SHIFT

MetamorphoSis of cultural Heritage
Into augmented hypermedia assets
For enhanced accessibiliTy
and inclusion

Document info

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Abstract:	This document contains an initial outline of a Policy Brief, delivered at M12. It will be updated continuously and finalised in the last month of the project as D6.8.

The document describes results of SHIFT which have potential implications for policies and related actions of different kinds at local, national, regional and European levels, and indicates who the target audiences are with estimated metrics and KPIs.

Its eventual content will be used by the SHIFT consortium to brief strategic partners, stakeholders and policy makers. Its tone is mainly non-technical and plain language, so that different sections may be recombined for appropriate use in briefing. |
| **Keywords** | Digital Cultural Heritage, Accessibility, Inclusivity, Technology, Tools, Cultural Heritage Institutions, Policies |

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Contents

Executive Summary

It is the European Union's role is to assist and complement the actions of Member States in preserving and promoting Europe's cultural heritage. The European Commission (EC) has developed a number of relevant policies and programmes towards this end. It also supports and promotes policy collaboration between Member States and stakeholders on cultural heritage. Its strategic framework for cultural heritage includes a number of elements which are outlined in this document .

Europe's cultural heritage is one of the richest in the world. Cultural heritage was recognized by the Council of European Union and the EC in 2014 as a strategic resource that not only should be preserved, but also leveraged as a driver of economic and social development. In this context, Cultural Heritage content contributes to the Digital Single Market, by providing copyright content protection and expertise. Cultural heritage is evolving rapidly thanks to digital technologies. The transformation of the sector is resulting in easier online access to cultural material for everybody.

The EC Directorate General for Communications Networks, Content & Technology (DG CONNECT) has conducted extensive policy coordination and funding actions to supplement Member States' cultural policy, which cover the areas of digitisation, online access to cultural material and digital preservation. The EC fuels the policy debate and brings stakeholders together to improve the framework conditions for digitisation and digital preservation, for example through its Recommendation on a common European data space for cultural heritage. The Commission's Expert Group on a common European Data Space for Cultural Heritage (CEDCHE) monitors progress towards the implementation of the Commission's Recommendation and facilitates the exchange of information and good practices working closely with cultural institutions.

The realities of applying theoretical policies to practical situations require extensive validation through research, implementation and evidence gathering. This document forms a first version of a Policy Brief, intended to outline the potential and intentions of SHIFT to address some important policy issues related to the deployment and impact of digital cultural heritage in a number of social, economic and technology-related policy contexts.

SHIFT is one of a cluster of six projects funded by the European Commission's Horizon Europe Program under *Cluster 2: Culture, Creativity, and Inclusive Society: Preserving and enhancing cultural heritage with advanced digital technologies*, within which SHIFT supports the adoption of digital transformation strategies and the uptake of tools within the creative and cultural industries (CCI). Since impact on policies may be achieved more effectively through a coordinated approach between the clustered projects, this will be investigated and pursued actively during the remainder of the project duration.

D6.7 therefore attempts to systematise the expected results of SHIFT which have potential implications for policies and related actions of different kinds at local, national, regional and European levels, and indicates who the target policy stakeholders are.

The document is structured according to defined policy areas of relevance to SHIFT (see the Table of Contents). It is presented at this stage as an initial structure, which will be regularly updated and expanded throughout the remainder of the project duration, so that it becomes increasingly useful in creating policy-related communications and messaging, eventually becoming D6.8 in its final form in the last month of the project.

The format of the Policy Brief is divided into topics drawn from the objectives of the project as set out in the Grant Agreement, but also taking into account known relevant policy initiatives, for example in the fields of Digital Cultural Heritage, Accessibility and Digital Technology. Each topic is described in a tabular form, as follows:

Policy issue
Policy stakeholder (s)
Intended SHIFT Message
Supporting evidence available.
Expected/emerging evidence from SHIFT

Anticipated policy impacts of SHIFT

The sections on policies in individual countries which form section 10 of this document, currently reflect the perceptions and interests on policy priorities of SHIFT partner organisations in their country or region. They will be used as a basis for achieving a wider and more comparable coverage across all the countries involved in D6.8.

Its eventual content will be used by the SHIFT consortium to brief strategic partners, stakeholders and policy makers. Its tone is mainly non-technical and plain language, so that different sections may be more easily recombined for appropriate use in briefing.

Estimated metrics of the number of target policy-makers are provided in a final section, together with KPIs for graded levels of contact and impact.

Introduction

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SHIFT is one of a cluster of six projects funded by the European Commission's Horizon Europe Program under Cluster 2: Culture, Creativity, and Inclusive Society: Preserving and enhancing cultural heritage with advanced digital technologies. SHIFT supports the adoption of digital transformation strategies and the uptake of tools within the creative and cultural industries (CCI).

Policy makers and public policy organisations are two of the nine target groups for dissemination of the results of SHIFT. The other stakeholder audiences include: cultural heritage institutions (CHI) and clusters, content creators, the haptics industry, citizens, vulnerable groups, organisations to promote inclusion of all citizens, and scientific research communities. In formulating this Policy Brief it is hoped that to take account of the interests of each of these groups in relevant policy developments.

1 Policy issues impacted by SHIFT. What's at stake?

The European Union's role is to assist and complement the actions of Member States in preserving and promoting Europe's cultural heritage. The European Commission has developed a number of relevant policies and programmes

towards this end. It also supports and promotes policy collaboration between Member States and stakeholders on cultural heritage.

The EU's strategic framework for cultural heritage includes the following elements:

- European Commission Communication: "Towards an integrated approach to cultural heritage for Europe" (2014). See also the accompanying press release.
- New European Agenda for Culture (2018): protecting and promoting Europe's cultural heritage as a shared resource is one of the strategic objectives.
- The European Council 2023-26 Work Plan for Culture sets out four concrete actions: the safeguarding of cultural heritage against natural and human-made disasters, the fight against illicit trafficking of cultural goods, the preservation of cultural heritage in Ukraine and climate action through arts and cultural heritage.

Europe's cultural heritage is one of the richest in the world. Cultural heritage was recognized by the Council of European Union and the European Commission in 2014 as a strategic resource that not only should be preserved, but also leveraged as a driver of economic and social development. In this context, Cultural Heritage content contributes to the Digital Single Market, by providing copyright content protection and expertise.

Cultural heritage is evolving rapidly thanks to digital technologies. The momentum is now to preserve our cultural heritage and bring it to this digital decade. Unprecedented opportunities offered by technologies, such as Data, AI, 3D and XR bring cultural heritage sites back to life. Virtual museums provide visitors with the possibility to see art works in context and experience objects or sites inaccessible to the public. The transformation of the sector is resulting in easier online access to cultural material for everybody.

The European Commission Directorate General for Communications Networks, Content & Technology (DG CONNECT) has conducted extensive policy coordination and funding actions to supplement Member States' cultural policy. These actions cover the areas of digitisation, online access to cultural material and digital preservation.

The European Commission fuels the policy debate and brings stakeholders together to improve the framework conditions for digitisation and digital

preservation, for example through its Recommendation on a common European data space for cultural heritage.

The European Commission's Expert Group on a common European Data Space for Cultural Heritage (CEDCHE) monitors progress towards the implementation of the Commission's Recommendation. The CEDCHE reviews and discusses policies for digital cultural heritage and the upcoming initiative for a common European data space. It also facilitates the exchange of information and good practices working closely with cultural institutions. The expert group was set up in 2019 to maintain the unique multi-stakeholder cooperation and policy dialogue achieved during the European Year of Cultural Heritage 2018. Its objective is to promote public policies that ensure the long-term value and sustainability of Europe's cultural heritage based on an integrated approach. The experts provide advice and expertise to the Commission and serve as a platform for consultation and exchange of information on cultural heritage policies to support the implementation of the European Framework for Action for Cultural Heritage. Its members include: EU Member States, Western Balkans countries, Norway, Representatives of 26 European cultural heritage stakeholders' organisations, 5 experts in an individual capacity and international organisations such as UNESCO, Council of Europe, OECD and the International Centre for the Study of the Preservation and Restoration of Cultural Property (ICCROM), European Parliament (as observer), Committee of the Regions (as observer).

Major funding instruments include open calls on digital cultural heritage under the Horizon Europe and Digital Europe Programme (DEP). Previous actions under Horizon 2020 Societal Challenges 6 programmes for 2014-2020 have supported cultural heritage-related topics with an EU funding of around €70 million.

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2 Sectoral recovery and resilience post-COVID

Policy issue

While the COVID-19 crisis has heavily impacted the cultural and creative sectors, it also provides momentum to further accelerate a number of trajectories towards more sustainability that emerged prior to or during the crisis. Given the multilevel vulnerabilities that characterised the sectors already pre-COVID19, a return to the 'old normal' after the crisis is not considered as a viable option. A more systemic transition is needed in which unsustainable practices (related to e.g. vulnerable working situations, fragile remuneration structures) are replaced by more sustainable alternatives.

The alternatives that emerged during the crisis provide a strong foundation upon which to further develop. During the crisis, many cultural and creative workers and organisations have shown their innovative power to experiment with possible alternatives, often in collaboration with new partners. When the containment measures forced CHI, creative industries and freelancers to halt their normal activities, many promptly adapted to new digital distribution formats – with interesting lessons learnt to further build upon. The sector witnessed an increased sectoral unity through numerous joint actions and movements. But the most striking opportunities that the crisis has accelerated relate to the great contribution of the organisations and professionals to the well-being of citizens, social innovation and social cohesion.

To accelerate these opportunities, support for innovation and experiments will be crucial.

The 2030 Sustainable Development Goals of the United Nations can serve as a powerful compass for steering (support for) the transition process as they set clear and internationally approved ambitions and mobilise every citizen, organisation, sector or institution to contribute. The crisis has illustrated the power of the CCS to be(come) a substantial partner in the EU's commitment to implement the United Nations' 2030 Agenda.

Policy stakeholder(s)

European Parliament
UNESCO
National Ministries

Intended SHIFT Message

The SHIFT consortium has observed at firsthand how the post-COVID recovery is happening through visits to two museums participating in the consortium (in Hungary and Serbia) and foresees an important role for its tools, technologies and results in further stimulating the innovative power of the sector to achieve recovery and greater resilience.

Supporting evidence available

16 out of 22 Member States have included in their recovery and resilience plans a range of reforms and investments to support the resilience of the cultural and creative industries and to drive their green and digital transition [1].

These measures supporting culture and the creative industries account for around €10 billion, representing approximately 2.3% of the estimated cost of the 22 recovery and resilience plans adopted in 2021. The figure takes into account measures contributing to the cultural sector and partly include measures related to tourism.

Various countries have included important legislative reforms, including legislation to improve the status and working conditions of artists and cultural workers or embrace digital and greening opportunities.

Member States have also planned investments to support the digitisation, production and dissemination of content as well as to develop digital skills in the cultural and creative sectors.

Renovations aiming to increase the energy efficiency in cultural heritage buildings and incentives for green and climate-friendly projects by cultural actors are also part of some plans. Other investments will target the competitiveness, innovation and internationalisation of the culture and creative industries.

Several Member States have planned to finance the creation and production of cultural content and the promotion of cultural offerings to foster cultural tourism and increase the attractiveness of the regions.

Other innovative planned actions will enhance access to culture and harness its power for social cohesion and well-being.

The culture and creative industries will also benefit from a larger pool of measures that have a wider policy focus, such as green construction, digitalisation of small and medium-sized enterprises, financial instruments or digital skills trainings of workers also open to professionals and companies active in the cultural sector.

Expected/emerging evidence from SHIFT

Evaluations of pilots

Take-up through dissemination (WP6)

Anticipated policy impacts of SHIFT

Strengthening of the case for investing in digital transformation of cultural heritage institutions in support of resilience, recovery and well-being through cultural engagement.

3 User engagement and enriched experiences

Policy issue
In order to stimulate the growth of CHI, there is a critical need to develop new methodologies for user engagement, improved user experiences, advances in accessible technologies and consideration of inclusion by design principles.

