



3/4/2017 – 38<sup>th</sup> CRM-SIG meeting  
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# General purpose - Innovation

- A generic **browsing mechanism** that gives the user a flexible, highly – configurable, detailed overview of an RDF dataset / database.

## **BASIC PRINCIPLES**

1. Ability to display data of any schema/rdf format.
2. Ability to display all nodes of any class/instance.
3. Configurable rules to improve the layout or presentation for known classes and properties.
  - 3.1 Hide URIs that are meaningless for the user
4. Display high density information in one screen (that is not possible in solutions based on “object templates”)

## **INNOVATION**


Current systems that allow principles 1, 2 fail with principles 3,4 and those that allow for 4 fail with 1,2,3

# General purpose - Innovation

metaphacts

RESEARCH SPACE

Sparql Clipboard Account



Example image from Wikidata - Agostino Carracci

## Person Record

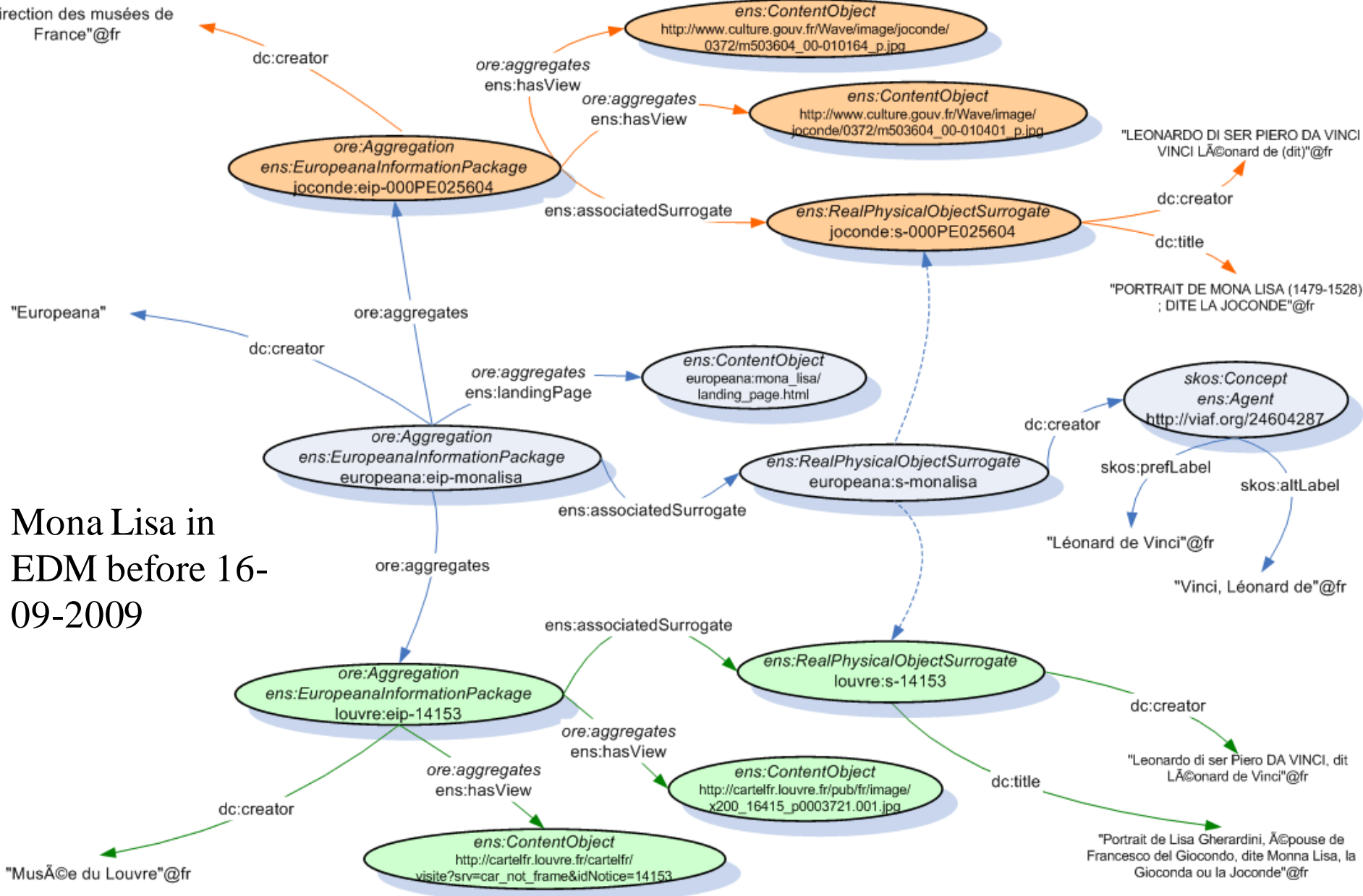
<b>Name</b>	<ul style="list-style-type: none"><li>Agostino Carracci</li></ul>
<b>Note</b>	<ul style="list-style-type: none"><li>Engraver, painter, draughtsman, and print publisher; born in Bologna. Pupil of Bartolomeo Passarotti and Domenico Tibaldi. Active in Bologna (1579/81), Venice and Cremona (1582 and 1588/99), Florence and Rome (1581? and 1597-c.1600), etc. Buried in Parma Cathedral.</li></ul>
<b>Appellation</b>	<ul style="list-style-type: none"><li>Carracci, Agostino</li></ul>
<b>Gender</b>	<ul style="list-style-type: none"><li>male</li></ul>
<b>Profession</b>	<ul style="list-style-type: none"><li>draughtsman</li><li>printmaker</li><li>printer</li></ul>
<b>Nationality</b>	<ul style="list-style-type: none"><li>Italian</li></ul>
<b>Birth date</b>	<ul style="list-style-type: none"><li>1557 ::</li></ul>

Related actors

Actor	Name
group	Circle/School of Carracci, Agostino
group	Circle/School of Carracci, Agostino
group	Circle/School of Carracci, Agostino
group	Circle/School of Carracci, Agostino
group	Circle/School of Carracci, Agostino
group	Circle/School of Carracci, Agostino

Research space- Metaphacts (template based view)

# General purpose - Innovation



Mona Lisa in EDM before 16-09-2009



# General purpose - Innovation

## SOLUTION

- **Create an indented list** to handle the density and depth of information.
- **Invert incoming links** to display all the nodes of every class/instance.
- **Use priority based rule chains**, to define style and order of properties, depending on super classes and super properties.
- **Apply rules** for replacing labels.
- Provide the mechanisms for **configuring the display** of the information based on user's preferences.
- Use **default options** for anything not converted by a rule.
- Improve the **usability and readability** of the web interface.

