

AN APPROACH TO MODEL ARCHAEOLOGICAL DATA AND CREATE RDF FROM SPREADSHEETS

VIRTUAL WORKSHOP ON SEMANTIC MAPPING OF EXCAVATION DATA
 15TH OF JUNE 2022
 GERALD HIEBEL, UNIVERSITY OF INNSBRUCK

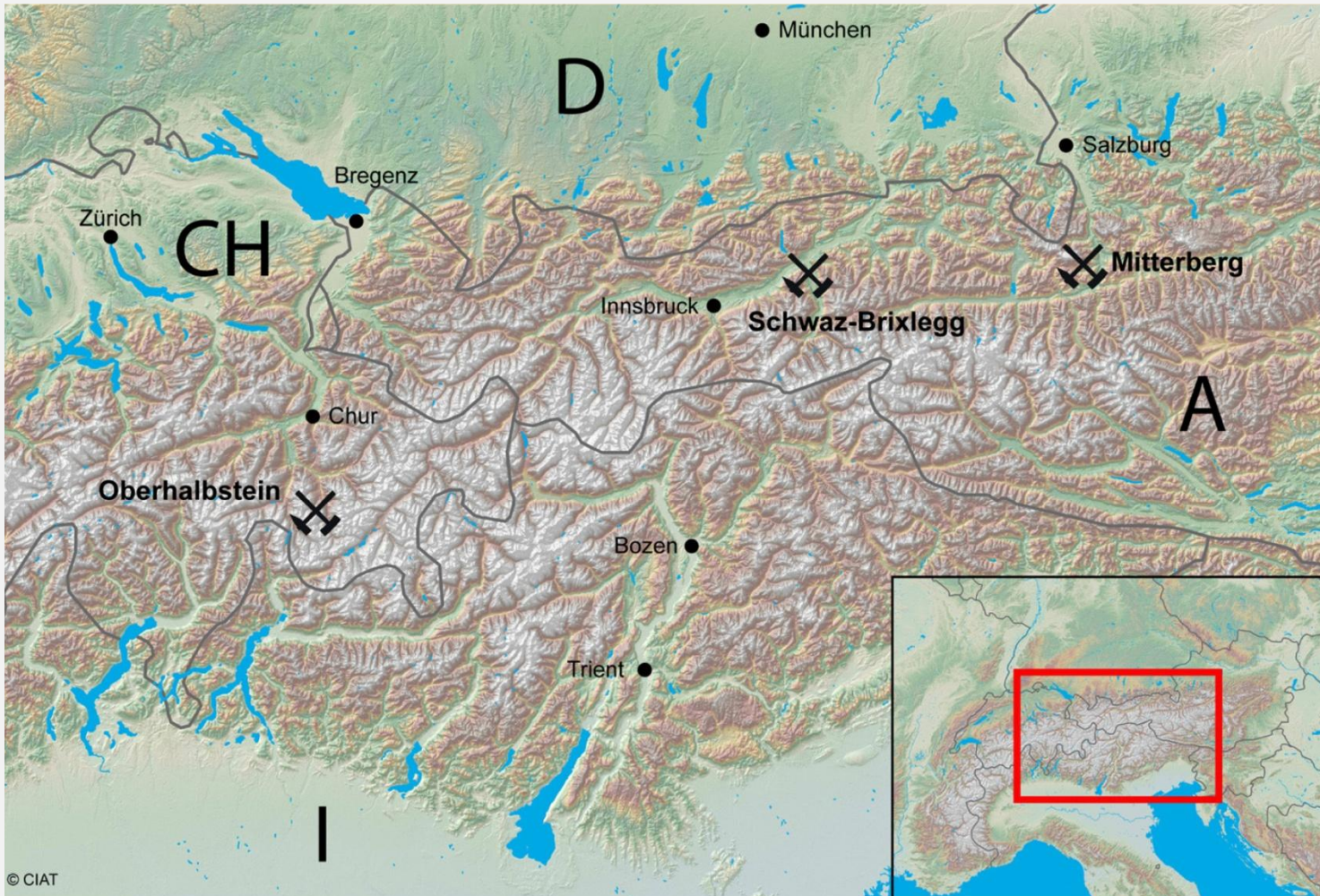
Excavation Data from project „Prehistoric Copper Production in the Eastern and Central Alps“

Modelling - CIDOC CRM / CRMsci / CRMarchaeo

Excel Sheets for Excavation data

RDF Creation Pipeline

Additional: Ariadne Catalog / Thesaurus



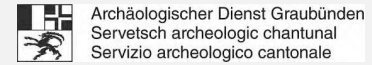
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Partner

AUSTRIA:



SWITZERLAND:



GERMANY:



Fördergeber



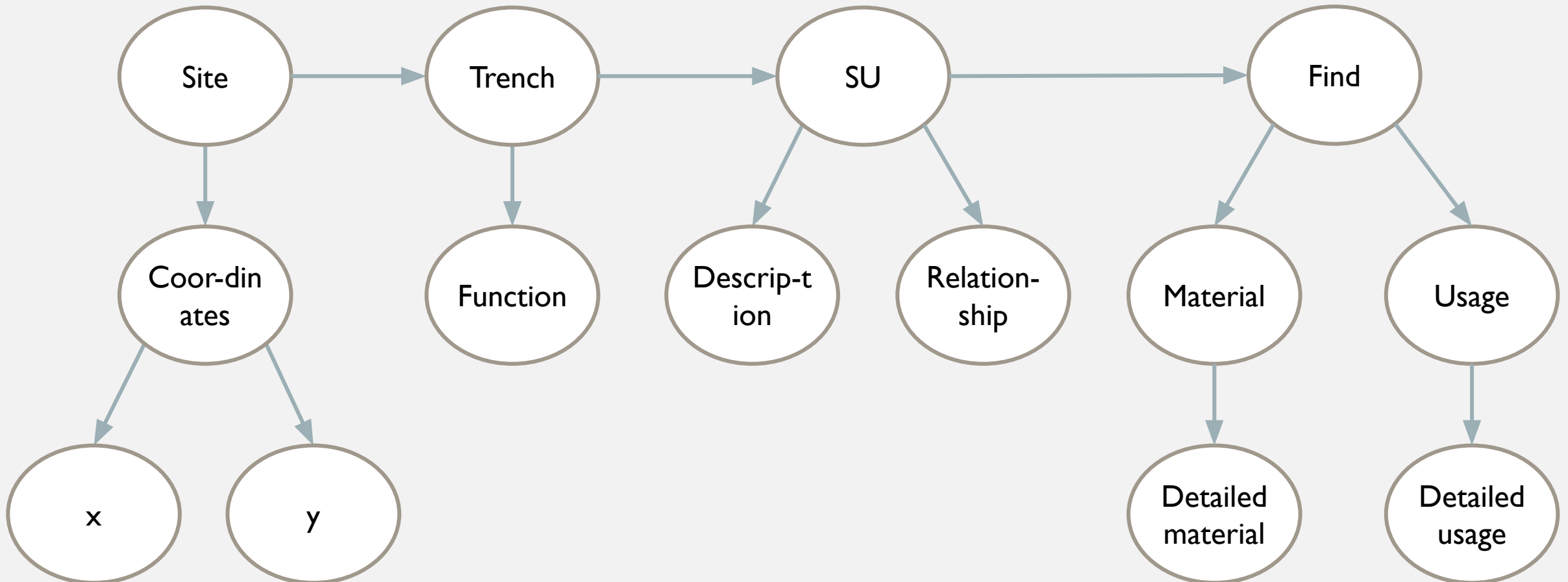
DOCUMENTATION

<ul style="list-style-type: none"> <ul style="list-style-type: none"> 87002.15.01_Verhuettungsplatz_suedlich_der_Ruine_Rottenburg 01_Deckblatt 02_Bericht_Teil_A <ul style="list-style-type: none"> Abbildungen 03_Bericht_Teil_B 04_Technische_Daten 05_SE_Liste 06_SE_Protokollblätter 07_Objektlisten 08_Objektgruppenliste 09_Planliste 10_Fundliste 11_Grabungsprotokoll 12_Vermessungsunterlagen 13_Originalmessdaten_und_Metadaten_Prospektion 14_Maßnahmenpolygon-Maßnahmenkurzinformation <ul style="list-style-type: none"> 15_Technischer_Gesamtplan 16_Detailpläne <ul style="list-style-type: none"> etransmit Pdfs Pdfs-interpretiert Umzeichnungen 17_Fotodokumentation <ul style="list-style-type: none"> Schn1 <ul style="list-style-type: none"> Schn1-2_gesamt Schn2 Strassenprofil <ul style="list-style-type: none"> Alle_Seg1-5 SE14 Seg1-2 Seg2-3 Seg3 Seg4-5 18_Darstellung_der_stratigrafischen_Einheiten 19_Bericht_zur_konservatorischen_Maßnahmen_am_Fundmaterial 	<ul style="list-style-type: none"> 01 Cover sheet 02 Report – part A 03 Report – part B 04 Technical data 05 List of SU's 06 Protocolls of SU's 07 List of object 08 List of object groups 09 List of Plans 10 List of findings 11 Protocoll of excavation 12 Survey documentation 13 Original survey files 14 Polygon of archaeological action 15 Technical total plan 16 Detailed plans 17 Photographic documentation 18 Matrix
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DIFFERENT FORMATS OF DATA

- Text files
 - Word (.doc/.docx)
 - Pdf (.pdf)
 - Clear text formats (.txt, .csv, .rtf)
- Pictures (.jpg, .png, .tif, .raw-formats)
- Plans
 - CAD (.dwg, .dxf)
 - CAD-Container (.exe, .zip)
- Excel (.xlsx)
- Miscellaneous formats (.ai, .qgz, .shp, .bak etc.)