User engagement and enhancing cultural appeal are two main contributions to be achieved through digital transformation. This involves enriching user experiences for interacting with cultural assets**.**

Policy stakeholder (s)
DG CONNECT
CEDCHE representatives
EU DG FOR EDUCATION, YOUTH, SPORT AND CULTURE
Relevant National Ministries and Associations

Intended SHIFT Message
Addressing user engagement is a major feature of the SHIFT objectives, which is drawn out more explicitly in many specific aspects of the work of the and results of the project (described in sections which follow).

SHIFT delivers a cutting-edge, beyond the state-of-the-art curation solution that brings together multimedia algorithms and content processing capabilities, for transforming audio-visual assets to textual descriptions capable of analysing emotional quotient (EQ), 3D representation models which offer the sense of touch for end-users and software interfaces to configure digital 3D representations with haptic interfaces to be worn by citizens, which will be implemented in the business models of its CHI partners.

Supporting evidence available

Expected/emerging evidence from SHIFT
D4.3 Tools for Cultural Asset Curation and features extraction - final version

Anticipated policy impacts of SHIFT
Support for development of policies which increase digital appeal and accessibility of cultural heritage.

4 Accessibility of cultural assets

Policy issues

Being able to access the cultural life of a community is a fundamental human right. Enabling people with disabilities to enjoy equal opportunity to experience cultural content in cultural institutions, such as museums, will benefit not only these people, but also local communities financially. Digital content accessibility refers to the inclusive practice of making digital contents usable and comprehensible by all citizens (with abilities and disabilities included). Within the current adoption of digital transformation strategies, the notion of accessibility has been widely addressed within the context of information being shared through Internet services.

There is a need to increase accessibility of cultural assets by making digital content usable and comprehensible by all citizens, where there remains a lot of room for improvement. The lack of multimodal user engagement tools has resulted in unimodal representation (in text) of historical content.

In the realm of museums where culture is preserved and stories are shared, critical challenges to a vision of inclusivity and accessibility are encountered.

Challenge 1: diverse heritage, diverse needs. Our cultural heritage often excludes individuals of diverse backgrounds from fully engaging with it.

Challenge 2: physical barriers transform heritage exploration into a struggle for individuals with mobility challenges. Limited access narrows their ability to engage with exhibits, diminishing their capacity to immerse themselves in their stories.

Challenge 3: language and cognitive barriers. The language barrier and cognitive disabilities create a divide leaving visitors disconnected from heritage stories.

Challenge 4: exclusion of sensory diversity. Many cultural experiences focus on sight and sound, excluding those who experience the world differently.

Challenge 5: theatre of inclusivity. While museums should prioritise inclusivity for all visitors, certain interactive elements and live performances may unintentionally exclude individuals with varying abilities.

Policy stakeholder (s)
CEDCHE representatives
Relevant national Ministries and Associations

Intended SHIFT Message
SHIFT makes an important contribution to the public policy on accessibility and

inclusion by revitalising the cultural heritage experience, matching innovation with tradition and creating multi-sensory heritage encounters that transcend boundaries and welcome everyone. The project aims to unlock the past for everyone by ensuring that cultural heritage becomes accessible to all and allowing everyone inclusively to connect with their heritage, regardless of background or ability.

Emphasising that diversity matters, SHIFT pursues the empowerment of people with disabilities to enrich their perspectives and foster their understanding, thereby contributes to greater harmony in our diverse world.

The SHIFT project takes these challenges head-on, reimagining accessibility to cultural heritage through innovative and inclusive approaches and strategies to redefine heritage experiences. Enhancing multimodal interaction has redefined heritage management. By addressing these issues we pave the way to a more accessible and enriching cultural experience for all.

Supporting evidence available

Museums have taken measures to be more accessible and considerate of the needs of people with disabilities, for example by providing audio descriptions for people with visual impairments or by offering virtual tours, benefitting people who cannot travel and may have limited mobility. Initiatives in SHIFT partner institutions in Hungary and Serbia exemplify the direction of what can be achieved.

Expected/emerging evidence from SHIFT

Our approach involves:
- recreating artefacts digitally for immersive experiences
- a novel accessibility framework for virtual reality
- multimodal access and enhancing virtual reality with haptic techniques in order to provide a more diverse user engagement
- alternative interaction modalities to leverage user experience, with tools tailored to end-users' accessibility needs, such as haptic feedback methods that replicate tangible assets and multi-sensory encounters through forces, vibrations and shapes
- personalised interaction by enabling content provision to adapt to individual needs
- integral inclusivity - developing applications accessible by design
- technology that bridges the gap between sight and touch. empowering the visually impaired to perceive art in profound new ways

Based on this approach, we have developed haptic techniques for 3D digital asset perception for visually impaired persons. The haptic integration is provided to the users through interactive haptic gloves powered by Weart TouchDIVER. These gloves offer touchable 3D experiences enabling the user's field force and temperature
feedback for an immersive touch.

Beyond visuals, we are transforming 3D into touchable encounters that make the gloves react to material characteristics like marble and paintings, creating a truly immersive encounter. By adding a dynamic layer to the experience, we enable dynamic feedback, for example, temperature changes, while the user explores the asset to simulate fire, water, wind, and more.

Creation of new automated content using technologies like 'Text to Speech", "Video to Text" and haptics sensing encourages vulnerable groups to engage in an innovative manner with CH content and ensures wider inclusion.

Our tools employ multiple methods, including haptic devices, virtual reality controllers,
and keyboards and by elevating the output channels through haptic feedback, AI- AI-generated auditory cures, and immersive 3D soundscapes, a holistic and inclusive heritage experience is ensured.

In order to easily employ our tools in immersive environments, we are implementing a framework for accessible content. Its key features include:
- auditory feedback for extended reality environments
- tactile feedback via haptic gloves
- immersive 3D sound experiences for spatial awareness
- adaptation of provided information to diverse needs through customizable visual settings
- improved font colour and text-to-speech capabilities
- enhanced visibility of fine details via magnification lens
- interactive zone navigation enabling the effortless immersive exploration of digital worlds
- and personalised configurations for tailored experiences according to the user's accessibility needs.

Research outcomes from participatory studies on digital transformation and inclusion methodologies adopted within cultural institutions will be published in D5.4 - Pilots Final Report.

Anticipated policy impacts of SHIFT
Increased policy level understanding of what is needed to improve accessibility and widen inclusivity of digital access to cultural heritage**.**

4.1 Inclusion by design

Policy issue

Following the wide-scale adoption of digital technologies, there is increasing evidence of communities being left behind, due to the lack of awareness and resources to adopt inclusion by design methodologies. Inclusion offers a methodology that enables and draws on the full range of human diversity. The principle of inclusion emphasises the importance of recognising exclusion, learning from human diversity and aiming to solve problems for one but extend the solution to many. Universal design is a strategy for developing spaces, communication, products and services in a way that provides optimal and inclusive access. It is particularly crucial for enhancing inclusion of people with disabilities but also for the elderly and carers of dependants.

There is a need for inclusion by design methodologies within cultural heritage for people with a disability such as a hearing, sight or mobility impairment. Effective engagement with digital media content and interacting with social media applications represent additional challenges.

Such design characteristics are found lacking in the mainstream digital transformation strategy. Despite the market presence of assistive technologies, there is a significant lack of overall uptake of such solutions among wider communities (including people with disabilities), which limits opportunities and experiences to engage with cultural heritage.

Policy stakeholder (s)
Relevant National Ministries and Associations

Intended SHIFT Message
Digital transformation policy strategies for CH should adopt inclusion by design methodologies. The SHIFT technological tools will place users at its centre with a broad consideration of inclusion principles, empathetic design, and community interaction to achieve the universal design for experiencing cultural heritage.

Supporting evidence available
The recommendations on adopting universal design, including the triple synergy between Usability, Accessibility and Inclusion have been well addressed in the literature.

Expected/emerging evidence from SHIFT
D1.4 SHIFT requirements, user evaluation guidelines and acceptance metrics - final version

Anticipated policy impacts of SHIFT
Increased awareness among policy makers of inclusive rather than top-down approaches to design of strategies, content and applications.

4.2 Haptic technologies

Policy issue
The haptics industry involves the inclusion of haptic actuator hardware and associated technology into over a billion devices each year. A variety of different markets require different types of haptic technologies. Haptics can potentially benefit people whose exploration of cultural heritage is impaired due to a visual disability.

Policy stakeholder (s)
The EuroHaptics Society (EHS) and other Industry Associations

Intended SHIFT Message
Haptics Industry providers should consider SHIFT tools for vulnerable groups. Innovative solutions generate business growth in their field through greater demand for sensing devices with digitally specific content.

Repurposing the haptic interaction paradigms used in VR, towards supporting multimodal natural interaction, will enable users to feel they are touching the CH assets, even though they cannot actually reach them.

For example, a SHIFT VR/Haptics tool might mitigate issues of re-building on conservation sites if they can be made accessible alternatively via VR.

Supporting evidence available

See references [2] and [3]

Expected/emerging evidence from SHIFT
A haptics toolkit will enable multi-sensory interaction with digital objects through a novel approach that delivers haptic feedback, emulating the feeling of touch in a digital object**.**

D3.7 Haptic based interaction with CH assets' digital twins - final version
SHIFT Haptics Toolkit

Anticipated policy impacts of SHIFT
Increased recognition and responsiveness in the haptics industry towards specific needs of cultural heritage users.

4.3 Standards compliance

Policy issue
The relevant standards published by W3C as the Web Accessibility Initiative (WAI) formulated recommendations on creating accessible- for- all content published online. Nevertheless, the lack of uptake by cultural institutions and of support for integrating such accessibility standards within individual organisations has been well documented, resulting in the information published from cultural heritage institutions and other CCI stakeholders becoming inaccessible.

Policy stakeholder (s)
World Wide Web Consortium
CEN and CENELEC

Intended SHIFT Message
SHIFT develops accessibility tools not only for interacting with information available in digital format but also to enrich accessibility with semantic technologies, for modelling linguistic evolutions, among other solutions.

Supporting evidence available

Expected/emerging evidence from SHIFT
SHIFT Accessibility framework
Evaluations of pilots

Anticipated policy impacts of SHIFT
Further development and deepening of web accessibility standards demonstrated through cultural heritage, linked with increased support for uptake.

5 Tools and technologies

Policy issue
Today there is access to digital content that was until recently, not widely available, because it was difficult to search and find using old semantic descriptors, complex indexing thesauri, unfriendly content search interfaces, etc. Increasingly, users now create their own content, creating a huge and growing amount that becomes, however, very difficult to discover time-efficiently.

Policy stakeholder (s):
DG CONNECT
EU DG for Research and Innovation/Research Executive Agency (REA)

Intended SHIFT Message
SHIFT develops interdisciplinary scientific innovations leading to new algorithms, and methodologies. It is strategically conceived to deliver a set of technological tools, that offers CHI the necessary impetus to stimulate growth, and embrace the latest innovations in artificial intelligence, machine learning, multi-modal data processing, digital content transformation methodologies, semantic representation, linguistic analysis of historical records, and the use of haptics interfaces to effectively and efficiently communicate new experiences to all citizens (including people with disabilities).

The ability offered to bring static content to life is expected to greatly impact the innovation capacity of CH institutions, as well as content producers at any level (professional and non-professional), because a radically new dimension for content consumption and re-use will be enabled, allowing these institutions to offer new services and products.

Supporting evidence available

See reference [4]

Expected/emerging evidence from SHIFT
SHIFT will:

Extend and build on existing technical environments, creating a platform and tools and conditions for innovation and experimentation with digital cultural content.

Act as a "facilitator" to encourage access, sharing and sustainability of cultural heritage content.

Implement new technologies, such as deep learning, in a way that users are able to use and to integrate it on a daily basis without the need for strong technical capacities. New and more efficient algorithms will enable tools to be

regularly updated to bring to the market the latest and most pertinent technologies.

D 5.4 Pilots final report

Anticipated policy impacts of SHIFT
Innovation, growth and reuse are clearly linked in policies to use of technology tools demonstrated by SHIFT

5.1 AI algorithms

Policy issue
Artificial Intelligence (AI) can be defined as the proposal to create intelligent machines and equipment, capable of reproducing aspects of human intelligence, and can be classified as several types:

Narrow Artificial Intelligence, also known as weak AI, is a form of AI already present in a multitude of applications and devices, used in facial recognition, voice recognition and self-driving cars. Artificial General Intelligence (AGI), or strong AI, aims to mimic human intelligence to solve a diverse range of problems. Although it is currently available in the form of chatbots, research is in progress towards enabling machines to see and understand in a way similar to humans.

