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GENERAL ARTICLES

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UNESCO and the Challenge of Preserving the Digital Cultural Heritage**

Abstract: In recent years there has been a growing awareness of the need to preserve the digital cultural heritage, a part of which is at significant risk of being lost. In light of the pressing demands to develop informed and targeted strategies, this article analyses UNESCO's approach towards the preservation of the digital cultural heritage. Being the lead UN agency in the field of cultural heritage preservation, the organization responded to the challenge early on, notably by adopting the Charter on the Preservation of Digital Heritage. The article thus outlines UNESCO's competencies regarding the digital cultural heritage as well as its concept thereof, before

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examining the organization's strategies for the preservation of digital cultural heritage. Furthermore, by providing an outlook on some emerging trends, i.e. increasing privatization and commercialization, future requirements are identified.

Keywords: UNESCO, digital cultural heritage, Charter on the Preservation of Digital Heritage

Introduction

In past decades, the advent of digital technologies and the Internet has profoundly changed the ways in which cultural heritage is created, used, and disseminated.[1] For one thing, technical innovations allow for the conversion of cultural objects from analogue to digital form. Owing to this, philosophical writings, valuable manuscripts, drawings and engravings, compositions by Old Masters, paintings, photographs, and movies exist in digital form today. A prominent example is the 42-line Gutenberg Bible – the first book printed in Europe with movable type. Its famous Goettingen copy, being one of only four of the original bibles that still exist in their complete form, was fully digitized for online presentation in 2000.[2] In this regard, digitization is considered an essential and sustainable instrument for the preservation of valuable heritage for future generations, particularly in light of the destruction of cultural heritage in crisis and conflict zones,[3] and the deterioration of old and fragile cultural objects.[4] Still, the rapidly evolving digital technologies pose substantial challenges to traditional cultural policy concepts largely based on materiality. Categories initially designed to fit such concepts of "classical" heritage are likely to be disrupted by the dynamic and particularly "fluid" characteristics of new media.[5]

1 RICHES, *Digital Copyright Framework. The Move from Analogue to Digital and New Forms of IPR*, European Policy Brief, June 2015, p. 1, https://resources.riches-project.eu/wp-content/uploads/2015/09/EUROPEAN-POLICY-BRIEF_Digital-Copyright-Framework_final.pdf [accessed: 04.08.2020].

2 SUB Goettingen, *Gutenberg Digital*, http://www.gutenbergdigital.de/ [accessed: 04.08.2020]; on the whole F. Cameron, *Beyond the Cult of the Replicant – Museums and Historical Digital Objects: Traditional Concerns, New Discourses*, in: F. Cameron, S. Kenderdine (eds.), *Theorizing Digital Cultural Heritage: A Critical Discourse*, The MIT Press, Cambridge, MA–London 2007, pp. 49-75; J. Hemsley, V. Cappellini, G. Stanke (eds.), *Digital Applications for Cultural and Heritage Institutions*, Ashgate, Aldershot–Burlington 2005.

3 For more on the destruction of cultural heritage in conflict situations, see S. von Schorlemer, *Cultural Heritage Protection as a Security Issue in the 21st Century: Recent Developments*, "Indonesian Journal of International Law" 2018, Vol. 16(1), pp. 28-60.

4 C.J. Nwabueze, *Copyright and Data Authenticity in the Digital Preservation of Heritage: The Case of OAPI States*, "International Journal of Intangible Heritage" 2017, Vol. 12, p. 94.

5 B. Graham, *Redefining Digital Art: Disrupting Borders*, in: F. Cameron, S. Kenderdine (eds.), *Theorizing Digital Cultural Heritage: A Critical Discourse*, The MIT Press, Cambridge, MA–London 2007, p. 93.

In addition, cultural resources can be created digitally (so-called "born-digital" heritage), as for example technical architectural drawings or electronic compositions such as electronic music, journals, digital images, and computer games. Also, Social Media may contribute to knowledge generation and be part of the digital heritage. Furthermore, digital tools and networks – most notably the Internet – allow for the global dissemination of cultural heritage and thus offer "unprecedented possibilities for new access paths encouraging interactivity".[6] As an increasing number of people are gaining access to the Internet, there is hope that comprehensive cultural participation outside of traditional knowledge communities can be achieved and innovative cultural production facilitated.[7]

However, while the increase in technological capabilities has presented policymakers and cultural institutions with a variety of new opportunities to shape the cultural heritage framework, it has also brought about significant challenges, including in terms of heritage preservation. In fact, due to multiple threats such as the rapid obsolescence of the hardware and software on which the digital heritage is stored, it is at risk of being lost.[8]

Already in 2002, the European Commission on Preservation and Access (ECPA)[9] thus emphasized that "[a]dequate resources and support at policy level are indispensable to ensure that future generations will still have access to the wealth of digital resources in whose creation we have invested so much over the past decades".[10] The Commission also determined that "the terrain is so new and experience as yet so limited, that immense efforts will be needed to build up the necessary infrastructure".[11] Yet, it was noted in 2003 that given the rapid and cost-

[6] Council of Europe, *European Cultural Heritage Strategy for the 21st Century*, May 2018, p. 16, https://rm.coe.int/european-heritage-strategy-for-the-21st-century-strategy-21-full-text/16808ae270 [accessed: 04.08.2020].

