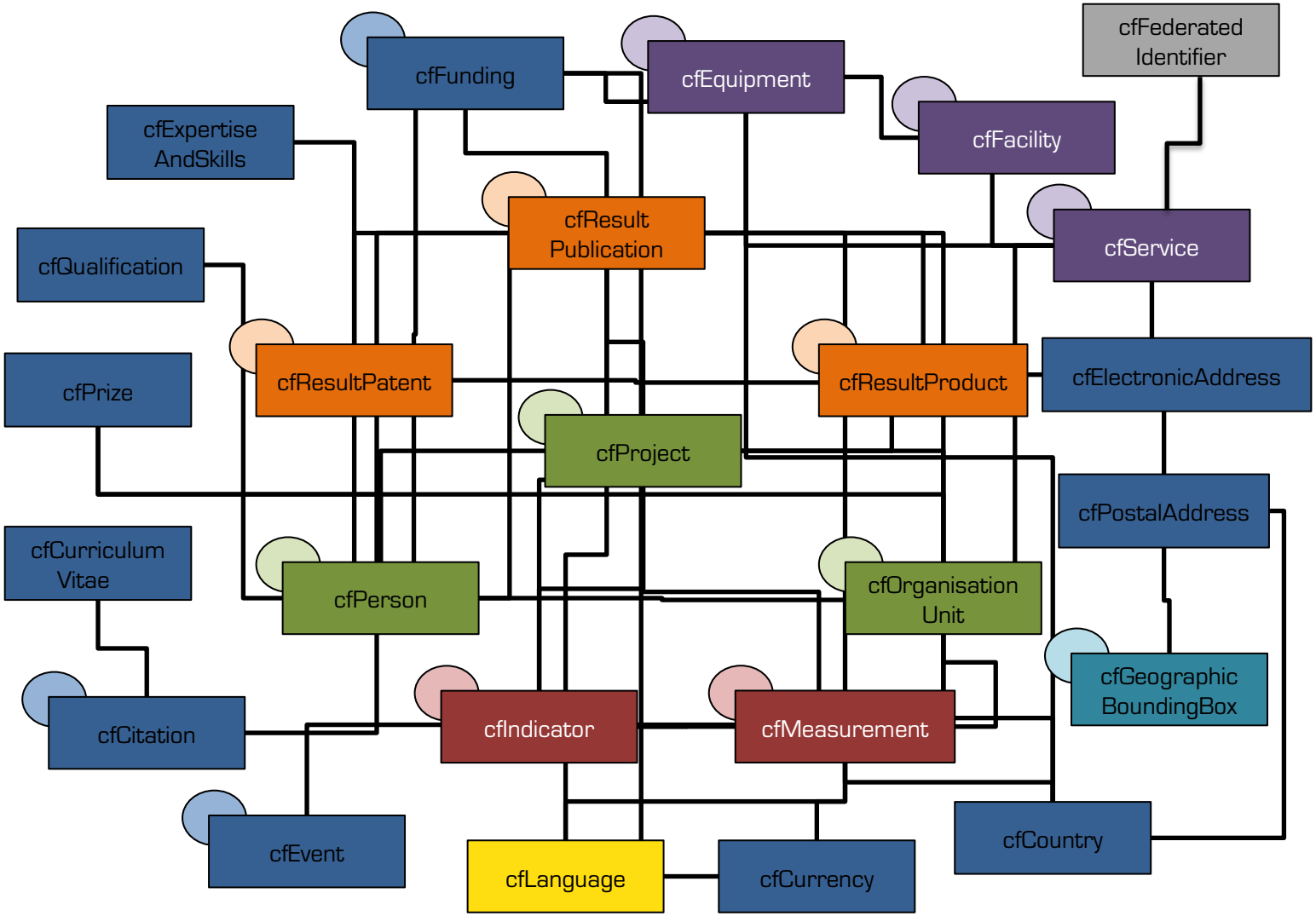
Type
Status
Subject

CERIF General Pattern

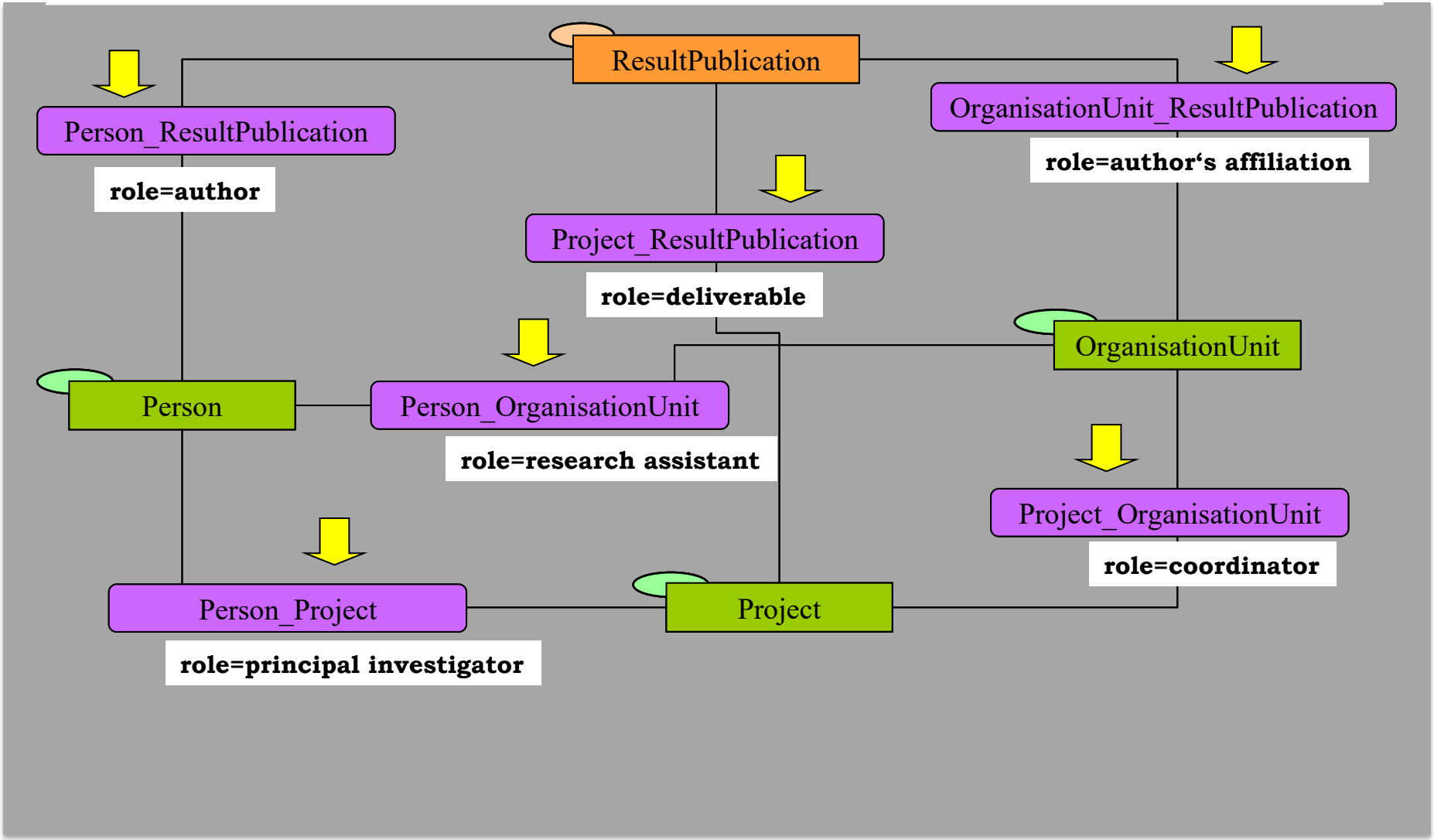
A typical CERIF entity has:

- Identifier (internal)
- Attributes
  - the basic ones
  - the multi-lingual ones
- External Identifiers
- Classifications
  - Type
  - Status
  - Subject area
  - + other
- Links
  - to other entities
  - recursive, a.k.a. self-referential

