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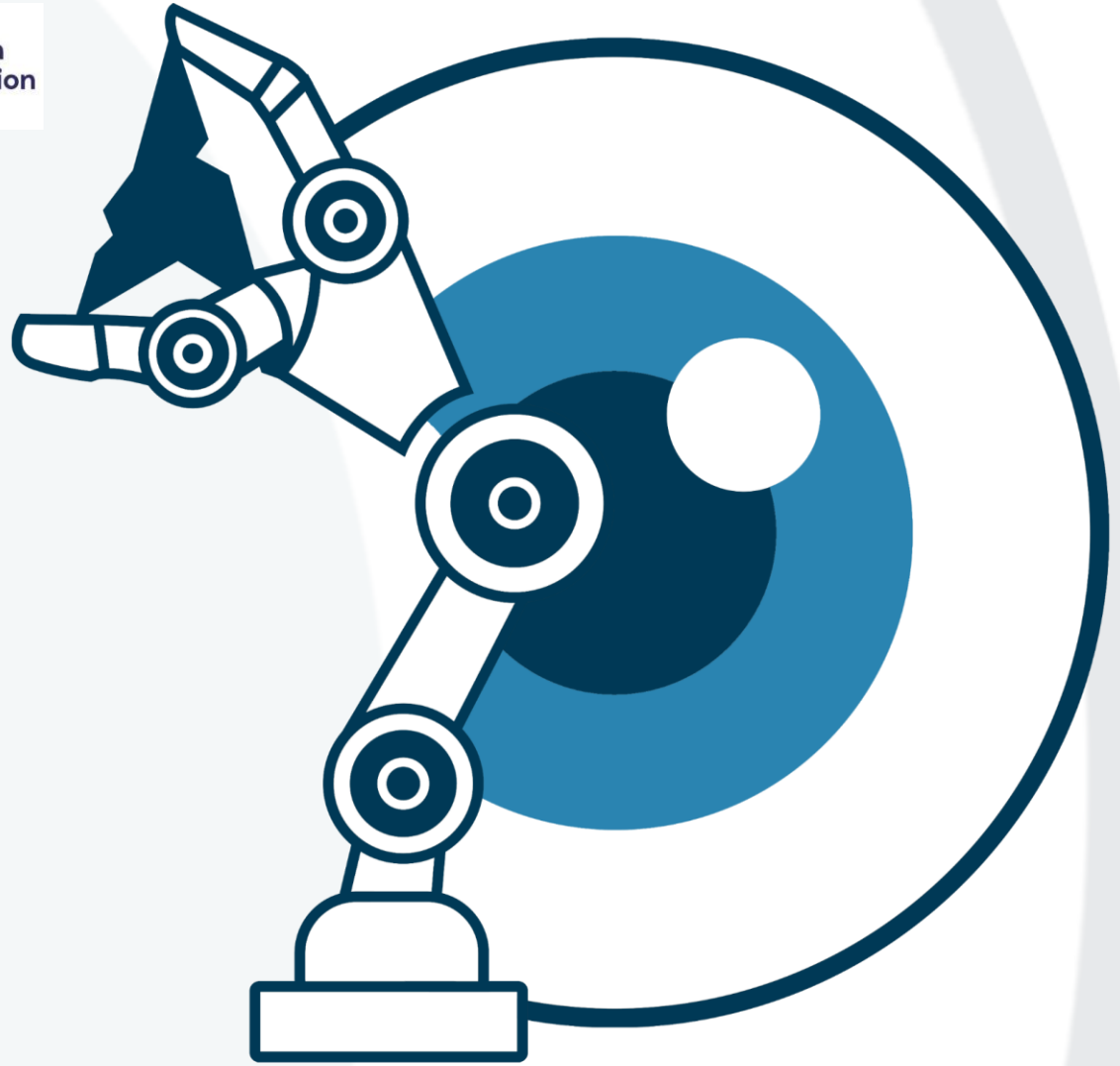


