



HERIFORGE

Cultural Heritage
and Immersive Technologies Forge



HERIFORGE

2ND OPEN CALL

TERMS & CONDITIONS

Guide for Applicants

**Submission of applications starts on the 25th of August, 2026 at 09:00
(Brussels time)**

Submission deadline: 27th of October, 2026 at 17:00 (Brussels time)

Version 2: 21/09/2026



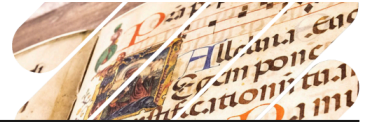
**Funded by
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Open Call Terms and Conditions

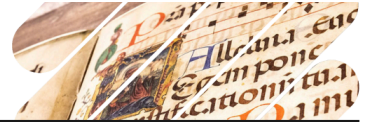
Welcome to the HERIFORGE 2nd Open Call Terms and Conditions, which serves as a Guide for Applicants (also “Terms” or “Guide”). This document outlines the rules for participation in the HERIFORGE 2nd Open Call, including eligibility criteria, maximum grant amount, timeline, submission rules, and the evaluation process.

Please take a moment to read this document carefully to understand the requirements and process. For any questions, please contact us at heriforge.help@fundingbox.com

Good luck!
 HERIFORGE Team

History of changes

No	Change Type	Section	Original Text	Updated Text
1	Clarification	Annex I - CY Challenge description	The prototype must provide a stable and comfortable experience on the selected headset.	The prototype must provide a stable and comfortable experience on the selected platform (headset/mobile).
2	Addition	Annex I - CY Challenge description	Target at least 90 frames per second on standalone or desktop head-mounted displays.	Target 60–90 FPS depending on the delivery platform, with ≥60 FPS for mobile experiences, ≥72 FPS for standalone VR, and ≥90 FPS for PCVR experiences.
3	Rewrite	Annex I - CY Challenge description	Up to 100,000 triangles for mobile or lightweight XR assets and up to 500,000 triangles for desktop or standalone headset assets at the highest real-time level of detail.	Up to 30K triangles for assets used for mobile and standalone VR/MR applications and up to 250K triangles for PCVR. In both cases this applies for LOD0 (highest in detail).
4	Correction	Whole document	Various sections	Minor syntax, grammar, and wording revisions throughout the document to improve clarity.
5.	Addition	Basic conditions - Who can apply?	N/A	Entities (e.g., SMEs, NGOs, foundations, associations) or natural persons previously funded under HERIFORGE 1st Open Call are not eligible to receive funding under the 2nd Open Call and therefore cannot participate.



1. Open call basic conditions

Section	Description
Call opening date:	25 August 2026 at 9:00 (Brussels time)
Call deadline:	27 October 2026 at 17:00 (Brussels time)
Project scope - type of activities that can be funded	HERIFORGE 2nd Open Call is looking for innovative projects developing technical solutions in the use of immersive technologies for cultural heritage, addressing specific Challenges defined by the HERIFORGE Hubs. For a more detailed description, please check Annex I.
Who can apply?	Individual legal entities applying as • SMEs¹ • <i>NGOs, foundations, associations</i> - or • <i>natural persons</i>², These individual legal entities should be legally registered³ on the day of application submission in Cyprus, Poland or Türkiye and specialising in the area of XR for cultural heritage. Applicants from other EU Member States and Horizon Europe Associated countries are eligible to apply if they demonstrate, in the application form, a local footprint⁴ (i.e. local staff and/or business record) in Cyprus, Poland or Türkiye. Entities (e.g., SMEs, NGOs, foundations, associations) or natural persons previously funded under HERIFORGE 1st Open Call are not eligible to receive funding under the 2nd Open Call and therefore cannot participate.

¹ An **SME** will be considered as such if it complies with the European Commission's Recommendation 2003/361/EC. As a summary, the criteria defining an SME are:

- Headcount in Annual Work Unit (AWU) less than 250;
- Annual turnover less or equal to €50 million OR annual balance sheet total less or equal to €43 million.

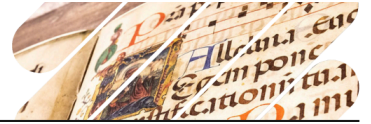
Note that the figures of partners and linked enterprises should also be considered as stated in the SME user guide. For detailed information check EU recommendation:

https://ec.europa.eu/growth/smes/business-friendly-environment/sme-definition_en

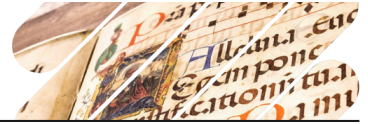
² An individual professional working in the area of CCI and heritage, such as freelancers (under civil contracts, in tax categories of influencers, etc.) who are citizens or permanent residents of an eligible country, identifiable by their name, surname, address, identity document, tax ID (or national insurance number), and of legal age, which allows them to sign a contract. More details can be found in the FAQs.

³ Date of registration applicable to SMEs, NGOs, foundations and associations. For natural persons, 'place of registration' shall be understood as their country of citizenship or residence.

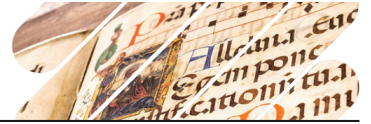
⁴ Local footprint refers to demonstrating a presence in target (Hub) countries (Cyprus, Poland, or Türkiye) through elements like local staff, a branch office, residence, or a track record of work in the local context (e.g. through cultural organisations, etc.). This condition applies to applicants from other EU Member States and Horizon Europe Associated countries. For a more detailed explanation of 'local footprint' please check the FAQs.



Max. grant amount	The maximum grant amount is up to €50 000 per grantee based on the budget included in the application form. The Project budget is part of the application form. The total amount you list will be fixed and will determine the grant you'll receive. The funding rate is 100% of the budget included in your application form. The grant will be paid as a lump sum.
Number of grants and total funding available	We will support up to 6 Projects in this Open call. The total budget available for this Open call is €300 000.
Support programme	Our Support programme covers financial support of up to €50,000 per project along with technical mentoring and services (including training, technology showcases, demonstration of hub infrastructure and tools, etc.) for a maximum duration of up to 6 months. The Support Programme is divided into 3 main stages over the 6 months. Third-party projects will receive their grant in installments upon the successful completion of each stage. For more details on the exact payment schedule and how each project's progress will be evaluated, please refer to 'Payment conditions' and 'Progress evaluation' chapters.
Duration of the Support Programme:	The Grant is offered together with the HERIFORGE Support programme. The Programme lasts up to 6 months.
Additional conditions related to who can apply?	Applicants under EU restrictive measures are ineligible. HERIFORGE partners and affiliates and employees cannot apply due to the conflict of interest.
How to apply?	Submit your proposal via our online form within the deadline. Your application must be in English, and all mandatory sections must be completed. Proposals can be modified after submission until the open call deadline. One applicant is allowed to submit up to 2 proposals, each addressing a different challenge. If more than one proposal was submitted, only the highest-scoring proposal will be considered for funding.



Ground rules and formal requirements	When applying to the HERIFORGE 2nd Open Call, please also note that the following conditions will be checked: 1. Submission deadline: Only proposals submitted through the online form before the deadline will be considered. 2. Language requirement: Proposals must be written in English. If mandatory sections (excluding the 'portfolio' and 'local footprint' sections) are submitted in another language, the proposal will be rejected. Non-mandatory sections provided in other languages will not be evaluated, but the proposal will remain valid. 3. Data accuracy: The information you provide must be correct, complete, and allow proper evaluation. Extra material provided by you that was not requested in the form will not be considered. Although we may use other resources to verify that the provided data is true. 4. Completeness: Ensure all required fields are filled. You can edit your submission until the deadline, but no changes are allowed after that. 5. European dimension: Your proposal should align with EU goals and contribute to creating a positive impact within the EU. 6. Conflicts of interest: We will check for any conflicts of interest between applicants and Consortium partners. Partners, their affiliated entities, and their employees cannot participate. Each case of conflict will be reviewed individually. 7. Financial stability: Entities under liquidation, in financial difficulty, or excluded from receiving EU funding are not eligible. We also exclude companies in bankruptcy. 8. Original work: Execution of your project should not violate third-party IPR. It must be based on your intellectual property or you must be allowed to use third-party rights. IPR to the project can not be subject to any dispute. 9. AI content: The use of AI tools to improve clarity and structure is permitted, provided the content remains accurate and fact-based. Applications may be rejected if found to be AI-generated and lacking a factual foundation. All submissions must be authentic reflections of the project, and the applicant team must evidence the technical and operational capacity required for implementation. Providing unverifiable or non-authentic information is grounds for immediate rejection. 10. Gender Equality Plan (GEP): Public bodies, universities, and research organizations from EU or Associated countries must have a GEP. 11. Acceptance of rules: By applying, you agree to the Open call Terms and Conditions outlined in this document.
More info about HERIFORGE	You can find more information about our Project on the HERIFORGE website. Open call is managed by FundingBox Accelerator sp. z o.o., and organised by the HERIFORGE Consortium partners. All documents - including the template of the Sub-grant Agreement can be found here.



2. Submission and evaluation process

Only proposals submitted through the [online form](#) before the [Call Deadline](#) will be considered. You will receive an email confirmation if the form is submitted correctly. If not, contact us immediately.

