

## From modelling to mappings: how to appropriate the CIDOC CRM

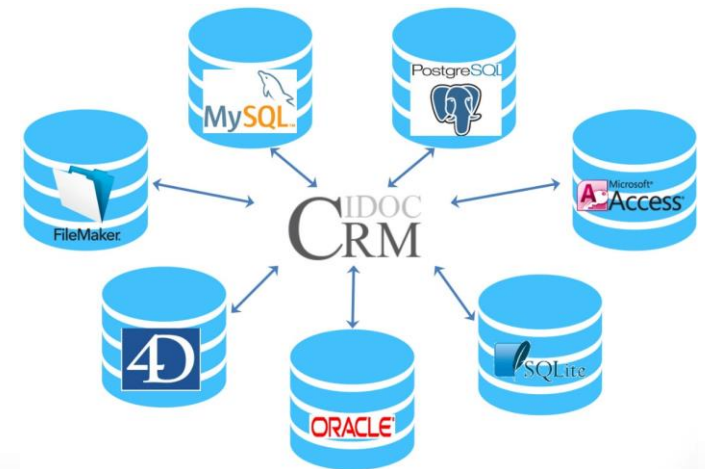
Olivier MARLET

MASA Consortium

CNRS, University of Tours



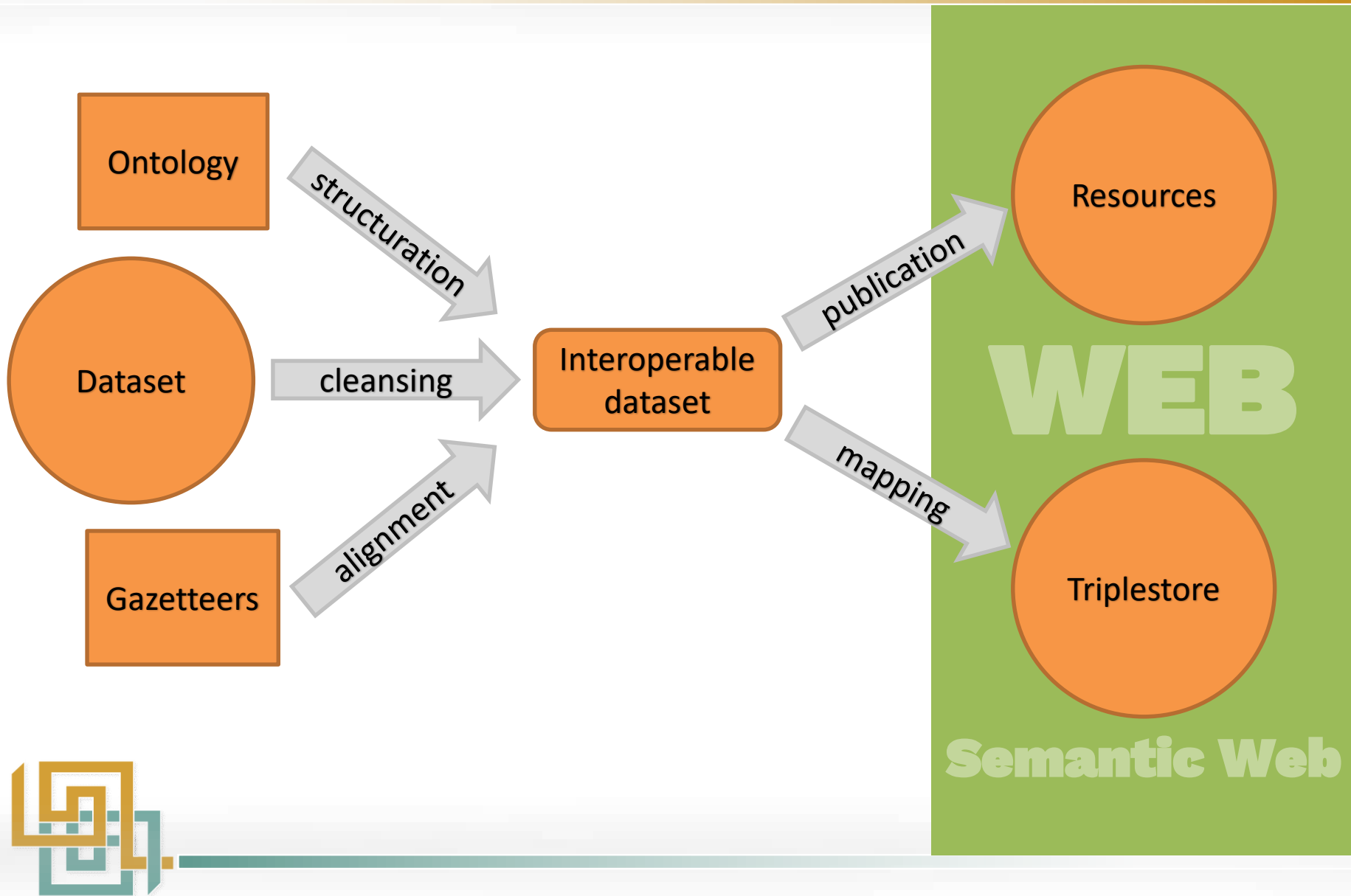
# MASA Consortium



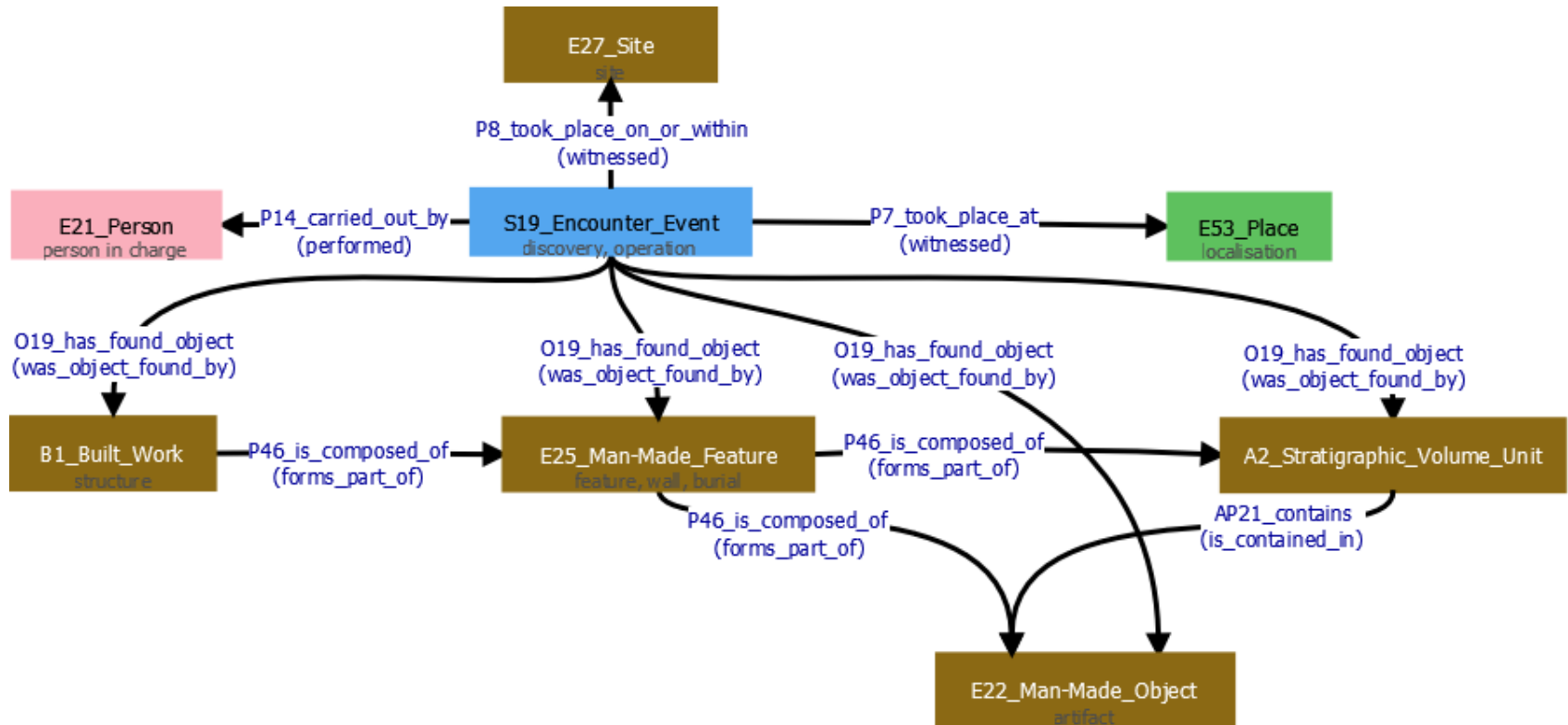
# Digital ecosystem



# Workflow



# Modeling datasets







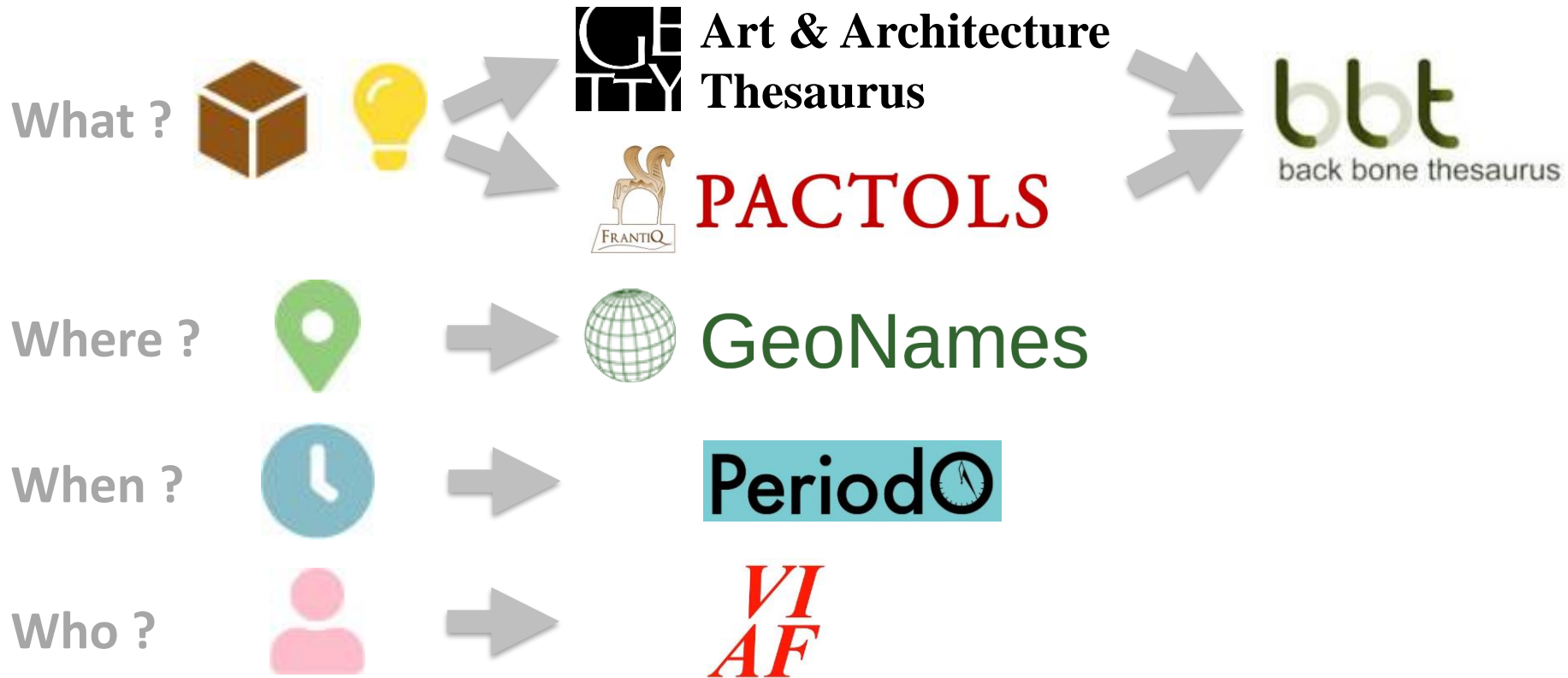


## OpenRefine

- **Data cleansing, harmonization:** detection of duplicates, variants in the occurrences of a field.
- **Data restructuring:** automatically split a field that contains several pieces of information (chronological range to be split into start date / end date).
- **Data enrichment:** use of web services to retrieve information (perennial URI of a concept in a thesaurus, geographic coordinates).