## USE CASES

- Browsing Triple Stores
- Browsing Graph Databases
- Browsing RDF instance files e.g. X3ML transformed data
- Browsing RDF-OWL schema files

## Requirements as Actions

- **Basic Functionality:** Start from an RDF resource (URI) and *create a tree* with all the outgoing and incoming properties of this resource.
  
- **Input:**
  - ✓ Support *Triple Stores*
  - ✓ Support *RDF file input*
  
- **Principles:**
  - ✓ Be *schema agnostic*
  - ✓ Create *loosely coupled* component
  
- **Presentation:**
  - ✓ *Display the labels* instead of the URIs
  - ✓ *Display the type* of each entity
  - ✓ *Expand/collapse big texts*
  - ✓ *Collapse/extend* to hide/show many results
  - ✓ *Display Images*
  
- **Advanced Actions:**
  - ✓ Mark *same instances*
  - ✓ *Display path* of selected element
  - ✓ Support *geospatial* functionalities

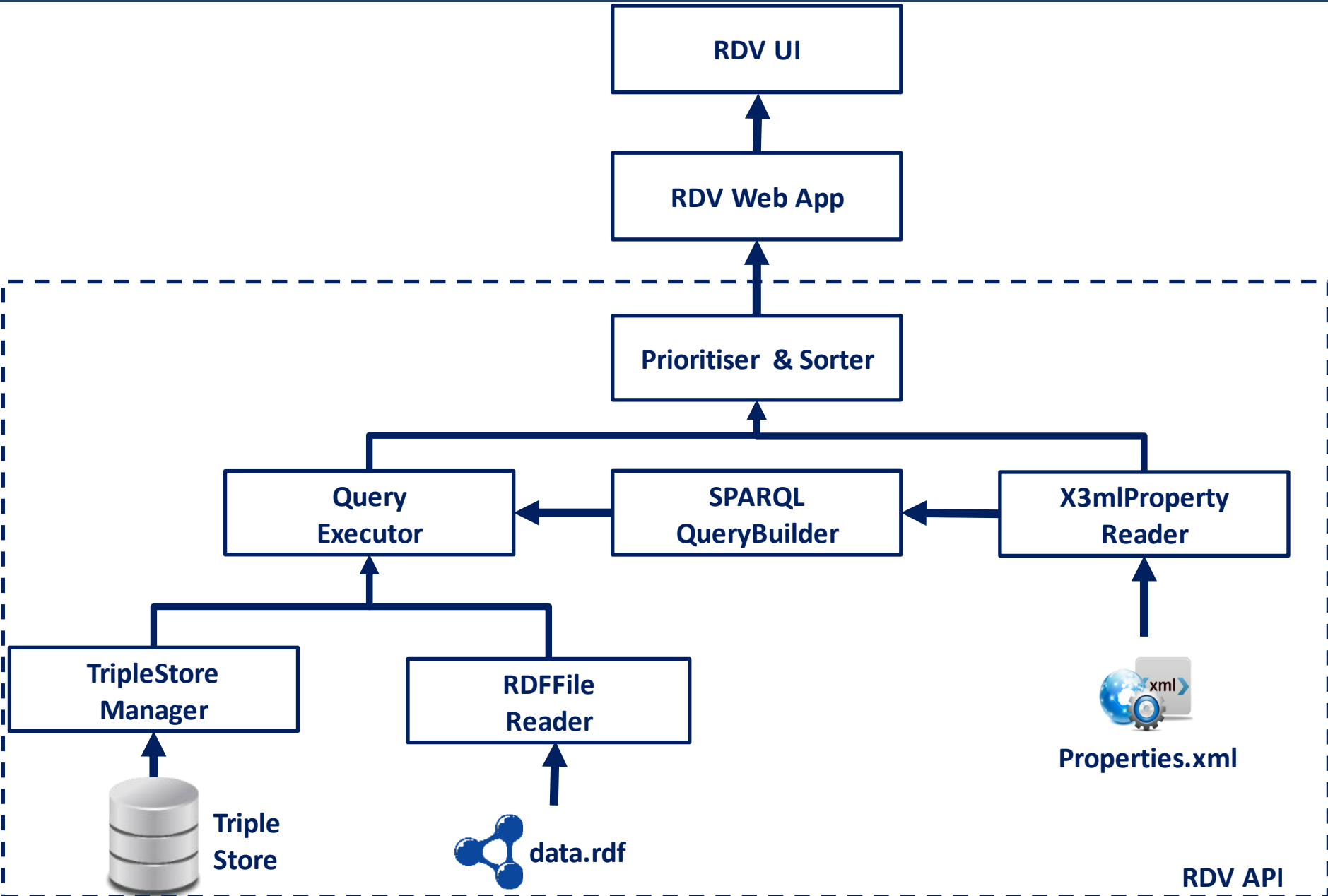
## Requirements as Actions

### ➤ **Configuration:**

- ✓ *define default **depth** of the visualization*
- ✓ *change name of the **labels***
- ✓ *modify **appearance of entities***
- ✓ *give **priorities** to **properties** according to the type of each entity*
- ✓ *give **priority** to **sub properties***



# Architecture



➤ **RDV API:** Provides the *core functionalities* to the developers to create their own applications.

- Maven Java API
- MicroServices based / Loosely Coupled Components Architecture
  - *12 select functions (select \* with labels) - Level 1 component*
  - *XMLPropertiesReader - Level 1 component*
  - *4 return functions (return outgoing links with weight) - Level 2 component*
  - *RDFfileManager - Level 3 component*
  - *TripleStoreManager - Level 3 component*
  - *Prioritiser&sorter - Level 3 component*

➤ **RDV WebApp:** Uses the RDV API to provide the *visualization functionalities* to the end users.

- Maven Java WebApp
- JavaScript
- jQuery
- Bootstrap
- Tomcat / Jetty

# Basic Functionality

- ✓ **Collapse** to hide/show many results
- ✓ default **depth** of the visualization