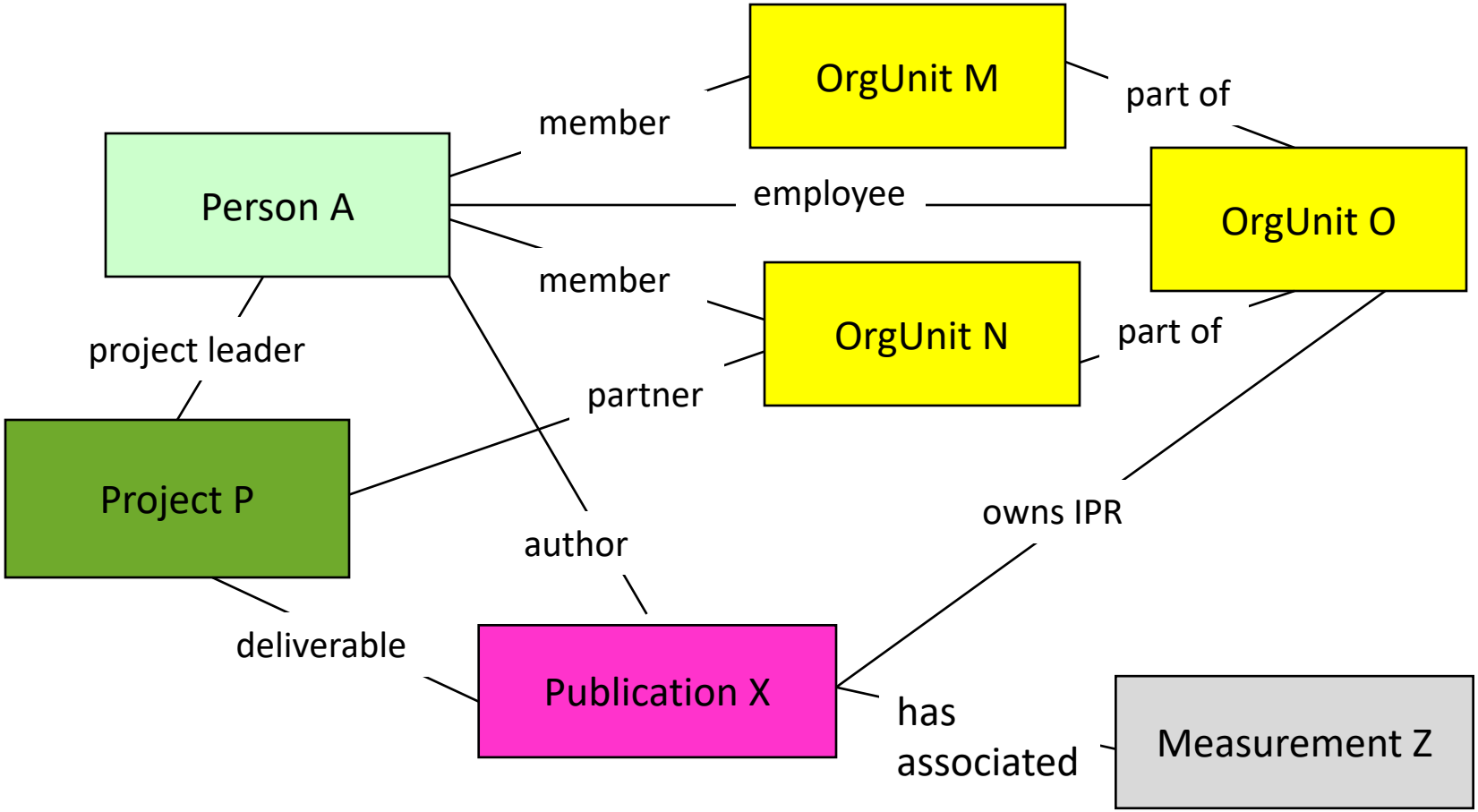
CERIF 1.6


cfFunding
cfEquipment
cfFederated Identifier
cfExpertise AndSkills
cfFacility
cfResult Publication
cfService
cfQualification
cfResultPatent
cfResultProduct
cfElectronicAddress
cfPrize
cfProject
cfPostalAddress
cfCurriculum Vitae
cfPerson
cfOrganisation Unit
cfGeographic BoundingBox
cfCitation
cfIndicator
cfMeasurement
cfEvent
cfLanguage
cfCurrency
cfCountry

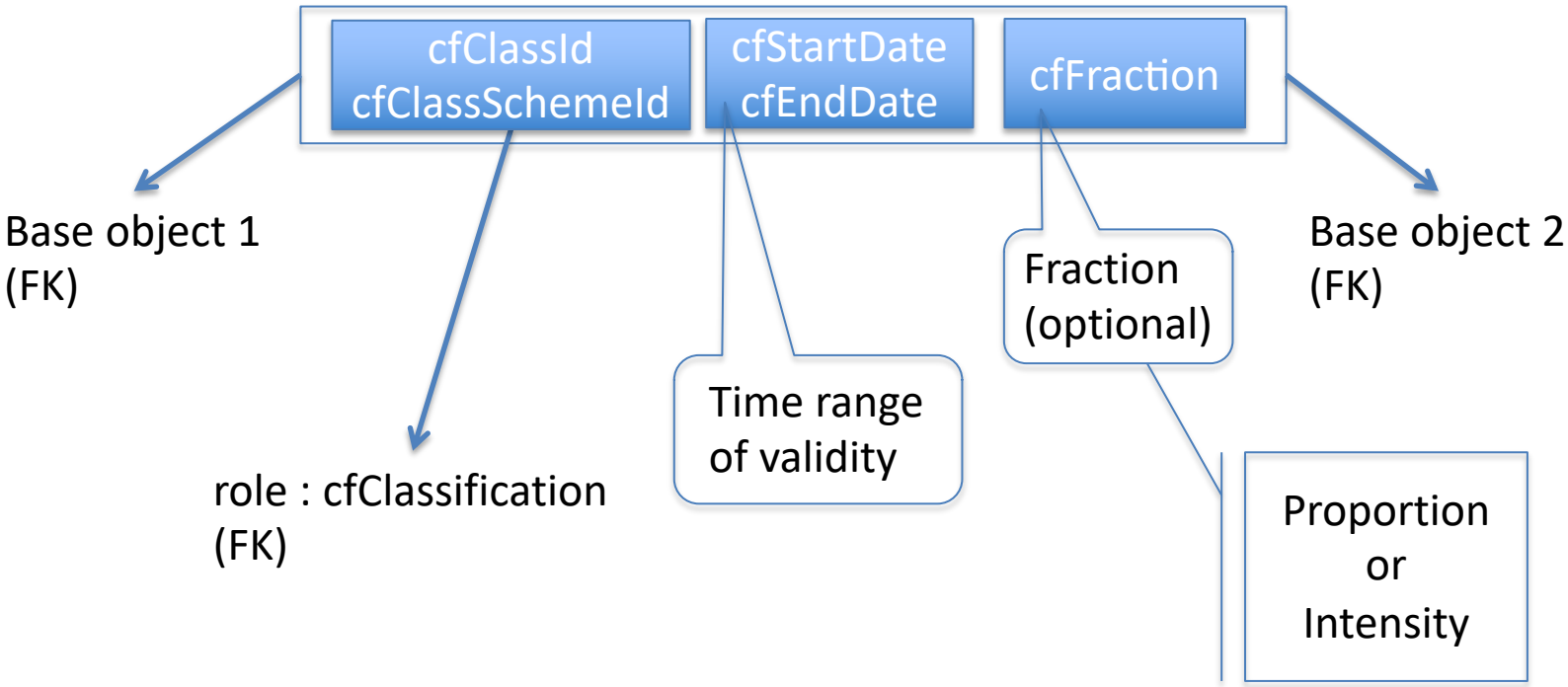
Some CERIF Link Entities



Another example
(slide by Keith Jeffery)