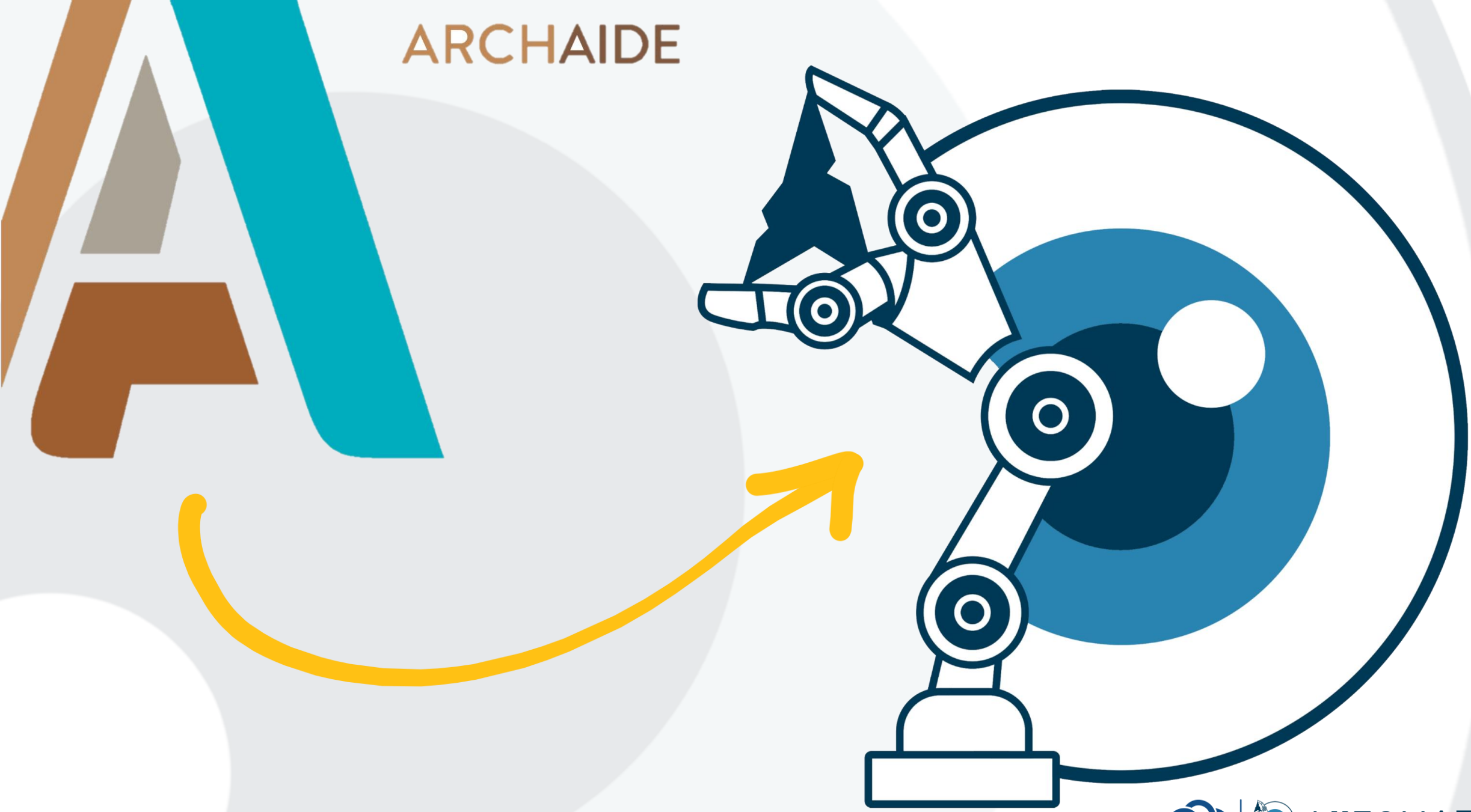
AUTOMATA

Athens, 05 May 2025

In the beginning was Data.
From user needs to technical solutions

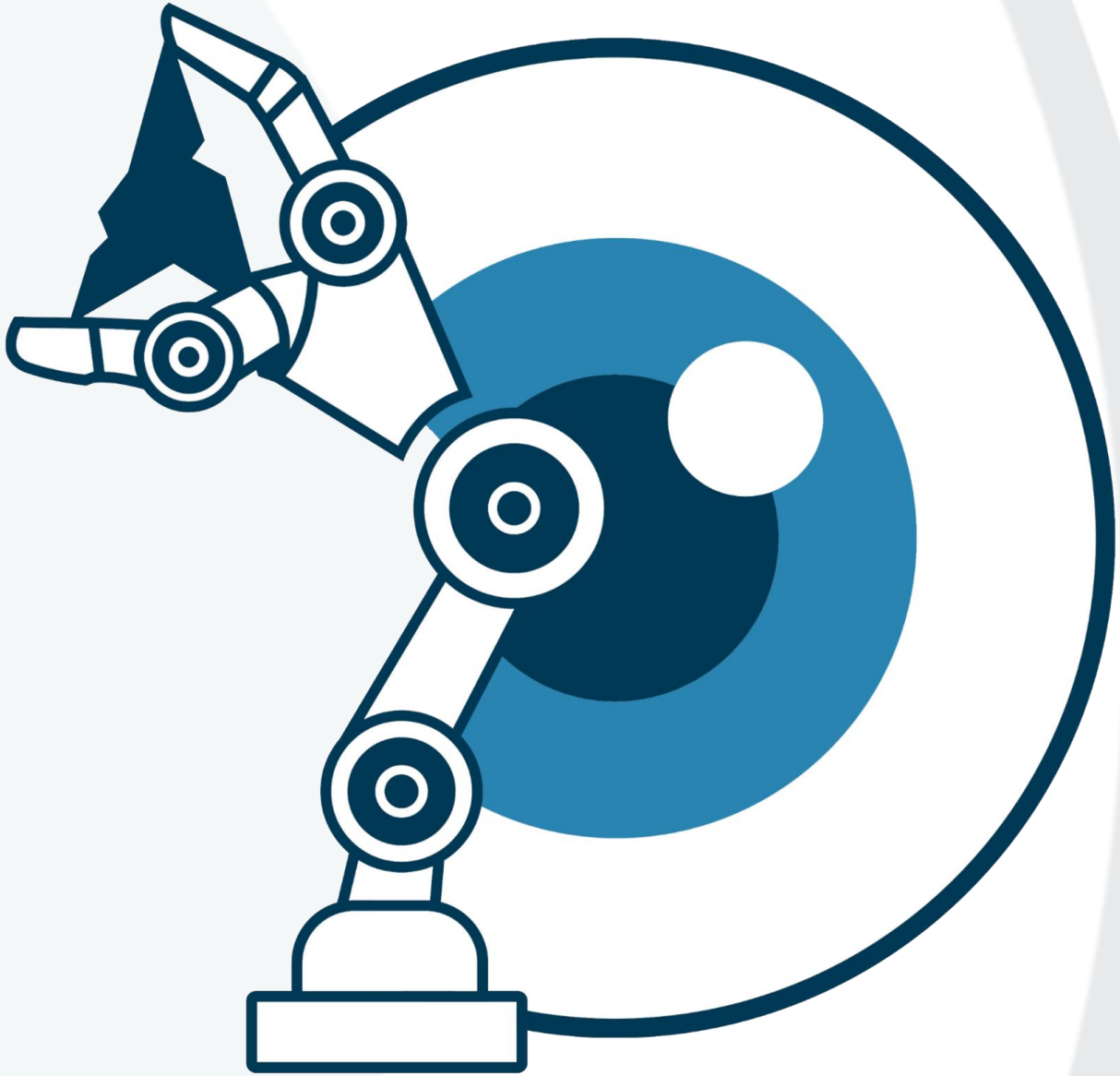
Gabriele Gattiglia
University of Pisa

ARCHAIDE



AUTOMATA

AUTOMATA will facilitate large-scale, rich, low-cost digitisation campaigns for archaeological finds (pottery and lithics) through an AI-augmented robotic system equipped with sensors. It will quickly and efficiently create 3D models of archaeological finds, enriched with archaeometric data, made freely available online, allowing effective data reuse by researchers and citizens.



