HERIFORGE
Cultural Heritage
and Immersive Technologies Forge

HERIFORGE D2.1

Policy Landscape Analysis

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Executive summary

The HERIFORGE project is built upon the cooperation of three regional excellence hubs, each specialising in XR, digital humanities, and advanced IT infrastructures, embedded in cultural heritage ecosystems. The ultimate aim is to develop an interregional innovation ecosystem aligned with smart specialisation strategies, with each hub tailoring its activities to its respective regional capacities. These individual ecosystems will be progressively interconnected into a HERIFORGE Hubs Network, forming a durable structure for cross-border innovation and investment. **Work Package 2 (WP2: Strategy building for future Research & Innovation supporting CHIs)**, within which this Report is situated, contributes to this effort by analysing current policy frameworks and guiding the creation of a shared strategic direction, culminating in an integrated action plan and investment framework to be further

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developed over the course of the project.

This *Policy Landscape Analysis* constitutes Deliverable **D2.1** of the HERIFORGE project and reports the outcomes of **Task 2.1.** It provides a comprehensive examination of the policy environment affecting the reuse of digital cultural heritage (CH) through extended reality (XR) technologies – encompassing virtual, augmented, and mixed reality, in Cyprus, Poland, Türkiye, and at the EU level. The primary objective of this task was to identify policy gaps, regulatory limitations, and emerging opportunities that could inform the formulation of a joint Research and Innovation (R&I) strategy and related investment plans for the HERIFORGE hubs.

As part of its broader strategic ambitions, HERIFORGE delivers a cohesive suite of strategic documents, comprising Deliverables:

1. **D2.1** – *Policy Landscape Analysis*
2. **D2.2** – *Ecosystems strategy*
3. **D2.3** – *Action and investment plans*
4. **D4.1 –** *Hubs' Profiles and Inclusivity Strategies*

designed to influence policy development and guide investment planning across the HERIFORGE Hubs Network and the wider innovation ecosystem. This integrated package will be formally adopted by the three national hubs and will remain a cornerstone of their operational and strategic frameworks beyond the project's duration.

The research **methodology combined extensive desk research and qualitative data collection through 23 stakeholder interviews**. More than 100 documents were gathered and reviewed, of which 35 national policies and approximately 25 EU-level strategies were selected for in-depth analysis. The policy documents spanned the period from 2020 to 2025. The desk research focused on identifying relevant legal, financial, institutional, and skills-related frameworks affecting the deployment of XR in the cultural heritage sector. Interview questions were developed in parallel with the document analysis and were partially adapted based on country-specific findings, ensuring alignment between the two methodological phases. Data coding and thematic analysis were conducted using Zotero and Obsidian software, applying a structured coding scheme to ensure analytical coherence.

The analytical framework guiding the study was organised around four key policy dimensions identified as central to the successful deployment of XR in cultural heritage:

1. regulatory framework,
2. funding mechanisms,
3. intellectual property (IP) and licensing,
4. and skills and training.

These dimensions reflect not only the current policy challenges but also the enabling conditions necessary for responsible and innovative XR adoption within the CH.

The insights generated through this landscape analysis directly inform the subsequent phases of the HERIFORGE project. In **Task 2.2**, the empirical findings will underpin the development of a joint cross-border R&I strategy, which will include practical guidelines and operational models for the HERIFORGE hubs. In **Task 2.3**, the stakeholder priorities and challenges identified here will be revisited in the formulation of common action and investment plans designed to ensure the long-term sustainability and commercial scalability of XR in CH. In **WP4 (Work Package 4: Strengthening Excellence Hubs Innovation Ecosystem)**, these strategic documents will support scenario development, innovation management, and collaboration through open calls and networking activities.

In conclusion, *Policy Landscape Analysis* provides an evidence-based foundation for policy reform and strategic planning in support of XR innovation in CH. It identifies critical obstacles, but also highlights avenues for growth,

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collaboration, and policy evolution. It underscores the need for national governments to harmonise their approaches with EU-level ambitions and to recognise XR not merely as a technological tool but as a strategic component in the future of cultural heritage preservation, engagement, and dissemination.

Revision history

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List of acronyms

Acronym	Description
AI	Artificial Intelligence
AR	Augmented Reality
CC	Creative Commons
CC0	Creative Commons Zero
CH	Cultural Heritage
CJEU	Court of Justice of the European Union
CUT	Cyprus University of Technology
DCAT-AP	Data Catalogue Vocabulary – Application Profile for data portals in Europe
DIH	Digital Innovation Hubs
DSM Directive	Directive on Copyright in the Digital Single Market
EDIH	European Digital Innovation Hub
EIF	European Interoperability Framework
EIRA	European Interoperability Reference Architecture
EOSC	European Open Science Cloud

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ERDF	European Regional Development Fund
ESF+	European Social Fund Plus
GDPR	General Data Protection Regulation
GLAM	Galleries, Libraries, Archives, Museums
IP	Intellectual Property
MUES	Müze Ulusal Enformasyon Sistemi (National Information System for Museums)
NCBR	National Centre for Research and Development
PARP	Polish Agency for Enterprise Development
PDM	Public Domain Mark
PFR	Polish Development Fund
PM	Public Domain
PRKC	Digital Competence Development Programme
R&D	Research and Development
RIF	Research and Innovation Foundation
RIS	Regional Smart Specializations
RRF	Recovery and Resilience Facility

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SOR	Strategy for Responsible Development
TUES	Taşınmaz Ulusal Envanter Sistemi (National Inventory System for Immovables)
VR	Virtual Reality
XR	Extended Reality

1. Introduction

This Report presents the work carried out under **Task 2.1 of the HERIFORGE project**, which focuses on analysing the current European policy landscape and regional case studies related to the innovative and responsible reuse of digital cultural heritage (CH) through extended reality (XR) technologies. Its main objective is to offer insights that will contribute to the formation of a joint research and innovation strategy and coordinated investment plans for the HERIFORGE Hubs Network. In order to provide a well-rounded and evidence-based perspective, the report combines desk-based policy research with qualitative data gathered through interviews with policymakers, cultural institutions representatives, and business representatives as stakeholders.

The Report begins with a chapter on **Methodology**, where we outline the research approach. Readers can learn about how data was collected and analysed, the criteria for selecting documents and interview participants, and the process through which qualitative interview material was coded and interpreted. This methodological transparency is intended to provide clarity and reproducibility of our research process. Following this, the report introduces the **data collection methods** in more detail, explaining how desk research was used to identify relevant policy frameworks and instruments **at both the European and national levels**. The subsequent section elaborates on how the interviews were conducted, coded, and analysed to complement the desk research and provide richer, context-specific insights.

The **Key policies analysis** section of the report focuses on the European and national policies relevant to cross-sectoral creative collaborations and R&I initiatives involving digital CH and XR. This analysis includes a discussion of the interplay between EU-wide strategies and national-level implementations, shedding light **on how regulatory frameworks, funding mechanisms, and intellectual property issues shape the operational environment for cultural heritage innovation**. It also addresses **training and skills** development, providing an overview of sources and mechanisms for monitoring policy at the European level. To support ongoing relevance and practical application, the Report includes a curated table of policy monitoring sources (see: **3.1.5**.; **3.2.7**.; **3.3.7**.; **3.4.7**. – *Policy monitoring sources*). This resource is intended as a living reference point, enabling readers and stakeholders to regularly update their knowledge and remain aligned with evolving policy landscapes at both national and European levels.

The report then moves into the country-specific chapters for **Cyprus, Poland, and Türkiye**. Each of these chapters offers a comprehensive look at the national policy environment in relation to digital CH and XR, highlighting regulations and governance models, availability of funding, infrastructure and technological readiness, intellectual property (IP) and data issues, and workforce development. **Special attention is given to the identification of gaps and challenges** that may hinder innovation, as well as strategic reflections tailored to each region's specific needs and capacities. In each case, we also present sources used to monitor relevant policy developments.

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Building on the insights from the policy analysis on those levels, the report discusses the perspective of stakeholders through a detailed analysis of interviews conducted with representatives from cultural institutions, businesses, and policymakers. Some of the in-depth interview questions were customised based on the preliminary findings of the desk research, allowing the inquiry to target country-specific challenges and contextual nuances. This approach ensured methodological continuity between the two phases and enabled a deeper exploration of national policy realities. This section then explores their level of **policy awareness, perceptions of current policy shortcomings, and views on financial and institutional support frameworks**. Stakeholders also provided input on future policy needs and offered concrete ideas for addressing current barriers to innovation in the CH and XR sectors. These perspectives are presented both in a general overview and broken down regionally, again for Cyprus, Poland, and Türkiye, allowing for a comparison across diverse contexts. A summary is provided to distil the key insights and identify cross-cutting themes.

In the final analytical section, the report broadens its lens to provide a **European-level outlook**. Here, we reflect on larger structural issues that transcend national borders, including the lack of coherent policy on data sharing and the persistent digital divide within the heritage sector, both of which present considerable challenges to equitable participation in R&I activities across Europe.

To support the findings presented throughout the Report, **a comprehensive list of references is included**, followed by a set of appendices. They provide details on the document collection methodology, the two sets of interview questions used for different stakeholder groups, and the coding scheme used in our qualitative analysis. These additional materials are intended for readers who wish to delve deeper into the technical and procedural aspects of the research process.

This Report is designed to be read linearly but can also be used as a reference document. Readers interested in specific regions or themes – such as funding, IP, or infrastructure, may choose to navigate directly to the corresponding sections.

2. Methodology

The methodology underpinning **Task 2.1 of the HERIFORGE** project was designed to systematically gather and analyse policy documents influencing the use of immersive technologies and extended reality (XR) in the Cultural Heritage (CH) sector at European, national, and local levels. The high level view of the research process used to implement this methodology is presented in Figure 1. The research focused on laws, regulations, strategic frameworks, and contextual materials relevant to the creation, preservation, interpretation, and dissemination of tangible and intangible cultural heritage, with particular attention to the integration of virtual reality (VR), augmented reality (AR), and mixed reality (MR) technologies. Emphasis was placed on identifying innovative practices existing in policies, particularly those related to smart specialisations, that drive regional development and economic growth. The data collection process was geographically structured, with teams organised into four groups:

1. **Cyprus – CY,**
2. **Poland – PL,**
3. **Türkiye – TR,**
4. **and the European Union – EU.**

Each group was tasked with collecting region-specific documents, ensuring a comprehensive and balanced representation of local, national, and European perspectives. The five-year timeframe (2020–2025) was strategically chosen to capture the impact of the COVID-19 pandemic[1] on digital innovation and cultural resilience, while

[1] The COVID-19 pandemic represents a major global event that has reshaped social, economic, and technological landscapes since 2020.

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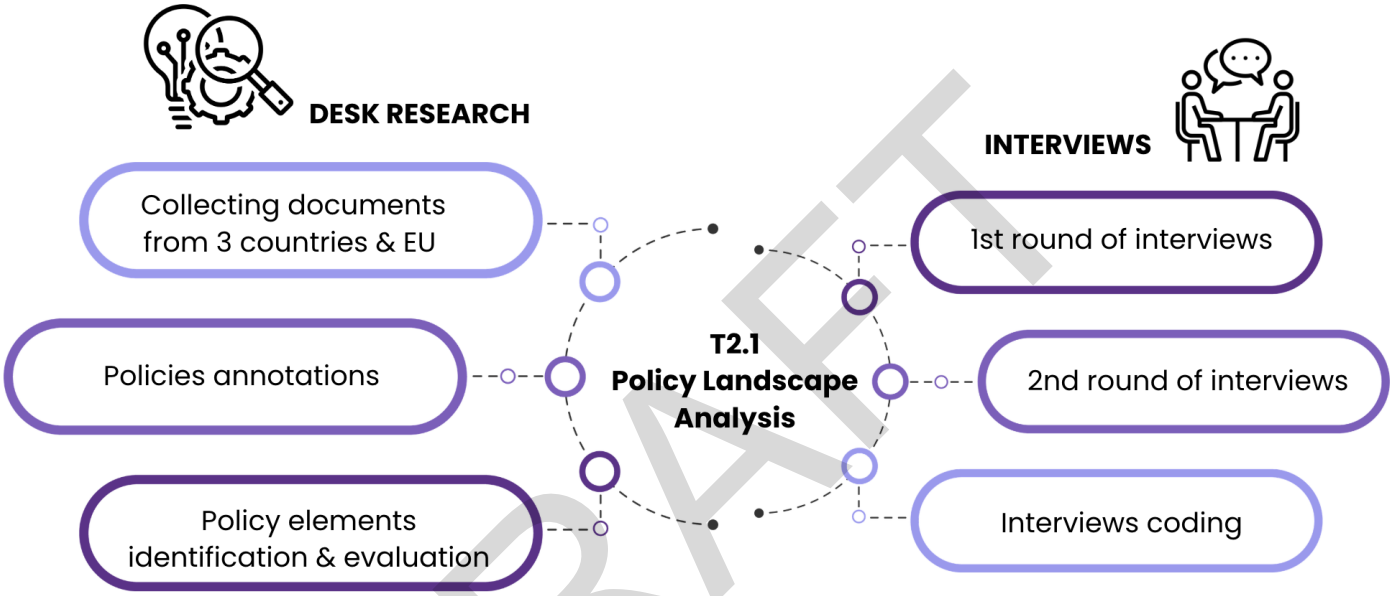
maintaining relevance to current policy developments. Earlier documents of exceptional relevance were also included when necessary. The methodology also incorporated the collection of expert insights through two rounds of in-depth interviews:

1. the first targeting policymakers, cultural heritage institutions, and business representatives at the national level (**Cyprus, Poland, Türkiye**),
2. and the second round, engaging experts providing **European-level** perspectives.

Figure 1: Research process during Task 2.1 – Policy Landscape Analysis.



2.1. Data collection and analysis

Task 2.1. was designed to run during the first six months of the HERIFORGE project, beginning simultaneously with the project's official launch. It was then essential that the research processes adopted during this period were both clearly structured and capable of providing a strong foundation for subsequent phases of work. Consequently, the data collection strategy prioritised both immediate usability and long-term relevance, ensuring that the outputs would directly support future analyses and broader project activities. Within the first two months, the research teams succeeded in gathering over 100 relevant documents across European, national, and local levels. From these, researchers selected 35 key national policies – spanning Cyprus, Poland, and Türkiye, and approximately 25 European-level documents to undergo detailed annotation and element identification for the policy matrix. In parallel, between March and April 2025, the team conducted 23 in-depth interviews with stakeholders, ensuring a robust sample to contextualise policy findings and provide a deeper understanding of existing conditions in the participating countries.

In Task 2.1, each policy document and interview transcript was treated as part of a broader ecosystem that frames the evolving role of XR technologies in CH innovation. The research team applied a narrative framework inspired by William N. Dunn's Public Policy Analysis (Dunn, 2017), where policy analysis is not simply about compiling regulations but about interpreting how actors define problems, assign causality, make moral (ethical) evaluations, and recommend solutions. Importantly, the research team at this stage deliberately refrained from prematurely proposing concrete initiatives. Recommended actions were not the focus yet, as the first phase of HERIFORGE research is dedicated to

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understanding needs, gaps, challenges, and opportunities. Building strategic recommendations will follow only after the foundational mapping is complete.

2.2. Desk research and policy element identification

Desk research followed a uniform protocol supported by Zotero[2] (see: **Appendix 1**). Researchers sourced documents from official institutional databases, governmental bodies, cultural institutions, and sector-specific repositories. Targeted search strategies employed predefined combinations of keywords adapted to local languages, focusing not only on XR, digital heritage, museums, GLAM (Galleries, Libraries, Archives and Museums) sectors, and cultural policies, but also on innovations and smart specialisations. Two categories of documents were collected: (a) policy-related materials, and (b) contextual scientific overviews. All retrieved documents were systematically stored in the HERIFORGE Zotero library designed for the research team, organised into five folders: Cyprus (CY), Poland (PL), Türkiye (TR), European Union (EU), and “General Research”.

Metadata collection adhered to a standardised format, including original and translated titles, author(s), publication date, language, URLs, and persistent identifiers (if existing). Each document was tagged with country codes and stakeholder types, ensuring consistent classification. Where necessary, documents were machine-translated into English using DeepL[3], with quality controls applied. For each document, a contextualised abstract was added to summarise. Additionally, key passages were selected or extracted in full when appropriate, translated into English, and stored as annotated notes within Zotero.

