CULTURE WORKING GROUP

Background Paper

Leveraging Digital Technologies for the Protection and Promotion of Culture

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1.   Background

Over the past decade, the accelerated growth of digital technologies has deeply impacted and reshaped the cultural sector across all cultural domains, notably as regards the digitization of cultural heritage as the particular area of focus of priority 4 within the G20 Culture under the Presidency of India. Policymakers, cultural institutions and professionals are increasingly mobilizing digital technologies towards not just the conservation of heritage sites, the safeguarding of living heritage, the protection of cultural property and artefacts and the fight against illicit trafficking, or the conservation of documentary heritage, but also in the field of museums, archives, private collections and cultural institutions more broadly[1]. While transforming professional practices across most concerned domains – from curators and heritage architects to archivists among others – the digital transformation also reshapes relationships with audiences and the general public. This accelerated process of digitization of culture not only concerns web platforms and social media, but also extends to the rapidly emerging technologies of artificial intelligence, virtual and augmented reality, as well as robotics, all of which have the potential to revolutionize the ways in which we preserve, create, access and experience culture. The deployment of 5G, artificial intelligence and big data are projected to prompt greater changes in the next 5 years than any other technology in the past three decades. The COVID-19 pandemic drastically accelerated the rate of change, stirring technological leaps – with 5 years of progress condensed in 3 months, as per a 2020 estimation – while also shifting cultural content online, from museum collections to heritage site visits.[2]

As one of the most culturally diverse countries in the world, India has a vast and unique cultural heritage that includes historical sites, monuments, artefacts, manuscripts, and intangible heritage. It has successfully leveraged the power of digital technologies to preserve and promote cultural heritage through various endeavours. The Digital India campaign, launched in 2015 by the Government of India, aims to use digital technologies to improve the delivery of public services and to promote the digitalisation of cultural heritage. An example is the Indian Heritage Cities Network Programme, which aims to preserve, develop, and promote the heritage of historic cities in India using digital technologies such as GIS (Geographic Information System), 3D modelling, and digital imaging. Through this programme, several heritage sites in cities like Ajmer, Amritsar, and Warangal have been digitised and made available for public viewing through virtual tours and augmented reality.[3]

2. Vision

In view of the transformative impact of digital technologies on the conservation, documentation, safeguarding and monitoring of cultural heritage, and the existing technical, ethical and policy challenges, the Culture Working Group under India's G20 Presidency aims to mobilise the G20 Membership towards (i) expanding the global reflection on digital technologies for cultural heritage, including through strengthened research, data collection and exchange of good practices; (ii) strengthening national and regional policy frameworks to encompass issues related to digital technologies in more systemic ways, building on a rights-based approach, including through capacity building; (iii) supporting alliances between public authorities, research institutes and

specialized entities from the private sector towards enhanced and more coherent investment in the digital technologies; and (iv) supporting the establishment of technical and ethical standards on the digitization of cultural heritage, in close cooperation with international organizations.

3. Challenges, opportunities and trends

3.1 Harnessing digital technologies to support the conservation, safeguarding and documentation of cultural heritage in the face of growing threats

Digital technologies have a significant role to play in safeguarding cultural heritage, particularly in the face of growing threats, linked notably to the rise in conflicts, disasters, air pollution[4], or the impact of climate change[5], among others. In that context, satellite imagery, drone technology, photogrammetry and SD models of heritage sites are increasingly harnessed towards documenting and assessing damage at heritage sites, including UNESCO World Heritage sites, in conflict situations, for example in Iraq, Syria or Yemen. These processes are engaged by public authorities, notably national cultural heritage departments, in collaboration with international organizations such as UNESCO or UNITAR-UNOSAT, but also with critical input from specialized entities from the private sector. Such information can serve as the crucial foundation for the recovery of countries and communities in rehabilitating the edifices of their shared identity, and in ensuring the transmission of memory in the case of irreversible damage. Digital technology can also help in the fight against illicit trafficking of cultural property. Looters are exploiting tools such as social media, online forums and the deep web, and public authorities can deploy remote sensing to detect and monitor excavations; as well as machine learning and 3D imagery-fed blockchain technology to trace provenance records. The sharing of data between countries, using technologies, is equally vital to support international cooperation and knowledge building, thus informing public policies more broadly.