Our evaluation process is transparent, fair and equal to all participants. We will evaluate your project in a few phases described below. We will inform you about the results of the evaluation as soon as they become available.

2.1 Initial Check

After the closure of the open call, the system will review your proposal to ensure it meets the Call Terms and Conditions (Section 1). This check will be based on the declarations in your proposal.

2.2 IN/OUT Scope Screening

In case of a big number of applications or special needs of the project, the Selection Committee might decide to apply a screening phase, based on an In/Out Scope Screening.

During the In/Out Scope Screening, we will review the proposal's fit with the project scope and goals, as indicated in the Project Summary and General Objectives section of the [online form](#), more specifically:

- Scope (focus on an innovative technical solution in XR for heritage, local footprint and challenge alignment)
- European Dimension as described in the Ground rules and requirements in section 1 above.

A "Yes/No" approach will be used to assess those basic criteria, and non-compliant proposals will be rejected.

We will inform you about the results of the In/Out Scope Screening phase soon after these steps have been completed.

2.3 Independent Individual Evaluation

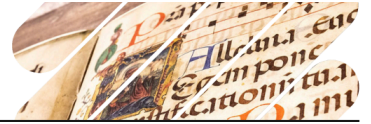
Eligible proposals will be evaluated by 2 independent experts using predefined award criteria:

EXCELLENCE will evaluate:

- **Ambition.** The applicants have to demonstrate to what extent the proposed third party project contributes to the project scope, have an European dimension and is beyond the State of the Art. The applicant project has to describe the innovative approach behind it (e.g. ground-breaking objectives, novel concepts and approaches, new products, services or business and organisational models).
- **Innovation:** applicants should provide information about the level of innovation within their market and about the degree of differentiation that this project will bring.
- **Soundness of the approach** and credibility of the proposed methodology.

IMPACT will analyse:

- **Market opportunity:** The applicants have to demonstrate a clear idea of what they want to do and whether the new/improved product/service/solution has market potential, e.g. because it solves a problem for a specific target customer.



- **Competition:** The applicants have to describe the existing competitive landscape related to their project's focus and how their proposed solution differs from current approaches or offerings, and what makes it distinct, novel and advantageous.
- **Commercial Strategy and Scalability:** The applicants have to demonstrate the level of scalability of the new/improved product meaning by not addressing a specific problem but able to be commercialised to solve a structural problem in a specific sector/process/etc.
- **Environmental and social impact:** The applicants have to demonstrate the project contribution towards environmental, social and economic impacts to contribute to sustainable development, Green Deal and other European policies.

IMPLEMENTATION:

- **Team:** The applicants have to demonstrate their management and leadership qualities, their ability to take a concept from ideas to market, their capacity to carry through their ideas and understand the dynamics of the market they are trying to tap into. The team should be a cross-functional team, with a strong background and skills base and taking into account its gender balance. In case of submission by a natural person, the applicant should define a team of collaborators which will work on the project.
- **Resources.** Demonstrate the quality and effectiveness of the resources assigned in order to get the objectives/work plan/deliverables proposed

Each criterion will be scored on a scale from 0 to 5, with evaluators providing individual reports and scores based on these criteria. Once the Individual Evaluation Reports are submitted, the final score for each individual criterion will be calculated as the average of the scores provided by each evaluator.

The final score per application will be calculated as the sum of the scores for each individual criterion.

For each criterion, the minimum threshold is 3 out of 5 points. **The maximum total score will be 15 points, with a minimum total threshold of 10 points.**

Ties will be solved using the following criteria, listed in order of priority:

- The highest score in the Impact section.
- Superior gender balance among the personnel responsible for carrying out the activities.
- The highest score in the Implementation section.

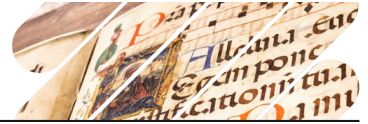
2.4 Jury Day - an online pitching session

Based on the ranking of proposals after the External Evaluation, around the top **3 highest-scoring applications** for each challenge will be invited to an **online pitching session**, where you'll present your project, team, and vision in front of **the Selection Committee** and External experts and reply to their questions. Finalists will be ranked based on the following Awarding Criteria:

- Team vision and attitude
- Potential impact on the project's goals
- Positive effect on the applicant's processes, products, or services

2.5 Consensus Meeting

The Selection Committee, composed of consortium partners (CYI, FBA, KU, PSNC) and 2 external experts, will review and discuss the results of the experts' evaluations and the Jury Day. The Selection Committee will reach a consensus or majority of $\frac{2}{3}$ votes on the list of proposals to be selected considering the evaluation scores and scope. The Selection Committee will review the ranking obtained from the Jury Day.



The final decision will be made based on the pitch and evaluation results (see the criteria in sections 2.3 and 2.4). Applicants will be notified after the Consensus Meeting about their status.

Keep in mind that although the highest-scoring proposals are usually chosen for funding, the Selection Committee can reject a candidate for valid reasons, such as not fitting HERIFORGE goals and scope, limited potential impact, commercial competition issues, serious ethical concerns, or possible conflicts of interest. The exact number of proposals approved will be decided based on the overall **quality** of the proposals.

2.6 Formal check & Agreement signature

Finalists will undergo a formal check to confirm their legal status (e.g., company registration, financial documents, ownership structure, tax ID, etc.). Therefore, we will ask you to provide documents to confirm all the details (these may include: company's registration document, tax ID number, ownership structure, financial statements, Bank Identification Form). Documents must be provided within the given deadline. If you don't deliver the requested documents on time, without a clear and reasonable justification, we will have to exclude you from further formal assessment.

After passing this check, we will invite you to sign the Sub-grant Agreement with the HERIFORGE consortium to officially participate in the programme.

3. After Sub-Grant Agreement signature

3.1 Payment conditions

The Grant will be paid in as a lump sum. Payments depend on the successful and timely completion of each stage of the work planned and outlined in the Individual Mentoring Plan developed at the beginning of the Support programme. Payments are scheduled in tranches, issued upon the successful completion of each stage of the Support Programme:

Stage 1 (Individual Mentoring Plan): Up to 20% of the Grant Amount after Stage 1 (duration of 1 month)

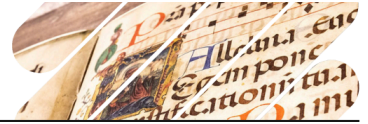
Stage 2 (Prototype): Up to 50% of the Grant Amount after Stage 2 (duration of 3 months)

Stage 3 (Demonstration and Integration): Up to 30% of the Grant Amount after Stage 3 (duration of 2 months)

3.2 Progress evaluation

We pay upon the delivery of the agreed results - not upon delivery of certain receipts. Therefore, Consortium Partners, gathered in the Selection Committee, will evaluate your progress regularly.

Stage	Explanation
Individual Mentoring Plan (IMP)	Within the first month of the Support Programme you will prepare an Individual Mentoring Plan (IMP), outlining the final budget, KPIs, and deliverables for performance assessment. It will also cover any specific Ethics Assessment requirements (if applicable).



	The IMP will be evaluated by the Selection Committee taking into account Deliverables quality (90%) and Deadline compliance (10%).
Stages 2 (Development of the Solution) & 3 (Release and Testing) Milestones' review	Before each payment, the Selection Committee will review your progress. Performance will be evaluated by Technical Partners and Ethics Partners (if applicable) based on: • Deliverables quality (30%) • Technical/Business KPIs (60%) • Deadline compliance (10%) Each criterion will be scored from 0 to 10, and the final score will be calculated based on the weights indicated. A score of 7 points or more is required to continue in the program. For more details, please check the template of the Sub-grant Agreement.

4. Contact us

If you have any questions about our application process, feel free to reach out to us by email at heriforge.help@fundingbox.com.

Please note that responses are given individually and do not change these Terms, they are provided for informational purposes only.

In case of any technical issues or problems, please include the following information in your message:

- your username and email address;
- details of the specific problem (e.g. error messages you encountered, bug description, i.e. if a dropdown list isn't working, etc.); and
- screenshots of the problem.

5. Complaints

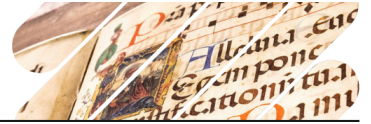
If you believe there was an error in one of the evaluation phases, you may submit a complaint within **three (3)** calendar days after sending the results to you. Send it, in English, to heriforge.help@fundingbox.com and include:

- your contact details (including email),
- the subject of your complaint,
- evidence of the specific issue.

Please note that we will review only complaints related to:

- errors in the process caused by our staff,
- technical issues beyond the applicant's control,
- clear human or mechanical errors made by our staff,
- incorrectly marked statements, minor clerical errors, and obvious typographical mistakes.

Please note that we will not review complaints related to the content of the expert evaluations.



Complaints will be reviewed within seven (7) calendar days. If more time is needed, we will inform you via email. Anonymous complaints or those with incomplete information will not be considered.

6. Last but not least - final provisions

Any issues not covered by these Terms and Conditions are governed by Polish law, Horizon Europe Programme rules, and EU grant regulations.

We make our best effort to keep all provided data confidential; however, for the avoidance of doubt, you are solely responsible for indicating your confidential or sensitive information as such. Please be aware that your application form will be shared with the external evaluators and HERIFORGE Consortium partners.