[7] As was noted in a report by the Organisation for Economic Co-operation and Development (OECD), the Internet Society (ISOC), and UNESCO, "[t]echnology can help support the recognition, creation, preservation, dissemination and utilisation of local content […]. [E]mpirical research shows there is a strong correlation between the development of network infrastructure and the growth of local content", see OECD, ISOC, UNESCO, *The Relationship between Local Content, Internet Development and Access Prices*, OECD Digital Economy Papers No. 217, 18 February 2013, p. 7.

[8] UNESCO General Conference, *Charter on the Preservation of Digital Heritage*, 15 October 2003, 32 C/Resolution 42, Art. 3.

[9] The ECPA was an Amsterdam-based non-profit foundation established in 1994 "to promote activities aimed at keeping collections in European archives and libraries accessible over time". It acted as a "European platform for discussion and cooperation of heritage organizations in areas of preservation and access"; see the cached version of ECPA's website: European Commission on Preservation and Access, *Who We Are*, http://web.archive.org/web/20080403233350/http://www.knaw.nl/ecpa/about.html [accessed: 04.08.2020]. For more on the work of the ECPA, see also Y. de Lusenet, P.J.D. Drenth, *Preservation and Access: Two Concepts, One Goal. The Work of the European Commission on Preservation and Access (ECPA)*, "Journal of the Society of Archivists" 1999, Vol. 20(2), pp. 161-168.

[10] UNESCO Executive Board, *Report by the Director-General on a Draft Charter on the Preservation of the Digital Heritage*, 9 April 2002, 164 EX/21, Annex I, p. 8, para. 54.

[11] Ibidem.

ly nature of the digital evolution, neither governments nor institutions have been able to develop timely and informed preservation strategies.[12]

Against this background, one can identify a pressing need to develop new, informed, and targeted strategies. This paper aims to analyse the approach developed by UNESCO, which – as the lead UN agency in the field of cultural heritage preservation – has devoted its attention to the issue early on. It begins by outlining UNESCO's competencies regarding the digital cultural heritage as well as its concept thereof. The paper then examines the organization's strategies in response to the manifold challenges to preservation, focussing on selection, digital continuity, integrity and authenticity, and accessibility. Furthermore, by giving an overview and outlook on some emerging trends, future requirements will be identified.

What Role for UNESCO?

The United Nations Educational, Scientific and Cultural Organization (UNESCO) is the principal international organization in the field of culture and information preservation. Being responsible for the safeguarding of the cultural, scientific, and information heritage on a worldwide scale, the UN agency's interest in the preservation of the digital cultural heritage comes as no surprise.[13] In fact, it is rooted in UNESCO's Constitution, which provides for the organization to maintain, increase, and diffuse knowledge, including "[b]y assuring the conservation and protection of the world's inheritance of books, works of art and monuments of history and science".[14]

The preservation of digital heritage is situated within the organization's Communication and Information Sector, which was created in 1990. In line with UNESCO's mandate to "promote the free flow of ideas by word and image",[15] one of the sector's goals is to foster access to information and knowledge. It is against this backdrop that UNESCO's efforts to preserve information can be understood: "Faced with the growing danger of loss of valuable information that determine the world's legacy of knowledge, the identity, history and values of humankind, UNESCO strives to sensitize governments, relevant institutions and the public at large of the importance to preserve information for present and future generations".[16]

12 UNESCO General Conference, *Charter on the Preservation of Digital Heritage*, Art. 3.

13 A. Abid, *Safeguarding Our Digital Heritage: A New Preservation Paradigm*, in: Y. de Lusenet, V. Wintermans (eds.), *Preserving the Digital Heritage. Principles and Policies*, Netherlands National Commission for UNESCO, Den Haag 2007, p. 7.

14 Constitution of the United Nations Educational, Scientific and Cultural Organization, 16 November 1945, 4 UNTS 275, Art. 1(2)(c).

15 Ibidem, Art. 1(2)(a).

16 UNESCO, *Information Preservation*, https://en.unesco.org/themes/information-preservation [accessed: 04.08.2020].

Since early on, the organization has addressed the preservation of the digital heritage as part of its activities for safeguarding the documentary heritage.[17] Drawing attention to the growing digital heritage in the world and its susceptibility to technical obsolescence and physical decay, UNESCO developed a far-sighted campaign for the promotion of digital preservation. This included the preparation of standard-setting instruments in the field of culture and information.[18]

In a continuous process involving the participation of memory institutions,[19] these activities resulted in the adoption of the Charter on the Preservation of Digital Heritage at the 32nd session of the UNESCO General Conference on 15 October 2003. Being one of the international texts "aimed at regulating the use of new technologies in the field of cultural heritage"[20] which emerged at the dawn of the new millennium, it marks a milestone in the organization's efforts to preserve digital cultural resources and has remained highly relevant to this day. As is emphasized in the literature, the Charter offers a "valuable basic framework in the new scientific field of the digital or new heritage" and has developed into a set of useful guidelines for science and practice.[21]

According to the Charter, UNESCO has the responsibility to serve as a forum in which Member States, intergovernmental organizations, NGOs, civil society, and the private sector may join together to elaborate policies, objectives, and projects.[22] Furthermore, the organization's authority in this regard includes proposing standard guidelines of an ethical, legal, and technical nature.[23]

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17 Y. de Lusenet, *Tending the Garden or Harvesting the Fields: Digital Preservation and the UNESCO Charter on the Preservation of Digital Heritage*, "Library Trends" 2007, Vol. 56(1), p. 164.

