

A woman wearing a VR headset and holding a controller, with colorful digital paint strokes in the background.

//MEMENTOES

Memorise



PRE
MIERE

SHIFT

Promoting Inclusive Innovation in Digital Technologies for Heritage Preservation

Policy Brief



HORIZON
RESULTS
BOOSTER

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Executive Summary

Policy frameworks to support cultural heritage, foster innovation, and promote digital inclusion abound in the European heritage and innovation context. Ensuring collaboration between technological firms, research institutes, universities, and cultural sectors and creating services for cultural heritage preservation are among the desired outcomes of such policies. However, supporting cultural heritage through innovation also stems from the need to enhance digital inclusion and literacy in the cultural heritage and creative sectors, addressing skills gaps, fostering innovation, and promoting inclusivity through interdisciplinary education, digital transformation, common infrastructures, and accessibility.

Building upon these needs, this policy brief suggests potential policy actions to bridge expertise gaps, build capacity, and promote inclusion to enhance the cultural heritage sector. The cluster, bringing together the MEMENTOES, MEMORISE, MuselT, PREMIERE, and SHIFT projects (still ongoing) supported by the EU under the call HORIZON-CL2-2021-HERITAGE-01-04—Preserving and enhancing cultural heritage with advanced digital technologies, aims to promote extensive digitisation of cultural heritage, including “born digital” heritage, to ensure its sustainable preservation, restoration, and wide accessibility.¹

Drawing from the learnings emerging from the cluster projects’ main research agendas, accomplishments, challenges and lessons learned along the way, a set of tailored recommendations for policymakers are provided. These focus on promoting digital inclusion and literacy in the cultural heritage and creative sectors by fostering interdisciplinary education, supporting digital transformation in cultural institutions, creating common digital infrastructures, bridging the digital divide, enhancing digital education, and ensuring digital engagement and accessibility.

¹ Learn more at <https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/horizon-cl2-2021-heritage-01-04>.

1 Background

1.1 Cultural Heritage and Creative Sectors

The European Union (EU) has established a robust framework of policies and programs designed to support cultural heritage across its member states. These initiatives encourage cross-border collaboration and facilitate the digital transformation of cultural and creative sectors.

 **Regulation (EU) 2021/818** establishes the Creative Europe Programme to support Europe's cultural and creative sectors. The program aims to promote cultural diversity, heritage, and artistic creation while fostering cross-border collaboration and increasing access to culture. This initiative provides financial support for projects that enhance the visibility and circulation of European cultural works and improve access to culture, particularly for underrepresented groups. By encouraging cooperation across member states, the program seeks to strengthen the competitiveness of the cultural and creative sectors. However, gaps in funding distribution clarity, particularly between cross-sectoral and cultural strands, can hinder the program's overall impact. Clearer guidelines on financial allocation are needed to ensure equitable support for all cultural sectors.

 In 2021, the European Commission published a recommendation for a common **European data space for cultural heritage**. The data space is a European Union flagship that will accelerate the digitisation of cultural heritage assets and the digital transformation of the cultural heritage sector. It comprises cutting-edge infrastructure, a vibrant community, and a suite of products, frameworks, and tools that facilitate the open and trustworthy sharing of heritage data across Europe. It empowers the sector through capacity-building opportunities and supports digital strategies for cultural heritage in Europe. The data space increases participation in Europe's cultural heritage and promotes digital culture as a public good. It offers access to high-quality data, with an emphasis on 3D, and encourages people to reuse it and find new value in it. Data spaces are an initiative of the European Commission, central to the ambitions of the European data strategy. Together, they will harness the value of data for the benefit of Europe's economy and society. Fourteen data spaces in strategic and public interest domains - from manufacturing and health to media and cultural heritage - make up this thriving ecosystem. The Data Spaces Support Centre acts as a platform for collaboration across data spaces. The data space for cultural heritage will be interoperable with other data spaces, enabling standardised data flows, innovation and discovery. Built upon the work of the Europeana Initiative and together with 13 other data spaces, it's central to Europe's ambition for a thriving, data-driven society. Exploration is underway to understand the interconnections between ECCH, the data space, the European Open Science Cloud (EOSC) and other closely related initiatives, such as the network of cultural heritage Competence Centres and to discuss how they will interact with and differ from each other.

 **The European Collaborative Cloud for Cultural Heritage (ECCCH)** aims to develop and protect Europe's cultural heritage through cutting-edge digitisation techniques. This framework enables transdisciplinary and large-scale collaboration among cultural heritage



professionals and researchers, providing advanced tools for digitising artefacts, studying artworks, and documenting data to enhance preservation, conservation, and restoration. ECCCH also offers a secure digital infrastructure for inclusive cooperation across cultural, artistic, and technological sectors, supporting long-term research projects with open access to shared datasets. The initiative targets museum professionals, including scholars, curators, archivists, and conservators, especially from smaller and remote institutions. However, the initiative is still in its early stages, with the European Commission planning several calls under Horizon Europe for 2023 and 2024, supported by a budget of €110 million. Moreover, a sustainable governance model needs to be established.