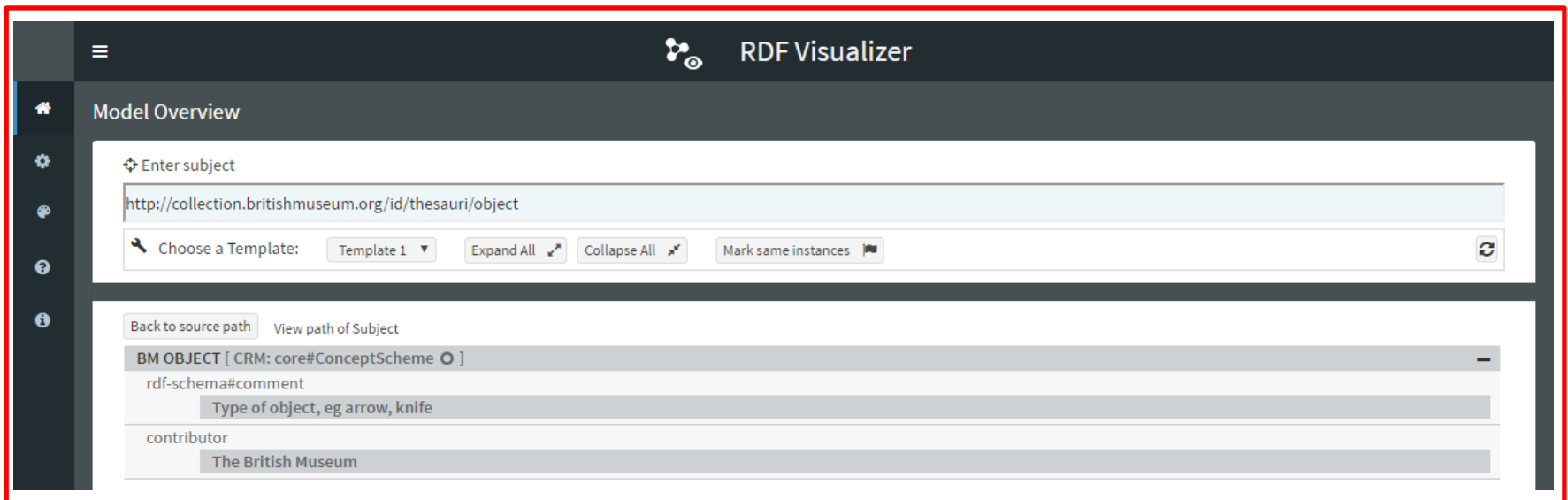
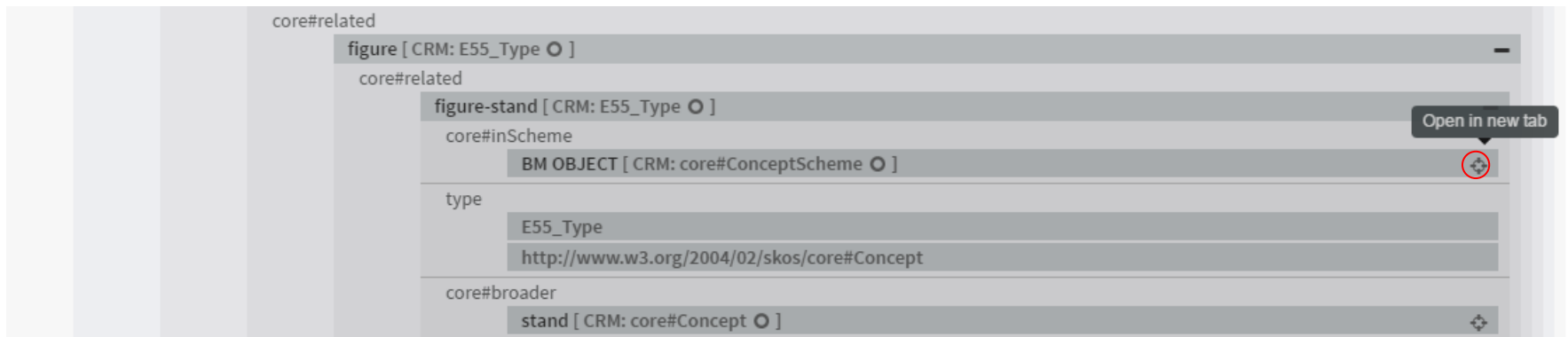
The screenshot shows the RDF Visualizer interface. At the top, there is a search bar labeled "Enter subject" with the URL "http://collection.britishmuseum.org/id/object/JCF11032" entered. Below the search bar are several control buttons: "Choose a Template", "Template 1", "Expand All", "Collapse All", and "Mark same instances". The main area displays a list of properties and their values for the subject. The first property is "PX\_object\_type" with the value "illustrated book [ CRM: core#Concept ]". This value is highlighted in black. To the right of the list, there is a vertical scroll bar. Red annotations are present: a red '1' points to the search bar, a red '2' points to the scroll bar, and a red '3' points to the collapse-expand buttons and the black label color for entities.

1. Subject
2. Scroll bar
3. Collapse-expand button and black label color for entities

# Basic Functionality

✓ Create **hrefs** with the URIs

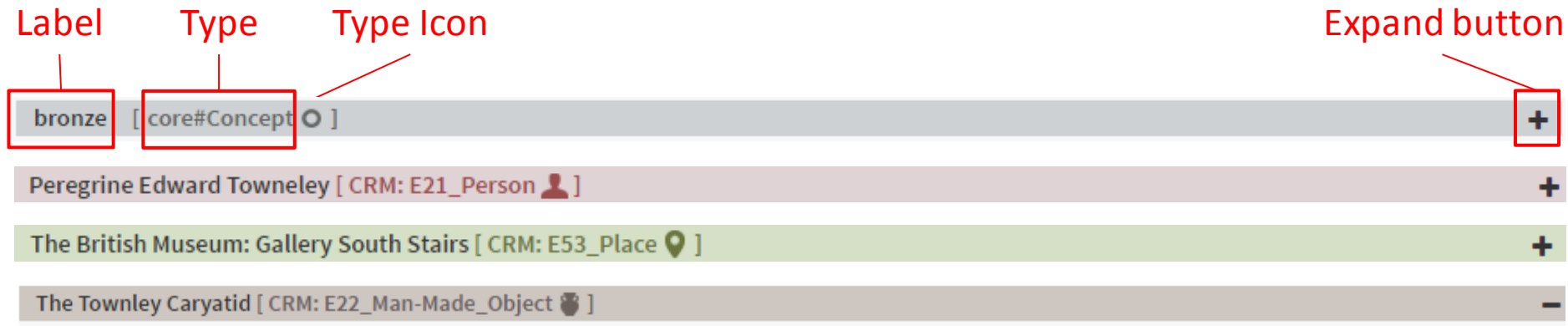
When tree depth > 6 levels then open in another tab



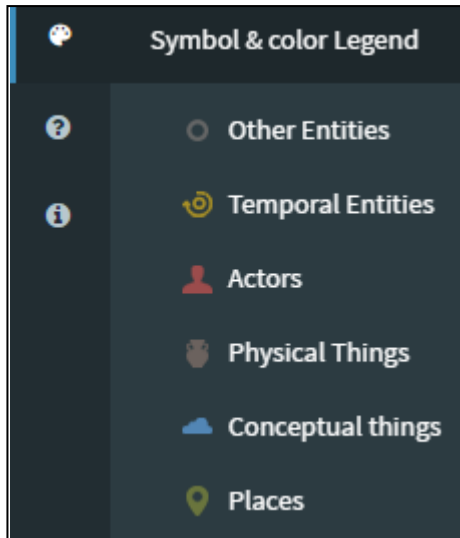
# Entities

- ✓ **Display labels** (or uris without prefix)
- ✓ **Display type labels**

Entity appearance examples:



A screenshot of a list of entities. The first entity is 'bronze' with type '[ core#Concept ]'. Red boxes and arrows highlight the 'Label' (bronze), 'Type' ([ core#Concept ]), and 'Type Icon' (a small circle icon). A red box and arrow also highlight the 'Expand button' (+) at the end of the row. Below it are three other entities: 'Peregrine Edward Towneley [ CRM: E21\_Person ]' with a person icon, 'The British Museum: Gallery South Stairs [ CRM: E53\_Place ]' with a location pin icon, and 'The Townley Caryatid [ CRM: E22\_Man-Made\_Object ]' with a vase icon. Each row has a '+' or '-' button at the end.



