‘The Cultural Heritage Cloud: new projects, lasting impacts’

Monday 1 December 2025 – 14.30h

DG Research & Innovation, European Commission

Research and Innovation for cultural heritage, cultural and creative industries, Cultural Heritage Cloud

Unit D4 – Democracy, Equality & Culture

Visit our website
Contact us RTD-CULTURAL-HERITAGE-CLOUD@ec.europa.eu

European Commission

HOUSE KEEPING RULES

- Keep your camera and microphone off during the event
- Questions can be asked via Slido at **#CloudProjects2025** or via the QR code. The link will also be shared via the chat. Please do not use the chat for asking questions!
- If you have questions for a specific project, please mention this in the question (For project X: why ….)

AGENDA

14.30	**Welcome**
14.45	**ECHOES update**
15.05	**ROUND 1: Innovation pitches**
16.05	**ROUND 2: The Cloud in practice**
16.35	**Q&A**
16.50	**Closing remarks and next steps**

Katja Reppel

Head of Unit for Democracy, Equality and Culture

DG RTD – European Commission

THE CULTURAL HERITAGE CLOUD

Directorate-General for Research and Innovation

Maria Claudia Bodino

Rickard Bucksch

R&I for Cultural Heritage and CCIs,
DG RTD, European Commission

THE BIG PICTURE: THREE PHASE DEVELOPMENT

1. INFRASTRUCTURE & TOOLS - 25 +10 M€

WP2023

Design and implement the **basic architecture**, data model and **governance**, including steering and coordination entity for all implementation actions

2. TOOLS
48 M€

WP2024

Research and develop **basic tools** and functionality that make the platform attractive, useful and user friendly

3. USE CASES
26 M€

WP2025

Develop and test **real-world use cases** of the platform together with stakeholders; pilot, test, improve, integrate

echoes
European Cloud
for Heritage Open Science

European Commission

1. BASIC ARCHITECTURE & 3 TOOLS ~ 25+10 mln

Preserving the Past, Shaping the Future: your Gateway to a Collaborative and Innovative European Cultural Heritage Community

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European Cloud for Heritage Open Science

AUTOMATA

HERITALISE

textailes

Coordinated by **Centre National de la Recherche Scientifique CNRS**

- https://cordis.europa.eu/project/id/101157364
- https://www.echoes-eccch.eu/
- https://www.echoes-eccch.eu/partners/

European Commission

2. INNOVATIVE TOOLS: SYNERGIES ~ 48 mln

Digitalisation and analysis of dynamic processes, objects and complex combined data	**MusicSphere**	A Multimodal Approach for Digitizing, Analyzing, and Simulating Traditional Musical Organs Through 3D Technologies, Acoustic Analysis and Interactive Experiences
	KINETIKA	Advancing the Digitization and Analysis of Dynamic Cultural Heritage Objects
Advanced data enrichment	**INFITINY**	Multidimensional knowledge-based annotation for ethical context-aware heritage data life cycles
	ECHOLOT	European Cultural Heritage Optimised Linked Open Tools
Documenting, interlinking and organising data	**ARXIVE**	Advanced Research and eXploration for Interoperable Value in European Heritage
	StratiGraph	Knowledge Graphs for Stratigraphy
High-value interactions with visitors and heritage objects	**UNICHE**	Unified No-Code platform for Interactive Cultural Heritage Experiences
	PlaceMUS XR	Digital Journey across Musical Places in Europe and Extended Realities
Study, conservation and restoration of heritage objects	**COLOURS**	Collaborative On-cloud Lab for the conservation and digital restoration of ColOUred heritage collectionS
	EXCALIBUR	Advanced toolkits for interdisciplinary and enhanced study, conservation, and restoration in burial excavations and findings

INTEGRATION into the ECCCH platform

Expectations on ECHOES

ECHOES should:

- **Supervise and steer** the overall development of the ECCCH
- Provide **one unified framework** for long-term access and preservation of digital(ised) data, both public and private, based on a user-driven and scalable design
- Provide basic **data** and **metadata management** layers
- Provide the necessary **guidelines, requirements** and **frameworks for developing applications** working on and integrating with the cloud
- Establish a **long-term sustainable governance** of the ECCCH, along with its legal entity

INTEGRATION into the ECCCH platform

Expectations on 13 tool projects

Tool projects should:

- **Integrate** the developed tools **with the ECCCH** before the end of the project
- Make sure that the developed tools are **compliant with the design of the ECCCH** and **with the data model** and **software development guidelines** elaborated by **ECHOES**
- Implement the tools **using the low-level APIs** established by **ECHOES**
- **Coordinate technical work** with other ECCCH projects and **contribute to** the activities and **objectives of ECHOES**
- Make sure that the **functionality offered by the platform is fully used**, and that **related functionality between tools is developed together – avoid overlaps and duplication**
- Design software tools to be **accessible online** without requiring installation nor special or particularly powerful equipment, and **allow use** avoiding loss of work in situations with **unstable or limited connectivity**
- Ensure that all software developed and used is **open source**

INTEGRATION into the ECCCH platform

Expectations

The **user experience** is **essential**:

One single cloud platform
NOT 15 or 20 interconnected independent platforms

The leadership is **clear:**

- **ECHOES coordinates** the entire initiative
  NOT 20 independent projects
- **Compliance** with technical standards elaborated by ECHOES is **mandatory**

European Commission

European Research Executive Agency (REA)

Get involved in building a greener and more inclusive Europe

Patricio Ortiz de la Torre - Head of Sector REA - Inclusive Society

Call HORIZON-CL2-2025-01-HERITAGE-03: A European Collaborative Cloud for Cultural Heritage – Innovative use cases

Call Published
15 May 2025

Call deadline
16 Sep 2025

Evaluation process
10 October to 12 December 2025

Results to applicants & Grant Preparation of successful projects
Beginning of February 2026

Signature Grant Agreement
Mid-May 2026

Type of action – IA
Budget – 26 MEUR
Projects to be funded - 8

We are looking for

EXPERT EVALUATORS

Scan for
more details!

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Discover the latest R&I funding news and research success stories!

The European Collaborative Cloud for Cultural Heritage set up by ECHOES

The European Collaborative Cultural Heritage Cloud in Action: Join us to explore the latest update

European Commission – Research and innovation

1 December 2025

ECCCH in Numbers

Coordinated by ECHOES

COUNTRIES	
ECHOES	ECCCH
17	30

PARTNERS	
ECHOES	ECCCH
53	187

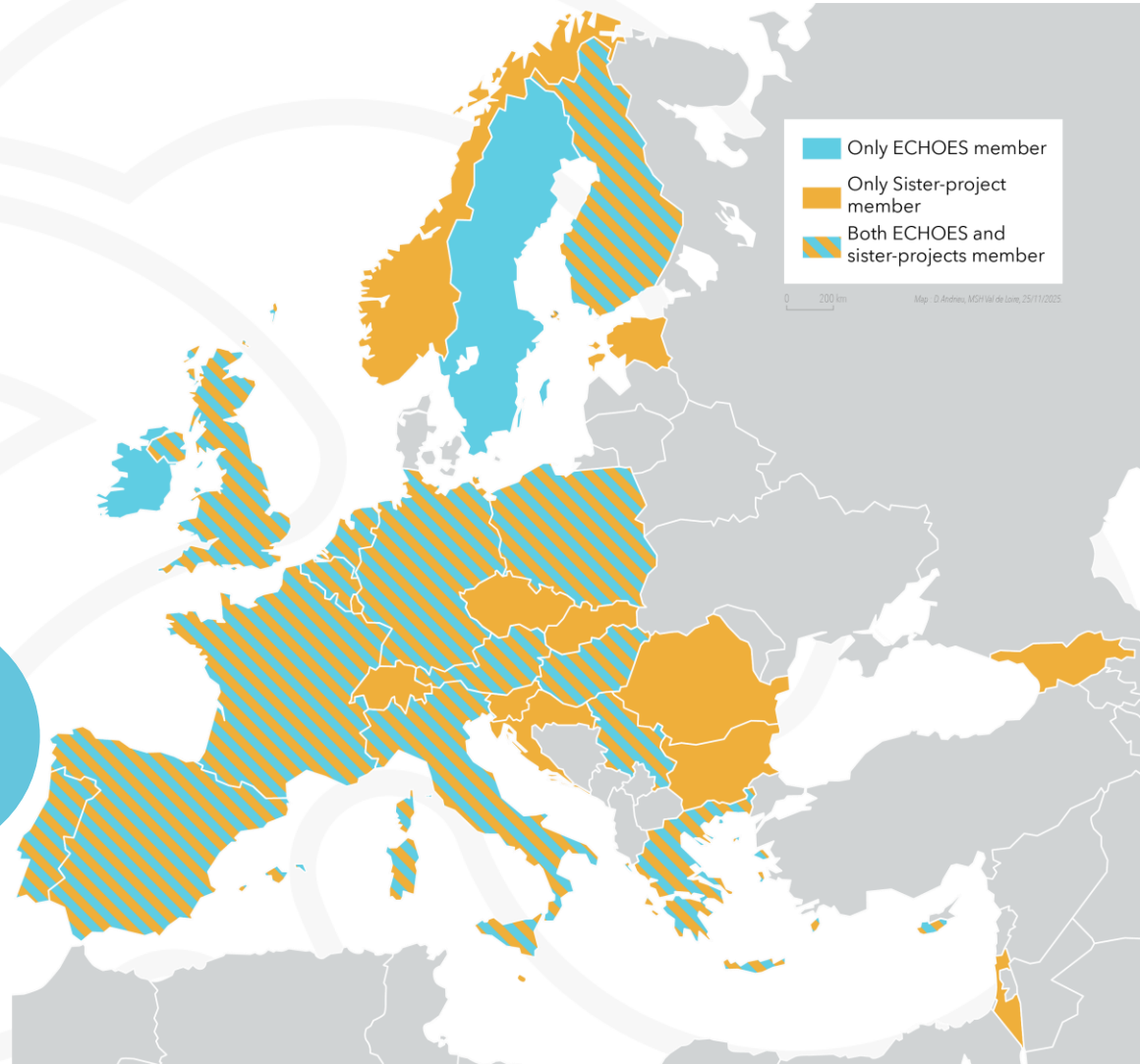
1 Cloud

>20 Projects

€ 110 M

Fully Impl. 2029

16 Umbrella organisations representing **more than 1000 organisations in Europe**



The Cultural Heritage Cloud Ecosystem

Innovative tools for digitising cultural objects

Digitisation and analysis of dynamic processes, objetcs and complexe combined data