Likewise, digital inventories of museum collections and archive digitization are critical to support disaster risk prevention and reduction. For example, the devastating fire that hit the National Museum of Brazil in Rio de Janeiro in 2018 is estimated to have destroyed some 80-90% of the museum's 20-million-piece collection. The fact that at least part of the museum's inventory was digitized plays an important role in the recovery process. Indeed, the digitization of museum's collections – repositories of some of the unique and vital objects of our common story – is vital for ensuring that content can be shared across museums. In that area, a 2016 report by the Economist Intelligence Unit[6] underlined that many country institutions from countries prone to natural disasters – such as in China, Indonesia, Mexico, Peru and Thailand, for example – have significantly engaged in archives digitization. New technologies can also enhance disaster risk reduction strategies. For example, the tsunami early warning systems are important for preserving cultural heritage, particularly of the Small Island Developing States. Whilst there is widespread recognition that digital technologies offer new ways to produce, store and share museum and heritage assets, the framework for doing so is yet to be fully defined and requires further policy engagement at the national, regional or international levels, including as part of national digital roadmaps on culture.

Digital technologies can also be harnessed for documenting, transmitting and revitalising intangible cultural heritage. As intangible cultural heritage cannot be seen or held in physical form, documentation - particularly through media production projects - allows to understand the evolutionary trends of a certain element of intangible cultural heritage and supports the formulation of measures for its safeguarding. A number of digitization processes of analogue audio-visual resources are underway at the national or regional levels, notably in Asia and the Pacific, including with support of research institutes, with a view to support sustainable safeguarding of living heritage. Digital tools can also act as pedagogic instruments to grasp the diversity of cultural heritage, both tangible and intangible, understand the interconnectedness of heritage practices, sites and concepts, and visualize the contribution of cultural heritage to different aspects of sustainable development through online mapping and visual representation, as illustrated by the online tool *Dive into Intangible Cultural Heritage* or the *Dive into Heritage* currently under development for World Heritage.

A growing number of academic works explore the role and impact of digital technologies in the preservation, documentation and study of cultural heritage across its different components. While the limitations and threats of virtual cultural storages as opposed to physical museums in terms of engaging with memory and history are underlined by some scholars, virtual museums and digital reconstructions of cultural artefacts also help to protect and preserve information which otherwise would be lost, while also opening up new pathways to document and analyse cultural heritage, thus offering critical source of knowledge building.[7] Similarly, the benefits of innovation in digital technologies towards strengthening conservation, documentation and inventorying practices is a particular area of focus. In a global context where the number of research entities specialized on the digitalization of culture remains limited, strengthening research in this area will be critical in the future to support countries in encompassing digital issues within their cultural policies, notably towards the development of national roadmaps.

3.2 Expanding access to culture through digital tools, while also renewing ways to engage in cultural heritage, thus fostering inclusive societies

Harnessing digital technologies will be critical in the coming years to forge an inclusive cultural sector, ensuring equitable access to culture to all and inclusive cultural participation, while also supporting more participatory, community-based cultural policy models. Overall, new technologies affect how we access – and participate – in culture and heritage. In the context of ever-growing social inequalities, digital technologies offer new opportunities to overcome inequalities in access to culture – notably between urban and rural areas, or between urban centres and their peripheries. Moreover, online platforms and collaborative tools are increasingly harnessed, notably at city level, to reshape the governance of culture and support more participatory, community-led public policies, including in the field of culture and cultural heritage.

Firstly, digital technologies have applications in enhancing visitor experiences whilst conserving heritage sites for the future. For example, the Mogao Caves in China, a UNESCO World Heritage site that contains the largest collections of Buddhist cave painting in the world, were beginning to decay as a result of growing contact with

visitors. A state-of-the-art visitor centre was built, featuring exact replicas of the caves and drastically reducing the time visitors spent in the original site. In a similar move to change the visitor experience of cultural heritage, the World Heritage Journeys in Europe platform features 34 lesser-known World Heritage sites from 19 European Union countries, to reduce the pressure on Europe's most visited sites and share the benefits of cultural tourism more equally in a way that is more environmentally and economically sustainable.