18 UNESCO General Conference, *Preservation of the Digital Heritage*, 3 November 2001, 31 C/Resolution 34.

19 As Yola de Lusenet notes, consultations and discussions were based on a paper prepared for UNESCO by ECPA and on the Guidelines for the Preservation of Digital Heritage written by the National Library of Australia. The latter document introduced general and technical guidelines for professionals responsible for preserving access to digital materials and serves as a companion volume to the Charter, see Y. de Lusenet, op. cit., p. 165; for the Guidelines, see National Library of Australia, *Guidelines for the Preservation of Digital Heritage*, March 2003, CI-2003/WS/3; for the discussion paper by ECPA, see UNESCO Executive Board, op. cit., Annex I.

20 V.M. López-Menchero Bendicho et al., *Digital Heritage and Virtual Archaeology: An Approach through the Framework of International Recommendations*, in: M. Ioannides, N. Magnenat-Thalmann, G. Papagiannakis (eds.), *Mixed Reality and Gamification for Cultural Heritage*, Springer, Cham 2017, p. 11.

21 C. Robertson-von Trotha, R. Hauser, *UNESCO and Digitalized Heritage: New Heritage – New Challenges*, in: D. Offenhäußer, W.C. Zimmerli, M.-T. Albert (eds.), *World Heritage and Cultural Diversity*, German Commission for UNESCO, Bonn 2010, p. 71.

22 UNESCO General Conference, *Charter on the Preservation of Digital Heritage*, Art. 12(b).

23 Ibidem, Art. 12(c); see for example the UNESCO/PERSIST Guidelines for the Selection of Digital Heritage for Long-term Preservation: UNESCO, PERSIST, *Guidelines for the Selection of Digital Heritage for Long-term Preservation*, March 2016, https://www.ifla.org/files/assets/hq/topics/cultural-heritage/documents/persist-content-guidelines-en.pdf [accessed: 04.08.2020].

The 2015 Recommendation Concerning the Preservation of, and Access to, Documentary Heritage Including in Digital Form ("the 2015 Recommendation")[24] supplements the Charter. It was adopted at the 38th session of the UNESCO General Conference under the impression that a considerable share of the documentary heritage had been lost due to the rapid technological change, despite the adoption of several declarations in prior years.[25]

In conjunction both documents – the Charter and the 2015 Recommendation – outline the cornerstones of UNESCO's approach for the preservation of the digital heritage and provide for a legal policy framework at the universal level. In this regard they are closely connected to UNESCO's Memory of the World Programme (MoW), which – created in 1992 and operative since 1995 – aims at preserving and making accessible the world's rich documentary heritage.[26]

UNESCO's Concept of Digital Heritage

According to the Charter on the Preservation of Digital Heritage, the digital heritage consists of "unique resources of human knowledge and expression" such as "cultural, educational, scientific and administrative resources, as well as technical, legal, medical and other kinds of information", provided that these resources were created digitally or converted into digital format from existing analogue resources.[27] Following this understanding, the digital heritage comprises both digitized analogue as well as born-digital heritage. The latter – if born digital

[24] UNESCO General Conference, *Recommendation Concerning the Preservation of, and Access to, Documentary Heritage Including in Digital Form*, 17 October 2015, 38 C/Resolution 55, Annex V.

[25] See for example UNESCO, *Warsaw Declaration: 'Culture – Memory – Identities'*, Fourth International UNESCO Memory of the World Conference, 18-21 May 2011, http://www.unesco.org/new/fileadmin/MULTIMEDIA/HQ/CI/CI/pdf/mow/warsaw_declaration_en.pdf [accessed: 04.08.2020]; UNESCO Information for All Programme (IFAP), *The Moscow Declaration on Digital Information Preservation*, International Conference on Preservation of Digital Information in the Information Society: Problems and Prospects, 3-5 October 2011, http://www.unesco.org/new/fileadmin/MULTIMEDIA/HQ/CI/CI/pdf/ifap/Moscow%20Declaration.pdf [accessed: 04.08.2020]; UNESCO General Conference, *UNESCO/UBC Vancouver Declaration*, 6 August 2013, 37 C/INF.15, Annex.

[26] UNESCO, *Memory of the World*, https://en.unesco.org/programme/mow [accessed: 04.08.2020]; the programme's register lists documentary heritage identified as meeting the criteria of world significance and comprises 432 inscriptions as of December 2018, see UNESCO, *Statistics of Memory of the World*, December 2018, https://en.unesco.org/sites/default/files/statistics_of_mow.pdf [accessed: 04.08.2020]; for more on the inscriptions, see UNESCO, *Safeguarding the Documentary Heritage of Humanity*, 2010, CI-2010/WS/3-CLD11910, pp. 6-9. In recent years, the MoW has been subject to profound criticism due to difficulties in the practical implementation of its objectives. Caroline Robertson-von Trotha and Robert Hauser refer in particular to linguistic barriers and insufficient contextualization, see C. Robertson-von Trotha, R. Hauser, op. cit., pp. 72-73; see also I. Wilson, *The UNESCO Memory of the World Program: Promise Postponed*, "Archivaria" 2019, Vol. 87, pp. 106-137.