textailes HERITALISE AUTOMATA

Kinetica MusicSphere

High-value interactions with visitors and heritage objects

UNICHE

PlaceMUS XR

echoes

Vertical Applications

StratiGraph

ARXIVE

Documenting, interlinking and organising data

OCRA
Online Conservation Restoration Annotator

VTL
Virtual Transcription Laboratory

CIT
Collection Ingestion Tool

Study, conservation and restoration of heritage objects

EXCALIBUR

COLOURS

8 projects in 2026

ECHOLOT

Infinity

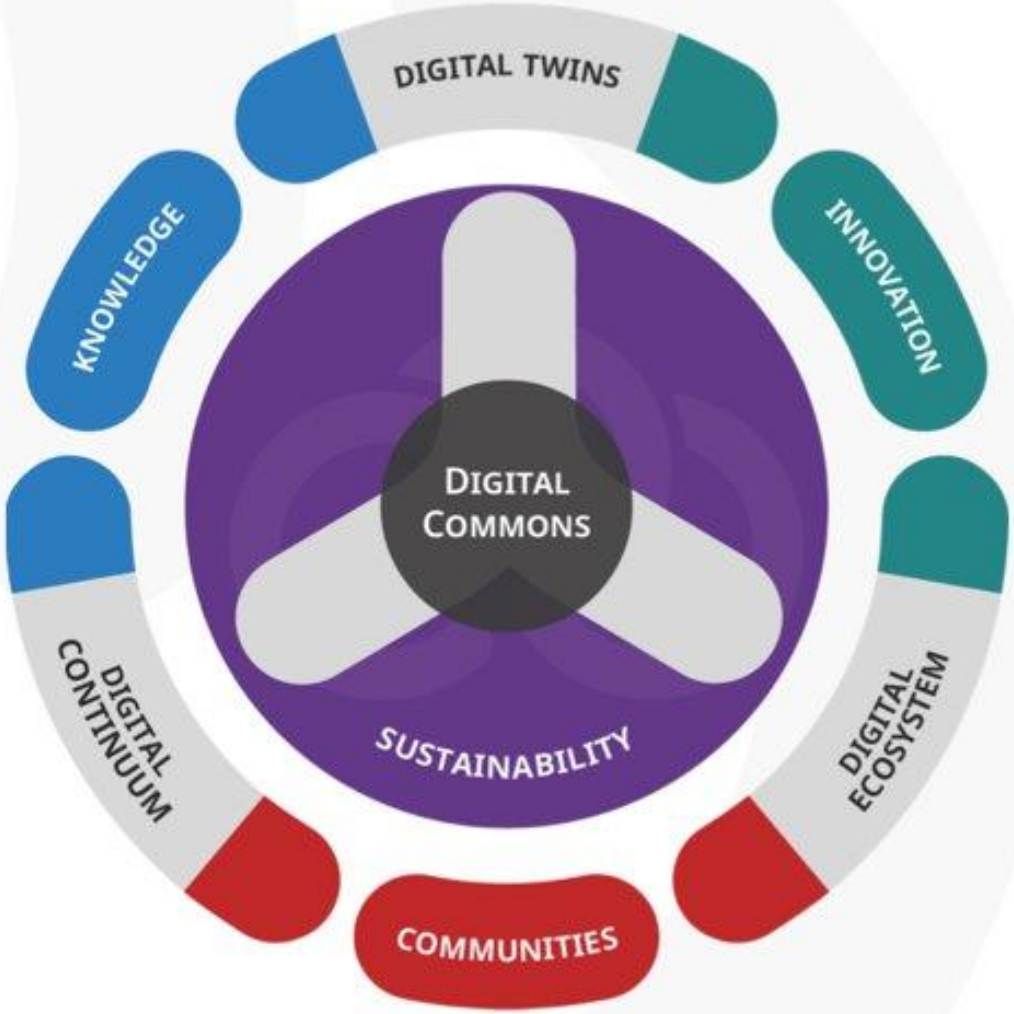
Advanced data enrichment

Innovative use-cases

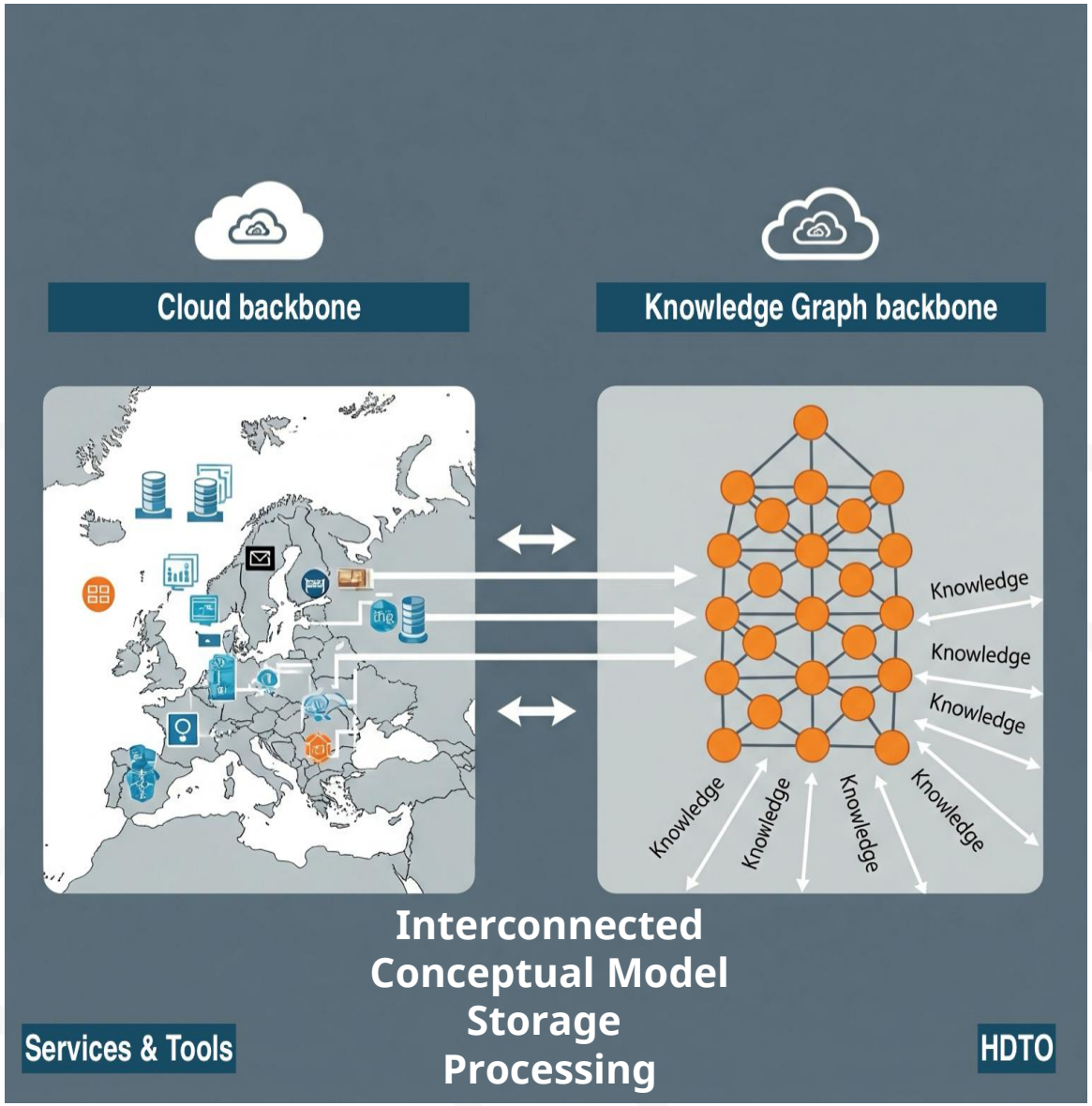
The Digital Commons

- ECHOES will create a **Digital Continuum**, based on a **Digital Ecosystem**, which will empower users to interact with, manipulate and enrich **Digital Twins**, leading to new, jointly developed scientific knowledge.

- This digital environment will allow the creation of a new generation of heritage objects, the **Digital Commons**, which are semantically rich and collectively produced.