At the European level, the team mapped the policy landscape across thematic categories, reflecting key frameworks like Horizon Europe, Creative Europe, the Open Data Directives, the European Digital Strategy, and the Digital Skills Agenda. The categories include:

- Regulatory framework
- Funding mechanism
- Intellectual Property (IP) and licensing
- Skills and training

For national-level analysis, researchers systematized document collection using Zotero-based tags capturing stakeholder type and policy level (national/non-national). In the analysis, particular attention was directed to whether XR technologies were clearly defined in CH frameworks; whether national strategies prioritized tourism, education, creative industries, archaeology, or digital transformation; and to what extent there was alignment with broader European strategies. Furthermore, the team mapped key thematic trends across the four policy dimensions, identifying opportunities, barriers, contradictions, and degrees of integration with EU-level evolution.

2.3. Interviews conducting and coding

In-depth interviews enabled researchers to translate formal policy – or its absence – into narrative frames, moving beyond static documents to understand the dynamic interpretations, experiences, and aspirations of real-world stakeholders. The interviews provided a rich contextual layer for understanding the collected policies, especially regarding causal interpretations – what actors or systemic conditions are perceived as driving the need for XR technologies in cultural heritage sectors, and ethical evaluations, which appeared most vividly in conversations with European-level experts. These interviewees, operating with broader ethical and strategic perspectives, introduced values such as sustainability, democratisation of access, innovation, competitiveness, and preservation.

[2] https://www.zotero.org/
[3] https://www.deepl.com/pl/translator

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Two tailored interview scenarios were developed: one for policymakers, one for representatives of cultural heritage institutions and businesses. Interviews with European experts were conducted in a semi-structured manner, individually semi-structured. Before each interview, researchers confirmed the stakeholder type to ensure the appropriate scenario was followed (see: **Appendices 2** and **3**). The target was to conduct approximately 6–8 interviews per country group hub, each lasting a maximum of one hour, comprising two policymakers, two to three representatives from cultural heritage institutions (CHI)cultural heritage institution (CHI) representatives, and two to three business stakeholders. In line with Horizon Europe's commitment to fostering gender equality, particular attention was paid to achieving a balanced gender distribution among interview participants. The aim was to ensure that the final sample reflected an approximate gender parity, allowing for a deviation of no more than ±10% (European Commission, 2021a). Country coordinators were responsible for considering balance when proposing interview candidates, and adjustments to the sample composition were made when necessary to maintain proportional representation. The interviews were conducted between March and April 2025 across the three participating countries and at the European level. The country breakdown was as follows: six interviews were held in Poland, seven in Cyprus, eight in Türkiye (including two interviewees participating in one interview), and three interviews with European-level experts. Regarding gender representation, the research team achieved an almost even balance effecting, in total, 11 female and 13 male participants across all hubs. Within individual hubs, the gender breakdown remained similarly balanced. The breakdown of stakeholders in shown in Figure 2.

Interviews were conducted both in national languages and English. However, if interviews were held in the interviewee's language, interviewers were responsible for translating the questions beforehand. Recordings were audio-only, in compliance with GDPR standards[4]. Interviewers transcribed the recordings using Happyscribe[5] accounts linked to the WP2 leadership account, or submitted audio files for central transcription. Non-English interviews were translated into English and subsequently proofread to ensure accuracy and coherence. Completed pseudonymised transcripts were stored in the designated HERIFORGE interview materials folder, using a strict file naming convention. All interviewees signed an Information for Participation and Consent Form prior to the interview. The Zotero library also includes the transcripts of the conducted interviews, which can be used in the next phases of the project.

[4] Data Management Plan (DMP) of the HERIFORGE project. Data collected within the HERIFORGE project, including policy documents, contextual materials, and interview transcripts, is managed in compliance with the project's DMP, which adheres to Horizon Europe guidelines. All resources are stored in a structured Zotero library with appropriate metadata, access controls, and licensing information. Sensitive data, such as interview recordings and transcripts, is pseudonymised and stored securely in GDPR-compliant environments. Access to personal data is restricted to authorised project members. Data sharing, long-term preservation, and open access follow FAIR principles (Findable, Accessible, Interoperable, Reusable) while respecting ethical obligations, consent agreements, and confidentiality clauses.

[5] https://www.happyscribe.com/

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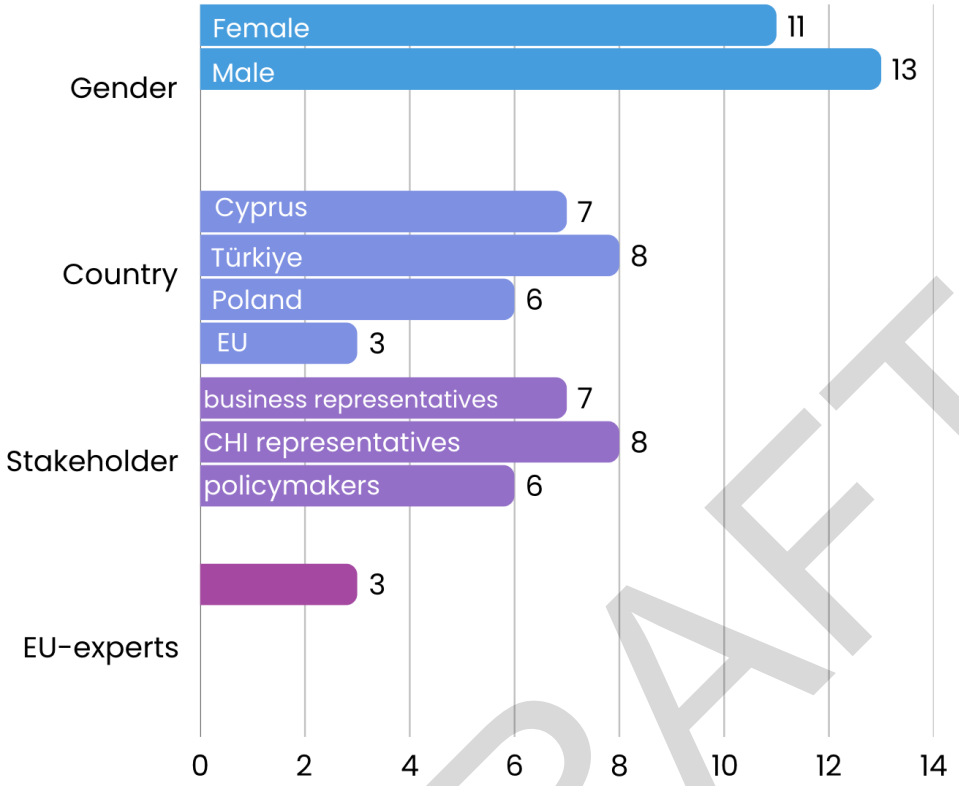
Figure 2: Gender, country and stakeholder breakdown.



To guide the analysis of the interviews, the research team developed a structured coding scheme. This analytical framework was designed to capture critical insights into the evolving policy landscape surrounding the integration of XR technologies in the cultural heritage sector. The primary aim of the coding process was to reveal the strengths and weaknesses of existing policies, uncover persistent gaps and challenges, and highlight emerging needs and opportunities for fostering innovation, collaboration, and resilience in this field. The *Existing Policy Frameworks* code was applied to passages where interviewees mentioned current laws, strategies, regulations, or guidelines relevant to the cultural heritage sector at the local, regional, national, or European levels. Text segments referring to how frameworks structure or influence the adoption of XR technologies were marked with this code. The *Policy Challenges and Gaps* code was used to tag parts of the interviews discussing difficulties, barriers, or shortcomings in the policy landscape. This included references to missing regulations, legal uncertainties, interoperability problems, and limited cross-sector collaboration affecting XR use in CH. The *Policy Ideas* code marked excerpts where interviewees suggested new policies, recommended changes to existing regulations, or proposed improvements to policy implementation, including ideas about funding, education, and governance. The *Impact of Policies on Practice* code was assigned to segments where the consequences of existing or missing policies for everyday work, project management, or innovation processes were discussed, particularly regarding the integration of XR technologies. The *Funding* code highlighted parts of the interviews that addressed financial support mechanisms for XR initiatives in cultural heritage. It included mentions of available programs, access barriers, needs for new funding structures, and comments about the role of shared resources and infrastructures. The last code applied by the research team was *Interesting Quotes* whenever there was a sentence highlighting the policy landscape specifics, or phrase worth using in the Deliverable (see: **Appendix 4** for the detailed coding scheme).

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The coding process was organised and conducted systematically using Zotero. All interview transcripts, previously transcribed and downloaded in PDF format, were imported into Zotero for structured annotation. The coding itself was performed through a system of coloured highlights corresponding to the defined thematic categories, ensuring visual clarity and consistency across documents. To maintain objectivity and prevent any potential biases arising from researchers' involvement in conducting the interviews, transcripts were assigned to coders independently of their participation in the original interviews. Each researcher analysed interviews conducted by others, allowing for a critical and detached reading of the material and reinforcing the reliability of the thematic analysis through a cross-checking process.

Once the initial coding was completed, the highlighted text segments were systematically extracted from selected PDF documents using the Obsidian note-taking application, facilitated by the Zotero Integration plugin[6] for content extraction, and the Pandoc plugin[7] for format conversion of the extracted annotations. The extracted material, containing all excerpts from each interview arranged by the code ascribed to them, was then distributed among the research team for text-level analysis. This step enabled researchers to focus more deeply on emerging patterns, thematic frequencies, and significant divergences across the interviews. Additionally, selected quotations were employed in the discussion of the results, providing direct insights from the stakeholders.

3. Key policies analysis

In conducting a cross-country and cross-sectoral analysis of the regulatory landscape related to XR technologies in the cultural heritage sector, it was essential to ground the investigation within the legal and institutional frameworks of the participating hubs. A preliminary comparative landscape overview thus forms a foundation for understanding both the opportunities and constraints that arise in the process of building Excellence Hubs for XR in CH. This methodological approach aligns with contemporary best practices in comparative governance studies, where recognition of structural legal diversity is regarded as essential for designing sustainable and scalable policy interventions (Knill & Tosun, 2020; Pollitt, 2019). Accordingly, before engaging in detailed policy mapping, this section provides a brief structured legal overview of the three national contexts under examination – Cyprus, Poland, and Türkiye, analysing how their constitutional orders and relationships with the European Union's *acquis communautaire* influence the regulatory environment, and as an effect – the policy landscape of the XR technologies in cultural heritage.

Cyprus, a member of the EU since 2004, operates under a mixed legal system that synthesises Common Law principles with elements of Civil Law. Following EU accession, Cyprus has undertaken comprehensive legal harmonisation in fields critical to digital innovation and cultural heritage protection (Nicolaou & Loizou, 2016; European Commission, 2023a). The Cypriot judiciary increasingly references jurisprudence from the Court of Justice of the European Union (CJEU), ensuring a high degree of conformity with EU legal standards, particularly relevant for this Report – in intellectual property, data protection, and cultural policy. Poland, also an EU member since 2004, adheres to a Roman-Germanic Civil Law tradition, emphasising codified statutes as the primary source of law (Harasimiuk, 2023). Despite recent controversies concerning the rule of law and judicial independence (European Commission, 2023b), Poland remains legally bound by the EU *acquis*. Legislative initiatives relevant to digitisation, data governance, copyright, and CH preservation continue to be shaped by binding EU regulations and directives. Türkiye presents a distinct case within this comparative framework. As a candidate country for European Union accession since 1999, Türkiye has engaged in significant legal harmonisation efforts, particularly in areas such as commercial law and intellectual property. While progress has been made in aligning various legislative domains with the EU, the accession process has faced challenges, notably concerning matters of governance (European Commission, 2023c). As a result,

[6] mgmeyers. n.d. Obsidian Zotero Integration. Obsidian Community Plugin. GitHub Repository. Accessed May 5, 2025. https://github.com/mgmeyers/obsidian-zotero-integration.
[7] OliverBalfour. n.d. Pandoc Plugin. Obsidian Community Plugin. GitHub Repository. Accessed May 5, 2025. https://github.com/OliverBalfour/obsidian-pandoc.

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Türkiye demonstrates partial convergence with European legal standards, particularly in fields such as trade and customs. At the same time, some divergences remain in regulatory areas closely connected to digital innovation and cultural heritage policy.

3.1. EU–National policy interplay

The purpose of this analysis is to provide a comparative review of the key policy dimensions outlined in the methodology section, including regulatory frameworks, funding mechanisms, Intellectual Property (IP), and licensing, and skills and training. Table 1 provides a foundational snapshot of the existing policies and frameworks, offering an initial comparison between EU-level initiatives and national policies in these three countries. While this table summarises the main policy elements and identifies key gaps, the progress of the analysis will be further elaborated upon in subsequent subchapters Cyprus, Poland, and Türkiye, providing insights into the specific policy landscape within each national context.

Table 1: Policy elements mapped in the national policies from the EU policy framework.

Policy Dimension	EU Policy Framework	Cyprus	Poland	Türkiye	Key Gaps
Regulatory Frameworks	GDPR, European Digital Strategy	No XR-specific policy	Fragmented policies	No XR-specific policy	No national XR strategy
Funding Mechanisms	Horizon Europe, Creative Europe	Relies on EU funds	Some national R&D funding	Some national R&D funding	Unequal co-financing
IP and Licensing	Copyright Directive, Open Data Directive	Unclear licensing for XR	Lack of XR IP guidance	Complex rules for digital heritage	No harmonized framework
Skills and Training	Digital Skills Agenda	Few training initiatives	Some programs, but not XR-focused	Digital skills training, but not XR-focused	Lack of targeted training

3.1.1. Regulatory framework

Between 2020 and 2025, the European Union implemented several policies aimed at enhancing cross-sectoral collaboration and promoting the reuse of digital cultural heritage through XR technologies. The Europeana Strategy 2020-2025[8] (Europeana, 2020) was launched as a comprehensive initiative transforming Europe's cultural heritage through digital means. By aligning policies and standards with EU directives, the strategy facilitates the digitisation and online accessibility of cultural heritage across Europe. For cultural heritage hubs, the Europeana Strategy presents an important framework for collaboration. It emphasises cross-sectoral partnerships, encouraging museums, archives, and technology providers to engage with XR technologies to innovate in the presentation and preservation of cultural

[8] Official title: Europeana Strategy 2020-2025: Empowering digital change

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assets. This initiative provides hubs with the tools and platforms necessary for fostering cooperation and developing cutting-edge digital applications that enhance the cultural experience. The Creative Europe Programme has been a significant EU initiative supporting the cultural and creative sectors. With an allocation of approximately EUR 340 million in 2025[9], the program focuses on the digital and green transitions, as well as strengthening the resilience of social and economic structures. For Cyprus and Poland, Creative Europe can serve as a vital funding source for projects that utilise digital tools to increase accessibility to cultural heritage, but the funds are not available for Türkiye[10]. The program encourages the use of XR technologies in cultural heritage initiatives, facilitating the creation of new immersive experiences and supporting the digitisation of cultural artefacts (European Commission, 2025a). This financial backing enables hubs to scale their projects and collaborate with other institutions, ensuring that digital tools are utilised to their full potential in cultural preservation.

The Digital Europe Programme is another key policy aimed at enhancing Europe's digital infrastructure, with a specific focus on the cultural heritage sector. One notable example is the XRCulture project, which integrates high-quality 3D models and XR applications to enhance the European data space for cultural heritage (European Commission, 2022). This initiative underscores the EU's commitment to leveraging digital technologies for cultural preservation and innovation. For hubs, such projects represent an opportunity to engage with broader European efforts, contributing to the creation of a unified digital cultural heritage ecosystem. The programme also provides a platform for hubs to collaborate with other stakeholders, facilitating knowledge exchange and promoting best practices in the integration of XR technologies.

The Cross-Sectoral Strand[11] of the Creative Europe Programme plays a crucial role in encouraging cooperation across different cultural and creative sectors. This strand addresses shared challenges and fosters innovative solutions through cross-sectoral activities (European Commission, 2023d). For hubs working in XR, the Cross-Sectoral Strand is a valuable resource, promoting interdisciplinary partnerships that combine expertise in technology, culture, and business. By supporting knowledge transfer and the development of new business models, it helps hubs create sustainable and scalable XR applications within the cultural heritage sector.

Furthermore, the EU's plans for the digitalisation of cultural heritage, established as part of the Recovery and Resilience Plans[12], represent a significant investment in the future of cultural heritage. These initiatives focus on building digital infrastructures that collect, integrate, and make cultural resources publicly accessible (European Commission, 2021b). For XR-focused hubs, these investments are important in providing the necessary technical frameworks for digitised cultural assets to be reused and repurposed in immersive technologies. These national plans not only support the development of XR applications but also create a conducive environment for hubs to engage with broader public initiatives, enhancing the public's interaction with cultural heritage in innovative ways.

In Cyprus, there is currently no specific national policy or regulatory framework for XR in cultural heritage, meaning cultural institutions rely on EU-wide policies, but these are often not tailored to the unique needs of cultural heritage digitisation (Cypriot Ministry of Culture, 2025). Poland faces similar challenges with fragmented policies on digital heritage, and Türkiye lacks a cohesive XR strategy, relying on broader technology policies that do not address the needs of the cultural heritage sector.