A dark-themed panel titled 'Symbol & color Legend'. It contains a list of categories with corresponding icons and radio buttons:

- Other Entities (radio button)
- Temporal Entities (clock icon)
- Actors (person icon)
- Physical Things (vase icon)
- Conceptual things (cloud icon)
- Places (location pin icon)

CRM Entity categories

# Properties

- ✓ *priorities to properties according to the type of each entity*

Subject hint on hover

The Townley Caryatid [CRM: E22\_Man-Made\_Object] 18785/height/1 [ CRM: E54\_Dimension ○ ]

**P46i\_forms\_part\_of** — Property label (or uri without prefix)

Townley Collection [ CRM: E78\_Collection ○ ]

- 1 The Marion Kouros [ CRM: E22\_Man-Made\_Object 🗿 ]  
PX\_object\_type  
statue [ CRM: core#Concept ○ ]
- 2 P48\_has\_preferred\_identifier  
GAA3387 [ CRM: E42\_Identifier ○ ]
- 3 P1\_is\_identified\_by  
Sculpture B325 [ CRM: E42\_Identifier ○ ]  
1887,0801.1 [ CRM: E42\_Identifier ○ ]  
464245 [ CRM: E42\_Identifier ○ ]
- 4 P102\_has\_title  
The Marion Kouros [ CRM: E35\_Title ○ ]
- 5 PX\_physical\_description

✓ *Lists of entities*

**Different cases:**

- 3 or less: expanded

P1\_is\_identified\_by

1979,0305,0.117 [ CRM: E42\_Identifier ○ ]



JH.117Hillier no. [ CRM: E42\_Identifier ○ ]



779444 [ CRM: E42\_Identifier ○ ]






# Lists

## ✓ *Lists of entities*

### Different cases:









- 3 or less: expanded
- More than 3: expand-collapse button

P138i\_has\_representation

	AN00389/AN00389387_001_l.jpg [ CRM: E38_Image ○ ]	+
	AN00390/AN00390244_001_l.jpg [ CRM: E38_Image ○ ]	+
	AN00859/AN00859527_001_l.jpg [ CRM: E38_Image ○ ]	+

expand list (8 entries) ▾

P138i\_has\_representation

	AN00389/AN00389387_001_l.jpg [ CRM: E38_Image ○ ]	+
	AN00390/AN00390244_001_l.jpg [ CRM: E38_Image ○ ]	+
	AN00859/AN00859527_001_l.jpg [ CRM: E38_Image ○ ]	+
	AN00865/AN00865805_001_l.jpg [ CRM: E38_Image ○ ]	+
	AN00860/AN00860150_001_l.jpg [ CRM: E38_Image ○ ]	+
	AN00389/AN00389381_001_l.jpg [ CRM: E38_Image ○ ]	+
	AN00865/AN00865888_001_l.jpg [ CRM: E38_Image ○ ]	+
	AN00860/AN00860285_001_l.jpg [ CRM: E38_Image ○ ]	+

collapse list (8 entries) ▲



# Lists

## ✓ *Lists of entities*

### Different cases:


- 3 or less: expanded
- More than 3: expand-collapse button
- More than 10: open list in pop up window
- More than 200: warning message

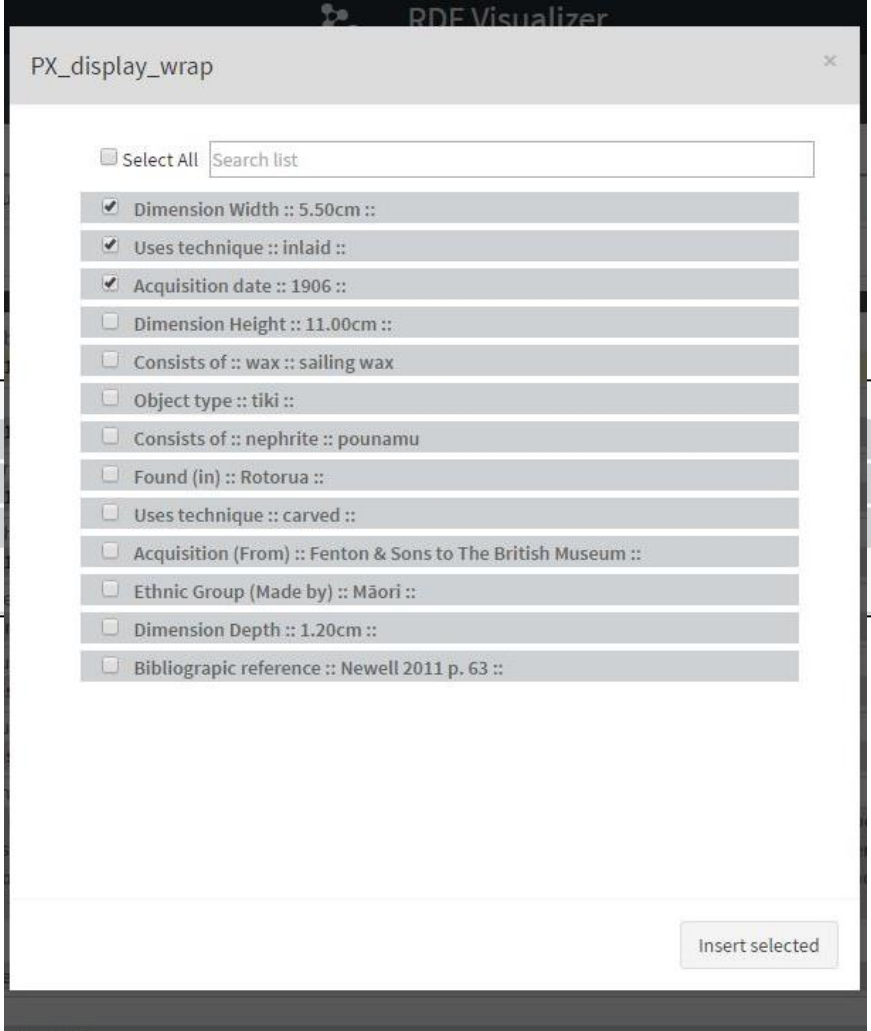
PX\_display\_wrap

Dimension Width :: 5.50cm ::