Digital technologies – and particularly Open Access approaches to technology – also allow to increase and democratise access to cultural sites and experiences, engaging more broadly with a diversity of audiences – particularly youth as the primary users of digital technologies – reshaping narratives on cultural heritage and facilitating their transmission and appropriation. Overall, technologies support interest, appreciation and awareness among larger audiences. By leveraging social media, in particular, the outreach of curated digital cultural experiences may become accessible to a diverse global audience.

Digital technologies are also increasingly expanding opportunities for cultural mediation in museums and libraries. In the future, virtual and augmented reality usage may be expanded to enhance the visitor experience, also allowing visitors to explore World Heritage sites in their original state, or providing personalised virtual museums. UNESCO's 2015 Recommendation concerning the Protection and Promotion of Museums and Collections, their Diversity and their Role in Society explicitly acknowledges the opportunities of information and communications technologies for museums in terms of "the preservation, study, creation and transmission of heritage and related knowledge" and calls upon countries to support museums in using these technologies. Doing so could enable public authorities to overcome the paradox of the digital transformation, whereby certain populations suffer further exclusion from cultural life, for example by reaching out to new audiences, such as youth, or enhancing visitor spaces for people living with a disability to enjoy content. The 2016 report[8] by the Economist Intelligence Unit mentioned earlier concludes that museums, galleries and theatres in many countries have made considerable strides, for example, in creating rich, user-friendly websites, and in using social media to expand their audiences. However, there is still progress to be made in terms of allowing patrons to interact with art and culture, as well as digital literacy, notably through TVET and capacity-building of educators, learners and practitioners. Crucially, the report notes that digital access boosts rather than reduces physical engagement with cultural content.

Overall, digital technologies lie at the intersection between culture and education. During the height of the COVID-19 pandemic global lockdown, with hundreds of millions of students worldwide confined at home, cultural material proved to be vital to continue learning, stimulate the imagination and engage in critical thinking. The role of the publishing industry, artists' audio recordings of books, and the online resources made available by museums and other cultural institutions were brought to the fore. In addition, the internet provides opportunities for lifelong learning about heritage and the arts, opening up channels for intercultural dialogue. Digital technologies are also proving key in contributing to community-based education and learning about intangible cultural heritage. For example, an innovative project to document indigenous knowledge of plants for medicinal, agricultural, economic and religious

uses in the Subanen community of the Philippines ensured that this ancestral knowledge would be available to present and future generations in multimedia format.

3.3 Addressing a persisting digital divide which spurs inequalities, despite significant areas of progress at the global level

The digital transformation also raises new inequalities and areas of concerns in view of the persisting digital divide. The cost of digital infrastructure and technologies – both in terms of acquisition and maintenance – remains a barrier in some parts of the world, particularly for public authorities, stirring inequalities in terms of connectivity and access. While significant progress has been achieved over the past decade and particularly in the context of the pandemic – which spurred public investment in digital infrastructure globally, notably as part of public funding devoted to COVID-19 recovery plans – access to digital technologies remains unequal between Global North and Global South countries, but also between urban and rural areas. The Broadband Commission estimates that 66%[9] of the world now has access to digital technologies, leaving one third of the world population offline – a global coverage which has however significantly increased since 2020 where it was estimated to reach only 53.6 %[10]. Likewise, the 2022 Global Connectivity[11] report states that many internet users only enjoy basic connectivity, preventing them from harnessing the full potential of digital tools. There are also glaring inequalities between and within countries: digital penetration drops to 36% in the Least Economically Developed Countries, whilst there are 16% fewer women who use mobile internet[12] than men in Low and Middle Income Countries.

Such a digital divide encompasses the "access divide" – namely inequalities in terms of access to internet and digital technologies, which curtails access to information and related economic opportunities – but also more broadly the "use divide" – inequalities in terms of digital skills and literacy, language barriers[13] and socio-economic factors which prevent users from fully utilizing digital technologies [14] – as well as the "quality of use" gap – encompassing the disparities in the quality and speed of access to digital technologies and services linked to the reliability of internet connection or the quality of devices among others[15].