Setting up the ECCCH



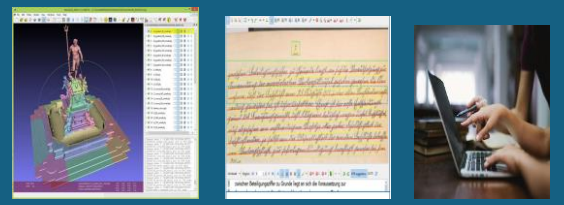
Knowledge Pillar

Setting up the ECCCH

- Cascading Grants Projects
- Sister ECCCH projects
- Other relevant projects

Vertical Applications

OCRA VTL CIT



Pipeline handler | API Gateway | VA Services

AAI | Single Entry Point | Security

Catalogues
- Data / Metadata
- Applications
- Services

Personal User Space | Documentation

Access Management

Data Space(s) | Other Data Providers | Endpoints

Mappings

Data Space(s) | Other Data Providers | Endpoints

Mappings

Data Aggregation Services | PID assignment

Intelligent Search and Querying | Intelligent Summarization

Logging

HDTO

Distributed Knowledge Base

Workflows | Data Provenance | Data Quality

Knowledge Graph

Data Management/Storage

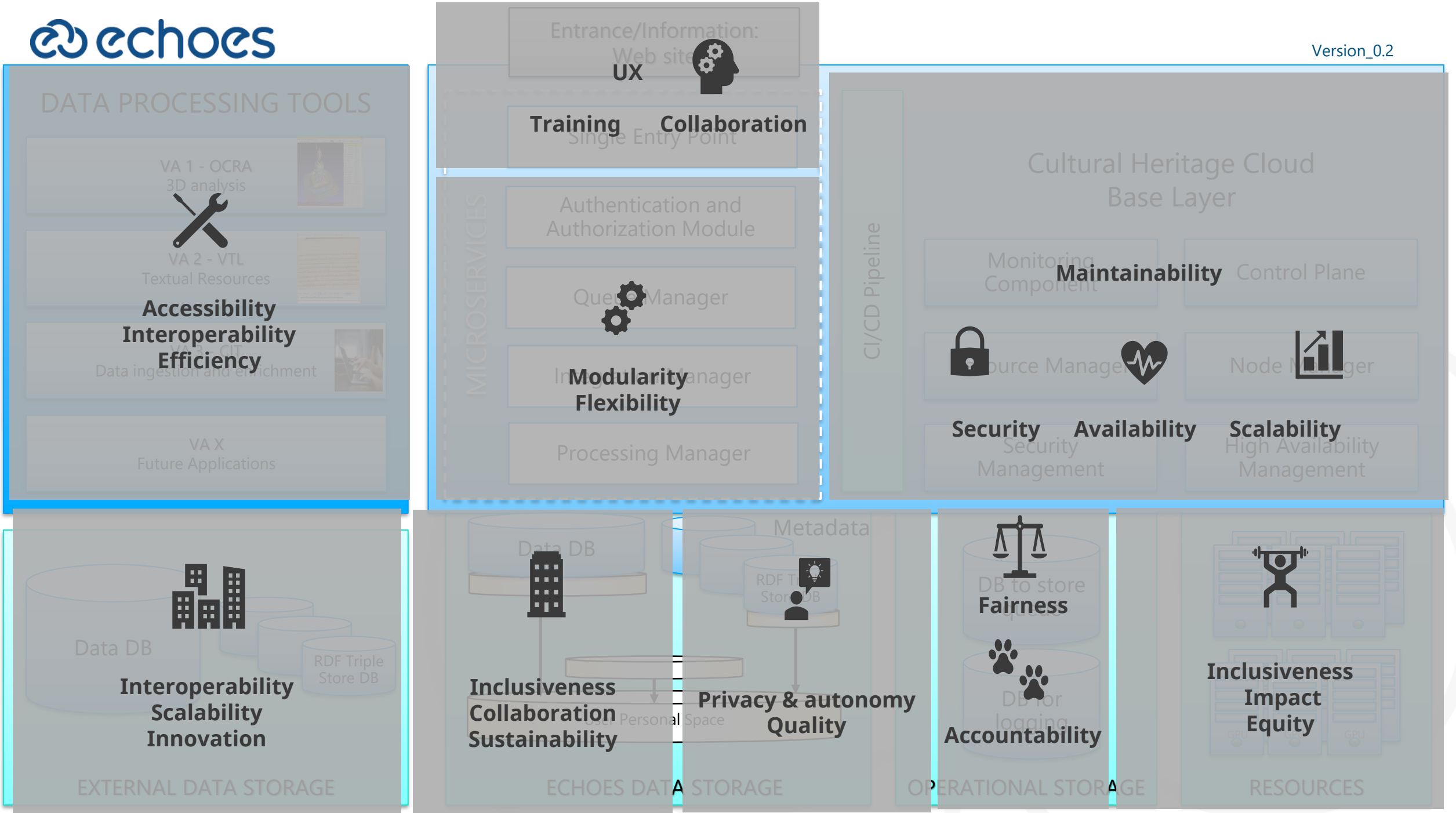
Support and Monitoring

Distributed Processing

Scalability | Messaging | Load balancing | **Cluster Management** | IIIF streaming | Other common routines | Cloud native storage

Distributed Storage

Base Cloud Components


UX
Training
Collaboration
Accessibility
Interoperability
Efficiency
Modularity
Flexibility
Maintainability
Security
Availability
Scalability
Interoperability
Scalability
Innovation
Inclusiveness
Collaboration
Sustainability
Privacy & autonomy
Quality
Fairness
Accountability
Inclusiveness
Impact
Equity

Services & APIs (by ECHOES) list not exhaustive

- Authentication & Authorization (AAI) - mandatory
- Access management (in a way to be extensible by the apps)
- Security
- Catalogues (data/applications/services)
- Generation of UIDs (URIs) - mandatory
- (Intelligent) search and querying (over the Knowledge Graph)
- Data/Metadata storage
- Data/Metadata management
- Data/Metadata (KB) enrichment
- Connection to major data sources (e.g. Data Spaces)
- Federation management - internal
- Processing facilities management - internal
- Monitoring – internal
- Logging – to be used by apps
- Support – developer level

ECHOES API endpoints – Knowledge Base Manager

Digital Twin
Digital Twin Related Operations

- POST `/hdt/unregister` Un-registers an existing Digital Twin (Demo)
- POST `/hdt/register` Registers a new Digital Twin (Demo)
- POST `/hdt/enrich` Insert RDF content to Digital Twin from file

Data File
Data file Related Operations

- POST `/datafile/insert` Insert RDF content from file
- GET `/datafile/download/text` Retrieve the contents of a specific named graph as text
- GET `/datafile/download/file` Download the contents of a specific named graph

Triple Store
Operations related to the triple store repositories

- POST `/repository/register` Register a new Repository
- POST `/repository/query` Constructs a federated SPARQL query and executes it.
- GET `/repository/getAll` Get All Repositories in terms of administrative metadata
- GET `/repository/get/{id}` Retrieve Repository's administrative metadata

ECHOES API endpoints – Single Entry Point

KB related:

- GET /hdt
- GET /hdt/{hdtId}/resources
- POST /hdt
- POST /tools/{toolId}/ingestRdf
- POST /query (SPARQL)

API endpoints - SEP

Tools:

- GET /tools
- GET /tools/{toolId}
- POST /tools/{toolId}/callApi
- POST /tools/{toolId}/callback

Project

- GET /projects
- POST /projects
- GET /projects/{projectId}
- DELETE /projects/{projectId}

Resource Processing

- GET /jobs/{jobId}

Application-Level Services

Text Analyzer tasks

- GET /tasks/text-analyzer/{resourceId}
- GET /tasks/text-analyzer/{resourceId}/wordcount

Timeline

Software components: 6 - month release cycles

Nov 2025

First versions of:

- AAI : Authentication and Authorization module
- Knowledge Base and the Knowledge Graph APIs
- HDTO: Heritage Digital Twin Ontology

- Integration Strategy
- Integration Roadmap
- Data/Metadata Strategy

Feb 2026

- Integration meetings with all 13 sister-projects
- Interoperability requirements by ECHOES
- Generation of UIDs
- Catalogues (first internal versions)
- Vertical Applications (first internal prototypes)

May 2026

- Final Cloud architecture
- Final version of the HDTO
- Data/Metadata storage
- Data/Metadata management
- VAs: First Working (external) Prototypes publicly available
  - Doc & Tutorials will be available

GitHub: https://github.com/ECHOES-ECCCH

Nurturing a Cloud Ecosystem

- Ambition: ***being used***
- Cloud Infrastructure are successful only if their use become pervasive and ‘transparent’ for the final user
- Community oriented, collaboratively built and available to all applications, tools and services to create an inclusive Cloud

Elements of Integration

Data, metadata, tools, applications

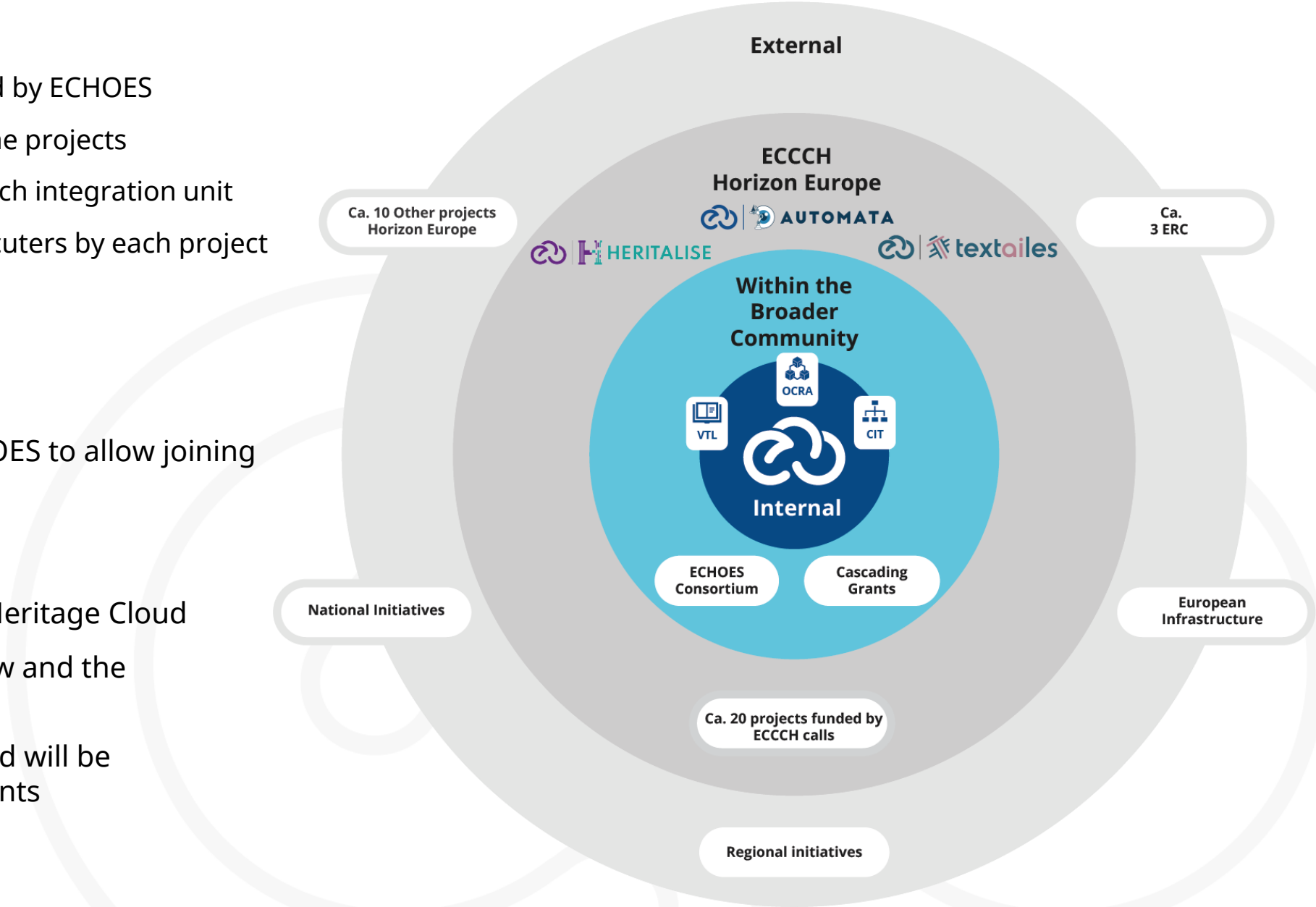
- Integration requirements published by ECHOES
- Definition of integration units by the projects
- Analysis of integration needs for each integration unit
- Nomination of the different interlocuters by each project
- Validation of each integration unit
- Addition to the ECHOES ecosystem

