Digital Infrastructures for Archaeology: Past, Present and Future directions

CAA2019, Krakow

24 April 2019

@ARIADNEplus #KrakCAA #s22
Infrastructures: Past

Archaeological Records of Europe - Networked Access

Welcome to the ARENA search portal.

Please select a flag from the right to start searching in your language.

The ARENA search portal allows you to search for archaeological sites and monuments from six European countries: Denmark, Great Britain, Norway, Iceland, Romania and Poland.

The content of this project does not necessarily reflect the position of the European Community, nor does it involve any responsibility on the part of the European Community.

Culture 2000

© ADS 1999 - Edited by Jo Clifford, email
Date only: http://ads.ac.uk for this page
Life before ARIADNE...
Project basics

- **ARIADNE:**
  - 4 year project
  - 02/2013 - 02/2017
  - 6.5m euros
  - 23 partners; 18 countries

- **ARIADNEplus:**
  - 4 year project
  - 02/2019 – 02/2023
  - 6.6m euros
  - 41 partners; 27 countries
Extending geographically

**ARIADNE:**
23 partners; 18 countries

**ARIADNEplus:**
41 partners; 27 countries

Plus: Argentina, Japan & USA
Extending thematically
# ARIADNEplus special interest groups

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<tr>
<th>Sites and monuments record and event records</th>
<th>Remote Sensing</th>
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<td>Paleo-anthropology</td>
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<td>Bio-archaeology and Ancient DNA</td>
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94% of researchers agreed that it is important that datasets are available online in an uncomplicated way.

87% of researchers agreed that they often do not know what research data is available because it is stored in so many different places and databases.

74% of researchers consider it important to have easy access to international datasets.

The perceived lack of professional recognition and reward for sharing data is a barrier to data sharing for 72% of researchers.

A lack of institutional or international repositories for archaeological data sets was a barrier to data sharing for 60% of researchers.
The ARIADNE roadmap

1. **Metadata richness and standardisation**
   - Legacy metadata
     - General purpose, e.g. Dublin Core
   - Application profiles
     - Domain ontologies, e.g. CIDOC-CRM

2. **Dimensions of integration**
   - Complex time–spatial relations
   - Part–whole relations
   - Managing different knowledge models

3. **Addressing complexity**
   - Pan-European integration of datasets
     - Multi-lingual tools and services
   - Extending the Conceptual Reference Model
   - Standardisation to high-level ontologies
Achieving interoperability

• We have datasets in many languages and complying with many different standards

• ARIADNE uses the CIDOC CRM with extensions for archaeology to achieve integration
  – Existing datasets are mapped to the ARIADNE data model
  – Subject concepts are mapped to the Getty A&AT
  – Periods are defined in Perio.Do
ARIADNE Reference Model

Few concepts, high recall

Special concepts, high precision
Interoperability Framework

ARIADNE e-Infrastructure and Integrated Services

ARIADNE Portal
Cross-search and other applications

ARIADNE Registry
Datasets, metadata schema, KOSs, mappings, ..., CRM

Meta/data records => collect/transform2/RDF

Data Centers
(nat./int., archaeology or general)

Subject/Domain-based Repositories & Portals
(nat./international)

Institutional Repositories / DBs

Subject/Domain-based Referatories & Portals
(nat./international)

Research Projects

ARIADNE e-Infrastructure and Integrated Services

Other e-Infra & Services

Legend:
dep=deposit, coll=collect, acc=access;
D= Data, M= Metadata

L1: Projects, research groups

L2: Institutions, institutional repositories/DBs

L3: Higher-level data managers

L4: e-infra & integrated services

ARACHNE
accData
Search, browse, ...

Other e-Infra & Services


LOD aggregators (nat./thematic)?

Several ARIADNE partners
The ARIADNE Portal

Welcome
ARIADNE brings together and integrates existing archaeological research data infrastructures so that researchers can use the various distributed datasets and new and powerful technologies as an integral component of the archaeological research methodology.

Browse the Catalog
Transnational Activity

Training events

• 2D/3D documentation for archaeology
• Legacy data and dataset design
• Mapping existing datasets to CIDOC CRM
• Data curation
ARIADNE services

ARIADNE visual media service
Create your online showcase for 3d models, images and RTI.

Upload » Browse »

3D models
3D representations produced with 3D scanners or photogrammetry are extremely high-resolution and hard to visualize at interactive rate. This service produces a web page that supports interactive visualization of your data, after converting it into an efficient multiresolution encoding.

View details » Demo

RTI images
Re-lightable images (called Reflection Transformation Images, RTI, or Polynomial Texture Maps, PTM) are becoming an increasingly used media. This service closes a current gap, giving support for easy publication on the web and interactive visualization of RTI images.