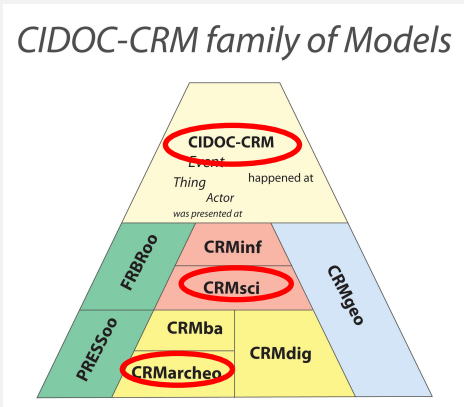
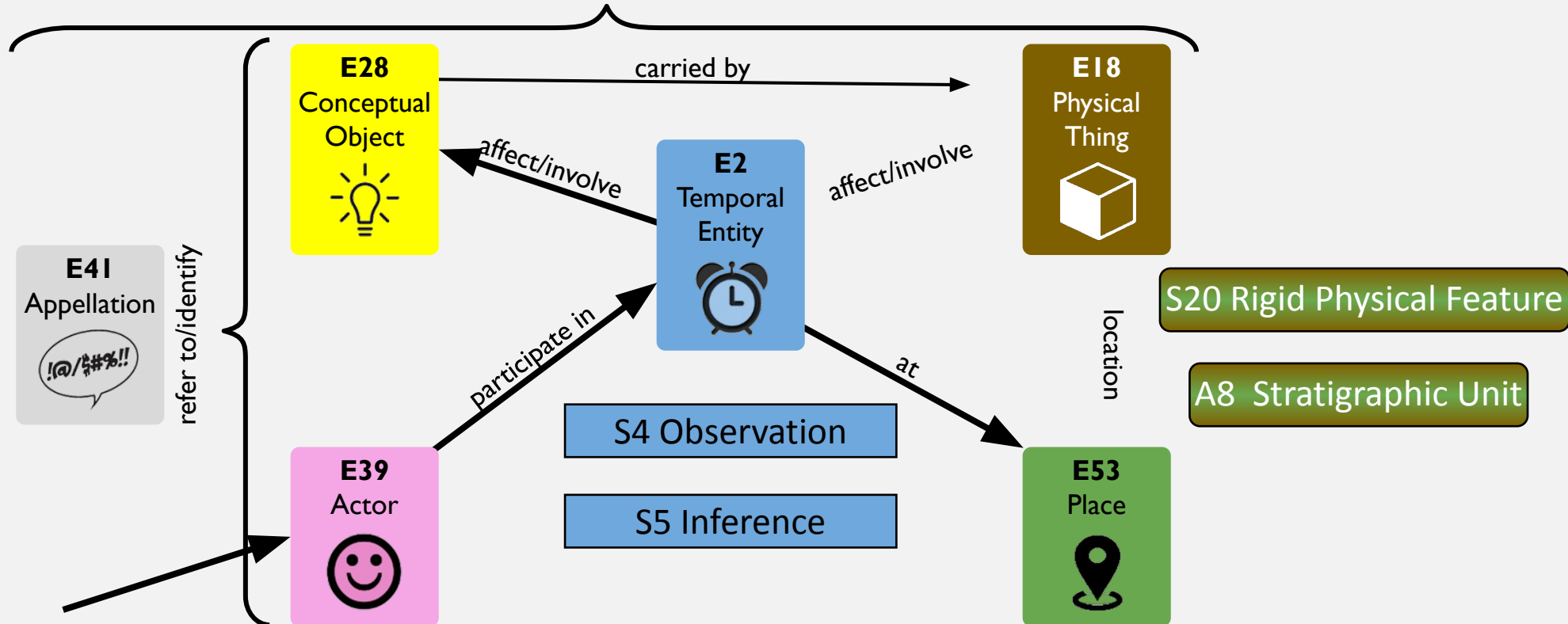
- At an archaeological Site at location xy
 - In trench 2 (test trench)
 - In layer SU 4 (an ash-layer)
 - An Object with Find-No. 8 was found, the material is stone (Amphibolit) and it was used as stone-tool



ONTOLOGY: CIDOC CRM / CRMsci / CRMARCHAEO



refer to/refine



refer to/identify

CIDOC-CRM: *E-Numbers*

CRMsci: Scientific observation model *S-Numbers*

CRMarchaeo: Excavation model *A-Numbers*

Source: George Bruseker

- At an archaeological Site at location xy: S20->P189 is approximated by ->E53 Place (Geometry)
 - In trench 2 (test trench): S20 (Site) -> P46 is composed of-> S20 (Trench)
 - In layer SU 4 (an ash-layer): S20 (Trench) -> P46 is composed of -> A8 Stratigraphic Unit
 - An Object with Find-No. 8 was found in SU4: E19 Physical Object -> AP21 is contained in -> A8 Stratigraphic Unit

S20 Rigid Physical Feature

S20 Rigid Physical Feature

A8 Stratigraphic Unit

E19
Physical
Object

Site

Trench

SU

Find

E53
PlaceCoor-din
atesE55
Type
TTTT
YIII
*XXX
IIII

Function

Descrip-t
ionRelation-
shipE55
Type
TTTT
YIII
*XXX
IIII

Material

E55
Type
TTTT
YIII
*XXX
IIII

Usage

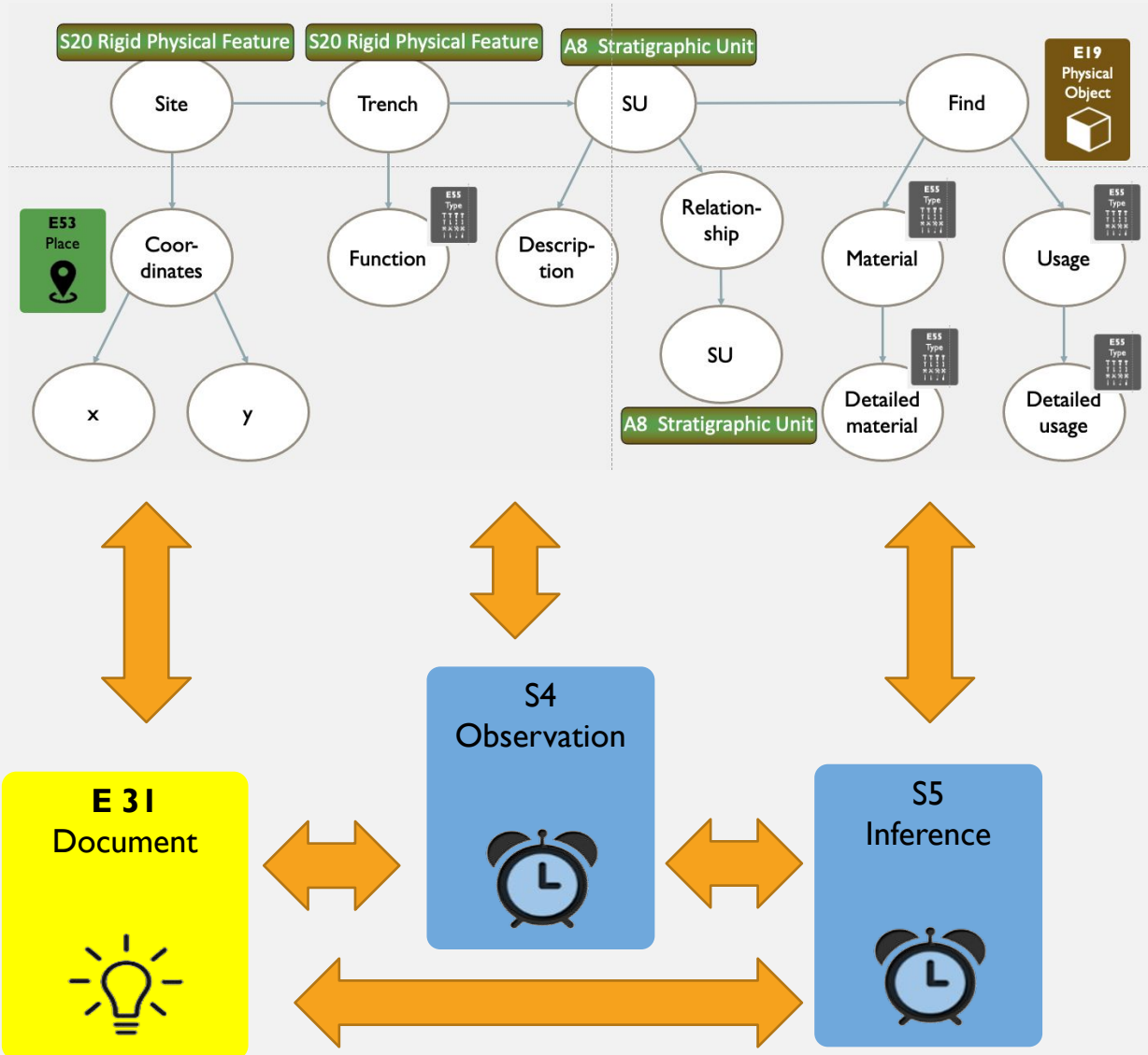
x

y

SU

A8 Stratigraphic Unit

Detailed
materialE55
Type
TTTT
YIII
*XXX
IIIIDetailed
usageE55
Type
TTTT
YIII
*XXX
IIII



1. Creation of identifiers for different instances of modelled classes

2. Creation of Excel spreadsheets for different classes

3. Enter instances and relations in Fields of sheets

4. Alternative: get data from an existing database and match fields to classes

	A	B	C	D	E	F	G	H	I	J	K	L
1	E15_project	:15_institution	01_provenanc	E39	S20_id	S20_parent_id	E41_S20	E55_E7_past	E55_S20	E53 (Datenerze	S3_katgem_n	3_katgem_nari3
2	ORD	uibk_himat	S20_ORD-Ur	Staudt	Rotholz_Verhuettungsplat	Rotholz_Verl	175784@Ver	240207@Ver	BEV		87002	Buch in Tirol 1:
3	ORD	uibk_himat	S20_ORD-Ur	Staudt	Rotholz_Verl	Rotholz_Verl	Rotholz_Verl	175784@Ver	240207@Ver	BEV	87002	Buch in Tirol 1:
4	ORD	uibk_himat	S20_ORD-Ur	Staudt	Rotholz_Verl	Rotholz_Verl	Rotholz_Verl	175784@Ver	240207@Ver	BEV	87002	Buch in Tirol 1:
5	ORD	uibk_himat	S20_ORD-Ur	Staudt	Rotholz_Verl	Rotholz_Verl	Rotholz_Verl	175784@Ver	240207@Ver	BEV	87002	Buch in Tirol 1:
6												
7												
8												

