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COMMON EUROPEAN DATA SPACE FOR CULTURAL HERITAGE

3D Data in the Data Space for Cultural Heritage

Sander Münster, et al.

EUREKA3D

5D culture

XR culture

3D BIG DATA SPACE

EUREKA3D XR

3D-4CH Competence Centre

COMMON EUROPEAN DATA SPACE FOR CULTURAL HERITAGE

ADAPT. ASPIRE. ACHIEVE

Funded by the European Union

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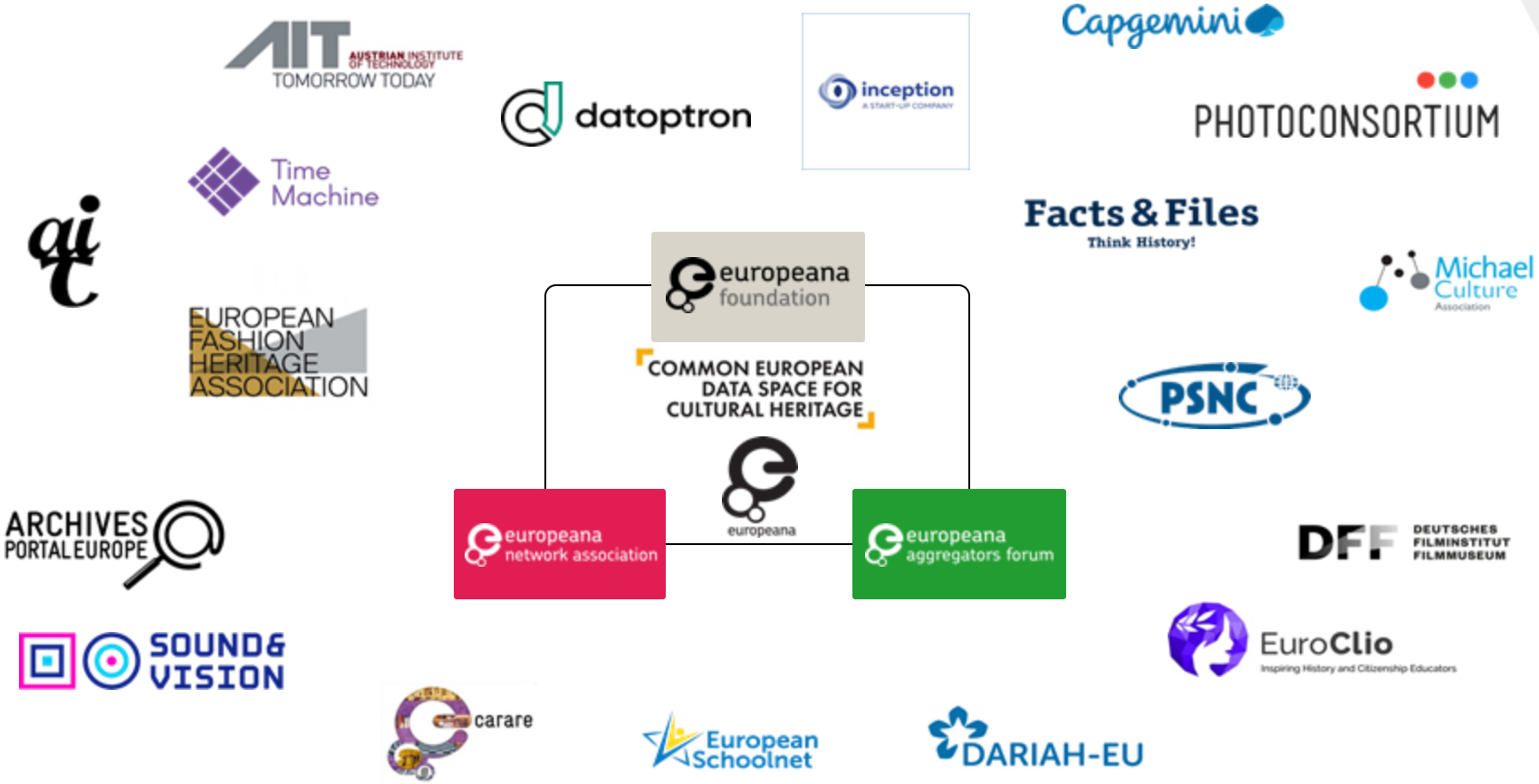
60 staff
5000+ members
European Union
3700+ museums,
libraries & archives
europeana
43 accredited
aggregators

The consortium




We democratise access to cultural heritage data

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TWIN IT!