You retain ownership of your intellectual property rights (IPR). However, to facilitate the reuse and sustainability of the project results, you are required to publish specific project outputs - including software, 3D assets, source code, and documentation - under an open license, as detailed in the requirements and deliverables for each specific Challenge in Annex I. If any intellectual property ends up being jointly owned, the joint owners will sign an agreement to set out how their rights and responsibilities are managed.

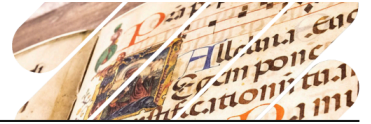
The signature of the Sub-grant Agreement is the initial condition to establish any obligations among applicants and any Consortium partners (with respect to the obligation of confidentiality of the application). The Sub-grant Agreement will include a set of obligations towards the European Commission (for example: promoting the project and giving visibility to the EU funding, maintaining confidentiality, and understanding potential controls by the EC/ECA, EPPO, and OLAF).

Please be aware that eligibility criteria will be checked throughout the process, including a final review and support programme.

In the event of any discrepancies between these Terms and their Annexes, the Terms shall prevail.

The HERIFORGE Consortium reserves the right to cancel or modify the call at any time, informing applicants accordingly.

Need more help? Contact us at heriforge.help@fundinbox.com, and we'll be happy to assist.



Annex I

1. Technical description

The main goal of HERIFORGE is to develop a network of three interconnected place-based hubs in Poland, Cyprus and Türkiye providing a Research and Innovation environment for innovation in the Cultural and Creative Industries with the responsible use of XR (extended reality) technologies and cultural heritage for the benefit of social resilience.

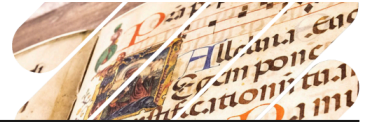
HERIFORGE 2nd Open Call is looking for innovative projects developing technical solutions in the use of immersive technologies for cultural heritage. The HERIFORGE 2nd Open Call will finance up to 6 Proposals to address specific Challenges defined by the HERIFORGE Hubs. The Challenges are the following:

- **Cyprus Hub CHALLENGE:** Decolonising Cypriot Histories - Creating XR experiences for Shared Approaches to Heritage and Social Resilience
- **Poland Hub CHALLENGE:** Unlocking Interactive Stories: Inclusive XR Experiences for Cultural Heritage
- **Türkiye Hub CHALLENGE 1:** Standardized Asset Organization Pipeline for Ankara Orchard House
- **Türkiye Hub CHALLENGE 2:** Living Layers: Storytelling in XR for Ankara Orchard House with Community Engagement

Only technical solutions will be eligible. The application must clearly describe how the proposed innovation advances beyond the current state-of-the-art and provides a compelling solution to the challenge identified by the Hubs. The solutions can be e.g. software applications, artistic/museum installations, data interoperability systems, information management such as automation, integration, etc. Examples of proposals outside of scope include those focusing on social science solutions, theoretical research, frameworks, guidelines or policies.

The activities that qualify for financial support and fall within the scope of the HERIFORGE project should start at a [Technology Readiness Level \(TRL\)](#)⁵ of 4-5 and aim to reach TRL 6-7 during the Support Programme. Applications at lower TRL may be accepted as long as the applicant presents the road map to reach the higher TRL level by the end of the project.

⁵ TRL is a scale from 1 to 9 used to measure how mature or developed a technology is, from a basic concept (TRL 1) to a fully tested and ready-for-market solution (TRL 9). It helps funders understand how far along your technology is. For a detailed explanation, please consult the FAQs document.



2. Challenges

Cyprus Hub CHALLENGE: Decolonising Cypriot Histories -Creating XR experiences for Shared Approaches to Heritage and Social Resilience

CHALLENGE DESCRIPTION:

Cyprus has a rich and diverse cultural heritage shaped by the many communities who have co-existed and still are living on the island, their traditions and collective memories. However, many heritage sites, narratives, and cultural practices remain disconnected from one another due to the divide and the pursuit of hegemonic narratives, while cultural heritage institutions, cultural tourism industry and the CLAM sector in general, often face practical, organisational, ethical, and interpretive challenges when introducing XR technologies into their activities.

This Call invites collaborative proposals developed jointly by at least one cultural heritage institution/cultural heritage expert and one XR company or technology provider. The aim is to plan, design, implement, and evaluate an XR experience that supports the inclusive interpretation of Cyprus' shared heritage and contributes to dialogue, mutual understanding, and social resilience.

Proposals may address tangible or intangible heritage, including archaeological or historical sites, monuments, museum collections, oral histories, traditions, crafts, contested narratives, multi-vocal perspectives of history or community memories. The XR experience should not present heritage as a single, fixed narrative. It should enable users to engage with multiple, alternative perspectives of history and encourage reflection.

The Call places particular emphasis on the process of integrating XR interfaces into creating inclusive approaches to cultural heritage. Applicants should identify and examine challenges encountered during their proposed activities, such as institutional readiness, collaboration/decision making between heritage and technology professionals, community interpretation, accessibility, content selection, ethical representation, intellectual property, technical capacity and long-term maintenance.

The proposed solution should therefore demonstrate not only a functional XR experience, but also report lessons learnt about the **organisational, methodological, and operational conditions under which the proposed XR experience can be used responsibly and effectively by cultural heritage institutions.**



EXPECTED DELIVERABLE:

Where applicable, all relevant technical specifications (in relevant Section) shall be clearly included in the deliverable reports.

No.	Item	Type	Description
D1	Project concept, Methodology and Collaboration plan	Report	A report defining the project objectives, heritage context, target audiences, proposed XR technology, roles of the cultural heritage institution and XR partner, stakeholder involvement (if any), accessibility measures. The report should also identify the main challenges expected during implementation and explain how they will be addressed.
D2	XR Prototype	Software / Application / Features	A functional XR application demonstrating the proposed heritage experience. The prototype should support the agreed target platforms/hardware, include the core user journey and accessibility features (D1), and be suitable for testing with representative users in a <u>cultural heritage setting</u> .
D3	3D asset pack	3D models, textures, metadata and Validation Reports	A representative set of reusable and openly licensed 3D assets developed for the prototype. The pack should include all necessary LODs, archival source files (where applicable), textures, provenance information, licensing information, and metadata aligned with the specified cultural heritage best practices (see “Reference info” section).
D4	Implementation and Institutional Adoption Report	Report / practical guide	A report of how the XR experience was developed and introduced into the cultural heritage institution setting. The report should document experienced barriers and enabling conditions, including collaboration, internal capacity, decision-making, curatorial control, accessibility, intellectual property, infrastructure, maintenance, staff readiness, and long-term ownership. It should include practical recommendations that can be reused by other cultural heritage institutions. (if the application comes with a collaboration of a CHI expert, the team should define a CHI / public infrastructure where the XR experience should take place)
D5	Evaluation and Impact Assessment	Report	An evaluation of the prototype covering usability, accessibility, audience engagement, representation of multiple perspectives, institutional value (this is another aspect mentioned by CVAR – XR has no added value), and contribution to awareness, societal inclusion and dialogue. The assessment should combine quantitative and qualitative



			evidence and clearly describe the methodology, sample, limitations, and findings in the report.
D6	Sustainability, Reuse and Exploitation Plan	Plan	A practical plan describing how the XR experience, assets, code, and methodology may be maintained, reused, updated, or transferred after the project. It should address technical maintenance, institutional responsibilities, hosting, licensing, preservation, staff capacity, and potential integration into exhibitions, educational activities, or wider cultural heritage data infrastructures (such as Europeana 3D sketchfab collections).
D7	Dissemination and Demonstration Materials	Videos, presentation and exhibition documentation	A communication package supporting the public presentation and wider advertisement of the project. It should include a short demonstration video, screenshots, a project summary, presentation materials, and documentation of any public demonstration or exhibition.

REFERENCE INFO:

Mandatory:

- Commission Recommendation (EU) 2021/1970 of 10 November 2021 on a common European data space for cultural heritage.

Suggested / Recommended:

- FAIR principles for making digital cultural heritage assets findable, accessible, interoperable, and reusable.
- Europeana Data Model and relevant guidance for 3D cultural heritage content.
- Provenance and paradata documentation describing the origin, creation, transformation, interpretation, and validation of digital assets.
- Open and reusable exchange formats for 3D and XR content.
- Open licensing of project outputs, including digital assets, metadata, documentation, and source code.



TECHNICAL SPECS:

The technical specifications below provide a common quality and interoperability framework for the projects supported under this challenge. As XR experiences may differ substantially in format, content, level of immersion, target platform, use of 3D assets, and intended audience, not all specifications will apply equally to every proposal.