# Standard vocabularies and gazetteers





# Datasets publication

**ArSol**  
Archives du Sol - © 1996 - 2014 UMR 7324 CITERES - Laboratoire Archéologie et Territoires

**RECHERCHE** CONSULTATION STRATIGRAPHIQUE

Recherche  
Résultats [Retour à la Fiche du Départ](#)

Tours site 17 - Marmoutier  
sol carrelé  
Fait 14

Nom : sol carrelé    Secteur : 1    Structure :    Zone : 1

Description :  
Dallage de carreaux de terre cuite

**Le Fait contient 6 US.**

Número	Description
10172	Carreaux de terre cuite. Le carrelage occupait une surface limitée à l'intérieur du bâtiment 4 dans un espace délimité.
10239	Niveau très friable de mortier de chaux de couleur blanche comprenant des gravillons fin. Niveau de préparation...
10240	Mortier de chaux de couleur blanche contenant des inclusions très fines. Réfection du sol de carreaux de terre cuite...
10252	terre limoneuse de couleur brune avec des inclusions très fines de buffeau, très peu de chaux et de sable servant de...
10258	Mortier de chaux avec des inclusions de galets (1cm), des fragments de tuffeau et de TCA. Il s'agit d'une réfection du...
10291	niveau de terre limono-argileuse compact de couleur brune, peu épais.

[Aide à la datation par la céramique](#)  
[Affichage du fichier FDF](#)

36 PHOTOS 12

**citres** UMR 7324

## AERBA ATLAS DES ÉTABLISSEMENTS RURAUX DE LA BEUCE ANTIQUE

A propos    Carte de l'atlas    Liste des sites    Bibliographie    Classification sites

Ouvrir l'outil de recherche

Numéro notice : AERBA 28.212.06  
Commune : Loigny-la-Bataille  
Lieu-dit : les Fontaines  
Lien fiche : [Cliquez-ici](#)

La mission archéologique française de Kition et Salamine

Rechercher

Accueil | Kition | La nécropole de Kition-Pérvola | Zone 2 | Locus 25

DOCUMENTATION NUMÉRIQUE

Sondage 4, locus 17 (dromos), locus 25 (sûl du dromos) et locus 30 (stomion)

**Locus 25**

Numéro : 25  
Tombe : 196  
Date de création : 04/10/13

Datation :  
Cypro-Classique II (CCI) : Hellénistique (H1) :

Localisation  
Site : Kition Pérvola  
Sondage : S4  
Localisation précise : carré D-3/3, dans le locus 17

Altitude corrigée  
Z. supérieur (corrigé) : 4.91 4.91  
Z. inférieur (corrigé) : 4.91 4.91