Navigation: S20 | S4 | A8 | E19 | E31 | E31_from_gsheet | +

S20 Rigid
Physical
Feature – Site
and Trench

S4
Observation

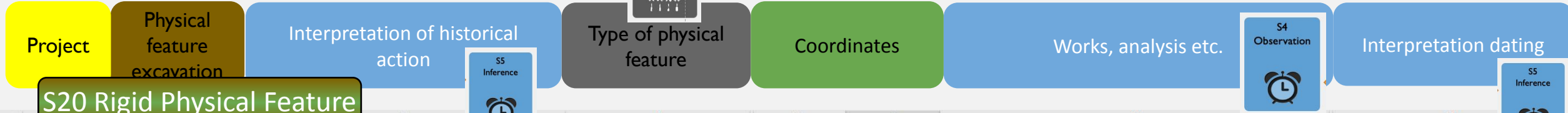


A8
Stratigra
phic Unit

E19
Physical
Object

E 3 I
Document





S20 Rigid Physical Feature

A8 Stratigraphic Unit

E19 Physical Object

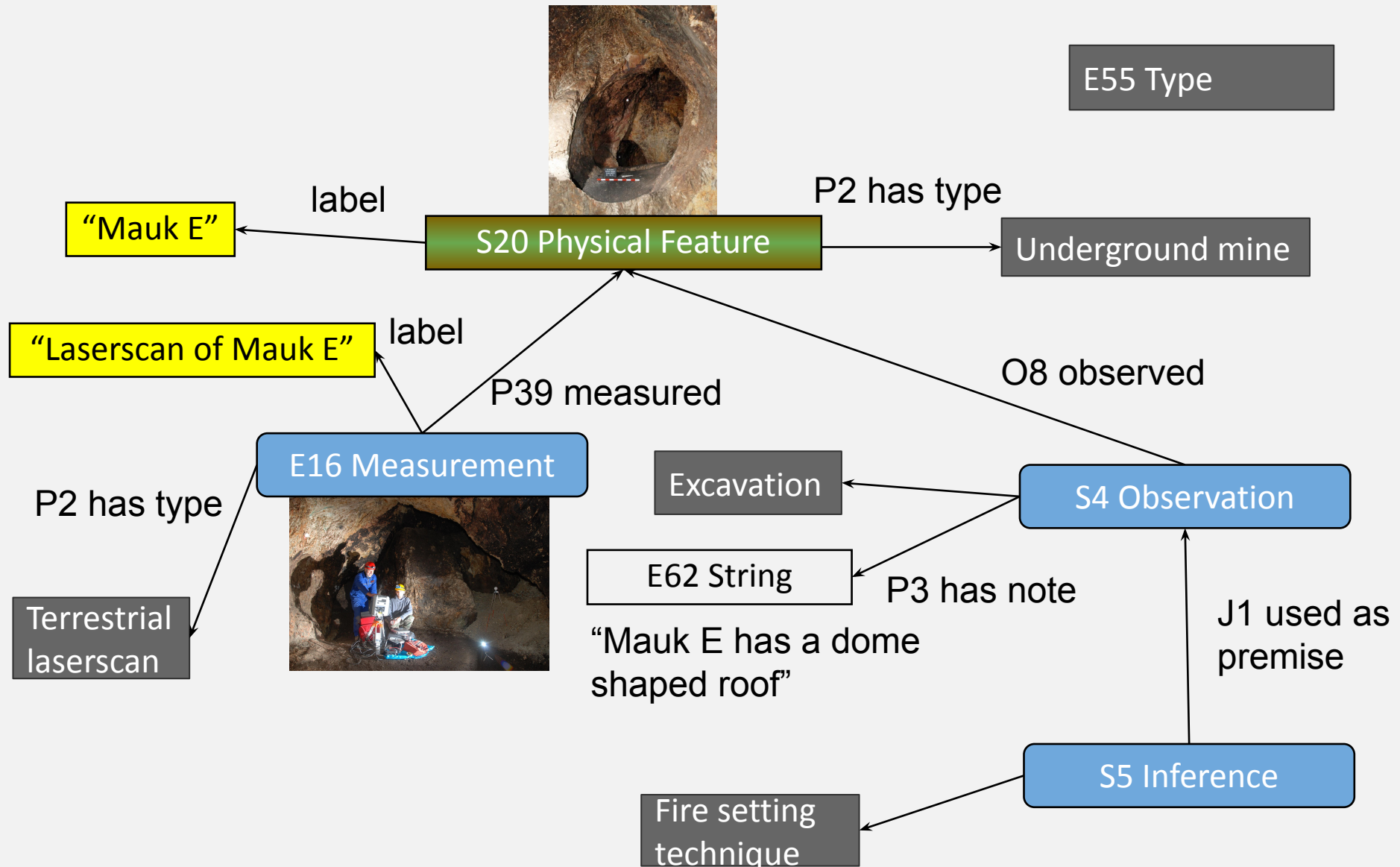
	H	I	O	P	Q	U		
1	E15_project	S20_id	E55_E7_past	E55_S20	LAT_WGS84	LONG_WGS84	E55_E7	E55_E49
2	ORD	Gratlspez-1	175771@Abbau 175770@Feuersetzen 175771@Abbau	175655@Grube 240225@Halde	47,417	11,941	175410@Ausgrabungen 175386@Dendrochronologie 175383@14C	175487@Eisenzeit 175488@Hallstattzeit
3	ORD	Gratlspez-1_1	175771@Abbau 175770@Feuersetzen	175655@Grube	47,4178226	11,94118964	175410@Ausgrabungen 175386@Dendrochronologie 175383@14C	175487@Eisenzeit 175488@Hallstattzeit
4	ORD	Gratlspez-1_2	175771@Abbau	240225@Halde	47,41797188	11,94159665	175417@Geländebegehung	
5	ORD	Gratlspez-2	175771@Abbau 175770@Feuersetzen	175655@Grube	47,3278602	11,9380768	175410@Ausgrabungen	
6	ORD	Blutskopf	175771@Abbau	175673@Pingenbau	47,3555363			175485@Spätbronzezeit
7	ORD	Gratlspez-3	175771@Abbau 175770@Feuersetzen	175655@Grube	47,4178608			
8	ORD	Mauk-B	175771					
9	ORD	Mauk-B_3	175771	1				
10	ORD	Mauk-B_4	175771	2				
11	ORD	Moosschrofen-1	175771	3				
12	ORD	Moosschrofen-1_1	175771	4				
13	ORD	Moosschrofen-1_2	175771	5				
14	ORD	Moosschrofen-2	175771	6				
15				7				

	H	I
1	E15_project	maßnahmen_id
2	ORD	87007.15.01
3	ORD	87007.15.01
4	ORD	87007.15.01
5	ORD	87007.15.01
6	ORD	87007.15.01
7	ORD	87007.15.01
8	ORD	87007.15.01
9	ORD	87007.15.01
10	ORD	87007.15.01

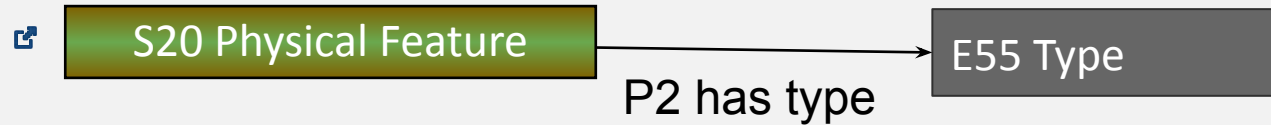
	H	I	J	R	S
1	S4_id_moved	S20_id	S4_id_moved	A8_id	A8_description
2	ORD	Gratlspez-1_1	Gratlspez-1/87007.15.01/Ausgrabungen	Gratlspez-1/87007.15.01/Ausgrabungen_1	1 Grau-humose Schicht, letzter Gehhorizont
3	ORD	Gratlspez-1_1	Gratlspez-1/87007.15.01/Ausgrabungen	Gratlspez-1/87007.15.01/Ausgrabungen_2	2 Grober, steriler Versatz mit wenig Erz und HK
4	ORD	Gratlspez-1_1	Gratlspez-1/87007.15.01/Ausgrabungen	Gratlspez-1/87007.15.01/Ausgrabungen_3	3 Steril-lehmige Sedimentschicht
5	ORD	Gratlspez-1_1	Gratlspez-1/87007.15.01/Ausgrabungen	Gratlspez-1/87007.15.01/Ausgrabungen_4	4 Prähistorischer Versatz mit HK auf Grubensohle
6	ORD	Gratlspez-2	Gratlspez-2/87007.15.01/Ausgrabungen	Gratlspez-2/87007.15.01/Ausgrabungen_KA	KA Nur eine Schicht (Dolomitschutt), keine SEnummern vergeben
7	ORD	Gratlspez-3	Gratlspez-3/87007.15.01/Ausgrabungen	Gratlspez-3/87007.15.01/Ausgrabungen_1	1 Feiner Dolomitschutt
8	ORD	Gratlspez-3	Gratlspez-3/87007.15.01/Ausgrabungen	Gratlspez-3/87007.15.01/Ausgrabungen_2	2 Reste einer Feuerstelle (Mittelalter oder Neuzeit)
9	ORD	Gratlspez-3	Gratlspez-3/87007.15.01/Ausgrabungen	Mauk-B/87007.15.01/Ausgrabungen_1	1 Sandsteinmure
10	ORD	Gratlspez-3	Gratlspez-3/87007.15.01/Ausgrabungen	Mauk-B/87007.15.01/Ausgrabungen_2	2 Gehhorizont

	J	R	S
1	fundnr	E19_parent_id	E55_E19
2	1	Gratlspez-1/87007.15.01/Konvolut_1	240255@Konvolut
3	1	Gratlspez-1/87007.15.01/Probe_1	175880@Probe
4	1	Gratlspez-1/87007.15.01/Leuchtspäne_1	xxxxxx@Leuchtspäne
5	2	Gratlspez-1/87007.15.01/Konvolut_2	240255@Konvolut
6	2	Gratlspez-1/87007.15.01/Keramik_2	175868@Keramik
7	2	Gratlspez-1/87007.15.01/Blech_2	xxxxxx@Blech
8	2	Gratlspez-1/87007.15.01/Anorganische Probe_2	175882@Anorganische Probe
9	4	Gratlspez-1/87007.15.01/Konvolut_4	240255@Konvolut
10	4	Gratlspez-1/87007.15.01/Keramik_4	175868@Keramik
11	4	Gratlspez-1/87007.15.01/Probe_4	175880@Probe
12	5	Gratlspez-1/87007.15.01/Holz_5	175523@Holz
13	6	Gratlspez-1/87007.15.01/Probe_6	175880@Probe