National & Regional Initiatives

- Requirements published by ECHOES to allow joining
- Federated architecture

European Initiatives

- Accessible through the Cultural Heritage Cloud
- Ongoing dialog to specify the flow and the interactions
- **EOSC**: The Cultural Heritage Cloud will be compatible with EOSC requirements



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Funded by the European Union

UK Research and Innovation

ECHOES is a project funded by the European Union under Grant Agreement n.101157364, with the support of UK Research and Innovation (UKRI) under the UK government's Horizon Europe funding guarantee n.10110142 & n.10110466.

ROUND 1: INNOVATION PITCHES

Each of the 10 projects gets **6 minutes** to answer:

1. In what ways does your project introduce fresh and innovative perspectives that build upon and enhance existing scientific work?

2. What new and valuable scientific insights and contributions do you anticipate your project will generate?

3. What problem does it solve for the heritage community?

Digitalisation and analysis of dynamic processes, objects and complex combined data

KINETIKA

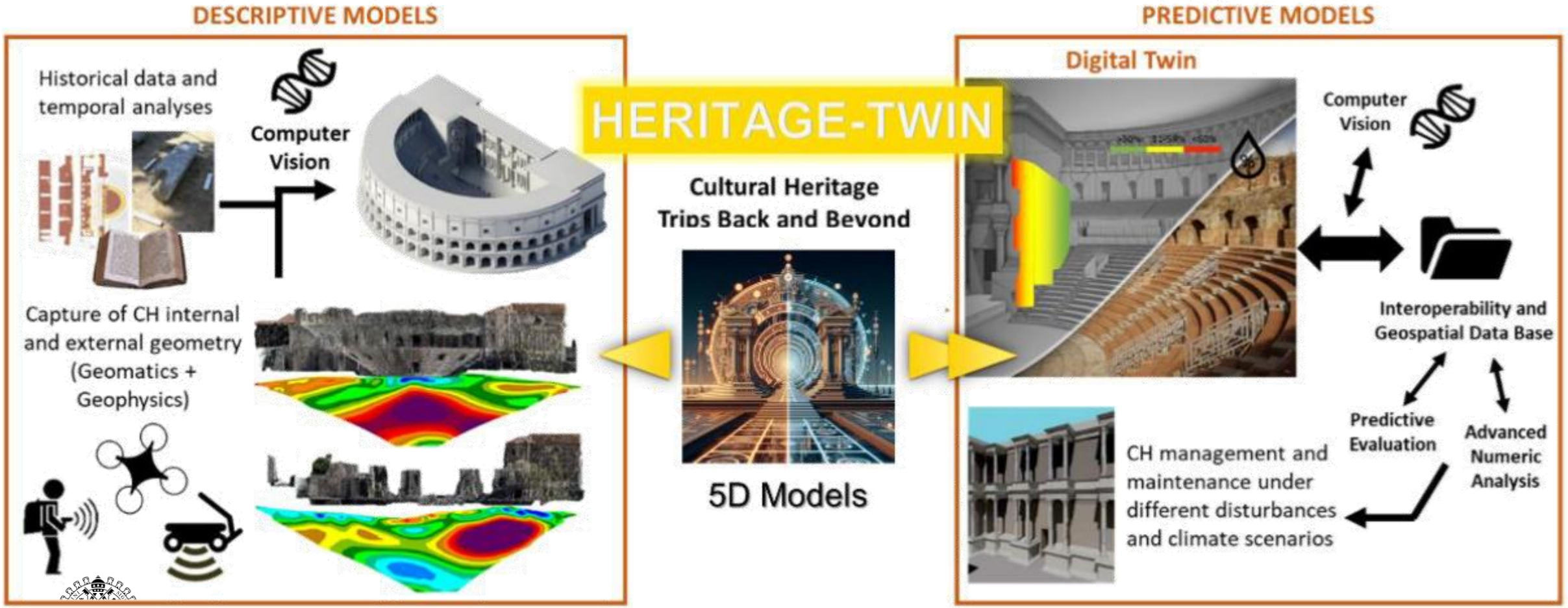
Advancing the Digitization and Analysis of Dynamic Cultural Heritage Objects

Diego González Aguilera

KINETIKA

University of Salamanca

KINETIKA
CULTURAL HERITAGE OBJECTS
INCORPORATING MECHANICAL PARTS



VNiVERSiDAD D SALAMANCA

Digitalisation and analysis of dynamic processes, objects and complex combined data

MusicSphere

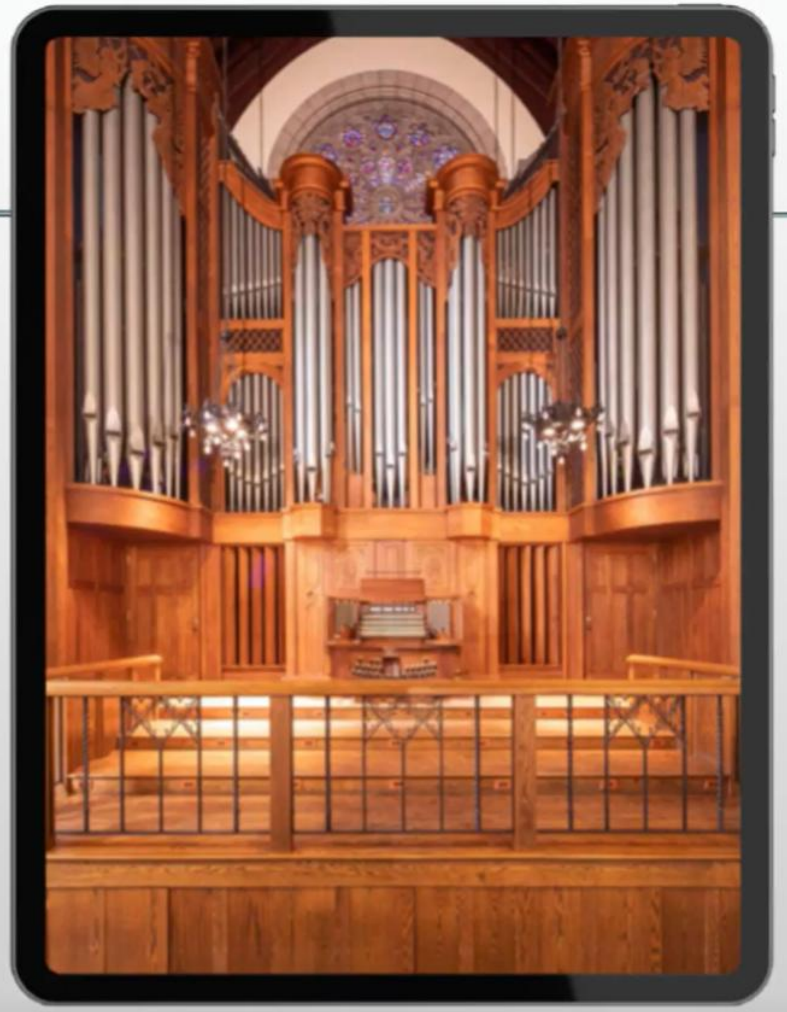
A Multimodal Approach for Digitizing, Analyzing, and Simulating Traditional Musical Organs Through 3D Technologies, Acoustic Analysis and Interactive Experiences

Georgia Georgious

MusicSphere

MusicSphere vision & innovative approach

MusicSphere's vision is to develop tools that combine advanced technologies for analysing, studying and preserving musical cultural heritage.