The extent of these inequalities in access to digital technologies has profound implications for culture: while online cultural consumption has increased massively in most countries, the digital divide is clearly reflected in cultural production and consumption patterns. For example, in 2020, only 5% of museums[16] in Africa and the Small Island Developing States were reported to have an online presence as per a study undertaken by UNESCO in the context of the pandemic. Such inequalities impact access to digital resources and tools – and the related knowledge – but also access to the broad spectrum of digital technologies and tools, which curtails in turn countries' capacities to preserve, safeguard and promote their cultural heritage[17].

Addressing the impact of the digital divide in the cultural sector requires further engagement in the development of infrastructure, but also in the adaptation of digital technologies to make them more accessible and operational across the different countries. For example, digital data and platforms need to be optimized to overcome some of these gaps, allowing them to be functional irrespective of connection speeds. Likewise, 3D platforms which offer users different quality options are more accessible

in areas with limited connectivity. More broadly, addressing the digital divide in culture requires a policy shift, whereby the broad spectrum of these inequalities are encompassed when designing strategies and roadmaps on digital culture.

3.4 Developing technical and ethical standards to frame the protection, privacy, security and access to digital cultural data, while also protecting copyright and intellectual property

An increasing part of the world's cultural heritage is being produced, distributed and accessed in digital form. UNESCO defines digital heritage as "heritage that exists in digital form and can be managed and preserved through digital means." This includes a wide range of cultural and historical materials, such as digital documents, images, audio and video recordings, and virtual reality environments.[18] Cultural and educational resources that are "born digital", such as electronic journals, web pages or online databases constitute a substantial repository of human knowledge with the potential to facilitate intercultural dialogue and social inclusion.

Ensuring that digital heritage is preserved and remains accessible over time requires the development of technical and ethical standards – a domain where the engagement of international organizations is particularly critical in view of their normative function. Digital heritage is particularly vulnerable to the risk of technical obsolescence, data migration and data integrity issues. To ensure digital data preservation, efforts are also needed to develop and implement international data standards and FAIR data management to improve the Findability, Accessibility, Interoperability and Reuse of digital assets, so that digital cultural heritage can be sustainably preserved for the future. Interoperability between existing and future digital platforms for culture is key to ensure longevity. The UNESCO Charter on the Preservation of the Digital Heritage (2009)[19] provides guidance on ways in which texts, audio, film and image files should be preserved. Likewise, in the field of tangible cultural heritage, developing international standards for digitizing cultural heritage, as well as data processing and optimization, is particularly critical – a process currently underway as part of the UNESCO 1972 World Heritage Convention, with a view to create an online platform leveraging digital technologies using 3D models, GIS, satellite imagery and audiovisual resources.

Such perspective also requires, more broadly, the development of ethical standards as regards issues such as intellectual property, privacy or access among others. Such standards should notably encompass the free, prior and informed consent of rights holders, including local communities and indigenous peoples, particularly as regards intangible cultural heritage. In line with the principles at the core of the UNESCO 2003 Convention on the Safeguarding of Intangible Cultural Heritage, community-based negotiations for the documentation and digital circulation of representations of local intangible expressions remain key in ensuring that digital technologies are harnessed in ethical ways. Concurrently, it is increasingly important to combat the associated emerging challenges around the digital ownership of cultural artefacts, including the need to compensate local and indigenous communities for digital commodities created for and traded digitally. In that regard, leveraging the knowledge and expertise of universities and international institutions to build capacities in digital recording, processing and modelling can enhance local ownership of digital data assets.

Among the issues to be addressed are notably:

- **Copyright:** Many digital cultural heritage resources are protected by copyright, which can limit access to and reuse of the content. This can be particularly challenging when working with academic collaborators, as copyright laws can vary between countries and may not always align with the goals of open access.[20] Nonetheless, for digital heritage platforms, technology permits making data accessible for certain uses such as exploration, study and discovery without being necessary downloadable by a third party provided that access is granted by the data owner in consultation with the platform administrators.