Matériel  
K13-12 : bord de stilo (?) en calcaire  
N° d'inventaire du matériel : K13-12 : amphorique Bichr. + "Blackwell"

Nature  
Nature du locus : Niveau de sol

Description : Sol du dromos entre la corniche marche de l'escalier au S et le dromos au N



# CIDOC Mapping tools



XML dataset ▶ 3M

#	SOURCE	TARGET
1	D <input type="checkbox"/> ../site	<input type="checkbox"/> E27_Site
1.1	P <input type="checkbox"/> ↓ @id	↓ P48_has_preferred_identifier
	R <input type="checkbox"/> @id	<input type="checkbox"/> E42_Identifier
1.2	P <input type="checkbox"/> ↓ ../name	↓ P1_is_identified_by
	R <input type="checkbox"/> ../name	<input type="checkbox"/> E41_Appellation
1.3	P <input type="checkbox"/> ↓ ../author	↓ P70i_is_documented_in
		<input checked="" type="checkbox"/> E31_Document [bibliography]
		↓ P94i_was_created_by
		<input checked="" type="checkbox"/> E65_Creation [creation_bibliography]
		↓ P14_carried_out_by
		↓ E21_Person
R <input type="checkbox"/> ↓ ../author	<input type="checkbox"/> E82_Actor_Appellation	
1.4	P <input type="checkbox"/> ↓ ../topo	↓ P46i_forms_part_of
		<input checked="" type="checkbox"/> E27_Site
		↓ P3_has_note
R <input type="checkbox"/> ↓ ../topo	<input type="checkbox"/> rdf-schema#Literal	
1.5	P <input type="checkbox"/> ↓ ../origin	↓ P70i_is_documented_in
		<input checked="" type="checkbox"/> E31_Document [bibliography]
		↓ P94i_was_created_by
		<input checked="" type="checkbox"/> E65_Creation [creation_bibliography]
		↓ P136i_supported_type_creation
		<input type="checkbox"/> E83_Type_Creation
		↓ P136_was_based_on
		<input type="checkbox"/> E7_Activity
R <input type="checkbox"/> ↓ ../origin	<input type="checkbox"/> rdf-schema#Literal	



DBMS ▶ Ontop

The screenshot shows the Ontop web interface for the CIDOC CRM ontology. The main window displays the 'Mapping editor' with several mappings defined. The mappings are as follows:

- MOB-G\_usage-01:** `arsol:imobi{CoSiUSObj} :P2_has_type arsol:imobi{CoSiUSObj}#usage .  
SELECT CoSiUSObj FROM mobilier`
- MOB-G\_usage-02:** `arsol:imobi{CoSiUSObj}#usage a :E55_Type .  
SELECT CoSiUSObj FROM mobilier`
- MOB-G\_usage-03:** `arsol:imobi{CoSiUSObj}#usage :P1_is_identified_by arsol:imobi{CoSiUSObj}#usageid .  
SELECT CoSiUSObj FROM mobilier`
- MOB-G\_usage-04:** `arsol:imobi{CoSiUSObj}#usageid a :E41_Appellation .  
SELECT CoSiUSObj FROM mobilier`
- MOB-G\_usage-05:** `arsol:imobi{CoSiUSObj}#usageid :P3_has_note {G_usage}^^rdf:s:Literal .  
SELECT CoSiUSObj, G_usage FROM mobilier`

The interface also shows a class hierarchy on the left with 'Thing' as the root, and various properties like 'P2\_has\_type', 'P1\_is\_identified\_by', and 'P3\_has\_note' listed. The bottom status bar indicates 'Mapping count: 46' and 'To use the reasoner click Reasoner [ ] Start reasoner [x] Show Inferences'.