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mappa
metodologie applicate alla predittività del potenziale archeologico

AVIARCH
AVIFAUNA IN ARCHAEOECOLOGICAL NETWORKS

Maia
Managing Artificial Intelligence in Archaeology

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FAIR
FUTURE AI RESEARCH

Funded by the European Union

cost
EUROPEAN COOPERATION IN SCIENCE & TECHNOLOGY

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erc
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NextGenerationEU

KING'S College LONDON

UNIVERSITY of York

culturelab
International cultural expertise

amz

Inrap
Institut national de recherches archéologiques préventives

Inria

Université BORDEAUX MONTAIGNE

IN SUPREMÆ DIGNITATIS 1343
UNIVERSITÀ DI PISA

qb robotics

UNIVERSITAT DE BARCELONA

האוניברסיטה העברית בירושלים
THE HEBREW UNIVERSITY OF JERUSALEM
الجامعة العبرية في أورشليم القدس

iit SoftBots
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Miningful

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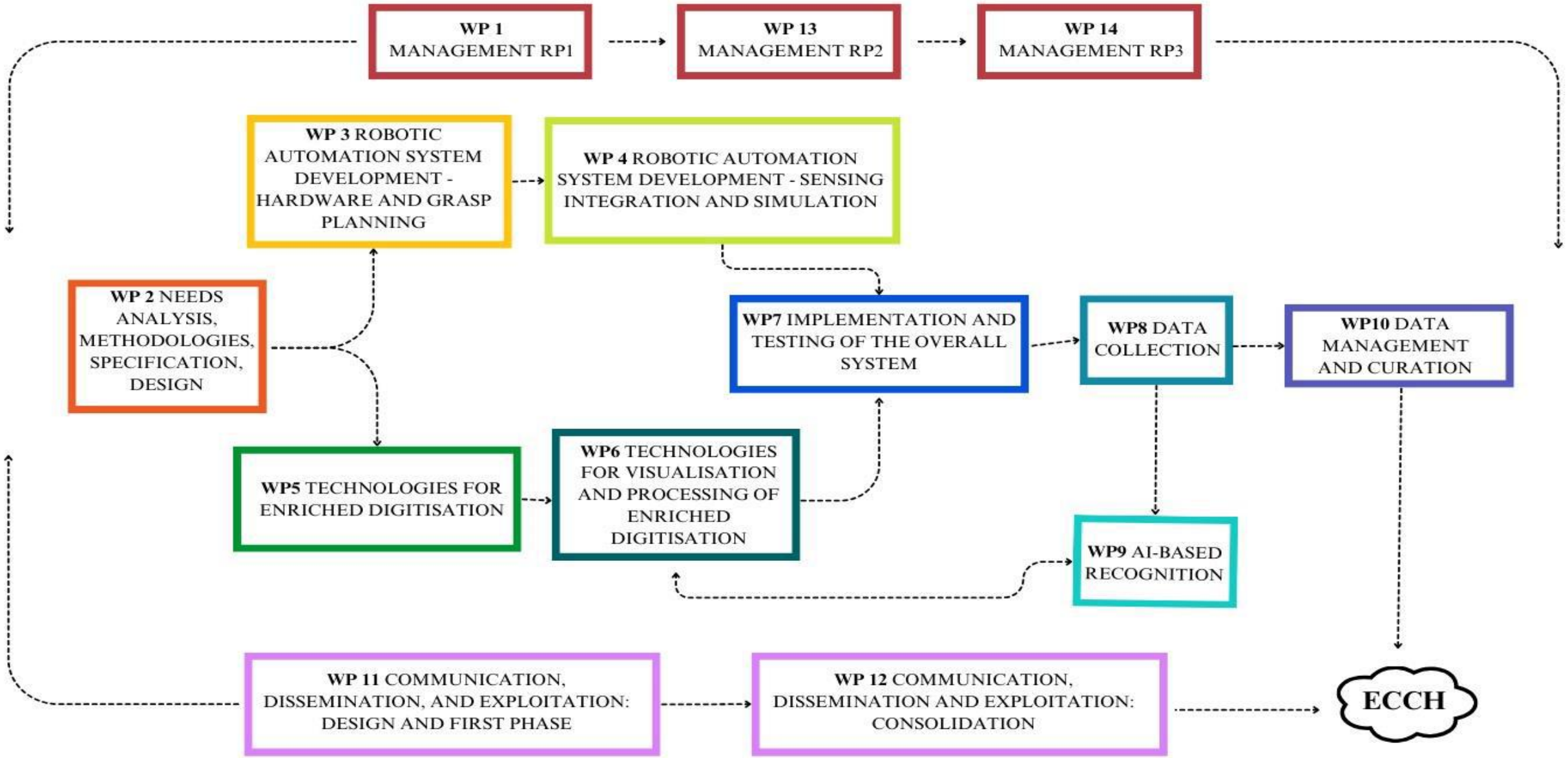

