Funded by EU H2020 Research and Innovation Action
Duration: 36 months
June 2016 to May 2019
Pottery often represents a significant percentage of finds in many parts of the world, and therefore significant investment of time and expertise.
Analysis of sherds:
(a) the identification of the ceramic class, the specialist looks at:
- surface treatment,
- the decoration
- the fabric
(b) identification of the form type:
- looks into the ceramic class paper catalogues for the specific form;
- analyses the section of the potsherd and its profile;
- makes a comparison with published types (hundreds of pages and drawings)
ArchAIDE is developing a new app for tablets and smartphones to speed and support the ceramic classification and interpretation work of archaeologists, during both fieldwork and post-excavation analysis.
Partners
Archaeologists and Computer Scientists

University of York
Archaeology Data Service

University of Cologne
Institut für Archäologie

University of Barcelona
Fac. de Prehistòria, Història Antiga i Arqueologia
BARAKA
ELEMENTS

University of Pisa (coordinator)
Dipartimento di Civiltà e forme del sapere
CNR –Istituto di Scienza e Tecnologie dell’Informazione
INERA srl

University of Tel Aviv
School of Computer Science
ArchAIDE
Archaeological Automatic Interpretation and Documentation of cEramics

Roman Amphorae

Terra Sigillata

Majolica
[Digitisation]

catalogues
Digital Resources

Roman Amphorae: a digital resource
University of Southampton, 2008 (updated 2014)

Click on the image to see metadata record and link to larger version of the image for download.

Africana 1 Piccolo

https://doi.org/10.5284/1028192
(Assisted) manual and automatic text digitisation
Production
Subform 23.1 is probably made in many parts of Italy; examples in Padana ware do not show applied decoration. Subform 23.2 is made in Italy but apparently not in the Padana region.

Distribution
Subform 23.2 is very common throughout the Mediterranean region, with sporadic examples found in the North and in North-Italy; Subform 23.1 is relatively uncommon.

What we have:

What we want:

```json
{
  "form": "23.1",
  "origin": "Italy",
  "decoration": "none",
  "occurs": "uncommon"
},
{
  "form": "23.2",
  "origin": "Italy, not Padana",
  "occurs": "Mediterranean region; North-Italy"
}
```
From drawings digitisation to 3D models
Database design

The database is designed to:

• Hold images, shape models and descriptive data from the comparative collections

• Allow the recognition technologies developed to be applied

• Incorporate data from users
Multilingual vocabularies

- Allows mapping of concepts rather than terms by archaeologists
- Different recording traditions may not only use different words, but work at different levels of granularity.
- Concepts are mapped to the Getty AAT as a ‘neutral spine’ to allow interoperability with other resources.
Database implementation

Agora G199
Amphorae

Distinctive Features
This type of amphora is known as the Agora G199 (Robinson, 1959: 43 Pl. Ostia forma 631 [Pamella, 1973: 474-6 Fig. 34]; Zerner no. 41 (1978: 52); M. Am. Amphora 4 [Riley, 1978: 186-7]; Nea Paphos amphora [Leonard, 1995: 144-5]; Dycksz, 2t distinctive short and right-angled handles; w. At first the vertical handle bar is longer than in length horizontally and vertically. The bod elongated toe, sometimes with a ‘mushroom’ rim gently everted. Early versions have a lop have shorter necks and handles. The later ty mushroom-cap at the base. The relationship the late-third and fourth centuries AD (as Ro. Pl. 28) needs to be clarified (cf. Stane, 2004: ...)

Courtesy of Dottsa Lucrezia Ungaro, Museo Del Forte Imperiale e Mercati Traiani
Media Type: Photograph
Scale: Photograph of whole amphora
Original Source:

Courtesy of Dr. D. F. Williams
Media Type: Photograph
Scale: Photograph of partial amphora
Original Source:

Media Type: Photograph
Scale: Hand specimen, fresh broken surface
Original Source:

Courtesy of Bodrum Museum of Underwater Archaeology
Media Type: Photograph
Scale: Photograph of whole amphora
Original Source:

mouth_radius: 53.3446
ratio_mm_pixels: 0.42337

Profiles_SVG_DRI167
Media Type: Drawing
Scale: Original Source:

3D_Model_DRI167
Media Type: 3D model
Scale: Original Source:

After Scialliano & Sibella, 1991
Media Type: Drawing
Scale: Drawing at 1:10 scale
Original Source:

ArchAIDE
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[appearance and shape based similarity search and retrieval]
Appearance based recognition

Decoration

Stamps
Following discussion with pottery specialists, a methodology was defined on how the data should be classified:

1. The user annotates a profile on a picture
2. The shape is extracted from the annotation
3. This shape is used for finding similar profiles, and ranking them by relevance

Ranking of pottery classes by relevance
The main steps for building the shape-based system are:

• Extract pottery profiles from the catalogues
• Reconstruct 3D models of the pottery from the profiles
• Generate a database of synthetic sherds for each class
• Extract the fracture shapes from the sherds
• Train the neural-network to learn how to classify the sherds by their fractures
[workflow]

[find a potsherd]

[search and retrieval]

[automatic recognition]

https://www.flickr.com/photos/londonmatt/
The ArchAIDE knowledge-base is a collection of search and retrieval tools that allows to access the database of reference classes for types, decoration and stamps. The defined classes derive from online and paper catalogues that was used to populate what we call the "Reference Database". A team of expert archaeologists and researchers are continuously working on the database extending the catalogue and refining the definitions.
Genere 26. Fascia con ovali e rombi.
Il genere 26, nella fase ancora sperimentale di costruzione della tipologia “a ovali e rombi”, ha un motivo primitivo costitutivo.

Genere 13. Foglia di prezzemolo
Questa tipologia decorativa, concepita come l’insieme di minuscoli seoni incrociati in blue cobalto, di forma simile a quella

Genere 27. Fascia con ovali
Si tratta di undecoro pertinente alle sole forme chiuse, che si presenta strutturalmente simile al genere precedente, in quanto

Genere 38. Piatti baccellati
Il genere 38 si colloca tra le produzioni minori del primo periodo rinascimentale, le crescenti a basso piede rappresentano un

Genere 18. Fascie Geometriche
La tipologia che abbiamo definito “fascia a triangoli” ci fornisce uno dei casi più emblematici di trasformazione e costruzione di
MANUAL: Draw as much points you can along the shape's profile
The prediction engine tries to identify only the top level classes. For example, the class “Conspectus form 34” is the parent of “Conspectus form 34.1” and “Conspectus form 34.2”
[Data preservation]
ArchAIDE is participating in the **Open Research Data Pilot**
The data created will be preserved and disseminated online, and made freely available for use and re-use.
We created a Data Management Plan (DMP), following Guidelines on FAIR Data Management in Horizon 2020

- Open Access
- Interoperability (Open formats, metadata)

At the end of the project, all data within the Reference database (catalogue data, images, models etc), and a subset of data from the Results database will be available within ADS archive, accompanied by rich metadata permitting wide array of re-use.

https://doi.org/10.5284/1050896
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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.

[Thank you for your attention]

www.archaide.eu