CIDOC CRM REPRESENTATION



RDF: A WAY TO ENCODE DATA IN TRIPLES

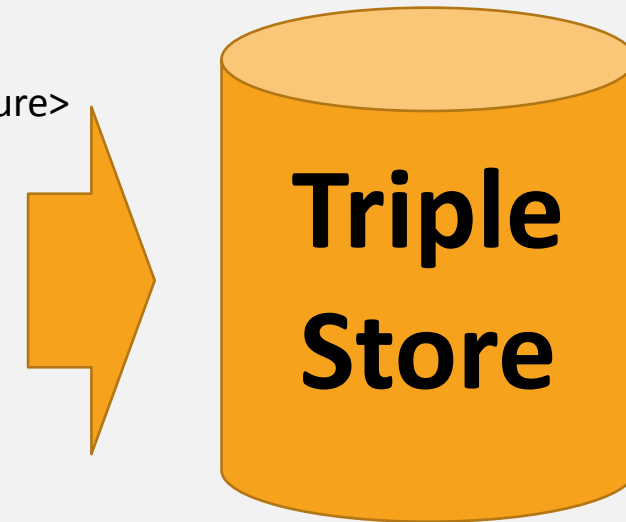


Subject: <http://www.uibk.ac.at/himat/himat_source/Pirkl/S20/1>
Predicate: <<http://www.w3.org/1999/02/22-rdf-syntax-ns#type>>
Object: <http://www.cidoc-crm.org/cidoc-crm/S20_Physical_Feature>

Subject: <http://www.uibk.ac.at/himat/himat_source/Pirkl/S20/1>
Predicate: <http://www.cidoc-crm.org/cidoc-crm/P2_has_type>
Object: <<http://www.uibk.ac.at/himat/E55/175390>>

Subject: <<http://www.uibk.ac.at/himat/E55/175390>>
Predicate: <<http://www.w3.org/2004/02/skos/core#prefLabel>>
Object: "Underground mine"@en

Subject: <http://www.uibk.ac.at/himat/himat_source/Pirkl/S20/1>
Predicate: <<http://www.w3.org/2000/01/rdf-schema#label>>
Object: "Mauk E"



"Mauk E"

E18 Physical Thing



Underground mine

RDF CREATION PIPELINE

EXCEL-> TXT FILE-> DATABASE-> KARMA/ONTOREFINE-> GRAPHDB

Excel: Data Entry

	A	B	C	D	E	F	G	H	I	J	K	L	
1	E15_project	15_institution01	provenanc	E39	S20_id	S20_parent_id	E41_S20	E55_E7_past	E55_S20	E53 (Datenerze	S3_katgem_n	3	
2	ORD	uibk_himat	S20_ORD-Ur	Staudt	Rotholz_Verhuettungsplat	Rotholz_Verl	175784@Vei	240207@Vei	BEV		87002	Buch in Tirol 1:	
3	ORD	uibk_himat	S20_ORD-Ur	Staudt	Rotholz_Verl	Rotholz_Verl	Rotholz_Verl	175784@Vei	240207@Vei	BEV		87002	Buch in Tirol 1:
4	ORD	uibk_himat	S20_ORD-Ur	Staudt	Rotholz_Verl	Rotholz_Verl	Rotholz_Verl	175784@Vei	240207@Vei	BEV		87002	Buch in Tirol 1:
5	ORD	uibk_himat	S20_ORD-Ur	Staudt	Rotholz_Verl	Rotholz_Verl	Rotholz_Verl	175784@Vei	240207@Vei	BEV		87002	Buch in Tirol 1:
6													
7													
8													

Thesaurus

Central Topic
activities@bibt:00001 aat:300404112
disciplines@bibt:000010 himat:175420 aat:300054134
human interactions@bibt:000011 himat:238108
intentional destructions@bibt:000012 aat:300053085
functions@bibt:000013
other activities@bibt:000014
natural processes@bibt:000002 himat:175753
materials@bibt:000003 himat:175511
material things@bibt:000004 aat:300311889
mobile objects@bibt:000017 himat:175860 aat:300310093
built environment@bibt:000018 aat:300254226
physical features@bibt:000019 himat:175592
structural parts of material objects@bibt:000020
types of epochs@bibt:000005 himat:175475 aat:300264088
Epochen@himat:175476
Römische Kaiserzeit@himat:175490 aat:300020541 po:p0qhb66wrng
Spätantike@himat:175491
Mittelalter@himat:175492 aat:300020756 po:p0qhb66433w
Neuzeit@himat:175496 po:p0qhb668mm5
Prähistorisch@himat:240040 ORD_period:38 aat:300019257
Archaik@himat:240033 aat:300020086
Geologische Zeiträume@himat:175499 aat:300391250
conceptual objects@bibt:000006 himat:175419
groups and collectivities@bibt:000007 himat:175981 aat:300025948
roles@bibt:000008 aat:300435108
geopolitical units@bibt:000009

Database: Identifier creation / Joins

Query Editor

```
1 SELECT art_id, title, authors, year, vol_nr, art_nr_in_volume,
2 FROM public.av_toc_gt_lv;
```

Data Output

art_id	title	authors
1 jbav_1873_004_155	Erste Besteigung des Grossen Geiger.	Issler, Richard
2 jbav_1980_105_15	Bergsteigen in den östlichen Zillertaler Al...	Höfner, Horst
3 jbav_1990_114_38	Skitouren in den Osttaler Alpen: 1948 bis ...	Weiss, Rudolf
4 jbav_1981_106_75	Karwendel - Abenteuer für Generationen ...	Wagner, Helmut

RDF Creation

OntoRefine

Visual graph

GraphDB

Triple Store

Visual graph

GraphDB

Import

Explore

Visual graph

SPARQL

Monitor

Setup

Help

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OVERVIEW – RDF CREATION PIPELINE DOCUMENTATION

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OVERVIEW – RDF CREATION PIPELINE

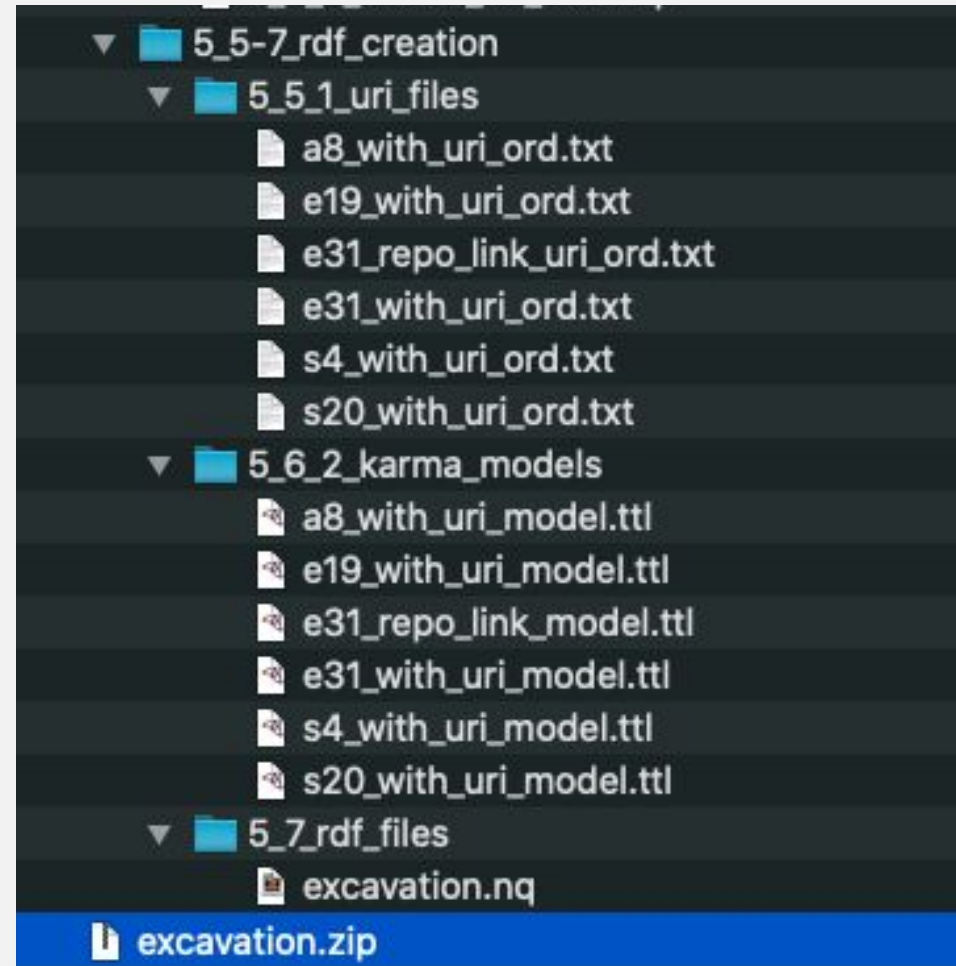
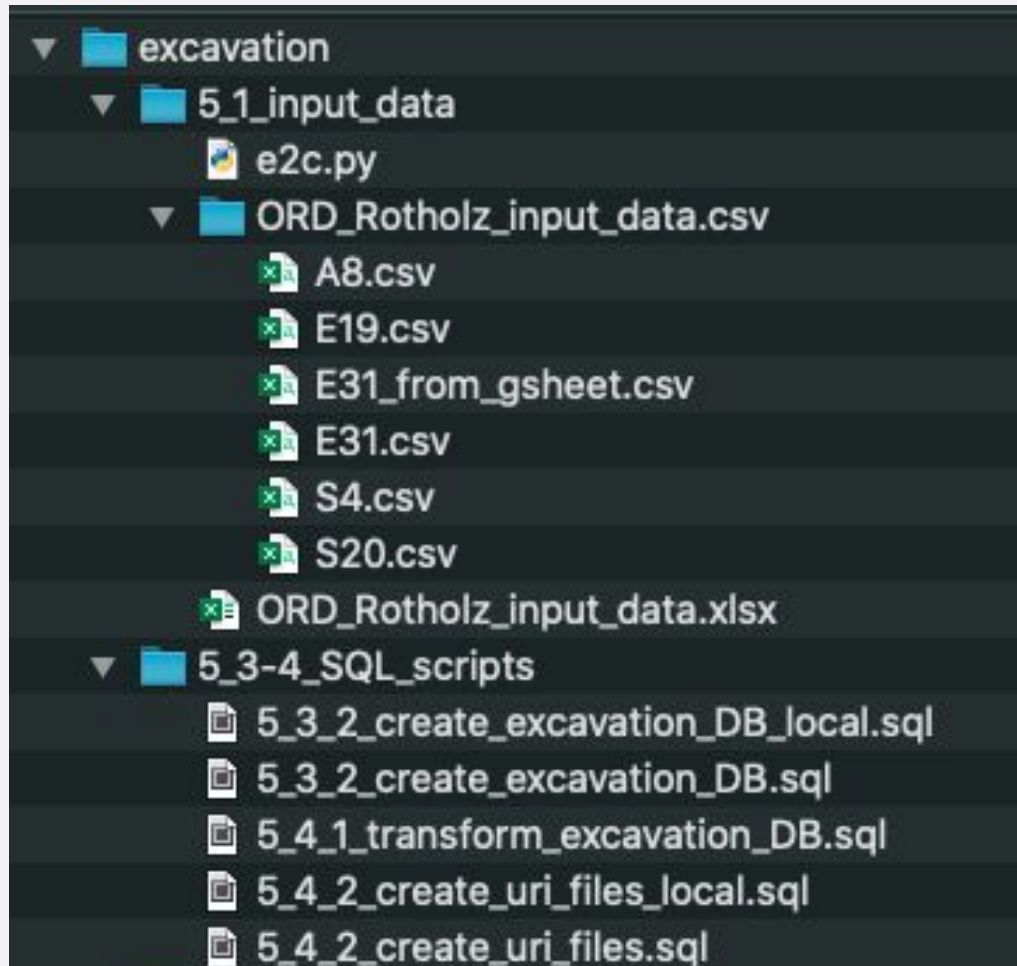
RDF Creation Pipeline

https://drive.google.com/open?id=1Mnapm5Oly85qputE7s0JAPllmQSbCRqU&authuser=gerald.hiebel%40uibk.ac.at&usp=drive_fs