WP 1 MANAGEMENT RP1
WP 13 MANAGEMENT RP2
WP 14 MANAGEMENT RP3
WP 3 ROBOTIC AUTOMATION SYSTEM DEVELOPMENT - HARDWARE AND GRASP PLANNING
WP 4 ROBOTIC AUTOMATION SYSTEM DEVELOPMENT - SENSING INTEGRATION AND SIMULATION
WP 2 NEEDS ANALYSIS, METHODOLOGIES, SPECIFICATION, DESIGN
WP7 IMPLEMENTATION AND TESTING OF THE OVERALL SYSTEM
WP8 DATA COLLECTION
WP10 DATA MANAGEMENT AND CURATION
WP5 TECHNOLOGIES FOR ENRICHED DIGITISATION
WP6 TECHNOLOGIES FOR VISUALISATION AND PROCESSING OF ENRICHED DIGITISATION
WP9 AI-BASED RECOGNITION
WP 11 COMMUNICATION, DISSEMINATION, AND EXPLOITATION: DESIGN AND FIRST PHASE
WP 12 COMMUNICATION, DISSEMINATION AND EXPLOITATION: CONSOLIDATION
ECCH

AUTOMATA

September 2024

February 2029

54 months

Provide advanced technological solutions to create accurate 3D models and acquire archaeometric attributes

WP5/6.

Create a robotic ‘work cell’ to digitise visible and non-visible characteristics of CH objects

WP3/4.

Enable Big Data collection

WP7/8.

Provide AI-based classification

WP9

Enable open reuse of all data collected and preserved in an open data repository

WP10.

Building skills and capacities of employees in the CH sector as well as of the creators of innovative use strategies

WP11.