Artificial Superintelligence societies are a hypothetical model of AI that surpasses human abilities, often a source of inspiration in science fiction stories about artificial entities taking over the world.

There is a lack of strategic roadmap on how to enhance the uptake of digital tools within the CHI. Recent innovations in the field of AI and machine learning (ML) have created new opportunities to strengthen the impact of cultural heritage assets through the stimulation and increased appeal of historical artefacts.

However, the integration of AI in CH is accompanied by certain doubts, dilemmas

and hesitations, including those concerning the replacement of employees by robots.

Information and communication technologies (ICT) have substantially reshaped the way we consume, access and distribute information, and CHI has the potential to occupy a strategic position at the centre of this transformation. To remain competitive in the information market, CHI must adopt new technologies and AI is becoming a critical necessity, driven by the new paradigms. Despite the unknowns that the widespread use of AI raises, advanced technologies open up new opportunities. AI should be approached, rather than as a threat, as a work tool can be used to better serve future generations.

Policy stakeholder (s)
Partnership on AI
UNESCO
ISO/IEC JTC 1/SC 42

Intended SHIFT Message
Building on the success of these past scientific innovations, SHIFT further develops innovative tools and algorithms to effectively revitalise cultural assets, improving their appeal and social richness and helping to further illustrate the specific role of AI in CH.

Supporting evidence available
Taking public libraries as an example, engagement in the digital transformation process was mainly determined by the continuously expanding information consumption needs of contemporary users, against a background of the diversification of content types, with a pronounced emphasis on the management and distribution of aggregated, processed and stored data supported by technology.

Currently, AI is starting to penetrate more and more into libraries and is having a significant impact in this field by: automating publication loan and return operations for increased efficiency; facilitating and accelerating document content indexing and processing thus eliminating manual work and removing some repetitive tasks; improving library service quality, using chatbots to provide answers to simple questions and freeing up libraries' time for more complex activities.

Expected/emerging evidence from SHIFT
Content discovery through machine learning, new and up-to date themes suggested by social networks; Visual search plus text search plus audio files will be provided according to the frame/video-clip most pertinent theme

Related to economic growth, SHIFT will ease market opportunities for the project stakeholders providing a new way to access a kind of content previously

inaccessible in an easy and effective manner.

Anticipated policy impacts of SHIFT
Significant uses of AI/ML with cultural heritage are more clearly understood and manifested in policy statements .

5.2 3D/XR

Policy issue
3D digitisation has significant potential and value in the area of cultural heritage. By signing the 2019 Declaration of Cooperation on advancing the digitisation of cultural heritage in Europe, 25 Member States and Norway and the UK have acknowledged the importance of 3D digitisation technologies for cultural heritage and the urgent need to make full use of them. The declaration also endorses a call for common standards, methodologies and guidelines for comprehensive, holistic 3D documentation of European 3D cultural heritage assets.

Tangible cultural heritage digitised in 3D can be a source of new knowledge, including with respect to climate-related impact and adaptation. Digitised cultural heritage also has great reuse potential in many sectors, including the creative and cultural sectors, but also education and tourism. The innovative re-use of digitised cultural heritage can be a significant contribution to a European sense of belonging and to European integration.

Policy stakeholder (s)
DG CONNECT
CEDCHE
EU DG for Research and Innovation/Research Executive Agency (REA)

Intended SHIFT Message

Supporting evidence available
A focus on 3D content is a core goal of the Common Data Space for Cultural Heritage, deployed by the Europeana initiative. The European Commission has just launched the 'Twin it! 3D for Europe's culture' campaign and invited the 27 EU Ministries of Culture to select and submit one 3D digitised cultural heritage asset to the data space.

A recent EU study coordinated by Cyprus University of Technology aimed to identify all the relevant elements for 3D digitisation of tangible cultural heritage, classifying them by degree of complexity and purpose or use. It also covered the specific types of equipment used throughout the different stages of the 3D digitisation process, and all the types of relevant data, including geometry, colour, texture and materials. The study aimed to enable cultural heritage professionals, institutions, content developers and academics to define and produce high-quality digitisation standards for tangible heritage, by cataloguing the technical parameters that determine the level of quality of 3D digitisation; existing digital formats, standards, benchmarks, methodologies and guidelines for 3D digitisation; and past or ongoing 3D digitisation projects and existing 3D models and data sets that can serve as benchmarks.

- Final results of the study [5]

Expected/emerging evidence from SHIFT
D3.4 Accessible framework of inclusive museum exhibits for 3D digital asset perception

Anticipated policy impacts of SHIFT
The need for and specific implications of accessibility are recognised in policy-driven initiatives towards creation of and access to 3D assets

5.3 Computer vision

Policy issue
Research in the computer vision community has been driven by the pursuit of implementing algorithms to enable knowledge extraction from automated analysis.

The recently published European Accessibility Act (EAA) provides a regulatory framework, which formalises digital interface needs across several digital displays, such as computers, Automated Teller Machines (ATM), ticketing systems, and TV equipment, among others. On the other hand, the exponential growth of AI technologies has further facilitated launch of new products and systems in the market (such as Amazon Echo, Google Assistant and Apple Siri to name a few), which has offered the citizens new and improved ways of interacting with digital technologies.

Defining "digital content accessibility" is here restricted to the inclusive practice of making digital contents usable and comprehensible by all citizens (with abilities and disabilities included). Within the current adoption of digital transformation strategies, the notion of accessibility has been widely addressed within the context of information being shared through Internet services. The relevant standards published from W3C on Web Accessibility Initiative (WAI) individuals' formulated recommendations on creating accessible- for- all content published online. The recommendations on adopting universal design, which includes the triple synergy between Usability, Accessibility and Inclusion have been well addressed in the literature

Policy stakeholder (s)
EU DG for Research and Innovation/Research Executive Agency (REA)

Intended SHIFT Message

Since the dawn of the Internet and web content, the topic of accessibility can be traced back to the early efforts of World Wide Web Consortium (W3C)[1] dedicated to promoting guidelines on web accessibility initiative (WAI). The European Union adopted WCAG 2.1 in September 2018 as a standard for websites and electronic documents. The WCAG recommendations help website designers and developers to better meet the needs of users with disabilities and older users.

The EAA is a step[2] forward in reducing barriers for people with disabilities within the EU: better accessibility of products and services that citizens use every day, such as phones, transport, or banking services, will help people with disabilities to be able to fully participate in society on an equal basis with others, to have better access to education and to enter more easily the open labour market. Accessibility is also necessary for older people to maintain an active role in society, including extending their working lives. In general, accessibility is beneficial to all EU citizens. For example, people trying to hear travelling information in noisy environments like train stations or trying to get money from cash machines on a sunny day, or employees working with enlarged documents to avoid eye strain will also greatly benefit from further accessibility.

A major challenge around digital accessibility concerns the present inability of technology to cover the diverse types of disabilities. More specifically, as Kelly and colleagues (2010) and Lazar and colleagues (2015) explain: while perceptual disabilities (i.e., those involving vision and hearing limitations) and physical disabilities (i.e., those involving limitations of use of limbs as well as speech) have been the focus of accessibility solutions, cognitive disabilities have proven difficult to address. For example, screen readers can help persons who have visual limitations and captioning of videos can help persons who have hearing limitations. Similarly, certain types of keyboards and other hardware devices can help persons who have physical limitations. However, in case of cognitive impairments such as Down syndrome or Alzheimer's disease, technology is yet unhelpful and needs to be attended to.

Supporting evidence available

Empirical Studies on Web Accessibility of Educational Websites: A Systematic Literature Review [6]

Expected/emerging evidence from SHIFT

The scientific contribution of the SHIFT computer vision toolkit relates to two main challenges: enhancement of image and video sequence analysis and generation of short motion clips with considerations on physical limitations.

According to ECAG recommendations[7], the four principles of accessibility could be defined as follows:
- Perceivable - Information and user interface components must be presentable to users in ways they can perceive.

- Operable - User interface components and navigation must be operable.
- Understandable - Information and the operation of the user interface must be understandable.
- Robust - Content must be robust enough that it can be interpreted reliably by a wide variety of user agents, including assistive technologies.

D2.2: Automatic generation of motion sequences from pictorial repositories - final version
SHIFT Visual Toolkit

Anticipated policy impacts of SHIFT
Increased responsiveness to the benefits of developing computer vision to support accessibility and for its inclusion in future research and innovation policies

5.4 Audio processing

Policy issue
There is a need for automated solutions for currently manual systems to enable greater scalability and wider adoption of text-to-speech algorithms within cultural institutions.

Policy stakeholder (s)
EU DG for Research and Innovation/Research Executive Agency (REA)

Intended SHIFT Message
Scientific innovations in SHIFT allow the inclusion of emotional cues within text-to-speech to generate an authentic human experience for all citizens (including people with disabilities)

Supporting evidence available

Expected/emerging evidence from SHIFT
An auditory toolkit that will deliver an emotional response to the audience by using advances in auditory synthesisers. Human-like correspondence will minimise
barriers for effective interaction by people with sensory impairments.

D3.6 Text and video to affective speech synthesis - final version
SHIFT Auditory Toolkit

Anticipated policy impacts of SHIFT
Further mainstreaming of text-to-speech (TTS) within digital cultural heritage implementation initiatives

5.5 Natural Language Processing (NLP)

Policy issue

Human language is an evolving construct, with word semantic associations changing over time. Policy issues in the area of Natural Language Processing (NLP) are of growing importance in our digital age, where NLP technologies are becoming increasingly integrated into various aspects of society, including AI. Policy issues primarily revolve around privacy, ethics, bias and fairness, regulation, and access and inclusivity.

Policy stakeholder(s)

Partnership on AI
UNESCO
ISO/IEC JTC 1/SC 42

Intended SHIFT Message

NLP technologies hold the promise of rendering CH assets more accessible and inclusive by enabling advanced analysis, curation, and presentation. The introduction of foundational models like GPT (OpenAI) and BERT (Google) broadens the horizons for engaging and relatable presentations of CH assets. Alongside these, the emergence of open-source language models such as the multilingual BLOOM (Huggingface) and NLLB (Meta) open possibilities for multilingual and culturally diverse narratives, fostering understanding and appreciation of CH across linguistic boundaries. Specialized models like variants of the LLaMA model further bring forth unique storytelling capabilities that seamlessly align with the overarching objectives of the project. Additionally, advancements in models for image captioning allow for the generation of descriptive and informative text for visual assets, providing further cues and enhanced context, leading to better understanding of the visual elements of the assets.

Supporting evidence available

Expected/emerging evidence from SHIFT

Two pivotal use cases by BMN and ANBPR, serve to guide our efforts in the initial release of the toolkit.

Use Case 1 (BMN) is focused on the generation of comprehensive textual descriptions for paintings, illuminating the evolutionary trajectory of descriptions over time, and providing audio renditions to enhance accessibility.

Use Case 2 (ANBPR) is centred around CH videos, with an emphasis on bolstering accessibility through textual summaries, translations, and alternative audio renditions, all while pre-serving the nuanced emotional aspects of the content

D3.5 Tool for the textual representation of CH assets - final version
D3.6 Text and video to affective speech synthesis - final version

Anticipated policy impacts of SHIFT
Incorporation of NLP in relevant cultural heritage standards and implementation initiatives

5.6 Semantic framework

Policy issue
General concept-based image annotation is a highly active field that has recently reached near-human level accuracy. Concept-based image/video-shot annotation refers to the problem of automatically annotating images/video-shots with semantic labels such as sky, sun, animal etc. Nevertheless, existing methods for generic concept- based annotation and object detection cannot be directly applied to cultural videos/images.

Policy stakeholder (s)
DG CONNECT
EU DG for Research and Innovation/Research Executive Agency (REA)
Standards bodies

Intended SHIFT Message
SHIFT advances the state-of-the-art, through knowledge representation schemes which use metadata about the content and semantics of each multimedia item for cultural content analysis, finding correlations between indexed cultural assets and establishing links with related information available online (e.g. on Wikipedia, Dbpedia and Europeana).