Technical area	Minimum requirement	Recommended target / best practice	Evidence required
XR delivery platforms	The prototype must be validated on WebXR through a Chromium-based browser and on at least one standalone XR headset (provided the scale of the experience allows this).	Meta Quest 3 or an equivalent standalone headset. Android ARCore may also be supported where relevant.	List of tested devices, operating systems, browsers, and versions, including any known compatibility limitations.
Browser compatibility	The WebXR version must operate on a current Chromium-based browser, such as Google Chrome or Microsoft Edge. (applies to webXR)	Applicants should clearly communicate unsupported browsers or devices to users.	Browser compatibility and testing report.
3D exchange formats	Final real-time 3D assets must be supplied in an open and interoperable format. (applies to all)	glTF 2.0 or GLB for real-time and WebXR delivery. USDZ may be supplied where relevant.	Final exported assets and a list of file formats provided.
Proprietary source files	Proprietary working files may be used during production, but they must not be the only versions delivered. (applies to all)	Include editable source files together with open-format exports.	Source-file inventory and open-format equivalents.
Geometry optimisation	Assets must be optimised for the selected platform and intended viewing conditions. (applies to all)	Up to 30K triangles for assets used for mobile and standalone VR/MR applications and up to 250K triangles for PCVR. In both cases	Geometry statistics for representative assets.



Technical area	Minimum requirement	Recommended target / best practice	Evidence required
		this applies for LOD0 (highest in detail). ⁶	
Levels of detail	Complex 3D assets must support appropriate optimisation and performance management.	At least three levels of detail for complex assets, where technically and visually appropriate.	LOD files or automated LOD implementation, with triangle counts for each level. (for the entire scene)
Visual and heritage integrity	Optimisation must preserve the significant visual, material, and interpretive characteristics of the heritage asset. (applies to all)	Optimisation decisions should be agreed between the XR partner and the cultural heritage institution.	Brief record of optimisation decisions and institutional validation.
Geometric accuracy	Applicants must define an appropriate accuracy level based on the intended use of each digitised or reconstructed asset. (applies to where scanning takes place)	Indicative targets of up to 1 mm for small artefacts and up to 10 mm for monuments, buildings, or larger heritage structures.	Description of the capture or modelling method, expected accuracy, validation approach, and limitations.
Reconstructed or interpretive content	Degree of uncertainty of hypothetical, reconstructed, incomplete, or interpretive elements must be clearly identified. (this applies to intangible cultural heritage)	Use visual, textual, or metadata-based methods to distinguish documented evidence from interpretation.	Documentation of the evidential basis and degree of certainty for reconstructed content.
Materials and rendering	Real-time assets must use materials compatible with the selected delivery environment.	A glTF-compatible physically based rendering workflow.	Representative material and texture files.

⁶ Assets that require a higher number of triangles due to their complexity, should be broken to smaller pieces of geometry, grouped as one when delivered.



Technical area	Minimum requirement	Recommended target / best practice	Evidence required
Texture maps	Texture maps must be selected according to the asset and platform requirements.	Base Color, Metallic-Roughness, Normal using the OpenGL convention, Occlusion, and Emissive maps, where applicable.	Texture inventory for representative assets.
Texture resolution	Texture resolution must balance visual quality, loading time, memory use, and device performance.	Resolution tiers between 1024 × 1024 and 4096 × 4096 pixels, selected according to asset size, viewing distance, and visual significance.	Texture dimensions and compression information.
Texture compression	Assets must be suitable for real-time delivery on the selected platforms.	Basis Universal or KTX2 compression is recommended.	Compressed delivery files and technical documentation.
Metadata	Each reference 3D asset must include sufficient metadata to support identification, interpretation, reuse, and preservation.	Metadata should align, where proportionate, with the Europeana Data Model, relevant 3D guidance, and FAIR principles (see “Reference Info” Section).	Metadata records accompanying the reference asset pack (actually it is general asset info and surfaces/objects names).
Minimum metadata fields	Metadata must include, where applicable, title, description, source institution or collection, creator, contributors, creation date, rights, licence, methods, scale, and version.	Additional information should cover equipment, software, accuracy, source material, optimisation, limitations, and related heritage records.	Completed metadata template for each reference asset. (if selected file format does not support metadata integration these should be delivered in an XML / CSV format)



Technical area	Minimum requirement	Recommended target / best practice	Evidence required
Provenance and paradata	Applicants must document the origin of the digital content and the processes through which it was created or transformed. (applies to all)	Include capture, modelling, cleaning, reconstruction, interpretation, optimisation, validation, and approval decisions.	Provenance and paradata documentation.
IIIF interoperability	Not mandatory unless directly relevant to the project workflow. (not compulsory but preferable)	An IIIF Presentation API version 3 manifest is recommended where it supports interoperability, presentation, or dissemination.	IIIF manifest, where implemented.
Headset performance	The prototype must provide a stable and comfortable experience on the selected platform (headset or mobile).	Target 60–90 FPS depending on the delivery platform, with ≥ 60 FPS for mobile experiences, ≥ 72 FPS for standalone VR, and ≥ 90 FPS for PCVR experiences.	Performance test results from representative scenes and interactions.(on what specs machine?)
Mobile performance	Mobile implementations must remain usable and responsive on the selected target devices.	Target at least 60 frames per second on supported mobile devices.	Mobile performance test results, where applicable. (define a target mobile device spec?)
Latency	Interaction and display latency must not create avoidable discomfort or materially reduce usability.	Motion-to-photon latency below 20 milliseconds at the 95th percentile, where this can be reliably measured.	Latency measurements or a justified qualitative assessment where direct measurement is not feasible.



Technical area	Minimum requirement	Recommended target / best practice	Evidence required
Performance reporting	Performance must be evaluated under representative use conditions. (applies to all and these reports will greatly support our effort with JPRP impl.)	Report average frame rate, major frame-rate drops, loading time, memory use where measurable, scene complexity, device, and browser.	Technical performance report.
Permitted performance deviations	A lower frame rate may be accepted where technically justified and where the experience remains stable, usable, and comfortable.	Deviations should be discussed with the cultural heritage institution and supported by test evidence.	Explanation of the deviation, its causes, and mitigation measures (if any).
User journey	The prototype must contain a coherent, complete, and testable user journey. (maybe it should be tested for bugs – similar to gaming industry approach) (user sticking phenomena)	The main experience should be understandable without specialist technical knowledge.	User-flow diagram and prototype demonstration.
Interaction design	Users must receive clear instructions, system feedback, and an obvious method for starting, pausing, exiting, or restarting the experience.	Provide onboarding, contextual guidance, and progressive disclosure of more complex interactions.	Demonstration and user-testing evidence.
Physical use conditions	The solution must be appropriate for its intended physical and institutional environment.	Support seated or standing use where appropriate and minimise disorientation, motion sickness, and unnecessary movement.	Description of the intended installation and use conditions.



Technical area	Minimum requirement	Recommended target / best practice	Evidence required
Public demonstration	The prototype must be suitable for supervised demonstration in a cultural heritage setting. (this is the operation stage not the interaction design) (applies to VR/MR)	Include an operator mode, reset function, hygiene considerations, and simple troubleshooting guidance.	Demonstration protocol or operator guide.
Interpretive transparency	Users must be able to understand the source and interpretive status of significant heritage content.	Clearly distinguish documented evidence, community testimony, curatorial interpretation, and hypothetical reconstruction.	In-experience examples and supporting documentation.
Accessible content	Relevant audiovisual and textual content must be provided in accessible forms.	Subtitles, transcripts, text alternatives, audio description, adjustable text, adequate contrast, and colour-independent communication.	Accessibility feature inventory and prototype demonstration.
Accessible interaction	Interaction design must consider users with different physical, sensory, and cognitive needs.	Alternative interaction methods, seated-use options, reduced-motion modes, volume controls, and multimodal visual, audio, or haptic feedback.	Description and testing of implemented alternatives.
Alternative access	Where the full immersive experience cannot be made accessible to all users, an alternative means of	A non-immersive desktop, screen-based, video, audio, or guided	Description or demonstration of the alternative access method.



Technical area	Minimum requirement	Recommended target / best practice	Evidence required
	accessing the core content must be considered.	version of the experience.	
Archival masters	The final package must include archival-quality files for newly digitised assets, where applicable. (applies to those that will scan)	Include raw or minimally processed capture data and unoptimised OBJ, PLY, or equivalent source models.	Archival file inventory.
Production and delivery assets	Archival, production, and optimised delivery files must be clearly distinguished (naming convention)	Use a documented folder structure and consistent naming and versioning conventions.	Final package structure and file manifest.
Source code	Source code for the prototype must be delivered under an OSI-approved open-source licence, subject to any justified third-party restrictions.	Include commented code and a clear repository structure.	Source-code repository or packaged source archive.
Preservation and reuse	The delivered materials must support future maintenance, migration, adaptation, and reuse.	Include version information, licence information, known dependencies, technical limitations, and migration considerations.	Preservation and reuse documentation.
Technical documentation	Applicants must provide concise documentation covering the system, assets, platforms, installation, operation, and maintenance.	Include system architecture, development tools, supported platforms, optimisation workflow, accessibility features, testing methods, performance results,	Final technical manual.



Technical area	Minimum requirement	Recommended target / best practice	Evidence required
		and known limitations.	
Validation checklist	Applicants must demonstrate compliance with the applicable technical requirements of the call.	Use an automated validator where appropriate, supplemented by manual testing and review.	

Applicants should identify from the table below, which requirements are relevant to their proposed solution and explain how they will be addressed.



EXPECTED RESULT AND IMPACT:

Applicants must propose a minimum of five measurable Key Performance Indicators from the list provided below.

The selected KPIs should be relevant and proportionate to the proposed XR experience, target audience, cultural heritage context, technical approach, and project scale.