- **Intellectual property rights:** Collaboration on the preservation and promotion of cultural heritage can also raise issues related to protecting intellectual property rights, such as patents and trademarks, which can limit access to and use of digital cultural heritage resources.[21]

- **Legal and ethical considerations:** Digitising and sharing cultural heritage, including through online platforms or social media, can raise legal and ethical considerations such as issues related to the rights of the bearer communities, requiring to address risks of misuse, misappropriation and decontextualization of cultural heritage.[22]

- **Data privacy and security:** The use of digital technologies to collect, store, and share information about cultural heritage can also raise data privacy issues and may require strict security measures to protect personal information, including as regards the use of social media platforms.[23]

- **Lack of common standards**: Establishing technical standards to support interoperability is particularly critical, particularly in view of the diversity of media (3D, GIS, video, audio, AR, VR, XR) and the multiple available standards and file formats. While standards have already been established for some media such as photo and video, other domains such as 3D or XR remain less standardised.

- **Technical challenges:** Digital cultural heritage materials are often stored in various file formats, some of which may become obsolete over time, which hampers access. This can make it difficult to preserve and access the materials in the long-term and may require complex migration or emulation techniques. In addition, proprietary file formats often make it challenging and costly to store and open files. In that light, open standards need to be promoted for all types of digital data so that this data can be stored and accessed without the need of buying expensive proprietary software.

- **Storage:** Digital cultural heritage materials can take up large amounts of storage space and may require specialised storage solutions such as digital preservation repositories or cloud-based storage services. Additionally, maintaining the integrity and authenticity of the materials over time can be challenging.

- **Human and financial resources:** Preserving digital cultural heritage requires skilled professionals with digital preservation and curating expertise and sufficient financial resources to ensure continuity of the preservation. It also requires collaboration among institutions and organisations to share resources and expertise.

- **Compatibility issues:** It is important to preserve digital heritage materials in a way that future generations can access; however, the technology and software used today may not be available in the future. This means that the digital heritage material needs to be kept in a way that allows them to be migrated to new formats and technologies as these become available.[24]

3.5. Encompassing digital technologies in cultural policies in systemic ways, while also forging alliances between public authorities, research institutions and the private sector

Adapting to the new digital landscape is one of the main frontier issues for the development of national cultural policies that will ensure that culture, and cultural heritage in particular, remains a global public good, accessible to all. In that regard, Ministries of Culture and public cultural agencies around the world have made positive steps towards adapting their work to meet the demands of the digital age, even if this work tends to fall short of a comprehensive national digital culture plan. Many of these initiatives have focused on the modernisation of specific sectors, such as books, music and film, as well as updating copyright legislation. Cultural statistics remain exceedingly scarce and very few countries collect information on culture in the digital environment, thus hampering the development of evidence-based policies.

Enhanced collaboration between public authorities, international organizations in charge of culture, universities and specialized digital heritage actors in the private sector is therefore essential to harness digital technologies for cultural heritage monitoring, conservation, protection, promotion and exploration, thus also contributing to pass on cultural heritage to future generations. Digital technologies can be instrumental, in particular, to support knowledge building, learning and education, sustainable management and dissemination of cultural heritage, while also enabling the creation of exchange networks involving communities or professionals.

In order to address the digital divide, which holds back cultural digitization in some countries, public authorities should also invest proactively in the development of infrastructure and acquisition of specialized technological equipment by public bodies – a perspective which also requires more systemic public-private partnerships, as well as broader commitment from international and regional organizations, in support of national efforts, including as part of ODA or international development strategies. Beyond technical and infrastructure issues, addressing the digital divide requires adapting policy frameworks. Yet, even within countries that benefit from strong digital infrastructure, very few have developed a comprehensive national digital culture plan which goes beyond initiatives taken to digitalize or strengthen certain facets of their cultural sectors.

Moreover, cultural policies should factor in the need to develop digital capacity of concerned institutions, while also raising awareness among culture professionals and institutions on the benefits of digitization. Even where the technical possibilities exist, the digital skills gap remains a major barrier for such technologies becoming a powerful tool for all people. In that perspective, digital data sharing for public access, cooperation through capacity development, as well as exchange of expertise on innovative digital technologies and data recording are among the key areas of engagement for the future. Moreover, supporting leading edge research in the area of digital technologies for cultural heritage is critical, including through the creation of national dedicated research entities.