- 5.1. Create utf8 tab delimited structured data from a spreadsheet or from a database
- 5.2. Understand your data and create a conceptual model based on an ontology
 - 5.2.1. CIDOC CRM ontology
- 5.3. Load data into Postgres
 - 5.3.1. Move data to input directory for postgres.
 - 5.3.2. Create database and use SQL Scripts to load data
- 5.4. Transform data & create URI identifiers (and labels) for concepts in postgres
 - 5.4.1. Transform data
 - 5.4.2. Create URI identifiers
- 5.5. Import in RDF creation software (Karma)
- 5.6. Create conceptual model or apply existing model
- 5.7. Publish RDF to triple store (GraphDB)
6. Triple Store

RDF CREATION PIPELINE EXCAVATION DATA

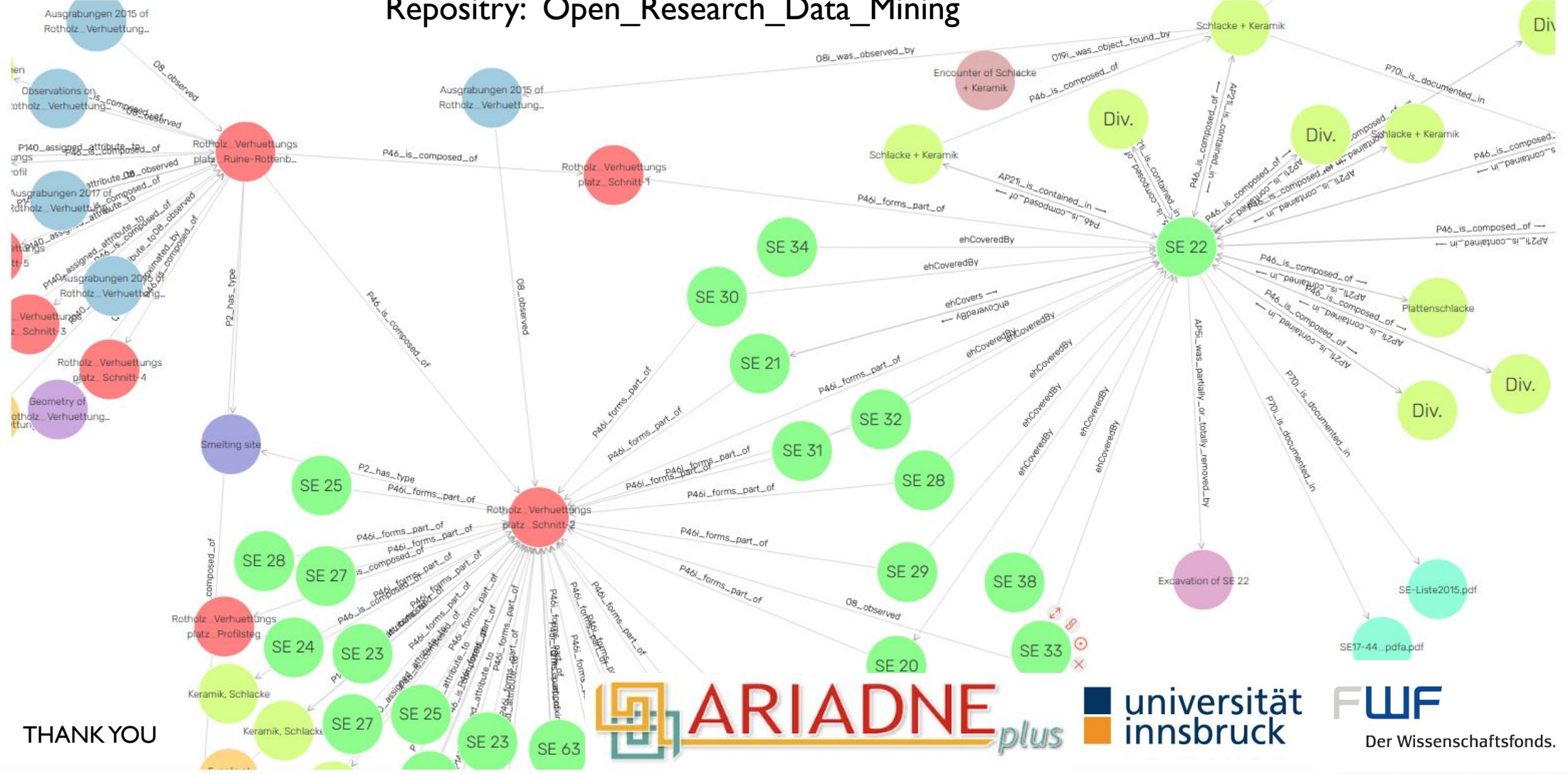
RDF Creation Pipeline Excavation Data <https://drive.google.com/drive/folders/1O1qXl3PkLF9bhhyS6aR9qbm4voEM62CU?usp=sharing>



Visual graph

<https://disc-semantic.uibk.ac.at/>

Repository: Open_Research_Data_Mining



GraphDB STANDARD

Graphs overview

Import

Explore

Search Graphs

Showing 1 - 10 of 21 results

THANK YOU



OUTLOOK: CREATE ARIADNE DATA

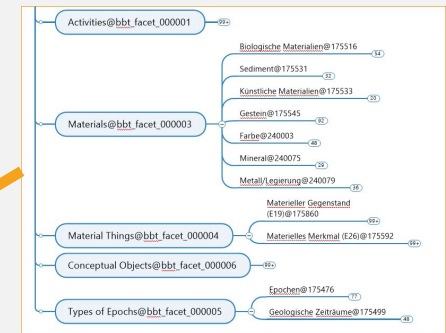
ARIADNE meta data

	A	B	C	D	E
1	URI_AO_Entity	rdf_type	rdfs_label	aocat_has_landing_page	aocat_has_description
2	https://zenodo.org/communities/himat-uibk/	https://www.ariadne-infrastructure.eu/resource/ao/cat/1.1/AO_Collection_UIBK_HIMAT_collection	https://zenodo.org/communities/himat-uibk/	https://zenodo.org/communities/himat-uibk/	This is the collection of the research center
3	http://uibk.ac.at/ORD/E31/10.5281/zenodo.52447	https://www.ariadne-infrastructure.eu/resource/ao/cat/1.1/AO_Individual_Austrian_Federal_Monument_Rotholz_Verhuettungsp	https://doi.org/10.5281/zenodo.52447	https://doi.org/10.5281/zenodo.52447	The documentation of the Austrian Federal Monument Rotholz close to Ruine Rottenburg
4	http://uibk.ac.at/ORD/S20/Rotholz_Verhuettungsp	https://www.ariadne-infrastructure.eu/resource/ao/cat/1.1/AO_Individual_Austrian_Federal_Monument_Rotholz_Verhuettungsp	https://doi.org/10.5281/zenodo.52434	https://doi.org/10.5281/zenodo.52434	The documentation of the Austrian Federal Monument Rotholz close to Ruine Rottenburg
5	http://uibk.ac.at/ORD/E31/10.5281/zenodo.52434	https://www.ariadne-infrastructure.eu/resource/ao/cat/1.1/AO_Individual_Austrian_Federal_Monument_Rotholz_Verhuettungsp	https://doi.org/10.5281/zenodo.52434	https://doi.org/10.5281/zenodo.52434	The documentation of the Austrian Federal Monument Rotholz close to Ruine Rottenburg
6	http://uibk.ac.at/ORD/S20/Rotholz_Verhuettungsp	https://www.ariadne-infrastructure.eu/resource/ao/cat/1.1/AO_Individual_Austrian_Federal_Monument_Rotholz_Verhuettungsp	https://doi.org/10.5281/zenodo.52447	https://doi.org/10.5281/zenodo.52447	The documentation of the Austrian Federal Monument Rotholz close to Ruine Rottenburg
7	http://uibk.ac.at/ORD/E31/10.5281/zenodo.52447	https://www.ariadne-infrastructure.eu/resource/ao/cat/1.1/AO_Individual_Austrian_Federal_Monument_Rotholz_Verhuettungsp	https://doi.org/10.5281/zenodo.52447	https://doi.org/10.5281/zenodo.52447	The documentation of the Austrian Federal Monument Rotholz close to Ruine Rottenburg
8	http://uibk.ac.at/ORD/S20/Rotholz_Verhuettungsp	https://www.ariadne-infrastructure.eu/resource/ao/cat/1.1/AO_Individual_Austrian_Federal_Monument_Rotholz_Verhuettungsp	https://doi.org/10.5281/zenodo.52366	https://doi.org/10.5281/zenodo.52366	The documentation of the Austrian Federal Monument Rotholz close to Ruine Rottenburg
9	http://uibk.ac.at/ORD/E31/10.5281/zenodo.52366	https://www.ariadne-infrastructure.eu/resource/ao/cat/1.1/AO_Individual_Austrian_Federal_Monument_Rotholz_Verhuettungsp	https://doi.org/10.5281/zenodo.52366	https://doi.org/10.5281/zenodo.52366	The documentation of the Austrian Federal Monument Rotholz close to Ruine Rottenburg
10	http://uibk.ac.at/ORD/S20/Gratspitz-1	https://www.ariadne-infrastructure.eu/resource/ao/cat/1.1/AO_Individual_Mining_Site_Gratspitz_1	https://doi.org/10.5281/zenodo.52447	https://doi.org/10.5281/zenodo.52447	The documentation of the Austrian Federal Monument Rotholz close to Ruine Rottenburg
11	http://uibk.ac.at/ORD/S20/Gratspitz-2	https://www.ariadne-infrastructure.eu/resource/ao/cat/1.1/AO_Individual_Mining_Site_Gratspitz_2	https://doi.org/10.5281/zenodo.52447	https://doi.org/10.5281/zenodo.52447	The documentation of the Austrian Federal Monument Rotholz close to Ruine Rottenburg
12	http://uibk.ac.at/ORD/S20/Gratspitz-3	https://www.ariadne-infrastructure.eu/resource/ao/cat/1.1/AO_Individual_Mining_Site_Gratspitz_3	https://doi.org/10.5281/zenodo.52447	https://doi.org/10.5281/zenodo.52447	The documentation of the Austrian Federal Monument Rotholz close to Ruine Rottenburg
13	http://uibk.ac.at/ORD/S20/Mauk-B	https://www.ariadne-infrastructure.eu/resource/ao/cat/1.1/AO_Individual_Mining_Site_Mauk_B	https://doi.org/10.5281/zenodo.52447	https://doi.org/10.5281/zenodo.52447	The documentation of the Austrian Federal Monument Rotholz close to Ruine Rottenburg
14	http://uibk.ac.at/ORD/S20/Mooschrofen-1	https://www.ariadne-infrastructure.eu/resource/ao/cat/1.1/AO_Individual_Mining_Site_Mooschrofen_1	https://doi.org/10.5281/zenodo.52447	https://doi.org/10.5281/zenodo.52447	The documentation of the Austrian Federal Monument Rotholz close to Ruine Rottenburg
15	http://uibk.ac.at/ORD/S20/Mooschrofen-2	https://www.ariadne-infrastructure.eu/resource/ao/cat/1.1/AO_Individual_Mining_Site_Mooschrofen_2	https://doi.org/10.5281/zenodo.52447	https://doi.org/10.5281/zenodo.52447	The documentation of the Austrian Federal Monument Rotholz close to Ruine Rottenburg
16	http://uibk.ac.at/ORD/E31/10.5281/zenodo.52431	https://www.ariadne-infrastructure.eu/resource/ao/cat/1.1/AO_Individual_Austrian_Federal_Monument_Grosskogel-Bauernzeche	https://doi.org/10.5281/zenodo.52431	https://doi.org/10.5281/zenodo.52431	The documentation of the Austrian Federal Monument Rotholz close to Ruine Rottenburg
17	http://uibk.ac.at/ORD/S20/Grosskogel-Bauernzeche	https://www.ariadne-infrastructure.eu/resource/ao/cat/1.1/AO_Individual_Mining_Site_Grosskogel-Bauernzeche	https://doi.org/10.5281/zenodo.52431	https://doi.org/10.5281/zenodo.52431	The documentation of the Austrian Federal Monument Rotholz close to Ruine Rottenburg
18	http://uibk.ac.at/ORD/S20/Blutskopf-Schoenbieglerlei	https://www.ariadne-infrastructure.eu/resource/ao/cat/1.1/AO_Individual_Mining_Site_Blutskopf-Schoenbieglerlei	https://doi.org/10.5281/zenodo.52431	https://doi.org/10.5281/zenodo.52431	The documentation of the Austrian Federal Monument Rotholz close to Ruine Rottenburg
19	http://uibk.ac.at/ORD/S20/Kleinkogel	https://www.ariadne-infrastructure.eu/resource/ao/cat/1.1/AO_Individual_Mining_Site_Kleinkogel	https://doi.org/10.5281/zenodo.52431	https://doi.org/10.5281/zenodo.52431	The documentation of the Austrian Federal Monument Rotholz close to Ruine Rottenburg