This includes modification and improvement of methods of categorising and finding content using tools which enable sorting of content in ways more naturally similar to human cognition e.g. through search engines with hybrid visual-semantic search, geographical maps and timelines or semantic concepts.

Supporting evidence available

Expected/emerging evidence from SHIFT
D4.3 Tools for Cultural Asset Curation and features extraction - final version

Anticipated policy impacts of SHIFT
Adoption of SHIFT advances in semantic frameworks as contributions to as baselines for future cultural heritage research and innovation programmes.

6 Impact on the role of Cultural Heritage Institutions of different types and sizes.

6.1 Digital transformation

Policy issue

Digital transformation plays a crucial role in reshaping the role of Cultural Heritage Institutions (CHI). It enables these institutions to adapt to the changing needs and expectations of audiences, while also enhancing their ability to preserve and promote cultural heritage. It also has a profound impact on the role of CHI, enabling them to preserve and promote cultural heritage in innovative ways, while also enhancing accessibility and audience engagement. However, it is important for institutions to address the challenges associated with digital transformation and invest in the necessary infrastructure and expertise to fully leverage the benefits. By doing so, CHI can continue to play a vital role in safeguarding and promoting our shared heritage.

Digital transformation has had a profound impact on museums, revolutionising how they operate, engage with audiences, and preserve and present cultural heritage. Impact can be measured both internally and externally in relation to involved institutions. Overall, digital transformation has empowered museums to adapt to the changing needs and expectations of their audiences while preserving and promoting cultural heritage in innovative and accessible ways. It has become a vital strategy for museums to remain relevant and sustainable in the digital age

There is a need to enhance community engagement by local museums, libraries and galleries through enriched CH experiences. CHI face difficulties in implementing innovative and emerging technologies due to lack of specialised personnel and of access to modern tools that stimulate and increase the appeal of historical artefacts.

Digital transformation therefore presents challenges CHI such as the needs to:

- invest in robust digital infrastructure, including high-speed internet, storage systems, and security measures, to ensure the smooth functioning of digital initiatives.

- hire or train skilled professionals who can handle digital technologies and data analytics and digital marketing to ensure they can effectively utilise the available technologies.

Policy stakeholder (s)
National Ministries of Culture

Local Authorities
DG CONNECT

Intended SHIFT Message
The impact of participation in SHIFT goes beyond digital transformation and extends to various aspects of CHI, enriching their roles and contributions to society through:
upgrading their digital infrastructure and existing technologies and adopting new ones to facilitate the preservation and presentation of cultural artefacts, capacity building and training, diversifying services and programmes, enhancing accessibility and inclusivity, and visitor experiences and becoming more appealing to 'Generation Z', storytelling opportunities, fostering cross-sectoral collaboration between CHI, CCI and universities, enhancing the role of museums as hubs for innovation and experimentation with new technologies, conservation and protection through high-resolution imaging, 3D scanning, and digital archiving techniques, expanding their regional and national reach, preserving and promoting the cultural of regions and dissemination of knowledge about successful technology deployment through professional networks like the Balkan Museum Network, economic sustainability through new revenue streams, cultural diplomacy and cultural tourism.

Museum and exhibition creators will be able to enrich their creativity by using the SHIFT suite of tools and better promote it to end-users. SHIFT will ensure reliability, authenticity and attractiveness of collections and digital repositories, broader access and controlled exchange. Enriched and protected content will enable better promotion, and the creation of new eBooks, storytelling and edutainment products

Key aspects of digital transformation in CHI include:

- digitisation of artefacts and collections, through the use of advanced imaging technologies to create high-resolution digital replicas of artefacts, making them accessible to a wider audience and helping ensure preservation.

- creation of online platforms and virtual exhibitions, providing immersive and interactive experience for visitors to explore cultural artefacts remotely enhanced by VR/AR.

- enabling CHI to leverage data analytics and machine learning algorithms to analyse data on visitor preferences, behaviour, and engagement to gain insights that inform their decision-making processes and help them to tailor their exhibitions, marketing strategies, and educational programs to better meet the needs and interests of their audiences, through a data-driven approach.

- enhancing the accessibility of cultural heritage through the use of AI-powered tools, to provide multilingual translations, closed captions, and audio descriptions, making their content accessible to people with disabilities or those who do not speak a language.

- engaging with audiences through social media platforms to share behind-the-scenes content, conduct live streams, and interact with their audience in real-time, thereby fostering a sense of community, helping to promote cultural heritage and attract new visitors.

Supporting evidence available

Interactive exhibits, augmented reality (AR), and virtual reality (VR) experiences provide immersive and engaging ways for visitors to explore exhibits and learn about artefacts.

Balkan Museum Network (BMN) has promoted accessible services of member museums creating an online map and repository of museum activities that are inclusive and accessible.

Public libraries in Romania are actively involved in the digital transformation process and are currently required to carry out a critical re-evaluation of the use and arrangement of the library spaces, the service offers and their collections, as well as a reconfiguration of the IT infrastructure, so that it allows alignment with the requirements imposed by digital transformation.

Expected/emerging evidence from SHIFT

Availability of 5.000+ revitalised multimedia content items for professionals and end users. Content will be augmented using the SHIFT suite of tools, including to augment personal family collections (photos, books, video).

Museums and Libraries which are members of BMN (Western Balkans) and ANBPR(Romania) will include SHIFT into their activities and will support wider adoption across EU CH institutions

The Homeland Museum of Knjaževac (Serbia) is a local, small museum and involvement in European projects can provide valuable opportunities for learning and benefiting from SHIFT results on several levels.

Anticipated policy impacts of SHIFT

Increased momentum and policy support for digital transformation in cultural heritage institutions of different shapes and sizes.

7 Impact on The Creative Industries

7.1 Changes and responses to market developments

Policy issue

Since the dawn of the content economy, user engagement has been placed at the heart of digital transformation strategies being adopted within the creative and cultural industries (CCI). The trend is complemented by the changing demographics within Europe, where increasing numbers of citizens and users demand high-quality content. The demand is further driven by the generation of digital natives, who are seeking information from "born-digital" platforms. Despite the wide scale of adoption of digital transformation strategies across several industrial sectors, the uptake of such strategies within the creative and cultural industries has been found lacking.

Despite the popularity of audio- visual content, commonly encountered within the CCI, limitations and barriers are still preventing audio visual media accessibility, related to usability, interoperability, and standards issues, as well as the lack of business-cases for take-up by mainstream actors, legal barriers (for example for the transnational reuse of accessible content) and difficulties in the reuse of accessible content over time and across different platforms. In general, the creative sector needs "fresh" and new content.

Policy stakeholder (s)

EU DG FOR EDUCATION, YOUTH, SPORT AND CULTURE
EU DG for Research and Innovation/Research Executive Agency (REA)

Intended SHIFT Message

SHIFT will contribute to current social changes in cultural content consumption trends, by presenting and developing a new concept in this field, adding value to the European cultural heritage by creating high quality content and ensuring its conservation. This links directly to an increment in user interest and promotion of increased consumption.

Additionally, SHIFT introduces new and improved technologies to the market (machine learning, artificial intelligence, natural language, etc.). In relation to economic growth, SHIFT will ease market opportunities for the project stakeholders by providing a new way to access content types previously inaccessible in an easy and effective manner.

The project effectively addresses the challenges posed by the digitisation of all aspects of todays' life, with a focus on the way people discover and enjoy content through mobile devices and digital platforms. By addressing this challenge, and

the underpinning need for digitally enhanced contents, a positive impact on both the extent and diversity of engaged target users is expected. Cultural content will become more attractive to younger audiences, helping to arrest the decline occurring in the digital era and due to invasive social media content.

Supporting evidence available
European citizens spend on average 1/3 of their waking time-consuming media in one form or another and that the European creative industries are dominated by small enterprises (micro-companies and freelancers represent 85% of companies in creative industries).

Expected/emerging evidence from SHIFT
The SHIFT approach is expected to produce a double impact: improving the awareness and sense of proximity of people towards their cultural heritage (social impacts); and widening the market of people interested in cultural contents and experiences (economic impacts).

Typical estimators of cultural contents with improved access to a vast amount of photo, contents, and sources. Augmented hypermedia assets will promote niche or "long tail" content which is produced by smaller content creators, and which would generally be overlooked in "mass consumption" content scenarios (e.g., viral video on social networks), yet which needs this greater reach to achieve Return on investment (RoI), computed based on the market forecast for adopting digital technologies in improving accessibility and inclusion across CH and increased employment opportunities. There is a rapid growth in the cloud-based video streaming market which is driving market growth. SHIFT will lead to creation of new moving image content from existing stills with reliable long-term preservation. Content creators will subscribe and adopt the SHIFT tools to create valuable CH content.

Exploration of interactive ways to target people which are typically unlikely to appreciate cultural and historical contents. Access to cultural assets has several benefits to individuals at all ages, allowing them to widen their cultural background, stimulating awareness towards cultural heritage and a common sense of belonging towards European culture, and improving their capability to recognise and appreciate cultural expressions and historic memory. Besides these transversal benefits, specific impacts exist for younger generations through access to an unprecedented amount of digitalised cultural contents, of optimised quality and enhanced with interactive and multimedia features which generate genuine interest and improve learning experiences.

Anticipated policy impacts of SHIFT
SHIFT results are linked to market developments at policy levels

7.2 Monetisation opportunities

Policy issue
As a result of an overall lack of appeal, accessibility and technical inclusivity, CHI institutions are losing out monetary benefits to be gained from publishing high-quality content sourced from historical archives. The monetisation of the content economy has been dominated by content platforms, catering to the needs and demands of several communities. Examples include YouTube, Instagram, Twitter (X) to name a few, each dedicated to market verticals within the CCI. New business models, which rely on marketing and advertisements as a source of revenue within a content platform have not been adopted by CHI, leading to missed opportunities.

Despite efforts from the academic community to develop immersive experiences in re-creating large-scale archaeological sites, market take-up has been found lacking. Despite advances in recent times in the maturity of immersive technologies, there is a lack of content creation services catering to the specification of improved hardware equipment (e.g. for head-mounted displays).

Additional constraints often encountered by cultural institutions include:

- the lack of training and skilled resources.

- inability to adopt new business models which continually engage with citizens to promote the importance of cultural heritage.

- high dependency of CHI on the tourism sector which resulted in a devastating economic downturn following the start of the pandemic.

Policy stakeholder (s)
DG CONNECT
EU DG for Research and Innovation/Research Executive Agency (REA)
EU DG FOR EDUCATION, YOUTH, SPORT AND CULTURE
UNESCO

Intended SHIFT Message
SHIFT explores monetisation strategies, examine both editions' uptake to finalise a market acceptable pricing scheme. It Investigates how to maximize profitability based on early user feedback from trials and demos and establishes its own remuneration policy, proportioning revenue to the partners.

Digital technologies will be a cross-cutting issue in topics addressing:
- the protection and restoration of cultural heritage
- sustainable financing of museums and cultural institutions
- revival of traditional crafts
- strengthening the innovation potential of the cultural and creative sectors

Supporting evidence available

There are major conceptual challenges to be addressed regarding monetisation of cultural heritage [8]. Leaving aside core theoretical issues, these include policy challenges such as defining cultural and heritage 'assets' and mapping their condition, the need to explore the whole idea of a 'services' model for cultural and heritage assets (which already exists for natural capital), questions around the validity of monetary values as proxies for heritage values, and major questions around the application of such models to different areas of heritage and cultural policy and practice. Cultural capital is not a new idea, but what is new is the attempt to take the monetisation of values a step further. This is an important debate, but it will require proper resources, and considerable engagement from the sectors, practitioners and communities in order to close the gap between economists and non-economists, and to help better make the case for investing in culture and heritage.

Expected/emerging evidence from SHIFT

D6.6 Market analysis, business models, commercial sustainability and knowledge transfer - final version

Anticipated policy impacts of SHIFT

Greater clarity on feasibility of monetisation options for cultural heritage content and services

7.3 Rights

Policy issue
The role of DRM is vital in licensing the newly produced content in the "born digital" paradigm, which also influences the pricing models and schema for enabling commercial exploitation of the SHIFT platform.

