

# AI-DRIVEN PARTICIPATORY CULTURAL HERITAGE PROJECTS: A TYPOLOGY-BASED DATA ANALYSIS

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The study is part of the **AISTER** Erasmus+ project that addresses AI-enabled Citizen Participation in University-driven Ukrainian Cultural Heritage Safeguarding (Nr. 2024-2-LU01-KA220-HED-000290738)

**Duration:** 2025-2027

**Scope:** The project aims to enhance the capacities of European universities in Artificial Intelligence (AI) and human participation for cultural heritage safeguarding in emergency. AISTER fosters interdisciplinary synergies in computer science, cultural heritage, and social sciences, thereby stimulating innovation in teaching and learning methods within university settings.

**Consortium:** University of Luxembourg (Coordinator), Web2Learn (Greece), University of Latvia (Latvia), Taras Shevchenko National University of Kyiv (Ukraine), Europeana (Netherlands)

## INTRODUCTION

AI-enabled citizen participation is rapidly reshaping cultural heritage preservation. This study inventories and analyses international and European-based projects, identifying several key dimensions in 4 topics: **AI ethics, public participation, cultural heritage domain, and risk/emergency phase**, to explore patterns, correlations, and emerging directions.

Research questions:

- RQ1: How do the selected initiatives distribute across established **typologies** of Artificial Intelligence, human participation, and cultural-heritage emergency phases?
- RQ2: What patterns, trends and insights emerge from **exploratory data analysis** of these initiatives?

## OBJECTIVE

To publish a peer-reviewed, open-access inventory and data analysis of AI-enabled, participatory projects that safeguard cultural heritage in both emergency and non-emergency contexts.

**Intended audience:**

- Researchers and educators
  - Cultural heritage practitioners
  - Policy makers
  - technicians
- interested in the responsible application of AI in cultural heritage and the promotion of participatory models in both emergency and non-emergency contexts.

## METHODOLOGY

i) Creating an **inventory** of projects based on 4 basic criteria:

- **AI Component:** Uses at least one AI technology in the project implementation.
- **Participatory Component:** Involves citizens/communities beyond simple end-user status.
- **Cultural Heritage Focus:** Addresses the safeguarding or documentation of any heritage asset.
- **Broad Risk Context:** Any circumstance that threatens cultural heritage in a broad sense.

ii) Selection of 14 **typologies, models, and classifications** to categorise the selected initiatives, based on **4 key topics**: artificial intelligence, participation, cultural heritage, and risk/emergency phase.

iii) Typology **description** based on 4 variables:

- **Scope:** Defining the overall objective of the typology.
- **Question:** Stating the key inquiry guiding the classification.
- **Analytical Tool:** Refers to the classification, model or typology.
- **Dimensions:** Lists the specific categories or values used within the typology (e.g., contributory, collaborative, co-created).

iv) **Data mapping** of inventoried projects based on the selected typologies across 24 data fields.

v) **Data processing** including harmonisation, duplicate checks, missing data handling (completed via secondary sources or flagged as "unclear"), and final validation.

## ANALYSIS

- 55 European and global projects were initially inventoried by all project partners.
- After peer review, 22 projects were finally retained for their clear intersection of AI, citizen engagement, cultural heritage focus and broad risk preservation.
- Data analysis and visualisations were performed on Tableau software, pivoting data through:
  - **Descriptive statistics** to provide first insights.
  - **Exploratory data analysis** to explore patterns and hypotheses.
  - **Cross-Tabulation analysis** by connecting different topics to uncover relationships and gain deeper insights.

## RESULTS

Data analysis yielded **23 data visualisations** capturing key insights across typologies.

Findings:

- **Build cross-sector capacity:** Enable Government and Industry to align with Academia and Civil Society on ethical awareness.
- **Promote open licensing:** Especially for high-risk AI (e.g., NLP and Machine Vision) to enhance transparency and public trust.
- **Support human-centred AI:** Focus on Intangible Cultural Heritage, which remains underexplored compared to Tangible Heritage.
- **Empower civic participation:** Shift from contributory to co-created and collaborative models in AI-driven heritage projects.

Selected data visualisations:

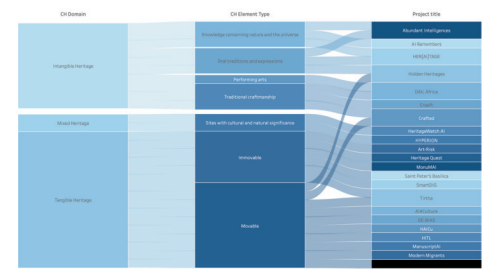


Figure 2: Sankey diagram showing how projects align with Tangible, Intangible, and Mixed Heritage domains and their specific element types, based on UNESCO classifications. Source: 2025. Web2Learn for the AISTER project, CC BY 4.0.

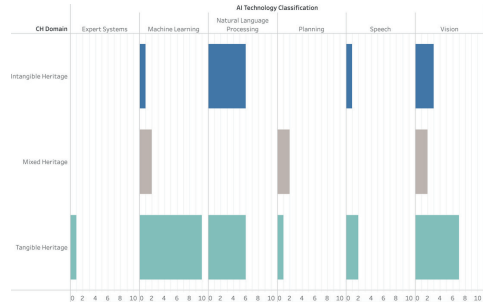


Figure 4: Grouped bar chart showing how AI types (e.g., Vision, NLP, ML) are applied across CH domains (Tangible, Intangible, Mixed, Natural). Highlights thematic alignments based on Mukhamediev et al. (2022) and UNESCO classifications. Source: 2025. Web2Learn for the AISTER project, CC BY 4.0.



Scan QR code to view the interactive data visualisation

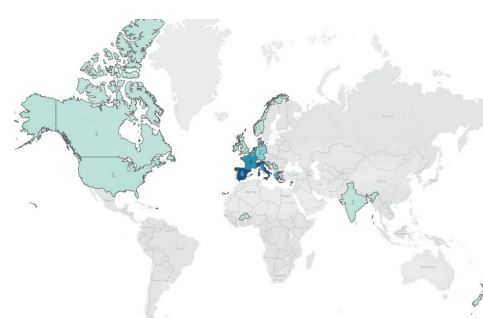


Figure 1: Choropleth map showing country-level participation across all projects. Source: 2025. Web2Learn for the AISTER project, CC BY 4.0.



Scan QR code to view the interactive data visualisation



Scan QR code to view the interactive data visualisation



Figure 3: Matrix chart visualising how projects embed AI ethics across design phases, by, for, and in design, based on Chen et al. (2023). Source: 2025. Web2Learn for the AISTER project, CC BY 4.0.



Scan QR code to view the interactive data visualisation

## LIMITATIONS

The analysis is constrained by:

- **Limited sample size** and data gaps due to reliance on publicly available information.
- Potential **inconsistencies in data mapping** by partners may affect data accuracy.
- **Lack of longitudinal data** for early-stage projects limits outcome assessment.

Future work should:

- Expand the dataset.
- Validate data mapping by inviting review from partners of the selected initiatives.
- Track project outcomes over time.

## PROJECT OUTPUTS

All resources are openly available under the Creative Commons license CC BY 4.0.

- **Harmonised dataset** in structured spreadsheet format
- **Data analysis report** (40 pages) detailing findings and interpretations.
- **Methodology documentation** (12 pages) describing selected typologies.
- **23 interactive data visualisations** with filtering and tooltip functionality.

Access all 23 data visualisations:  
[web2learn.eu/aister-data](https://web2learn.eu/aister-data)



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