[9]https://culture.ec.europa.eu/news/creative-europe-in-2025-focus-on-green-and-digital-transitions-on-strengthening-social-and-economic-resilience; Accessed May 7, 2025.

[10] List of non-EU Participating Countries in the Creative Europe Programme, https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/crea/guidance/list-3rd-country-participation_crea_en.pdf; Accessed May 7, 2025.

[11] https://culture.ec.europa.eu/creative-europe/cross-sectoral-strand; Accessed May 7, 2025.

[12] https://reform-support.ec.europa.eu/what-we-do/recovery-and-resilience-plans_en; Accessed May 7, 2025.

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3.1.2. Funding mechanisms

At the EU level, programs such as Horizon Europe, Creative Europe, and Digital Europe provide funding for XR-based cultural heritage projects (European Commission, 2025a; European Commission, 2025b). While all three programs are available for Cyprus and Poland, Türkiye can only benefit from Horizon Europe and Digital Europe and the national funding mechanisms in these countries remain underdeveloped. Cyprus relies heavily on EU funds, with no dedicated national funding scheme for XR-specific initiatives in cultural heritage (Cypriot Ministry of Culture, 2025). In Poland, while some national funds are allocated to research and development (R&D), these are not typically directed toward XR in cultural heritage, creating a gap in targeted funding for these projects (Polish Ministry of Culture, 2025). Türkiye has limited public funding specifically for XR, which restricts the ability to launch large-scale cultural heritage initiatives. The reliance on EU funding, coupled with general national funding policies, highlights the need for more comprehensive national financial mechanisms to support XR in cultural heritage (Türkiye Ministry of Culture and Tourism, 2025).

Table 2 provides the mapping of funding possibilities for XR technologies in cultural heritage, highlighting the key EU programmes (funding) available. For each programme, it specifies the main beneficiaries, such as member states and institutions, and the coordinator or entities managing the grants. Additionally, it outlines the roles of partners and partner beneficiaries, as well as the years of running, which indicate the duration of each programme.

Table 2: Funding possibilities for XR technologies in cultural heritage, highlighting the key EU programmes (funding) available.

***Creative Europe** – program supports culture and creative industries, including cultural heritage projects that can involve XR. ****Horizon Europe** – an overarching R&D program that supports technology and innovation, including XR. Poland, Cyprus, and Türkiye can all participate, depending on the specific call and research focus. *****Digital Europe Programme** – aimed at digital transformation, this program supports the adoption of new technologies such as XR. ******Erasmus+** – though typically associated with education and youth, Erasmus+ funds mobility and educational exchanges that can include cultural heritage professionals. *******EU Digital Innovation Hubs (DIH)**: These hubs support businesses and public entities in adopting new digital technologies, including XR.

Programme	Main Beneficiary	Coordinator of the Grant	Partner	Partner Beneficiary	Years of Running
Creative Europe*	All EU Member States, including Poland and Cyprus	CHIs, NGOs, universities (RPOs)	Museums, art galleries, creative industries	CHIs, small enterprises	2021–2027
Horizon Europe**	Poland, Cyprus, Türkiye	Universities, research institutions (RPOs), companies	SMEs, start-ups, CHIs	Local authorities, NGOs, research centres (RPOs)	2021–2027

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Digital Europe Programme* **	All EU Member States, Cyprus, Poland, Turkey (subject to limitations on cybersecurity[13])	Universities (RPOs), public authorities, tech firms	Tech companies, SMEs, R&D institutions	CHIs	2021–2027
Erasmus+** **	All EU Member States, Cyprus, Poland, Türkiye (for specific calls)	Higher education institutions	Cultural heritage professionals , NGOs	Local authorities, CHIs, NGOs	2021–2027
EU Digital Innovation Hubs (DIH)*** **	Poland, Cyprus, Türkiye (for tech-based innovation)	Digital Innovation Hubs (DIHs), tech companies	Local and regional authorities, SMEs	CHIs universities (RPOs)	2021–2027

3.1.3. Intellectual Property (IP) and licensing

The EU has made significant strides with regulatory frameworks that also impact XR, particularly with the General Data Protection Regulation, and the Digital heritage strategy[14], in the shape of new regulations such as the AI Act and Digital Services Act (European Commission, 2025c). These regulations ensure that cultural heritage practices, including XR applications, are aligned with digital and data governance standards. The EU's Copyright Directive and Open Data Directive (European Parliament, 2019a; European Parliament, 2019b) provide frameworks for managing intellectual property and content sharing, vital for XR projects that deal with cultural assets.

Cyprus faces challenges in providing clear policies on XR content rights. The absence of an established framework for licensing and IP in cultural heritage projects makes it difficult for institutions to protect and distribute digital content. In Poland, museums and other cultural institutions encounter similar barriers, with unclear guidelines on copyright in XR applications, especially for digital reconstructions and content reuse. Türkiye lacks harmonised IP policies specifically addressing XR, further complicating the digitalisation and sharing of cultural heritage materials (Türkiye Ministry of Culture and Tourism, 2025).

3.1.4. Skills and training

The European Skills Agenda[15] and the Digital Education Action Plan[16] have driven progress in digital education and skills development, including in emerging technologies like XR. It seems, though, that training and education programs in Cyprus, Poland, and Türkiye remain insufficient for building a skilled workforce in XR within the cultural heritage sector. Cyprus has few initiatives focusing specifically on XR training for cultural heritage professionals, while Poland

[13] https://digital-strategy.ec.europa.eu/en/faqs/questions-and-answers-digital-europe-programme#:~:text=At%20this%20time%2C%20EFTA%2FEEA,and%20Herzegovina%20are%20associated%20countries; Accessed May 7, 2025.

[14] https://digital-strategy.ec.europa.eu/en/policies/cultural-heritage; Accessed May 1, 2025.

[15] https://employment-social-affairs.ec.europa.eu/policies-and-activities/skills-and-qualifications/european-skills-agenda_en; Accessed May 8, 2025.

[16] https://education.ec.europa.eu/focus-topics/digital-education/action-plan; Accessed May 7, 2025.

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offers some general digital skills programs, but not targeted towards XR. In Türkiye, digital skills training in the cultural sector has only recently been included in high-level strategic documents. Targeted programs will be necessary to build a skilled workforce in XR.

3.1.5. EU-Policy monitoring sources

As mentioned in the Introduction to the current report, this deliverable contains curated tables of policy monitoring sources. Table 3 constitutes such a table for the European level sources.

Table 3: European cultural policy monitors and platforms.

Name of the Policy monitoring source	EU-Policy monitors	Link to Policy monitoring sources
Joinup	Provides tools for public sector digital services	Joinup
EUR-Lex	Legal and legislative tracking	EUR-Lex
CORDIS	EU-funded projects and R&I policy trends	CORDIS
European Audiovisual Observatory	Copyright and media policy monitoring	European Audiovisual Observatory
Culture Action Europe	Digital culture policy	Culture Action Europe
DARIAH-EU	The Digital Research Infrastructure for the Arts and Humanities	DARIAH
European Commission	Official EU policy documents and reports	European Commission
European Heritage Hub	Digital cultural heritage data initiatives	European Heritage Hub
IOPEU	The Interoperable Europe (IOPEU) Monitoring	IOPEU
UNESCO	UNESCO Policy Monitoring Platform	UNESCO Policy Monitor
The OECD	The OECD Digital Policy Platform (DPP)	DPP
The Compendium of Cultural Policies & Trends	The Compendium of Cultural Policies & Trends Policy Monitoring Platform	Cultural Policies & Trends

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3.2. CYPRUS

The Republic of Cyprus addresses XR for CH from the broader perspective of its national digital transformation agenda (Deputy Ministry of Research, Innovation, and Digital Policy, 2024). Although there are no fully developed policies on deploying XR in CH, various national priorities and strategic initiatives indicate the potential for XR's implementation in the areas of:

1. preservation and safeguarding of CH (Ministry of Education, Sport, and Youth, 2018),
2. the enhancement of the tourism and visitors' experience (Deputy Ministry of Tourism, 2023),
3. and the modernisation of education (Ministry of Education, Sport, and Youth, 2024).

Based on the action plans of the relevant ministries, XR technology is generally understood as a family member of immersive technologies (virtual, augmented, and mixed reality), used to access interactive visualisations, and to enable the interpretation, remote access, and experience of historic objects and archaeological sites. The term is mentioned in relevant scientific publications by research experts for European research programmes (Argyridou et al., 2023; Orzechowski et al., 2024); however, the operational definition is missing from the strategy plans of the authorities. XR technology in Cyprus is currently understood as a use case of digitisation, rather than a regulated domain in its own right. This is problematic and very limiting, as the development and application of XR technologies in CH is far more complex than the digitisation of CH assets - which is only the first step in the whole process. Therefore, resource allocation and policy is lacking the necessary depth and breadth to contribute to addressing the needs identified. Policy orientation is currently driven by four intersecting priorities:

a. Public sector digitalisation and future economic growth

The Digital Strategy for Cyprus 2020–2025 (Deputy Ministry of Research, Innovation and Digital Policy, 2024) pledges "ubiquitous digital services" and lists cultural content among the data ecosystems to be built around open standards and cloud infrastructure. It indicates a commitment to transforming Cyprus into a future-ready, knowledge-based economy by leveraging digital and emerging technologies to stimulate sustainable economic growth, support social prosperity, and strengthen international competitiveness. This strategy provides a context within which the integration of technologies like XR can be considered across different sectors, including CH.

Parallel instruments, e.g., the National Policy of the Republic of Cyprus for Open Science Practices (Deputy Ministry of Research, Innovation and Digital Policy, 2025) and the 2023–2027 Open Data Strategic Plan (Open Data Team, Public Administration and Personnel Department, Ministry of Finance, 2023), highlight reuse rights and machine-readable formats that favour XR pipelines' future development. Cyprus actively participates in European initiatives and aligns its policies with EU directives. The 2023–2027 Open Data Strategic Plan (Deputy Ministry of Research, Innovation and Digital Policy, 2025) promotes the release and reuse of public sector data, leveraging digital assets for innovation and transparency, which could be valuable for XR applications in CH.

The National Policy of the Republic of Cyprus for Open Science Practices revises the existing policy to align with European Commission recommendations, the Horizon Europe framework, and the developments of the European Open Science Cloud (EOSC). This demonstrates a commitment to broader European trends in open access and digital research infrastructure, which can indirectly support the digital transformation of CH.

b. Tourism enrichment

The Deputy Ministry of Tourism's 2024-2026 strategic plan (Deputy Ministry of Tourism, 2023) frames heritage storytelling and experiential technologies as drivers to extend the season and diversify visitor profiles. In this effort, XR is therefore seen more as an economic enabler.

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c. Quality standards for 3D digitalisation of CH

Cyprus-led research (Argyridou et al., 2023) has positioned the country as an early advocate of methodological standards for 3D scanning, standardised metadata and digital automation workflows in CH. Although these studies are not yet transposed into national regulation, they provide a strong reference adopted and further developed by universities and centres of excellence.

d. Coordination of heritage digitisation

Since 2018 an inter-ministerial National Committee for the Digitisation of Cyprus's Cultural Heritage (Ministry of Education, Sport, and Youth, 2018) has acted as a policy sounding board and promotes shared equipment, skills and funding bids. The committee aligns its roadmap with Europeana, the forthcoming European Data Space for Cultural Heritage and the Digital Decade targets, ensuring that local efforts mirror EU benchmarks for openness, interoperability and long-term preservation. While not explicitly focused on XR, this initiative lays the groundwork for future applications of immersive technologies, like Cyprus Digital Heritage (2025) a project funded by the European Union dedicated to the digitisation and indexing of CH sites across Cyprus, using technologies such as 3D Reconstruction and Virtual Reality, aiming to make heritage accessible to all.

3.2.1. Regulatory framework

Cyprus has no operative laws around the use of XR in CH, however its intention to legal framework modifications towards digital transformation is part of several strategic documents or action plans and research initiatives. The Digital Strategy for Cyprus 2020-2025 (Deputy Ministry of Research, Innovation and Digital Policy, 2024), outlines the nation's plan for digital transformation that focuses on government, society and the economy, guided by the principle of "Government as a Platform". It also acknowledges the need to improve coordination between public sector bodies and emphasises the government's intention to bridge communication gaps across ministries. Hence, four strategic portfolios have been established:

1. Digital Government to transform government functions,
2. Digital Infrastructure to support efforts to modernise the country's infrastructure and digital capabilities,
3. Digital Economy to promote economic transformation through the use of digital technologies
4. and Digital Society to build an inclusive and digitally powered society.

The National Open Science Policy (Deputy Ministry of Research, Innovation, and Digital Policy, 2025) promotes open access to scientific research and data, thereby facilitating the dissemination and reuse of cultural heritage information. The Deputy Ministry of Tourism's Strategic Plan 2024–2026 (Deputy Ministry of Tourism, 2023), focuses on the upgrading of the tourism product, as well as the development of all alternative forms of tourism. It acknowledges Cultural Tourism as a major form of tourism and underscores the role of digital heritage and immersive technologies in enriching tourism offerings, improving visitor experiences, and boosting Cyprus's cultural tourism profile internationally.

3.2.2. Funding mechanism

Cyprus allocates resources for the development of general digital infrastructure, which indirectly can benefit applications of XR in CH (Deputy Ministry of Research, Innovation and Digital Policy, 2024). The most significant source of funding is the EU Recovery and Resilience Facility (RRF). Of the EUR 282 million allocated in total, approximately 23% is dedicated to digital priorities, e.g., e-government services, high-speed internet infrastructure (EUR 53 million), digital skills' development (EUR 24 million), and smart city solutions (EUR 35 million). National general digitalisation funds, sourced from the state budget, are allocated to support the implementation of Cyprus's broader digital strategy. For instance, the Research and Innovation Foundation (RIF) provides grants for projects that enhance digital capabilities within the cultural sector. In addition, Cyprus also benefits from a range of European Union funding programmes, including the Digital Europe Programme, Connecting Europe Facility, Horizon Europe, EU4Health, and European Structural and Investment Fund. Cyprus' government (Deputy Ministry of Research,

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Innovation and Digital Policy, 2024) stresses the importance of digital skills and infrastructure, as well as cross-sectoral collaboration, as the main key challenges.

3.2.3. Intellectual Property and licensing

In Cyprus, as there is no specific legislation regarding the use of XR in CH, the general copyright law (L. 155(I)/2022) applies to the use of digital CH content. As immersive technologies become more integrated into cultural experiences, copyright complexities arise, particularly around the digitisation of heritage assets, 3D scanning, and co-created content in virtual environments. These challenges highlight the need for more detailed guidelines on copyright exceptions for educational use, public domain access, and digital restoration. Additionally, more clarity is needed regarding the rights of cultural institutions when adapting CH assets for XR platforms, especially in collaborative or open-source contexts.

The Open Data Strategy 2023–2027 (Open Data Team, Public Administration and Personnel Department, Ministry of Finance, 2023) supports making high-value public-sector datasets accessible in machine-readable formats through platforms like data.gov.cy, potentially enabling opportunities for developers and cultural institutions to use open datasets in immersive heritage experiences. It also supports the goals of the Open Data Directive, committing to expanding the availability of high-value datasets and improving the interoperability of digital infrastructure. The strategy outlines the establishment of an Open Data Council to oversee implementation and ensure compliance with EU regulations.

3.2.4. Infrastructure and technology

Cyprus aims for digital transformation, as outlined in the Digital Strategy for Cyprus 2020-2025 by the Deputy Ministry of Research, Innovation and Digital Policy (Deputy Ministry of Research, Innovation and Digital Policy, 2024). One key area is the Digital Infrastructure Portfolio, targeting modern and secure telecommunications and smart resource management (Deputy Ministry of Research, Innovation and Digital Policy, 2024). Additionally, the Annual Action Plan of the Deputy Ministry of Research and Innovation 2025 includes Digitisation of Cultural Heritage (Deputy Ministry of Research, Innovation and Digital Policy, 2024). Cyprus recognises the need for Cultural Heritage repositories and cloud infrastructures to host high-quality content (Orzechowski et al., 2024). Cloud computing is increasingly important in CH digitisation projects, with potential future integration into a common European Cultural Data Space (Argyridou et al., 2023). Cyprus also hosts the European Digital Innovation Hub “DiGiNN” (2024-2029), a national one-stop shop that accelerates digital transformation across sectors and serves as an enabling platform for deploying XR applications and Cultural Heritage solutions.