3D FOR EUROPE'S CULTURE

Twin it! logo. A composition of Windmolen van Elene by FrDr, CC BY-SA 4.0 and Elene windmill by visualdimension, CC BY-NC-ND. Creator: Ana Moreno Date: 2023 Institution: Europeana Foundation.

sweden 2023.eu

EU23 SPANISH PRESIDENCY

Funded by the European Union

3D Working Group

Contribute to the building of a training programme for 3D

Develop an extension of the Europeana Data Model for 3D

Define quality requirements for 3D for the Europeana Publishing Framework

Advise in data governance discussions around 3D

Mainstream 3D in products & services

Position the data space

Background

Activity in the Data Space for Cultural Heritage (2024)

(1)desk research

(2)a questionnaire based online survey.

Desk research	
No. of repositories checked	98
No. of extant repositories	85
No. of repositories containing 3D and not in online survey	52
Online survey	
Repositories participating	23
De-duplicated dataset	75

Mapping action – results

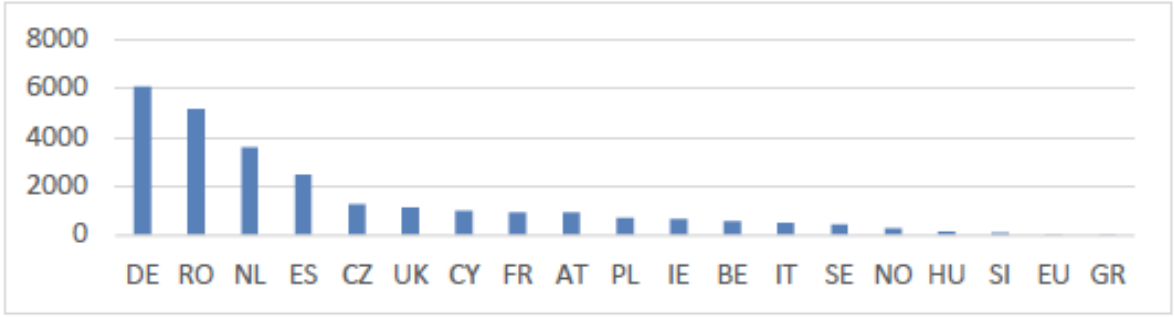


Fig. 1. 3D Assets held by repositories per country (n=26.277)

