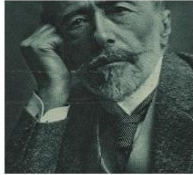


The British
Museum



Reshaping the Knowledge Graph by Connecting Researchers, Data and Practices in ResearchSpace

Dominic Oldman & Diana Tanase
ISWC 2018
October 10th, 2018

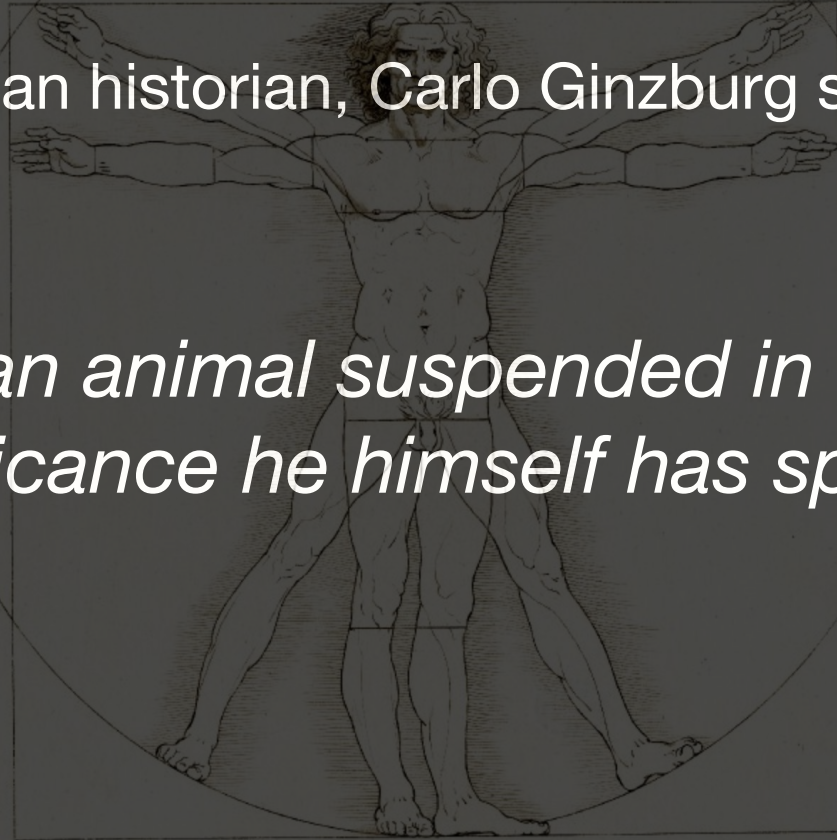


THE
ANDREW W.
MELLON
FOUNDATION



A famous Italian historian, Carlo Ginzburg said,

“Man is an animal suspended in webs of significance he himself has spun.”



As researchers we aspire to build and
preserve knowledge across space and
time...

We investigate, connect ideas and assert
different arguments.

We bring knowledge to life in descriptive and analytical narratives which convey how people and things interconnect, their role in both history and in the present, and how the world and human life changes.

Progressing knowledge is a collaborative effort.

But when we translate our knowledge into
data we hit problems.

As we use spreadsheets and databases, we abstract our knowledge in a way that loses meaning, context, and the connections that our minds created.

Networks of context are created by adding relations between things, or more precisely processes.

When we present research in narratives the meaning can be ambiguous. Different narratives, even on the same subject, are difficult to compare...

And some concepts need more than
narratives to describe them.

These limitations affect our ability to build
and reuse knowledge.

Through ResearchSpace, researchers represent the complexity of the real world by producing data with context.

The artificial conventions of databases and spreadsheets are replaced by a knowledge map, a constellation of people, organisations, places, events, objects, ideas, and practices, which is grown over time and is designed to incorporate and share researchers' beliefs and arguments.

Researchers can, through a range of tools,
continually understand, interpret and
expand these networks of knowledge,
contributing their discoveries
collaboratively.

As well as visualising the knowledge map, ResearchSpace generates views of the data including maps, timelines, diagrams and graphs, all of which can be used for presentation in semantic narratives.

As we write narratives in ResearchSpace
we are continually connected to the
knowledge map and the underlying
networks of research activity and data.