Uses technique :: inlaid ::

Acquisition date :: 1906 ::

View all (13 entries) 



RDE Visualizer

PX\_display\_wrap

Select All

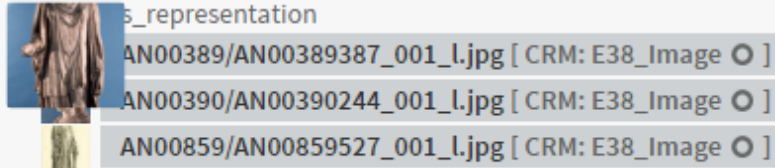
- Dimension Width :: 5.50cm ::
- Uses technique :: inlaid ::
- Acquisition date :: 1906 ::
- Dimension Height :: 11.00cm ::
- Consists of :: wax :: sailing wax
- Object type :: tiki ::
- Consists of :: nephrite :: pounamu
- Found (in) :: Rotorua ::
- Uses technique :: carved ::
- Acquisition (From) :: Fenton & Sons to The British Museum ::
- Ethnic Group (Made by) :: Māori ::
- Dimension Depth :: 1.20cm ::
- Bibliographic reference :: Newell 2011 p. 63 ::

Insert selected

# Images

## ✓ *Display Images*

- Thumbnail (resize on mouseover)
- Lists of images (same functionality as any other list)
- Pop up image gallery (click on thumbnail)



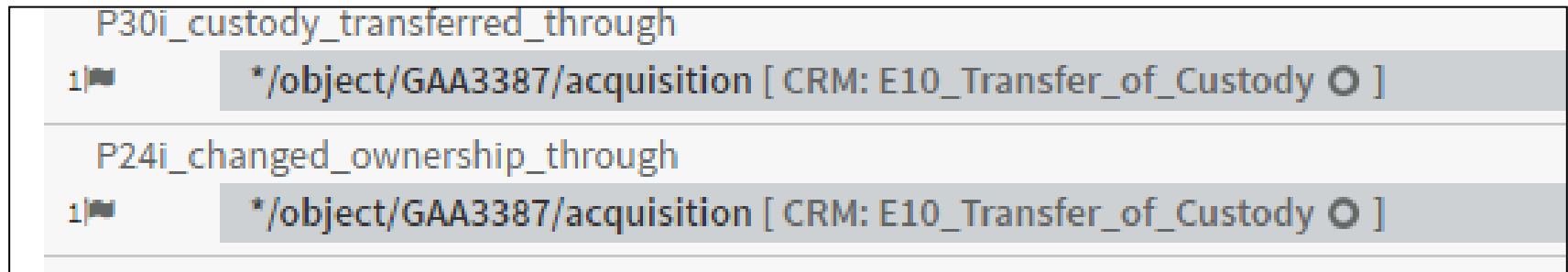
expand list (8 entries) ▾



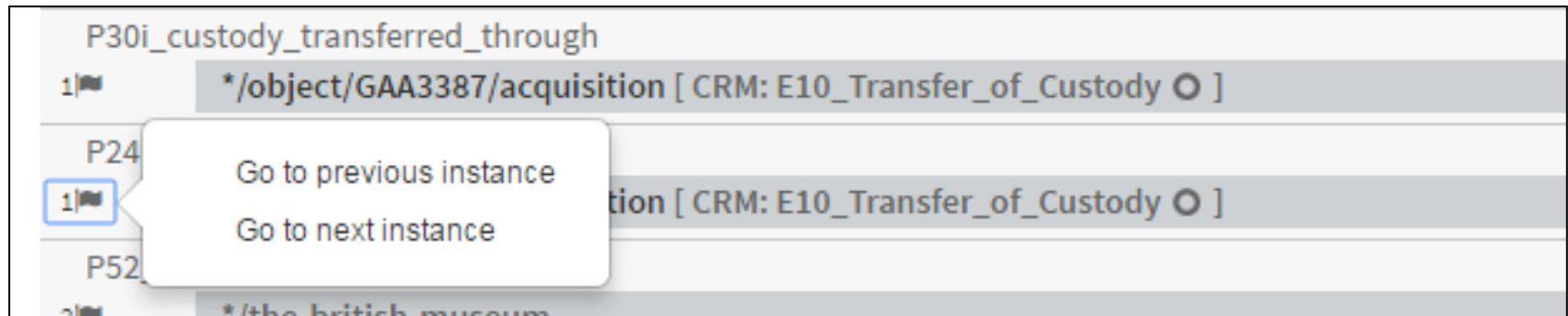
## Mark same instances (under construction)

✓ *Mark same instances*

- Mark same instances
- Guide to next and previous same instances and highlight



A screenshot of a list of instances. The first instance is labeled 'P30i\_custody\_transferred\_through' and has a value of '\* /object/GAA3387/acquisition [ CRM: E10\_Transfer\_of\_Custody ]'. The second instance is labeled 'P24i\_changed\_ownership\_through' and has the same value. Both instances are highlighted with a grey background.



A screenshot of a list of instances. The first instance is labeled 'P30i\_custody\_transferred\_through' and has a value of '\* /object/GAA3387/acquisition [ CRM: E10\_Transfer\_of\_Custody ]'. The second instance is labeled 'P24' and has a value of '\* /object/GAA3387/acquisition [ CRM: E10\_Transfer\_of\_Custody ]'. The third instance is labeled 'P52' and has a value of '\* /the british museum'. A context menu is open over the second instance, showing two options: 'Go to previous instance' and 'Go to next instance'. The second instance is highlighted with a grey background.

✓ *Expand/collapse **big texts***

### Different cases:

- Less than 600 characters: expanded

PX\_curatorial\_comment

In a style adapted from Athenian work of the 5th century BC. One of a group of five surviving caryatids found at the site, arranged to form a colonnade in a religious sanctuary, probably of Demeter. The sanctuary was built on land owned by Regilla, wife of the Greek magnate and philosopher Herodes Atticus. One fragmentary caryatid, now in the Villa Albani, Rome, is signed by the Athenian sculptors Kriton and Nikolaos.

# Texts appearance

✓ *Expand/collapse big texts*

## Different cases:

- Less than 600 characters: expanded
- 600-1000 characters : expand-collapse button

PX\_curatorial\_comment

This "hei-tiki" neck pendant is named in early museum records as "Kaupwina" (two stomachs). It is highly unusual because it is double-sided. These objects are usually filled with "paua" shell, but "Kaupwina" has got eyes filled with European sailing wax. There is a hole at the top for a suspension cord. The "hei-tiki" (hei : suspended from the neck / tiki: human figure) generally are considered as an ancestral treasure ("taonga") passed down the generations. When these pendants are given as gif...