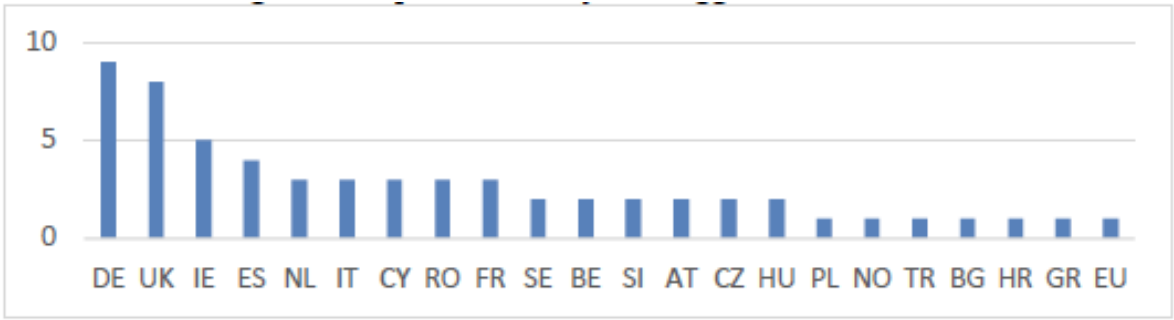
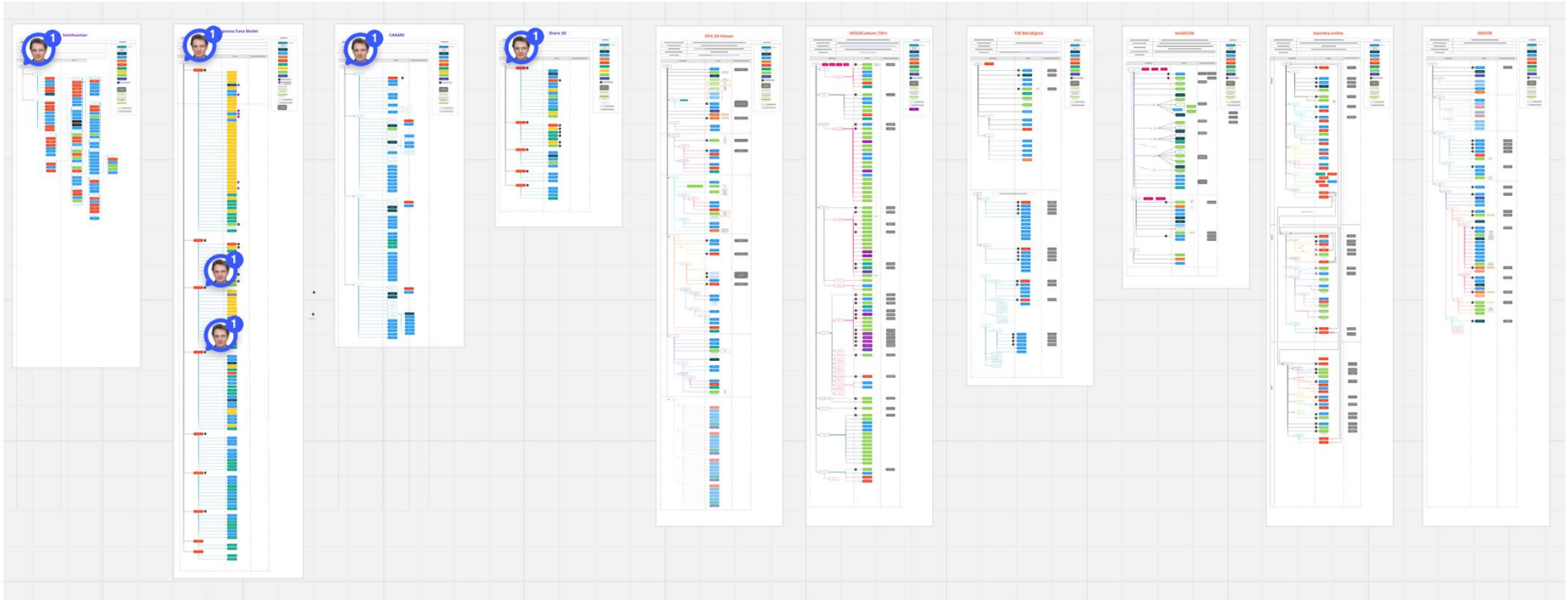


Fig. 2. Number of repositories included in the survey activity (n=60)

Metadata scheme mapping



Recording metadata

EUreka3D promotes quality of 3D digitisation

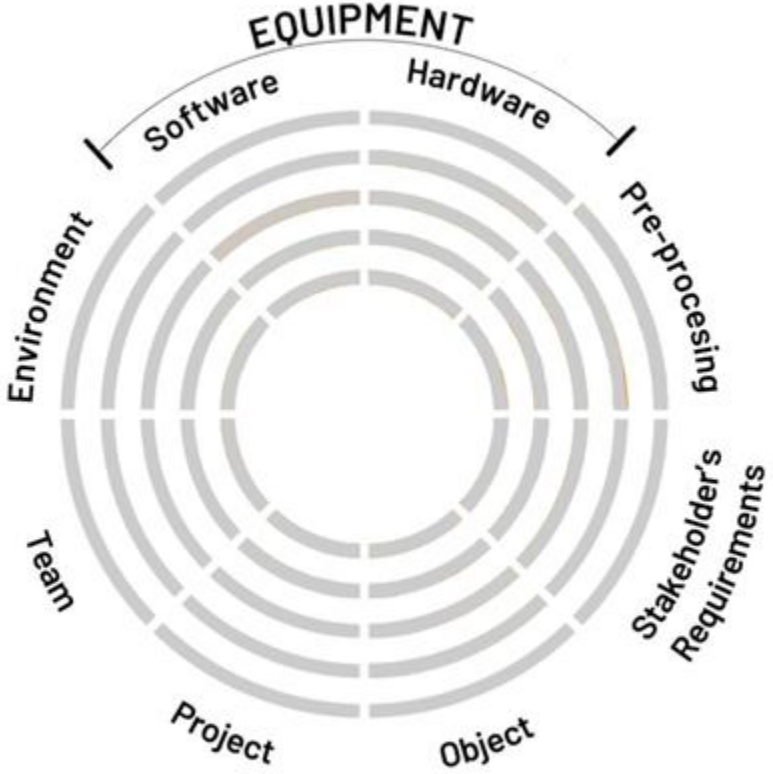
The Guidelines are available for free download from the EUreka3D website