Within ResearchSpace, data, and all its connections, is not locked into a system. Research is embedded in an open data format which preserves contextual meaning.

Computers can understand and process this enriched data allowing future researchers access to previous chains of evidence, beliefs and arguments.

As we build knowledge in ResearchSpace,
we can assert perspectives, contrasts and
contradictions.

....and by collaboratively connecting people, with different experience and backgrounds, we can ensure that our evolving knowledge and understanding of reality can be better reflected in a digital space.

“Nothing that has ever happened should be regarded as lost for history. “

Walter Benjamin

Semantics

Semantic Web

“...if properly designed, the Semantic Web can assist the evolution of human knowledge as a whole.”

“The challenge of the Semantic Web, therefore, is to provide a language that expresses both data and rules for reasoning about the data and that allows rules from any existing knowledge-representation system to be exported onto the Web.”

BERNERS-LEE, HENDLER and LASSILA Scientific American: Feature Article: The Semantic Web: May 2001



Onto-epistemological



TALKING POINT

Art and production

Machine, human, artistic, or immaterial. What do we mean when we talk about production?



“...is the conscious act to understand the doing, the making of a thing...some production you see, some of it is completely hidden” - Clare Twomey

WHAT IS 'PRODUCTION' AND WHY DOES IT MATTER?

Change

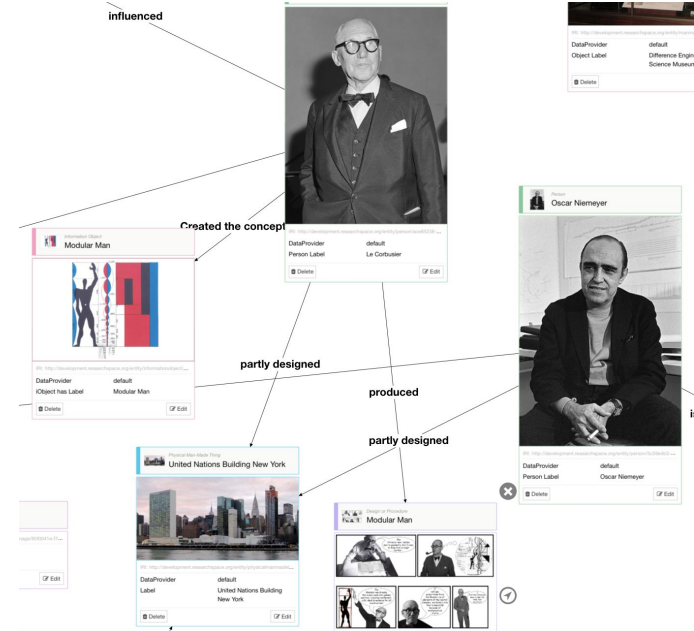
The Way of the World

Many things and processes cannot be abstracted to simple rules and laws.

The world is a constantly changing and complex.



**Stephen Hawking's advice for
twenty-first century grads:
Embrace complexity**



Meaning and History Changes

What processes were involved in its creation

What was its original function?



What is its significance today?

What does it tell us about the past, present, and future?

Architecture

Architecture



Semantic Components in Use

Hope's Destiny



View of a shipping yard at Lowestoft, with a figure up a ladder examining a boat named 'Hope', houses in the background, paper (1952,1031.20)

Hope's Record



ResearchSpace beta Demo Site

Search Example Resources Sparql Account

Home View of a shipping yard at Lowestoft, with a figure up a ladder examin... Edit Page

View of a shipping yard at Lowestoft, with a figure up a ladder examin... ● Object (Man-Made Object) record, British Museum

Summary Annotations Explore Related



British Museum

Field	Value	Annotations	Assertions
Object Description	View of a shipping yard at Lowestoft, with a figure up a ladder examining a boat named 'Hope', houses in the background, paper (1952,1031.20)	1	0
Production End Date	1827-12-31	0	0
Production Start Date	1827-01-01	0	0
Person who carried out Prod...	British	0	0
Person Depicted	Lowestoft	0	0
Legal Owner	1. The British Museum 2. BM Department Prints and Drawings	0	0
Curators Physical Description	View of a shipping yard at Lowestoft, with a figure up a ladder examining a boat named 'Hope', houses in the background; reproduction of a drawing by Varley, c.1827 Hand-coloured soft-ground etching	0	0
Object Production End Date	1827-12-31	0	0
Thing has Production Influe...	Cornelius Varley	0	2