The following three KPI areas are mandatory for all projects:

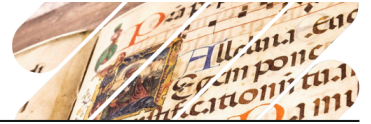
Impact area	Target	Verification method
Collaboration between CHI and XR partner	One documented collaborative workflow defining roles, responsibilities, decision-making, and approval processes	Collaboration plan, meeting records/decisions, and final implementation report
User testing and evaluation of XR experience	Prototype tested with a minimum of 10 representative users, subject to the nature of the target audience and project	Test protocol, anonymised participant profile, results, and limitations
Representation of multiple perspectives of historical narratives	The prototype includes at least two clearly identified perspectives, narratives, or forms of evidence where relevant to the selected heritage topic	Content review by the cultural heritage institution and stakeholder feedback

Applicants must select at least two additional KPIs from the remaining list. These may relate to accessibility, audience engagement, technical performance, dissemination, reuse, or institutional adoption.

Impact area	Target	Verification method
Institutional readiness	A documented assessment of the participating institution's capacity, needs, risks, and conditions for future XR adoption	Institutional readiness assessment completed at project start and end
Accessibility	Core accessibility measures implemented and tested with representative users	Accessibility checklist, testing report, and documented improvements
User satisfaction	Mean satisfaction score of at least 7 out of 10	Post-experience user survey



Impact area	Target	Verification method
Ease of use	At least 75% of users complete the main user journey without critical assistance	Observational testing and task-completion records
Audience engagement	At least 70% of tested users report that the experience increased their interest in or understanding of the heritage topic	Post-experience questionnaire
Awareness of cultural diversity	At least 60% of users report improved awareness of multiple perspectives or Cyprus' cultural diversity	Pre- and post-experience survey or structured interview
Reusable methodology	One practical guide or case study describing the collaboration process, barriers, enabling conditions, and lessons learned	Final institutional adoption report or published case study
Dissemination reach	Project results communicated through at least three appropriate dissemination channels	Website analytics, event records, professional networks, publications, or media evidence
Post-project adoption potential	One agreed sustainability and reuse plan adopted by the participating cultural heritage institution	Approved sustainability plan and institutional statement
Interest from other institutions	At least three cultural heritage institutions or professional stakeholders engaged with the project results	Workshop/meeting attendance, expressions of interest to adopt the workflow



Poland Hub CHALLENGE: Unlocking Interactive Stories: Inclusive XR Experiences for Cultural Heritage

CHALLENGE DESCRIPTION:

Creating high-quality, and engaging eXtended Reality (XR) experiences remains complex, time-consuming and costly for many Polish cultural heritage institutions. Limited resources, uncertainty about implementation and maintenance, and communication barriers between cultural heritage professionals and XR creators can discourage institutions from adopting new technologies or entering long-term collaborations. The Polish Heriforge Hub seeks to address these issues.

This Open Call invites innovators to develop prototype XR solutions or experiences that **unlock interactive cultural heritage stories for audiences facing barriers to accessing and participating in culture**. Applicants should identify a specific audience, describe the barriers it encounters, and explain how the proposed experience will make cultural heritage more accessible, meaningful and engaging.

XR is understood broadly. Proposed solutions may include virtual, augmented or mixed reality, but also spatial and interactive audio, haptic or tactile interfaces, immersive installations, projection-based environments, and hybrid onsite or remote experiences. Projects may therefore take the form of an interactive museum exhibition, an offsite or home-based experience, a multisensory installation, or an audio-centred experience designed, for example, for blind or partially sighted users. Gamification may be used where appropriate, but it is not mandatory.

The proposed solution must be developed **in close cooperation with at least one Polish cultural heritage or art institution**, such as a museum, gallery, archive, archaeological site or other cultural organisation. The institution should contribute to defining the need, shaping the concept, supporting access to content and users, and validating the solution. Applicants are strongly encouraged to include within the project team, or as an active project partner, a professional from the cultural heritage, museum or arts sector, such as a curator, educator, researcher, producer or accessibility specialist. This collaboration must be defined and **proved by a letter of intent** signed with a particular culture heritage or art institution (delivered in 1st month of the project) The letter of intent should clearly describe the planned scope of cooperation, including the roles and responsibilities of each partner, the cultural heritage assets or content to be involved, the intended XR activities and outcomes, as well as the expected benefits for the institution.

The Open Call aims not only to create individual prototypes, but also to strengthen cooperation between the Polish cultural heritage and XR communities. The project should establish a practical workflow for collaboration, reduce uncertainty around the adoption of XR, and generate knowledge that can be reused by other institutions and technology providers, summarised in a final report and case study at the end of the project (M6).

Solutions may be **tailored to the needs** of a specific institution, collection or audience. However, applicants must consider how the technology, methodology or production workflow **should/must be reapplied in other contexts**. Reusability may be demonstrated through, for example, a plugin, toolkit, modular component, reusable content pipeline, template, documented workflow, open standard, or another approach that limits dependence on a single supplier and makes future adaptation feasible and cost-effective.

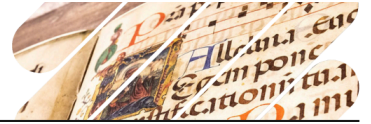
Open Call beneficiaries will be supported and mentored by the **HERIFORGE team** experienced e.g. with art, tech and research. During project implementation, selected teams may use the laboratory equipment and expertise of PCSS, including 3D laser scanning, photogrammetry, motion capture and immersive sound facilities.



EXPECTED DELIVERABLES (Report, Software, Hardware, etc.):

The details of the deliverables will be agreed upon in M1 as part of the Individual Mentoring Plan (IMP).

No.	Item	Type	Description
D1 (M1)	IMP & Visual Mockup	Document	Individual Mentoring Plan incl. use of Hub resources and support.
D2 (M1)	Letter of support from cultural heritage institution	Legally signed document	Letter of intent or support or other type of contract expressing willingness of Polish CH institution to collaborate and/or test the solution.
D3 (M1)	Project design and technical specification	Document (+ multimedia presentation or short video)	Report describing technical concept, system architecture, storyboards/visual mock-ups and full technical description and technology of the envisioned solution concept.
D3 (M4)	Solution developed	Software/app (executable version) + technical documentation + Online demo	Executable version of a prototype solution together with technical documentation describing the prototype solution functionality, system architecture, technical requirements and specification. Demo the solution with example XR experience content.
D4 (M4)	Testing and validation plan	Document	A testing and validation plan, including appropriate ethical, consent, privacy and accessibility documentation
D4 (M6)	Final demonstration and report	Document + Case study + Video	Document summarising the final results of final demonstration and tests with end user CH institution (incl. feedback from end users, as well as the exploitation plan with a model for implementing the solution in other cultural institutions). Case study - short public report summarizing the project and results (acc. to template delivered by the project). Demo video (short video demonstrating the solution and its potential, incl. behind scene materials).
D5 (M6)	3D asset pack	3D models, assets, textures, metadata	3D models, textures, assets representing cultural heritage objects created within the project, including relevant metadata published under an open license.



REFERENCE INFO (datasets, models, benchmarks):

- Applicants are encouraged to reuse existing cultural heritage digital objects made available under suitable licences through local, national or European repositories (e.g. [Digital Repository of Scientific Institutes \(RCIN\)](#), [Polish Digital Libraries Federation \(FBC\)](#), [Europeana](#)), or to use their own assets and datasets acquired during project implementation.
- Projects should use relevant accessibility, inclusive design, usability and ethical research guidance appropriate to the identified audience and testing context.
- A list of equipment, facilities and expert services available through the Polish Hub is available here: [OC2 PL HUB Resources offer](#). Access conditions will be determined individually through the IMP.

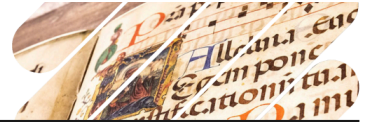
TECHNICAL SPECS:

- The technical form is open and may include visual, auditory, tactile, haptic, spatial, mobile, web-based, installation-based or hybrid components.
- The solution should use interoperable and commonly supported formats wherever possible and should be accompanied by sufficient documentation to enable installation, operation, maintenance and adaptation.
- The applicant should address the practical conditions of implementation, including required space, staffing, user support, licensing, hardware, hygiene, safety and estimated maintenance costs, where relevant.
- Digital cultural heritage assets created within the project, including 3D models, audio, textures, metadata and other reusable resources, must be delivered in standard, interoperable formats and, where legally and ethically possible, published under an open licence in an open repository designated or approved by the Hub.

REQUISITES

Mandatory:

- The solution must use XR or immersive and interactive technologies in a meaningful way that directly supports access to, interpretation of or engagement with cultural heritage.
- The proposed solution must address access to culture for a clearly identified audience facing barriers to accessing, experiencing or participating in cultural heritage. The application must describe the audience, the relevant barriers and the expected benefit.
- The solution must be developed and validated in close cooperation with at least one Polish cultural heritage institution. The institution must contribute to the definition of the need, the development process and the final validation or testing.
- The proposed solution must be publicly demonstrated and validated/tested with the cooperating Polish cultural heritage institution.
- The final end-user demonstration must involve at least 50 participants, and feedback must be collected from at least 10 end users or visitors. Testing involving end users must be conducted in accordance with applicable ethical, consent, privacy, accessibility and safety requirements.