Policy stakeholder (s)
DG CONNECT
Industry Associations/rights bodies

Intended SHIFT Message
The implementation of DRM standards within SHIFT extends beyond the functionalities currently supported by enabling smart contract negotiations for automating content accessibility, based on the business models to which a CHI has subscribed. More specifically, a pay-as-you-go business model will be complemented by other business transaction modalities that support subscription for accessing the revitalised content.

Supporting evidence available
European Digital Rights and Principles [9]

A list of published DRM standards already addresses industrial requirements.

Expected/emerging evidence from SHIFT
An IPR toolkit will address the challenge of protecting born digital content. SHIFT will adopt international standards on copyrights and digital protection of derivative copyrights.

SHIFT D4.2 SHIFT Curation Repository for Cultural Assets with DRM capabilities

Anticipated policy impacts of SHIFT
Strengthened understanding of DRM issues and potential solutions in relation to born digital and other heritage content.

8 Impacts on training and education

Policy issue
Capacity building has a multifaceted nature: the process by which individuals and organisations obtain, improve, and retain skills, knowledge, tools, and other resources.
A range of considerations are critical to support digital capacity building, including: integration of cultural heritage goals into national strategies, clear policy direction, advocacy for the sector, allocation of sufficient funds to the cultural sector and its digital transition, the European Commission's support and leadership, training, multilinguality, collaboration within the sector and cross-sectoral collaboration at local, national and European level.

Policy Stakeholders
EU DG for Education, Youth, Sport and Culture
EU DG CONNECT
UNESCO
National Ministries of Education and Culture
Sectoral Associations e.g. NEMO, ICOM, IFLA

Intended SHIFT Message
The skillset of the majority of professionals in the CHI (especially the smaller ones which form the majority) does not include strong digital or technology skills. As a result many technical innovations that would be helpful for the inclusiveness of museums cannot readily be adapted successfully as they have to be outsourced, are not long-term sustainable or cost effective and CHI staff cannot easily follow the use of the technology. As a result the main ways to achieve a change in this field is through the training of CHI staff, so that they can adopt adequately more off the shelf solutions and collaborate with outside companies for the higher technology solutions only.

Supporting evidence available
The common European data space for cultural heritage is a new flagship initiative of the European Union to support the digital transformation of our sector. The Europeana Initiative - at the heart of the data space - offers capacity building activities which support the development of, and participation in, the common European data space for cultural heritage.

Europeana Foundation (2022). Guidelines for delivering training and development [10]

A need for training on how to use the Cloud and in digital skills, alongside an active user community, appropriate IT equipment and support is also evident. Respondents pointed out several challenges and difficulties, for example, the lack of knowledge, information or understanding of the ECCCH initiative. The lack of a digital strategy among management is also a frequent concern both for those working either in a cultural heritage institution or in a private company

along with the lack of available time, personnel and funds, especially among volunteer-led organisations. Respondents were also concerned about the potential obsolescence of current virtual reality/augmented reality experiences or services and the long-term sustainability of the projects after the end of funding.

Expected/emerging evidence from SHIFT
HERITAGE (the training partner) will collaborate with the partners involved in developing each of the 7 main SHIFT tools, to create a training module for each tool, which will be delivered as an online or hybrid workshop to the users of each pilot in combinations of modules relevant to the specific tools used in each pilot. Training resources will also be made available to these workshops on digital preservation, business modelling and other relevant 'background' issues. Each module will also be available and promoted through the SHIFT platform as an online video, for ongoing access by a wider audience.

Anticipated policy impacts of SHIFT
Added momentum to policies and programmes for training and capacity building in use of digital cultural heritage tools.

9 Relation to digital infrastructure

9.1 The European Collaborative Cloud for Cultural Heritage

Policy issue
The ECCCH is an initiative, launched in 2022, with a reputed 100 million Euros of funding, which is intended to join and mutually reinforce other past and future European initiatives such as Europeana/Common Data Space for Cultural Heritage.

The overall goal is to define, extend and accelerate the development of a platform for multidisciplinary and multi-sectoral collaboration on cultural heritage, focusing on users' requirements and ease of use, as well as underpinning an open digital ecosystem that provides the tools and services needed to enable and scale-up future research and innovation in the field.

Additionally ECCCH has the purposes to:
● help cultural heritage institutions to work with their digital objects more visibly and in a more interconnected way;
● unlock the untapped potential of the sector by organising joint exhibitions, digitising artefacts, researching artworks, and documenting data;
● enable transdisciplinary and large-scale collaboration between specialists, who will be able to work in a highly professional digital working space using state of the art tools;
● generate new income for CHI by opening new opportunities for marketing and commercialisation, in particular of the digital dimension of the cultural heritage sector

Policy stakeholder (s)
EU DG for Research and Innovation/Research Executive Agency (REA)

Intended SHIFT Message
ECCCH appears likely to provide an infrastructural environment amenable to exploitation of the results of SHIFT, although its practical specification is still at a formative stage and services are not expected to be available until 2025. Nevertheless, SHIFT and the Horizon project cluster of which it is a member should maintain active contact with the initiative as it develops both through the Research Executive Agency (REA) and independently.

Supporting evidence available
In December 2022, the European Commission published the results of a 'Stakeholders' survey' conducted between September and November, aiming to gather the views of cultural heritage stakeholders on the Commission's ECCCH initiative. A thousand detailed responses revealed high interest within the sector in a digital collaboration platform for cultural heritage. This provides a basis upon which the Commission will target support for the cultural heritage sector and prioritise the most useful types of tools.

A need was felt among respondents for a clear strategy and plan on how the ECCCH will relate to existing infrastructures as well as to other existing initiatives at the local, regional, national, and international level.

For some respondents, it was important that any technology is always human-centred and that it augments but does not replace the work of a person. The importance of personalising tools and of accessibility and ease of use were manifest in the responses. Tools must be perceived as a service, developed together with the target users and tested at a large scale.

The first two Horizon Europe calls for projects to develop the Cloud infrastructure and for innovative tools for digitising cultural heritage closed on 21 September 2023.

Expected/emerging evidence from SHIFT
The range of Tools developed in WP 3 and 4 and the evidence from pilots in WP5

Anticipated policy impacts of SHIFT
SHIFT tools are made available in the ECCCH service and act as pointers for future policies

9.2 The common European data space for cultural heritage

Policy issue

Among important initiatives with a clustering effect which SHIFT can advantageously engage with is The Europeana Initiative - financed by the European Commission with the support of EU Member States, which has aggregated over 55 million digital items of cultural heritage content since 2008, open to public access through the Europeana portal. The Initiative is run by the Europeana Foundation, as the operator of the core service, with a consortium of partners and in close collaboration with the Europeana Aggregators' Forum (EAF) and the Europeana Network Association (ENA).

This collaboration creates a multiplier effect for the Initiative's many activities at European level. Together with work undertaken at Member State level, an ecosystem is created to support Member States' drive for digital transformation across the sector and across Europe, including 40+ aggregators (national and domain/thematic) which ingest metadata linked to content from over 4,000 Cultural Heritage Institutions (museums, libraries and archives). Alongside this ENA has around 4500 individual members from CHI, education, research, the creative industries and elsewhere, from every EU member state and throughout the world.

Under its most recent procurement contract within the Digital Europe Programme (DEP) Europeana is the core operator of the common European data space for cultural heritage [11]. Within this, there is a special focus on Europe's digital transition. Europeana's priorities for action within the Data Space include exploiting 3D content and Artificial Intelligence. As such Europeana represents a key cluster and potential avenue for SHIFT exploitation. Europeana is contributing through: empowering heritage institutions to develop leadership and capacity for digital transformation:
• offering tools, a network and events for heritage professionals to learn new skills, develop expertise and gain specialist knowledge;
• developing a training programme and resources which support participation in the common European data space for cultural heritage;
• a strategy to guide capacity building through the data space.

Policy stakeholder(s)
EU DG CONNECT
CEDCHE

Intended SHIFT Message
Europe's cultural heritage (CH) is one of the richest in the world. Cultural Heritage was recognised by the Council of European Union and the European Commission in 2014 as a strategic resource that not only should be preserved, but also leveraged as a driver of economic and social development. In this context, Cultural Heritage content contributes to the Digital Single Market, by

providing copyright content protection, expertise and can connect businesses to communities of end-users. SHIFT will support wider adoption of its results across EU CH institutions. Community engagement will be advanced by enriching CH experiences by local museums, libraries and galleries.

Supporting evidence available
SHIFT participates in the Europeana Tech conference, October 2023
https://pro.europeana.eu/page/conference

Expected/emerging evidence from SHIFT
D6.1   Communication, Dissemination & Impact

Anticipated policy impacts of SHIFT
Contributions to capacity building and standards in the data space

10 Nationally or regionally specific policy issues

10.1 Western Balkans

Policy issues
Digital transformation is a very important topic and a mechanism for strengthening regional collaboration in the Western Balkans with commendable results in fields such as free roaming which enables: Wi-Fi connectivity across borders, allowing museum visitors to use their own devices when accessing digital museum content and easier GPS navigation between historic monument sites; decreased data prices for consumers travelling between the EU and Western Balkans; and simplified business, cultural, tourism, and other exchanges between the EU and the Western Balkans, strengthening the links between neighbouring regions.

Cultural heritage digitisation efforts in the Western Balkans have often been fragmented, with limited coordination between different institutions, regions, and countries, hindering the sharing of resources, best practices, and digitised content. One example of this fragmentation can be seen in the lack of standardised approaches and collaboration among different institutions and countries in the region, with each country in the region often operate independently with their own digitisation projects and initiatives using their own standards and metadata practices, leading to a fragmented digital landscape where materials from the same historical or cultural context may be digitised differently, making it challenging for researchers, scholars, and the public to access and use these resources effectively. This makes it difficult to ensure interoperability and data exchange between institutions and systems.

Many cultural institutions in the region face financial constraints, making it challenging to invest in digitization efforts, which therefore often progress slowly and are incomplete. Funding for digitisation projects in the Western Balkans may

come from various sources, including national governments, international organisations, and grants from foreign institutions, which can lead to variations in their scope, quality, and sustainability, further contributing to fragmentation. Efforts to address this fragmentation often involve promoting cross-border collaboration, sharing best practices, and working towards the development of common standards and guidelines. However, achieving greater cohesion in cultural heritage digitization across the Western Balkans is an ongoing challenge. Thus, many digitization initiatives face sustainability challenges, including the ongoing costs of digital preservation, maintenance of digital infrastructure, and staffing, encompassing.

- Technological Infrastructure especially in rural regions, is inadequate to support digitisation initiatives and equipment is unevenly distributed.
- Lack of skills and training among cultural professionals in the area of digitisation.
- Complex copyright and legal issues, particularly when dealing with orphan works or materials with uncertain ownership rights.
- Long-term digital preservation strategies are often lacking, putting digitised cultural heritage materials at risk of loss or degradation over time.
- Public awareness and engagement with digitised cultural heritage are relatively low in some areas.
- The Western Balkans is characterised by linguistic and script diversity, presenting challenges for metadata management and accessibility.
- Security and Cybersecurity is a concern, especially as more cultural institutions embrace digital technologies.
- While there are collaborations with international organisations and institutions, there is room for increased cooperation to access expertise, funding, and best practices.

Addressing these gaps often requires a multi-stakeholder approach involving governments, cultural institutions, academia, international organisations, and civil society. Additionally, regional and international support and funding can play a significant role in overcoming these challenges and advancing cultural heritage digitisation efforts in the Western Balkans.

Both **Bosnia and Herzegovina** and **Serbia** have ratified numerous international conventions, and both countries are in the process of adjusting and adopting international, especially European regulations and laws in these fields. This process can be observed as a starting phase, with plenty of possibilities and obstacles. Policies and legal framework in the field of human rights and digitization are based on the concept of DEAI (Diversity, Equity, Accessibility, Inclusion) in both countries.