Researching Attribution

ResearchSpace beta Demo Site Search Example Resources Sparql Account Edit Page


Home

Find: Things CREATED BY Cornelius Varley

● Thing > created by > Actor > Cornelius Varley > remove

● Person ● Location ● Time ● Calendar ● Chat ● Tag ● Search

created on


















1781 AD to 1874 AD

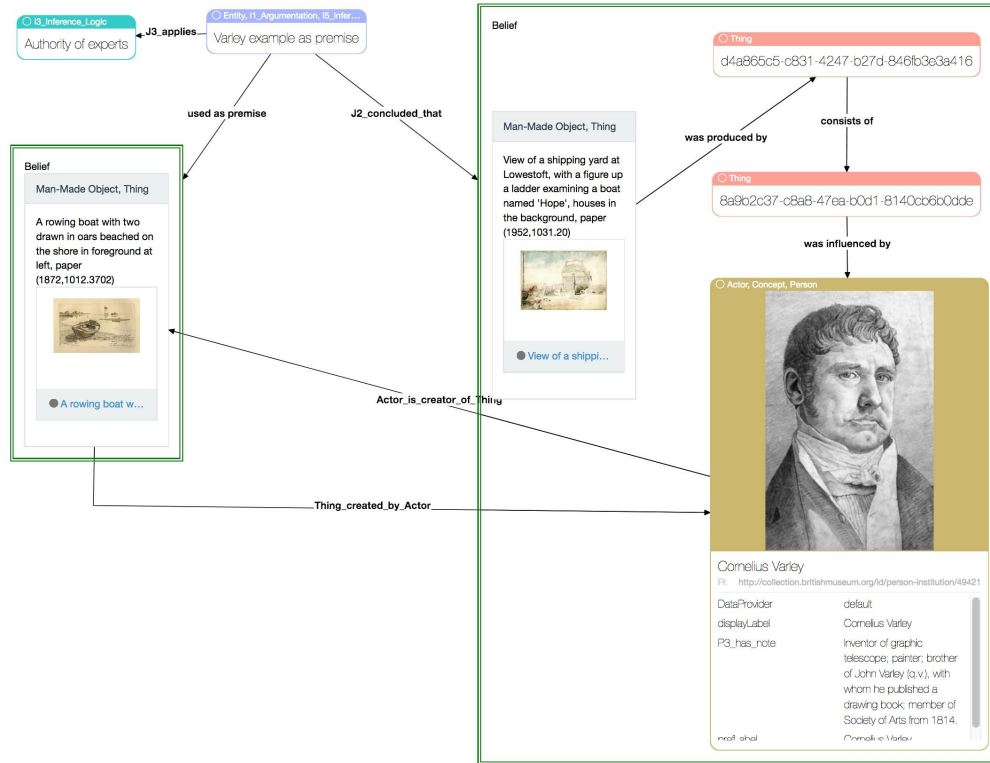
● refers to

Found 58 matches

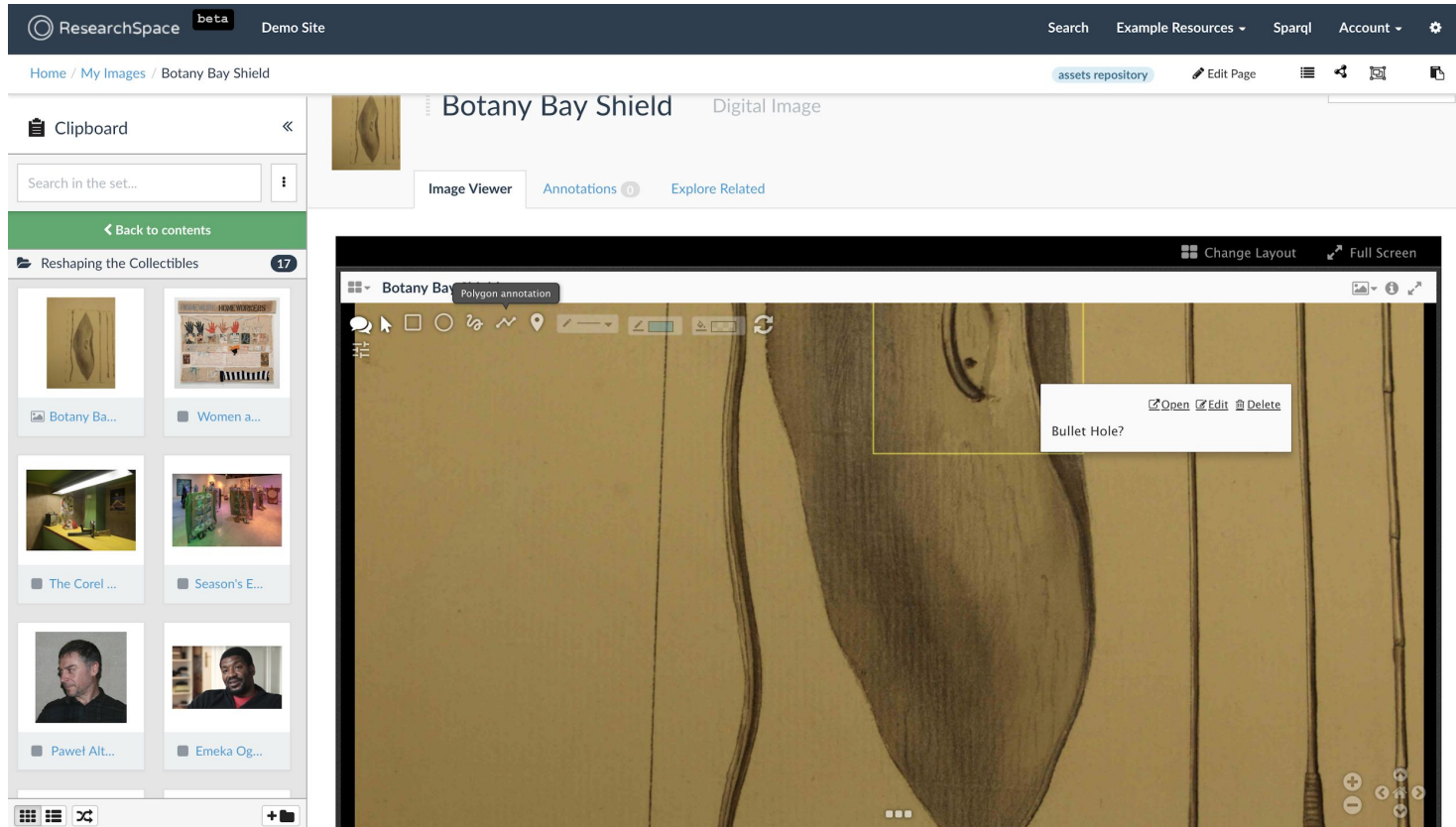
Timeline Chart Table Grid

 ● A moored ...	 ● A moored ...	 ● A boat wit...	 ● A boy seat...	 ● A boy seat...
 ● Two boats ...	 ● Two boats ...	 ● A boat wit...	 ● A rowing b...	 ● A boat wit...
 ● A rowing b...	 ● A boat wit...	 ● A small sail...	 ● Two boats ...	 ● Portrait of ...

Assertions & Arguments



Annotate to build Arguments



The screenshot displays the ResearchSpace interface. At the top, the navigation bar includes the ResearchSpace logo, a 'beta' badge, and the text 'Demo Site'. On the right side of the navigation bar are links for 'Search', 'Example Resources', 'Sparql', and 'Account'. Below the navigation bar, the breadcrumb trail reads 'Home / My Images / Botany Bay Shield'. To the right of the breadcrumb are links for 'assets repository', 'Edit Page', and several utility icons. The main content area is divided into two sections. On the left is a 'Clipboard' sidebar with a search input field and a 'Back to contents' button. Below this is a section titled 'Reshaping the Collectibles' with a count of 17 items. The main image viewer shows a 'Digital Image' of a 'Botany Bay Shield'. A yellow polygon annotation is drawn on the image, with a tooltip that says 'Bullet Hole?' and options to 'Open', 'Edit', and 'Delete'. The image viewer includes a toolbar with various annotation tools and a 'Change Layout' / 'Full Screen' button in the top right corner.