The Online Course is going to be accessible on the Europeana Learning Platform

Quality matters

- Digitization is a static capture of a dynamic object at a certain moment in time
- A still image of a painting, the picture of a monument or the representation of a cultural site, they are all 2D projection of a 3D object
- Initial stakeholder requirements, equipment, practices, actual setting, software processing all impact the final result

The **VIGIE 2020/654 Study** on quality in 3D digitisation of tangible cultural heritage is made available by the EU. We should take advantage of it!



PHOTOCONSORTIUM

EUREKA3D

Official Media Partner
DIGITALMEETSCULTURE
www.digitalmeetsculture.net

Retroassigning metadata

Data

Retrieved 3D datasets

Dataset	No	License
Objaverse 1.0 – cultural heritage	55.614	Open
Scan the world	12.448	Open
Megascenes Pointclouds	20.649	Open
Smithsonian	3.685	Open
5DCulture	8.406	Open
Europeana	220	Open
LiDAR & Geotiles	1.374	Open & Restricted*

3D datasets in processing

Dataset	No	License
Objaverse XL – Github & Thingiverse	5.236.361 3.732.212 (all types)	Open
LiDAR & OSM Tiles	1.232.802 (all types)	Open & Restricted*

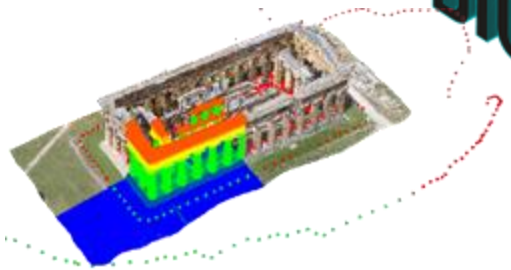
Processed image datasets

Data source	No.	Licenses
WikimediaCommons	124.896	CC-BY
Europeana Buildings	1.318.086	Open & restricted
Fortepan	18.816	Open
4DBrowser Dataset	34.486	Open
Architectural Dataset	Ca. 70.000	Open

Repository: https://3drepo.eu

Data enrichment

- Heritage content classification
  - Set up pipeline and tools to classify 3D objects both automatically, via image-based (2D) and geometry-based (3D point clouds) content classification, and manually:
    - CLI-based Random Forest classifier specialised for labeling points clouds
      - Goal: User defined classes (through the provision of own training data)
    - Initial test of pipeline based on several AI-tools to enrich the metadata: language detection, translation of text into English, summarization of descriptions, content categorization using both image- and text-based approaches, identification of location information from text, image description for caption creation and image-based content retrieval
    - Initial work on a web-based manual annotation tool based on Europeana defined classes of objects