Digitisation in museums started when official government strategies were non-existent thus it has been a partial and ad hoc digitisation of collection parts and artefacts, producing digital records of objects with digital photography and the

register of inventory books in digital form (mostly 2D digitisation as 3D was more resource intensive). The digitisation of cultural heritage in Serbia is an important endeavour aimed at preserving and promoting the country's rich cultural and historical heritage through digital means. This effort involves the digitisation of various cultural artefacts, documents, artworks, and historical sites to make them more accessible to the public, researchers, and scholars. Some key aspects of the digitisation of cultural heritage in Serbia include:

Serbia has been working on the establishment of a <u>National Digital Library</u>, which aims to provide digital access to a wide range of cultural and historical materials, including digitised books, manuscripts, photographs, maps, and other valuable resources. <u>Digital Archives</u>: Cultural institutions in Serbia, such as libraries, museums, and archives, have been digitising their collections. This includes historical documents, art collections, and archival materials, making them accessible to a global audience. Digitisation efforts often involve the <u>preservation</u> of fragile or deteriorating cultural artefacts, including digitisation of old manuscripts, paintings, sculptures, and archaeological finds. Digital platforms have been used to create <u>online exhibitions</u> that showcase Serbia's cultural heritage. These exhibitions can include virtual tours of museums, galleries, and historical sites. There is a national project 'Serbia Google Arts and Culture' where many museums, galleries, sites, etc have been presented. Serbia has collaborated with <u>international organisations</u>, such as UNESCO, to support the digitisation and preservation of cultural heritage. These collaborations often involve sharing best practices and expertise. Digitised cultural heritage materials are often made available to researchers, students, and educators to support research, learning, and cultural studies. The Serbian Ministry of Culture has been financially supporting various projects in the sphere of digitisation of cultural heritage, sites on web platforms, development of Android/iOS applications, databases, etc. Serbia has put in place <u>legal frameworks</u> and regulations to govern the digitization and dissemination of cultural heritage materials while respecting copyright and intellectual property rights.

Efforts are made to engage the public in the digitisation process, encouraging citizen participation in identifying, preserving, and sharing cultural heritage. In addition to textual and visual materials, Serbia has also been digitising audio and visual materials, including historic recordings, films, and sound archives. Both government and non-governmental organisations have provided funding and support for digitisation projects, recognizing the importance of preserving and promoting Serbia's cultural heritage.

Policy stakeholder (s)

Regional Cooperation Council, a cooperation body that brings together key stakeholders from Southeast Europe, is very active in leading in the process of digital transformation.

Ministries of Culture.

Intended SHIFT Message

The establishment of a regional framework to support digital upskilling/reskilling and enhanced regional capacities on developing digital skills strategies is also important since many of the countries do not have a comprehensive policy. A focus is placed on the public and educational sectors while culture and cultural heritage sectors are not perceived as a priority.

Supporting evidence available

In Bosnia and Herzegovina the most recent study is "Digital Ecosystem Country Assessment (DECA)" produced by USAID BiH in January 2023 outlines the policy framework [12].

Serbia has various policies and regulations related to digitization and accessibility, primarily aimed at promoting digital inclusion, protecting personal data, and fostering the growth of the digital economy. Also, there is an initiative to create a network between different sectors, such as education, cultural heritage, tourism on one hand and also governing bodies, health and social services, etc. This multisectoral collaboration should produce important social and economic outcomes in the future. Digital Agenda for Serbia is a strategic framework that outlines the country's goals and objectives for the development of the digital economy. It includes measures to promote the use of digital technologies, improve internet access, and support the growth of the IT sector.

Serbia also has:
- enacted data protection laws to ensure the privacy and security of personal data. The main law governing this area is the Law on Personal Data Protection, which aligns with the European Union's General Data Protection Regulation (GDPR);
- been working on the development of e-government services to make government information and services more accessible to citizens and businesses online. The Law on Electronic Government defines the legal framework for e-government initiatives.
- regulations governing electronic signatures and transactions to facilitate e-commerce and digital transactions. The Law on Electronic Document, Electronic Identification, and Trust Services in Electronic Business sets the legal framework for these areas.
- made efforts to align its web accessibility standards with international guidelines, such as the Web Content Accessibility Guidelines (WCAG).
- been working on strengthening its cybersecurity framework, including the protection of critical infrastructure.
- initiated programs and policies to promote digital literacy and inclusion, particularly among marginalised groups and rural communities.
- regulations are in place to protect intellectual property rights in the digital domain.
- been working on open data initiatives to promote transparency and access to government data. The Law on Free Access to Information of Public Importance governs the availability of public data.

Digitisation of Collections: Many museums within the **Balkan Museum Network** have undertaken digitisation projects to make their collections more accessible to the public. This involves digitising artefacts, documents, photographs, and other cultural heritage items, not only preserving these items but also making them available for research and public enjoyment. Museums within the network have developed online catalogues and databases where they share information about their collections. These catalogues often include high-resolution images, detailed descriptions, and historical context for the artefacts. Some museums within the BMN have created virtual exhibitions that allow people to explore their collections and exhibitions online. These virtual exhibitions provide an immersive experience and reach a wider audience.

The BMN has worked on creating educational resources based on the digitised collections. These resources can be used by educators and students for learning about the history and culture of the Balkan region. The network promotes collaboration among museums, including sharing expertise and best practices in digitalization and access initiatives. Museums within the network often collaborate on joint projects to improve access to cultural heritage. Some museums within the BMN have adopted open access policies, allowing the public to freely access and use digitised cultural heritage materials for non-commercial purposes. This promotes wider dissemination and reuse of cultural content. The BMN organises workshops, seminars, and training sessions for museum professionals to enhance their digitalization and access capabilities. This ensures that museums have the necessary skills and knowledge to carry out digitization projects effectively. The network may advocate for policies and funding to support digitization and access initiatives in museums across the Balkans. This includes seeking support from governments, international organisations, and other funding sources. Some museums within the BMN collaborate on cross-border projects that focus on shared cultural heritage and historical narratives. These projects often involve joint digitization efforts and the development of transnational digital platforms. BMN has initiated and implemented a regional project that resulted with the interactive, accessible web map of accessible museums and sites, mainly, but not exclusively, members of this professional network. BMN also organises an annual international conference Meet, See, Do that covers many different topics in the field of museology, preservation of cultural heritage, preservation and interpretation of cultural heritage, digitization, education, access and inclusion, etc

Expected/emerging evidence from SHIFT
Based on its use case on '19th Century to modern days Serbian paintings and modern art', SHIFT will become an essential service and mechanism to The Balkan Museum Network to increase the access by "modernising" and being more up to date with a new and intense solution that creates excitement among visitors.

Anticipated policy impacts of SHIFT
A range of SHIFT results deployed in support of digital transformation and skills

strategies in the cultural heritage field.

10.2 Germany

Policy issues

Germany may have nationally or regionally specific policy issues due to how disability is regulated and the consequently firm position of people with disability who (self-) organise as stakeholders.

Disability status, identification, and recognition

In Germany, disability and the corresponding status of the affected individual person is relatively regimented in ways both complex and complicated. Legally, disability is defined by the "Neuntes Sozialgesetzbuch (SGB IX)" [14] ('ninth book of social law') and the corresponding status is awarded at reaching a certain degree of impairment(s) as outlined in detail in the German Pension Medical Ordinance [15]

On this basis, regional administrations (depending on federal state and municipality) upon request via application will examine anyone's individual medical case and award a degree of disability. While the review process follows a complex guideline taking into account forms and severity of conditions as well as possible interplay between combinations, the result is a simple singular degree in percent (in increments of 10%), possibly with the addition of specific markers. While the former bestows the legal status as disabled individual from a degree of 50% and upward with certain general compensatory social measures applying with increasing percentage (e.g. tax benefits) on top of baseline support granted by the status itself (i.e. at 50%, for instance support in job search or protections from job termination), the aforementioned markers (in the form of signal letters) are more specific to types of disability. Some denote specific disabilities, e.g. "Bl" for blind, while others more generally denote resulting conditions, e.g. "G" for "gehbehindert" or more technically correct 'decreased mobility,' or alternatively indicate specific rights, e.g. "B" for "Begleitperson," that is assistant or accompanying caretaker. Although the latter two markers can cover wildly differing types of disability, since mobility as an example can be a result of limitation by motoric capabilities as well as by lack of

sensory orientation, the existence of the markers promotes categorising, which may have positive as well as negative effects. A positive effect would be the raised awareness of conditions and rights as far as those rights go. Tendentially positive is also an ostensible clarity of the situation; the disabled person receives a Disability ID card, which should easily allow them to claim rights from parties other than the government without official access to the status info. Raised (self)awareness enables community-building as well as grants more confidence to claim one's rights and to fight for improvement in organised effort (to be addressed in the following section). Negative effects include, for instance, the risk of stigmatisation, if, say, the right to bring along a caretaker (e.g. manifested in reduced fees or free tickets for the accompanying person for holders of marker "B") is turned around and instead taken as a requirement for the disabled individual to have accompaniment along instead.

Another issue lies in the policies organisations and corporate actors adopt as they interact with customers, visitors, etc. with disabilities either individually or as a rule. Whereas the legal framework is usually respected reliably by public service, the private sector occasionally adopts a less friendly stance, hiding access to their rights from people with disabilities by complicated small print or only offering information upon direct request, while in the remainder of cases framing as generosity that which they are legally expected to adhere to. One more negative aspect is – contrary to the promoted awareness – a risk of generalisation of perception, since while the existence of the Disability ID is mostly known, its inner workings and the markers are less so, potentially leading to misunderstanding and resentment if disabled people 'all' receive benefits universally – they do not; rights such as e.g. the use of regional public transit for seemingly free is limited to individual with limited mobility ("G", "aG", or "Bl") and moreover paid for by them at a state-aided flat rate.

The DBSV criticises a current lack of solid empirical data on the blind and even more so the partially sighted [16]. The currently available data appears limited to a hodgepodge of data left over from the DDR, a WHO-conducted survey from 2002, and data gleaned from various statistics with different focus. Aside from the former two being severely outdated, the WHO data underlines another issue – definitions of visual impairment and the gradients between different degrees of it into empirical categories vary internationally and therefore pose risks of distortion in simply transposing down to national scale.

Audio description On a technical level, it is becoming increasingly simpler to facilitate blind and visually impaired audiences with spoken descriptions of what is visible. Whereas it was already possible during the era of analogue TV decades ago to broadcast an additional secondary audio channel containing either original language dubs or audio descriptions for the blind, as at least occasionally practiced by the public stations, the rise of digital and home media, as well as the proliferation of personal and mobile devices have opened a multiplicity of potential channels to supply audio description in a variety of formats. In spite of this, the content remains lacking and, even more demoralising, the technical

digital solutions that are available in theory leave room for much improvement. Following up on groundwork laid down by DIRECTIVE (EU) 2018/1808 concerning the provision of audiovisual media services (Audiovisual Media Services Directive) https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:32018L1808, the DBSV works on multiple fronts to raise the availability and visible presence of audio descriptions in various areas of culture and entertainment, from providing information and guidelines, the self-help style production of audio guides for museums and tours, to influencing the political process, e.g. in case of the upcoming novelisation of the German "Filmfördergesetz" ('law for film funding grants') https://www.bundesregierung.de/resource/blob/973862/2041360/f3a157cc8ce25dffac7db6b43f54cd8d/2022-05-19-bkm-stellungnahme-dbsv-data.pdf?download=1, which calls for the general provision of audio description content by universal means independent of cinema location and apparently defunct app platforms.

Cultural heritage/museums, accessibility, and audio guides Related and more directly relevant for SHIFT, museums and cultural heritage institutions present another area where spoken description in form of audio guides could play a deciding role in facilitating accessibility, and a selection of model museums demonstrates this. Overall, the situation is less commendable, resulting from idiosyncrasies of stereotypically pedantic nature of German language and law. According to engineer Alexander Gruber, the English term accessibility has two possible German translations, more directly "Zugänglichkeit" (literally 'being accessible') and "Barrierefreiheit" ('free of barriers') https://nullbarriere.de/ausstellung-museum-barrierefrei.htm?layout=nullbarriere_mobil

 Gruber argues that German law tends toward use of the former, often additionally foregrounding access for wheelchair users to the detriment of other barriers. This is amplified by questions about the definitions, where museum may refer either to the building or its function, i.e. its content in for of exhibitions, etc. This may lead to confusion in which a museum technically speaking is accessible whereas its exhibitions nevertheless are full of barriers (the telling example is a wheelchair user who may physically move within the building but may have difficulties reading text installed at normal eye level). If this calls for a re-examination and perhaps re-evaluation of the terms "Zugänglichkeit" and "Barrierefreiheit" on legal grounds to better align with more inclusive international standards and policies (such as the UN Convention on the Rights of Persons with Disabilities or the International Council of Museums (ICOM)), more progressive individual museums and special interest groups have taken matters into their own hands.

