

### Make it Happen – Carrying out Research and Analysing Data (PARTHENOS Webinar)

George Bruseker, Carlo Meghini

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PARTHENOS for Heritage E-research Networking Optimization and Symerges

# Make it Happen -Carrying out Research and Analysing Data

(George Bruseker & Carlo Meghini)

### A Webinar of the PARTHENOS eHumanities and eHeritage Series

Picture: Linking Open Data cloud diagram 2017, by Andrejs Abele, John P. McCrae, Paul Buitelaar, Anja Jentzsch and Richard Cyganiak. <u>http://lod-cloud.net/ CC-BY-SA</u>

Webinar start: **05.04.2018, 11:00 CEST** Moderation: Ulrike Wuttke (University of Applied Sciences Potsdam)



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@Parthenos EU



#### PARTHENOS Poring Activities, Resources and Tools for Heritage Freesarch Networking, Ceptimization and Syrverges

### **PARTHENOS eHumanities and eHeritage Webinar Series**



#PARTHENOSWebinar



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# Some Housekeeping...

- As a participant you will be **muted** and not be seen throughout the webinar.
- For **questions** and **remarks** please use the **chat**. For questions, please use the word **question**.
- Your questions are going to be answered by the trainers during / after the presentation.
- If you have **sound problems**, please test your technical settings. You have to click on the **speaker symbol** on top to to be able to hear (it has to be green).
- Help us improve: Follow up e-mail with a link to a short feedback survey.





# Some words about PARTHENOS...

- **PARTHENOS** stands for: Pooling Activities, Resources and Tools for Heritage eResearch Networking, Optimization and Synergies
- PARTHENOS is a Horizon 2020 project with the aim to strengthen the cohesion of Heritage related E-research
- Running time: 1 May 2015 30 April 2019
- PARTHENOS has 16 partners from 9 European countries
- PARTHENOS Coordinator: PIN Scrl (Italy)
- The PARTHENOS webinar series is a cross PARTHENOS training effort









### Which country are you participating from?



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## Make it Happen – Carrying Out Research and Analysing Data

### **Trainers**



**George Bruseker** (FORTH, Greece)



Carlo Meghini (CNR, Italy)

> Dr Ulrike Wuttke (University of

Applied Sciences Potsdam, Germany)



FHP Fachhochschule Fachhochschule F University of Applied Sciences

**Moderation** 



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# "MAKE IT HAPPEN"

CARRYING OUT RESEARCH AND ANALYSING DATA in a Research Infrastructure

A Webinar of the Parthenos eHumanities and eHeritage Series

### Webinar Programme

- 1. Benefits and Challenges of Research Infrastructures for Researchers
- 2. Technical Challenges to Setting up an Effective RI and the Parthenos Proposition
- 3. Step-by-Step of the Research-Register-Research, Ondemand Integration Cycle

### The Journey



Martin Grandjean. Henri Bergson et les paradoxes de Zénon : Achille battu par la tortue ?.WikiMedia Commons. CC-BY SA4.0. https://commons.wikimedia.org/wiki/File:Zeno Achilles Paradox.png



Gordon Joly. Be more tortoise and less hare. Flickr. CC-BY SA2.0. https://www.flickr.com/photos/loopzilla/26687633281

1. Benefits and Challenges of Research Infrastructures for Researchers

### What is a Research Infrastructure

A complex IT system, set up and constantly enriched by a research organization to provide its scientific community with digital resources for conducting research.

A virtual doppleganger of the real community

Resources:

- Data and Knowledge, including scientific literature
- Data and Knowledge Processing Tools
- Services
  - Authentication, Authorization, Accounting
  - User and Community Management
  - Resource Discovery and Access
  - Virtual Research Environments
  - $\circ$  ... and more

# Poll: Are you happy with the data, tools and services you have access to?

### Research in an RI Context - Benefits

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6	Female	L on R	64	21	Right	Some	Ne	ever
7	Male	L on R	83	18.833	Right	Freq	Ne	ever
8	Female	R on L	74	35.833	Right	Freq	Ne	ever
9	Male	R on L	72	19	Right	Some	Ne	ever
10	Male	R on L	90	22.333	Right	Some	Ne	ver

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Richard Cyganiak and Anja Jentzsch. Picture of LOD. Wikimedia Commons. CC-ASA 3.0. https://commons.wikimedia.org/wiki/File:Lod-datasets 2009-07-14.svg

### Shared Datasets

### Research in an RI Context - Benefits



**Shared Tools** 

### Research in an RI Context - Benefits



Four Blair Services Pvt. Ltd.. Graphic Representing Services. Wikimedia. CC ASA 4.0 https://commons.wikimedia.org/wiki/File:Services4.png