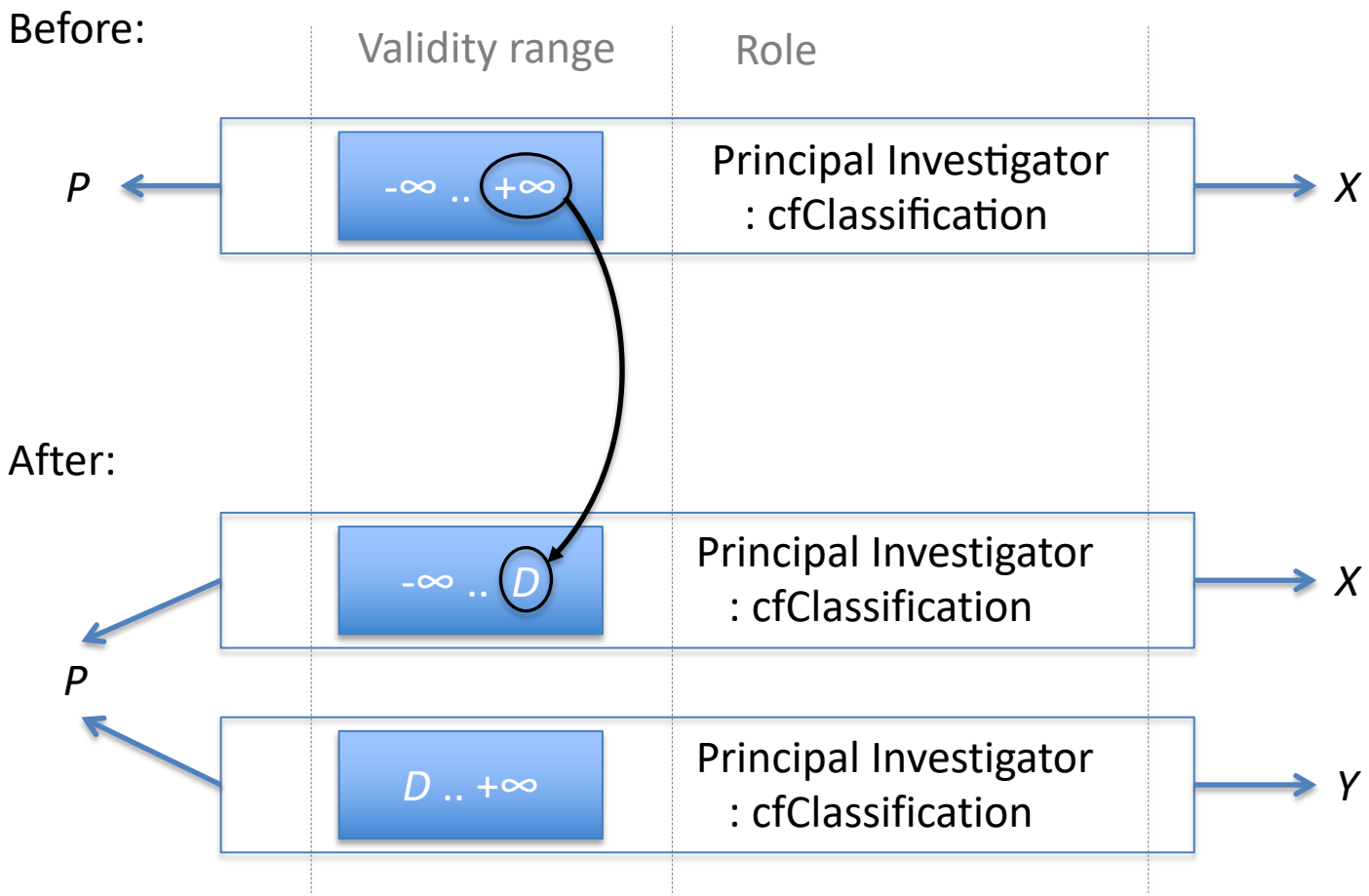


Generic Linking Entity Structure

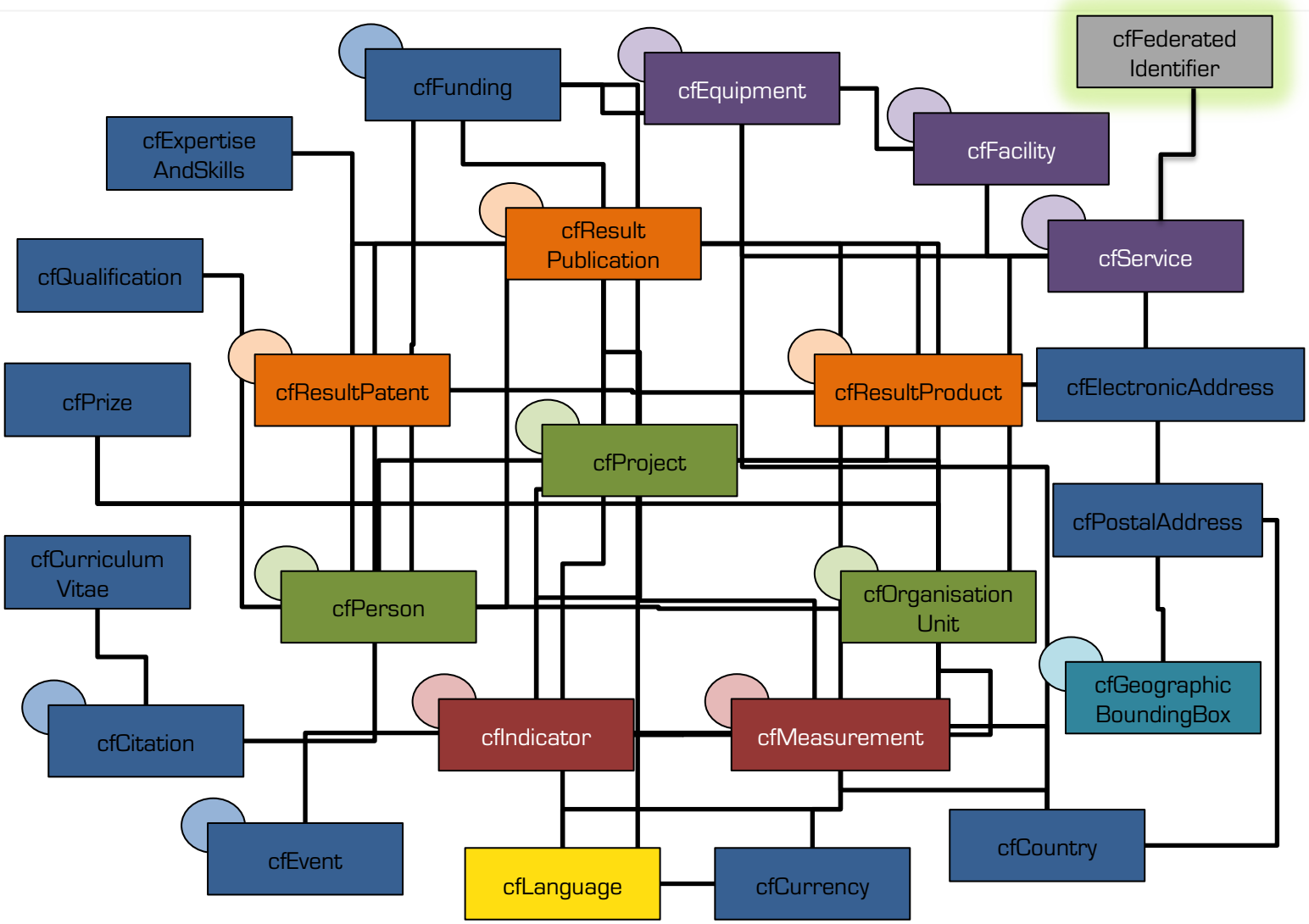


Recording Change in CERIF

Example: The Principal Investigator of project *P* changes: *X* is replaced by *Y* effective date *D*.



CERIF 1.6


cfFederated Identifier
cfFunding
cfEquipment
cfExpertise AndSkills
cfFacility
cfResult Publication
cfService
cfQualification
cfPrize
cfResultPatent
cfResultProduct
cfElectronicAddress
cfProject
cfPostalAddress
cfCurriculum Vitae
cfPerson
cfOrganisation Unit
cfGeographic BoundingBox
cfCitation
cfIndicator
cfMeasurement
cfEvent
cfLanguage
cfCurrency
cfCountry

CERIF Federated Identifiers

Publication

- ISBN
- ISSN
- DOI
- WoS Accession Number
- Scopus EID
- PubMed Central ID

Person

- Social Security Number
- ORCID
- Staff Id in HR system
- Author identifier

  IdRef, DAI, Número Lattes, ResearcherID, Scopus Author ID

Project/Grant

- Funder's reference number
- Organisation's reference number

Organisation

- VAT Identification Number
- FundRefID
- GridID
- OrgID

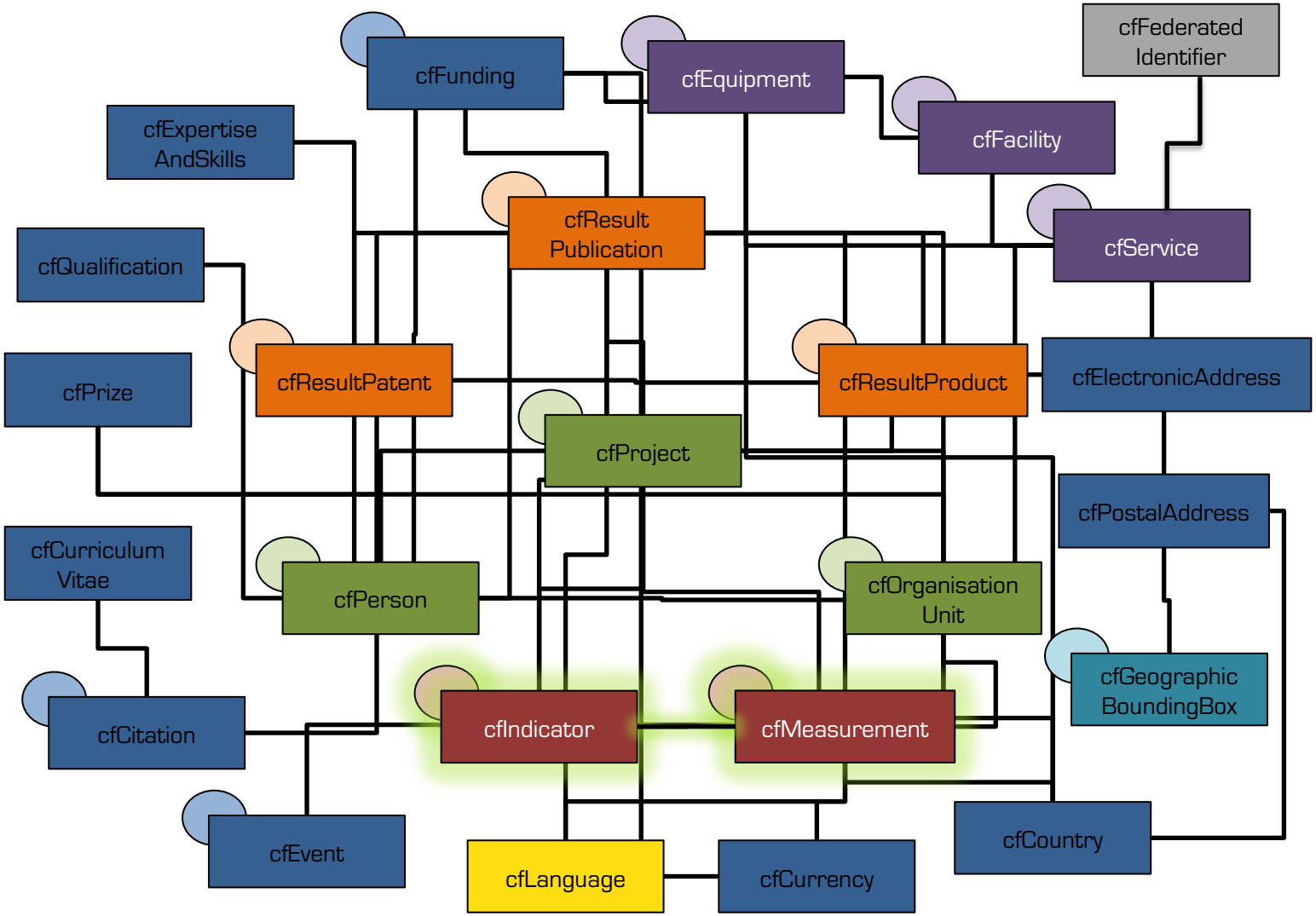
Classification

- External Code

CERIF Federated Identifiers

- Records the “tag” by which an object is known elsewhere
- For any CERIF research entity
- “Identifier Types” classification scheme
- (optionally) Connects to a Service representing the issuer of the identifier
    - Usually an information system

CERIF 1.6

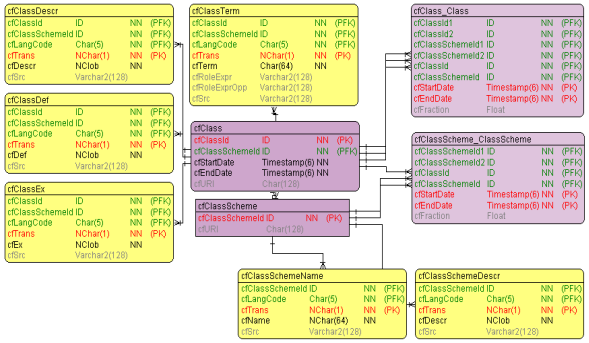

cfFunding
cfEquipment
cfFederated Identifier
cfExpertise AndSkills
cfFacility
cfResult Publication
cfService
cfQualification
cfPrize
cfResultPatent
cfResultProduct
cfElectronicAddress
cfProject
cfPostalAddress
cfCurriculum Vitae
cfPerson
cfOrganisation Unit
cfGeographic BoundingBox
cfCitation
cfIndicator
cfMeasurement
cfEvent
cfLanguage
cfCurrency
cfCountry

CERIF Semantic Layer

Central place to store declared semantic classifications

Allows to capture any Schema or Structure

- Flat Lists
- Thesauri
- Classification Systems (e.g. SKOS, ...)
- Taxonomies
- Ontologies