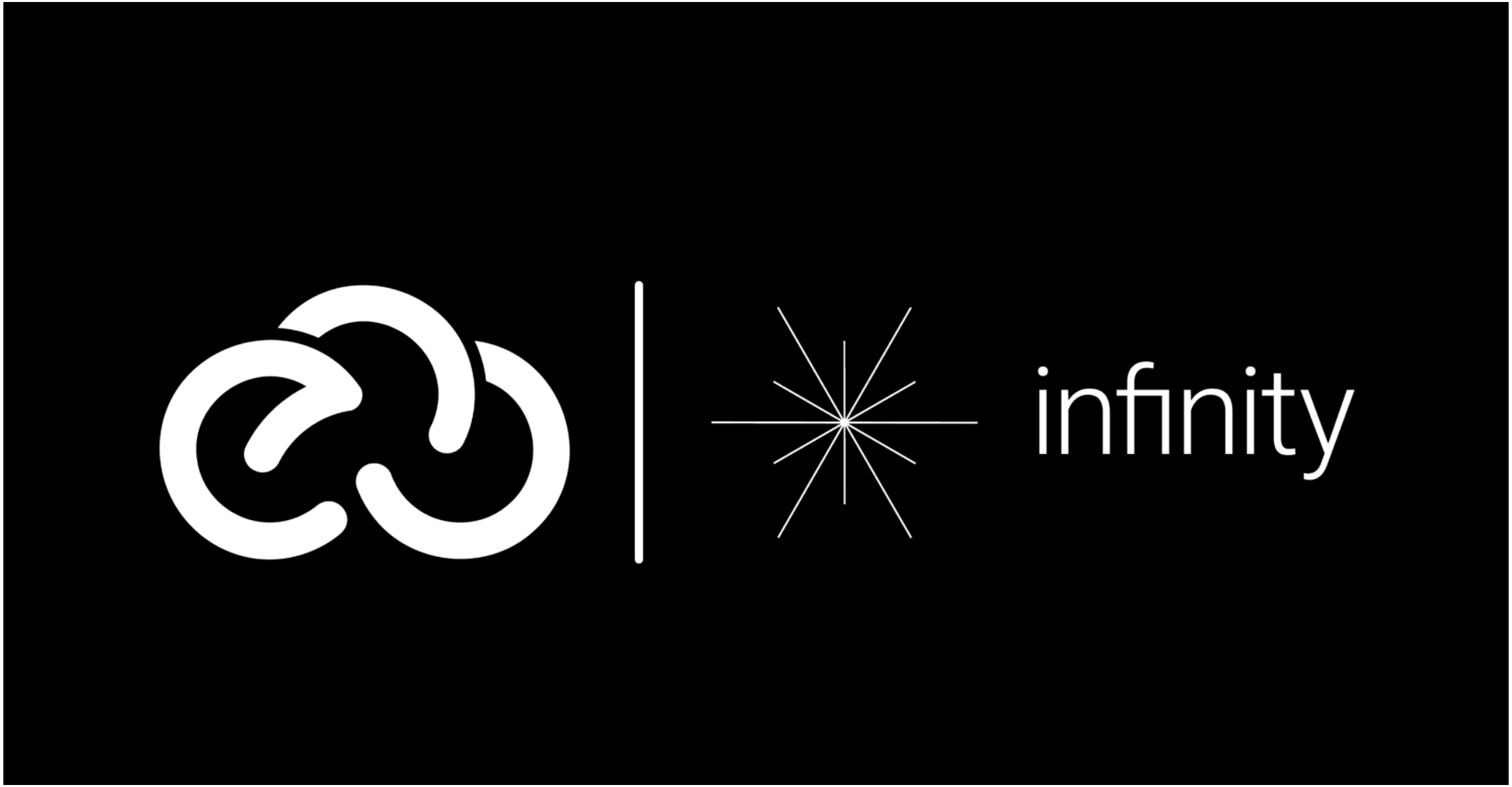


Advanced data enrichment

INFINITY

Multidimensional knowledge-based annotation for ethical context-aware heritage data life cycles

Valentina Presutti

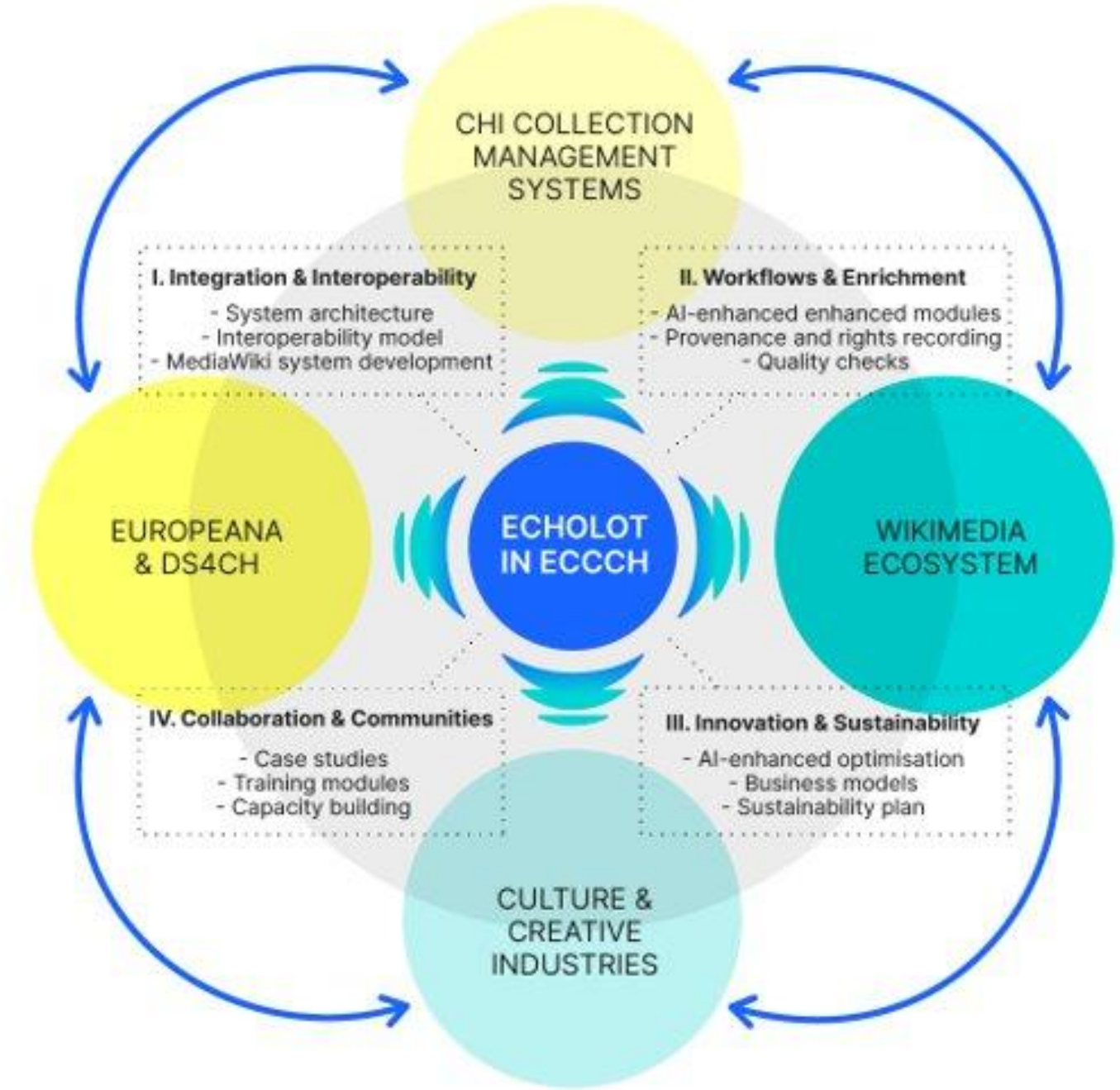

infinity

Advanced data enrichment

ECHOLOT

European Cultural Heritage Optimised Linked Open Tools

Matej Durco


CHI COLLECTION MANAGEMENT SYSTEMS
I. Integration & Interoperability
- System architecture
- Interoperability model
- MediaWiki system development
II. Workflows & Enrichment
- AI-enhanced enhanced modules
- Provenance and rights recording
- Quality checks
EUROPEANA & DS4CH
ECHOLOT IN ECCCH
WIKIMEDIA ECOSYSTEM
IV. Collaboration & Communities
- Case studies
- Training modules
- Capacity building
III. Innovation & Sustainability
- AI-enhanced optimisation
- Business models
- Sustainability plan
CULTURE & CREATIVE INDUSTRIES