Policy stakeholder(s) Principally, all citizens with disabilities and interest in cultural heritage could be considered stakeholders here. More strictly speaking, the stakeholders are their representative organisations such as the DBSV, along with cultural heritage institutions who feel it their mission to be inclusive to those groups. Functioning as an umbrella organisation operating on the national level,

the DBSV [16] coordinates 19 regional subsidiary associations (for the most part corresponding to Germany's federal states) with a combined membership of around 36,000 blind and partially sighted people supplemented by 35 additional specialist organisations comprising another 10,000 members. Vertically, the DBSV focuses these shared efforts and voices unto the national socio-political, economic and cultural landscape, and in turn feeds into a European and global discourse by itself being a part of further national and international networks such as the European and the World Blind Union. While arguably the smaller units are more immediately present to offer a directly available self-help community, comprehensive advice and leisure activities, the consolidation of voices on the subsequent levels offers a foundation through strength in numbers to form a lobby and influence politics as well as economic and cultural policies by engaging with the relevant actors as an organised entity.

Intended SHIFT Message
A number of the SHIFT tools (e.g. Image-to-text, accessibility framework, VR environment) directly address the above-mentioned issues. The SHIFT platform is not only one more contribution to a growing collection of assorted yet more or less disparate tools but is intended as an integrated multi-purpose solution. Back-end tools can be used to generate content more effortlessly like audio descriptions of cultural objects, while audience-facing tools such as the haptics/VR environment can enable the sensory (visually) impaired as well as mobility impaired visitors to experience at least virtually that where they would otherwise face physical barriers, potentially alleviating dilemmas of costs and conservation requirements for rebuilding CH estates.

Supporting evidence available
Through political activism as well as cooperation with corporations, the DBSV follows or fights for a number of policies to be established or expanded, some directly or indirectly relevant for SHIFT. The DBSV offers a multitude of information on barrierless museums ranging from self-help material to practical guidelines for institutions https://www.dbsv.org/museum-%C3%BCbersicht.html, many of which were developed in collaboration with forward thinking museums and technical developers, such as for instance an accessible and inclusive model app made for the Berlinische Galerie (museum of contemporary art of Berlin) https://www.dbsv.org/Accessiblemuseums.html. It is clearly in the interest of the affected groups to see more museums adopt such ideas as well as to establish technical standards.

Expected/emerging evidence from SHIFT
Based on the use case 'CH exhibition as visitor's journey's, with no sensing boundaries
Staatliche Museen zu Berlin (SMB) - Preußischer Kulturbesitz (DBSV) aims to test innovative solutions that will provide superior assistance for people with visual impairments while visiting the SMB museum thereby boosting their participation at museum expositions and events.
SHIFT Haptics/VR Framework

Audio Toolkit

Anticipated policy impacts of SHIFT Continued pressure towards improved accessibility for people with visual and other impairments in cultural heritage services.

10.3 Greece

Policy issue

In Greece almost 29% of citizens [18] have some type of disability or severe impairment. Another important influential factor is the ageing of the population, resulting in a considerable proportion of the users of contemporary and future technological environments being older, who – in a literal sense – perceive and interact with technology differently from younger people, due to functional limitations and age-related changes in cognitive processes.

Recently, the aspect of citizen inclusivity and digital accessibility has been put on the spotlight in Greece, having established pertinent legislation regarding the citizens' right to access public sector and government online services: Law 4727/2020, Law 4994/2022 which incorporate EU's Directive 2016/2102 - Accessibility of the websites and mobile applications of public sector bodies.

Although important positive steps have been made towards citizen inclusivity, these concern the conventional digital transformation, i.e. web services and mobile applications. On the other hand the abundant use of new technologies such as eXtended Reality (XR) nowadays, necessitates the commencement of new policies regarding a wider strategy for digital accessibility towards the new technological trends.

Policy stakeholder (s)

National Accessibility Authority [19] is an advisory body of the State, subordinate to the Prime Minister, for the purpose of access for persons with disabilities in all areas of human activity and has as its mission the continuous monitoring of issues related to the right of access of persons with disabilities and formulating proposals for the formulation of public policies in matters of its subject.

Intended SHIFT Message

SHIFT aims to address digital accessibility for emerging technologies that are used by CH institutions. Being committed to accessibility and inclusivity principles, will pursue to enable cultural heritage to become accessible to museum (digital)-visitors, and thus allow citizens to connect with their heritage regardless of background or ability. Emphasising also that diversity matters, SHIFT pursues to empower people with disabilities to enrich their perspectives and foster their understanding of CH.

Supporting evidence available

Despite the legislation in place and the abundance of guidelines to achieve web accessibility, studies at an international and national level point out that there are still considerable barriers to accessibility, even when it comes to well-established technological realms, such as the web or mobile applications.

At an international level, a recent study [20] of the home pages for the top 1 million websites identified an average of 50 errors per page, making them frequently inaccessible and unusable by people with disabilities. Other studies on the accessibility of mobile applications concur with these findings, indicating that the majority of mobile apps exhibit numerous accessibility violations [21].

In Greece, an analysis of 306 websites featuring 770 webpages of public administration bodies and organisations and 17 mobile applications, which was conducted in 2021, identified 105 accessibility problems on an average per page [22] (Hellenic Republic - Ministry of Digital Governance, 2021).

As a result, it can be concluded that the issue of digital accessibility remains unaddressed, needing more effective solutions. Ensuring digital accessibility goes beyond simply complying with regulations to provide equitable access to information. Studies reporting on the reasons for this gap between policies and practice point out the lack of appropriate education, the complexity of guidelines to follow, as well as the lack of appropriate tools facilitating software engineers in promoting digital accessibility [23]

Advancing the discussion on digital accessibility to contemporary technologies, it is clear that the gap between policies and practice is expected to become even larger. More specifically, for Extended Reality (XR) technologies, studies with developers reveal that a key barrier to developing accessible XR environments is the lack of a consistent accessibility framework across all platforms as well as the lack of concrete accessible implementation examples for XR environments [24].

In this regard, it is imperative, among other measures, to actively pursue the development of appropriate methodological frameworks and tools to promote digital accessibility in XR environments, an endeavour which SHIFT will address.

Expected/emerging evidence from SHIFT
SHIFT, in the context of WP3, will carry out user-based studies assessing the effectiveness of the SHIFT tools for assisting users with disabilities in navigating and perceiving XR environments.

An initial small-scale study of the SHIFT accessibility framework has just been conducted, involving 20 participants with visual impairments. A preliminary analysis of results highlights that the framework assists users in effectively using Virtual Reality environments, ensuring a positive user experience without imposing workload to users. A detailed analysis of the results will be carried out and reported in pertinent SHIFT deliverables.

Anticipated policy impacts of SHIFT
Continued pressure towards improved accessibility for people with visual and other impairments in cultural heritage services.

10.4 Hungary

Policy issue

In Hungary, a significant portion of the population is affected by disabilities or severe impairments, accounting for approximately 1 million people (10% of the population)1. Moreover, the aging population in Hungary is a crucial factor contributing to a growing proportion of citizens using technological environments, such as eXtended Reality (XR), who experience technology differently due to functional limitations and age-related cognitive changes.

The Hungarian government has taken steps to address digital accessibility and citizen inclusivity, particularly in the context of accessing public sector and governmental online services. Legislation similar to the EU's Directive 2016/2102 on the accessibility of websites and mobile applications of public sector bodies has been enacted in Hungary to promote digital accessibility: Act XXVI of 1998 on the Rights and Equal Opportunities of Persons with Disabilities and the CXXV of 2003 Act on Equal Treatment and Promotion of Equal Opportunities.

However, these efforts primarily focus on conventional digital transformation, such as web services and mobile applications, and there's a need for policies that encompass emerging technologies like XR, ensuring inclusivity and accessibility for all citizens.

Policy stakeholder(s)

The National Accessibility Authority of Hungary is a key advisory body to the government, responsible for overseeing and advocating for accessibility and inclusivity for persons with disabilities across various aspects of life. Their mission includes continuous monitoring of accessibility issues and formulating policy proposals to enhance accessibility and inclusivity.

Intended SHIFT Message

SHIFT in Hungary aims to tackle the challenge of digital accessibility concerning emerging technologies used by cultural heritage (CH) institutions. Committed to accessibility and inclusivity principles, SHIFT strives to make cultural heritage accessible to museum (digital) visitors, allowing citizens to connect with their heritage regardless of background or ability. Emphasizing the importance of diversity, SHIFT seeks to empower people with disabilities, enriching their perspectives and understanding of cultural heritage.

Supporting evidence available

While Hungary has made progress in enacting legislation and guidelines for digital accessibility, studies both internationally and within Hungary indicate persistent barriers to accessibility. A study in 2020 analysing 25 websites from public administration bodies identified an average of 30.4 accessibility problems per page.

These findings underscore the need for more effective solutions to bridge the gap between policies and actual practice in digital accessibility. Education gaps, complex guidelines, and a lack of appropriate tools for software engineers are identified as reasons for this disparity. Moreover, accessibility challenges in emerging technologies like XR are recognized, emphasizing the need for consistent accessibility frameworks and concrete accessible implementation examples [25,26,27,28].

Expected/emerging evidence from SHIFT

Based on its use case on 'Experimenting the transformation of medicine and pharmacy' SOM - Magyar Nemzeti Múzeum – Semmelweis Orvostörténeti Múzeum aims to emerge the visitors into the history of medicine and let them "feel" how different illnesses have been treated before modern times. This will be achieved using several tools within the project, haptics being among one of them.

Anticipated policy impacts of SHIFT

Continued pressure towards improved accessibility for people with visual and other impairments in cultural heritage services.

10.5 Romania

Policy issues

The emergence of Artificial Intelligence (AI) as a transformative force in society has prompted legal and regulatory considerations across the globe. Romania, in alignment with European Union directives, has initiated steps to address various facets of AI governance.

In order to align Romania with coordinated EU-wide efforts in AI, the Romanian Government has in 2023 created the Romanian Committee for Artificial Intelligence. (AIR) as a consultative body of the Ministry of Research, Innovation and Digitalization, with the aim to support the Ministry in regulating, coordinating, monitoring and evaluating activities related to artificial intelligence in Romania. Its objectives are to direct, coordinate and monitor strategic actions in the field of AI in Romania, across all societal domains, with a major impact on developing technological and industrial capacity, adapting to social challenges, increasing the competitiveness of the economy, ensuring the ethical use of AI solutions and actively participating in international exchanges of views.

The Authority for the Digitisation of Romania has incorporated the implementation of AI in the public sector as part of its objectives. This authority is tasked with developing and coordinating the national strategy for automation, robotics, and artificial intelligence in alignment with the EU Commission's Digital Europe 2021–2027
Program.

While notable steps have been taken to align with European directives and establish AI-related initiatives, there remains a need for comprehensive legislation addressing key facets such as AI definition, liability, safety, and intellectual property protection. Romania's approach to AI governance continues to evolve, reflecting the dynamic nature of this transformative technology.

Public libraries

The legislative structure has so far allowed technologically sound development, at least for most medium-sized libraries in terms of collections and population served. Unfortunately, the current gap between large and medium libraries compared to small ones is very large. By amending the law, it is expected to give a new turn to the activity of the national network of libraries.
In the new format of the law that is currently being submitted to Parliament, the following should be mentioned from the point of view of institutional evolution in relation to these new technologies:
Definition - Library - an institution, or part of an institution, the principal purpose of which is to facilitate the use of information resources, services and facilities provided to meet the information, research, educational, cultural or recreational needs of its users.
Functions of the public library - Public libraries are libraries governed by public or private law, with or without legal personality, encyclopaedic, with multiple

roles, information, cultural, educational, research and development and social roles, aimed at all audiences.