3D classification based on classes representing construction element

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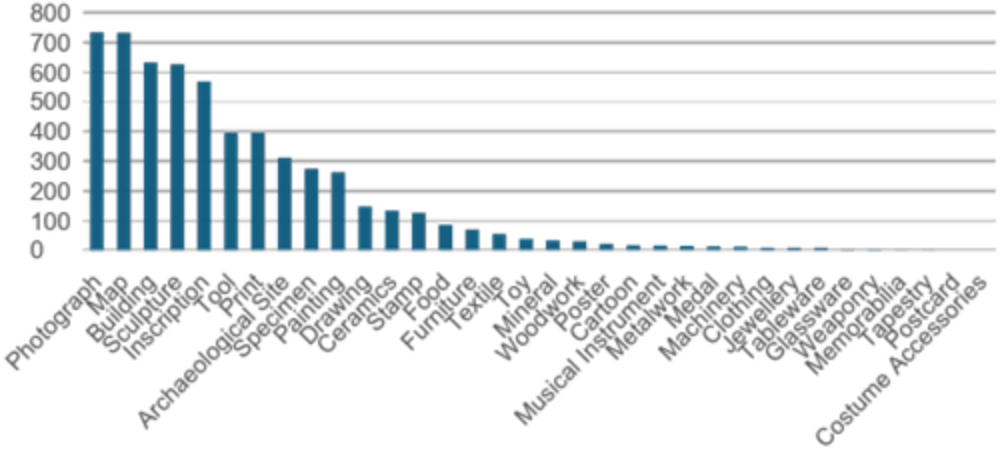
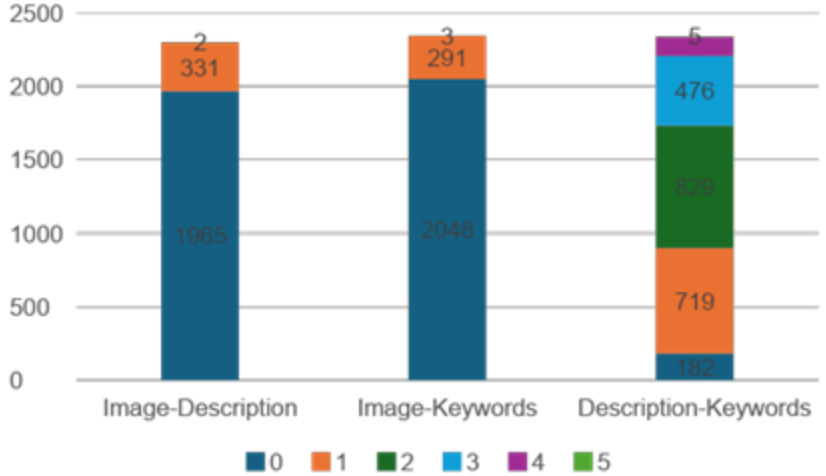
Data enrichment - results



Identification of object categories via keywords in (translated) descriptions (n=5.798)

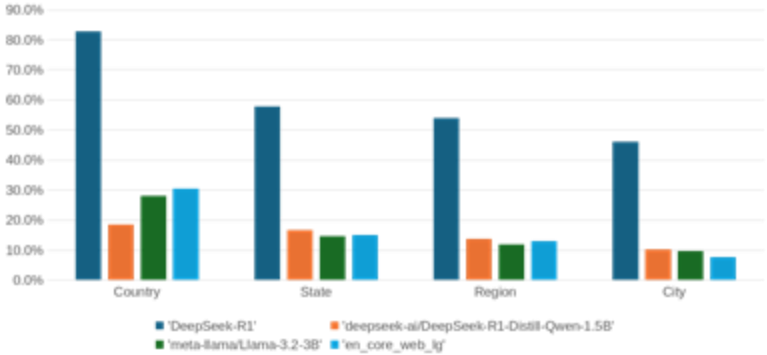


Identification of object categories via keywords in (translated) descriptions (n=2.296)

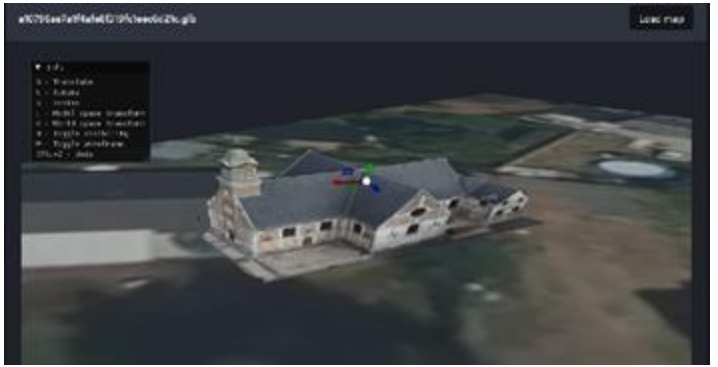
Münster, S., Bruschke, J., Rajan, V., Komorowicz, D., Preßler, R., & Ukolov, D. (2025). 4D World Viewers as Multi-user Content Management Systems. ISPRS - International Archives of the Photogrammetry Remote Sensing and Spatial Information Sciences.