- 📍 **The Directive on Copyright in the Digital Single Market** addresses the challenges of copyright in the digital age. It aims to ensure that creators and rights holders are fairly compensated while promoting access to cultural content. The directive introduces measures to adapt copyright rules to the digital environment, such as enhanced licensing practices and obligations for online platforms to prevent unauthorised use of copyrighted material. These changes aim to balance the interests of creators, consumers, and digital service providers. However, its implementation has been uneven, and its complex regulations can pose challenges for smaller cultural institutions. Simplifying the regulations and providing support for smaller institutions could improve compliance and effectiveness.

1.2 Innovation and Research

Supporting cultural heritage also means creating the conditions and setting the stage for innovation to flourish across the sector, fostering innovation and talent and promoting technological advancement across member states. Through strategic initiatives such as the EIT's Strategic Innovation Agenda, Horizon Europe, and frameworks for generative AI and extended reality (XR), the EU aims to enhance research capabilities, support entrepreneurship, and ensure the responsible use of emerging technologies. These policies are designed to create a synergistic environment that leverages the potential of cultural and creative industries, promotes global collaboration, and addresses societal challenges through cutting-edge research and innovation.

- 📍 **Decision (EU) 2021/820** outlines the EIT's Strategic Innovation Agenda, focusing on boosting innovation, talent, and capacity in Europe. This agenda aligns with Horizon Europe, emphasising the integration of cultural and creative industries. It sets priority fields and strategies for the EIT over a seven-year period, including actions to foster innovation ecosystems, support entrepreneurship, and enhance skills development. The agenda aims to generate significant social, economic, and environmental impacts by leveraging the potential of cultural and creative sectors. Nonetheless, stronger synergies with Horizon Europe and more robust mechanisms are required to evaluate its socio-economic and environmental impacts. Better integration with existing programs and comprehensive impact assessment tools are essential. Photo: InnoRenew CoE

- 📍 The EU is developing guidelines and frameworks for the use of artificial intelligence (AI) and extended reality (XR) in research. These frameworks emphasise ethical standards, inclusivity, and the responsible use of technology. The **AI Act**, for instance, aims to regulate AI applications, ensuring they are transparent and safe and respect fundamental rights. Similarly, the XR frameworks seek to promote the development and use of immersive

technologies that benefit society and align with ethical principles. Whilst the frameworks provide essential guidelines for ethical AI use, they suffer from broad and sometimes ambiguous definitions, leading to potential enforcement inconsistencies across member states. Clear definitions and standardised enforcement mechanisms are needed to ensure uniform application of these guidelines.

1.3 Digital Transformation and Inclusion

A third essential element for enhancing cultural heritage and Inclusion through disruptive technologies. In this context, the EU has developed a suite of policies to enhance transparency, foster innovation, and promote digital inclusion across member states. These policies collectively aim to create a comprehensive and inclusive digital ecosystem that supports economic growth and societal well-being.

- 📍 **The Directive on Open Data and the Reuse of Public Sector Information** promotes the availability and reuse of public sector data across the EU. By enhancing transparency and fostering innovation, this directive aims to create a comprehensive data ecosystem that benefits the public and private sectors. It encourages member states to make their data available in open formats, thus facilitating the development of new services and applications that can drive economic growth and improve public services. However, it excludes specific cultural establishments like orchestras and theatres, limiting its comprehensive impact on the cultural sector. Expanding the directive's scope to include all cultural establishments could enhance its effectiveness.
- 📍 **EU policies on digital inclusion and media** focus on ensuring that all citizens can access digital technologies and participate in the digital economy. Initiatives such as Europe's Digital Decade and the Digital Services Act aim to bridge the digital divide, enhance digital literacy, and protect users' rights online. These policies promote a diverse and inclusive digital culture by supporting access to high-speed internet, improving digital skills, and fostering the development of digital content and services that reflect Europe's cultural diversity. Yet, significant disparities in digital skills and infrastructure remain, affecting the uniform adoption of digital technologies. Addressing these disparities ensures that all EU citizens can benefit from digital advancements.
- 📍 **The Digital Education Action Plan** aims to integrate digital technologies into education, promoting equal access to digital tools and enhancing digital literacy across the EU. This plan outlines actions to support the development of digital skills among students and educators, improve the digital infrastructure of educational institutions, and promote innovative teaching methods. By addressing the digital divide and ensuring that all learners have access to digital resources, the plan seeks to enhance educational outcomes and prepare citizens for the digital economy. However, unequal access to technology and varying digital literacy rates among member states continue to hinder its full effectiveness. Enhancing infrastructure and providing equal opportunities for digital education are necessary to overcome these challenges.