However, currently, no national R&D hubs are exclusively focused on XR and CH. Research activity around XR and CH is, however, taking place in Cyprus University of Technology (CUT), The Cyprus Institute (CyI) and CYENS (Deputy Ministry of Research, Innovation and Digital Policy, 2024). Although one can observe a clear, EU-aligned national vision in (Deputy Ministry of Research, Innovation and Digital Policy, 2024), no detailed integration of smart specialisation strategies with CH digitisation or XR technologies.

3.2.5. Skills and training

Cyprus adheres to European policies on lifelong learning, implementing projects such as Erasmus+ to enhance adult skills and participation (Ministry of Education, Sport, and Youth, 2024). The National Digital Strategy promotes a digital economy and lifelong digital skills through a Digital Academy for Citizens (Deputy Ministry of Research, Innovation and Digital Policy, 2024). The National Open Science Policy supports training for researchers (Deputy Ministry of Research, Innovation and Digital Policy, 2025). Currently, two bodies are providing qualified training programs related to CH and digital technologies relative to XR; a) the Human Resource Development Authority of Cyprus, responsible to provide qualified training seminars on relevant subjects, and b) The EDIH (European Digital Innovation Hub) – DiGiNN project supports digital skill's development around subjects that centres of excellences are well experienced on (Deputy Ministry of Research, Innovation and Digital Policy, 2024).

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3.2.6. Gaps, challenges and strategic reflections

Key challenges in advancing digital heritage applications using XR are linked to the lack of guidelines and protocols, high cost and a concurrent lack of funding. Monitoring and enforcement mechanisms for digital openness and data governance are still evolving. The national narrative, though not explicitly focused on XR, promotes digital technologies (mainly 3D documentation and VR) as tools to preserve and democratize access to cultural heritage. It emphasises innovation, societal benefit, and alignment with European standards. However, a distinct policy framing XR as a transformative force within the CH sector is not yet fully articulated.

3.2.7. Policy monitoring sources

As mentioned in the Introduction to the current report, this deliverable contains curated tables of policy monitoring sources. Table 4 constitutes such a table for the sources in Cyprus.

Table 4: Policy monitoring sources in Cyprus.

Institutions to be monitored	Links
Deputy Ministry of Culture	Homepage - Deputy Ministry of Culture - Gov.cy)
Department of Antiquities	Department of Antiquities - Home Page
Deputy Ministry of Research, Innovation and Digital Policy	Homepage - Deputy Ministry of Research, Innovation and Digital Policy - Gov.cy
Ministry of Education, Sport, and Youth	Cyprus Ministry of Education, Sport and Youth
Ministry of Finance	Homepage - Ministry of Finance - Gov.cy
Deputy Ministry of Tourism	Homepage - Deputy Ministry of Tourism - Gov.cy
Ministry of Interior	Homepage - Ministry of Interior - Gov.cy
United Nations Development Programme – Technical Committee on Cultural Heritage in Cyprus	TCCH Cyprus – The Technical Committee on Cultural Heritage) (Cyprus heritage sites | Cyprus monuments | Cyprus Digital Heritage
Research and Innovation Foundation	https://www.research.org.cy/en/
Additional resources: • Cultural Heritage 3D Object Management with Integrated Automation Workflows • Cyprus Digital Heritage • National Policy of the Republic of Cyprus for Open Science Practices • THE FIRST ATTEMPT FOR STANDARDISATION IN 3D DIGITISATION. THE EU STUDY ON QUALITY IN 3D DIGITISATION OF TANGIBLE CULTURAL HERITAGE • Diakivernisi • ΚΥΠΡΙΑΚΗ ΔΗΜΟΚΡΑΤΙΑ ΥΠΟΥΡΓΕΙΟ ΠΑΙΔΕΙΑΣ ΚΑΙ ΠΟΛΙΤΙΣΜΟΥ 23 Φεβρουαρίου 2018 Ίδρυση Εθνικής Επιτροπής Ψηφιοποίησης της Πολιτιστικής Κληρονομιάς της Κύπρου • Open Data Cyprus • ΥΦΥΠΟΥΡΓΕΙΟ ΤΟΥΡΙΣΜΟΥ ΣΤΡΑΤΗΓΙΚΟ ΣΧΕΔΙΟ 2024-2026 • ΥΠΟΥΡΓΕΙΟ ΠΑΙΔΕΙΑΣ ΑΘΛΗΤΙΣΜΟΥ ΚΑΙ ΝΕΟΛΑΙΑΣ ΣΤΡΑΤΗΓΙΚΟ ΣΧΕΔΙΟ 2025-2027	

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3.3. POLAND

To begin, it must be emphasised that an analysis of the identified policies does not reveal a clear legal definition of the term XR within the context of CH in Poland. Nevertheless, these materials offer insight into the national digital policy, which forms the broader background for the potential use of XR technologies in this field.

The main objectives of Polish policy documents issued by relevant ministries is to provide a regulatory and visionary framework for broad digital transformation of the Polish state and society and the implementation of EU legislation. The materials analysed highlight the importance of developing information infrastructure, opening public data, enhancing digital competencies, and digitising resources, including cultural heritage. In the context of cultural heritage, the policy primarily focuses on the digitisation of museum, library, archival, audiovisual resources, and monuments. The goal is their conservation, preservation, and (less often) making them available for reuse. Digitisation criteria consider their significance for the country's culture and history. Although education is not the sole priority, the documents analysed indicate the potential for using digitised resources for educational purposes.

National priorities shaping digital transformation in CH include increasing access to public information and encouraging its reuse, which also (to some extent)[17] applies to digitised cultural resources; the Dane.gov.pl portal serves as a central repository for such data. Priorities also involve improving the quality and standards of shared data, including through the application of metadata standards, fostering innovation by sharing data and creating an open data ecosystem, and ensuring the continuity of actions regarding data opening and adapting policy to technological development. The strategic narrative favours digitisation as a modern form of preservation for the most valuable cultural resources, as well as a means for their broader dissemination. There is also a new theme of innovation regarding the use of new technologies, including artificial intelligence algorithms, to develop digital tools for improving searchability and discoverability of cultural heritage. Heritage protection serves as a motivation for the digitisation process.

Generally, there is a strong alignment with European digital and cultural strategies. Poland refers to the European Interoperability Framework (EIF) and the European Interoperability Reference Architecture (EIRA). Data opening programs are implemented in accordance with EU directives on open data and the reuse of public sector information. Poland actively participates in EU initiatives concerning the development of artificial intelligence. The Digital Competence Development Programme aligns with the EU's 2030 Policy Programme and Path to the Digital Decade[18].

3.3.1. Regulatory framework

Poland lacks a dedicated national strategy or legal definition for XR in CH. These topics are embedded within broader digital transformation policies like the Strategy for Responsible Development and the AI Policy (Polish Council of Ministers, 2020), which emphasise digitising resources for preservation, as well as providing access to these materials, and developing AI tools. Existing laws address museum digitisation and data interoperability, but not XR specifically. Poland also lacks a national digitisation policy pointing towards objectives, harmonisation and standardisation of digitisation practices. Coordination involves the Ministry of Culture and National Heritage, the Ministry of Digital Affairs and cross-ministerial data initiatives. However, it is observed that the ministries tend to operate as silos with no dialogue between them leading to creation (example: no mention of culture in the Digital Strategy of Poland document of the Ministry of Digital Affairs).

[17] https://nim.gov.pl/files/publications/56/2023_Ponowne_wykorzystywanie_ISP_w_dzialalnosci_muzeow_wyd_2.pdf; Accessed May 8, 2025.

[18] https://commission.europa.eu/strategy-and-policy/priorities-2019-2024/europe-fit-digital-age/europes-digital-decade-digital-targets-2030_en; Accessed May 28, 2025.

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There is a strong alignment with EU digital and data strategies (EIF, DCAT-AP, AI policy, Digital Decade, DSM Directive and Recommendations on digitisation) and participation in relevant EU declarations. Trends show a strong focus on digitisation, growing interest in AI (and indirectly XR), an active open data policy for CH resources, and EU integration. Key gaps include the lack of specific XR strategies/laws and underdeveloped metadata standards hindering resource discovery and interoperability, as well as challenges linked to intellectual property management. Digital Competence Centres promote different metadata standards in their respective fields of specialisation (libraries, archives, museums). Within the programs they run, the centres indicate minimum requirements not only for visual documentation but also for the metadata.

3.3.2. Funding and support

a. National Investment in CH digitisation, XR innovation, creative industries

Poland has made substantial investments (over PLN 1 billion, potentially doubled by 2030) in digitising CH. National strategies, like the Strategy for Responsible Development (SOR), prioritise digital culture, implying public funding. The national AI Policy stresses the need for public sector and state-owned company involvement in financing AI projects, which can benefit CH and creative sectors. Several public programs support innovation potentially applicable here, managed by entities like NCBR (National Centre for Research and Development), PARP (Polish Agency for Enterprise Development), the Ministry of Culture and National Heritage (Digital Culture – Kultura Cyfrowe programme) the Ministry of Education/Science (e.g., AI implementation doctorates), PFR (Polish Development Fund - VCs), and European Digital Innovation Hubs (DIHs).

b. Access to or co-funding from EU programs (Horizon Europe, Creative Europe)

EU funding distributed through the Polish government is also considered a highly relevant source for digitisation projects (SOR, POPC[19] transformed into FERC[20]). The national Digital Competence Development Programme (PRKC) utilises both national and EU funds (RRF, ERDF, ESF+ via national recovery plans and 2021-27 operational programs like FENG[21] and FERS[22]). The Ministry of Culture leads a digital skills development initiative for culture workers (funded by FERS 2024–2029).

Poland actively aims to secure EU funding for the digital transformation of various sectors and investments in digital technologies within the 2021–2027 Multiannual Financial Framework, targeting programs like the Cohesion Fund, European Regional Development Fund – ERDF, European Social Fund Plus - ESF+, Digital Europe, Horizon Europe. Poland advocates for dedicated AI support mechanisms and proportional funding distribution based on economy size. Active participation is planned in the EU's new public-private partnership for AI, data, and robotics (under Horizon Europe), aiming to maximise Polish entities' involvement in EU programs (Digital Europe, Horizon Europe).

c. Funding barriers or gaps for cross-sectoral collaborations

The policies suggest a reliance on public (state) funding, due to the prevalence of fewer large private companies, which may create barriers for purely private or cross-sectoral (culture-tech) AI innovation funding. SOR notes limited pro-

[19] Polish acronym – Program Operacyjny Polska Cyfrowa; https://www.bgk.pl/programy-i-fundusze/fundusze-europejskie/projekty/popc/; Accessed May 28, 2025.
[20] Polish acronym – Fundusze Europejskie na Rozwój Cyfrowy, https://www.rozwojcyfrowy.gov.pl/; Accessed May 28, 2025.
[21] Polish acronym – Fundusze Europejskie dla Nowoczesnej Gospodarki.
[22] Polish acronym – Program Fundusze Europejskie dla Rozwoju Społecznego 2021-2027.

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innovation drive among businesses (funding less R&D internally than the EU average) and difficult access to long-term finance/innovation funding, especially for smaller entities (potentially affecting cultural institutions or tech startups). This limited financial capacity often makes public–private research partnerships essential, as emphasised in the AI Policy[23]. SOR also highlights low effectiveness of some EU-funded projects due to poor targeting and lack of coordination among national innovation support institutions, hindering cross-sectoral collaborations.

3.3.3. Intellectual Property and licensing

a. Copyright frameworks affecting digital CH (especially for reuse practices, including XR experiences)

Polish CH organisations, especially museums, must comply with domestic legal requirements and align their operations with European Union legislation, which national regulations implement. The key legislative acts relevant to this context include:

1. The Act on Copyright and Related Rights (February 4, 1994, Journal of Laws of 2025, item 24), which also implements Directive (EU) 2019/790 of the European Parliament and of the Council on copyright and related rights in the Digital Single Market and amending Directives 96/9/EC and 2001/29/EC (April 17, 2019, PE/51/2019/REV/1),
2. The Act on Open Data and the Reuse of Public Sector Information (August 11, 2021, Journal of Laws of 2021, item 1641), which implements Directive (EU) 2019/1024 of the European Parliament and the Council on open data and the reuse of public sector information (June 20, 2019, PE/28/2019/REV/1),
3. The Act on Museums (November 21, 1996, Journal of Laws of 2022, item 385), which defines the general principles governing the functioning, objectives, and responsibilities of these institutions.

With regard to the reuse of digital copies of cultural artefacts it has to be emphasised that digitising museum objects does not create a new work or exclusive rights to the digital reproduction for the digitising entity; digital copies are digital twins that should not have its own IP status but follow the one of the physical artefact. The online sharing of a digital reproduction of a copyrighted museum object requires the creator's permission (a licence), or can rely on regulatory limitations and permissions (primarily for educational or research purposes). Metadata models should (which is often still not the case) account for copyright, clearly stating the object's status (copyrighted work, public domain), rights ownership (museum-held rights, licence, no rights), and the institution's sharing terms (e.g., All Rights Reserved, Public Domain Mark, Creative Commons licenses). Digitisation alone does not generate new copyright; materials in the public domain remain in the public domain after digitisation. However, the institutional practice in many Polish GLAMs does not follow this regulation, putting copyright blockage on digital artefacts and thus harming its potential reuse.

No specific copyright regulations for XR experiences are mentioned, but general reuse principles should apply: appropriate licences are needed to use copyrighted works within XR, and the XR experience itself may be copyrightable if original. AI systems as both users and creators of IP raise unique patent, copyright, and ownership questions, impacting how cultural institutions manage digital assets in the long term. Discussions on the use of AI in cultural works and data also touch upon these copyright challenges, as well as the ethical use of cultural data in AI applications.

While legal frameworks provide some structure for copyright and reuse, there are currently no standardised recommendations addressing the ethical dimension of sharing data — particularly from the perspective of respect, care for audiences, or handling of "sensitive heritage". This includes content related to marginalised communities, traumatic histories, or culturally significant artefacts that may require contextual sensitivity or restricted access. Institutions should

[23] https://www.gov.pl/web/ai/polityka-dla-rozwoju-sztucznej-inteligencji-w-polsce-od-roku-2020; Accessed May 28, 2025.

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be encouraged to develop policies that not only reflect copyright compliance but also demonstrate ethical stewardship, ensuring cultural data is used in ways that honour the source communities and intended meanings.

b. Open access, open content, and open data strategies

Poland has implemented the EU Open Data Directive (2019/1024/EU) through new legislation replacing a 2016 act. This aims to improve public data availability and promote innovative reuse ("open as possible, closed as necessary"), supporting data-intensive technologies such as AI. Post-2014 legal updates regarding the reuse of public sector information indicate ongoing alignment with evolving EU regulations, likely including the Open Data Directive.

Open access and reuse of digitised cultural resources are promoted across umbrella organisations in Poland supporting the GLAM sector – often acting as Digital Competence Centres appointed by the Ministry of Culture and National Heritage. Familiarity with Open Data principles (e.g., 5 levels of openness) are advised; data archived via National Institute of Museums should reach at least level two. Users must be clearly informed about reuse permissions based on copyright status and licences. Public domain materials should use the Public Domain Mark (PDM), not copyright notices. Creative Commons (CC) licences are recommended for clarifying usage rights, offering various levels of freedom. Europeana's standard for metadata sharing is Creative Commons Zero (CC0), which allows for unrestricted use. The national Open Data Programme aims to enhance access to and innovative use of public data, advocating for machine-readable, open formats at the highest possible level of openness. Data interoperability using standards like DCAT-AP is vital. Public-private with science partnerships are encouraged to help cultural institutions open resources. Many institutions already use CC licences online. Opening high-value datasets is highlighted.

3.3.4. Infrastructure and technology

a. National R&D hubs, innovation centres, relevant to XR and CH

One notable mention under infrastructure is definitely an AI Factory that will be located in Poznań. “The Poznań Supercomputing and Networking Center (PSNC) will receive EUR 50 million (around PLN 200 million) in funding from the EC to build the Piast AI factory”[24].

b. Public or private investment in supporting technologies (5G, AI, immersive media)

The national AI Policy highlights diverse funding sources for AI, including programs from the National Centre for Research and Development (NCBR), the Polish Development Fund (PFR), the Ministry of Education and Science, and European Union funds. Specific programs supporting AI projects and companies are available (e.g., BRIdge Alfa/VC, LIDER, PFR Starter). Poland aims to increase public and private investment in AI and secure dedicated funding within the EU's 2021– 2027 financial framework. The SOR strategy emphasised expanding ICT infrastructure, with the National Broadband Plan aiming for universal access and enabling technologies like 5G. Specialised ICT (cybersecurity, computer games, bioinformatics) is identified as a strategic sector for support. The Digital Competence Development Programme receives funding from national and EU budgets (including RRF, ERDF, ESF). Private initiatives (like Microsoft's AI for Cultural Heritage) and the need for public-private partnerships for AI services in culture are also noted.

c. Strategic vision in relation to Digital Europe or national smart specialization

Poland's AI Policy is framed within its broader national Productivity and Modern State strategies, focusing on building a robust AI ecosystem (data, infrastructure) to enhance its global/European position and ensure interoperability. Active

[24] https://researchinpoland.org/news/six-new-ai-factories-to-launch-in-europe-one-in-poznan/; Accessed May 5, 2025.