Open / Extensible in all directions

- New Schemas
- New Concepts / Terms
- New Relationships

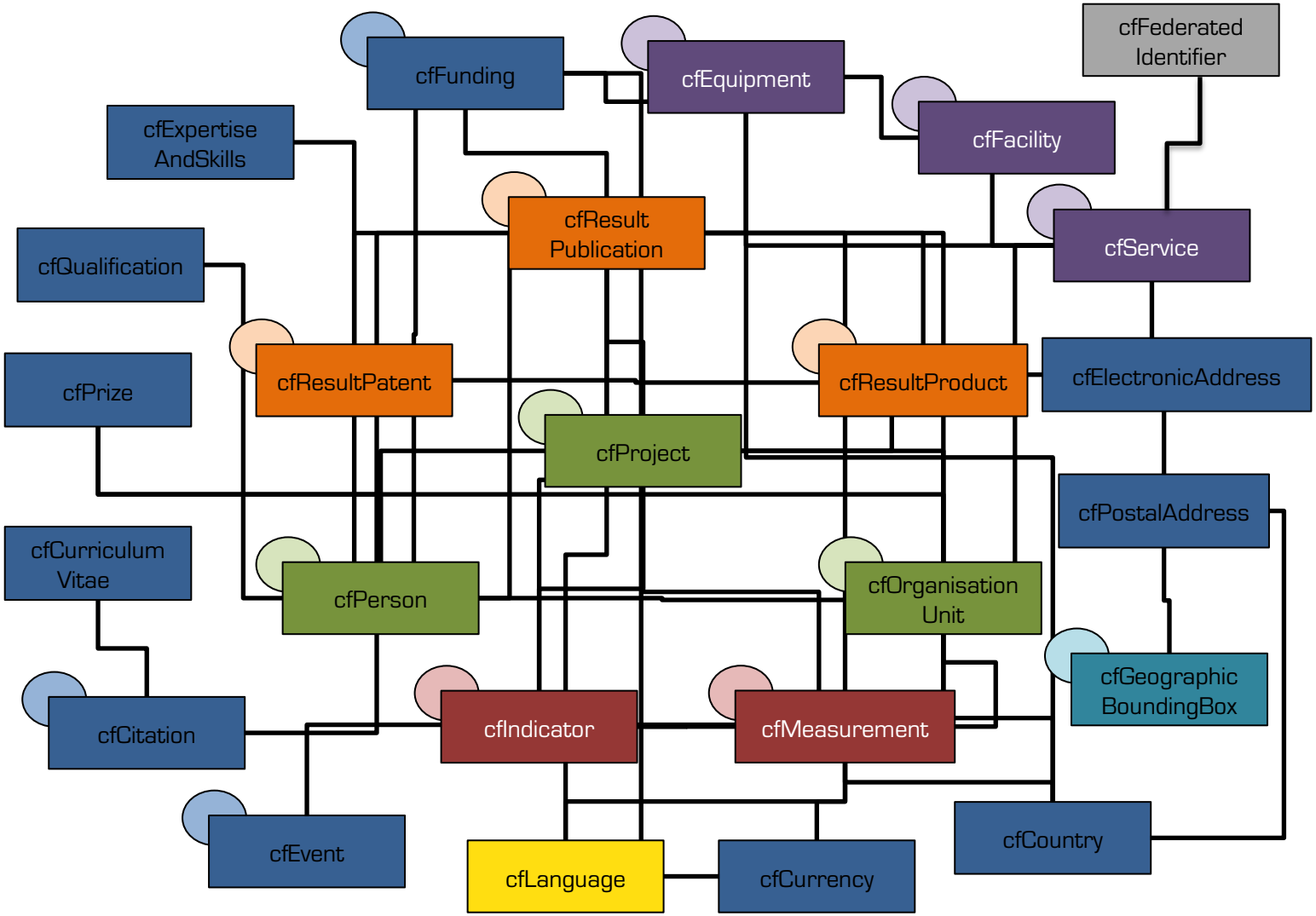
Enables to manage

- Roles, Types, Statuses, ... Semantics
- Subject Headings
- Versioning and archiving (start+end dates)

Allows for Mappings between Schemes

- skos:closeMatch, skos:exactMatch or any other mapping you need

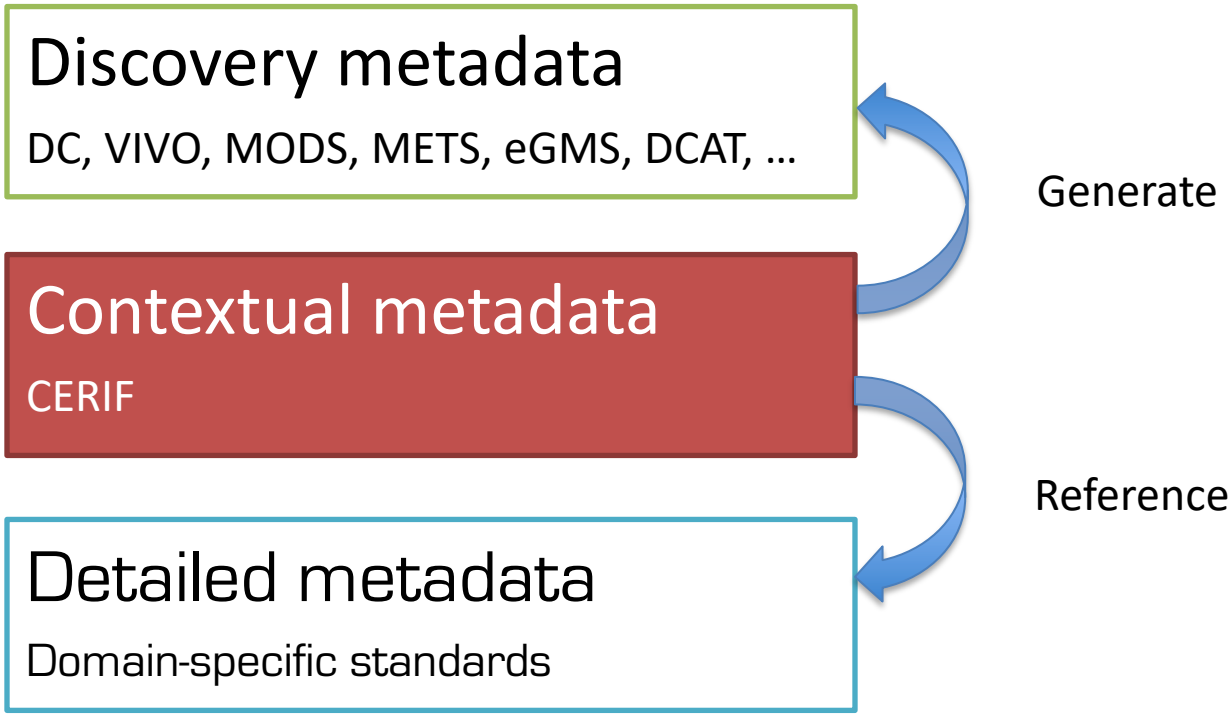
CERIF 1.6


cfFunding
cfEquipment
cfFederated Identifier
cfExpertise AndSkills
cfFacility
cfResult Publication
cfService
cfQualification
cfPrize
cfResultPatent
cfResultProduct
cfElectronicAddress
cfProject
cfPostalAddress
cfCurriculum Vitae
cfPerson
cfOrganisation Unit
cfGeographic BoundingBox
cfCitation
cfIndicator
cfMeasurement
cfEvent
cfLanguage
cfCurrency
cfCountry

CERIF highlights

- Right level of abstraction
- Normalized model
  - Record information only once
  - Reference rather than copy
- Versatile Semantic Layer
- Time-based relationships
- Clean design, regular structure

Metadata Layers



Current Research Information System

- Ongoing
- Past, of current interest
- Currently planned or decided upon

CERIF development

By the CERIF Task Group of euroCRIS

Adopting open-source software projects
tools & best practices:

→ https://github.com/EuroCRIS/CERIF-DataModel

→ https://github.com/EuroCRIS/CERIF-Vocabularies

→ CC BY license

Two branches:

- master: latest official release (1.6.1)
- develop: on-going development

Model Info

Basic Information

Project	CERIF: the Common European Research Information Format
Model	CERIF Data Model
Version	CERIF current development DM
Company	euroCRIS
Author	CERIF Task Group
Created	30.6.2014
Last Modified	22.12.2017

Statistic Information

Entities	295				
Attributes	1829				
Domains	1				
User Data Types	0				
Relationships	671	Identifying	638	Non-identifying	33
Indexes	0				
Keys	298	Primary Keys	295	Alternate Keys	3
Views	0				
View Relationships	0				
Procedures	0				
Defaults	0				
Schemas	0				
Users	0				
User Groups	0				
Notes	0				

Common European Research Information Format

- CERIF is an EU Recommendation to Member States
- The European Commission (EC) has authorised euroCRIS to maintain and develop CERIF and its usage

http://cordis.europa.eu/cerif/

Interoperability

1. Agreed Semantics
2. Agreed Format
3. Agreed Protocol

CERIF-XML exchange formats (based on XML Schema)

Original

1:1 with the ER structure

Only uses embedding for multilingual texts

→ Many foreign key relationships

→ Takes several API requests to get a presentable form of an object

Ex.: OpenAIRE Guidelines for CRIS Managers 1.0.
DOI 10.5281/zenodo.17065

2nd Generation

Template XML Schema → adaptation

Profiles: Useful subsets of CERIF for specific research information exchange scenarios

1. Specify a subset of CERIF entities & attributes
2. Fix semantic vocabularies to use
3. Add integrity constraints

Ex.: OpenAIRE Guidelines for CRIS Managers 1.1.
DOI 10.5281/zenodo.1298649

OpenAIRE Guidelines for CRIS Managers 1.1

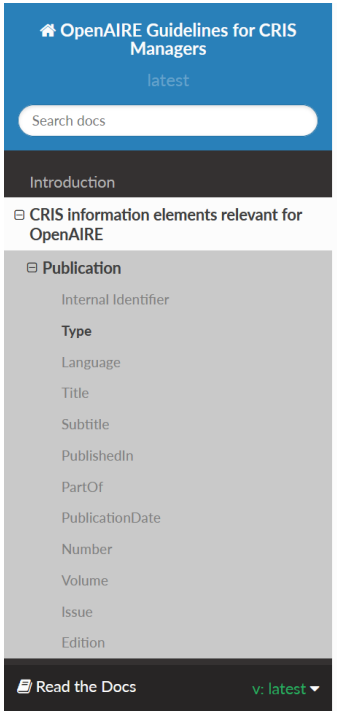
- Dvořák, Jan, Bollini, Andrea, Rémy, Laurent, & Schirrwagen, Jochen. (2018). OpenAIRE Guidelines for CRIS Managers 1.1 (Version 1.1.1). Zenodo. DOI 10.5281/zenodo.2316420

- Document on the web https://openaire-guidelines-for-cris-managers.readthedocs.io/en/latest/index.html
  - Introduction
  - CRIS Information elements relevant for OpenAIRE
    - CERIF, CERIF XML
  - Technical implementation guidelines
    - CERIF XML as payload of OAI-PMH 2.0

- Ongoing: https://github.com/openaire/guidelines-cris-managers for version 1.2 with Andreas Czerniak and Dragan Ivanović

Version 1.1: Aligned vocabularies

- COAR Resource Types
- COAR Access Rights
- ISSN Media List



Type

Description:	The type of the publication
Use:	mandatory (1)
Representation:	XML element `Type` from namespace https://www.openaire.eu/cerif-profile/vocab/COAR_Publication_Types
CERIF:	the ResultPublication_Classification (https://w3id.org/cerif/model#ResultPublication_Classification)
Vocabulary:	Publication types extracted from the COAR Resource Types concept scheme: Types of publications as extracted from the COAR Resource Types concept scheme (http://vocabularies.coar-repositories.org/documentation/resource_types/, the term 'text' and its descendants in the hierarchy except 'patent').