ResearchSpace **beta** Demo Site

Search Example Resources Sparql Account

Home / Knowledge Patterns Catalog

Knowledge Patterns Catalog

Prefixes should be defined and resolved using the system-wide namespace registry.
Please consult Semantic Form help page for further details.

Create New Field...

With selected ... Import Fields Export All Import All Delete All

Filter Results

Field	Modified	Delete
<input type="checkbox"/> Production End Date	March 20, 2018 4:05 AM	<input type="button" value="Duplicate"/> <input type="button" value="Delete"/>
<input type="checkbox"/> Material	March 20, 2018 4:09 AM	<input type="button" value="Duplicate"/> <input type="button" value="Delete"/>
<input type="checkbox"/> Curators Physical Description	March 23, 2018 9:29 AM	<input type="button" value="Duplicate"/> <input type="button" value="Delete"/>
<input type="checkbox"/> Profession or Role	March 20, 2018 4:09 AM	<input type="button" value="Duplicate"/> <input type="button" value="Delete"/>
<input type="checkbox"/> CollectionhasFind	March 16, 2018 4:08 AM	<input type="button" value="Duplicate"/> <input type="button" value="Delete"/>
<input type="checkbox"/> End Date of Production	March 20, 2018 4:10 AM	<input type="button" value="Duplicate"/> <input type="button" value="Delete"/>
<input type="checkbox"/> Legal Owner	March 20, 2018 4:10 AM	<input type="button" value="Duplicate"/> <input type="button" value="Delete"/>
<input type="checkbox"/> Identifier	March 20, 2018 4:10 AM	<input type="button" value="Duplicate"/> <input type="button" value="Delete"/>
<input type="checkbox"/> Inscription Type	March 20, 2018 4:11 AM	<input type="button" value="Duplicate"/> <input type="button" value="Delete"/>
<input type="checkbox"/> Dimension Value	March 20, 2018 4:11 AM	<input type="button" value="Duplicate"/> <input type="button" value="Delete"/>
<input type="checkbox"/> Former or Current Owner	March 20, 2018 4:11 AM	<input type="button" value="Duplicate"/> <input type="button" value="Delete"/>
<input type="checkbox"/> Production Start Date	March 20, 2018 4:12 AM	<input type="button" value="Duplicate"/> <input type="button" value="Delete"/>

ResearchSpace **beta** Demo Site

Knowledge Pattern Catalog / Edit Field Definition: Curators Physical Description


assets repository Edit Page


Edit Knowledge Pattern Definition


Label*

Identifier*


Description Click to add an optional Description.


Categories 

Domain 

XSD Datatype 

Range Click to add an optional Range.


Min. Cardinality 


Max. Cardinality 

Default values [+ Add default value](#)

Test Subject Click to add an optional Test Subject.

Insert Pattern*

Select Pattern 

Delete Pattern 

ASK Validation Pattern Click to add an optional ASK Validation Pattern.

Value Set Pattern Click to add an optional Value Set Pattern.

Data, Processes, and Narrative

ResearchSpace **beta** Demo Site

Home / My Pages / A Tour of Suffolk, Lowestoft and ResearchSpace

Search Example Resources Sparql Account

assets repository Edit Page

Clipboard

Search all...

- Saucer dis...
- Flask, porc...
- lnkpot, po...
- Q Actor is cr...
- A rowing ...
- Study of a ...
- Ferrybridg...
- View of a ...
- Reproducti...

Hope in the Shipyard

The print on the right shows a ship called 'Hope'. Lowestoft has a history of ship building and this is well documented with small businesses existing today. It's possible that this ship sank off the coast of (Dunwich) near Lowestoft soon after this print was made. The coast around Lowestoft, although beautiful, is also treacherous. The print is based on a water colour by Cornelius Varley. Varley was a co-founder of the Water Colour Society and exhibited at the Royal Academy. His compositions included architecture and agricultural as well as boats and river craft, particularly on the Thames. The searches on the left display lithographs and etching from 1809 created by Varley and his father John Varley.

Examples of Varleys work can be found in the Maritime Museum (see right), Yale Center for British Art, the Metropolitan Museum of Art, as well as the Tate. Interestingly a completely different profile can be found at the [Science Museum](#) because Varley was also optical instrument maker and inventor with an association with Michael Faraday.