2 Recommendations for policy actions promoting digital inclusion and literacy

Building from the experience of the PG, this document presents key policy recommendations to promote digital inclusion and literacy within the cultural heritage and creative sectors. These actions address the challenges and barriers in bridging the skills and technological literacy gap while fostering innovation and inclusivity. By focusing on interdisciplinary education, digital transformation, unified digital infrastructures, and accessibility, these recommendations aim to empower diverse communities and ensure equal opportunities in the digital age. The outlined strategies align with existing EU initiatives and promote cohesive, comprehensive approaches to enhancing digital skills and cultural awareness across Europe.

2.1.1 Promote interdisciplinary education and training:

To foster a holistic educational environment, developing and implementing programs that integrate arts, technology, and cultural studies across various educational levels, from primary schools to universities, is crucial. These programs should emphasise the interconnections between these fields, demonstrating how technological advancements can enhance artistic expression and cultural understanding. Aligning these initiatives with EU programs such as Erasmus+ and the Digital Education Action Plan will leverage existing resources and expertise, facilitating student exchanges, collaborative projects, and sharing best practices. This comprehensive approach aims to enhance students' digital literacy and cultural awareness, preparing them for the dynamic, interdisciplinary nature of the modern workforce.

2.1.2 Support Digital Transformation in Cultural Institutions

Providing sustained financial and technical support for digital infrastructure is essential for the digital transformation of cultural institutions. This includes funding for high-speed internet, digital archives, and state-of-the-art equipment. Additionally, staff training programs must be offered to ensure that employees are equipped with the necessary digital skills. Programs should also focus on building internal capacities for managing digital transformation, including leadership training and strategic planning workshops. These initiatives will help cultural institutions create and maintain digital content, engage with broader audiences, and innovate their offerings, ensuring they remain relevant in the digital age.

2.1.3 Enhance Synergies and Shared Standards in Digital Infrastructures

Developing and promoting common standards for digital infrastructure across cultural and heritage institutions is key to facilitating seamless collaboration and data sharing. This includes standardised data formats, interoperability protocols, and shared software platforms. Encouraging collaboration among stakeholders—such as cultural institutions, technology providers, and policymakers—through regular workshops, conferences, and collaborative platforms will promote knowledge sharing and the adoption of best practices. A unified digital infrastructure will enable institutions to work together more efficiently, enhancing their ability to innovate and provide diverse digital offerings to the public.

2.1.4 Bridge the Digital Divide:

To address the digital divide, it is essential to implement initiatives ensuring high-speed internet access in underserved and rural areas. This can be achieved through public-private partnerships, government subsidies, and infrastructure development projects. In addition to providing connectivity, launching comprehensive digital literacy programs targeting various demographic groups—such as the elderly, low-income families, and individuals with low digital proficiency—is crucial. These programs should offer training that ranges from basic to advanced digital skills and be accessible both online and offline. By improving internet access and digital literacy, all citizens can be empowered to participate in the digital economy and society.

2.1.5 Enhance Digital Education

Enhancing digital education requires providing resources and training to help students and educators integrate digital technologies into the classroom. This includes funding for digital devices, access to online learning platforms, and teacher professional development. Encouraging the adoption of innovative teaching methods that leverage digital tools—such as flipped classrooms, interactive learning apps, and virtual reality simulations—can significantly enhance student engagement and learning outcomes. Supporting students and educators in this transition will create a more dynamic and effective educational environment that prepares students for the digital world.

2.1.6 Foster Digital Engagement and Accessibility

To ensure digital content is accessible to all users, including those with disabilities, it is necessary to develop and implement policies adhering to standards like the Web Content Accessibility Guidelines (WCAG). These policies should require digital content to be available in multiple formats, such as text, audio, and visual, to cater to different needs. Encouraging cultural institutions to adopt accessibility standards and best practices is also essential. This can be supported by providing grants for accessibility audits and upgrades and recognising institutions with high accessibility standards. By fostering digital engagement and accessibility, digital resources can become more inclusive, benefiting a wider audience.



3 Resources

Academic Literature

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Online repositories

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Archives Portal Europe. Available at <https://www.archivesportaleurope.net/>.

EHRI. Available at <https://portal.ehri-project.eu/data-policy>.





Project group

// MEMENTOES

MEMENTOES (iMmersive gamEs for Museums as vehicles to Engage visiTOrs in Empathetic reSponses)- <https://mementoes.eu/>.



MEMORISE (Virtualisation and Multimodal Exploration of Heritage on Nazi Persecution) - <https://memorise.sdu.dk/>.



MuseIT (Multisensory, User-centred, Shared cultural Experiences through Interactive Technologies) - <https://www.muse-it.eu/>.



PREMIERE (Performing arts in a new era: AI and XR tools for better understanding, preservation, enjoyment and accessibility) - <https://premiere-project.eu/>.



SHIFT: (MetamorphoSis of cultural Heritage Into augmented hypermedia assets For enhanced accessibiliTy and inclusion) - <https://shift-europe.eu/>.





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