- **text** (http://purl.org/coar/resource_type/c_18cf): A resource consisting primarily of words for reading. Examples include books, letters, dissertations, poems, newspapers, articles, archives of mailing lists. Note that facsimiles or images of texts are still of the genre Text.
  - **annotation** (http://purl.org/coar/resource_type/c_1162): An annotation in the sense of a legal note is a legally explanatory comment on a decision handed down by a court or arbitral tribunal.
  - **bibliography** (http://purl.org/coar/resource_type/c_86bc): A systematic list or enumeration of written works by a specific author or on a given subject.
  - **book** (http://purl.org/coar/resource_type/c_2f33): A non-serial publication that is complete in one volume or a designated finite number of volumes. (adapted from CiTO; EPrint Type vocabulary)

Information scope of the OpenAIRE Guidelines for CRIS Managers 1.1

The Core:

- The CRIS as a Service
- Organisations
- Researchers

Activities:

- Projects
- Funding
- Events

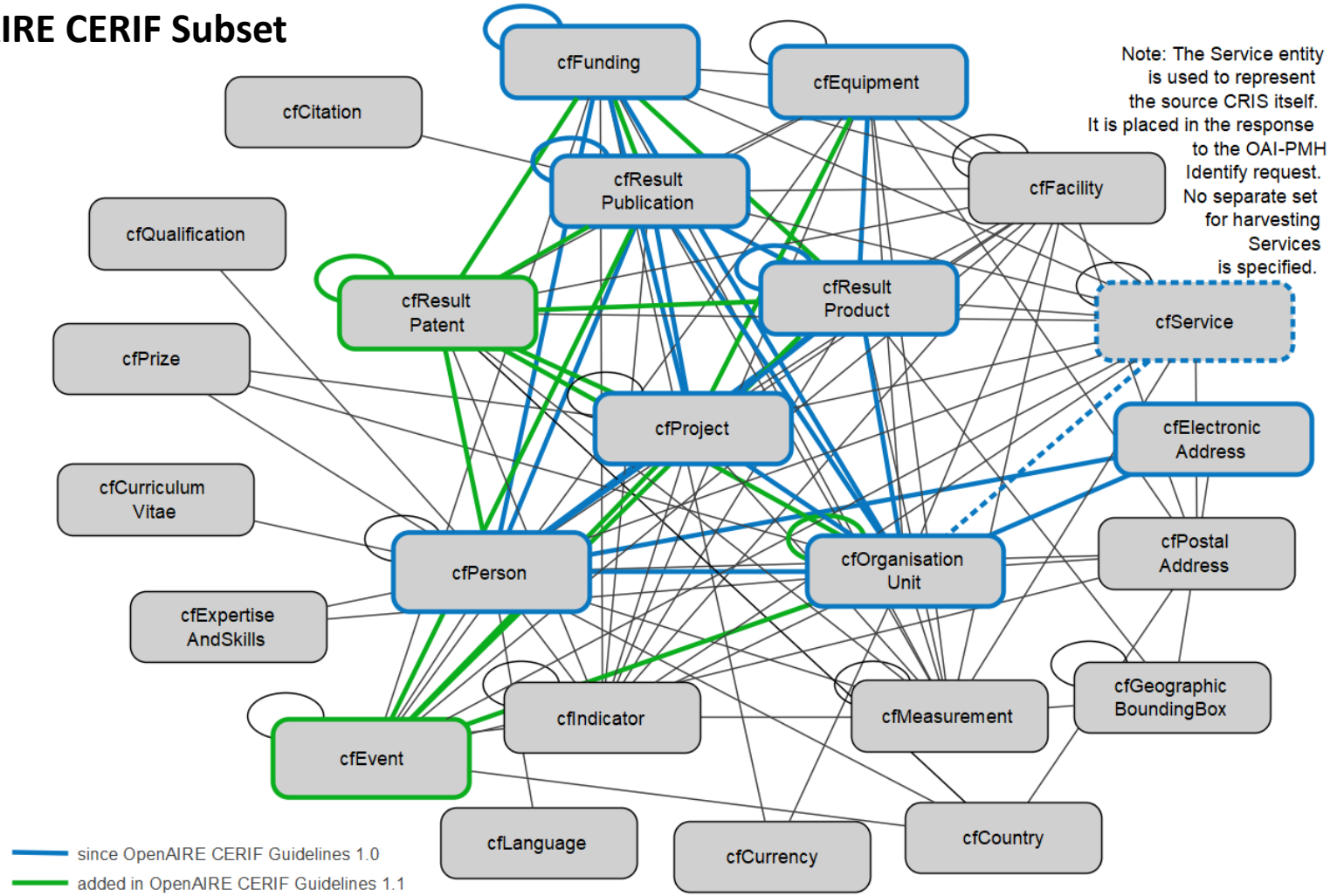
Outputs:

- Publications
- Datasets, Software & other Products
- Patents

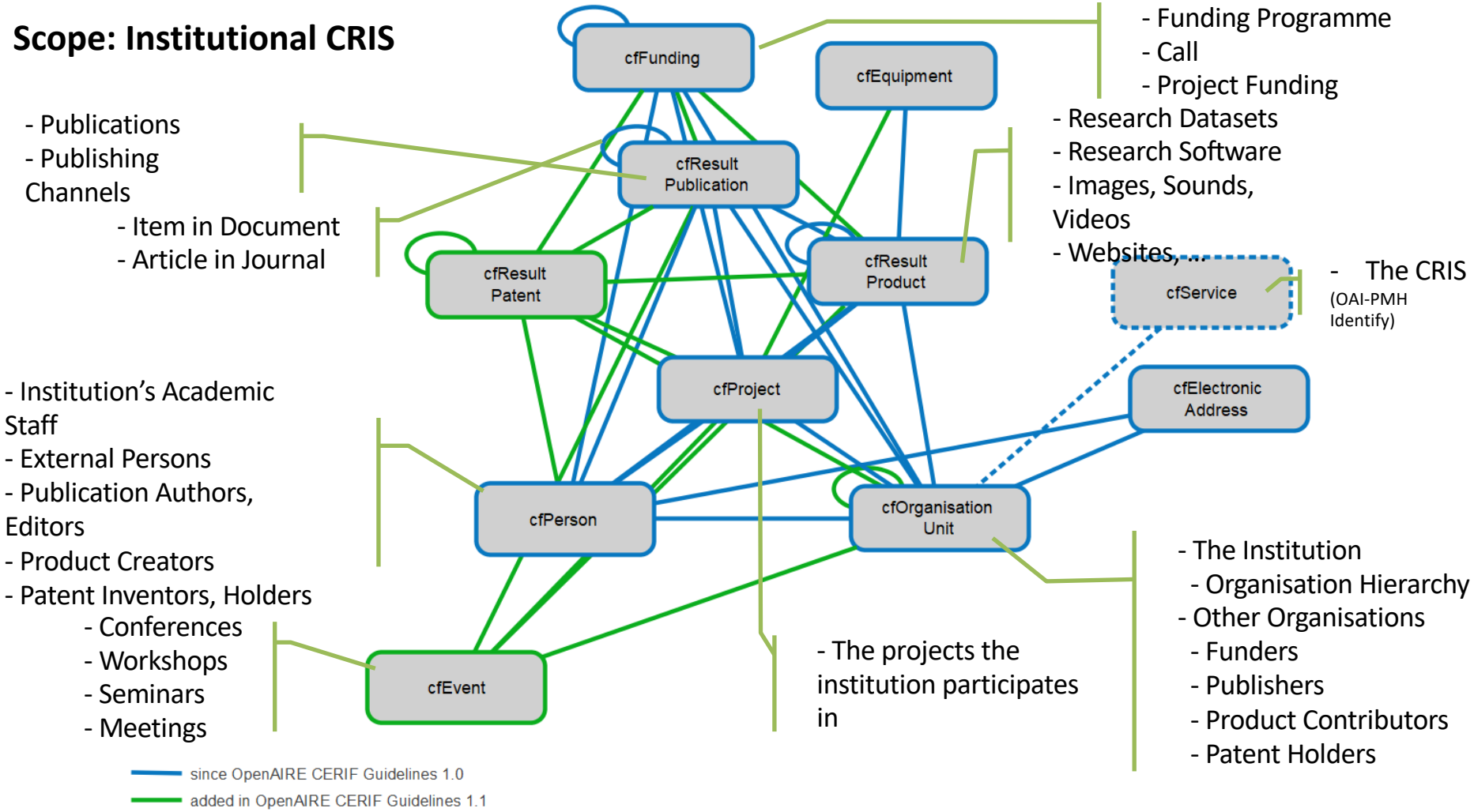
Infrastructure:

- Equipment

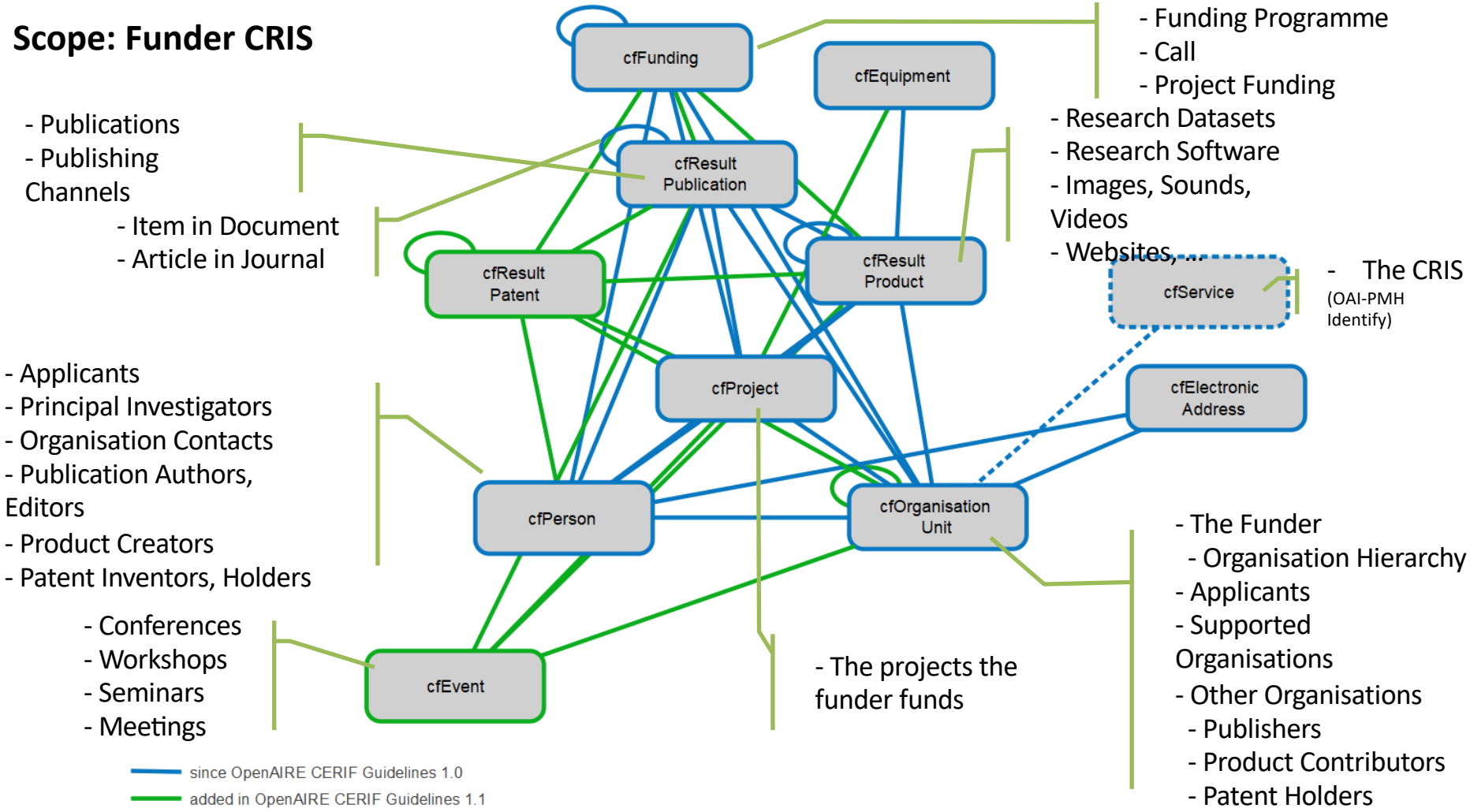
OpenAIRE CERIF Subset



Scope: Institutional CRIS



Scope: Funder CRIS



Identifiers

- Publication:
  - DOI
  - Handle
  - PMCID
  - ISI Number (WoS Accession Number)
  - SCP Number
  - ISSN
  - ISBN
  - URL
  - URN

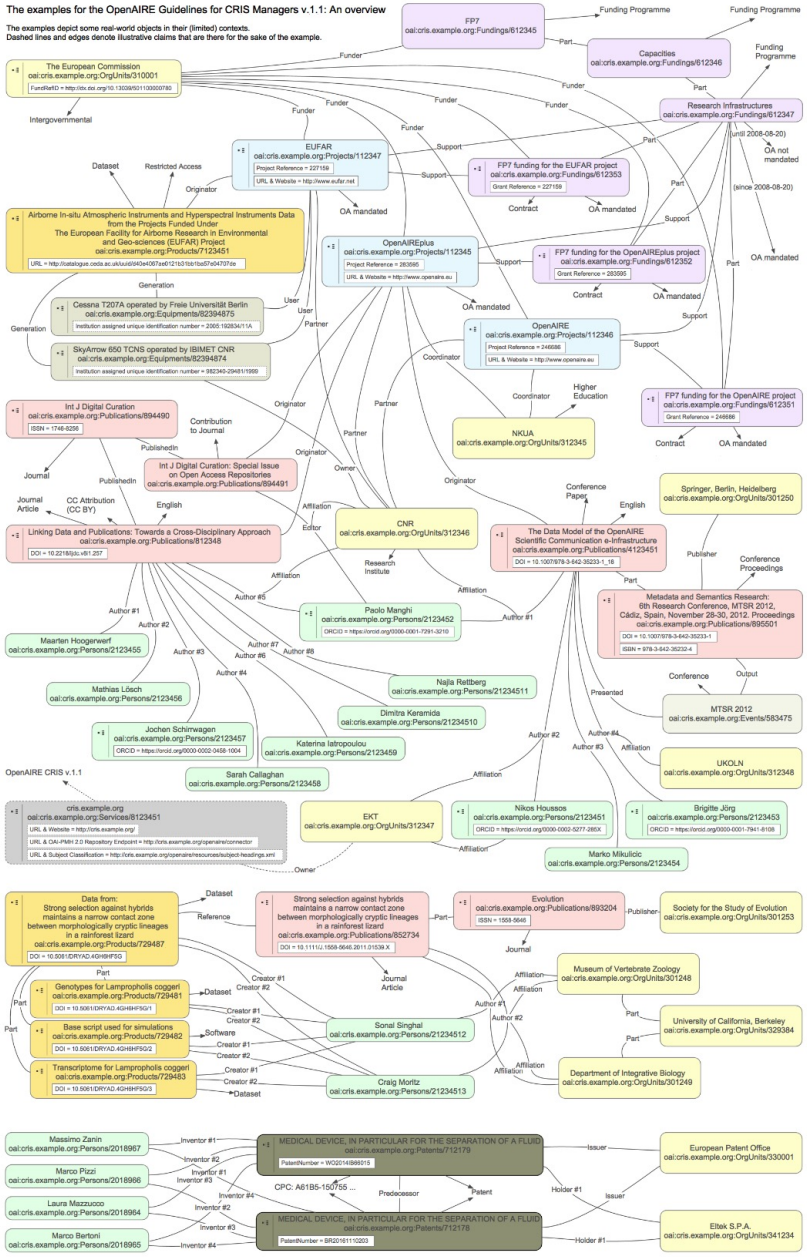
- Persons:
  - ORCID
  - ResearcherID
  - Scopus Author ID
  - ISNI

- Products:
  - ARK
  - DOI
  - Handle
  - URL
  - URN

Elsewhere generic

Supporting artifacts

- XML Schema
  - Namespace https://www.openaire.eu/cerif-profile/1.1/
  - A few Schematron integrity rules embedded
- Comprehensive set of examples
- Prototype validator