[27] UNESCO General Conference, *Charter on the Preservation of Digital Heritage*, Art. 1.

in the 21st century – exists in its digital form exclusively as "there is no other format but the digital object".[28]

UNESCO further defines digital heritage as made up of "computer-based materials of enduring value",[29] including texts, databases, audio, images, graphics, software, and web pages.[30] The processes of its creation are diverse, as it emanates from different regions, communities, industries, and sectors.[31] Moreover, the digital heritage is "inherently unlimited by time, geography, culture or format" and therefore potentially allows for the comprehensive representation of all peoples, nations, cultures, and languages of the world.[32]

The specific characteristics of the digital heritage have led to its designation as a "new heritage" in the literature.[33] Features distinguishing it from analogue heritage include the possibility to copy digital objects an infinite number of times without a reduction in their quality (unlike old manuscripts for instance) and its potential accessibility from everywhere in the world via the Internet.[34] It is defined by "an environment where space and time are no longer restrictive qualities" and characterized by interrelation and interactivity between users.[35]

To summarize, digital heritage offers "broadened opportunities for creation, communication and sharing of knowledge among all peoples",[36] thus serving the higher goals of equal opportunities, development, and good governance.[37]

The importance of the digital heritage – as highlighted in the Charter – can be illustrated in the light of the COVID-19 pandemic. Recently, UNESCO noted

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28 Ibidem; the classification of both born-digital and born-analogue heritage as digital heritage is criticized by Titia and Bram van der Werf, who argue that it confuses heritage professionals about the nature of native digital heritage and distracts memory institutions from tackling the preservation of true digital heritage, see T. van der Werf, B. van der Werf, *Documentary Heritage in the Digital Age: Born Digital, Being Digital, Dying Digital*, in: R. Edmondson, L. Jordan, A.C. Prodan (eds.), *The UNESCO Memory of the World Programme. Key Aspects and Recent Developments*, Springer, Cham 2020, pp. 183-184.

29 UNESCO, *Concept of Digital Heritage*, https://en.unesco.org/themes/information-preservation/digital-heritage/concept-digital-heritage [accessed: 04.08.2020].

30 UNESCO General Conference, *Charter on the Preservation of Digital Heritage*, Art. 1.

31 UNESCO, *Concept of Digital Heritage*.

32 UNESCO General Conference, *Charter on the Preservation of Digital Heritage*, Art. 9. In this regard, the organization indirectly builds upon its achievements and experiences regarding governance and regulation in the context of the diversity of cultural expression, see the Convention on the Protection and Promotion of the Diversity of Cultural Expressions, 20 October 2005, 2440 UNTS 311.

33 C. Robertson-von Trotha, R. Hauser, op. cit., p. 69; for a list of special characteristics that distinguish digital objects from traditional heritage materials, see J. Mackenzie Owen, *Preserving the Digital Heritage: Roles and Responsibilities for Heritage Repositories*, in: Y. de Lusenet, V. Wintermans (eds.), *Preserving the Digital Heritage. Principles and Policies*, Netherlands National Commission for UNESCO, Den Haag 2007, pp. 47-48.

34 C. Robertson-von Trotha, R. Hauser, op. cit., p. 69.

35 L. Marcato, *Culturally Digital, Digitally Cultural: Towards a Digital Cultural Heritage?*, in: S. Pinton, L. Zagato (eds.), *Cultural Heritage. Scenarios 2015-2017*, Edizioni Ca' Foscari, Venezia 2017, p. 519.

36 UNESCO General Conference, *Charter on the Preservation of Digital Heritage*, Preamble.

37 Y. de Lusenet, op. cit., p. 177.

in a statement on the threat posed by the disease that preserving records related to the pandemic, including records of humanity's artistic and creative expression, will provide a perspective on how governments, citizens, and the international community have addressed the outbreak of the virus. These records will therefore be "necessary for understanding, contextualizing and overcoming such crises in the future".[38] Furthermore, the organization noted that digital technologies and digitized heritage have enabled memory institutions to continue to serve the public amidst the crisis (e.g. by offering free online exhibitions, making available digitized copies of ancient manuscripts, and engaging with citizens on social media), thereby helping communities to connect with each other and providing psychosocial support through records of shared languages, cultures, and creative expression.[39]

UNESCO's understanding of digital heritage clearly implies that it is of great importance for humankind. Therefore, the Preamble of the Charter on the Preservation of Digital Heritage stipulates that it must be preserved for posterity.[40]

In addition, the Charter highlights major challenges involved in this regard.[41] Specifically, Article 1 takes account of the fragmented and frequently ephemeral nature of digital materials. Article 3 further notes that rapid technological developments result in the degradation of storage media and may lead to data formats quickly becoming obsolete. As operating systems and their hardware platforms change roughly every two years, major compatibility issues arise.[42] The European Commission on Preservation and Access noted in a discussion paper prepared for UNESCO that the average life expectancy of a website ranges from 44 days to two years, with some websites vanishing completely as soon as interest declines.[43] While the conversion of data to new platforms or different programs is technically possible, no one can predict how successful successive conversions will prove to be over time.[44] As a consequence, the timescale for preservation has shrunk considerably.[45]

Another challenge identified in the Charter on the Preservation of Digital Heritage pertains to the massive and continuously growing amount of digital heritage materials.[46] As cultural resources are increasingly "produced, distributed, accessed

[38] UNESCO, *Turning the Threat of COVID-19 into an Opportunity for Greater Support to Documentary Heritage*, April 2020, p. 1, https://en.unesco.org/covid19/communicationinformationresponse/documentaryheritage [accessed: 04.08.2020].

[39] Ibidem, p. 2.

[40] UNESCO General Conference, *Charter on the Preservation of Digital Heritage*, Preamble.

[41] C. Robertson-von Trotha, R. Hauser, op. cit., p. 71.