Data enrichment

- Spatialization: image geolocalization
  - Associate real-world geographic coordinates and scale to 3D models lacking spatial information:
    - Automatically: Ongoing work on a method that combines synthetic renderings (synthetic views using Blender), deep-learning visual localization solutions (GeoCLIP), georeferencing libraries (rasterio with satellite imagery), and deep-learning feature matching algorithms (such as SuperPoint+SuperGlue).
    - Manually: Initial work on a web-based tool for manual geolocation, allowing 3D models to be placed and scaled on a terrain map



Initial results from matching between model retrieved and human-assigned location information from the Europeana dataset (n=2.465)



Initial screenshots from the manual geolocation annotator

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Competency development

Reaching out to our network

Survey of existing training courses, curriculum and materials

In April we launched a survey to find out from our network what training is currently available for 3D in cultural heritage:

- 84 responses:
  - 45% educational institutions
  - 14% governmental institutions
  - 11% research institutions
  - 9.5% cultural heritage organisations
  - 9.5% enterprises
  - 8% professional associations
  - 1% vocational education and training provider

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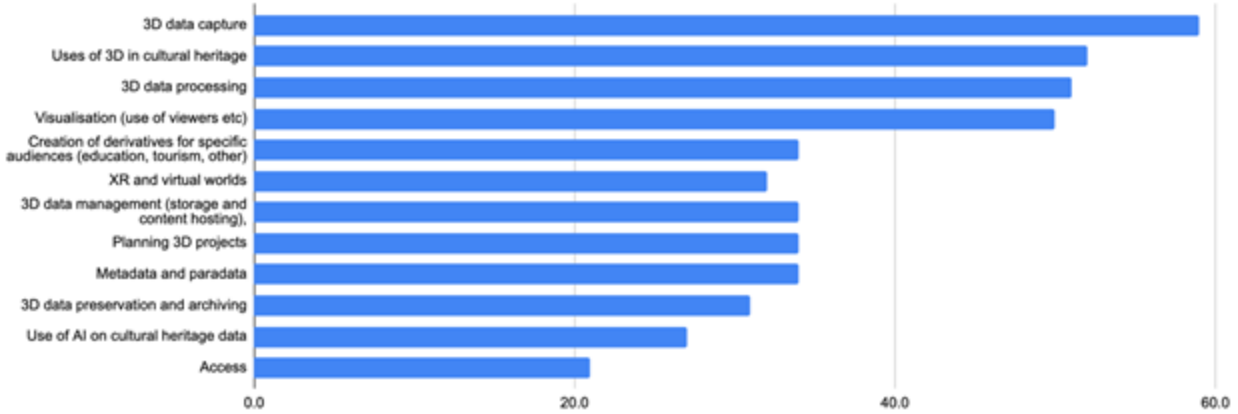
Training topics

The topics most respondents reported covering in training were **3D data capture** (88%), **Uses of 3D in cultural heritage** (78%), **3D data processing** (76%) and **Visualisation** (75%).

Less frequently reported were **Access and licences** (31%), **Uses of AI on cultural heritage data** (40%) and **3D data preservation and archiving** (46%).

The other 5 topics (metadata and paradata, 3D data management, Creation of derivatives, XR and virtual worlds and planning 3D projects were reported by 32-45% of respondents.