Documenting, interlinking and organising data

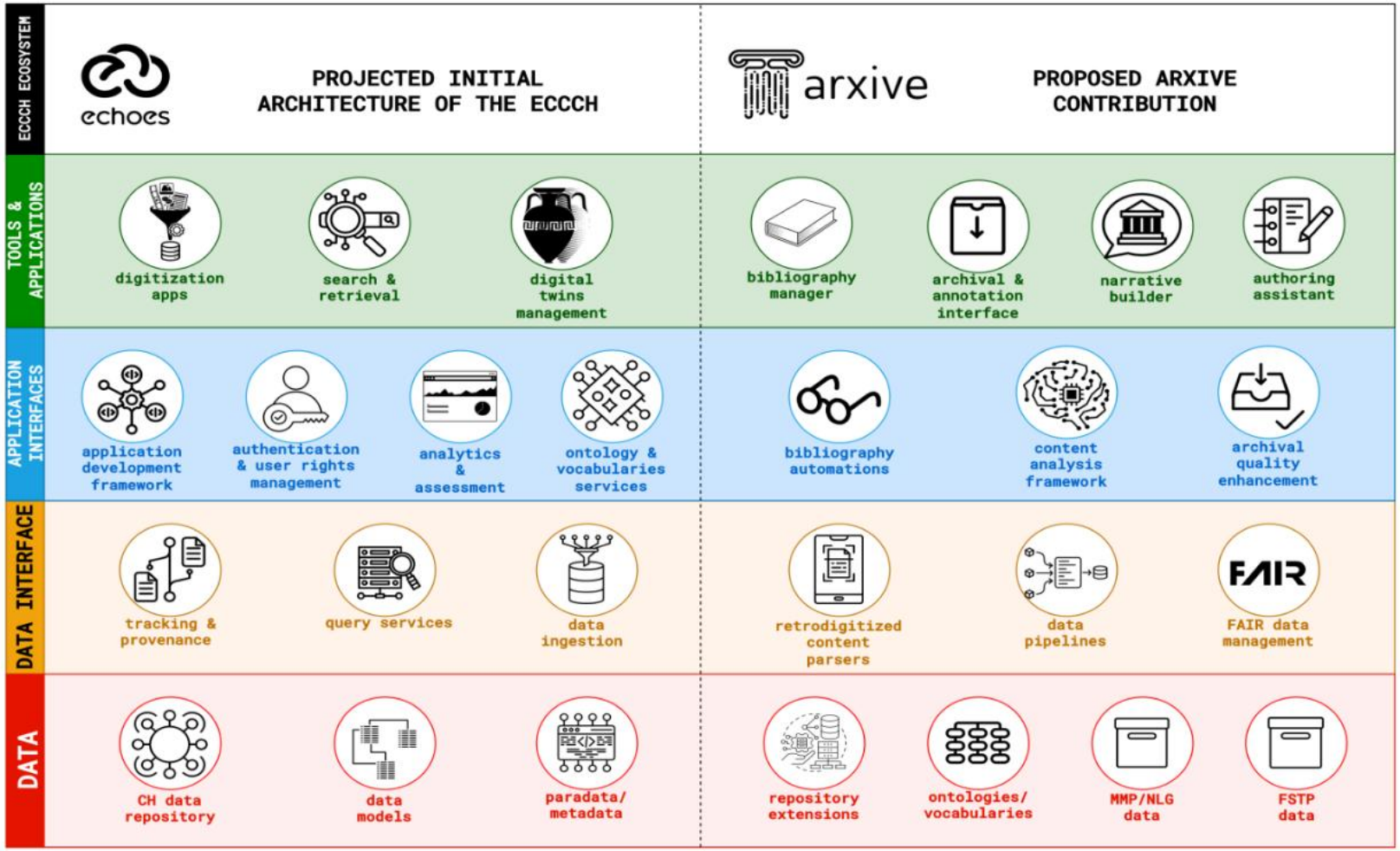
ARXIVE

Advanced Research and eXploration for Interoperable Value in European Heritage

Alexandra Garatzogianni

European Commission

The ECCCH layered architecture juxtaposed with the ARXIVE contributions

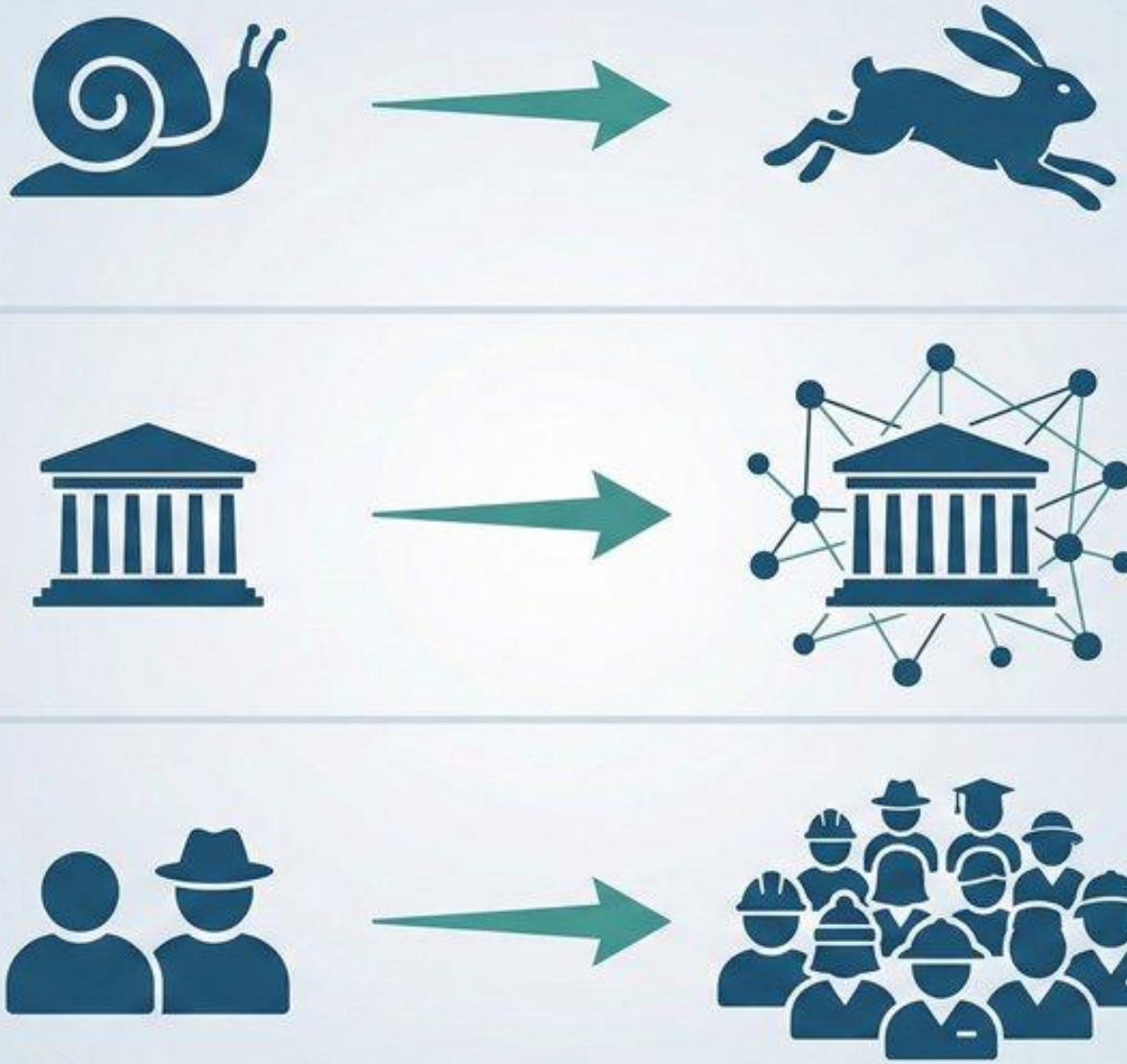


Documenting, interlinking and organising data

StratiGraph

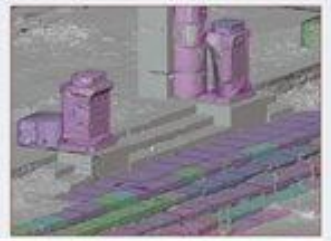
Knowledge Graphs for Stratigraphy

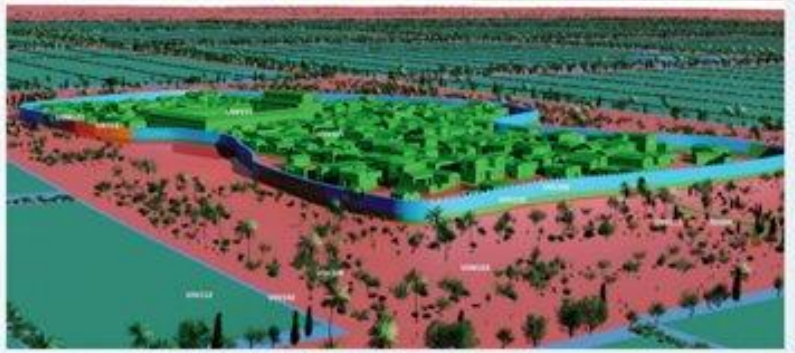
Emanuel Demetrescu

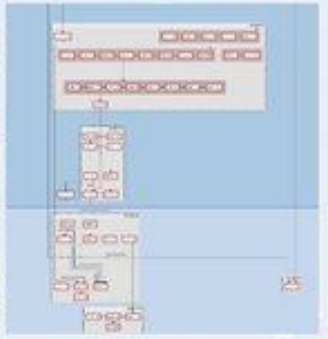


StratiGraph

Knowledge Graphs for Stratigraphy







High-value interactions with visitors and heritage objects

UNICHE

Unified No-Code platform for Interactive Cultural Heritage Experiences

Chairi Kiourt

UNICHE Unified No-Code platform for Interactive Cultural Heritage Experiences

Main Goals:

- an **intuitive, technology-agnostic "black-box" platform** as a "**no-code**", **single-entry**, **collaborative tool**
- generate high-value interactive content in **multiple formats** (**multimodal**)
- the four **E's: Exhibits, Experience design, Exhibitions, and Evaluation**
  - the cultural content (**exhibits**) channeled through the ECCCH is utilized and repurposed in the AI-assisted **Experience** design process and presented through the **Exhibition** phase (Onsite, Hybrid, and Remote), in which **Evaluation** processes are put in place to inform the enhancement of visitor engagement
- ensure seamless **integration with ECCCH**
- **three type of internal pilots**: open-air archaeological sites, museum exhibitions, and portable exhibitions
- **ten external pilots** (open call)