Expand text ▾

PX\_curatorial\_comment

This "hei-tiki" neck pendant is named in early museum records as "Kaupwina" (two stomachs). It is highly unusual because it is double-sided. These objects are usually filled with "paua" shell, but "Kaupwina" has got eyes filled with European sailing wax. There is a hole at the top for a suspension cord. The "hei-tiki" (hei : suspended from the neck / tiki: human figure) generally are considered as an ancestral treasure ("taonga") passed down the generations. When these pendants are given as gifts, they carry heavy obligations of reciprocity and they absorb ancestral power. During the death ritual ("tangihanga"), elders may place "hei-tiki" on or near the deceased, acting as a portal between the living, newly dead and the ancestors who previously wore it. The "hei-tiki" is an artifact that appeared to pre-date Maori arrival in New Zealand. It represents perhaps a woman in childbirth, a foetus or a spirit figure.

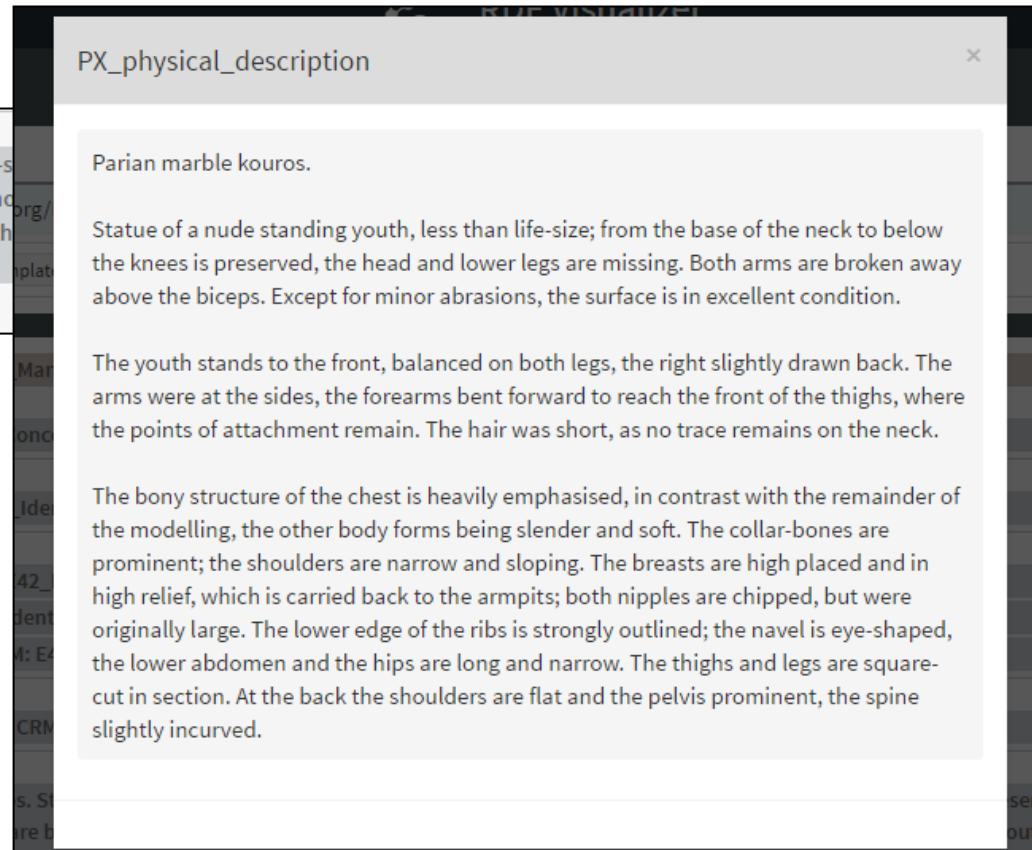
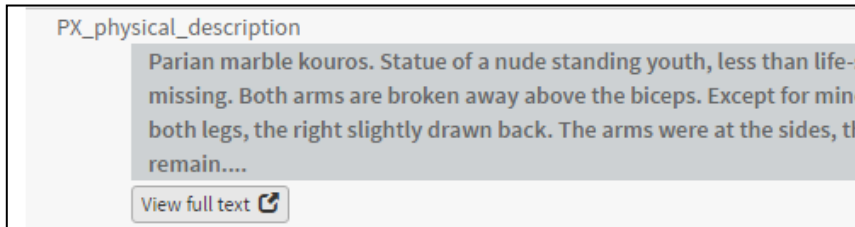
Collapse text ▲

# Text appearance

## ✓Expand/collapse **big texts**

### Different cases:

- Less than 600 characters: expanded
- 600-1000 characters : expand-collapse button
- More than 1000 characters : open text in pop up window



# Dimension appearance

## ✓ *Dimension appearance*

Current appearance:

P43_has_dimension	
*/object/GAA3387/height/1 [ CRM: E54_Dimension ○ ]	
P2_has_type	Height [ CRM: E55_Type ○ ]
P91_has_unit	*/Centimeter
P90_has_value	72.0
type	E54_Dimension

Future improvement:

P43_has_dimension	
Height: 72.0 Centimeter	[ CRM: E54_Dimension ○ ]

## Location functionality

### ✓ **Location** functionality

Current appearance:

P55\_has\_current\_location

The British Museum: Gallery G22/WallCase [ CRM: E53\_Place  ]

Future improvement (use a geolocation API when coordinates are available):