- The applicant must describe how the solution, methodology or workflow may be reused, adapted or reapplied by other cultural heritage institutions or in other cultural heritage contexts.
- The solution prototype should use or support cost-effective XR devices and equipment currently available on the Polish market or that can be easily procured by Polish cultural heritage institutions.
- Data and digital resources created within the project should follow the FAIR principles: findable, accessible, interoperable and reusable. Materials reproducing public-domain cultural heritage objects or sites and not subject to new rights should be made available under an open licence of at least CC BY 4.0, unless legal, ethical, privacy or cultural-sensitivity considerations require justified restrictions.

Preferential:

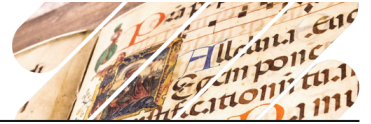
- The project team includes an active member with professional experience in cultural heritage, museums, galleries, archives, arts, cultural education or accessibility.
- Representatives of the target audience are involved in co-design, iterative testing or evaluation rather than only in the final demonstration.
- The proposed solution includes reusable technical components, such as a plugin, toolkit, modular system, template, open workflow or content-production pipeline.
- The solution supports multimodal access and offers more than one way of receiving information or interacting with cultural heritage content.
- The project uses gamification, participatory storytelling or other engagement mechanisms where they are appropriate to the audience, content and institutional context.
- The applicant demonstrates a realistic pathway for further adoption, maintenance and adaptation after the funded project.

EXPECTED RESULT + IMPACT (target KPIs):

Project-specific KPIs will be agreed individually during the first month of implementation as part of the IMP. They will reflect the technological maturity, target audience, accessibility goals, collaboration model and intended route to adoption of each project. The indicators may include technical progress and performance, accessibility and usability findings, participation in co-design and testing, quality of collaboration with the cultural heritage institution, reusability of the solution, documentation and knowledge-sharing activities.

The following minimum indicators apply to all selected projects:

KPI	Description	Target	Verification
End-user/visitors demonstration days	Number of days the final solution is demonstrated to the end users	Min 4.	Photos from the event or other proof



End-user/visitors demonstration	Number of users participating in demonstration/testing event	Min. 50	Photos from the event or other proof
End-user/visitors feedback	Number of feedback surveys	Min. 10	Post-demo survey (audience)

Additional KPIs and verification methods will be defined with the project mentor and the cooperating institution. These may include technical reports, accessibility and usability findings, evidence of successful task completion, documentation of barriers identified and reduced, reuse or adaptation scenarios, institutional readiness, dissemination outputs and contributions to the Hub network.

1. Polish Hub Resources Offer

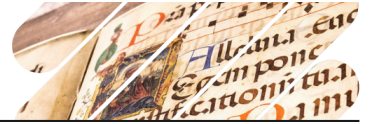
A list of equipment and services that can be made available to Heriforge 2nd Open Call Applicants applying to solve a challenge defined by the Polish HUB.

1. Equipment available stationary in the PCSS laboratories

1. Access to multimedia laboratory
 - a. Visualization with projectors, screens, lighting, VR
 - b. Multi-speaker installation (surround sound, ambisonic sound)
2. Access to recording laboratory
 - a. Sound recording (various microphones, ambisonic microphones)
 - b. Image recording (video cameras, photo cameras, 360° cameras)
 - c. 3D scanning (photogrammetry, point clouds, mesh)
3. Access to the Motion Capture equipment (Optitrack)
4. Additional devices
 - a. VR goggles: Oculus Quest 3, Meta Quest Pro, Pimax Crystal
 - b. XR Goggles: Vive XR elite
 - c. Haptic devices: Touch DIVER, bHaptics Tactsuit, Woojer Vest
 - d. EEG sensors: Unicorn Hybrid, Mindrove ARC
 - e. Depth cameras: Kinect One

2. Enabling Projects with Imaging, Audio, and Immersive Technology Services

1. Scanning of space - point clouds
2. Scanning of objects - 3D models
3. Photogrammetry from a drone photos
4. Lidar scanning from a drone
5. Films and photos from a drone
6. Motion Graphics
7. Production of audio and video recordings
8. Production of surround sound recordings and 360° and VR images



9. Support for post-production of sound recordings and their adaptation to multi-speaker installations
10. Support for designing and implementing installations based on mapping technologies and surround sound
11. Support for interaction prototyping (Touch Designer, Max MSP)
12. Support for the creative team and creative-technological mentoring (experience in the practical application of immersive technologies in a cultural environment)
13. Support for production in the field of implementation of immersive technologies in culture

3. Terms and conditions

The equipment and services listed above are made available exclusively to beneficiaries of the Open Call, for the purposes of developing and implementing their proposed solutions.

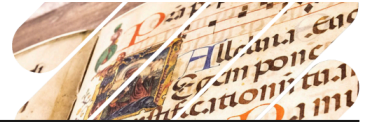
Access is granted in accordance with PCSS laboratory guidelines and schedules.

All equipment and facilities must be used responsibly, and according to the instructions provided by PCSS staff. Any damage resulting from misuse will be the responsibility of the beneficiary.

Access to specific equipment, laboratories, and services is subject to availability and must be scheduled in advance in coordination with PCSS staff.

PCSS and the Polish HUB reserve the right to suspend or terminate a beneficiary's access to equipment and services.

PCSS and the Polish HUB reserve the right to modify these terms and conditions at any time.



Türkiye Hub CHALLENGE 1: Standardized Asset Organization Pipeline for Ankara Orchard House

CHALLENGE DESCRIPTION:

XR experiences combine multiple dimensions of information, including **2D media**, **3D content** (such as digital models and scans), **4D content** (including time-based media and dynamic reconstructions), and immersive, semantic-rich, and interactive environments created by integrating 2D, 3D, and/or 4D assets into dedicated XR formats that enable interaction within virtual spaces. This challenge aims to **address the lack of interoperable asset management solutions for intangible cultural heritage in XR experiences**. While many institutions already use library, archive, and collection management systems, these platforms are often not designed to represent semantic relations, contextual knowledge, community contributions, and living practices associated with intangible heritage.

In this challenge, participants will work with intangible cultural digital assets provided by the Türkiye Hub based on the **Ankara Orchard House**, including 3D point clouds, splats, cultural practices, historical stories, craftsmanship, and community knowledge. Through the use of the Ankara Orchard House case study dataset, participants are expected to demonstrate how intangible heritage assets can be semantically structured, interconnected, and made reusable across institutions, platforms, and future XR experiences. It is also expected to identify limitations and best practices for interoperable intangible heritage data management.

During this challenge, rather than developing a complete software application, participants are invited to rethink how these assets should be structured within or alongside the institution's current asset management system. Proposals may include a **new organizational framework, metadata schema, workflow, interface concept, or an add-on** which enables semantic interoperability through standards such as **Dublin Core, CIDOC CRM and Linked Open Data technologies** by enhancing the institution's existing archiving infrastructure to better accommodate **multimodal and intangible cultural heritage** content.

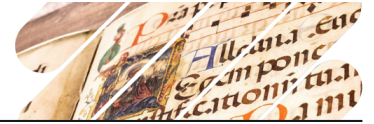
BACKGROUND OF THE CHALLENGE:

Cultural heritage institutions use a diverse range of Collection Management Systems. Many of these systems were originally designed primarily to maintain inventories, document heritage objects and their associated values, support conservation and restoration activities, and facilitate curatorial processes. They were not necessarily designed to publish collection data for discovery, aggregation and reuse by external users or digital services.

Over the past decade, the growing influence of open-access, public-domain and open-data movements has encouraged cultural heritage institutions to make their collections more widely available online. This development represents an expansion from predominantly internal collections management towards public access, participation and responsible reuse. Institutions increasingly seek to engage wider audiences, support education and enable research through the comparison, cross-referencing and linking of collections held in different institutions and countries.

The online discoverability of cultural heritage resources depends heavily on metadata. This is particularly important for non-textual resources—including images, audiovisual materials, music and three-dimensional objects—as well as textual resources that do not contain machine-readable text that can be indexed by search engines. Cultural heritage institutions have therefore developed metadata records that describe the identity, content, context, provenance and technical characteristics of their resources.

The cultural heritage community has also invested substantially in transforming traditional metadata models through semantic-web and linked-data technologies. The resulting landscape is characterised by a pluralism of standards, including Dublin Core, LIDO, MARC21, the Europeana Data Model and CIDOC



CRM. These standards serve different institutional, descriptive and technical purposes: some function primarily as descriptive element sets or exchange formats, while CIDOC CRM provides a formal, event-centred ontology for representing complex cultural heritage knowledge.

Mappings between these standards can support interoperability. For example, Dublin Core elements such as dc:title, dc:creator and dc:date can be mapped to corresponding structures within CIDOC CRM. However, such mappings are not necessarily complete or lossless. Differences in granularity, semantics, institutional practices and data structures can result in ambiguities or the loss of contextual information. Interoperability therefore requires not only technical mappings but also semantic alignment, documentation and sustained curatorial work.

Discoverability is often supported through an aggregation architecture in which a central or intermediary organisation collects metadata from multiple cultural heritage institutions and makes it searchable through a common portal. These portals use search and retrieval services adapted to cultural heritage metadata. The Open Archives Initiative Protocol for Metadata Harvesting has traditionally been one of the dominant technologies used for this purpose.