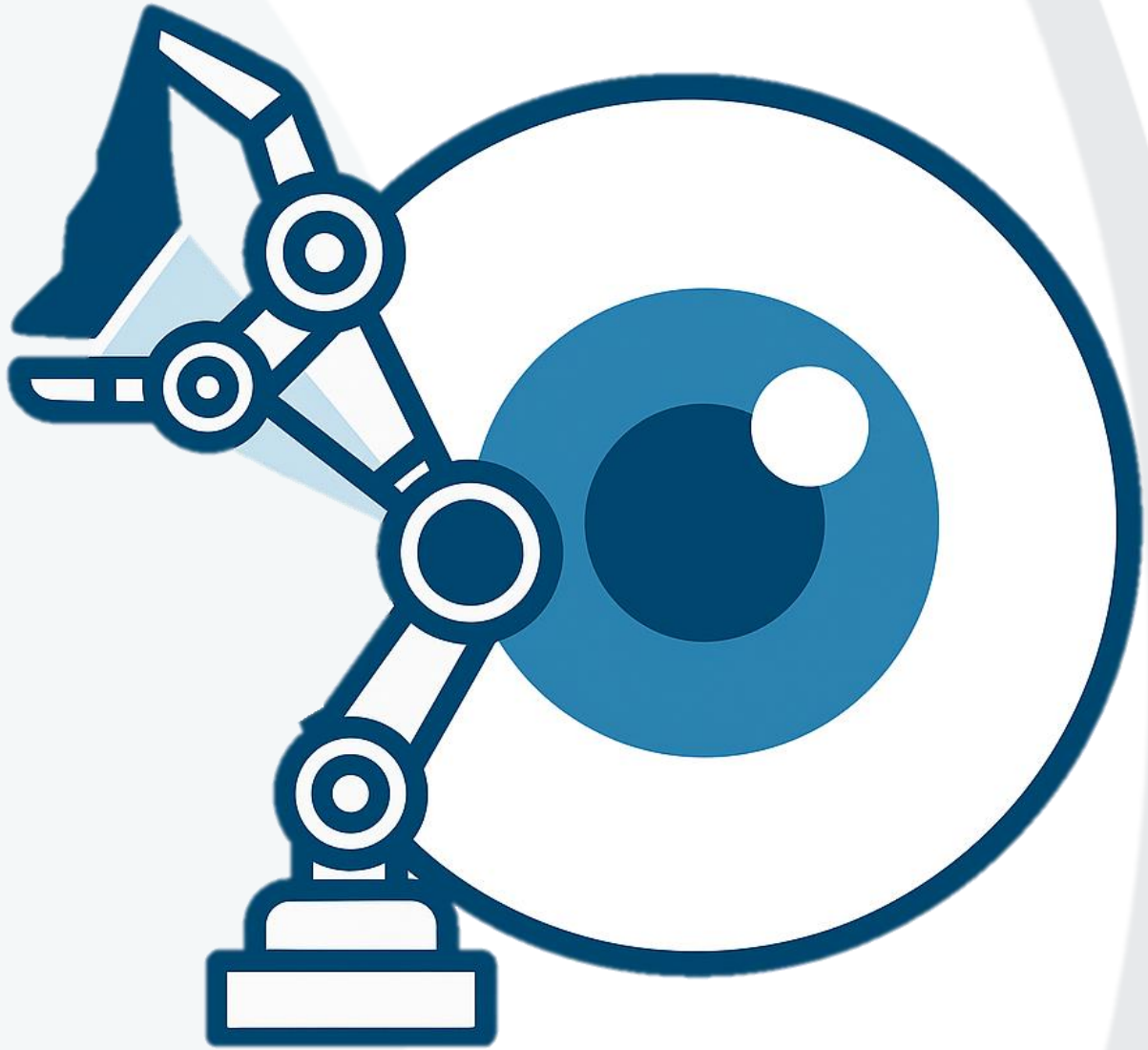
Enable novel public uses of complex archaeological data

WP11.

AUTOMATA

Automated acquisition of chemical and physical data: multimodal data acquisition using non-invasive and portable sensors for archaeometric analysis of artefacts.

Enhanced Digitisation: creation of enriched digital representations combining detailed 3D models with archaeometric analysis and advanced 2D representations.