P55\_has\_current\_location



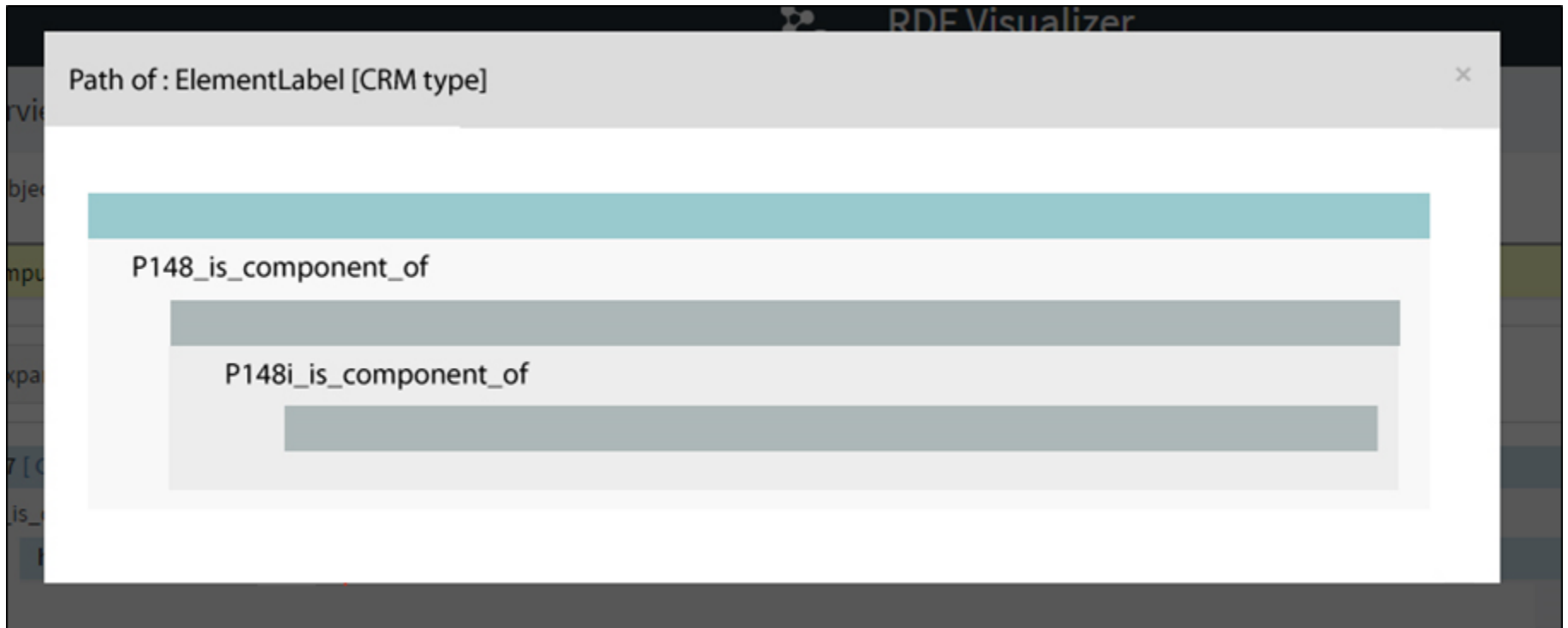
The British Museum: Gallery G22/WallCase [ CRM: E53\_Place  ]



## Show path of selected element (not implemented)

### ✓ *Show path of selected element*

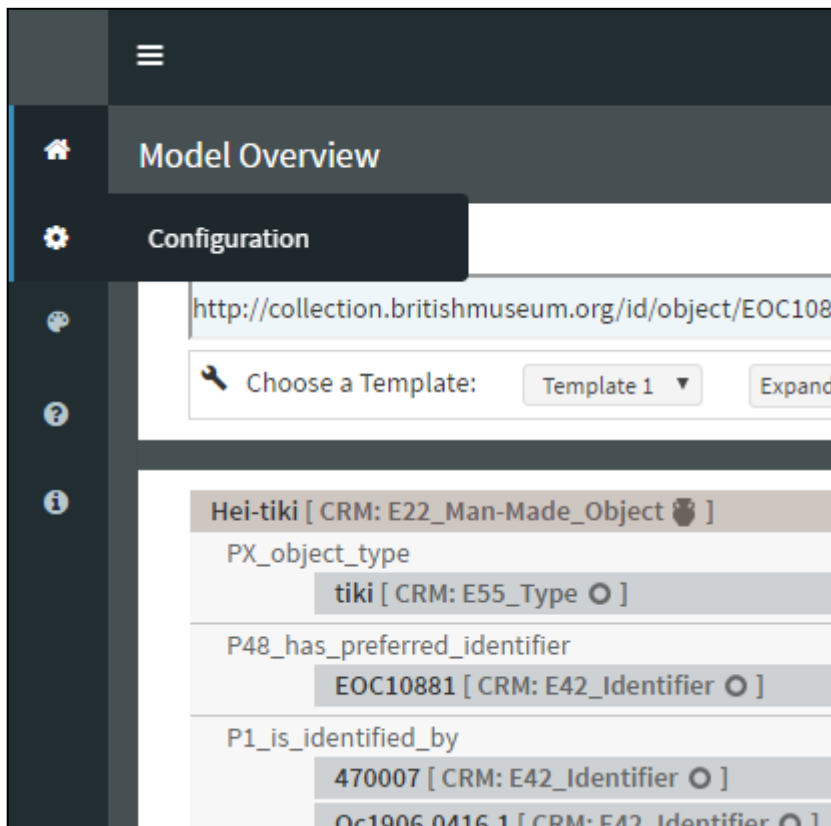
- Right click: show path of selected element
- Pop up window: only elements related to the path of the selected object



# Configuration

## Configurable:

- ✓ create **templates**
- ✓ expansion **depth**
- ✓ type of the **entities**
- ✓ **priorities to properties** according to the type of each entity
- ✓ **property label**
- ✓ **thumbnails**



# Configuration- Create templates

✓ *create templates*

### Model Overview

Enter subject

Choose a Template: Template 1 ▾ Expand All ↗ Co

Hei-tiki [ CRM: E22\_Man-Made\_Object 🗑 ]

PX\_object\_type

tiki [ CRM: E55\_Type 🗑 ]

## Table of templates

Filter Table

AA	Template name	Author	Related Ontology	Related Database		
1	Archaeology	Nikos Minadakis	CIDOC	.....		
2	Biology	Lida Harami	LIDO	.....		

## New template (or Edit template)

Template number (AA): 3 Author: Nikos Minadakis

Template title


Related Ontology

Related Database or file






# Configuration- Expansion depth

✓ *expansion depth*

### Expansion depth configuration

 Information about explanation deprth configuration


Depth  Related Entity Type  Add to table

Depth	Related Property or Entity type	
5	- 	 
2	has name	 



# Configuration-Entities

- ✓ *type of the entities*
- ✓ *priorities to properties according to the type of each entity*

### Entity Type configuration

 Information about entity type configuration


Original entity type label	New entity type label	Color	Icon
<input type="text"/>	<input type="text"/>	<input type="text" value=""/>	<input type="text" value=""/>
Property label	Property priority		
<input type="text"/>	<input type="text"/>	<input type="button" value="+"/>	
<input type="button" value="Add to table"/>			

Original entity type label	New entity type label	Color	Icon	Property label	Property priority	
Actor	Person	<input checked="" type="checkbox" value=""/>	<input type="checkbox" value=""/>	has appellation	1	 
				has .....	2	
				has .....	3	

# Configuration-properties



## ✓ *property type label*

Property label configuration

 Information about property label configuration

Original property label	New property label	
<input type="text"/>	<input type="text"/>	<input type="button" value="Add to table"/>

Original property label	New property label	
has appellation	has name	 

# Configuration-thumbnails







## ✓ *thumbnails*

### Thumbnail configuration

**i** Information about thumbnail configuration

**Show thumbnail next to entity label in the following case:**

File extension

file extension	
png,	 
jpeg	 
gif	 

**Show characteristic thumbnail next to subject entity label in the following case:**

Subject entity type      Property of characteristic thumbnail original location

# Integration with 3M

## Metadata Transformation

If you have a Generator Policy xml file available, please upload it (Info tab). Otherwise you are provided with a generic one. If a target record file has already been uploaded (Info tab), you may view it in "Target Record RDF File". You may modify both source and generator files on the fly, but changes will be lost next time you click on the Transformation tab. (You may read instructions about generators by clicking Notes about Generators). Choose UUID size and output format and then click "Run Transformation". View metadata transformed (or x3ml exception messages) inside "Target Record RDF File" textarea. You may save transformed metadata as your target record file by clicking "Save as Target Record" button. However, this action will overwrite any previous metadata, so use it with caution!