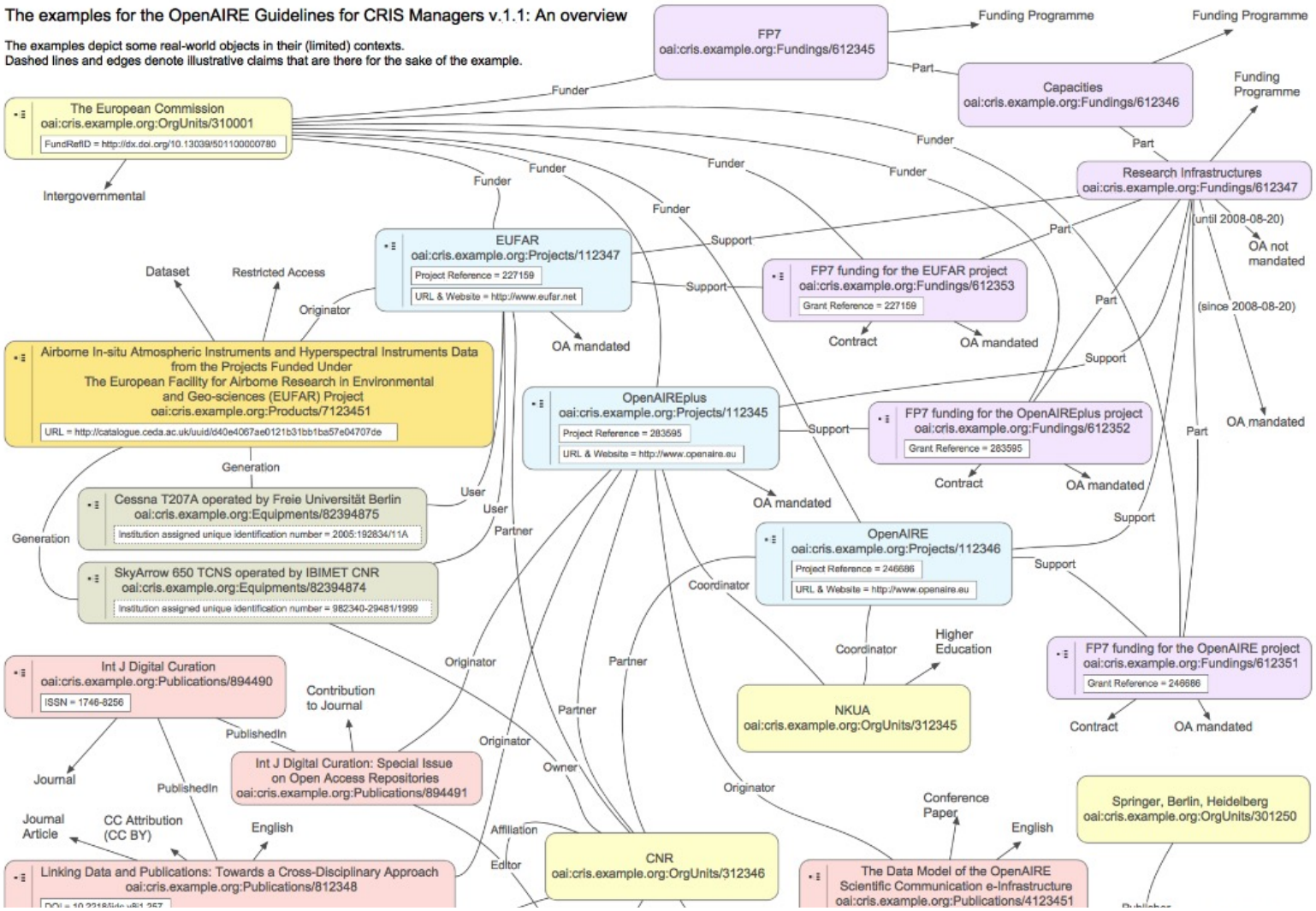


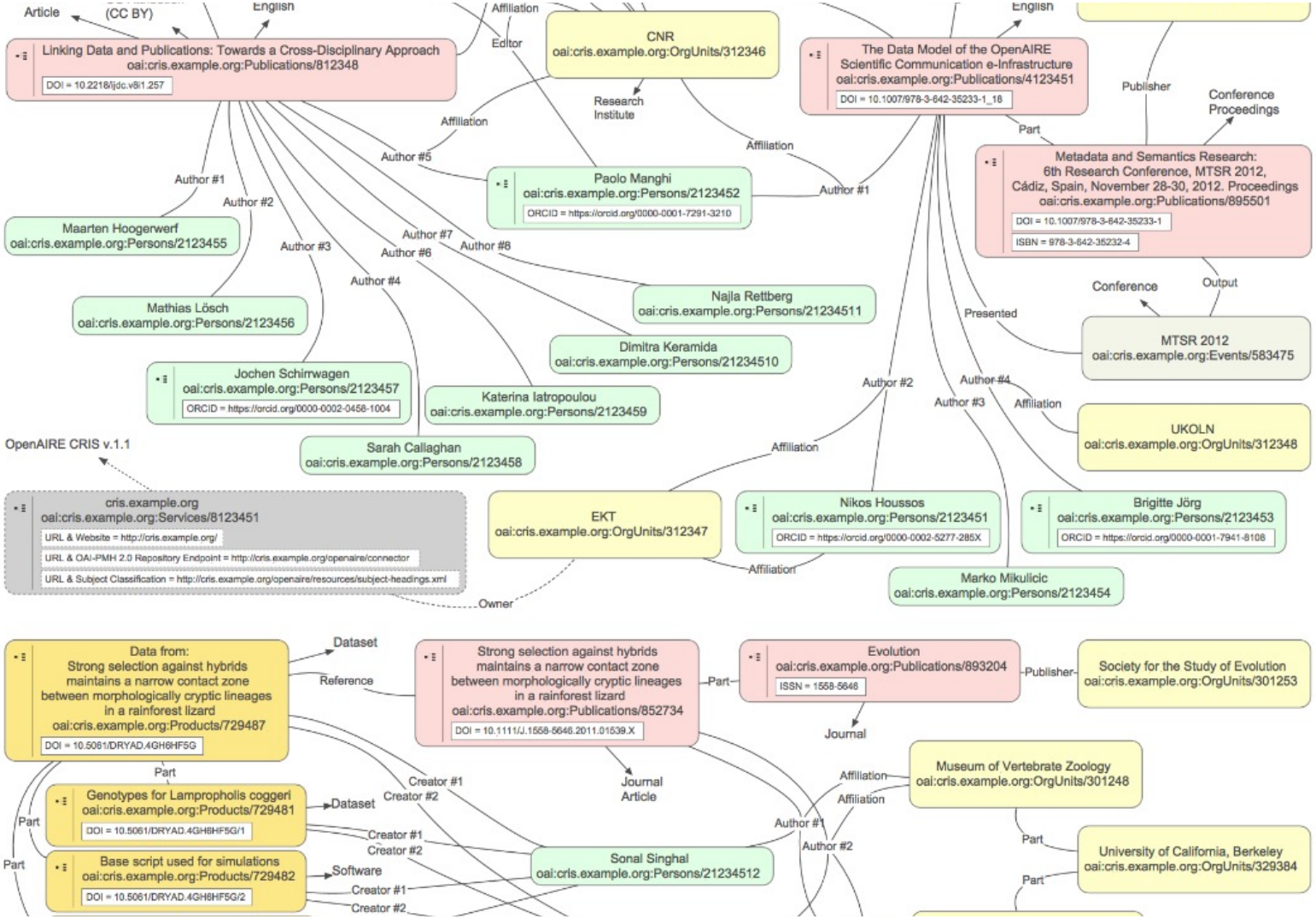
A Research Graph:
The example set from the OpenAIRE Guidelines for CRIS Managers 1.1

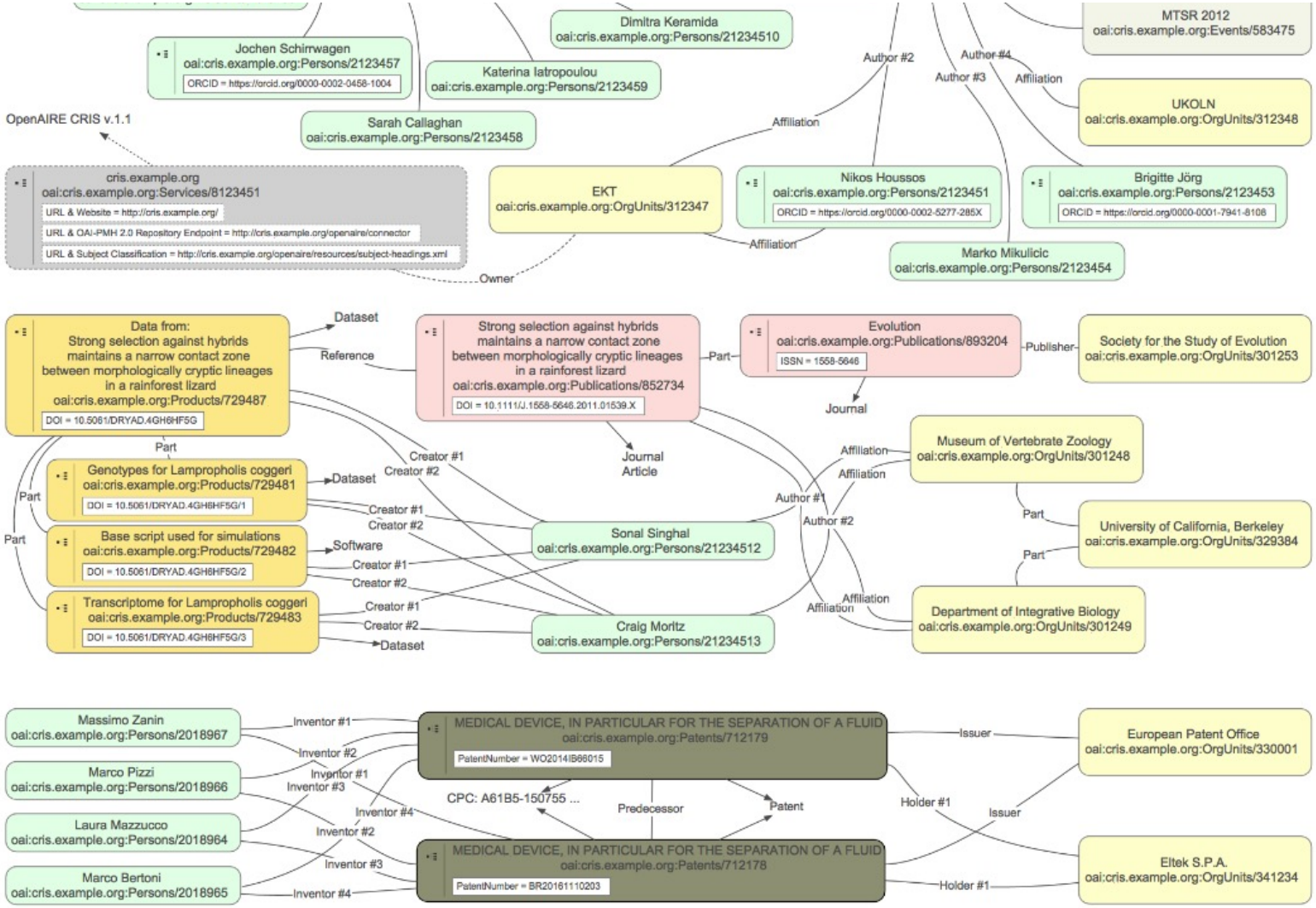
OpenAIRE Technical Meeting @ CERN

The examples for the OpenAIRE Guidelines for CRIS Managers v.1.1: An overview

The examples depict some real-world objects in their (limited) contexts.
Dashed lines and edges denote illustrative claims are there for the sake of the example.