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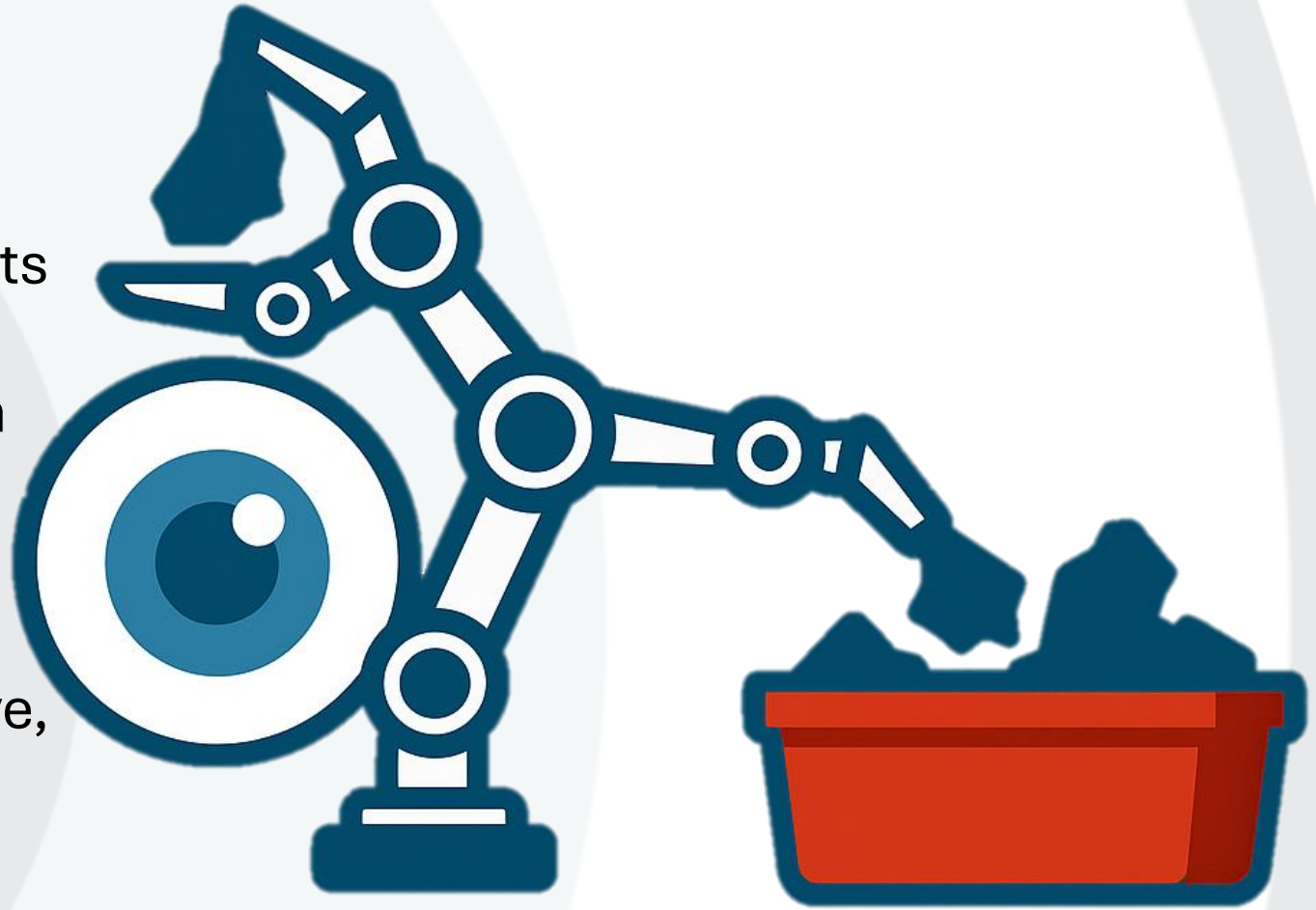
Automation for massive data acquisition: Creation of a configurable manipulation and handling station, integrating soft robotic technologies with innovative gripping solutions, designed to handle the uncertainties and delicacy of the artefacts and guided by algorithms capable of integrating manipulation with perception sensors to identify objects.

Open-Source Robotic System: development of a modular, cost-effective, and easy-to-deploy open-source robotic system.

Customisation: adaptability to various archaeological contexts, with a focus on customisation for specific needs.