### **Shared Services**

### Research in an RI Context? - Ends



Unknown. Graphic of Sharing Economy. Escuela de Organizacion Industrial. Unknown http://www.eoi.es/blogs/imsd/what-you-have-is-what-i-need-collaborative-economy/

Efficient and Trustworthy Sharing of Knowledge

### Research in an RI Context? - Problems

Lack of:

- Visibility of Resources
- Standards
- Shared/sharing Culture



Hans Hillewaert .Graphic of Acquifer. Wikimedia Commons. CC ASA 3.0 https://commons.wikimedia.org/wiki/File:Aquifer\_tr.svg



Agnico-Eagle .Photograph of Gold bars created by Agnico-Eagle. Wikimedia Commons. CC0 1.0 https://commons.wikimedia.org/wiki/File:Gold\_Bars.jpg



Pixabay .Graphic of Sharing. Pixabay. CC0 1.0 https://pixabay.com/en/child-kid-sharing-friendship-game-145067

### Move to RI based Research Requires



Unknown .Fig. 146 in Manual of Egyptian archæology and guide to the study of antiquities in Egypt. For the use of students and travellers. Flickr. Unknown. https://www.flickr.com/photos/internetarchivebookimages/14589744169/ 4. Deploy Critical Scholarly Apparatus in Virtual Research Environment

3. Common Workflows

2. Common Research Infrastructure Context

1. Shared General Priorities

2. Technical Challenges to Setting up an Effective RI and the Parthenos Proposition Poll: What percentage of your time do you devote to downloading, installing, configuring, and maintaining IT tools or trying to understand and clean existing datasets for your research?

## How do we get there? Meeting the Info Integration Challenge

motivates

1 - Unknown. Graphic Representing Actors. Pixabay. CC0 https://pixabay.com/en/business-team-people-group-894846/ 2 - Unknown. Graphic Representing Actors. Pixabay. CC0 https://pixabay.com/en/objects-things-icons-beach-sun-1315199/ 3 -Moini. Graphic Representing Tools on the wall. Public Domain Files. None. http://www.publicdomainfiles.com/show\_file.php?id=13526406018618 4 - Unknown. Graphic Representing Actors. Pixabay. CC0 https://pixabay.com/en/arrow-target-range-bullseye-sport-2889040/

**Data** are inherently <u>heterogeneous</u> owing, inter alia, to the diversity of:





ACTORS	Objects

**Tools**<sub>3</sub>



**Goals**<sub>4</sub>

### **Common Information Integration Solutions**

		Minimalist	Maximalist
	Core Fields	Few or None	Comprehensive
	Extensibility	Open	Closed
<b>→</b>	Advantages	Light, Flexible, Expressive	Complete and comprehensive for its time
	Disadvantages	Weak Automated Integration, difficulty of mainte- nance	Heavy conversion and update price, unevenness of source data, takes a strong position

### Info Integration Challenge and the Supermarket Bias



Information Integration perceived as:

- List of Items
- Maximalist List
- Minimalist List

But this is **not adequate for** science and **scholarship**. We need to know:

- Where it came from?
- How was it made?
- Who is responsible for it?
- How can we learn more about it?

Not a list of items, but a picture of a scientific/scholarly environment.

TheeErin .Picutre of Planking in Supermaket. Wikimedia Commons. CC ASA 2.0.. https://commons.wikimedia.org/wiki/File:Planking\_in\_supermarket.jpg

## Down with the Catalogue, Up with the Register!

Research

Infrastructures



Services

Software



Datasets



An adequate Data or Conceptual Model for RIs should provide a framework for describing and mapping basic relations that hold between:

Services, Actors, Projects, Datasets, Software, Research Infrastructures

This will **provide** not yet another aggregation but a picture of the research infrastructure and information integration landscape itself to identify, support and build useful and sustainable aggregations.

This picture serves the function of determining what has been integrated, where and by who and gives the ability to plan and managed the continuous activity of multiple integrations for different purposes

Actors

**Projects** 

### **Parthenos Entities**



### **Research Infrastructure Components for Scholarship**



A register linked to an aggregation environment supports targeted, on-demand integration of datasets, software and services in VREs for scholars to carry out critically grounded research.

## What's a VRE?

A complex IT system, made available by one or more RIs for a designated research community to collaboratively conduct research on a specific theme.

The members of the designated community find in the VRE the digital resources:

- Data and Knowledge, including scientific literature
- Data and Knowledge Processing Tools
- Services

that they need for their activity. These digital resources are provided by the underlying RIs.

# In their most general form, VREs have an overarching role, enabling interoperation across RIs



3. Step-by-Step of the Research - Register -Research on-demand integration Cycle

### The Research and Register Data Cycle Overview



### Carry out Research and Register Results

Research undertaken in VRE has association to its inputs and new data is registered back to central registry

#### Setup VRE and populate

Initiate VRE on top of registry and setup for research, create necessary mappings from resources to create rich data network in appropriate format

### Determine useful Integrations and map

Use register to identify combinations of services, datasets and software that would support research

## 1. Register Resources

This step is the foundation of all further research. It establishes the basic knowledge of who holds what data, how it was produced, and how it can be accessed.