### Source Record XML File

```
<?xml version="1.0" encoding="UTF-8"?><dataroot xmlns:od="urn:schemas-microsoft-com:officedata" generated="2016-01-03T15:46:54">
  <ObjDaten_CORE>
    <ObjId>304549</ObjId>
    <ObjTypS>general</ObjTypS>
    <ObjAufId>153</ObjAufId>
    <ObjInventarNrS>AN1891.470</ObjInventarNrS>
    <ObjInventarNrSortiertS>AN1891.0470</ObjInventarNrSortiertS>
    <ObjInv01S>AN</ObjInv01S>
    <ObjInv02S>1891</ObjInv02S>
    <ObjInv03S></ObjInv03S>
    <ObjInv04S>470</ObjInv04S>
    <ObjDinId>33</ObjDinId>
    <ObjMuld>85370</ObjMuld>
    <ObjAnzahlS>1</ObjAnzahlS>
    <ObjFeld03M>Cyprus Exploration Fund, excavation by J.A.R. Munro and H.A.Tubbs</ObjFeld03M>
    <ObjFeld02M>subscription</ObjFeld02M>
    <ObjFeld01M>Property</ObjFeld01M>
  </ObjDaten_CORE>
  <Odald>69633</Odald>
```

### UUID Size

### Output Format

### Generator Policy XML File

```
<generator name="Identifiers" prefix="ash">
  <pattern>{id}/{concept}/{reference}</pattern>
</generator>

<generator name="InlineTerms" prefix="ash">
  <pattern>{id}/{concept}/{reference}</pattern>
</generator>

<generator name="Thesaurus" prefix="ash">
  <pattern>{id}/{concept}/{reference}</pattern>
</generator>

<generator name="displayone">
  <pattern>{display1}</pattern>
</generator>

<generator name="displaytwo">
  <pattern>{display1}::{display2}</pattern>
</generator>

<generator name="displaythree">
```

### Target Record RDF File (Using x3ml engine version 1.7.5-SNAPSHOT)

```
<http://www.ashmolean.org/id/object/AN1912.147/country>
  a crm:E53_Place ;
  rdfs:label "Cyprus" .

<http://www.ashmolean.org/id/inline/length%20x%20width>
  a crm:E55_Type ;
  skos:prefLabel "length x width" .

<http://www.ashmolean.org/id/object/AN1891.474/period>
  a crm:E4_Period ;
  skos:prefLabel "Cypro-Archaic Period (c. 750 - c. 480 BC)" .

<http://www.ashmolean.org/id/object/AN1891.462/system>
  a crm:E42_Identifier ;
  crm:P2_has_type <http://www.ashmolean.org/id/identifiers/systemid> ;
  skos:prefLabel "306108" .

<http://www.ashmolean.org/id/object/AN1909.837/findspot>
  a crm:E53_Place ;
```

Visualize













# Integration with Metaphacts Platform for Fundamental Searching

Find: **Things** HAS TYPE **Bronze**

Find: ● HAS TYPE [icon] Bronze or + and +

● HAS TYPE [icon] Bronze

Table **Grid** Carousel

 100044 ▼	 100108 ▼	 100203 ▼	 100887 ▼	 100889 ▼
 100891 ▼	 101414 ▼	 102603 ▼	 103134 ▼	 103361 ▼

# Integration with Metaphacts Platform for Fundamental Searching

[View in RDF visualizer](#)

Filter Results

property	object
has met	German Archaeological Institute
has type	coins
has type	Bronze
has type	ae
has type	coin
has type	300010957
by	German Archaeological Institute
from	German Archaeological Institute
is identified by	100044
was produced by	production of coin 100044

«

1

2

3

»

# Integration with Metaphacts Platform for Fundamental Searching

https://www.dainst.org/COIN/100044

Choose a Template: Template 1 Expand All Collapse All Mark same instances

100044 [ CRM: E22\_Man-Made\_Object ]

- P2\_has\_type
  - coins [ CRM: E55\_Type ]
- P43\_has\_dimension
  - urn:uuid:fa92ac2c-3085-407a-8fa4-182ebb319ad5 [ CRM: E54\_Dimension ]
  - weight of coin 100044 [ CRM: E54\_Dimension ]
  - diameter of coin 100044 [ CRM: E54\_Dimension ]
- P52\_has\_current\_owner
  - German Archaeological Institute [ CRM: E40\_Legal\_Body ]
- P45\_consists\_of
  - Bronze [ CRM: core#Concept ]
- P3\_has\_note
  - Datierung: ca. 215-Anfang 2. Jh. v. Chr. Westermark 1991, 14; BMC (Mysien) S. 121-122, 75-83
- P50\_has\_current\_keeper
  - German Archaeological Institute [ CRM: E40\_Legal\_Body ]
- P108i\_was\_produced\_by
  - production of coin 100044 [ CRM: E12\_Production ]
  - P7\_took\_place\_at
    - Pergamon [ CRM: E53\_Place ]
  - type
    - http://www.cidoc-crm.org/cidoc-crm/E12\_Production
  - P17\_was\_motivated\_by
    - Attaliden [ CRM: E39\_Actor ]
  - P10\_falls\_within
    - hellenistisch [ CRM: E4\_Period ]
- P1\_is\_identified\_by
  - 100044 [ CRM: E41\_Appellation ]

## Test data

- We used a part of the British Museum's database BMCollection-2013-09-25.tar as test data
- Size of Triple Store: 52,261,811
- Demo url: <http://139.91.183.60:8084/RDFVisualizer-webapp>

- *Return **reverse properties***
- *Entities with **multiple types***
- *Complete **mark same instances** functionality*
- *Use **geolocation API***
- *Choose **“label missing”** policy*
- *Make **UI configurable and more user friendly***
- ***Documentation and Uploading to Github***
- ***Publication***