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participation in EU funding mechanisms (MFF 2021-27) and partnerships (e.g., the Horizon Europe PPP on AI, data, robotics) is planned. The SOR strategy integrated key horizontal technologies (IoT, big data, AI) into its development goals and emphasised concentrating support on National (Krajowe Inteligentne Specjalizacje – KIS[25]) and Regional (RIS) Smart Specializations to foster innovation and competitiveness. Open data and digital competence programs explicitly link to national strategies and European priorities (e.g., Digital Europe Programme, EU Declaration on digitisation of cultural heritage, EC AI White Paper), indicating alignment.

3.3.5. Skills and training

a. Training Programs, Curricula, and National Strategies for Digital/XR Skills

Analysed materials detail numerous initiatives focused on digital competencies, potentially including XR-related skills. The national AI Policy emphasises AI education, including courses for individuals whose jobs are threatened by automation, educational grants to prepare an AI-ready workforce, and support for interdisciplinary university programs. It also highlights the IT Talent Development Programme (2019-2029), aimed at advanced IT skills (cloud, AI, big data, machine learning, game design), promotes digital and programming skills across all education levels, and plans for comprehensive AI education in primary and secondary schools. The key Digital Competence Development Programme (PRKC), linked to the Productivity Strategy 2030, coordinates digital skills' development through initiatives like the Academy of Innovative Applications of Digital Technologies (AI Tech) and Workshops for Active Technology Use (PAKT), which may offer training in robotics, programming, multimedia, and potentially AI or XR. PRKC also addresses adult education through the establishment of Digital Development Clubs, expanding access to lifelong learning opportunities. The SOR (Strategy for Responsible Development) noted the need for skills relevant to 4.0 transformation and adapting vocational training. These strategies also emphasize the importance of interdisciplinary and future-oriented competencies, particularly those rooted in STEAM (science, technology, engineering, arts, and mathematics education).

b. Support for Re-skilling Cultural Professionals or Digital Creators

Specific support targets the cultural sector workforce. The AI Policy includes courses for those impacted by automation. The PRKC programme features dedicated actions for developing digital competencies among cultural workers (Action III.3.11), covering digitisation, IT infrastructure management, digital tools, strategy development, legal aspects, and modern technologies like AI and VR through training and educational materials. Another action (III.3.12) focuses on digitising local cultural centres (GOKs) and enhancing staff skills in online journalism, online education, graphic design, and digital tools. The need to boost digital skills (especially in new tech and programming) for cultural staff is emphasised, suggesting partnerships for knowledge transfer. SOR also mentioned active policies for adapting workforce qualifications to market needs.

c. Connection to Digital Skills Agenda

Polish initiatives show strong alignment with European digital skills strategies. The PRKC programme explicitly references and aligns with key EU documents, recommendations (e.g., European Semester 2020), and agendas, including the Digital Europe Programme, New European Skills Agenda, Key Competences Recommendation, European Pillar of Social Rights Action Plan, Digital Decade targets (contributing to EU 2030 goals for basic digital skills and ICT specialists), and the Digital Education Action Plan (2021-2027). It aligns with EU/OECD strategic directions. The AI Policy also emphasises cooperation respecting EU/OECD standards.

3.3.6. Gaps, challenges and strategic reflections

[25] https://www.gov.pl/web/rozwoj-technologia/krajowe-inteligentne-specjalizacje

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a. Systemic Gaps in Support for XR in Cultural Heritage

Analysis of the policies reveals several systemic gaps concerning the support for XR technologies within Polish CH. Primarily, there is:

1. **A lack of dedicated strategies or programs** specifically focused on the application of XR within the CH sector. While general programs for digital competence development exist (e.g., the Digital Competence Development Programme – PRKC) and support for digital skills in culture is mentioned, they do not specifically address the unique needs and opportunities presented by XR in relation to heritage. [Inferred from the absence of mentions of dedicated initiatives].
2. **Potentially insufficient infrastructure and specialised technical expertise** within cultural institutions to implement and manage XR projects effectively. Although national IT infrastructure development is addressed (e.g., State Information Architecture), its adaptation and accessibility for the specific XR needs of cultural heritage might represent a gap. Similarly, while technical aspects of digitisation are discussed (e.g., "Digitisation of literature"), XR likely requires a distinct set of skills and infrastructure. [Inferred from the general nature of discussions on digital competencies].
3. **Limited funding** specifically dedicated to XR initiatives in CH. Despite the existence of funds for digital projects and innovation, the lack of targeted financial support for XR within the cultural sector is a likely deficiency. [Inferred from the general nature of innovation/culture funding programs].
4. **Lack of unified best practices, guidelines, and interoperability frameworks** specific to XR in CH. While standards for digital collections are addressed (e.g., "Digitisation of literature"), XR might necessitate its own standards concerning content creation, preservation, and access.

b. Most Visible Structural Barriers

The most apparent structural barrier seems to be the digital skills gap within cultural institutions, especially regarding advanced technologies like XR. Although the need to enhance the digital competencies of cultural workers is recognised, the specific skills required for creating, developing, and managing XR content may not be fully addressed. Another barrier is resistance to implementing new technologies or a lack of understanding of the potential benefits of XR for cultural heritage among some institutions or professionals. Copyright and intellectual property issues related to the digitisation and use of cultural heritage in immersive XR experiences also constitute a barrier (mentioned regarding digitisation). These issues, already complex for digital collections, could be even more intricate for XR. Additionally, limited collaboration and knowledge exchange between technology providers, creative industries, and cultural heritage institutions regarding XR applications might hinder development in this area.

c. Opportunities and Strengths to Build Upon

Despite the challenges, Poland possesses several opportunities and strengths upon which to build in the context of developing XR in cultural heritage. The existing national emphasis on developing digital competencies (PRKC) and supporting digital transformation (SOR) can provide a foundation for incorporating specialized training and initiatives related to XR.

The ongoing "Open Data Plus" initiative can facilitate access to digitised cultural heritage resources that can be utilised in XR applications. The growing interest in artificial intelligence and other advanced technologies within creative sectors (Conference Agenda, AI Policy, AI usage analysis) creates a favourable environment for exploring related technologies such as XR. The focus on innovation and the development of future skills (AI Policy) can be leveraged to promote the adoption of XR in cultural heritage.

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Finally, the awareness among cultural institutions regarding the significance of digital strategies and technological trends (report on cultural institutions in the digital environment) indicates a potential readiness to explore and implement XR.

d. Implied or Explicit National Narrative around XR in Cultural Heritage

There is no explicit national narrative focused on XR in cultural heritage. However, a certain implied narrative can be inferred from broader trends and priorities identified in the analysed documents:

1. a drive towards digital transformation across all sectors, including culture.
2. A focus on the development of digital competencies and innovation.
3. An interest in utilising technology for economic and social development.
4. Recognition of the importance of protecting and sharing cultural heritage through digital means (digitisation of literature).

Therefore, a potential implied narrative surrounding XR in cultural heritage could be articulated as: XR as a future-oriented technology with the potential to increase accessibility, engagement, and preservation of Polish cultural heritage, aligning with national goals of digital transformation, innovation, and skills development. This narrative is currently implied and would require more explicit formulation and strategic support.

3.3.7. Policy monitoring sources

As mentioned in the Introduction to the current report, this deliverable contains curated tables of policy monitoring sources. Table 5 constitutes such a table for the sources in Poland.

Table 5: Policy monitoring sources in Poland.

Institutions to be monitored	Links
"Cultural Heritage" page under Ministry of Culture and National Heritage website	https://www.gov.pl/web/kultura
Ministry of Digital Affairs	https://www.gov.pl/web/cyfryzacja
National Institute for Museum	https://nim.gov.pl/en
National Science Center	https://www.ncn.gov.pl/en

3.4. TÜRKIYE

In recent years, Türkiye has entered a particularly fruitful period in the development of its digital transformation policies. These policies are largely shaped around critical technologies as outlined in the most recent development plans, including digital government, AI, Big Data and cybersecurity. Although there is currently no dedicated policy for XR technologies, the Twelfth Development Plan notably emphasises its importance in the context of education (Strategy and Budget Office, 2023, paras. 81, 254). Digitalisation has also emerged as a key area of focus within the CH sector. Current efforts primarily focus on the digital documentation of immovable CH and museum collections through national digital inventories. In the absence of a dedicated policy framework for digital CH, the integration of XR technologies into this domain has yet to be considered by policymakers. However, the vision set out of the Twelfth Development Plan, which is the introduction of a roadmap for the digital cultural economy, may create new opportunities for advancing XR applications in the CH sector (Strategy and Budget Office, 2023, para. 793). Türkiye continues to work towards aligning with European digital and cultural strategies. The European Commission's Türkiye 2024 Report offers

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a comprehensive analysis, outlining specific areas of progress as well as those requiring further harmonisation with European standards (European Commission, 2024, pp. 64–65, 72).

3.4.1. Regulatory framework

Augmented Reality (AR) was cited as one of the critical technology areas in the Eleventh Development Plan of Türkiye (2019–2023), alongside AI, internet of things, Big Data, and cybersecurity (Strategy and Budget Office, 2019, para. 354). However, beyond this mention, the plan provided no further reference to AR, nor did it elaborate on what it would entail in sector-specific contexts.

The Twelfth Development Plan of Türkiye (2024-2028) witnesses the rising awareness on AR in recent years from a policymaking perspective. Not only the terminology evolves to Virtual Reality while describing global trends (Strategy and Budget Office, 2023, para. 47), AR is referenced in sectoral sections such as innovation (para. 557), higher education (para. 688) and tourism - to be interpreted together with the 2025 Presidency Annual Program (Strategy and Budget Office, 2024, p. 174). Moreover, the Twelfth Development Plan brings a cultural policy novelty by proposing a “digital cultural economy roadmap” to assess the impacts of digitalisation (Strategy and Budget Office, 2023, para. 793). While this effort is closely related to the implementation of the UNESCO Convention on the Protection and Promotion of the Diversity of Cultural Expressions, it also presents an opportunity to address the current lack of a national digital cultural heritage strategy in Türkiye.

It is interesting to note that despite the absence of a national policy, CH actors have begun integrating the use of XR in site management processes. Several plans adopted since 2021 include AR experiences for promotion (Manisa Municipality, 2024, p. 99; Selçuk Municipality, 2021, p. 229), and access (Amasya Municipality, 2022, p. 155), and one 2022 plan foresees VR use for research and documentation (Adana Governorship, 2022, pp. 125–126).

The Ministry of Culture and Tourism is best positioned to lead a national digital CH strategy in Türkiye, given its cultural expertise. However, support from the Ministry of Industry and Technology, and the Digital Transformation Office could be valuable given the reliance of digitalisation on emerging technologies and innovation. While there is currently no dedicated policy for XR technologies, these two institutions underline the interconnectedness of AI with a wide range of emerging technologies, including AR, in the National Artificial Intelligence Strategy (Digital Transformation Office & Ministry of Industry and Technology, 2021, p. 14). Importantly, the Digital Transformation Office has been recently closed, and its functions have been transferred to the newly established Cybersecurity Directorate.

3.4.2. Funding mechanism

As part of efforts to digitise cultural heritage, the most significant national investments in recent years have been directed toward two major digital inventory initiatives: TUES – for immovable cultural heritage, and MUES – for museums (Ministry of Culture and Tourism, 2024, p. 63). Both projects are being implemented nationwide under the leadership of the General Directorate for Cultural Heritage and Museums of the Ministry of Culture and Tourism (Ministry of Culture and Tourism, 2024, p. 63). Given the scale and infrastructure of these initiatives, integrating components that support XR experiences—such as 3D models—could offer a cost-effective pathway to scale immersive technologies across the cultural heritage sector. This would require increased financial support and targeted capacity-building efforts to train custodians in scanning and 3D modelling practices.

The budget allocated to the Ministry of Culture and Tourism in the central government’s overall spending remains a significant limitation. As noted in the European Commission’s Türkiye 2024 Report, the Ministry of Culture and Tourism had the 12th lowest budget out of 32 central government agencies in Europe in 2023, less than 0.004% (European Commission, 2024, p. 72).

Another important topic regarding policy and investment priorities is the development of digital twins for cities. As part of the goal to “establish and sustain a smart city ecosystem” defined in the 2020–2023 National Smart Cities Strategy and Action Plan, a set of guidelines has been prepared to assist local governments. These guidelines compile best

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practices from smart city management initiatives around the world, and among the highlighted examples is the use of digital twins (Ministry of Environment, Urbanization and Climate Change, 2021, p. 28-31).

Türkiye remains actively involved in several European Union programmes such as Erasmus+, Horizon Europe, the Customs programme, the Single Market Programme (SME component) and the Digital Europe Programme (European Commission, 2024, p. 88). Türkiye is currently not participating in the Creative Europe programme. A future development of a national CH policy could provide an opportunity to revisit the reasons behind this withdrawal and to assess the potential for renewed participation.

3.4.3. Intellectual Property and licensing

Türkiye's primary legal framework for copyright is established under Law No. 5846 on Intellectual and Artistic Works. The Ministry of Culture and Tourism, through its General Directorate for Copyright, is the main authority responsible for the implementation of this law. In addition to enforcing this national framework, the Directorate also works towards aligning Türkiye's copyright regulations with relevant European Union legislation (European Commission, 2024, pp. 60–61).

In addition to Law No. 5846 on Intellectual and Artistic Works, there is a separate legal framework specifically governing cultural heritage in Türkiye, Law No. 2863 on Cultural and Natural Heritage. The implementation of this law falls under the responsibility of two different bodies, the General Directorate for Cultural Heritage and Museums of the Ministry of Culture and Tourism. Therefore, when it comes to the copyright frameworks affecting digital CH, especially for XR experiences, it remains unclear which body within the Ministry of Culture and Tourism, is responsible for providing guidance. Since this is a rather complex and technical issue, this gap needs to be urgently addressed so that all the public and private stakeholders can clearly understand their legal rights and the scope of use depending on the role they play in the XR processes.

Regarding the data governance framework, the preparations for a national data strategy are ongoing by the Digital Transformation Office. The latter collaborated with UNDP, which released a comprehensive Türkiye report on this topic last year (United Nations Development Programme, 2024). Given the increasing momentum, it is important to actively follow such developments and reflect on their impacts on the digital cultural heritage field.

3.4.4. Infrastructure and technology

AR is highlighted among the key emerging technologies for which developing human capital and establishing the necessary R&D infrastructure are identified as policy priorities within the Twelfth Development Plan (Strategy and Budget Office, 2023, para. 557). Of course, each of the key emerging technologies requires its own specific policy approach and assessment. Currently, areas such as big data, AI, and cybersecurity appear to be at the forefront of national policy agendas. In 2023, Türkiye joined the Digital Europe programme (European Commission, 2024, p. 65). In parallel, the Digital Transformation Office initiated efforts to establish the "Digital Innovation Collaboration Platform", which aims to bring together public institutions, industrial organisations, R&D infrastructures, and university research facilities involved in artificial intelligence, data science, robotics, and related technologies. One of the platform's key objectives is to support the formation of consortia and the development of projects in response to calls from the Digital Europe Programme (see: the Digital Transformation Office's website[26]).

3.4.5. Skills and training

In outlining its "digital cultural economy roadmap" objective, the Twelfth Development Plan places clear emphasis on digital skills training within the cultural sector. For instance, programs aimed at fostering digital skills and awareness of digital culture and arts are set to be integrated into formal education curricula (Strategy and Budget Office, 2023, para. 793.2). Specialized training initiatives will also be supported to enhance the digital competencies of stakeholders

[26] https://cbddo.gov.tr/projeler/diib/; Accessed May 8, 2025.

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across the cultural economy value chain, with certification to be provided (Strategy and Budget Office, 2023, para. 793.3).

On the other hand, digital transformation in higher education is explicitly addressed as a policy objective in the Twelfth Development Plan (Strategy and Budget Office, 2023, para. 688). Developing a skilled workforce in key emerging technologies such as AI, 5G, cybersecurity, and AR will be treated as a policy priority (Strategy and Budget Office, 2023, para. 688.6, 557).

All of these represent significant commitments for advancing the use of XR in the field of cultural heritage. To ensure these initiatives lead to effective outcomes in practice, their implementation must be closely and systematically monitored.