Open-air archeological sites

Archaeological site of Kalapodi, Greece

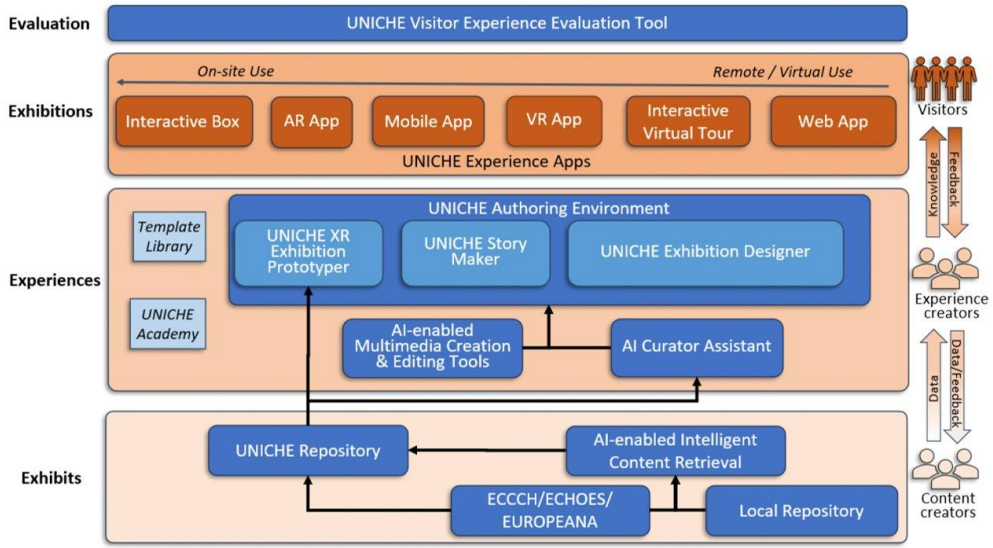
Messapian city walls in Ugento, Italy

Museum exhibitions

Museo Galileo, Italy

Portable exhibitions

Museum of Architecture in Wrocław, Poland



Funded by the European Union

UNICHE

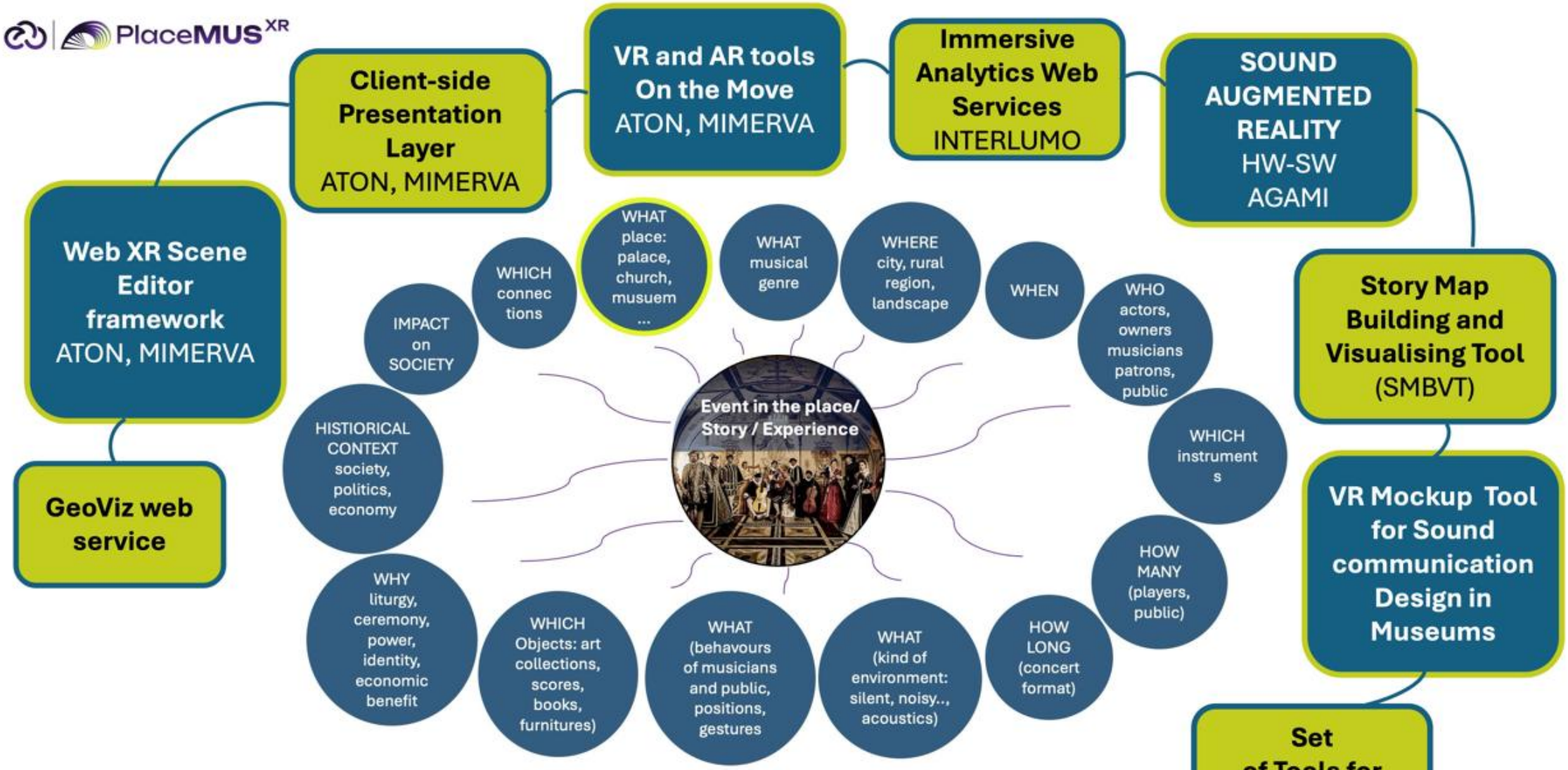
High-value interactions with visitors and heritage objects

PlaceMUS XR

Digital Journey across Musical Places in Europe and Extended Realities

Eva Pietroni & Daniela Maria Palama

PlaceMUS XR



Multi-layer Storytelling

Study, conservation and restoration of heritage objects

EXCALIBUR

Advanced toolkits for interdisciplinary and enhanced study, conservation, and restoration in burial excavations and findings

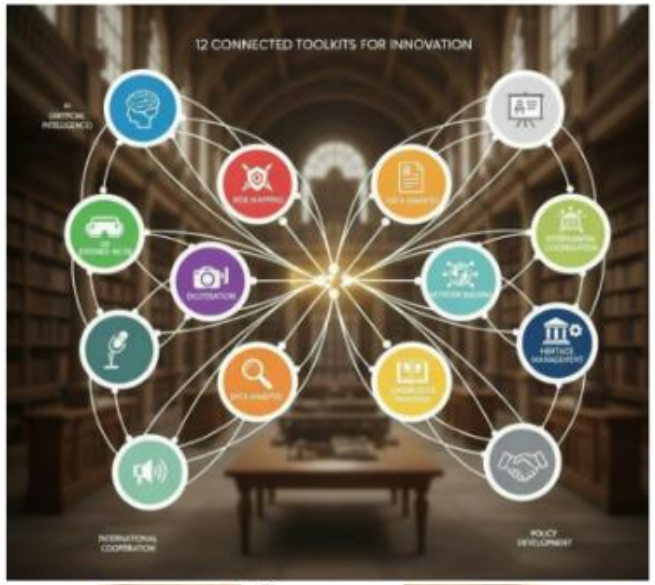
Eleftherios Anastasovitis

EXCALIBUR

Preserving the Past, Unveiling the Future.

CERTH
CENTRE FOR RESEARCH & TECHNOLOGY HELLAS

CENTRE FOR RESEARCH & TECHNOLOGY - HELLAS
Information Technologies Institute



EXCALIBUR is a project funded by the European Union under Grant Agreement n.101233712 - EXCALIBUR.

Dr. Eleftherios Anastasovitis (CERTH) anastasovitis@iti.gr
Project Manager and Coordinator of **EXCALIBUR** and **MusicSphere** ECCCH

Study, conservation and restoration of heritage objects

COLOURS

Collaborative On-cloud Lab for the conservation and digital restoration of ColOUred heritage collectionS

Daniele Ferdani

Build a Collaborative Environment

We are creating a hybrid digital space where conservators, curators, and scientists can meet and interact with 3D digital twins of artefacts in real-time, no matter where they are located.

Develop Predictive Restoration Tools

We are adapting and implementing AI-powered tools that allow experts to forecast and simulate various restoration strategies.

Create Tools to Assist Restoration

Our project will deliver a suite of digital tools that assist, document, and optimise the physical restoration process itself.

Enhance Public Engagement

We aim to make the restoration process more transparent and exciting for the public using immersive storytelling and mixed reality (AR/VR).

https://commons.wikimedia.org/wiki/File:Gardenbeforeandafter.jpg?uselang=it#Licenza

ROUND 2: THE CLOUD IN PRACTICE

A second, fast round of **2–3 minutes** per project:

1. **How exactly are you going to use and leverage the cloud?**
2. **What technical challenges and collaborations do you foresee?**

Digitalisation and analysis of dynamic processes, objects and complex combined data

KINETIKA

Advancing the Digitization and Analysis of Dynamic Cultural Heritage Objects

Diego González Aguilera

KINETIKA

University of Salamanca

How to leverage the ECCH cloud. Technical challenges and colaborations.

- **Storage and normalisation** of heterogeneous data (3D scans, muography, sensors, simulations, images).
- **Distributed computation** for FEM simulations, AI inference, muon tomography reconstruction, and real-time IoT data processing.
- **DTaaS deployment**, offering reusable models, functions, and tools through a **cloud marketplace** accessible to CH professionals.

Technical Challenges:

- Integrating extremely different data modalities.
- Ensuring **real-time synchronisation** of physical assets with their digital twins.
- Managing large-scale computing (FEA, AI training) efficiently in the cloud.

Collaborations Required: CH authorities, ECCCH's ecosystem.

Digitalisation and analysis of dynamic processes, objects and complex combined data

MusicSphere

A Multimodal Approach for Digitizing, Analyzing, and Simulating Traditional Musical Organs Through 3D Technologies, Acoustic Analysis and Interactive Experiences

Georgia Georgious

MusicSphere

A Multimodal Approach for Digitising, Analyzing, and Simulating Traditional Musical Organs through 3D Technologies, Acoustic Analysis and Interactive Experiences

Centre For Research and Technology Hellas

How exactly are you going to use and leverage the cloud?