Aggregation nevertheless places a substantial burden on participating institutions and aggregators. Heterogeneous local metadata must be cleaned, normalised and mapped to a shared target model, such as the Europeana Data Model. This process may produce semantic mismatches, inconsistent classifications, duplicated records or the loss of information that cannot be accommodated by the target model. Maintaining provenance, persistent identifiers, links, updates and rights information across the aggregation chain presents further challenges.

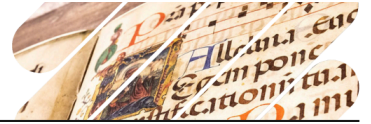
These long-standing challenges are intensified by emerging forms of digital cultural heritage. Two-dimensional images and documents are increasingly accompanied by 3D models, time-dependent representations, simulations and interactive or immersive experiences. These resources do not replace existing forms of digitisation but add new layers of complexity. Their documentation may need to capture geometry, materials, spatial and temporal relationships, digitisation processes, software dependencies, interaction logic, behaviours and relationships between physical heritage assets and their digital representations.

The challenge extends beyond making resources findable, accessible and interoperable. To satisfy the reuse dimension of the FAIR principles, digital cultural heritage resources must also be accompanied by sufficient information about the conditions under which they can be understood, evaluated and reused. This includes rights and licensing information, provenance and paradata, technical formats, software and hardware dependencies, authenticity and uncertainty, as well as the cultural and ethical conditions governing reuse.

The development of the proposed approach will be based on a process of co-creation and co-design between applicants and VEKAM curators. VEKAM curators should be engaged as active partners throughout the process—not only as providers of collections and metadata, but also as contributors to defining requirements, priorities, vocabularies, workflows and criteria for successful implementation.

Applicants should propose an iterative methodology that includes joint workshops, collection and user-journey analysis, collaborative prototyping, testing and validation. The resulting metadata framework and technical solution should reflect VEKAM's existing curatorial knowledge and collections-management practices while supporting future interoperability, aggregation and reuse. Particular attention should be given to preserving contextual and institution-specific knowledge when simplifying or mapping metadata to external standards.

Applicants should familiarise themselves with current developments, recommendations and emerging standards advanced by the IMPULSE project, the ECHOES project and the Wikimedia movement, particularly the resources listed below. Proposals should demonstrate how these developments inform

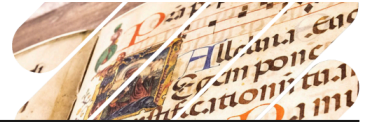


their approach to metadata simplification, semantic interoperability, aggregation and the responsible reuse of complex digital cultural heritage resources. The final approach should be developed and validated jointly with VEKAM curators to ensure that it is technically feasible, curatorially meaningful and responsive to the needs of the collections and their intended users.

EXPECTED DELIVERABLE (Report, Software, Hardware, etc):

The details of the deliverables will be agreed upon in M1 as part of the Individual Mentoring Plan (IMP).

No.	Item	Type	Description
D1 (M1)	IMP + Pipeline Analysis and Project Plan	Report	Identifying the current limitations of VEKAM's asset management system and defining the initial concept by considering alignment of metadata standards.
D2 (M4)	Draft Semantic Metadata Schema	Metadata Schema File (e.g. XML, JSON, RDF)	Initial iteration of the metadata schema and vocabulary mapping 2D, 3D, and intangible cultural assets
D3 (M4)	Asset Organization Tool Prototype	Software / Add-on	Enhances the VEKAM's asset management system to map, link, and structure intangible and multimodal assets semantically.
D4 (M6)	Transferable Pipeline	Open Source Repository	The source code of any developed mapping add-ons under an OSI-approved open license.
D5 (M6)	Open Source Code, Executable and Reproducibility Package	License for Code	The software must be released under an OSI-approved open-source licence, such as the European Union Public Licence (EUPL-1.2), MIT Licence, or Apache Licence 2.0. The selected licence must be included in a clearly named LICENSE file at the repository root; merely mentioning it in the README is insufficient. This ensures that the licensing terms are legally unambiguous and machine-detectable. Without an explicit licence, default copyright protection applies, and the public availability of the repository alone does not grant others permission to use, modify, or redistribute the software.
D6 (M6)	Assets Licenses	License Public Domain, CC0 or CC-BY 4.0. or equivalent.	Assets (3D models, textures, audio) are not automatically covered by the code license and need their own explicit license, stated separately, e.g. CC0 or CC-BY 4.0. This can go in the README



			or a separate LICENSE-ASSETS file.
D7 (M6)	Co-Design Report	Report	Documenting the collaborative design process should include joint workshops, data collection and user journey analysis, collaborative prototyping, testing, and validation processes. The documentation should be supported by records and visuals.
D8 (M6)	Final Report	Report	Complete documentation of the schema design, mapping workflows, potentials and limitations of the pipeline
D9 (M6)	Tutorial or Webinar	Video recording	Min. 1 tutorial or webinar disseminated online demonstrating the approach and prototype experience

REFERENCE INFO (datasets, models, benchmarks) :

Recommended references: FAIR data principles (Findable, Accessible, Interoperable, Reusable), Europeana Data Model and 3D content guidance, and Commission Recommendation (EU) 2021/1970 on a common European data space for cultural heritage.

Isaac, A. (Ed.). (2024). *Review of EDM to support 3D* (Revision Version 1.2). Europeana Foundation. https://pro.europeana.eu/files/Europeana_Professional/Publications/Review%20of%20EDM%20to%20support%203D.pdf

Rontzova, T., & Vandermeulen, B. (2025). *Guidelines on simplification of metadata based on open standards* (IMPULSE Deliverable D3.4, Version 6.0). KU Leuven. <https://lirias.kuleuven.be/4402553>

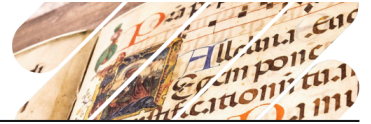
Hermon, S., Theodoridou, M., Kritsotaki, A., Doerr, M., Markhoff, B., Hivert, F., & Isaac, A. (2026). *ECHOES: The Digital Commons* (Deliverable D7.1, Version 1). Zenodo. <https://doi.org/10.5281/zenodo.20445938>

Freire, N., Voorburg, R., Cornelissen, R., de Valk, S., Meijers, E., & Isaac, A. (2019). Aggregation of linked data in the cultural heritage domain: A case study in the Europeana network. *Information*, 10(8), Article 252. <https://doi.org/10.3390/info10080252>

Freire, N., Meijers, E., de Valk, S., Raemy, J. A., & Isaac, A. (2021). Metadata aggregation via linked data: Results of the Europeana Common Culture project. In E. Garoufallou & M.-A. Ovalle-Perandones (Eds.), *Metadata and semantic research* (CCIS, Vol. 1355, pp. 383–394). Springer. https://doi.org/10.1007/978-3-030-71903-6_35

TECHNICAL SPECS :

The asset organization pipeline must map data using **Dublin Core** (for baseline discovery), **CIDOC CRM** (for semantic relationships/events), and **Linked Open Data (LOD) technologies** (RDF, OWL, JSON-LD). And must be aligned with the **Europeana Data Model (EDM)** and Commission Recommendation (EU) 2021/1970 for the common European data space.



The metadata schema must successfully support and reference diverse file types: **2D media** (image, audio, text), **3D content** (high-res photogrammetry, point clouds, 3D Gaussian Splats), and **4D content** (spatially anchored annotations, temporal relations, dynamic practices).

The asset organization tool should be developed either as a web-based application (including WebXR support) or as an add-on that can connect with VEKAM's existing repositories. The solution should support common data harvesting methods and allow optional connectors for systems such as OAI-PMH, MediaWiki, WordPress, Z39.50, CSV, and XML.

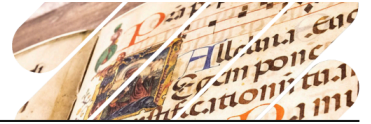
Any custom modules or services should be designed for containerized deployment (e.g., Docker or Podman). Compatibility with platforms such as **Red Hat OpenShift** and integration with event-streaming systems such as **Apache Kafka** are desirable but not required.

Any developed scripts, plugins, or tools must be released under an **OSI-approved open-source license** with comprehensive installation and configuration documentation. The overall architecture should be modular and flexible to support future integration and expansion.

REQUISITES

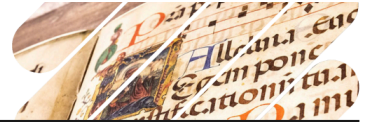
Mandatory:

1. **Work with datasets provided by CHI:** The pipeline must be designed around and validated using the use case of Ankara Orchard House datasets (VEKAM) provided by the TR-Hub. These will include:
 - Text and 2D resources on oral histories, historical stories, and community knowledge
 - High-resolution photogrammetry models, 3D point clouds, and/or splats of the Orchard House;
 - 3D and 4D representations of VEKAM's interiors and exteriors and collections
 - Metadata (in forms used by VEKAM's current library, archive, and collection management environment)
2. **Innovative linked data approach in descriptors for Intangible Cultural Heritage Representations:** The solution must propose explicit structures to represent and describe intangible cultural heritage and historical XR experience. It must cleanly transform raw metadata into standard output formats (CIDOC-CRM, EDM) usable on OAI-PMH endpoints.
3. **Community engagement activities:** must follow applicable ethical, consent, and privacy requirements
4. **Open License:** The entire solution (framework, schema, workflow, concept, or an add-on) and its documentation, scripts must be openly licensed and designed to be easily adapted and deployed in other heritage institutions and the Heriforge Hubs Network.
5. **Multilingual:** Schema fields, controlled vocabularies, and any pilot user interfaces must support both Turkish and English.
6. **Team Composition:** Other than usual roles such as, Project Lead, Tech Lead, Creative Lead, applicants should have team members' experience both in
 - a. Knowledge Representation and Semantic Technologies (KR&S)
 - b. 3D modelling, Volumetric Capture and Rendering Techniques (3D&VC&R).
7. **Ethical by Design:** Projects should use relevant accessibility, inclusive design, usability and ethical research guidance appropriate to the identified audience and testing context.