Responses by training topic



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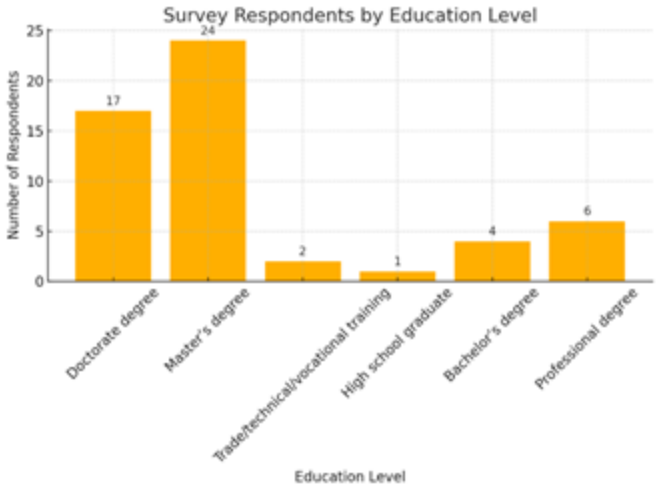
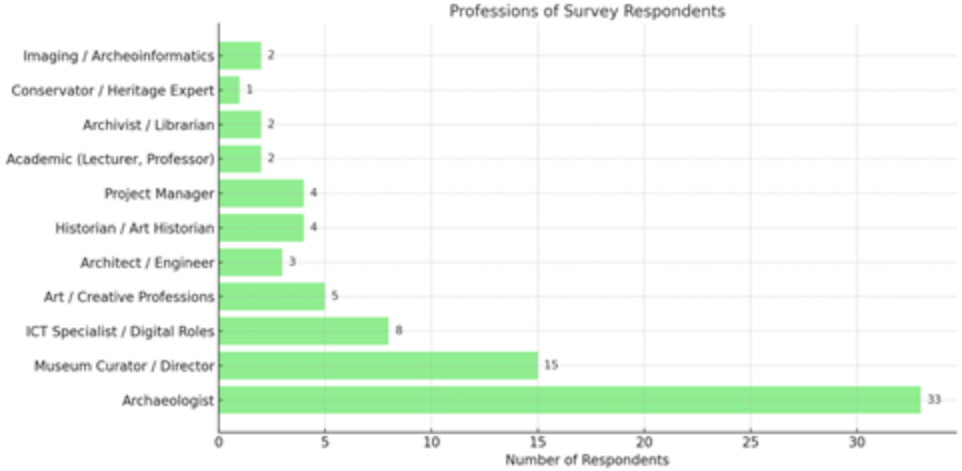
Who did we reach so far





Balanced gender-wise

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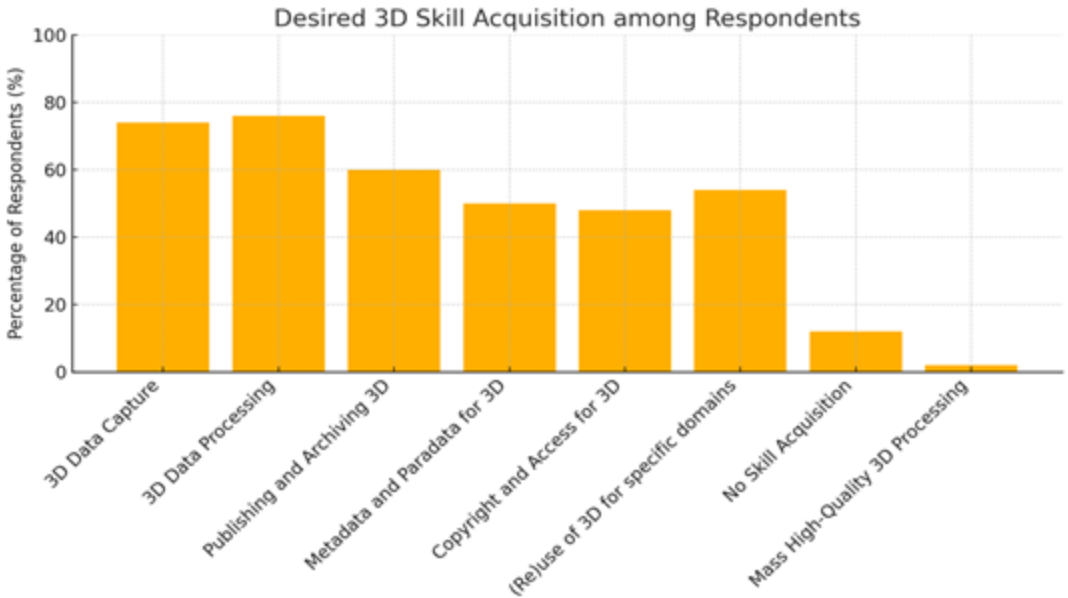
Identified needs and recommendations