Images from other sites can be added to ResearchSpace and displayed and of course hyperlinks added to other resources.

Things created by Actor-Cornelius Varley
(filtered to 1809 & Lithographs and etchings)

John Varley (17 August 1778 – 17 November 1842) a watercolour painter and an astrologer. Also and a close friend of William Blake. They collaborated on a book called *Visionary Heads*, written by Varley and illustrated by Blake. Hi family included the artists Cornelius Varley, William Fleetwood Varley, and Elizabeth, who married the painter William Mulready.

Cornelius V...

Varley was born at Hackney, in 1781 and was the younger brother of John Varley. He initially trained as a scientific instrument maker under his uncle and studied art later in his career. He died in Hampsstead on 2 October 1873.[2]

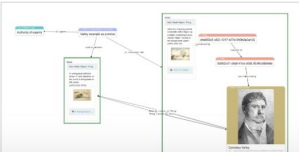
View of a shipping yard at Lowe...

Rowing boat at Lowestoft, 1807

Being Argumentative

ResearchSpace allows researchers to argue about exiting information or assert completely new knowledge. This means that it can transfer more of the thinking process of research activity to the social digital environment where the community can help resolve contradictions and evidence. This allows researchers to move from an individualistic analytical tradition to a more socially oriented mode of thinking and learning.

Arguments in the system are made up of beliefs which are about existing data or can be completelv new things. This means that although the initial data might b basic. the tvoes of



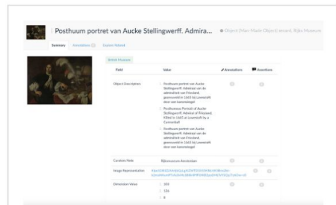
Researching across Collections



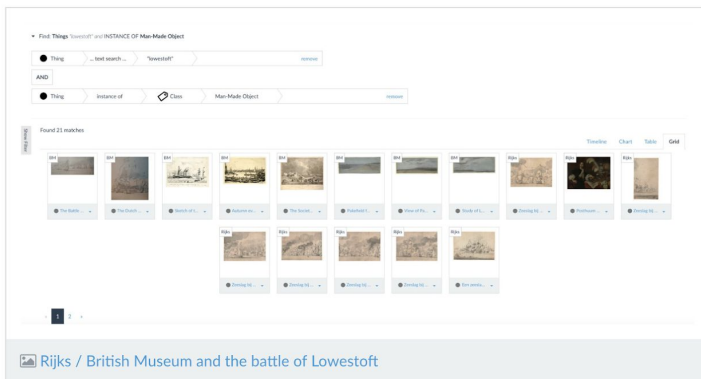
The Battle of Lowestoft - materials from the British Museum and the Rijks museum

ResearchSpace allows researchers to explore across different datasets. Data from two sources, The Rijksmuseum and the British Museum co-exist and are semantically integrated within the same Knowledge graph. Any number of additional datasets can also be integrated.

A Rijksmuseum Record - integrated into ResearchSpace



[Rijksmuseum record](#)



A ResearchSpace search across Rijksmuseum and British Museum data

Beyond the Museum Collections

ResearchSpace **beta** Demo Site

Search Example Resources Sparql Account

Home / Clipboard Manager

Edit Page

Search in the set...

Search in the set...