Tools General	Particular				
<ul> <li>Spread- sheet</li> <li>RDMS</li> <li>Triple Store</li> </ul>	<ul> <li>G-Spread- sheets</li> <li>Drupal</li> <li>OrientDB</li> </ul>				

### Resources

- Parthenos Minimal Metadata
   <u>Recommendation</u>
- Basic G-Spreadsheets

### 1. Register Resources



## 2. Data Mapping and Transformation

This step is used both to enrich the initial registry as well as to populate VREs with particular highly integrated datasets based on a useful local standard.



Beijing Tongzhou Modern International New City Investment and Operation Bureau. 通 州新城规划图. Wikimedia Commons. Public Domain. https://commons.wikimedia.org/wiki/File:Tongzhou\_New\_City\_Plan\_mapping\_03.jpg

Tools	
General	Particular
<ul><li>Mapping Tool</li><li>Transform</li></ul>	• X3ML Toolkit
Engine <ul> <li>Data</li> </ul>	<ul> <li><u>Themas</u> <u>Vocabulary</u></li> </ul>
Cleaning <ul> <li>Vocabularies</li> </ul>	Manager
Management <ul> <li>Aggregation</li> </ul>	• <u>D-Net</u>
Manager	

- Parthenos Minimal Metadata Document
- <u>CIDOC CRM</u>

### 2. Data Mapping and Transformation

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## Data Inspection and Cleaning

#### INPUT

### 3. Resource Analysis

This step proceeds to an analysis of the available resources in relation to research questions. It considers the available data sources and their formats as well as the tools available and their ability to work with certain formats.



Tools			
General	Particular		
<ul> <li>Registry</li> <li>Research Questions</li> </ul>	<ul> <li>Your Registry</li> <li>Your Research Questions</li> </ul>		

#### Resources

Parthenos Minimal Metadata

## 3. Resource Analysis

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REGISTRY					
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	spatial coverage								
	subject	Elvotningedatabasen 1933-1945							

## 4. VRE Setup and Population

This setup establishes a custom environment for plugging in available services and tools to work on harmonized and integrated datasets.



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Tools	
General	Particular
<ul> <li>VRE Software Platform</li> </ul>	D4Science

### Resources

D4Science Documentation

## The D4Science VREs' of Carlo

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### 5. Research, Results, Register

Using the resources deployed in the VRE, researchers carry out primary research generating new datasets and then re-register them to the overall system register. This creates fully provenanced knowledge.



Tools	
General	Particular
<ul> <li>As per research goal</li> </ul>	<ul> <li>As per research goal</li> </ul>

### Resources

• Domain dependent

Unknown. Graphic Representing Virtual Research. Pixabay. CC0 https://pixabay.com/en/face-faces-dialogue-talk-psyche-3189805/

# Poll: What are the chief benefits you hope from an RI?

### Conclusions

- 1. Share and Understand Priorities
- Build the data foundations, build the knowledge foundations (register what you have and what you know)
- 3. From the foundations extend your knowledge through targeted VREs
- 4. Slow but steady cross the infinite distance



Martin Grandjean Henri Bergson et les paradoxes de Zénon : Achille battu par la tortue ?.WikiMedia Commons.CC BY-SA4.0 https://commons.wikimedia.org/wiki/File:Zeno\_Arrow\_Paradox.png





# **Questions & Answers**



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## Announcements

- Next PARTHENOS webinar:
  - 24.04.2018, 13:00 CEST: <u>Boost your eHumanities and eHeritage research with Research</u> <u>Infrastructures</u> (Darja Fišer, Ulrike Wuttke)
- New PARTHENOS Training Suite module: <u>Manage, Improve and Open Up Your Research and Data</u>
- PARTHENOS YouTube Channel: e.g. <u>PARTHENOS TRAINING: Ontologies Explained (in 5 minutes or less)</u> (with Kristen Schuster, KCL)
- PARTHENOS Webinar Workshop at the European Summer University in Digital Humanities 2018 (ESU), Leipzig: <u>How Research Infrastructures empower eHumanities and eHeritage</u> <u>Research(ers)</u>







# **Questions & Answers**



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# Thank you for joining us!



 Please help us improving the PARTHENOS Webinar Series and fill out the short Feedback Survey that we'll sent you in a follow-up e-mail.

(Picture: CCO https://pixabay.com/photo-1889007/)



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#### PARTHENOS Poling Activities, Resources and Tools for Hering E-research Networking. Optimization and Synergies

### **PARTHENOS eHumanities and eHeritage Webinar Series**



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