**3M** Mapping  
Memory  
Manager

<http://139.91.183.3/3M/>

**ontop**

<https://ontop-vkg.org/>

## Validation results of 13 shapes

Download validation report in [CSV](#) [Turtle](#) [RDF/XML](#)

### 663 Violations

- Violation** 592 "Property needs to have at least 1 values, but found 0" (crm:P8\_took\_place\_on\_or\_within|^crm:P8i\_witnessed in shape oash:P80) [see details](#)
- Violation** 30 "Property needs to have at least 1 values, but found 0" (crm:P4\_has\_time-span in shape oash:P81) [see details](#)
- Violation** 19 "Property may only have 1 value, but found 2" (skos:prefLabel in shape oash:P32) [see details](#)
- Violation** 11 "Property may only have 1 value, but found 2" (skos:prefLabel in shape oash:P35) [see details](#)
- Violation** 8 "Property needs to have at least 1 values, but found 0" (crmsci:O19i\_was\_object\_found\_by|^crmsci:O19\_has\_found\_object in shape oash:P51) [see details](#)
- Violation** 1 "Property may only have 1 value, but found 13" (skos:prefLabel in shape oash:P35) [see details](#)
- Violation** 1 "Property may only have 1 value, but found 3" (skos:prefLabel in shape oash:P32) [see details](#)
- Violation** 1 "Property may only have 1 value, but found 3" (skos:prefLabel in shape oash:P35) [see details](#)





## Requêtes

- ARSOL : Liste des sépultures trouvées dans un site
- ARSOL : Nombre de sites découverts par découvreur
- ARSOL : Faits contenant du mobilier en fer
- ARSOL : Monnaies trouvées dans le cadre d'une fouille
- ARSOL : Responsables qui ont trouvé des sépultures
- AERBA : Responsables ayant trouvés un site par prospection aérienne daté avec fin postérieure à 400
- AERBA : Site trouvé dans la commune de Cormainville
- ARSOL/AERBA : Sites où un fossé à été mis à jour
- ARSOL/AERBA : Liste de tous les E27\_Site
- Explorer une URI connue
- Afficher une frise chronologique

```
1 PREFIX wfidfweb: <http://arsol.univ-tours.fr/4DACTION/WFICHEWEB/>
2 PREFIX crmsci: <http://www.ics.forth.gr/isl/CRMsci/>
3 PREFIX crmba: <http://www.ics.forth.gr/isl/CRMba/>
4 PREFIX crmarch: <http://www.ics.forth.gr/isl/CRMarchaeo/>
5 PREFIX crm: <http://www.cidoc-crm.org/cidoc-crm/>
6 PREFIX frantiq: <https://ark.frantiq.fr/ark:/26678/>
7 PREFIX xsd: <http://www.w3.org/2001/XMLSchema#>
8 PREFIX rdfs: <http://www.w3.org/2000/01/rdf-schema#>
9 PREFIX skos: <http://www.w3.org/2004/02/skos/core#>
10 SELECT DISTINCT ?person ?personLabel
11 FROM NAMED <http://openarchaeo.huma-num.fr/federation/sources/arsol>
12 WHERE {
13   ?person a crm:E21_Person .
14   ?person skos:prefLabel ?personLabel .
15   ?person crm:P14i_performed/crm:P8_took_place_on_or_within ?site .
16   ?site crm:P8i_witnessed/crmsci:019_has_found_object ?sepulture .
17   ?sepulture a crm:E25_Man-Made_Feature .
18   ?sepulture crm:P2_has_type <https://ark.frantiq.fr/ark:/26678/pcrt795b632nWw> .
19 }
```



 Response **Table** Pivot Table Geo Google Chart Timeline  

Showing 1 to 2 of 2 entries

Search: \_\_\_\_\_

Show  entries





The interface shows a query builder with two main components:

- Top Component:** A horizontal bar containing a 'Burial' icon, the text 'found in', a 'Site' icon, and a close button.
- Bottom Component:** A horizontal bar containing a 'Where' label, a 'Site' icon, the text 'studied by', an 'Actor' icon, and a value 'Elisabeth Lorans' with a plus sign and a close button.