Excavation data

	A	B	C	D	E	F	G	H	I	J	K	L
1	E15_project_15	Institution01	provenanc	E39	S20_Id	S20_parent_Id	E41_S20	E55_E7_past	E55_S20	S3	(DatenerzE33_katgem_n3_katgem_nar3	
2	ORD	uibk_himat	S20_ORD-Ur Staudt	Rotholz_Verhuettungsplat	Rotholz_Verl	175784@Vei BEV	87002	Buch in Tirol	1:			
3	ORD	uibk_himat	S20_ORD-Ur Staudt	Rotholz_Verl	Rotholz_Verl	175784@Vei BEV	87002	Buch in Tirol	1:			
4	ORD	uibk_himat	S20_ORD-Ur Staudt	Rotholz_Verl	Rotholz_Verl	175784@Vei BEV	87002	Buch in Tirol	1:			
5	ORD	uibk_himat	S20_ORD-Ur Staudt	Rotholz_Verl	Rotholz_Verl	175784@Vei BEV	87002	Buch in Tirol	1:			
6	ORD	uibk_himat	S20_ORD-Ur Staudt	Rotholz_Verl	Rotholz_Verl	175784@Vei BEV	87002	Buch in Tirol	1:			
7												
8												

Thesaurus for concepts under BBT and match to AAT and Period.o

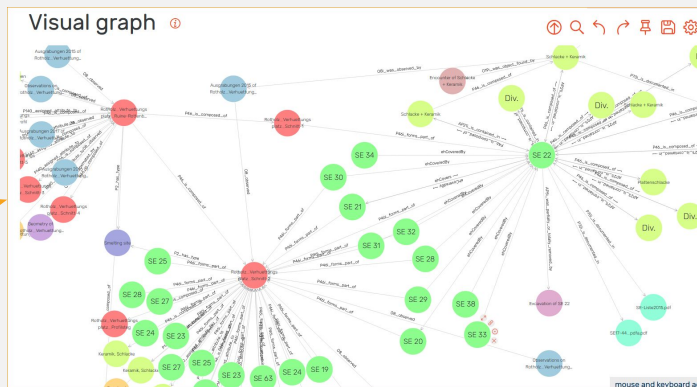
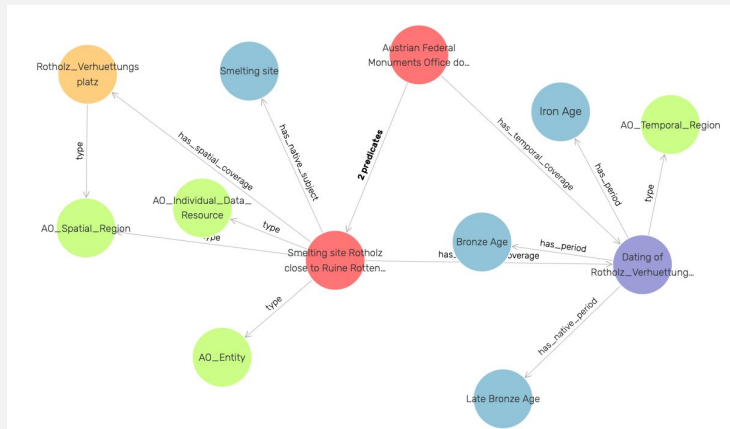


RDF Conversation with SQL and Karma/ Onto Refine / X3ML

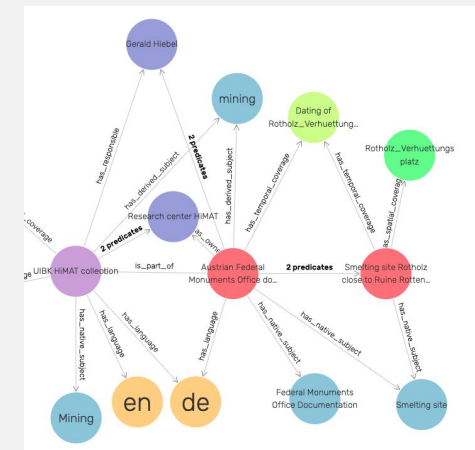
Graph for Ariadne Metadata with URIs related to Excavation Graph