Article
(CC BY)
English
Linking Data and Publications: Towards a Cross-Disciplinary Approach
oai:cris.example.org:Publications/812348
DOI = 10.2218/ijdc.v8i1.257
Affiliation
Editor
CNR
oai:cris.example.org:OrgUnits/312346
Research Institute
English
The Data Model of the OpenAIRE Scientific Communication e-Infrastructure
oai:cris.example.org:Publications/4123451
DOI = 10.1007/978-3-642-35233-1_18
Publisher
Conference Proceedings
Part
Metadata and Semantics Research: 6th Research Conference, MTSR 2012, Cádiz, Spain, November 28-30, 2012. Proceedings
oai:cris.example.org:Publications/895501
DOI = 10.1007/978-3-642-35233-1
ISBN = 978-3-642-35232-4
Author #1
Author #2
Author #3
Author #4
Author #5
Author #6
Author #7
Author #8
Maarten Hoogerwerf
oai:cris.example.org:Persons/2123455
Paolo Manghi
oai:cris.example.org:Persons/2123452
ORCID = https://orcid.org/0000-0001-7291-3210
Mathias Lösch
oai:cris.example.org:Persons/2123456
Najla Rettberg
oai:cris.example.org:Persons/21234511
Dimitra Keramida
oai:cris.example.org:Persons/21234510
Jochen Schirrwagen
oai:cris.example.org:Persons/2123457
ORCID = https://orcid.org/0000-0002-0458-1004
Katerina Iatropoulou
oai:cris.example.org:Persons/2123459
Sarah Callaghan
oai:cris.example.org:Persons/2123458
Conference
Output
Presented
MTSR 2012
oai:cris.example.org:Events/583475
UKOLN
oai:cris.example.org:OrgUnits/312348
OpenAIRE CRIS v.1.1
cris.example.org
oai:cris.example.org:Services/8123451
URL & Website = http://cris.example.org/
URL & OAI-PMH 2.0 Repository Endpoint = http://cris.example.org/openaire/connector
URL & Subject Classification = http://cris.example.org/openaire/resources/subject-headings.xml
EKT
oai:cris.example.org:OrgUnits/312347
Nikos Houssos
oai:cris.example.org:Persons/2123451
ORCID = https://orcid.org/0000-0002-5277-285X
Brigitte Jörg
oai:cris.example.org:Persons/2123453
ORCID = https://orcid.org/0000-0001-7941-8108
Marko Mikulicic
oai:cris.example.org:Persons/2123454
Owner
Data from: Strong selection against hybrids maintains a narrow contact zone between morphologically cryptic lineages in a rainforest lizard
oai:cris.example.org:Products/729487
DOI = 10.5061/DRYAD.4GH6HF5G
Dataset
Reference
Strong selection against hybrids maintains a narrow contact zone between morphologically cryptic lineages in a rainforest lizard
oai:cris.example.org:Publications/852734
DOI = 10.1111/J.1558-5646.2011.01539.X
Evolution
oai:cris.example.org:Publications/893204
ISSN = 1558-5646
Publisher
Society for the Study of Evolution
oai:cris.example.org:OrgUnits/301253
Journal
Journal Article
Genotypes for Lampropholis coggeri
oai:cris.example.org:Products/729481
DOI = 10.5061/DRYAD.4GH6HF5G/1
Base script used for simulations
oai:cris.example.org:Products/729482
DOI = 10.5061/DRYAD.4GH6HF5G/2
Software
Creator #1
Creator #2
Sonal Singhal
oai:cris.example.org:Persons/21234512
Museum of Vertebrate Zoology
oai:cris.example.org:OrgUnits/301248
University of California, Berkeley
oai:cris.example.org:OrgUnits/329384


Dimitra Keramida
oai:cris.example.org:Persons/21234510
MTSR 2012
oai:cris.example.org:Events/583475
Jochen Schirrwagen
oai:cris.example.org:Persons/2123457
ORCID = https://orcid.org/0000-0002-0458-1004
Katerina Iatropoulou
oai:cris.example.org:Persons/2123459
Author #2
Author #4
Author #3
Affiliation
UKOLN
oai:cris.example.org:OrgUnits/312348
OpenAIRE CRIS v.1.1
Sarah Callaghan
oai:cris.example.org:Persons/2123458
Affiliation
cris.example.org
oai:cris.example.org:Services/8123451
URL & Website = http://cris.example.org/
URL & OAI-PMH 2.0 Repository Endpoint = http://cris.example.org/openaire/connector
URL & Subject Classification = http://cris.example.org/openaire/resources/subject-headings.xml
EKT
oai:cris.example.org:OrgUnits/312347
Nikos Houssos
oai:cris.example.org:Persons/2123451
ORCID = https://orcid.org/0000-0002-5277-285X
Brigitte Jörg
oai:cris.example.org:Persons/2123453
ORCID = https://orcid.org/0000-0001-7941-8108
Affiliation
Marko Mikulicic
oai:cris.example.org:Persons/2123454
Owner
Data from:
Strong selection against hybrids
maintains a narrow contact zone
between morphologically cryptic lineages
in a rainforest lizard
oai:cris.example.org:Products/729487
DOI = 10.5061/DRYAD.4GH6HF5G
Dataset
Reference
Strong selection against hybrids
maintains a narrow contact zone
between morphologically cryptic lineages
in a rainforest lizard
oai:cris.example.org:Publications/852734
DOI = 10.1111/J.1558-5646.2011.01539.X
Part
Evolution
oai:cris.example.org:Publications/893204
ISSN = 1558-5646
Publisher
Society for the Study of Evolution
oai:cris.example.org:OrgUnits/301253
Journal
Part
Genotypes for Lampropholis coggeri
oai:cris.example.org:Products/729481
DOI = 10.5061/DRYAD.4GH6HF5G/1
Dataset
Creator #1
Creator #2
Journal
Article
Affiliation
Museum of Vertebrate Zoology
oai:cris.example.org:OrgUnits/301248
Part
Base script used for simulations
oai:cris.example.org:Products/729482
DOI = 10.5061/DRYAD.4GH6HF5G/2
Software
Sonal Singhal
oai:cris.example.org:Persons/21234512
Author #1
Author #2
University of California, Berkeley
oai:cris.example.org:OrgUnits/329384
Transcriptome for Lampropholis coggeri
oai:cris.example.org:Products/729483
DOI = 10.5061/DRYAD.4GH6HF5G/3
Craig Moritz
oai:cris.example.org:Persons/21234513
Department of Integrative Biology
oai:cris.example.org:OrgUnits/301249
Massimo Zanin
oai:cris.example.org:Persons/2018967
Marco Pizzi
oai:cris.example.org:Persons/2018966
Laura Mazzucco
oai:cris.example.org:Persons/2018964
Marco Bertoni
oai:cris.example.org:Persons/2018965
Inventor #1
Inventor #2
Inventor #3
Inventor #4
MEDICAL DEVICE, IN PARTICULAR FOR THE SEPARATION OF A FLUID
oai:cris.example.org:Patents/712179
PatentNumber = WO2014IB66015
CPC: A61B5-150755 ...
Predecessor
Patent
MEDICAL DEVICE, IN PARTICULAR FOR THE SEPARATION OF A FLUID
oai:cris.example.org:Patents/712178
PatentNumber = BR20161110203
Issuer
European Patent Office
oai:cris.example.org:OrgUnits/330001
Holder #1
Eltek S.P.A.
oai:cris.example.org:OrgUnits/341234

<Publication xmlns="*https://www.openaire.eu/cerif-profile/1.1/*" id="***852734***">
<Type xmlns="*https://www.openaire.eu/cerif-profile/vocab/COAR_Publication_Types*">**http://purl.org/coar/resource_type/c_6501**<!-- journal article --></Type>
<Title xml:lang="***en***">**Strong selection against hybrids maintains a narrow contact zone between morphologically cryptic lineages in a rainforest lizard**</Title>
<PublishedIn>
<Publication id="***893204***">
<Type scheme="*https://www.openaire.eu/cerif-profile/vocab/COAR_Publication_Types*">**http://purl.org/coar/resource_type/c_0640**<!-- journal --></Type>
<Title xml:lang="***en***">**Evolution**</Title>
<ISSN medium="http://issn.org/vocabularies/Medium#Online">**1558-5646**</ISSN>
<Publishers>
<!-- […] -->
</Publishers>
</Publication>
</PublishedIn>
<Volume>**66**</Volume>
<Issue>**5**</Issue>
<StartPage>**1474**</StartPage>
<EndPage>**1489**</EndPage>
<DOI>**10.1111/J.1558-5646.2011.01539.X**</DOI>
<!-- […] -->
</Publication>

```
<Publication xmlns="https://www.openaire.eu/cerif-profile/1.1/" id="852734">
    <!-- [ … ] -->
    <Authors>
        <Author>
            <Person>
                <PersonName>
                    <FamilyNames>Singhal</FamilyNames>
                    <FirstNames>Sonal</FirstNames>
                </PersonName>
            </Person>
            <Affiliation>
                <OrgUnit id="301248">
                    <Name xml:lang="en">Museum of Vertebrate Zoology</Name>
                    <PartOf>
                        <OrgUnit id="329384">
                            <Name xml:lang="en">University of California, Berkeley</Name>
                        </OrgUnit>
                    </PartOf>
                </OrgUnit>
            </Affiliation>  <!-- [ … ] -->
        </Author>  <!-- [ … ] -->
    </Authors>
    <!-- [ … ] -->
</Publication>
```

<Publication xmlns="*https://www.openaire.eu/cerif-profile/1.1/*" id="***852734***">
<!-- […] -->
<Keyword xml:lang="***en***">**hybrid zones**</Keyword>
<Keyword xml:lang="***en***">**phylogeography**</Keyword>
<Abstract xml:lang="***en***">**Phenotypically cryptic lineages comprise an important yet understudied part of biodiversity;**
<!-- […] --></Abstract>
<References>
<Product id="***729487***">
<Type xmlns="*https://www.openaire.eu/cerif-profile/vocab/COAR_Product_Types*">**http://purl.org/coar/resource_type/c_ddb1**<!-- dataset --></Type>
<Name xml:lang="***en***">**Data from: Strong selection against hybrids maintains a narrow contact zone between morphologically cryptic lineages in a rainforest lizard**</Name>
<VersionInfo xml:lang="***en***">**1**</VersionInfo>
<DOI>**10.5061/DRYAD.4GH6HF5G**</DOI>
<!-- […] -->
</Product>
</References>
</Publication>

CERIF Profiles in general

Useful subsets of CERIF
for specific research information
interchange scenarios

- Entities & attributes:
  - Profile ⊂ CERIF
- Semantic vocabularies:
  - Profile – specific choices
  - Sources: CERIF & beyond
- Integrity constraints:
  - Profile ⊃ CERIF

} Profile data is CERIF

CERIF Profiles in general

Producers know what to include

Consumers know what to expect

CERIF Refactoring

- Address shortcomings of current CERIF
- Modernize CERIF
  - Take away the perceived complexity of CERIF
  - Involve the community in further development of CERIF
  - New modelling approach (and tool), modularity, modern serialization formats
- Ongoing project started 2021

☞ more to be presented on Thursday at 13:55 ☜