3.4.6. Gaps, challenges and strategic reflections

The digital transformation agenda in Türkiye has entered a dynamic phase, underpinned by evolving policies and the well-defined priorities in the Twelfth Development Plan focused on digital infrastructure and workforce development. This provides a favourable environment to introduce a national policy framework for digital cultural heritage, emphasising the role of XR in the cultural heritage field. Developing such a framework at this early stage, when XR is not yet widely adopted in the cultural sector, would be instrumental in shaping XR's sustainable integration into the field and its responsible use by the stakeholders.

One of the most visible structural barriers is the need for coordination among multiple institutions. Given the technical complexity and emerging nature of XR, the establishment of a dedicated unit or working group focused specifically on this area may be essential. XR is often mentioned as part of a broader list of emerging technologies in high-level strategic plans, which risks it being overlooked. It is therefore critical that XR secures a distinct and visible position within national digital agendas, an outcome that can only be achieved through focused institutional responsibility. Such a unit could also draw on the practical experience of local cultural actors, integrating their insights into policy development to enhance impact and long-term sustainability.

3.4.7. Policy monitoring sources

As mentioned in the Introduction to the current report, this deliverable contains curated tables of policy monitoring sources. Table 6 constitutes such a table for the sources in Türkiye.

Table 6: Policy monitoring sources in Türkiye.

Institutions to be monitored	Links
"Strategic Management in Public Sector" website of the Strategy and Budget Office of the Presidency	http://www.sp.gov.tr/
High-level policy documents (development plans) and sectoral and thematic strategy documents	http://www.sp.gov.tr/tr/temel-belge
Institutional strategy documents	http://www.sp.gov.tr/tr/kurum
Digital Transformation Office of the Presidency	https://cbddo.gov.tr/
Strategy and Budget Office of the Presidency	https://www.sbb.gov.tr/

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Ministry of Culture and Tourism	https://www.ktb.gov.tr/
Ministry of Industry and Technology	https://www.sanayi.gov.tr/
Information and Communication Technologies Authority (BTK	https://www.sanayi.gov.tr/
Information and Communication Technologies Authority (BTK)	https://www.btk.tr/
Scientific and Technological Research Council of Türkiye (TÜBİTAK)	https://tubitak.gov.tr

4. Gaps, challenges and possibilities from the perspective of the stakeholders

The challenges and future of XR in cultural heritage are intricately shaped by the policy landscape, where opportunities for innovation are frequently tempered by political, regulatory, and financial obstacles. Insights gathered from stakeholder interviews reveal recurring patterns of gaps in policy awareness, regulatory frameworks, and financial support structures, which hinder the full realisation of XR technologies' potential. This section begins with a broad overview of the common policy gaps and challenges identified across various regions, including issues such as the lack of specific legislation on digital heritage, the absence of clear regulatory frameworks for XR technology, and the insufficient institutional support for cross-sector collaboration. These challenges are then explored in greater depth by focusing on the specific country contexts.

The following Table 7 presents key patterns identified through interviews.

Table 7: Policy analysis elements – key patterns identified through interviews.

Category	Pattern	Description
Policy awareness	Low awareness of XR-specific regulation	Many stakeholders are unaware of existing or applicable legal frameworks for XR in cultural heritage.
	Uncertainty about legal applicability	Confusion on how general digital policies apply to XR; lack of legal clarity hinders adoption.
	Institutional disengagement	Some national institutions are not participating in EU-level initiatives (e.g., European Collaborative Cloud for Cultural Heritage ECCCH).
	National-policy lag	In countries like Poland, legislation is seen as outdated relative to XR and digital museology needs.
	Reactive vs. proactive policymaking	Countries shape policies reactively, based on short-term needs rather than strategic planning.

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	Low XR literacy among stakeholders	Limited understanding of XR technology and its implications among cultural institutions representatives..
Policy challenges and gaps	Lack of legal definitions and standards	Absence of XR-specific terms in legal texts leads to regulatory ambiguity.
	IP and copyright issues	Recurrent concerns about intellectual property in digital/virtual spaces.
	Ethical uncertainties	No frameworks for handling behaviour, vandalism, or misrepresentation in virtual environments.
	Lack of standardisation	Interoperability and data standards across platforms are insufficient or nonexistent.
	Weak cross-sectoral collaboration	Few mechanisms exist to connect tech developers with cultural institutions; institutional silos persist.
Financial frameworks	Dependence on EU/national funding	XR initiatives rely heavily on Horizon Europe, Creative Europe, or national recovery funds.
	Complicated procedures	Bureaucratic funding application processes pose a barrier, particularly for smaller institutions.
	Innovation vs. infrastructure funding tension	Difficulty securing funds for basic digitisation, as calls to prioritise high-tech innovation.
	Shift toward repayable instruments	Loans are becoming more common than grants, potentially excluding smaller players.
	Fragmented funding landscape	Cultural and tech sectors struggle to find aligned calls and financing models.
	No sustainability planning	Long-term financial planning for XR maintenance and upgrades is often lacking.
Future needs	Strategic, forward-looking policies	Clear, future-oriented policy frameworks at EU and national levels are needed to support XR in cultural heritage.
	Legal recognition of digital objects	Laws must evolve to treat digital artefacts as museum objects or works of art.
	Education and training	Upskilling cultural professionals on XR technologies is essential for adoption.
	Support for knowledge-sharing platforms	Stakeholders call for centralised platforms or tools to link initiatives, projects, and partners.

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	Simplified access to funding	There is demand for streamlined, targeted funding instruments for XR and digital heritage.
	Stronger national participation in EU initiatives	Countries should engage more actively in European efforts like Europeana and the European Heritage Cloud.
	Addressing IP and licensing barriers	Reworking legal structures to enable safer and broader use of XR-generated content.
	Inclusive development plans	XR must be part of national cultural and technological development strategies to secure long-term institutional support.

4.1. Policy awareness

It seems that political awareness around XR in CH is lacking[27]. In Cyprus, some interviewees admitted to being unaware of specific regulations regarding XR in this context, reflecting a broader uncertainty about how existing legal frameworks intersect with this technology. In Poland, there is a prevailing view that national legislation is lagging behind advancements in museology and digital heritage, leaving critical areas inadequately addressed. CH professionals also expressed concern that digital versions of objects are often omitted from legal definitions, hindering proper integration of XR technologies. Conversely, in Türkiye, the development of policies related to the digital world is driven by current needs, as reflected in the Ministry of Culture and Tourism's strategic plans. However, without the guidance of a specific framework for XR in CH, there remains insufficient awareness about the potential of XR technologies, along with uncertainty about the right points of contact for support within the cultural sector.

4.2. Policy challenges gaps

The lack of specific regulations for digital heritage stands out as one of the major shortcomings in the current policy landscape. Across multiple countries, gaps and inconsistencies in the legal frameworks for XR and cultural heritage have been cited. These gaps affect key issues such as copyright, intellectual property, standardisation, interoperability, and ethical concerns surrounding virtual spaces. The absence of a clear legal definition for XR in cultural heritage also presents a significant issue. Furthermore, intellectual property and copyright problems are often mentioned as key barriers that have not received sufficient political attention.

In Poland, the lack of coordination between technology providers and cultural institutions is evident, with insufficient mechanisms for cross-sectoral collaboration. In some regions, there is a willingness to cooperate, but the absence of dedicated funds for cultural heritage-related XR projects makes such collaboration challenging. Similarly, certain regulations in Türkiye are seen as a potential barrier to investment in XR technologies. High purchasing costs for XR devices and customs policies that complicate the import of such devices are seen as obstacles to broader adoption. Moreover, there is no unified vision among decision-makers regarding the use of digital technologies in CH, with occasional discrepancies between national-level declarations and actual resource allocation at the ministerial level.

4.3. Financial frameworks

The financial frameworks for XR projects in CH are largely dependent on external funding from government budgets, EU funds, or other forms of public support. This reliance on external funding limits the ability of cultural institutions to implement XR technologies effectively. Obtaining funding for basic digitisation efforts is particularly challenging through

[27] It was a series of questions omitted by the interviewer, since the interviewee reported not to be aware of any specific policy.

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programs like Horizon Europe, which prioritise innovation over fundamental digitisation needs. Cultural organisations often face complicated application procedures when seeking funding, with restrictions in some countries regarding the eligibility of organisations with international ties. Ensuring sustainable development for XR projects after initial funding expires is another significant challenge. Dedicated funding lines specifically for digital heritage projects focusing on XR are considered essential for the future success of such initiatives. The current financial system often fails to bridge the gap between the technology and culture sectors, with many XR projects not fitting traditional funding criteria, leaving them vulnerable to economic instability.

4.4. Future needs

Looking ahead, there is a pressing need for more ambitious and better-regulated policy frameworks, to guide the digital integration of XR in CH. These frameworks should consider the protection of creators, designers, artists, and developers and ensure ethical standards, particularly in the context of digital preservation and dissemination of cultural artefacts. However, these initiatives require deeper involvement from national institutions, which currently seems insufficient. Additionally, it is crucial to simplify funding procedures for cultural institutions, allowing for more straightforward access to the financial resources needed for XR projects.

Other future needs identified include recognising digital objects as museum objects or works of art in legislation, as this recognition would facilitate the use of digital technologies in museums and other cultural institutions. Furthermore, initiating public discussions regarding the needs of cultural institutions in adopting XR technologies is deemed crucial, alongside offering professional training and knowledge dissemination to ensure that stakeholders can make informed decisions about the technology's potential.

A significant challenge lies in ensuring long-term sustainability for XR projects, which requires developing business models that will provide financial stability beyond initial funding. Additionally, issues such as intellectual property, licensing, and copyright need to be more rigorously addressed to safeguard cultural assets. Building a broader societal and institutional understanding of XR technology, alongside fostering an open and aware approach to its usage, is key to integrating XR into cultural heritage effectively. Finally, creating platforms for knowledge sharing, data access, and cross-sector networking will facilitate the collaboration between technology providers and cultural institutions.

4.5. Cyprus

4.5.1. Existing policy frameworks

Seven stakeholders who participated in the interviews were unaware of any formal or XR-oriented policies within the CH domain. Only a single stakeholder, a senior official in the Ministry of Culture, could identify a related EU directive (C-2021 / 4647 on digitisation and digital accessibility – common European data space for cultural heritage) and link it to national obligations such as 3D capture of thirty monuments by 2030. Everyone else, from small private museums to XR technology companies, was mentioning general digitalisation rules or procurement compliance guidelines rather than any purpose-built framework. Current practices in Cyprus surrounding XR applications in cultural heritage revolve primarily around EU policies, with no custom-made national policies in place. As one stakeholder noted, "the evolution of national policies is parallelly based around the evolution of European policies as well. In other words, I think that European policy is interlinked with the national policy that we pursue." (interviewee: Cyprus, Business representative).

In general terms, policies are viewed as distant and largely procedural operations. A museum director summed up the disconnect: "What policies? What governmental involvement? It's minimal if non-existent." (interviewee: Cyprus, cultural institutions representative). As a result, digitisation programmes – whether funded by EU institutions or private sponsors, often advance in relative isolation, with national policies providing neither clear support frameworks nor regulatory boundaries for XR experimentation.

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4.5.2. Policy challenges and gaps

A primary and persistent barrier identified across the cultural heritage sector – particularly among museum professionals – is the **uncertainty surrounding legal frameworks**, especially in the context of extended reality (XR) technologies. Museum directors and curators repeatedly report ambiguous interpretations of copyright laws, data ownership rights, and the legal status of digital replicas and digital twins. This legal opacity creates a high-risk environment for institutions seeking to innovate through immersive technologies.

In one illustrative case, a museum director shared that the institution had been engaged in a **protracted three-year legal dispute** concerning the inclusion of a 19th-century engraving in a virtual exhibition. Despite the artwork being in the public domain, the digitised reproduction used in the immersive tour became the subject of contested ownership and licensing claims. Such instances underscore the **urgent need for clearer, harmonised legal guidelines** that address the specificities of XR applications in the cultural heritage domain.

In addition to legal uncertainty, the research revealed a **critical lack of XR-specific operational guidance**, particularly in procurement and digitisation. Many public tenders are based on **generic, outdated templates** drafted by individuals unfamiliar with XR, thereby excluding many capable but smaller companies. As noted by a business representative in Cyprus – “Procurement rules are crafted by people who are incompetent in XR technologies, usually follow a default/traditional template, and limit the participation to multimillion-euro turnover companies that automatically excludes a large portion of the companies that could actually perform an amazing job.” (Interviewee: Cyprus, Business representative)

Moreover, there is a **notable absence of standard protocols** for digitisation processes preceding XR application – such as 3D scanning, photogrammetry, or artefact handling. As one museum professional from Cyprus stated – “There are many cases where the entity, if it is a company, will look to do a job, possibly at the least cost to them, offering digitisation on one hand, but without the necessary parameters being covered.” (Interviewee: Cyprus, cultural institutions representative).

4.5.3. Policy ideas

Despite frustration, interviewed stakeholders offered convergent suggestions. The most common proposal is targeted capacity building, i.e., hands-on workshops where curators, conservators, SMEs, and policy officers exchange knowledge, discuss ideas, and learn together on how to transition from basic digitisation to meaningful XR storytelling. The importance of interdisciplinary discussions, particularly during the drafting of new XR policies, is highlighted by one interviewee, who states, “the value of that policy would definitely increase if practitioners are also included in the discussion.” (interviewee: Cyprus, cultural institutions representative).

Cross-country dialogue within the sector is also seen as a way to make policymaking more efficient, with one interviewee suggesting, “The best way for the government to support it is to create more frameworks for cooperation and open more channels of communication with the CH sector, and with other member states and therefore, this will allow us to capture their knowledge and expertise, to learn from catching their errors and failures, and then avoid making mistakes.” (interviewee: Cyprus, policymaker).

Equally prominent is a call for product-oriented funding that carries a prototype all the way to market rather than stopping at the research phase; several developers emphasised that commercialisation is the only route to sustainability.

Policymakers also suggested a one-stop coordination mechanism, whether housed in a deputy ministry or a centre of excellence, which can distribute expertise, publish technical standards and pool existing infrastructure.

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Finally, there is a plea for political neutrality and the autonomy of CHIs: bicommunal institutions fear that funding streams can be throttled if exhibitions are not aligned with prevailing narratives, with one particular museum director noting; “Politics should stay out of culture. There should be objectivity, there should be freedom of speech and thought, and there should be critical thinking.” (interviewee: Cyprus, cultural institutions representative).

4.5.4. Impact of policies on practice

Because the formal policy landscape is limited, its influence is primarily felt through omission. The lack of clear rules regarding digital and technical specifications, forces each XR project to negotiate its own parameters with ministries, investors and rights-holders. In this respect, it ends up as an exhausting process that delays delivery and inflates costs. In some cases, it can also end up hindering possible applications because of legal concerns of cultural institutions. One interview revealed that museum educators rely on ad-hoc QR codes because larger immersive installations would trigger licensing questions no one can answer.

Existing policies intervene in two instances, and both are perceived as negative. First, in public tenders, with their high eligibility thresholds, direct contracts are given to large consortia rather than to agile creatives. And second, generic compliance regimes (audits, health-and-safety inspections, anti-money-laundering checks) divert scarce staff time away from curatorial or technical work; “Policies tend to put a stop rather than help” (interviewee: Cyprus, Business representatives).

4.5.5. Funding

Financing is described by all stakeholders as the pivotal enabler. EU competitive calls (Horizon Europe, Digital Europe, Europeana) remain the primary source of significant grants, but smaller actors struggle to assemble consortia or to cover the national match-fund. Domestic funding instruments, where they exist, are seen as intermittent, limited in scope, and rarely designed with XR in mind.

XR vendors see untapped potential, as they stated – “Europe has available funds; there is only a matter of us willing to put it all together” (interviewee: Cyprus, Business representatives, yet neither cultural organisations nor public officers have the bandwidth to scout, apply for and administer grants. Cultural Institutions suggest that shared assets (or infrastructure) such as a national photogrammetry (e.g.: scanning lab, a travelling mixed-reality, XR kit, and other needs) can help reach more cost-efficient solutions.

A developer of several high-profile heritage tours captured the prevailing frustration: “The biggest challenge we face is getting official approval – and the red tape that comes with it.” (interviewee: Cyprus, Business representatives). Unless future programmes explicitly account for the costs of permissions, licensing, and insurance, innovative concepts will continue to stall at the pilot stage.