Below the query builder is an orange 'EXECUTE QUERY' button and a dropdown menu set to 'Table'.

**SPARNATURAL** <http://sparnatural.eu/>

✓ Query successful! - [View/hide SPARQL query](#)

```

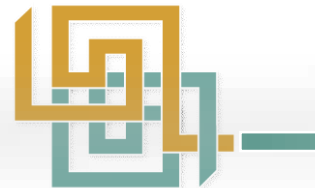
1 SELECT DISTINCT ?this ?thisLabel
2 FROM NAMED <http://openarchaeo.huma-num.fr/federation/sources/arsol>
3 WHERE
4 { ?this a <http://www.cidoc-crm.org/cidoc-crm/E25_Man-Made_Feature> ;
5   <http://www.cidoc-crm.org/cidoc-crm/P2_has_type> <https://ark.frantiq.fr/ark:/26678/pcrt795b632nWw> .
6   ?this <http://www.ics.forth.gr/is1/CRMsci/019i_was_object_found_by/><http://www.cidoc-crm.org/cidoc-crm/P8_took_place_at/>
7   ?Site1 a <http://www.cidoc-crm.org/cidoc-crm/E27_Site> .
8   ?Site1 <http://www.cidoc-crm.org/cidoc-crm/P8i_witnessed/><http://www.cidoc-crm.org/cidoc-crm/P14_carried_out_by/> <
9   OPTIONAL
10  { ?this <http://www.w3.org/2004/02/skos/core#prefLabel> ?thisLabel}
11 }
12

```

Response **Table** Pivot Table Geo Google Chart Timeline

Showing 1 to 50 of 722 entries Search: Show 50 entries

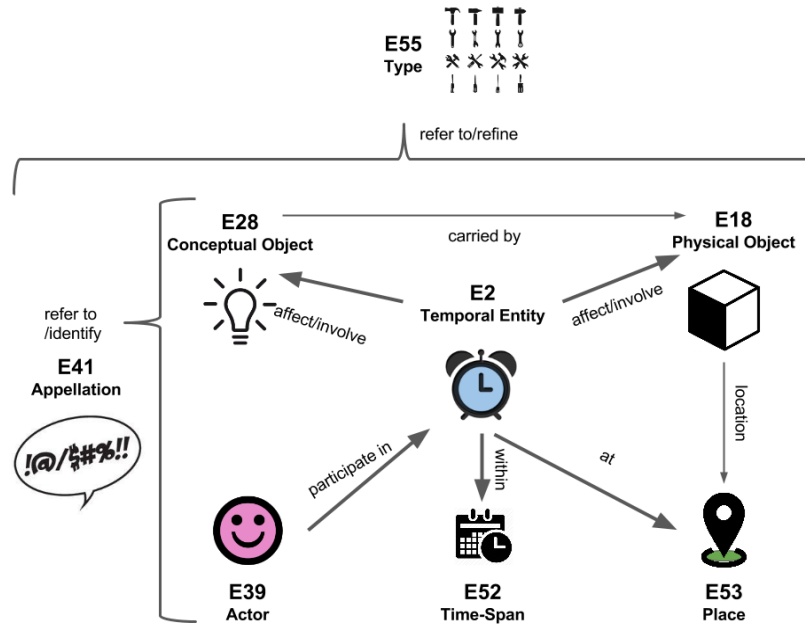
	this	thisLabel
1	<a href="http://arsol.univ-tours.fr/4DACTION/WFICHEWEB/isepuAJ000001">http://arsol.univ-tours.fr/4DACTION/WFICHEWEB/isepuAJ000001</a>	Seppulture AJ000001
2	<a href="http://arsol.univ-tours.fr/4DACTION/WFICHEWEB/isepuAJ000002">http://arsol.univ-tours.fr/4DACTION/WFICHEWEB/isepuAJ000002</a>	Seppulture AJ000002
3	<a href="http://arsol.univ-tours.fr/4DACTION/WFICHEWEB/isepuAJ000003">http://arsol.univ-tours.fr/4DACTION/WFICHEWEB/isepuAJ000003</a>	Seppulture AJ000003