EXPECTED RESULT (target KPIs):

KPI	Target	Verification
Community/expert engagement sessions during development	Min. 2 sessions, min. 10 participants in total	Session records, consent documentation, collected contributions
Semantic Representation of Intangible Heritage	Min. 3 categories of ICH information represented and linked with relevant people, places, objects, and time periods	Documentation, export from the pipeline tool
Standards Compliance and Interoperability	Min. 1 accepted metadata standard adopted and mapped to reuse across systems	Content review by TR-Hub and VEKAM
Replicability of the tool and framework	1 documented transferable framework; tool installable in a clean project following the documentation alone	D4 repository and D5 documentation review





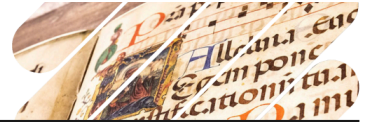
Türkiye Hub CHALLENGE 2: Living Layers: Storytelling in XR for Ankara Orchard House with Community Engagement

CHALLENGE DESCRIPTION:

XR experiences can combine multiple dimensions of information, including 2D (photos, videos, sound recordings) and 3D (models, scans, splats), and 4D (3D animations, motion captures, dynamic reconstructions) content, enriched by interactive semantic relationships that connect these layers into meaningful wholes. This challenge aims to advance the **documentation, interpretation, and representation of intangible cultural heritage** through **community-engaged immersive XR experiences** that curate this rich data, further enriched **by innovative community engagement methods such as 4D annotation**.

The thematic focus is the intangible cultural heritage of orchard house life in Ankara: the daily routines, seasonal practices, and traditional production processes that once animated these houses. Working with tangible and intangible digital assets of the Ankara Orchard House (VEKAM) provided by the TR-Hub, including 3D point clouds, splats, historical stories, craftsmanship and community knowledge, beneficiaries will design and develop an XR experience that enables users to explore the site through spatially and temporally situated annotations linked to locations, objects, activities, and historical periods. These annotations should allow multiple narratives, such as community memories, oral histories, and traditional craftsmanship, to coexist as different perspectives and temporal layers within the same virtual space. The first expected output is the XR experience as a tangible, exhibition-ready result, to be presented at VEKAM with XR headsets.

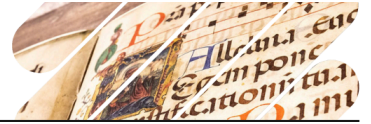
The second expected output embeds community engagement in the experience itself: beneficiaries are expected to develop a 4D annotation tool, as an Unreal, Unity, or WebXR plugin or web-based companion tool, through which community members, heritage experts, and audiences can directly contribute to the experience with annotations, stories, details, and additional layers of information, and can call new assets from the cloud (photos, videos, 3D content) and link them to specific parts of the experience. The tool should serve across the whole experience development process: during prototyping to collect insights from heritage experts and community members, and in the final exhibited version to gather contributions from the audience, transforming the digital twin from a static representation into a living storytelling environment. Both outputs must be replicable: the plugin/tool must be designed and documented for reuse in other heritage projects, and the experience delivered as a transferable framework that can be adapted to other case studies. Alongside the prototype, participants will produce a concise report documenting their methodology, annotation schema, community contribution processes, and lessons learned for the long-term management of time-based heritage knowledge.



EXPECTED DELIVERABLE (Report, Software, Hardware, etc):

The details of the deliverables will be agreed upon in M1 as part of the Individual Mentoring Plan (IMP).

No.	Item	Type	Description
D1 (M1)	Experience concept and project plan	Report	Concept and interaction design of the XR experience and annotation tool, including narrative approach for orchard house life themes (e.g. pekmez making), target hardware, community engagement plan, and use of TR-Hub datasets and mentoring.
D2 (M4)	Annotation tool, first release	Software (Unreal/Unity plugin or WebXR tool)	Working version of the contribution tool enabling annotations, stories, and linking of cloud-based assets (photos, videos, 3D content) to specific locations, objects, and time layers. Deployed early so it can be used during prototyping with heritage experts and community members.
D3 (M6)	XR experience prototype	Software / XR application	Exhibition-ready XR experience of the Ankara Orchard House for standalone XR headsets, presenting multiple narratives and temporal layers through spatially and temporally situated annotations, incorporating contributions gathered via D2.
D4 (M6)	Public exhibition at VEKAM	Demonstration + documentation	Supervised demonstration of the experience with XR headsets at VEKAM, with the annotation tool available to visitors for audience contributions. Includes operator guide, reset protocol, and documentation (photos, video) of the event.
D5 (M6)	Transferable framework documentation	Report	Documentation of the annotation schema, data structures, workflow, and plugin/tool (source code under an open licence) enabling reuse of both the tool and the experience framework in other heritage case studies.
D6 (M6)	Open Source Code, Executable and Reproducibility Package	License for Code	The software must be released under an OSI-approved open-source licence, such as the European Union Public Licence (EUPL-1.2), MIT Licence, or Apache Licence 2.0. The selected licence must be included in a clearly named LICENSE file at the repository root; merely mentioning it in the README is insufficient. This ensures that the licensing terms are legally unambiguous and machine-detectable. Without an explicit licence,



			default copyright protection applies, and the public availability of the repository alone does not grant others permission to use, modify, or redistribute the software.
D7 (M6)	Assets Licenses	License Public Domain, CC0 or CC-BY 4.0. or equivalent.	Assets (3D models, textures, audio) are not automatically covered by the code license and need their own explicit license, stated separately, e.g. CC0 or CC-BY 4.0. This can go in the README or a separate LICENSE-ASSETS file.
D8 (M6)	Co-Design Report	Report	Documenting the collaborative design process should include joint workshops, data collection and user journey analysis, collaborative prototyping, testing, and validation processes. The documentation should be supported by records and visuals.
D9 (M6)	Final report and dissemination materials	Report + video	Concise report on methodology and lessons learned for long-term management of time-based heritage knowledge, a project summary, plus min. 1 short demo video and screenshots for the dissemination of the project.

REFERENCE INFO (datasets, models, benchmarks) :

Applicants are encouraged to reuse existing cultural heritage digital objects provided by the TR-Hub:

- resources on oral histories, historical stories, and community knowledge
- high-resolution photogrammetry models, 3D point clouds, and/or splats of the Orchard House;
- interior and exterior asset collections
- Metadata for the assets

Recommended references: FAIR principles, Europeana Data Model and 3D content guidance, and Commission Recommendation (EU) 2021/1970 on a common European data space for cultural heritage.

Projects should use relevant accessibility, inclusive design, usability and ethical research guidance appropriate to the identified audience and testing context.

TECHNICAL SPECS :

The XR experience must run stably on at least one standalone XR headset suitable for supervised public exhibition (Meta Quest 3 or equivalent recommended), targeting a comfortable frame rate (at least 72 fps on standalone hardware).

The annotation tool must be delivered as an Unreal or Unity plugin and/or a WebXR/web-based tool operating on current Chromium-based browsers, and must function both in the development environment (for expert/community input during prototyping) and in or alongside the exhibited experience (for audience input).

Source code for the plugin/tool must be released under an OSI-approved open-source licence, subject to justified third-party restrictions, with documentation sufficient for installation, adaptation, and reuse in other projects.

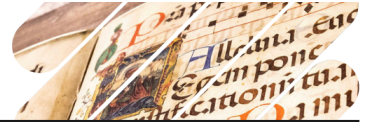
Mandatory:

All outputs (tool, schema, documentation) must be delivered in a reusable, openly licensed form.

Accessibility measures (subtitles, seated use, non-immersive fallback) are implemented.

The project is expected to deliver following KPIs during the project period.

KPI	Target	Verification
Community / expert engagement sessions during development	Min. 2 sessions, min. 10 participants in total	Session records, consent documentation, collected contributions
Contributions collected through the annotation tool	Min. 20 annotations / contributions across development and exhibition phases	Export from the tool with attribution metadata



Narratives and temporal layers in the experience	Min. 2 distinct narratives / perspectives, min. 2 temporal layers	Content review by TR-Hub and VEKAM
Public exhibition at VEKAM	Min. 5 demonstration days, min. 50 visitors experiencing the prototype	Event documentation, visitor logs
Visitor feedback	Min. 10 completed feedback surveys, mean satisfaction $\geq 7/10$	Post-experience survey results
Replicability of the tool and framework	1 documented transferable framework; tool installable in a clean project following the documentation alone	D5 repository and documentation review