To sum up, stakeholders converge on a single pressing concern: the mismatch between political ambition for cultural heritage and the practical means to realise it. XR experimentation is currently taking place in Cyprus, significantly supporting training purposes. Although a coherent national funding strategy is absent, XR experimentation is enabled by passionate individuals/startups, intermittent investments and one-offs in large or medium-sized EU projects. Although the sector’s immediate priorities are pragmatic (skill upskilling workshops, fit-for-purpose procurements, and funding streams), they also reveal a strong desire for improved collaboration between all parties that can transcend institutional silos and bicommunal disengagement in common needs. Cultural institutions see immersive storytelling as a potent draw; what they lack is an enabling policy environment that couples resources with clear strategic guidance.

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4.6. POLAND

4.6.1. Existing policy frameworks

Our respondents show varying degrees of awareness of existing policies at the national and EU levels. One of them, representing the business sector, states that they try to stay up-to-date with technology regulations as they relate to the interface of their activities, pointing to both opportunities and barriers (interviewee: Poland, Business representatives). They mention participation in advisory groups such as the Edtech Council at the Lewiatan Confederation, the VR/AR Industry Collection (an initiative of the European Commission), the Pact for Skills, and the initiative of the Ministry of Digital Affairs – PW eSkills. They note that approximately 70% of laws created in Poland result directly from EU regulations, and monitoring EU directives is easier thanks to organisations with relevant expertise.

Another interviewee, an employee of a CH institution, is well-acquainted with Polish museum law and copyright law but less so with EU regulations, although they know where to find information. They mention participating in consultations regarding a new digitisation strategy, which, although it touches on the topic, is seen as imperfect and not inclusive of all relevant environments. They note a strong emphasis in this strategy on e-sports and game development (interviewee: Poland, policymaker), which they see as positive in the case of game development as a large industry.

A respondent from the perspective of a cultural institution notes the lack of clear inclusion of new media or technologies in cultural strategies, both at the ministerial and local government levels. They refer to the Impulse project (Horizon Europe), which focuses on the use of augmented reality for the preservation and promotion of cultural heritage, aiming to influence cultural policies and funding issues. Participation in the VR AR Industrial Coalition and expert groups on legislation and smart specialisations in the creative industries allows for closer contact with policymaking processes.

4.6.2. Challenges and policy gaps

The biggest policy barriers identified by stakeholders primarily concern the lack of appropriate regulations regarding digital heritage and immersive technologies. A key problem is that national legislation does not see progress. The definition of a museum object does not include its digital version, which has a fundamental impact on the possibility of its reuse in creative contexts. The lack of regulations regarding digital heritage forces institutions to seek "frightening legal solutions" whose correctness they are unsure of. Challenges also relate to legal ambiguity and copyright issues, meaning that museums and cultural institutions fear copyright infringement. One of the respondents said that “this is something that I think is also problematic for institutions (…), this anxiety when it comes to copyright infringement (...), museums are always afraid of that” (interviewee: Poland, policymaker). Even in the case of objects in the public domain, there are issues of moral rights and ethics of use. The distinction between copyright for a physical object and its digitisation further complicates the situation. Insufficient knowledge of copyright law and issues of data ownership on commercial platforms are problematic.

Respondents also emphasise fragmentation and the fact that there is no single entity responsible for public policy in the field of immersive technologies, which leads to the dispersal of actions among various institutions and ministries. Another topic is a lack of standards and methodologies. Despite the existence of digitisation standards (documentation), there is a lack of consistent standards for popularisation purposes and for large-scale data, which can create different problems, like for instance – as one of the respondents puts it – “larger museums will want to do their own digitisation labs anyway, because they are supposed to be used not only for dissemination, but also for documentation” (interviewee: Poland, cultural institutions representative). Interviewees also mention the low digital capacity of institutions, meaning a lack of museum staff who have the time and willingness to engage in new technological projects. Institutions often do not have the resources to hire experts to navigate the complex legal and technological environment.

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4.6.3. Policy ideas

Stakeholders propose a number of changes and actions at the policy level. The first of these is inter-ministerial coordination and a central point of responsibility, with the postulate of creating a single entity responsible for public policy on technology or establishing inter-ministerial, interdisciplinary councils that include practitioners and officials to indicate the directions of development. One of the interviewees told us that "(…) it could be that there is one actor responsible for the public policy regarding a given technology or sector, so that it is not scattered across different institutions, agencies or ministries" (interviewee: Poland, Business representatives). Interviewees also propose a funding reform that involves simplifying application procedures, providing dedicated funds to strengthen technological areas in cultural and heritage institutions, as well as for interdisciplinary projects that combine technology and culture. It is necessary to rethink the balance between grants and repayable instruments, which can be a barrier for smaller entities. Another idea is about the training systems and efforts to build awareness, in particular by investing in the education of cultural and heritage institution staff on the possibilities of using new technologies. One idea we heard was to create and implement "educational strategies (…) to help disseminate knowledge and give tools [to the cultural institutions], cheap tools. They should simply be available and also directed to very different groups" (interviewee: Poland, policymaker).

Another important topic was about standardisation, meaning development and implementation of cataloguing standards, nomenclature, and dictionaries to enable easier searching and sharing of digital data, but also strengthening the voice of the creative and technology sectors in dialogue with the administration, mostly by creating umbrella organisations bringing together various entities and mapping the largest projects, stakeholders, and initiatives is crucial for building market knowledge (interviewee: Poland, Business representatives).

Among other suggestions, we heard about legal reforms, for instance, expanding the scope of permitted use for non-profit cultural institutions, support for risk-taking by creating systemic mechanisms that would allow institutions to take certain risks in experimenting with technologies, e.g., in cases of unclear copyrights.

4.6.4. Impact of policies on practice

Current policies have a significant impact on the real-world applications of XR in CH, often limiting daily activities and collaboration. First and foremost, legal and procedural barriers slow down innovation in museums, hence the need to apply complicated public procurement procedures is risky and ineffective. What we often heard was that the time-consuming nature of grant applications discourages institutional staff. One of the stakeholders told us that "the procedures which are offered to cultural institutions when it comes to funding should be simpler because sometimes they are so complicated that it takes one month to handle all the papers" (interviewee: Poland, policymaker).

One notable mention was about the fact that the lack of a clear legal framework for digital heritage prevents the full utilisation of digitised resources. This gap is followed by the siloed nature of funding and policies that hinders cross-sectoral collaboration, e.g., between culture and technology, hence interdisciplinary projects often do not fit the criteria of programs focused on a single area.

The interviewees also mentioned that the high costs of maintaining digital infrastructure, licensing commercial software, and hiring technology specialists pose a significant budgetary barrier for institutions. One respondent notes that wages for 3D modelling specialists or graphic designers are disproportionate to what a cultural institution can offer (interviewee: Poland, cultural institutions representative).

4.6.5. Funding

Funding for technological projects in the culture and heritage sector largely depends on external funds (governmental, budgetary, EU). We can observe two main topics here. The first one is the availability of EU funds (e.g., FERS) and national funds, which are available for the education sector (universities, schools) and seem to support digitisation. Respondents mention that tenders for non-governmental organisations often include a digitisation component, which is

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promising. Research projects at the EU level (Horizon Europe) fund innovation, but not basic digitisation. The second area is adequacy. Despite the availability of funds, the complexity of application procedures is a problem. There is a trend towards repayable instruments (loans) instead of grants in subsequent EU financial perspectives, which may be a barrier for smaller organisations without sufficient capital or assets for pre-financing (interviewee: Poland, Business representatives). There is a lack of dedicated funding programs that directly support interdisciplinary projects combining technology and culture. The high costs associated with data archiving, licensing commercial software, and hiring technology specialists are a significant burden that is not always fully covered by funding schemes. Proposals regarding investment in digital infrastructure mainly concern the postulate of shared resources at the regional or national level to reduce costs for individual institutions.

4.7. TÜRKIYE

4.7.1. Existing policy frameworks

Stakeholders in Türkiye do not recognise a specific legislation or policy framework dedicated to XR technologies. However, they are aware of adjacent regulatory developments at both national and European levels. National standards such as the Law No. 6698 on the Protection of Personal Data and sector-specific regulations in areas like finance, energy, health, and public administration are acknowledged. Law No. 7545 on Cybersecurity, which came into force on March 19, 2025, was mentioned as the most recent regulation in this area.

The policy environment is seen as enabling, in the sense that digital transformation is actively supported through development plans, and EU standards like GDPR are already shaping institutional practices. However, when it comes to XR specifically, stakeholders consider the policy landscape as fragmented and undeveloped. In particular, Law No. 2863 on Cultural and Natural Heritage is perceived as outdated or misaligned with emerging needs, as it does not account for digital or XR-related developments. Interpretation and adaptation rely on local authorities or conservation boards, leading to inconsistency.

4.7.2. Policy challenges and gaps

The main policy barriers identified by stakeholders include the lack of clear legal frameworks tailored to XR, institutional resistance coupled with limited awareness of emerging technologies, and a shortage of skilled professionals with technical expertise in XR development and implementation. Most stakeholders pointed to copyright and licensing as critical barriers in the production of digital content, although they did not have further details to provide on this matter. Stakeholders also mentioned challenges related to financial constraints, strict regulations related to cloud services, data privacy issues, the absence of standards for interoperability, lack of transparent and inclusive consultation, and concerns the legal liability associated with the custody and management of technological equipment in museums.

4.7.3. Policy ideas

Stakeholders propose, firstly, the integration of XR and digital technologies into national development plans and institutional strategies. They emphasise that high-level, overarching policy frameworks are necessary to accelerate digital transformation, especially in the cultural heritage sector. Stakeholders also underline that political decision-makers must first be convinced of the social value of XR, for example by demonstrating how it can expand access for disadvantaged groups.

Stakeholders then underline that long-term financial support and sustainability should be a central part of policy frameworks. They stress that many XR projects fail to scale or endure because there are no mechanisms to ensure continued funding beyond the initial project phase. From a sustainability perspective, stakeholders also highlight the physical limitations of museum infrastructures. They note that existing architectural structures are often not designed to accommodate immersive experiences, leading to significant challenges during installation. Therefore, future policy

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measures should not only prioritise sustainable funding models but also promote infrastructure upgrades or adaptive architectural planning to support better the integration of digital and immersive technologies in cultural institutions. In parallel, stakeholders highlight the need for policies to focus on human resources and education. They stress the importance of increasing specialised training programs to develop a skilled workforce capable of utilising XR technologies effectively. This includes both university-level courses and vocational training in technical schools.

Furthermore, stakeholders emphasise that policies should aim at overcoming key barriers to XR adoption. For instance, they suggest that policies should support the use of unlicensed spectrum to facilitate the widespread use of XR applications. Additionally, stakeholders argue that cloud computing should be recognised as an essential tool for making digital cultural heritage accessible. They also emphasise that policies must prioritise the integration of personal privacy technologies into XR experiences from the design phase, since “people and governments use technology that they trust” (interviewee: Türkiye, Business representatives).

Finally, stakeholders believe that policies should provide guidance on certain important issues, such as the protection of intellectual property rights and youth safety. This includes encouraging stakeholders to make clear agreements on intellectual property from the outset, particularly in cases involving software development and code sharing. Regarding youth safety, certain stakeholders recommend introducing age verification and enabling parental controls rather than applying blanket bans.

4.7.4. Impact of policies on practice

Stakeholders stressed that the absence of a comprehensive policy framework for XR or digital cultural heritage in Türkiye leads to the impermanence of projects in this area, the lack of adequate financial support, and the inability to effectively organise necessary training programs.

Additionally, this absence of policy also causes stakeholders to remain disconnected from one another. The consequences of this disconnect are even more critical when one considers that technology developers often approach their work with a vision of innovation – “We are always thinking how we can make it more interactive” (interviewee: Türkiye, Business representatives). Whereas cultural heritage institutions are inherently focused on preservation – “My priority has always been to preserve, and that is my duty” (interviewee: Türkiye, cultural institutions representative), which often makes them more conservative in their relationship with technology.

4.7.5. Funding

One of the most frequently mentioned challenges related to funding was the high cost of technology, including both infrastructure and software. Cultural heritage institutions emphasised that the financial resources allocated to them are insufficient to support such innovation. Therefore, they try to secure such investments from external sources, for example, by participating in European Union projects.

Another major concern relates to copyright and licensing fees, which are not accounted for in standard budget allocations. Museums implementing digital projects often face substantial royalty costs after the fact, with no designated funding to cover them. Similarly, the lack of budgetary provision for software licences and cybersecurity infrastructure makes it difficult to sustain these initiatives in the long run, undermining both security and continuity.

On a more general note, technology companies pointed to the absence of advanced infrastructure, such as AI-compatible data centres and hyperscale cloud platforms in the country, which are essential for operating sophisticated digital systems. Developing such infrastructure requires large-scale investment, yet current funding mechanisms do not provide a pathway for this. While some government initiatives, such as the HIT30 program from the Ministry of Industry and Technology, show promise in supporting emerging technologies, XR and digital cultural heritage are not yet prioritised within these frameworks.

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Another funding challenge, as highlighted by technology companies, concerns tender regulations. They reported that they often find themselves operating as subcontractors to construction firms because tender procedures tend to favour large-budget companies, limiting their direct access to tenders. Limited access to tender pools and the lack of direct support mechanisms make it difficult for these companies to survive, underlining the need for targeted policy interventions.

To sum up, the most pressing policy concern emerging from stakeholders in Türkiye is the absence of a coherent and dedicated policy framework for XR technologies, particularly in the cultural heritage sector. This gap results in fragmented implementation, institutional inertia, and a lack of consistent funding, and renders “XR technology-related work (…) a field dependent on individuals and their know-how” (interviewee: Türkiye, policymaker). Even if both the institutions using XR applications and the companies developing them are taking shared responsibility and working together to ensure sustainability, stakeholders emphasise the urgency of integrating XR into national strategies, establishing long-term financial mechanisms, and investing in training and infrastructure to enable the sector’s growth.

4.8. EUROPEAN-LEVEL OUTLOOK

During the methodology design phase, the research team aimed to capture a broad and nuanced perspective from European experts working at the intersection of Extended Reality and cultural heritage. Given the remarkable diversity of backgrounds and specialisations among the selected interviewees, the interviews were conducted using a semi-structured approach. This flexibility allowed the research team to tailor each conversation to the specific expertise of the interviewee, while maintaining consistency in addressing overarching themes. As a result, the interviews yielded rich, multidimensional insights not only into the current state of XR implementation in cultural heritage but also into the most urgent policy interventions needed at the EU level to foster meaningful, sustainable innovation in this field. Two key topics emerged as particularly critical: the absence of a clear policy for data sharing and the digital divide within the heritage sector.

4.8.1. Absence of a clear policy for data sharing

A major barrier identified by interviewees is the lack of a clear, unified policy for data sharing in the cultural heritage sector. Current inconsistencies between the principle of open access and national copyright laws allow institutions to restrict access to digitized public domain objects, often through restrictive licensing. This creates artificial ownership over public assets and severely limits reuse, especially in XR applications. Experts stressed that these legal uncertainties are more obstructive than technical challenges. A proposed solution involves adopting "viral open data" policies – ensuring that data generated through public funding remains freely accessible and reusable, including derivative works. This approach would foster openness, prevent commercial exploitation of public heritage, and provide a stronger foundation for the development of XR experiences that rely on high-quality, accessible cultural datasets.

Additionally, many European countries face the critical challenge of securing long-term funding for the infrastructure needed to store and maintain this data. It is not enough to deposit cultural datasets in platforms like Zenodo[28]; they must meet the FAIR principles – Findable, Accessible, Interoperable, and Reusable, and be of sufficient quality for use in research and (further) AI applications[29].

[28] https://zenodo.org/

[29] As one of the expert highlighted – “in a lot of the European countries, the biggest challenge is to have long long-term funding for the infrastructure that is going to hold the data that is made accessible. That's the ground stone. The infrastructure and making sure that data is of good quality and made fair when it's made accessible. You can't just store something on Zenodo and expect it to be good enough to use in AI models or in research processes” (interviewee: EU-level expert).

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4.8.2. The digital divide within the heritage sector

Another prominent concern is the growing digital divide across the heritage sector, particularly affecting smaller and local institutions. Many lack basic digital infrastructure, skills, and access to funding needed to participate in immersive technology projects. While EU programmes like Horizon Europe and Creative Europe support digitisation, they often favour innovation-driven, large-scale initiatives, leaving less digitally mature actors behind. Interviewees emphasised the need for targeted capacity-building and training to enable equitable access to XR technologies. Without this, the sector risks deepening inequalities, where only well-resourced institutions benefit from digital transformation. To close this gap, future policy must include dedicated support for skills development, simplified funding procedures, and platforms for collaboration—ensuring all institutions, regardless of size or capacity, can contribute to and benefit from Europe's digital cultural heritage landscape.