View details » Demo

High-resolution images
High-resolution images are a commodity resource in archaeology. Unfortunately, they are most often disseminated and published on the web by using low-resolution versions (a single 40Mpixel images is 120MB in uncompressed format and around 10MB when lossy compressed).

View details » Demo

http://visual.ariadne-infrastructure.eu/
NLP and Data Mining

NLP

Information Extraction

ARIADNE Data store

Data Mining

Archaeological knowledge

Patterns

Search/Query

(ARIADNE portal)
“One of the grand challenges of data-intensive science is to facilitate knowledge discovery by assisting humans and machines in their discovery of, access to, integration and analysis of scientific data.”

- **Findable**
  - Data are described with good metadata
  - Metadata are indexed in a searchable resource
  - Data are assigned a Permanent identifier

- **Accessible**
  - Data should be open and online

- **Interoperable**
  - Use a formal, open, shared language for knowledge representation

- **Re-usable**
  - Data should have clear data licenses
  - Metadata should meet domain-relevant standards
Standards: Guides to Good Practice

Archaeology Data Service / Digital Antiquity
Guides to Good Practice

Dendrochronological Data in Archaeology: A Guide to Good Practice

Peter Brewer, Laboratory of Tree-Ring Research, University of Arizona, USA
Esther Jansma, Cultural Heritage Agency and Utrecht University, The Netherlands

VERSION 1.1 - JUNE 2016

Section 1. Aims and Objectives
- 1.1 Background to the Guide
- 1.2 Scope of the Guide
- 1.3 Data and Metadata

Section 2. Creating Dendrochronological Data
- 2.1 Project Planning and Requirements
- 2.2 Sources of Data
- 2.3 File Types (whilst creating, working with, and processing data)
- 2.4 File Naming Convention
- 2.5 Documenting Data Creation and Processing

Section 3. Archiving Dendrochronological Data
- 3.1 Deciding What to Archive
- 3.2 Deciding How to Archive
- 3.3 Archiving File Types
- 3.4 Converting Data Formats
- 3.5 Archiving Strategies
- 3.6 Metadata and Documentation

Section 4. Copyright
- 4.1 Copyright for Dendrochronology

New Guides:
- Dendrochronology
- 3D Models in Archaeology
Links to other e-infrastructures

- European Open Science Cloud
- SSHOC (Social Sciences & Humanities Open Cloud)
- E-RIHS (European Research Infrastructure for Heritage Science)
CA18128 - Saving European Archaeology from the Digital Dark Age

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10.20 – 10.40
Introduction

10.40 – 11.00
Where is the data?
Ulf Jakobsson

11.00 – 11.20
My data manager is a robot!
Valentijn Gilissen, Hella Hollander

11.20 – 11.40
The ARIADNE project at INRAP: inception, implementation and future,
Kai Salas Rossenbach, Amala Marx,

11.40 – 12.00
OpenArchaeo: an application to query archaeological data via CIDOC CRM,
Olivier Marlet, Xavier Rodier, Thomas Francart, Béatrice Markhoff

12.00 – 12.20
Czech archaeology in the Digital Environment – Digitizing Archaeological Agenda in Theory and Practice,
Jan Hasil, David Novák

12.20 – 12.40
ZBIVA web application,
Benjamin Stular

LUNCH BREAK
14.00 – 14.20
Archaeological Map of Bulgaria in ARIADNE and ARIADNEplus,
*Georgi Nekhrizov, Nadezhda Kecheva*

14.20 – 14.40
‘A puzzle in 4D’: using semantic technologies for the integration
of resources from a long-term excavation project,
*Edeltraud Aspöck, Gerald Hiebel*

14.40 – 15.00
The Swedish Digital Archaeological Workflow in Action,
*Marcus J. Smith*

15.00 – 15.20
The ADED project - a Norwegian infrastructure for excavation data,
*Christian Emil Smith Ore, Espen Uleberg, Jakob Kile-Vesik*

15.20 – 15.40
Ísleif: a network-based approach to site survey,
*Adolf Fridriksson, Gisli Palsson*

**COFFEE BREAK**

16.00 – 16.20
ARIADNEplus for public/community archaeology,
*Andres Dobat*

16.20 – 16.40
CENIEH: A relevant source of digital paleoanthropological datasets for ARIADNEplus,
*Mohamed Sahnouni, Maria Isabel Sarro Moreno, Cecilia Calvo Simal*

16.40 – 17.00
Prospects and Potential for the National Digital Repository of Archaeological Site Reports,
*Yuichi Takata, Akihiro Kaneda, Miyu Konuma, Sadakatsu Kunitake*
THANK YOU!

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