[42] Ibidem, p. 69.

[43] UNESCO Executive Board, op. cit., Annex I, p. 2, para. 13.

[44] Ibidem, Annex I, p. 6, para. 38.

[45] Ibidem, Annex I, p. 1, para. 3.

[46] Ibidem.

and maintained in digital form",[47] UNESCO speaks of an "ever-growing heritage", which may exist in any part of the world, in any language, and in any form of human expression or knowledge.[48] For instance, while there is no conclusive data on the exact percentage of heritage digitization, it is estimated that on average only 22% of the heritage collections in Europe were digitized as of June 2017, with 54% of the analogue collection still needing to be digitized.[49] Additionally, it can be assumed that efforts aimed at overcoming the dominance of English by making the Internet multilingual will further add to the growth of digital cultural heritage information. Data indicates that while English continues to be the most-used language by Internet users, the growth rate of English-speaking users between 2000 and 2019 was considerably smaller compared to other languages such as Chinese, Arabic, and Russian.[50]

The growing amount of data touches upon another sensitive issue: the requirement of filter processes to determine which resources should be kept for posterity and which need not. The UNESCO Director-General identified the selection of materials worthy of preservation as a pressing issue as early as in 2002.[51] Inasmuch as this is a significant challenge for preservation, it will be returned to in more detail at a later point in this work.

Digital Heritage in the Light of UNESCO's Cultural Heritage Framework

The specific, "new" characteristics of the digital heritage suggest that it cannot simply be regarded as an integral part of UNESCO's cultural heritage framework. As noted in a discussion paper prepared by the ECPA, "[i]n the digital world, new types of materials have come into being that are hard to classify by conventional criteria".[52]

In fact, as the following two examples illustrate, the digital heritage rather challenges "classical" heritage concepts.

47 UNESCO General Conference, *Charter on the Preservation of Digital Heritage*, Preamble.

48 Ibidem, Art. 1.

49 The remaining 24% does not need to be digitally reproduced; see Europeana Foundation, *Europeana DSI 2-Access to Digital Resources of European Heritage*, D.4.4 Report on ENUMERATE Core Survey 4, 31 August 2017, p. 6; although no explanation is given as to why there is no need to digitally reproduce these collection items.

50 Internet World Stats, *Internet World Users by Language: Top 10 Languages*, https://www.Internetworldstats.com/stats7.htm [accessed: 04.08.2020].

51 UNESCO Executive Board, op. cit., p. 1, para. 3.

52 Ibidem, Annex I, p. 4, para. 6.

Intergenerational transmission

In the legal tradition of UNESCO, intergenerational transmission, i.e. the safeguarding for future generations, is not just an objective closely related to the organization's concept of cultural heritage – it is at its core. Thus, virtually all of UNESCO's cultural conventions emphasize the importance of preserving the cultural heritage for posterity.[53]

In Article 1 of the Charter on the Preservation of Digital Heritage, this objective can also be found regarding the digital heritage: "Many of these resources have lasting value and significance, and therefore constitute a heritage that should be protected and preserved for current and *future generations*".[54]

This gives rise to the question whether the concept of intergenerational transmission, which was initially drafted for the analogue heritage, should be automatically applied to digital heritage. Hitherto, "future generations" – referring to our physical descendants – indicated a timescale for preservation of a few dozen, if not hundreds of years. However, it is difficult to assume that this applies to rapidly successive technological generations or short-term technological leaps in the context of the digital heritage.

Thus, if the concept is to be retained for the digital heritage, the time frame for intergenerational transmission is much shorter. Unless appropriate preservation measures are taken, the opportunity to pass on the digital heritage to our descendants may be lost in a matter of only a few years.

Heritage value

The need to save the digital heritage for posterity presumes that it has a value attached to it. In Article 1 of the Charter on the Preservation of Digital Heritage, UNESCO recognizes that many of the digital resources have "lasting value and significance" and therefore require active preservation strategies. Yet, while this

[53] See for example the Convention for the Protection of the World Cultural and Natural Heritage, 16 November 1972, 1037 UNTS 151, Art. 4; Convention for the Safeguarding of the Intangible Cultural Heritage, 17 October 2003, 2368 UNTS 3, Art. 2; Convention on the Protection and Promotion of the Diversity of Cultural Expressions, 20 October 2005, 2440 UNTS 311, Art. 2(6). References to this concept can also be found in the literature, see for example S. Colley, *Ethics and Digital Heritage*, in: T. Ireland, J. Schofield (eds.), *The Ethics of Cultural Heritage* (*Ethical Archaeologies: The Politics of Social Justice*, Vol. 4), Springer, New York 2015, p. 14: "Cultural heritage is something valuable for past, present and future generations that people want to keep. It may be tangible [...] or intangible, e.g. values and ideas associated with or symbolised by tangible cultural heritage and cultural practices, representations and skills with enduring cultural significance for future generations"; W.S. Logan, *Closing Pandora's Box: Human Rights Conundrums in Cultural Heritage Protection*, in: H. Silverman, D.F. Ruggles (eds.), *Cultural Heritage and Human Rights*, Springer, New York 2007, p. 34: "Heritage usually comprises those things in the natural and cultural environment around us that we have inherited from previous generations – or were sometimes created by the current generation – and that we, as communities and societies, think are so important we want to pass them on to the generations to come".

[54] UNESCO General Conference, *Charter on the Preservation of Digital Heritage*, Art. 1 (emphasis added).

indicates a need to select the digital heritage worthy of preservation, it remains unclear how to determine its "value" and "significance".