← Back to contents

← Back to contents

Reshaping the Collectibles 17

Botany Bay

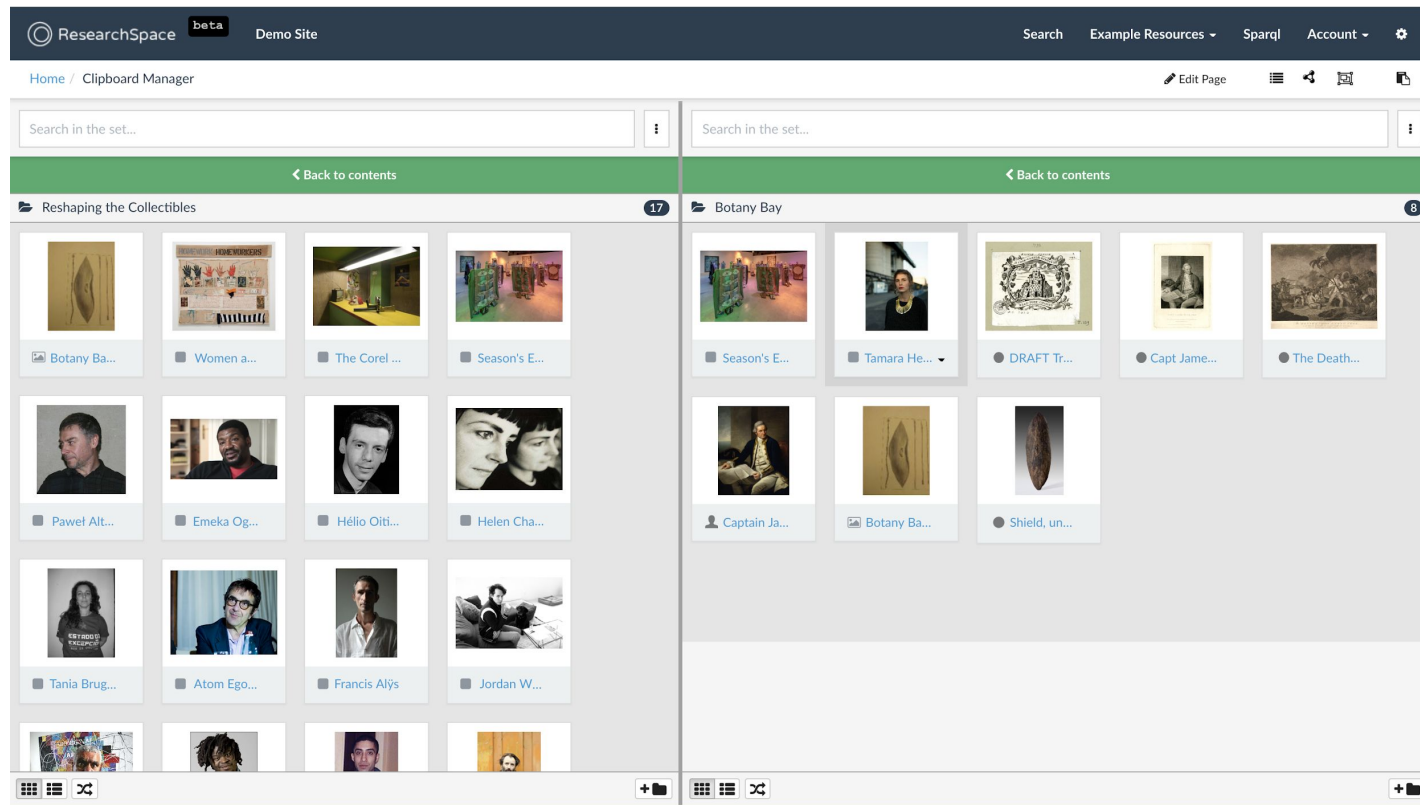
Botany Ba... Women a... The Corel ... Season's E...

Season's E... Tamara He... DRAFT Tr... Capt Jame... The Death...

Pawel Alt... Emeke Og... Hélio Oiti... Helen Cha...

Captain Ja... Botany Ba... Shield, un...

Tania Brug... Atom Ego... Francis Alÿs Jordan W...



New Features: Researchers' Authored Knowledge Graphs

Adding Entities

Clipboard

Search in the set...

Back to contents

Reshaping the Collectibles 16

Women a...

The Corel...

Season's E...

Pawel Alt...

Emeka Og...

Hélio Oiti...

Grid icons and navigation controls at the bottom.

The screenshot shows a network graph with several entities and relationships. A 'New Entity' dialog is open, and a context menu is visible over the graph.