# Learning by playing



- Temporal Entities
- Actors
- Physical things
- Conceptual things
- Appellation
- Types
- Places

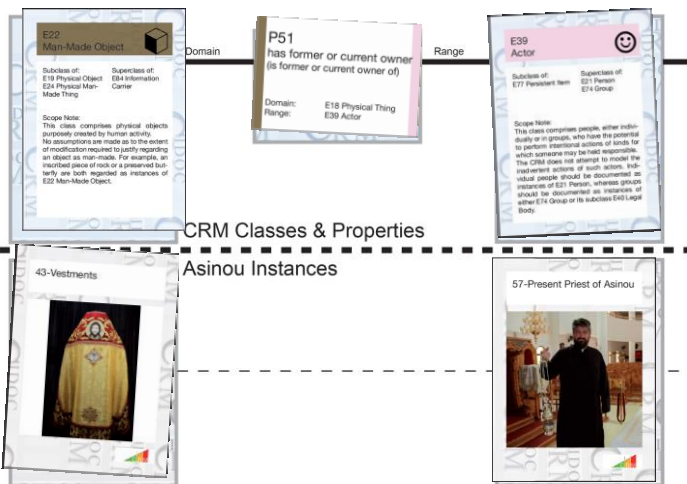


Photo from ITN-DCH workshop game play

# Learning by playing

## INSTANCE MODELLING (3)

CHALLENGE 1 / 15

Learning about instance ...

The site of Marmoutier was excavated by Elisabeth Lorans.

Find classes and properties required to model more complex relationships.

## CIDOC-CRM GAME

SCORE

0 / 300

25 / 25

**E27**  
Site

**SUPERCLASSES & SUBCLASSES**  
E26\_Physical\_Feature  
E27\_SITE

**SCOPE NOTE**  
This class comprises pieces of land or sea floor. In contrast to the purely geometric notion of E53 Place, this class describes constellations of mat...

[Click for full text](#)

36 / 36

**P8i**  
witnessed

**SUPERPROPERTIES & SUBPROPERTIES**  
P8i\_WITNESSED

**SCOPE NOTE**

[Click for full text](#)

25 / 25

**E7**  
Activity

**SUPERCLASSES & SUBCLASSES**  
E5\_Event  
E7\_ACTIVITY  
E8\_Acquisition  
E9\_Move

**SCOPE NOTE**  
This class comprises actions intentionally carried out by instances of E39 Actor that result in changes of state in the cultural, social, or physical systems docu...

[Click for full text](#)

36 / 36

**P14**  
carried out by

**SUPERPROPERTIES & SUBPROPERTIES**  
P11\_had\_participant  
P14\_CARRIED\_OUT\_BY  
P22\_transferred\_title\_to

**SCOPE NOTE**  
This property describes the ...

[Click for full text](#)

25 / 25

**E21**  
Person

**SUPERCLASSES & SUBCLASSES**  
E20\_Biological\_Object  
E39\_Actor  
E21\_PERSON

**SCOPE NOTE**  
This class comprises real persons who live or are assumed to have lived. Legendary figures that may have existed, such as Ulysses and Kin...

[Click for full text](#)

11

**MARMOUTIER GUESTHOUSE**



16

**EXCAVATION OF THE MARMOUTIER GUESTHOUSE**



12

**MRS LORANS (ARCHAEOLOGIST)**  
<http://viaf.org/viaf/120393>



VALIDATE

# THANK YOU!

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The views and opinions expressed in this presentation are the sole responsibility of the authors and do not necessarily reflect the views of the European Commission.

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