As early as 2002 the UNESCO Director-General noted a necessity to adapt or extend "[l]egal frameworks defining responsibilities and procedures" for digital heritage, including regarding the selection of materials for preservation.[55] The adoption of such a framework was supported with the argument that digital heritage, in principle, is now to be considered as part of the world's cultural heritage.[56]

However, by revisiting the process by which value is accorded to cultural forms,[57] UNESCO notably deviates from its traditional, material concept of world cultural heritage in this regard.[58] In fact, UNESCO acknowledges that "[h]eritage materials can exist well beyond the limits suggested by national legislation or international conventions. Anything that is considered important enough to be passed to the future can be considered to have heritage value of some kind".[59]

The heritage value of digital materials may also be based on what is important to a group or a community.[60] This sort of bottom-up process beyond national and international cultural heritage law takes account of the fact that individuals, organizations, and communities are increasingly "using digital technologies to document and express what they value and what they want to pass on to future generations".[61] Clearly, UNESCO's understanding of world heritage based on Outstanding Universal Value[62] is thus widening considerably regarding new digital heritage. Putting it bluntly, almost everything deemed worth preserving for the future can, in the broadest sense, be considered world heritage in the digital era.

This illustrates the difficulty in projecting traditional heritage concepts onto the dynamic digital environment. It also poses the danger of inappropriately

55 UNESCO Executive Board, op. cit., p. 2, para. 5.

56 UNESCO, *Digital Heritage*, https://en.unesco.org/themes/information-preservation/digital-heritage/ [accessed: 04.08.2020]; for a critical discourse on the "heritagization process", i.e. the "ascription of cultural materials in a digital form as heritage", see F. Cameron, *The Politics of Heritage Authorship. The Case of Digital Heritage Collections*, in: Y.E. Kalay, T. Kvan, J. Affleck (eds.), *New Heritage: New Media and Cultural Heritage*, Routledge, London–New York 2008, pp. 170-184.

57 Y. de Lusenet, op. cit., p. 176.

58 It should be noted that even UNESCO World Heritage Sites use the new technologies to convey world heritage, especially to present the sites in their uniqueness. See for example Welterbe Westwerk Corvey, *Neue Technologien zur Vermittlung von Welterbe*, https://welterbewestwerkcorvey.de/tagung/ [accessed: 04.08.2020].

59 UNESCO, *Concept of Digital Heritage*.

60 Ibidem.

61 Ibidem.

62 For more on the Outstanding Universal Value, see UNESCO Intergovernmental Committee for the Protection of the World Cultural and Natural Heritage, *Operational Guidelines for the Implementation of the World Heritage Convention*, 10 July 2019, WHC.19/01, paras. 49-53; see also F. Francioni, *The Preamble*, in: F. Francioni (ed.), *The 1972 World Heritage Convention. A Commentary*, Oxford University Press, Oxford–New York 2008, pp. 17-21.

conceiving digital heritage as "static", even though it shares a considerable number of features with intangible heritage.[63]

UNESCO's Strategies for the Preservation of the Digital Heritage

To counter the outlined challenges and preserve the digital heritage for the future, UNESCO has identified the need for a targeted approach and suitable measures in terms of the creation, maintenance, and management of digital materials.[64] The organization has therefore developed a set of guiding principles for Member States, cultural institutions, and other stakeholders involved in this task.

Selecting what should be kept

The selection of materials that should be kept for posterity is a precondition for preservation, and a particularly difficult challenge in light of the flood of digital heritage resources. According to the Charter on the Preservation of Digital Heritage, it must be based on certain criteria, with the main one relating to the "significance" and "lasting value" of the digital materials.[65] UNESCO further holds that born-digital materials should be given priority and that selection decisions must be accountable and based on "defined principles, policies, procedures and standards".[66]

However, for years there has been criticism that there are hardly any suitable guidelines or criteria to help with these decisions.[67] In 2015, the UNESCO Recommendation specified that such criteria should be developed by memory institutions in coordination with the civil society, taking into account key documents as well as contextual materials. It was also noted that the selection criteria must be non-discriminatory, clearly defined, and "neutrally balanced with respect to knowledge fields, artistic expressions and historic eras".[68] Compared to the Charter, this specification marks a significant progress at the normative level.

For further guidance, the UNESCO/PERSIST (Platform to Enhance the Sustainability of the Information Society Transglobally) Task Force published a set of guidelines for the selection of digital heritage for long-term preservation in March 2016, aimed at providing a starting point for memory institutions when

63 See F. Cameron, *The Politics of Heritage Authorship…*, p. 182; Y. de Lusenet, op. cit., p. 175.

64 UNESCO General Conference, *Charter on the Preservation of Digital Heritage*, Art. 1.

65 Ibidem, Art. 7.

66 Ibidem.

67 C. Robertson-von Trotha, R. Hauser, op. cit., p. 69.

68 UNESCO General Conference, *Recommendation Concerning the Preservation…*, Annex V, p. 3, para. 1.2.

drafting their own policies on the selection of digital heritage.[69] An institution should evaluate the relative significance of the digital heritage to its mandate and public, assess its sustainability, i.e. its capacity to preserve it for long-term access and use, and consider its availability to other heritage institutions.[70]

Preserving digital continuity

When addressing questions regarding the preservation of the digital heritage, the temporal dimension is another aspect that ought to be considered. As the digital world constantly evolves and file formats and programs quickly become outdated (if not obsolete), the process of preserving digital heritage must be continuous, taking place over decades "or even forever".[71] This entails preserving file formats and programs or converting files to other formats that can be interpreted by new programs.[72]