Excavation Graph Thesaurus Graph

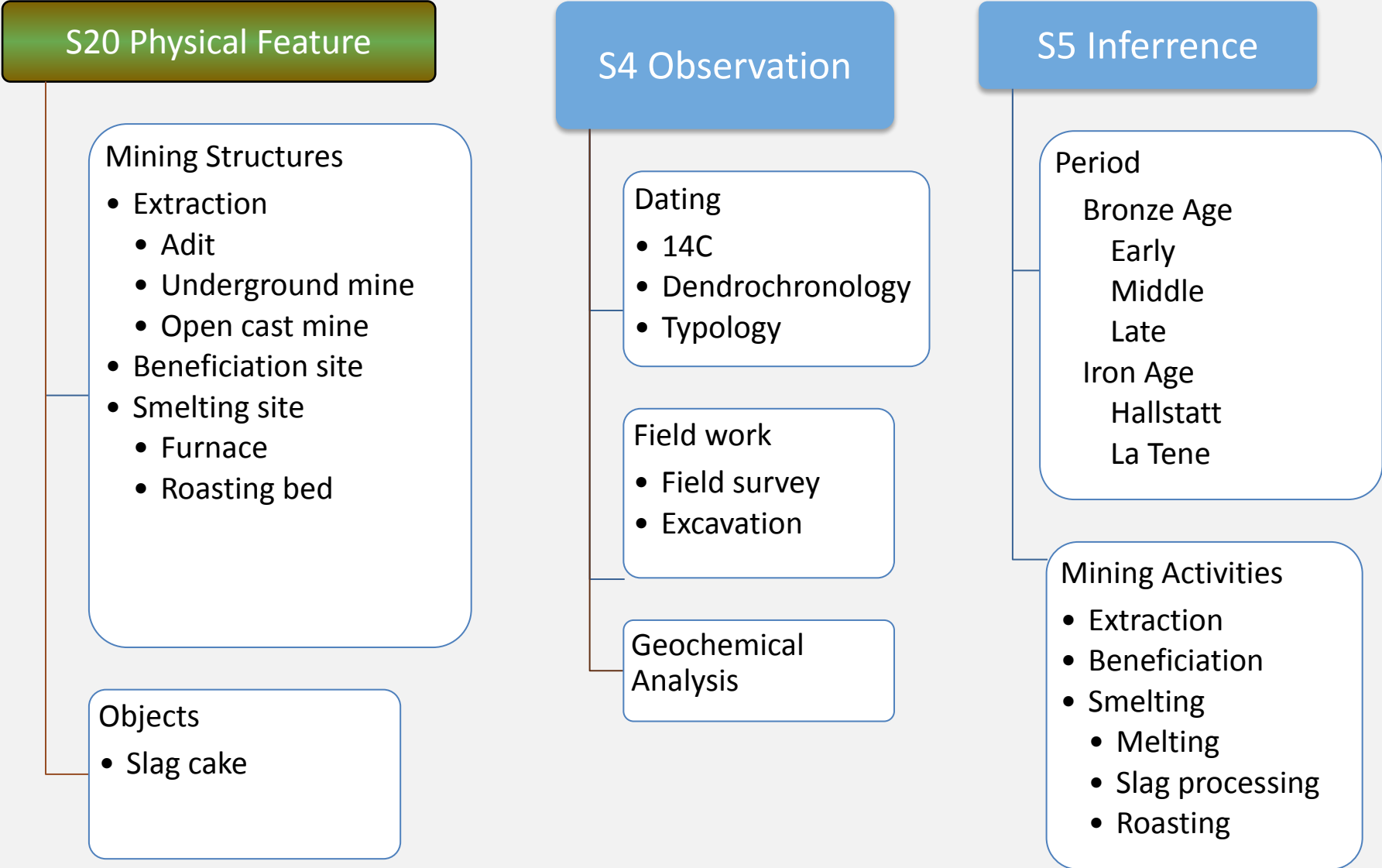
RDF for ARIADNE



Create instances for ARIADNE Catalogue



THESAURUS CREATION



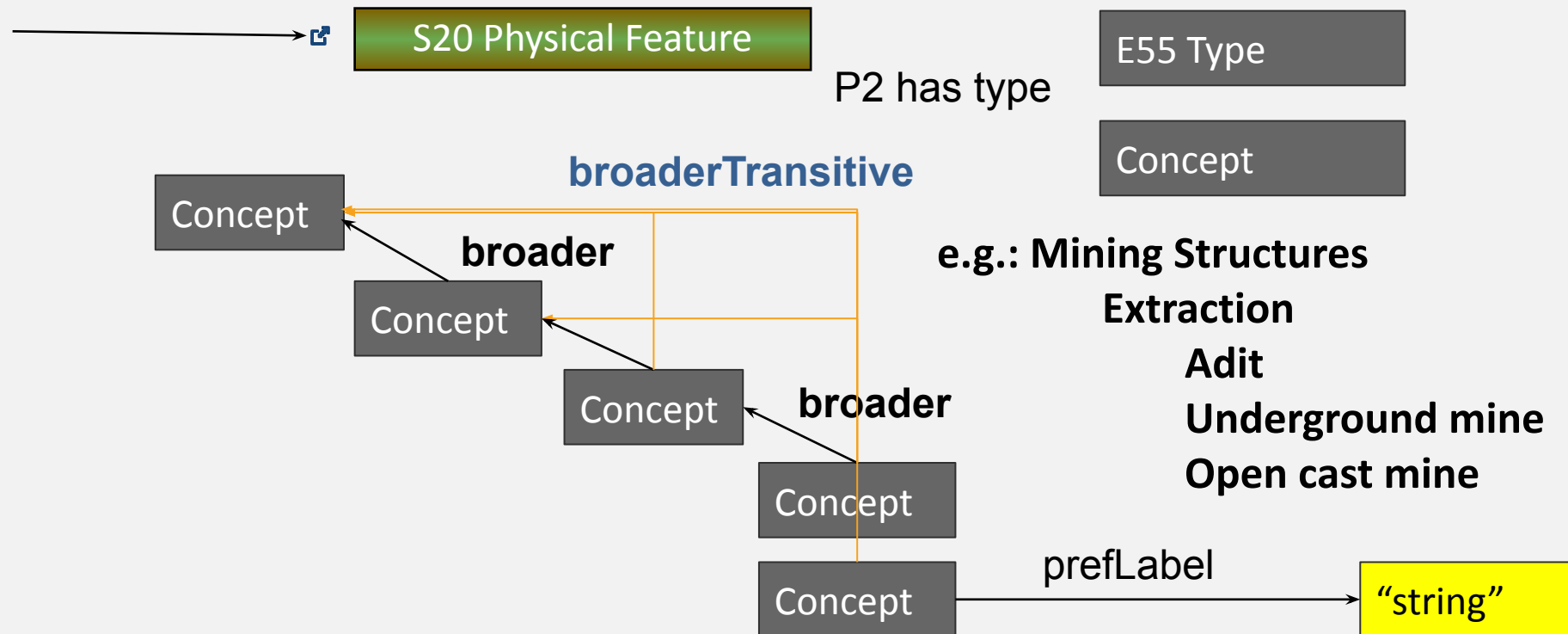
THESAURUS MAPPING TO SKOS

(<https://www.w3.org/2004/02/skos/>)

Simple Knowledge Organisation system:

Standard to support the use of knowledge organization systems (KOS) such as thesauri, classification schemes

“Concept” central class equivalent to E55



E55 TYPES: THESAURUS – CONCEPTS

Perioden: perio.do
<https://perio.do/en/>

Getty AAT
<https://www.getty.edu/research/tools/vocabularies/aat/>

▼ Central Topic

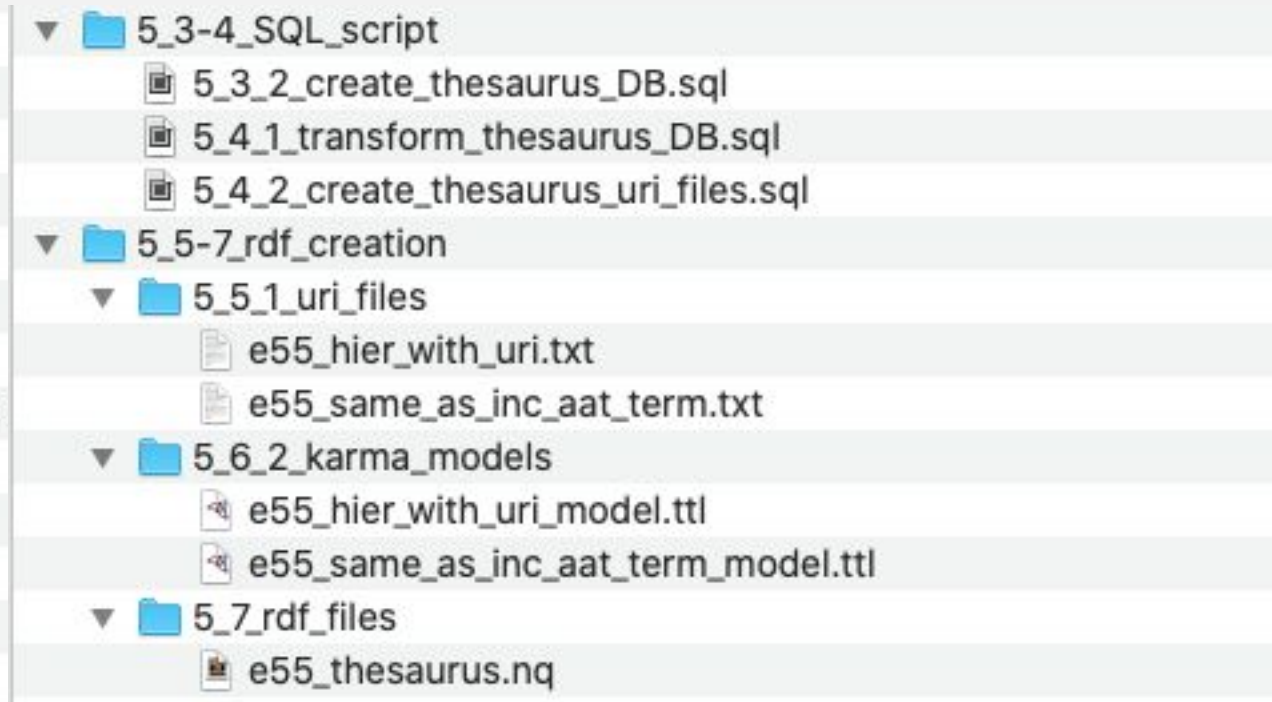
- ▼ activities@bbt:000001|aat:300404112
 - ▶ disciplines@bbt:000010|himat:175420|aat:300054134
 - ▶ human interactions@bbt:000011|himat:238108
 - ▶ intentional destructions@bbt:000012|aat:300053085
 - ▶ functions@bbt:000013
 - ▶ other activities@bbt:000014
 - ▶ natural processes@bbt:000002|himat:175753
 - ▶ materials@bbt:000003|himat:175511
 - ▼ material things@bbt:000004|aat:300311889
 - ▶ mobile objects@bbt:000017|himat:175860|aat:300310093
 - ▶ built environment@bbt:000018|aat:300254226
 - ▶ physical features@bbt:000019|himat:175592
 - ▶ structural parts of material objects@bbt:000020
 - ▼ types of epochs@bbt:000005|himat:175475|aat:300264088
 - ▼ Epochen@himat:175476
 - ▶ Römische Kaiserzeit@himat:175490|aat:300020541|po:p0qhb66wrng
 - ▶ Spätantike@himat:175491
 - ▶ Mittelalter@himat:175492|aat:300020756|po:p0qhb66433w
 - ▶ Neuzeit@himat:175496|po:p0qhb668mm5
 - ▶ Prähistorisch@himat:240040|ORD_period:38|aat:300019257
 - ▶ Archaik@himat:240033|aat:300020086
 - ▶ Geologische Zeiträume@himat:175499|aat:300391250
 - ▶ conceptual objects@bbt:000006|himat:175419
 - ▶ groups and collectivities@bbt:000007|himat:175981|aat:300025948
 - ▶ roles@bbt:000008|aat:300435108
 - ▶ geopolitical units@bbt:000009

- ▼ material things@bbt:000004|aat:300311889
 - ▶ mobile objects@bbt:000017|himat:175860|aat:300310093
 - ▶ built environment@bbt:000018|aat:300254226
 - ▼ physical features@bbt:000019|himat:175592
 - ▶ Vegetation@himat:175644|aat:300008932
 - ▶ Geologie@himat:175593
 - ▶ Hydrologie@himat:175611|aat:300387652
 - ▼ Hergestelltes Merkmal (E25)@himat:238106|aat:300224592
 - ▶ Alm@himat:175691|aat:300008635
 - ▶ Deponierung@himat:175727|aat:300195474
 - ▶ Gewässerfund@himat:175728
 - ▶ Passfund@himat:175729
 - ▶ Bestattungsplatz@himat:175730|aat:300387004
 - ▶ Religion/Sakrales@himat:175746|aat:300412063
 - ▼ Bergbau Merkmal@himat:238107
 - ▶ Schmiede@himat:175675
 - ▶ Verhüttungsplatz@himat:240207|himat:175674
 - ▶ Aufbereitungsplatz@himat:240241
 - ▶ Abbau Merkmal@himat:240228|aat:300000390
 - ▶ Ausgrabungsplatz@himat:240062|aat:300266151