Entity 1: Man-Made Object, Vitruvian man by Leonardo di Vinci

Entity 2: New Entity (ID: http://orntoia.org/newEntity_3228a11d322f503b)

Entity 3: Human Centered Design

Entity 4: Type, Human Centered Design

Relationships:

- Entity 1 has a subject of Entity 2
- Entity 2 is influenced by Entity 3
- Entity 3 arguably refers to the concept of Entity 4
- Entity 4 is influenced by Entity 3

Context Menu (Element type):

- Select element type
- Production
- Man-Made Object**
- Type
- Group
- Event
- Information Object
- Place
- Design or Procedure
- Visual Item
- Linguistic Object
- Transformation
- Document
- Propositional Object
- Image
- D1_Digital_Object

Dialog (Element type):

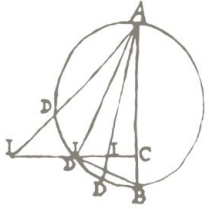
Man-Made Object

Dialog (Type):

- Select link type
- has similarities with
- Object Label
- this object influenced the creation of
- Object has Description
- is a premise for

Projects from History of Science, Art History, and Archaeology use ResearchSpace

History of Science in ResearchSpace



MAX-PLANCK-INSTITUT FÜR WISSENSCHAFTSGESCHICHTE
Max Planck Institute for the History of Science

Project (2015-)

The Sphere: Knowledge System Evolution and the Shared Scientific Identity in Europe

DEPARTMENT I

V. COSMOLOGICAL KNOWLEDGE FROM THE MIDDLE AGES TO THE EIGHTEENTH CENTURY



Art History in ResearchSpace





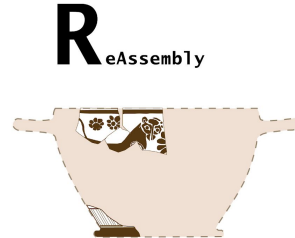
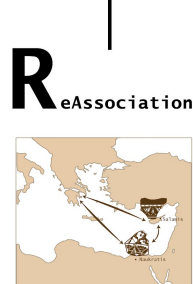
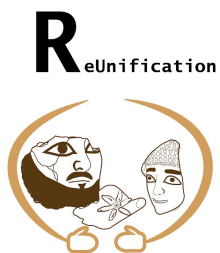
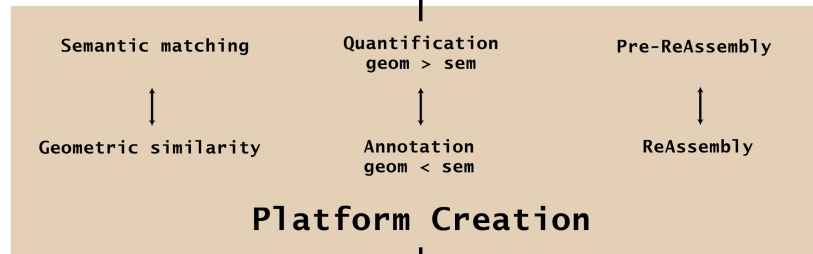
The Four Estates of Moral Purity (1823)



Demonstration of
Japanese woodblock
print production
at the British Museum

Photo ©
Benedict Johnson Photography
(2 June 2017)

Archaeology in ResearchSpace



References

Examples at:

<http://demo.researchspace.org> (Read only)

Conceptual Reference Model:

<http://www.cidoc-crm.org/>

Partnerships:

THE
ANDREW W.

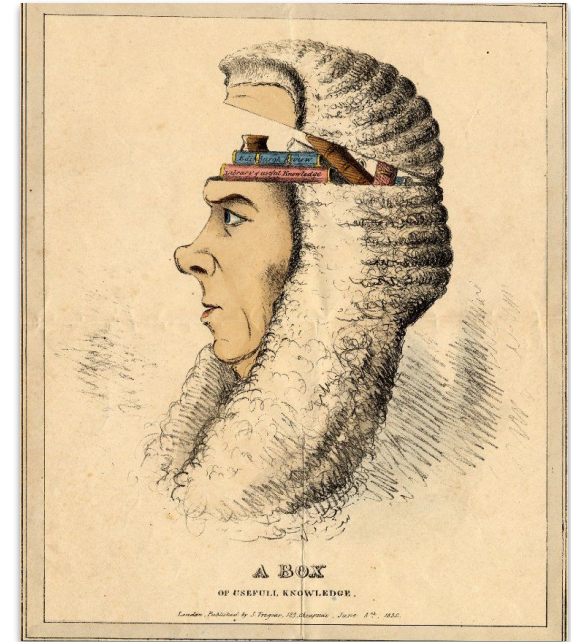
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metaphacts



FORTH
INSTITUTE OF COMPUTER SCIENCE



A Box of Useful Knowledge
[Caricature of Brougham] 1832