Thus, "digital continuity" is a fundamental strategy in UNESCO's approach to the preservation of the digital heritage: "To preserve digital heritage, measures will need to be taken throughout the digital information life cycle, from creation to access. Long-term preservation of digital heritage begins with the design of reliable systems and procedures which will produce authentic and stable digital objects".[73]

In this regard, early intervention and the reliability of preservation programmes are crucial. The former refers to the need to take steps for the preservation of digital materials "very early on in their lifecycle".[74] Seamus Ross notes that it is not enough to build the capacity to handle digital materials if they are deposited, but also necessary to ensure that the creators of digital records are securing their material or are at least preparing to do so.[75] Furthermore, early intervention requires that cultural heritage institutions work on ensuring that digital records are "secured and transferred to institutions for long-term use".[76]

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[69] UNESCO, PERSIST, op. cit. In 2019, UNESCO/PERSIST additionally supported the development of an Executive Guide on Digital Preservation for Practitioners by the Digital Preservation Coalition (DPC), see Digital Preservation Coalition, *Executive Guide on Digital Preservation*, https://www.dpconline.org/our-work/dpeg-home [accessed: 04.08.2020].

[70] UNESCO, PERSIST, op. cit., p. 9.

[71] UNESCO Executive Board, op. cit., Annex I, p. 4, para. 25.

[72] Ibidem.

[73] UNESCO General Conference, *Charter on the Preservation of Digital Heritage*, Art. 5.

[74] UNESCO Executive Board, op. cit., Annex I, p. 1, para. 3.

[75] S. Ross, *Digital Humanities Research Needs from Cultural Heritage Looking Forward to 2025?*, in: A. Benardou et al. (eds.), *Cultural Heritage Infrastructures in Digital Humanities*, Routledge, London–New York 2018, p. 156.

[76] Ibidem, p. 157.

To give a practical example, UNESCO recently commended that memory institutions are already recording decisions and actions being made and taken regarding the COVID-19 pandemic. It was noted that the complete and meticulous preservation of (official) records related to the virus is essential to prevent another outbreak or better manage its impact on society in the future.[77]

In terms of reliability, UNESCO provides guidance by defining the characteristics of long-term reliable programs. Amongst others, these include a fundamental commitment to preservation of the digital materials in question ("responsibility"), organizational viability, financial sustainability, technological and procedural suitability, and system security of a very high order.[78]

Retention of integrity and authenticity

Generally, moving digital objects from one environment to another poses risks for the integrity and authenticity of digital materials.[79] As the ECPA emphasized, integrity can only be preserved if digital objects remain complete and undamaged when transferred.[80] Similarly, it is crucial for future reference that the authenticity and trustworthiness of materials, particularly of electronic records, be preserved.[81]

"Digital continuity" therefore directly relates to another strategic element in UNESCO's approach to preserve the digital heritage, i.e. the "accurate rendering of authenticated content over time".[82] In this regard, integrity and authenticity must not only be protected against inadvertent changes resulting from misinterpretation or misrepresentation by computer systems, but also against abuse.[83]

As is well known, digital documents which sometimes exist in various versions, are prone to manipulation in manifold ways. Copies, replicas, forgeries, hoaxes as well as distortions, mutilations, digital reductions, and alterations, among other things, threaten the integrity and authenticity of digital documents. The possibility to access (including illegally downloading) and use cultural data, along with the availability of digital tools, make it highly feasible that digital heritage materials will be easily and frequently copied, altered, or reworked. Particularly in countries where intellectual property safeguards are weak, this could result in a "big business

77 UNESCO, *Turning the Threat…*, p. 1.

78 National Library of Australia, op. cit., pp. 42-43.

79 UNESCO Executive Board, op. cit., Annex I, p. 4, para. 26.

80 Ibidem.

81 Ibidem.

82 R. Edmondson, *Recommendation Concerning the Preservation of, and Access to, Documentary Heritage Including in Digital Form. Implementation Guidelines*, p. 4, https://en.unesco.org/sites/default/files/2015_mow_recommendation_implementation_guidelines_en.pdf [accessed: 04.08.2020].

83 UNESCO Executive Board, op. cit., Annex I, p. 4, para. 26.

in making illegal copies".[84] Furthermore, parts of several digitized cultural heritage products could be combined and used to create new cultural products. While this holds new opportunities for users to interact with the heritage and to use the digital format as a basis or inspiration for their own creations, it also offers the capacity for infinite reproduction and for the dissemination of false copies.[85] To summarize, "[d]igital heritage is faced with the problem of destructiveness caused by openness and sharing".[86]

In a critical review on the African cultural heritage, Caroline Joelle Nwabueze notes that if no legal boundaries are set, this invasive "tsunami" of new digital opportunities will lead to deceiving the public with regard to the authenticity of cultural heritage.[87]

To prevent this, UNESCO identifies a need for legal and technical frameworks. These "require that the content, functionality of files and documentation be maintained to the extent necessary to secure an authentic record".[88]

Ensuring accessibility

Unless there is access, digital materials are not considered as being preserved.[89] Ensuring the continued accessibility of digital materials is therefore an essential principle in UNESCO's strategy to preserve the digital heritage.[90]