Finally, policies should encompass a mid- and long-term data preservation strategy to ensure the sustainability of digital data in the rapidly growing field of digital technology, while the development of technical and ethical standards should be supported more

broadly by international institutions to frame national policies. More broadly, a rights-based approach to culture is therefore needed, setting the promotion of cultural rights at the forefront – including issues related to equitable access to culture or collective cultural rights of indigenous communities – thus contributing to more equitable, inclusive societies.

4. Guiding Questions

The G20 Membership is invited to explore the following guiding questions in relation to priority 4:

- How can the G20 Membership advance the global reflection on the digitization of cultural heritage, including through the sharing of good practices and broader investment in research and exploration ?
- How can the G20 Membership develop interoperable and connected digital cultural heritage platforms and create accessible digital platforms, while also ensuring sound and equitable digital preservation?
- How can the G20 Membership strengthen collaboration to address the digital divide, beyond the existing global UN Broadband Commission notably as regards facilitating access to open cultural heritage resources (OCHR) online?

5. Proposed outcomes

It is expected that the G20 Culture Working Group under India's Presidency will mobilise efforts to achieve the following proposed objectives.

5.1   Encompassing digital technologies in cultural policies in systemic ways, while also forging alliances between public authorities, research institutions and the private sector

The G20 Membership may consider the following actions to achieve the proposed outcome:
- Supporting the development of national digital plans, encompassing notably data preservation strategies as well as ethical issues related to cultural rights more broadly;
- Enabling alliances between public authorities, research institutions and specialized entities from the private sector to foster investment towards digital technologies and skills transfer, including through policy incentives.

5.2   Harness digital technologies to support the conservation, safeguarding and documentation of cultural heritage in the face of growing threats

The G20 Membership may consider the following actions to achieve the proposed outcome:
- Supporting the development of national digital inventories of cultural heritage, including as part of the implementation of the UNESCO Culture Conventions, by providing policy guidance and capacity building as relevant as well as by stimulating and facilitating public and private partnerships investment in this effort;

- Fostering the documentation and sharing of good practices in the field of digitization of cultural heritage with a view to support knowledge building and inform public policies more broadly, including through sustaining networks; Investing in leading-edge research institutes in areas related to the digitization of cultural heritage at national and/or regional levels, while also supporting interdisciplinary training programmes;

5.3 Expanding access to culture through digital tools, while also renewing ways to engage in cultural heritage, thus fostering inclusive societies

The G20 Membership may consider the following actions to achieve the proposed outcome:
- Developing and documenting Open Access digital platforms by encouraging joint ventures between public, industry and private sector to foster Open Cultural Heritage Resources (OCHR) accessible to all.
- Sustaining the development of culture-based digital literacy curricula in the educational systems, from curricula to formal, non-formal and informal education settings, including addressing Technical and Vocational Education and Training (TVET) and lifelong learning.

5.4 Addressing a persisting digital divide which spurs inequalities, despite significant areas of progress at the global level

The G20 Membership may consider the following actions to achieve the proposed outcome:
- Fostering international cooperation between G20 Member Countries to address the digital divide in the Global South, including through strengthened synergies between the G20 Culture and Digital workstreams
- Investing in the development of affordable digital creative tools, including through enhanced partnerships with leading entities from the private sector and the exploration of possible funding mechanisms.

The Charter on the Preservation of the Digital Heritage

The Charter covers a wide range of issues related to digital heritage preservation, including the identification, collection, and preservation of digital heritage materials, the use of digital technologies for the preservation and dissemination of digital heritage, and the importance of international cooperation and collaboration in the preservation of digital heritage. It also underlines the importance of preserving digital heritage as a means of fostering cultural diversity, promoting human rights and supporting sustainable development.

The Charter recognises that digital heritage is a global resource that requires international cooperation and collaboration to preserve it and encourages Member States to take steps to ensure the preservation of digital heritage, including through the development of policies, strategies, and best practices, the use of digital technologies and the promotion of international cooperation and collaboration.

The Charter is not legally binding, but it serves as a reference framework for the development of national and international policies, strategies, and best practices for the preservation of digital heritage.

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