Public libraries:
- ensure equal access to information and documents necessary for information, permanent education and the development of the personality of users without distinction as to social or economic status, age, sex, political affiliation, religion or nationality
- are single institutions at community level and are set up and operated within all territorial administrative units; they are located in a residence of commune, town or municipality or at a regional convergence point.
- primarily have the following roles:

a) local information centre: they organise and make available to users' information and collections of specific encyclopaedic documents in all formats, databases and other types of resources, ensuring optimal access to knowledge and information, including community information services;

b) cultural centre: they contribute to the cultural and artistic development of the community, to the shaping, support and preservation of its identity and cultural diversity, and to the preservation and promotion of local history.

c) educational centre: they support formal, non-formal and informal education at all levels and lifelong learning, providing learning resources, learning facilities, information literacy and digital skills programs, vocational training programs.

 d) local information and communication technology centre: they provide access to hardware, software, communications networks and help to train citizens to integrate and become an active part of e-inclusion and e-government.

 e) public social and leisure space;

For supporting specific roles and tasks, public libraries will be included as partners in government and local strategies in e-inclusion and e-government, culture, information provision, training and education.

With the agreement and financial support of local public administration, public law libraries can also be set up in smaller local communities within an administrative -territorial unit. The authorities of central and local public administration will ensure the consolidation and expansion of the public library system.

Policy stakeholder (s)
Romanian Committee for Artificial Intelligence
Ministry of Culture
Local Authorities
ANBPR (Library Association)
Romanian Association of the Blind

Intended SHIFT Message
The development of CHI to integrate tools and technologies emerging from SHIFT within their business models has huge potential for enabling them to

achieve their existing objectives towards vulnerable people.

Supporting evidence available

As an important heritage institution, the National Library of Romania (NLR) is constantly concerned with cultivating a modern, vibrant, and well-informed society. That is why NLR pays special attention to making cultural heritage accessible to vulnerable groups, particularly to visually impaired persons. In this respect, over the past decades, NLR has experimented with different ways of opening the way for the visually impaired persons to benefit from the documentary and informational resources in its spaces, strongly believing that people with disabilities are an integral part of the user community. NLR strives to grant them non-discriminatory access to its spaces and collections. Its headquarters, located in the centre of Bucharest,

meets accessibility requirements with access ramps, accessible

elevators, spacious corridors, easy-to-handle doors, accessible seats in the reading rooms or in the open spaces, as well as a tactile ground floor plan.

The library management also plans to transcribe the institution's signage into braille language. With a grant from the Orange Foundation, NLR has equipped one of the library's reading rooms with a computer with screen reader software and a screen magnifier and through accessibility devices and software solutions facilitates access to various areas of knowledge for visually impaired users; from browsing the internet to reading various information materials by voice, being informed about current events in a timely manner to developing tools that provide basic training for visually impaired users and institutions that want to make their products or services accessible for people with disabilities. NLR also has a number of assistive tools such as a graphical document touch playback device that provides tactile and audio access to maps, diagrams, and so on or daisy book reading devices. NLR's approach to people with disabilities is that they should not be isolated in a reading room designed just for them but should be included with other users and has therefore placed assistive devices in almost all spaces allocated to the general public.

the Sound Library of the Metropolitan Library of Bucharest.

The Metropolitan Library of Bucharest is a network of public libraries under the patronage of the Bucharest city hall, inaugurated in 2021 with an EU grant, which facilitates access to information and reading for the citizens of the Romanian capital and which actively contributes to improving the quality of life of its users. The main target audience is the visually impaired in Bucharest and its surroundings.

The Metropolitan Library of Bucharest management has set itself the goal of continuously developing the database of audio materials for blind people and in the future the audiobooks will be made available to beneficiaries throughout Romania by the FTP platforms of the branches of the Romanian Association of the Blind. The Sound Library of the Metropolitan Library of Bucharest has the potential

to expand nationally becoming one of the Metropolitan Library of Bucharest's

most
impactful specialised services for the visually impaired person. Designed as a modern pro-inclusion library service, The Sound Library is continuously being developed and popularised through the network of ANBPR and its member libraries.

Expected/emerging evidence from SHIFT
Equal access - Public libraries are libraries under public or private law, intended for all members of a local or regional community. Public libraries ensure equal access to information and documents necessary for information, permanent education and personality development of users, regardless of social or economic status, age, sex, political affiliation, religion or nationality.

 Based on its use case 'Romanian history and customs explained to digital natives' National Association of Public Librarians and Libraries in Romania (ANBPR), this pilot aims to support and engage at least 10 member libraries to revitalise their book collections presentations and descriptions, to boost the interest also for the digital native generation of European citizens. Member libraries will also be engaged in a contest to raise interest and will encourage citizens, through social media, to share their personal collection of historical photos to create short motion videos. Historical and rare books gain another dimension and are more comprehensive to a wider community. Curators will be assisted in organising the exhibition layout/objects in a culturally significant order, with contemporary references.

Anticipated policy impacts of SHIFT
Continued pressure towards improved accessibility for people with visual and other impairments in cultural heritage services, especially libraries.

Conclusion

It is evident from the initial analyses collected in this document that there is a considerable scope for the results of SHIFT to interface with and influence policy developments on a several levels, in a range of topics and with a variety of stakeholders. These understandings will continue to be updated throughout the remainder of the project duration, becoming D6.8 in their final version before the end of the project duration. They will thus become an important basis for SHIFT's communications and dissemination activity in the policy sphere.

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Metrics for policy maker contact

The following is a consolidated list of the relevant policy-oriented bodies cited in this document. It may not be exclusive.

ANBPR (Romanian Library Association)
CEN/CENELEC
Der Deutsche Verband der Blinden und Sehbehinderten (DBSV)
EuroHaptics Society (EHS) and other Industry Associations
European Commission DG CONNECT
European Commission DG for Education, Youth, Sport and Culture
European Commission DG for Research and Innovation/Research Executive Agency (REA)
European Commission Expert Group on the common European Data Space for Cultural Heritage (CEDCHE)
European Parliament
European/International sectoral Associations e.g. NEMO, ICOM, IFLA
Industry Associations /Rights bodies
ISO/IEC JTC 1/SC 42
Local Authorities

National Accessibility Authority (Greece)
National Ministries (various)
National Ministries and Associations (Accessibility and Inclusion)
National Ministries of Culture
Partnership on AI
Regional Cooperation Council (Southeast Europe)
Romanian Association of the Blind
Romanian Committee for Artificial Intelligence
Standards bodies
The National Accessibility Authority of Hungary
UNESCO
World Blind Union
World Wide Web Consortium

Quantifying this diverse group of policy makers, either as organisations, units or departments within them is not straightforward owing to lack of consistent statistical data. It may, however, be addressed for the purposes of SHIFT at three main levels of operation/responsibility

1. international or European level
2. within SHIFT partner countries (Germany, Greece, Hungary, Romania and the Western Balkans region [Bosnia and Herzegovina, Serbia]
3. within other European countries or regions

Among these levels it is somewhat easier (although also not straightforward) to gain a sense of quantity at levels 1 and 3. Otherwise, broad extrapolation is required. The data presented here should therefore be treated as estimates, which the project will seek to validate and improve as it proceeds.

Estimated number of senior policy-makers

European and International bodies	
European Commission DGs	20
European Parliament (Culture and education committee)	61
CEDCHE representatives	35
Standards bodies	10
European Industry and other Associations	10
UNESCO (relevant directorates)	12
Other International bodies	6
Sub-total	*154*
Bosnia and Herzegovina	
Sub-national and Cantonal Ministries of Culture	24
Germany	
Deutscher Bundestag - Committee on Labour and Social Affairs	49
Federal Ministry of Labour and Social Affairs, Division Va (inclusion, rehabilitation/participation and digital transformation).	6
Die Beauftragte der Bundesregierung für Kultur und Medien (Ministry of State for Culture	20
Deutscher Bundestag - Committee on Culture and the Media	19
Länder (federal states)	32
Kreise (urban and rural districts)	806
Bundesministerium für Wirtschaft und Klimaschutz - Cultural and Creative Industries Initiative	6
Kompetenzzentrum Kultur- und Kreativwirtschaft des Bundes (Federal Centre of Excellence for Cultural and Creative Industries)	6
Sub-total	*944*
Greece	
Ministry of Culture	19
Other relevant Ministries (e.g. digital transformation)	30
NGOs concerned with disabilities	20
Periferia	26
Regional and municipal councillors responsible for culture	664
Sub-total	*759*
Hungary	
Ministry of Culture and Innovation	4
Accessibility and inclusion. No single centrally responsible organisation. Estimated senior policy makers in relevant Ministries	10
Local authorities responsible for inclusion plans	3175
Major NGOs for equality and disability issues	2
Sub-total	*3191*
Romania	
Social inclusion units (central government)	76
Social inclusion units at county level	86
Ministry of Culture	20

County directorates for Culture	43
Sub-total	*225*
Serbia	
Ministry of Culture	20
City secretariats for culture	28
Muncipality Councils for culture	145
Other Ministries with stake in accessibility and inclusion	30
Sub-total	*223*

By extrapolating the number of policy contacts (5366) in the countries above to the other 42 countries in whole of Europe using total population size of the two respective groups as a proxy multiplier (X5.52), the number of potential country-based policy contacts would be in the order of 29620.[1]

Added to the estimated number (154) for European and international bodies , the total target audience of relevant policy makers at all geographical levels is proposed to be just under 30,000.

In measuring the reach and impact of the project towards policy makers of different kinds and in establishing KPIs, it will be important to distinguish between levels and types of contact with policy makers and for this purpose we have developed the following experimental 5 category measurement grading which will be tested and applied in the second half of the project's duration.

	Level 1 International or European level	Level 2 SHIFT partner countries	Level 3 Other European countries or regions
Category one - message reached policy contact (via social media <u>etc</u>)	75% KP1 - 116	50% KPI -2683	20% KPI-5924
Category two - policy maker participated in project event or activity	KPI - 50	KPI - 1000	KPI – 500
Category three – active enquiry from policy maker	KPI - 25	KPI - 100	KPI - 25
Category four – instances of evidence of	KPI - 10	KPI - 20	KPI - 2

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[1] Total population of Bosnia and Herzegovina, Germany, Greece, Hungary, Romania, Serbia (2024) = 134,044,885
Total population of 47 countries of Europe = 740,431,690
https://www.worldometers.info/population/countries-in-europe-by-population/

policy consideration as a result of project			
Category five – <u>instances of</u> evidence of policy adoption or change as a result of project	KPI - 3	KPI - 5	KPI- 3

The Members of the SHIFT Consortium:

Organizations	Country	Role
SIMAVI - SOFTWARE IMAGINATION & VISION	Romania	Coordinator
FORTH - IDRYMA TECHNOLOGIAS KAI EREVNAS	Greece	Partner
MDS - MASSIVE DYNAMIC SWEDEN AB	Sweden	Partner
AUD - audEERING GmbH	Germany	Partner
UAU - UNIVERSITAET AUGSBURG	Germany	Partner
SOMKL - MAGYAR NEMZETI MÚZEUM – SEMMELWEIS ORVOSTÖRTÉNETI MÚZEUM	Hungary	Partner
ANBPR - THE NATIONAL ASSOCIATION OF LIBRARIANS AND PUBLIC LIBRARIES IN ROMANIA	Romania	Partner
SPK - STIFTUNG PREUSSISCHER KULTURBESITZ	Germany	Partner
BMN - THE BALKAN MUSEUM NETWORK	Bosnia and Herzegovina	Partner
HERITAGE - HERITAGE MANAGEMENT	Greece	Partner
ERC - ETICAS RESEARCH AND CONSULTING	Spain	Partner
DBSV - GERMAN FEDERATION OF THE BLIND AND PARTIALLY SIGHTED	Germany	Partner
QMUL - QUEEN MARY UNIVERSITY OF LONDON	United Kingdom	Associated Partner

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