MusicSphere will develop new toolkits and extensions for digitization, simulation, and monitoring that will be fully integrated with ECCCH's low-level libraries, accompanied by shared documentation and guidelines for adopting and further developing MusicSphere modules.

MusicSphere framework will be intergrated seamlessly into the ECCCH platform and we will ensure that all functionalities of the original framework remain intact and fully operational within the ECCCH environment. We will transfer all relevant data, including 3D models, DTs assets, acoustic, spatial, simulation data, ontologies, and interconnections, to the ECCCH platform while maintaining data integrity and consistency and establish a data migration strategy that will ensure that the ECCCH platform can effectively handle and utilize the migrated data.

What technical challenges and collaborations do you foresee?

MusicSphere will produce a large amount of heterogeneous data, so seamless integration in alignment with ECCCH requirements is challenging.
MusicSphere will develop highly advanced technological tools, so we must ensure that are robust, scalable and aligned with the practical needs of CH stakeholders.
MusicSphere will run simulations to understand and revive the sound of lost organs, so achieving the highest possible degree of historical and acoustic authenticity is a key technical challenge.

We foresee and we have already begin to establish collaborations with cultural institutions, museums, CH professionals, organ builders and organ conservation workshops, CCIs, research institutions, Tech companies, educational institutions like music schools and of course, ECCCH and sister projects' stakeholders.

Advanced data enrichment

INFINITY

Multidimensional knowledge-based annotation for ethical context-aware heritage data life cycles

Valentina Presutti

INFINITY

Multidimensional Knowledge-Based Annotation for Ethical Context-Aware Heritage Data Life Cycles

University of Bologna

Using and leveraging the ECCCH

- **Deployment Environment** (Technical Integration)
- **Semantic Bridge** (Data Interoperability)
- **Distribution Channel** (Impact & Reuse)
- **Strategic Alignment** (Governance)

Technical challenges and collaborations

- Complexity of **Multidimensional Knowledge Graphs** (mKGs)
- **AI Reliability and Ethics** (Bias Detection)
- Interoperability with **Legacy Systems**
- Integration with the **ECCCH** (The Cloud)
- Collaboration with **ECHOES** and **DS4CH, Creative Industries** and **Citizen Scientists**

Advanced data enrichment

ECHOLOT

European Cultural Heritage Optimised Linked Open Tools

Matej Durco

ECHOLOT - European Cultural Heritage Optimised Linked Open Tools

Technische Informationsbibliothek (TIB)

- Expose cultural heritage data in accordance with the HDTO
- via triplestores integrated as part of the Federated CH Knowledge Base
- Offer ECHOLOT application suite as SaaS, deployable on demand in the cloud
- Provide (ai-assisted) metadata curation and enrichment services to be used by other applications in the cloud.

Collaborations:

- ECHOES team via EITF
- (mainly small and medium) CHI
- MediaWiki universe

Challenges:

- Cloud itself in development - development against a moving target

Documenting, interlinking and organising data

ARXIVE

Advanced Research and eXploration for Interoperable Value in European Heritage

Alexandra Garatzogianni

ARXIVE

Advanced **R**esearch and e**X**ploration for **I**nteroperable **V**alue in **E**uropean **H**eritage

[1 January 2026 - 31 December 2028]

Leibniz University Hannover

Leveraging the Cloud: Unified repository (3D, bibliographic, excavation), digital twins with contextual metadata, AI-driven annotation & bibliography automation, scalable, EOSC-ready & collaborative (versioning + provenance)

Technical challenges: Fragmented formats & archives, semantic interoperability, large multimedia datasets, provenance, versioning & FAIR compliance

Collaborations: GLAM institutions, standards networks (CIDOC-CRM, ICCROM, ICOMOS, etc.), 2 Pilots & **FSTP** Programme w/ **2 Open Calls** for 20 projects in total, integration with EOSC & national infrastructures

3D Digital Twins

AI Annotation Engine

Graph Database / RDF Triple Store

Collaboration Tools

EOSC / National Repositories

Safeguarding heritage

Enabling collaboration

Driving innovation

Fostering sustainability

Documenting, interlinking and organising data

StratiGraph

Knowledge Graphs for Stratigraphy

Emanuel Demetrescu

StratiGraph *Knowledge Graphs for Stratigraphy*

CNR-ISPC

LOGO

HOW WE USE THE CLOUD:

1.FIELD - Offline-first, full functionality
2.SYNC - Semantic synchronization to ECHOES
3.COLLABORATE - Real-time VR (Heriverse)
4.PUBLISH - CATALOG with PIDs via ECHOES

INNOVATION:

Granularity at Single stratigraphic unit / single find level
Scalability from small academic trench to 600+ sites (Italferr infrastructure)
Archaeology is **comparative science** at scale

TECHNICAL CHALLENGES:

1.Flexible ontology extensions for 3D stratigraphy
2.Hybrid **offline/online** transitions
3.Professional adoption pathway (enterprise-grade)

SUSTAINABILITY MODEL:

Tool works where data is born → Creates real value → Companies need it → Community maintains it → Survives post-2029

22 partners | 13 countries | €3.99M

High-value interactions with visitors and heritage objects

UNICHE

Unified No-Code platform for Interactive Cultural Heritage Experiences

Chairi Kiourt

Unified No-Code platform for Interactive Cultural Heritage Experiences

Coordinator: *Unisystems Luxembourg SARL* - **Technical Coordinator**: *Athena Research Centre*

- **What is the Cultural Heritage Cloud going to offer?**
- **Leveraging the Cloud**
  - Unified access to cultural assets
  - Cloud-based AI infrastructure
  - Semantic interoperability with ECCCH
  - Multi-site collaboration & content sharing
  - Hosting of UNICHE services & shared tools
  - Scalable distribution to all UNICHE apps
  - ECCCH network for communication and dissemination
- **Challenges & Collaborations**
  - Metadata & format harmonization
  - Streaming heavy (XR/3D) content
  - AI integration with cloud infrastructures/datasets
  - Security & rights management
  - Required collaboration with ECCCH tech teams, CH institutions, AI experts, and pilot sites

Funded by the European Union

High-value interactions with visitors and heritage objects

PlaceMUS XR

Digital Journey across Musical Places in Europe and Extended Realities

Eva Pietroni & Daniela Maria Palama

PlaceMUS XR

Digital Journey across Musical Places in Europe and Extended Realities

Coordinator: CNR ISPC

1 How exactly are you going to use and leverage the cloud?

2 What technical challenges and collaborations do you foresee?

1

- **To Create, share, re-use, interactive scenarios related to places and objects of music, integrated with metadata, and following the Heritage Digital Twin Ontology. Two WPs dedicated to this task**, analyses and integration
- **To improve interactions** with places and objects of music and with users**, offering VR and AR tools able to support the whole scenario production pipeline.** Tools are designed for **Digital and phy-gital experiences, online, offline**. **Usable/accessible** without complex installations or powerful devices

2

Challenges:

- To provide tools and **open applications** to create new **scenarios and contents enriched by metadata** for the benefit of CH professionals and CCIs.
- To provide the users with **lively engaging experiences,** not only with catalogues or databases.

Collaborations:

- **Partners from the ECHOES** consortium involved in PlaceMUS XR (CNRS, CNR, UT, 3DR)
- **DigiLab-It** (in the **E-RIHS.it** framework) developed by H2IOSC PNRR Project

Study, conservation and restoration of heritage objects

EXCALIBUR

Advanced toolkits for interdisciplinary and enhanced study, conservation, and restoration in burial excavations and findings

Eleftherios Anastasovitis

EXCALIBUR

Preserving the Past, Unveiling the Future.

CERTH
CENTRE FOR RESEARCH & TECHNOLOGY HELLAS

CENTRE FOR RESEARCH & TECHNOLOGY - HELLAS
Information Technologies Institute

Use and Leverage

- Dedicated WP for ECCCH
- Close and intensive collaboration
- Technical issues
- Communication
- Early adoption
- Knowledge exchange
- 12 toolkits and methods
- Dedicated WP for Integration

Technical challenges and Collaborations

- Open source
- Usable toolkits
- Training
- Test and evaluation by experts
- Financial Support to Third Parties
- Open Call
- 8 projects
- Up to EUR 50 000 per project

EXCALIBUR is a project funded by the European Union under Grant Agreement n.101233712 - EXCALIBUR.

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Project Manager and Coordinator of **EXCALIBUR** and **MusicSphere** ECCCH

Study, conservation and restoration of heritage objects

COLOURS

Collaborative On-cloud Lab for the conservation and digital restoration of ColOUred heritage collectionS

Daniele Ferdani

COLOURS

Daniele Ferdani – CNR ISPC

How COLOURS uses the Cloud:

- Development of a **Vertical Application** integrated in the ECHOES-ECCCH Application Layer.
- **Tools, services**, and **Heritage Digital Twins** will be deployed and accessed via the cloud for collaborative, cross-disciplinary use.
- **Semantic interoperability** enabled through alignment with the "Digital Commons" and CIDOC-CRM ontologies.
- APIs and middleware adapted for real-time, scalable, and secure data exchange.
- Ensures governance compliance, **FAIR data principles**, and role-based access within the ECCCH ecosystem.

Technical Challenges & Collaborations:

- **Integration of heterogeneous data**: 3D models, multispectral images, diagnostics, metadata into semantically rich and interoperable formats.
- **Migration** from hybrid infrastructures to the ECCCH Knowledge Base.
- Design and validation of interoperable APIs, scalable middleware and orchestration tools.
- Robust **testing & validation plan** to ensure long-term maintainability, performance and usability.
- Close **collaboration** with FORTH, FhG, NTNU, CNR, and ECCCH governance bodies to align cloud architecture, security and scalability.

Q&A SESSION

Join at

slido.com

#CloudProjects2025

CLOSING REMARKS & NEXT STEPS

Thank you!

Together, let’s leverage our **expertise**, embrace **collaboration**, and deliver impactful **scientific** results that honor the trust placed in us by society.

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