5. Conclusion

The Analysis concentrated on four main policy areas: regulatory frameworks, funding mechanisms, intellectual property and licensing, and skills and training. At the EU level, existing instruments such as the Europeana Strategy, Creative Europe, and Digital Europe provide a foundation for the digitisation of cultural heritage and for projects incorporating XR technologies. However, the landscape study found that national frameworks in Cyprus, Poland, and Türkiye are underdeveloped or fragmented in their support for XR in cultural heritage. **In Poland and Cyprus, digital heritage strategies are not unified, and in Türkiye, the absence of an overarching XR strategy constrains progress.** Moreover, stakeholders across all countries highlighted the limited practical impact of national policies, noting that they often operate in isolation from implementation realities.

Regulatory constraints emerged as a critical challenge. Legal definitions frequently fail to encompass digital assets such as 3D models or immersive experiences, **leaving cultural heritage institutions uncertain about their responsibilities and rights**. In several cases, rigid frameworks have excluded capable partners from participating in public contracts due to formal requirements that do not reflect the realities of small-scale creative innovation.

Funding represents another area of significant disparity. EU-level programmes remain the dominant source of funding, but many stakeholders – particularly smaller institutions, struggle with application complexity and low success rates. National funding mechanisms are either weak or ill-tailored to the specific demands of XR implementation in the cultural heritage domain. Interviewees repeatedly called for streamlined access procedures, the establishment of targeted funding instruments, and the creation of long-term financing frameworks. Intellectual property regulation was also flagged as a systemic barrier. Legal uncertainty around ownership and rights management for XR content discourages institutions from developing or sharing immersive outputs. **In all three countries, there is an absence of clear protocols governing the reuse or distribution of XR assets**, leaving organisations vulnerable to legal disputes.

The area of skills and training also presents structural weaknesses. While there are EU-level initiatives under the Digital Skills Agenda, there is limited translation into national programmes that specifically address the interface of XR and CH. Stakeholders identified **a need for specialised training and upskilling**, both within the cultural heritage sector and among technology providers (business representatives). They also pointed to the need for collaborative formats that can foster mutual understanding between technical and cultural domains.

Despite the challenges and systemic gaps highlighted, **the analysis also identified positive signals**. Across the studied regions, collaborations between heritage institutions and technology providers are beginning to emerge. **There is evidence of growing interest from policymakers and cultural institutions in understanding and leveraging XR as a transformative tool.** These findings suggest that, with well-designed and targeted interventions, it is possible to foster a policy environment that actively promotes innovation. Stakeholders proposed concrete policy actions such as the formulation of ethical guidelines, the standardisation of licensing frameworks, and the establishment of shared infrastructure and coherent data governance systems. The *Policy Landscape Analysis* thus provides the HERIFORGE

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project with a **state-of-the-art** understanding of the policy and institutional environment at the onset of a three-year effort to support innovation in the cultural heritage sector. The results of this analysis will be actively used in the design of investment strategies (**Task 2.3**), the establishment and operationalisation of the hubs (**WP4**), and the **launch of innovation partnerships** and **open calls**. By grounding future activities in these findings, HERIFORGE is well-positioned to address current barriers, support emerging collaborations, and contribute to long-term policy change both locally and at the European level.

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7. Appendices

APPENDIX 1. DOCUMENTS COLLECTION METHODOLOGY

HERIFORGE Zotero Document Collection guideline

1. Add new item
   - 1.1. Navigate to HERIFORGE Library
   - 1.2. Navigate to your group collection (e.g. Group I – Cyprus)

   - 1.3. Create new item (you can use the "New Item" button –green plus), → type: document
   - 1.4. If the document is more theoretical or methodological – add the document to the additional folder "General research"
2. Fill out the required metadata fields:
   - 2.1. Item Type: Document
   - 2.2. Title: [Full title in original language]
   - 2.3. Author: [for general research documents]
   - 2.4. Abstract: [Provide short, basic description of the document in English]. For every document to be gathered, include a contextualised abstract (up to 500 words).
   - 2.5. Publisher: Organisation name in English
   - 2.6. Date: [Date when the document was published – dd.mm.yyyy]

NOTE: If there is only the month and year or just a year written on the document, fill it using the same format: mm.yyyy or yyyy

   - 2.7. Language: type the code for a country ISO 3166-1 alpha-2: Cyprus: CY; Poland: PL and Türkiye: TR
   - 2.8. Short title: [Document title in English if the document's language is different]
   - 2.9. URL: [link to the document]
   - 2.10. Rights: [name the licence, or use "PD" for public domain]
3. Add the document
   - 3.1. Find the available PDF (it should work if you added URL to pdf)
   - 3.2. If not: download the file to your computer and choose Add attachment / Attach stored copy of file
4. Add the snapshot (only for policy collection)

4.1. If the website where the policy is posted contains some additional information, we can store it as a snapshot
4.2. Drag websites URL from your browser onto the Zotero item and drop it (do not worry if nothing happens – it takes an app. 5 seconds to update)

5. Add appropriate tags
5.1. You can do this either by dragging the document onto the tag in the left down corner, or by choosing the add option (be sure that you use suggested tags after typing a few first characters, to ensure coherence)
5.2. Add country tags using ISO 3166-1 alpha-2; Cyprus: CY; Poland: PL and Türkiye: TR
5.3. Add stakeholder tags (NOTE: the correct tags starting with a dot – ".")
5.4. research-orange, business-blue, government-yellow, societal-green

NOTE: there can be multiple tags to each document. Tags should address the object of the policy (e.g. NGOs that are described).

research	.research
business	.business
government	.government
societal	.societal

Additional information – "Passages" – only for policies collected in four folders

1. Passages: Select the relevant sections from each document for the project. If the entire document is applicable, you may include it in full. There is no specific length limit for a passage, but aim to keep it as concise and meaningful as possible. When in doubt, reach out to a country group coordinator or WP2 leaders for guidance.

- Use machine translation via DeepL to translate the passages into (UK) English, ensuring the translation is coherent and understandable for the reader.
- For each excerpt, add a separate note in the Zotero library record, including the following details: Title: Passage #1, Passage #2, …, Passage #n.

APPENDIX 2. INTERVIEWS SCENARIO 1 – CULTURAL INSTITUTIONS REPRESENTATIVES, BUSINESS REPRESENTATIVES

Note to the interviewer: There will be two slightly different interview scenarios, one for policymakers and another for cultural institutions representatives and businesses representatives. While they are quite similar, the distinction makes it easier to follow each scenario. Be sure to confirm whether you are conducting the interview with a policymaker or a CHI/business stakeholder before starting.

Introduction

Thank you for taking the time to participate in this interview. My name is [Your Name], and I am part of the HERIFORGE project, which aims to develop strategies for research and innovation that support Cultural Heritage Institutions in three countries: in Cyprus, Türkiye and Poland. This interview is part of our effort to

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understand how policies influence the use of Extended Reality (XR) technologies in the cultural heritage sector.

The interview will be divided into three parts:

1. The current situation when it comes to the policies related to XR and cultural heritage in your country
2. The impact of policies on daily practices, and your daily-basis work
3. Challenges and gaps in existing policies

Please remember that there are no right or wrong answers. Your viewpoints and valuable experiences are of utmost significance.

We will be using direct quotes anonymously from this interview in our reports. Your insights will contribute to our analysis of the policy landscape and the challenges and opportunities in implementing XR technologies for cultural heritage. Before we begin, I would like to inform you that this interview will be recorded for transcription purposes, and recording starts now.

Background Information

1. Can you briefly introduce yourself, your role, and your experience within the cultural heritage and/or XR technology sector?
2. What is your organization's involvement with digital cultural heritage and XR technologies?
3. How familiar are you with national, regional, or EU policies related to XR and cultural heritage?

Now, I would like to ask some contextual questions focused on the national policies in your country.

The current situation

- Do you follow policies on cultural heritage and XR/ emerging technologies? How well do existing policies support the use of XR technologies in the cultural heritage sector?
- What are the key challenges in implementing these policies in practice?

[Follow-up]: Do you see gaps or inconsistencies in the current policy framework? If so, what are they?

- Are organizations actively using government funding or support mechanisms for XR initiatives?

[Follow-up]: Can you give an example of a successful XR project that was supported by national funds?

- Do policymakers collaborate with practitioners and industry experts when drafting new policies?

[Follow-up]: Any public consultation, workshop or other activity to support the policy design?

- How do current policies impact the daily work and decision-making processes in your organization?

The impact of policies on daily practices

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- Can you share specific case studies where policies have significantly influenced the use of XR in cultural heritage?

[Follow-up]: What were the main positive outcomes of these policies in those cases?

- Were there any unintended consequences or challenges that arose?
- How have policies supported or limited your ability to integrate new technologies and creative solutions into your work?
- From your perspective, what are the biggest challenges that face when implementing XR projects in cultural heritage?
- What kind of policy support or funding would be most impactful for overcoming these challenges?

[Follow-up]: Do cultural institutions and tech businesses face challenges in accessing funding for XR initiatives?

- What legal factors contribute to successful collaborations between cultural institutions, businesses, and policymakers in XR innovation in your country?

Challenges and gaps in existing policies

- What do you think policymakers should prioritize to better support XR applications in cultural heritage?
- Are there any policy changes or new initiatives that would make a significant difference in your work or your sector?
- Are there regulatory burdens (e.g., licensing, copyright laws) that slow down innovation?
- Have you encountered any legal challenges related to copyright or licensing when using XR for cultural heritage?

[Follow-up]: Have you faced any ethical dilemmas or legal barriers in implementing policies on digital cultural heritage and XR?

Summary and conclusion

To conclude our conversation, I would like to ask a few final questions to summarize your insights. Based on our discussion, what do you think is the most urgent policy issue affecting the use of XR in cultural heritage today?

Is there anything we have not covered that you think is important for us to understand?

We sincerely appreciate your time and the valuable insights you have shared. Your responses will be directly used in our reports to contribute to a better understanding of the policy landscape around XR and cultural heritage. If necessary, would you be open to a follow-up mail contact to clarify certain points or provide additional information? Once our research progresses, we will share our findings with you and keep you updated.

Thank you again for your participation.

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APPENDIX 3. INTERVIEW SCENARIO 2 – POLICYMAKERS

Interview scenario

Note to the interviewer: There will be two slightly different interview scenarios, one for policymakers and another for cultural institutions representatives and businesses representatives. While they are quite similar, the distinction makes it easier to follow each scenario. Be sure to confirm whether you are conducting the interview with a policymaker or a CHI/business stakeholder before starting.

Introduction

Thank you for taking the time to participate in this interview. My name is [Your Name], and I am part of the HERIFORGE project, which aims to develop strategies for research and innovation that support Cultural Heritage Institutions in three countries: in Cyprus, Türkiye and Poland. This interview is part of our effort to understand how policies influence the use of Extended Reality (XR) technologies in the cultural heritage sector.

The interview will be divided into three parts:

1. The evolution of policies related to XR and cultural heritage
2. EU and national policy Interplay
3. Challenges and needs in current policies

We will be using direct quotes from this interview in our reports. Your insights will contribute to our analysis of the policy landscape and the challenges and opportunities in implementing XR technologies for cultural heritage. Before we begin, I would like to inform you that this interview will be recorded for transcription purposes, and recording starts now.

Background Information

1. Can you briefly introduce yourself, your role, and your experience within the cultural heritage and/or XR technology sector?
2. What is your organization's involvement with digital cultural heritage and XR technologies?
3. How familiar are you with national, regional, or EU policies related to XR and cultural heritage?

Now, I would like to ask some contextual questions focused on the national policies in your country.

Policy Evolution

Understanding Policy Development:

- Can you describe the evolution of policies related to digital cultural heritage and XR technologies in your country?

[Follow up]: Were there any key moments (laws, funding programs, EU directives) that influenced the development of XR in cultural heritage?

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- Who were the major stakeholders or decision-makers involved in shaping these policies?

[Follow-up]: Are there consultations? If so, who is/was taken into consideration, and what form of consultation has taken place?

- Which specific policies or frameworks do you consider most influential in shaping the current landscape of XR in cultural heritage?

Now, we will focus on the interplay between national and European level policies.

EU and national policy Interplay

[Questions for Cyprus and Poland]

- How do EU-level policies influence or translate into national and local policies in your country?
- Which EU policies, such as Horizon Europe, the EU Digital Strategy, or the European Cultural Heritage Strategy, have had the most impact in your sector?
- What challenges or benefits have you observed in applying EU policies to national or local contexts?
- Have initiatives such as the Common European Data Space for Cultural Heritage or the European Collaborative Cloud for Cultural Heritage influenced your organization's approach to XR and digital cultural heritage?

[Questions for Türkiye]

- How do EU-level policies influence or translate into national and local policies in Türkiye?
- Which EU policies, such as Horizon Europe, the EU Digital Strategy, or the European Cultural Heritage Strategy, have had the most impact in your country?
- What challenges or benefits have you observed in applying EU policies or frameworks to national or local contexts in Türkiye? If any.
- Have initiatives such as the Common European Data Space for Cultural Heritage or the European Collaborative Cloud for Cultural Heritage influenced your organization's approach to XR and digital cultural heritage?

Policy Shortcomings

- What are the biggest challenges or barriers in the current policy framework for XR in cultural heritage in your county?
- Are there any gaps in funding, training, or legal clarity that need urgent attention?
- Do you think national policies sufficiently address intellectual property and licensing issues for XR content?

Policy Needs

- What policy reforms or new regulations do you think are needed to better support XR innovation?
- How can the government improve support for training and capacity-building in the cultural sector?

[Questions for Cyprus and Poland]

- How can EU and national policies better align to ensure smoother XR implementation?

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Summary and conclusion

To conclude our conversation, I would like to ask a few final questions to summarize your insights. Based on our discussion, what do you think is the most urgent policy issue affecting the use of XR in cultural heritage today?

Is there anything we have not covered that you think is important for us to understand?

We sincerely appreciate your time and the valuable insights you have shared. Your responses will be directly used in our reports to contribute to a better understanding of the policy landscape around XR and cultural heritage. If necessary, would you be open to a follow-up mail contact to clarify certain points or provide additional information? Once our research progresses, we will share our findings with you and keep you updated.

Thank you again for your participation.

APPENDIX 4. INTERVIEWS CODING SCHEME

colour	CODE	DEFINITION	Comments
blue	Existing Policy Frameworks	This code identifies current policies, laws, regulations, strategies, and guidelines at the local, regional, national, and European levels that are relevant to cultural heritage, digitisation, technology adoption (including XR), intellectual property, and related areas. It includes discussions about the awareness, adequacy, and effectiveness of these existing frameworks.	*Use this code when the participant refers to any existing laws, strategies, regulations, or guidelines at local, regional, national, or EU level that influence cultural heritage, digitisation, XR technologies, or IP rights.*
green	Policy Challenges and Gaps	This code captures discussions about the difficulties, obstacles, shortcomings, and areas lacking adequate policy support in the context of using XR technologies for cultural heritage. This includes issues like the absence of specific digital heritage regulations, copyright complexities, funding limitations, lack of standardization and interoperability, ethical concerns in virtual spaces, and insufficient interdisciplinary collaboration mechanisms.	*Apply when the interviewee highlights barriers or weaknesses in the policy. Includes: Missing or outdated legal frameworks Copyright/IP issues Lack of interoperability/standards Inadequate collaboration frameworks (e.g. cross-sectoral or inter-ministerial) Ethical/legal ambiguities in virtual spaces.*
yellow	Policy Ideas	This code identifies suggestions, demands, and proposals for new policies, amendments to existing ones, or changes in policy implementation that stakeholders believe would better support the use of XR technologies in the cultural heritage sector. This may include calls for increased funding, educational initiatives, simpler procedures, inter-ministerial cooperation, stakeholder engagement, mapping of the XR landscape, and development of standards.	*Use this code for suggestions or proposals for policy improvement, new initiatives, or amendments.*
magenta	Impact of Policies on Practice	This code focuses on how existing or absent policies are perceived to affect the daily operations, project implementation, collaborations, and overall progress of cultural heritage institutions and technology providers in	*Use when the speaker describes how policies (or lack thereof) affect real-life implementation of XR in CH.*

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		utilizing XR. It explores whether policies facilitate, hinder, or remain neutral towards the integration of these technologies.	
orange	Funding	This code addresses policies and mechanisms related to the allocation of financial resources (governmental, EU, regional) for digitisation projects and the adoption of new technologies in cultural heritage. It includes discussions on the accessibility, adequacy, and impact of funding programs, as well as policies concerning shared resources and infrastructure for digital preservation.	*Use for references to the availability, accessibility, and effects of financial mechanisms. Includes: National/EU/institutional funding programs Barriers to accessing funds Infrastructure investment Gaps in support for XR or digital heritage Public/private funding synergies*
grey	Interesting quotes	This code highlighting the interesting quotes that could be later used in the Report text.	

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