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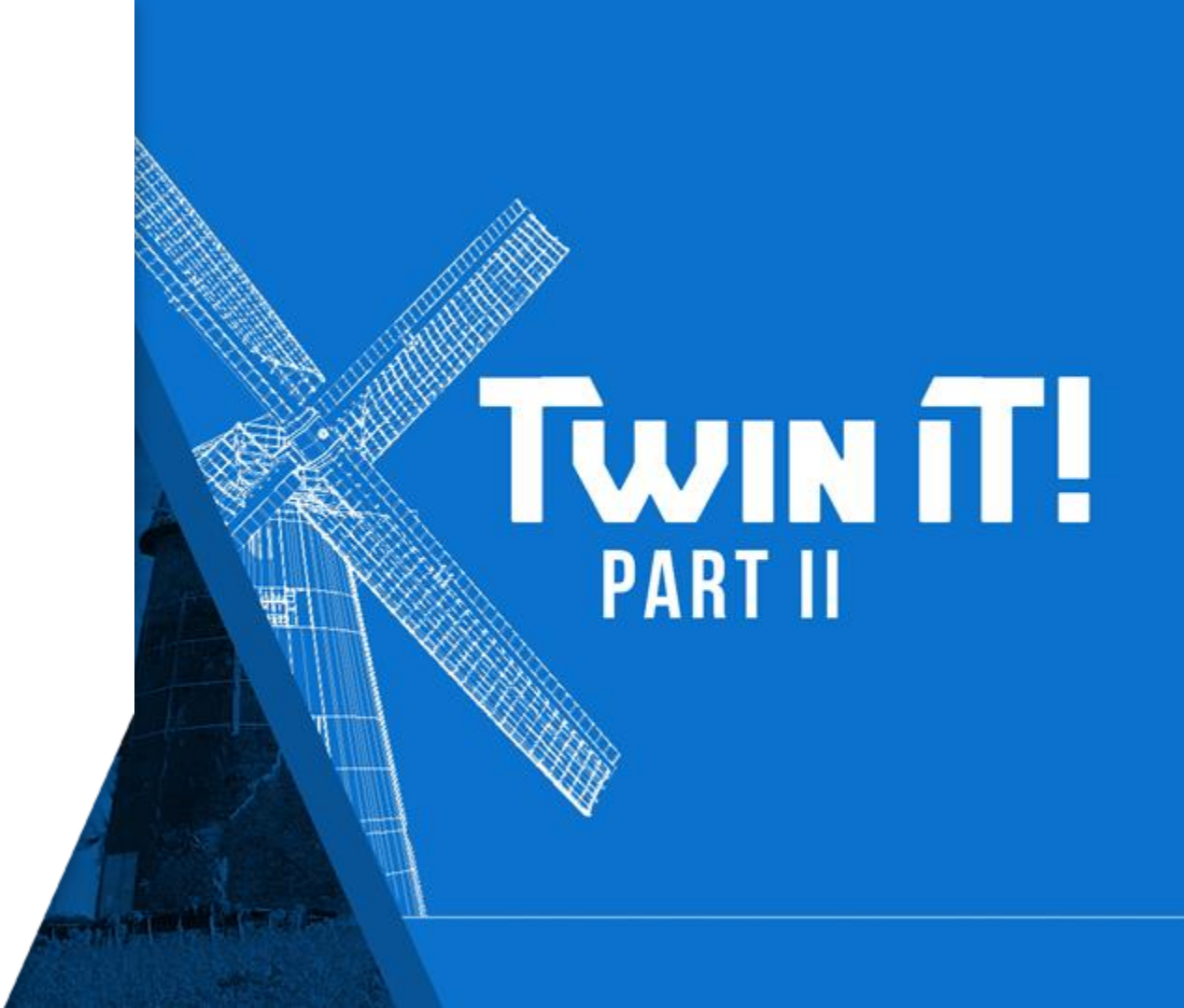

Valentine Charles,
Europeana Foundation

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Cross-presidency campaign

June 2023
June 2024

June 2025 - June 2026

The call to action towards Member States

The campaign invites Member States to **submit at least one high-quality 3D digitised asset to the data space, with clear reuse intent, and enriched with additional data** (e.g. documentation, metadata, paradata, contextualisation, 2D)

Professional, communities, citizen and general public engagement

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Mainstream 3D in products & services

Position the data space

Got heritage data? Share with the Data Space!

SCAN ME

- 1. Access a wider, global audience
- 2. Scale the reach of your collections
- 3. Encourage the innovative reuse of your collections

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COMMON EUROPEAN DATA SPACE FOR CULTURAL HERITAGE

Thank you!

Ministry of Culture and National Heritage Republic of Poland

National Institute of Cultural Heritage

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