RDF CREATION PIPELINE THESAURUS DATA

RDF Creation Pipeline Thesaurus Data

<https://drive.google.com/drive/folders/1PPg0hVqoN6mTzcP0olzpXlzkvTK8xE?usp=sharing>



PIPELINE

EXCEL-> TXT FILE-> DATABASE-> KARMA/ONTOREFINE-> GRAPHDB

Excel: Data Entry

	A	B	C	D	E	F	G	H	I	J	K	L	
1	E15_project	15_institution	01_provenanc	E39	S20_id	S20_parent_id	E41_S20	E55_E7_past	E55_S20	E53 (Datenerze	S3_katgem_n_3_katgem_nari3		
2	ORD	uibk_himat	S20_ORD-Ur Staudt		Rotholz_Verhuettungsplat	Rotholz_Verl	175784@Vei	240207@Vei	BEV		87002	Buch in Tirol 1:	
3	ORD	uibk_himat	S20_ORD-Ur Staudt		Rotholz_Verl	Rotholz_Verl	Rotholz_Verl	175784@Vei	240207@Vei	BEV		87002	Buch in Tirol 1:
4	ORD	uibk_himat	S20_ORD-Ur Staudt		Rotholz_Verl	Rotholz_Verl	Rotholz_Verl	175784@Vei	240207@Vei	BEV		87002	Buch in Tirol 1:
5	ORD	uibk_himat	S20_ORD-Ur Staudt		Rotholz_Verl	Rotholz_Verl	Rotholz_Verl	175784@Vei	240207@Vei	BEV		87002	Buch in Tirol 1:
6													
7													
8													

Thesaurus

Central Topic
activities@bbt:00001 aat:300404112
disciplines@bbt:000010 himat:175420 aat:300054134
human interactions@bbt:000011 himat:238108
intentional destructions@bbt:000012 aat:300053085
functions@bbt:000013
other activities@bbt:000014
natural processes@bbt:000002 himat:175753
materials@bbt:000003 himat:175511
material things@bbt:000004 aat:300311889
mobile objects@bbt:000017 himat:175860 aat:300310093
built environment@bbt:000018 aat:300254226
physical features@bbt:000019 himat:175592
structural parts of material objects@bbt:000020
types of epochs@bbt:000005 himat:175475 aat:300264088
Epochen@himat:175476
Römische Kaiserzeit@himat:175490 aat:300020541 po:p0qhb66wrng
Spätantike@himat:175491
Mittelalter@himat:175492 aat:300020756 po:p0qhb66433w
Neuzeit@himat:175496 po:p0qhb668mm5
Prähistorisch@himat:240040 ORD_period:38 aat:300019257
Archaik@himat:240033 aat:300020086
Geologische Zeiträume@himat:175499 aat:300391250
conceptual objects@bbt:000006 himat:175419
groups and collectivities@bbt:000007 himat:175981 aat:300025948
roles@bbt:000008 aat:300435108
geopolitical units@bbt:000009

Database: Identifier creation / Joins

pgAdmin 4

Query Editor

```
1 SELECT art_id, title, authors, year, vol_nr, art_nr_in_volume,
2 FROM public.av_toc_gt_lv;
```

Data Output

art_id	title	authors
1 jbav_1873_004_155	Erste Besteigung des Grossen Geiger.	Issler, Richard
2 jbav_1980_105_15	Bergsteigen in den östlichen Zillertaler Al...	Höfner, Horst
3 jbav_1990_114_38	Skitouren in den Osttaler Alpen: 1948 bis ...	Weiss, Rudolf
4 jbav_1981_106_75	Karwendel - Abenteuer für Generationen ...	Wagner, Helmut

RDF Creation

GraphDB

OntoRefine

Visual graph

Graph visualization showing nodes and relationships.

Triple Store

GraphDB


Visual graph

Network graph visualization with nodes and edges.

Nodes include: Article, 1873/1, Erste Besteigung des G..., Großes Geiger, AV_Zahlbuch_1873.

A8 Stratigraphic Unit

Project

S20
Physical
featureS4
Observation


Excavation

A8
Stratigraphic
Unit

	A	D	E	F	G	H	I
1	E15_project	maßnahmen_id	S20_id	S4_id_moved	A8_id	A8_nr.	A8_description
2	ORD	87007.15.01	Gratlspitz-1_1	Gratlspitz-1/87007.15.01/Ausgrabungen	Gratlspitz-1/87007.15.01/Ausgrabungen_1	1	Grau-humose Schicht, letzter Gehhorizont
3	ORD	87007.15.01	Gratlspitz-1_1	Gratlspitz-1/87007.15.01/Ausgrabungen	Gratlspitz-1/87007.15.01/Ausgrabungen_2	2	Grober, steriler Versatz mit wenig Erz und HK
4	ORD	87007.15.01	Gratlspitz-1_1	Gratlspitz-1/87007.15.01/Ausgrabungen	Gratlspitz-1/87007.15.01/Ausgrabungen_3	3	Steril-lehmige Sedimentschicht
5	ORD	87007.15.01	Gratlspitz-1_1	Gratlspitz-1/87007.15.01/Ausgrabungen	Gratlspitz-1/87007.15.01/Ausgrabungen_4	4	Prähistorischer Versatz mit HK auf Grubensohle
6	ORD	87007.15.01	Gratlspitz-2	Gratlspitz-2/87007.15.01/Ausgrabungen	Gratlspitz-2/87007.15.01/Ausgrabungen_KA	KA	Nur eine Schicht (Dolomitschutt), keine SENummern vergeben
7	ORD	87007.15.01	Gratlspitz-3	Gratlspitz-3/87007.15.01/Ausgrabungen	Gratlspitz-3/87007.15.01/Ausgrabungen_1	1	Feiner Dolomitschutt
8	ORD	87007.15.01	Gratlspitz-3	Gratlspitz-3/87007.15.01/Ausgrabungen	Gratlspitz-3/87007.15.01/Ausgrabungen_2	2	Reste einer Feuerstelle (Mittelalter oder Neuzeit)
9	ORD	87007.15.01	Mauk-B_3	Mauk-B/87007.15.01/Ausgrabungen	Mauk-B/87007.15.01/Ausgrabungen_1	1	Sandsteinmure
10	ORD	87007.15.01	Mauk-B_3	Mauk-B/87007.15.01/Ausgrabungen	Mauk-B/87007.15.01/Ausgrabungen_2	2	Gehhorizont
11	ORD	87007.15.01	Mauk-B_3	Mauk-B/87007.15.01/Ausgrabungen	Mauk-B/87007.15.01/Ausgrabungen_3	3	Versatz
12	ORD	87007.15.01	Mauk-B_3	Mauk-B/87007.15.01/Ausgrabungen	Mauk-B/87007.15.01/Ausgrabungen_4	4	Pochklein?
13	ORD	87007.15.01	Mauk-B_4	Mauk-B/87007.15.01/Ausgrabungen	Mauk-B/87007.15.01/Ausgrabungen_5	5	Höhlenstaub

E55
Type


E19 Physical Object



Excavation

E19 Physical
ObjectA8
Stratigraphic
UnitParent E19
Physical
Object

 Type of physical
feature

 Material of
physical feature

	D	F	G	I	J	R	S
1	S4_id_moved	E19_id	A8_id	fundnr	E19_parent_id	E55_E19	E57_E19
2	Gratlspitz-1/87007.15.01/Ausgrabungen	Gratlspitz-1/87007.15.01/Konvolut_1	Gratlspitz-1/87007.15.01/Ausgrabungen_4	1		240255@Konvolut	
3	Gratlspitz-1/87007.15.01/Ausgrabungen	Gratlspitz-1/87007.15.01/Probe_1	Gratlspitz-1/87007.15.01/Ausgrabungen_4	1	Gratlspitz-1/87007.15.01/Konvo	175880@Probe	240222@Holzkohle
4	Gratlspitz-1/87007.15.01/Ausgrabungen	Gratlspitz-1/87007.15.01/Leuchtpäne_1	Gratlspitz-1/87007.15.01/Ausgrabungen_4	1	Gratlspitz-1/87007.15.01/Konvo	xxxxxx@Leuchtpäne	175523@Holz
5	Gratlspitz-1/87007.15.01/Ausgrabungen	Gratlspitz-1/87007.15.01/Konvolut_2	Gratlspitz-1/87007.15.01/Ausgrabungen_1 Gratlspitz	2		240255@Konvolut	
6	Gratlspitz-1/87007.15.01/Ausgrabungen	Gratlspitz-1/87007.15.01/Keramik_2	Gratlspitz-1/87007.15.01/Ausgrabungen_1 Gratlspitz	2	Gratlspitz-1/87007.15.01/Konvo	175868@Keramik	
7	Gratlspitz-1/87007.15.01/Ausgrabungen	Gratlspitz-1/87007.15.01/Blech_2	Gratlspitz-1/87007.15.01/Ausgrabungen_1 Gratlspitz	2	Gratlspitz-1/87007.15.01/Konvo	xxxxxx@Blech	175542@Eisen
8	Gratlspitz-1/87007.15.01/Ausgrabungen	Gratlspitz-1/87007.15.01/Anorganische Probe_2	Gratlspitz-1/87007.15.01/Ausgrabungen_1 Gratlspitz	2	Gratlspitz-1/87007.15.01/Konvo	175882@Anorganische Probe	240220@Erz
9	Gratlspitz-1/87007.15.01/Ausgrabungen	Gratlspitz-1/87007.15.01/Konvolut_4	Gratlspitz-1/87007.15.01/Ausgrabungen_1	4		240255@Konvolut	
10	Gratlspitz-1/87007.15.01/Ausgrabungen	Gratlspitz-1/87007.15.01/Keramik_4	Gratlspitz-1/87007.15.01/Ausgrabungen_1	4		175868@Keramik	
11	Gratlspitz-1/87007.15.01/Ausgrabungen	Gratlspitz-1/87007.15.01/Probe_4	Gratlspitz-1/87007.15.01/Ausgrabungen_1	4		175880@Probe	240222@Holzkohle
12	Gratlspitz-1/87007.15.01/Ausgrabungen	Gratlspitz-1/87007.15.01/Holz_5	Gratlspitz-1/87007.15.01/Ausgrabungen_4	5		175523@Holz	
13	Gratlspitz-1/87007.15.01/Ausgrabungen	Gratlspitz-1/87007.15.01/Probe_6	Gratlspitz-1/87007.15.01/Ausgrabungen_4	6		175880@Probe	240222@Holzkohle