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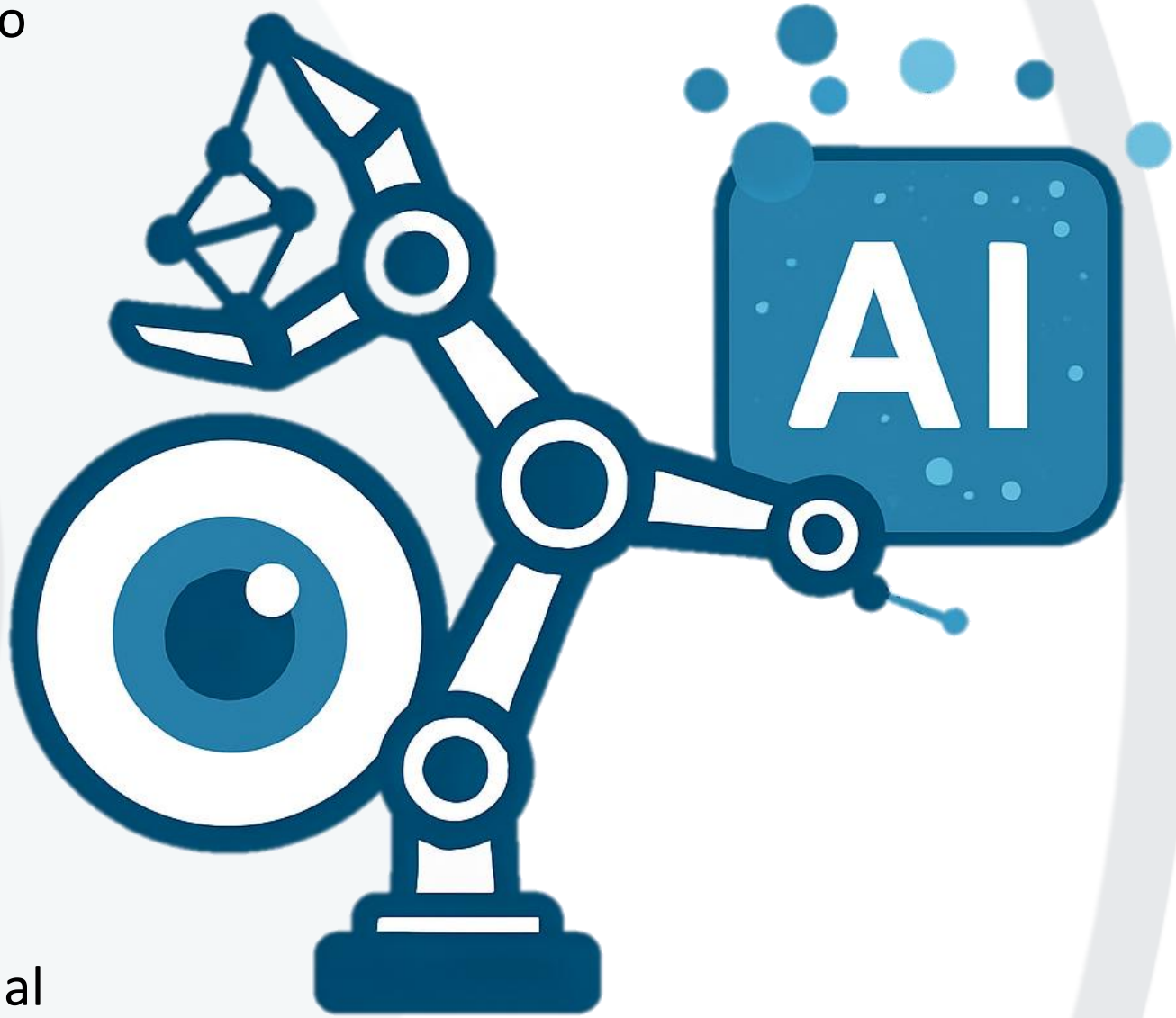
AI Model Development: creation of adaptable models with continuous learning capabilities to avoid instability.

Learning Approaches: Explore unsupervised and weakly supervised learning, enabling the creation of digital maps of artefacts for discovering hidden similarities.

Explainability and Ethics: develop explainable AI (XAI) functionality, ensuring human-comprehensible results and adherence to ethical principles.

Human-in-the-loop: encourage human intervention for data validation and AI continual learning, ensuring transparency and accuracy.



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Meaningful Public Involvement: Encourage public involvement through crowdsourcing, promote meaningful public participation in the cultural and creative processes linked to archaeological artefacts.

New Narratives: Narrate the stories connected to artefacts, making them more accessible and engaging for the public.

Artistic and Creative Engagement: Involve Creative Industries and cultural institutions to engage the public through artistic and creative interventions.

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Significance of Artefacts: Ceramics and lithics hold crucial archaeological information related to provenance, technological skills, cultural models, human/non-human relationships, trade, and chronology.

Advancing Archaeological Research: The application of Big Data and AI to artefact analysis opens new possibilities for archaeological research and interpretation.

AUTOMATA

FAIR Data Creation: generate large-scale FAIR data.

Enhancing AI in Archaeology: By providing accessible FAIR data, the project will help archaeology leverage AI more effectively, reducing the risks of low-quality results caused by inaccurate approximations.

Open Access: The project will ensure that digital content is stored, curated, and preserved for long-term sustainability, and openly available through ECCCH infrastructures

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3D INNOVATION FOR CULTURAL HERITAGE

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