Its importance can again be illustrated by the COVID-19 pandemic. Not only is it essential for scientists, researchers, and policymakers to have remote access to memory institutions and their records from past outbreaks (e.g. records of the Smallpox Eradication Programme of the World Health Organization) to make informed decisions and identify the best course of action to counter the spread of new diseases, but in addition preserving and providing access to primary source materials also has the potential "to enable public awareness and participation in public health procedures, grounded in historical lessons learned".[91]

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84 C.J. Nwabueze, op. cit., p. 99; as noted by the Arts and Law Centre of Australia, for example, digital technology enables piracy, i.e. using the internet "to copy and share other people's work for free, and without permission". This happens a lot with music, films, and visual art, see Arts and Law Centre of Australia, *How Do You Protect Your Work on the Internet?*, https://www.artslaw.com.au/legal/raw-law/how-do-you-protect-your-work-on-the-internet/ [accessed: 04.08.2020].

85 C.J. Nwabueze, op. cit., p. 99.

86 X. Wang et al., *Digital Heritage*, in: M. Ioannides, N. Magnenat-Thalmann, G. Papagiannakis (eds.), *Mixed Reality and Gamification for Cultural Heritage*, Springer, Cham 2017, p. 589.

87 C.J. Nwabueze, op. cit., p. 94.

88 UNESCO General Conference, *Charter on the Preservation of Digital Heritage*, Art. 8.

89 UNESCO, *Concept of Digital Preservation*, https://en.unesco.org/themes/information-preservation/digital-heritage/concept-digital-preservation [accessed: 04.08.2020].

90 Ibidem; see also R. Edmondson, op. cit., p. 4: "Preservation may be regarded as the totality of things necessary to ensure the permanent accessibility – forever – of documentary heritage with the maximum integrity".

91 UNESCO, *Turning the Threat…*, p. 2.

In the Charter on the Preservation of Digital Heritage, access to the digital heritage is set forth in Article 2, in which UNESCO declares that the purpose of preserving digital resources is to maintain accessibility. Accordingly, access "should be free of unreasonable restrictions". Where necessary, this requires the removal of obstacles.

Similarly, the assurance of access is also demanded in Article 8 of the Charter, which outlines measures required to protect the digital heritage: "Access to legally deposited digital heritage materials, within reasonable restrictions, should be assured without causing prejudice to their normal exploitation".

As was already noted, accessibility is generally impacted greatly by digitization. The conversion of analogue into digital objects, for instance, enables global access to them via the Internet. Thus, they are decoupled from time and space and transformed into ubiquitously available global "knowledge resources".[92] Still, there may be negative effects as well, related to the fact that cultural products are nowadays strategically placed in the mainstream digital marketplace. For example, selecting vinyl records and converting them to digital formats might subsequently limit access to a variety of records by discounting older, technically less "perfect" ones (e.g. by Charlie Parker [1920-1955] or Bruno Walter [1876-1962]), and as such risk reducing cultural diversity in the longer-term perspective.

In this respect, and in the light of technological changes, any preservation strategy must aim at securing "appropriate" forms of access to these global knowledge resources, also with effect for the future. It should primarily be "maximum inclusive".[93]

Digitization can also restrict access, namely in terms of standards. Digital cultural objects are attached to certain formats (e.g. pdf or doc formats), "in addition to being 'locked' into the hardware and software environments they depend on".[94] If these are of a proprietary nature and therefore protected, access might be restricted.

Thus, when converting a file to a new platform in order to preserve it, conversion into a standard, non-proprietary format should be favoured.[95] Similarly, producers of digital heritage should be encouraged to use open standards to facilitate preservation efforts.[96]

92 C. Robertson-von Trotha, R. Hauser, op. cit., p. 69.

93 UNESCO General Conference, *Recommendation Concerning the Preservation…*, Annex V, p. 4, para. 3.2.

94 C. Robertson-von Trotha, R. Hauser, op. cit., p. 69.

95 UNESCO Executive Board, op. cit., Annex I, p. 6, para. 38.

96 Ibidem, Annex I, p. 6, para. 42.

The issue of intellectual property rights

Digital media production, particularly in the online domain, raises interesting new legal questions regarding intellectual property rights. For example, with the advent of new media technologies museums started experimenting with digital media production and its intersection with traditional museum subject matter and commercial activity. In the 1990s, rights management and licensing – mainly in relation to photographic copyrights connected to museum collections – were seen as primary mechanisms for museums to generate revenues.[97]

As far as preservation of cultural material is concerned, traditionally there has been a division of tasks between creators and keepers of materials, with the former having no interest in their preservation and the latter having no control over their creation.[98]

In terms of maximizing accessibility, the Charter on the Preservation of Digital Heritage therefore demands that "[a] fair balance between the legitimate rights of creators and other rights holders and the interests of the public to access digital heritage materials should be reaffirmed and promoted, in accordance with international norms and agreements".[99]

To achieve this, cooperation between creators and owners is crucial, particularly regarding copyright issues. As copyright legislation places strict limitations on copying, these need to be resolved before keepers can take any steps to preserve materials.[100] Consequently, UNESCO speaks of the need to seek an agreement on the "right to copy for preservation".[101]

While the widening of copyright legislation for this purpose is not explicitly recommended in the Charter,[102] Member States are encouraged to "periodically review copyright codes" in the 2015 Recommendation.[103] Furthermore, they are urged to support the development of open source software and "standardized interfaces for managing digital documentary heritage".[104]

Additionally, in cases "[w]here preserving and accessing documentary heritage requires the use of software or other proprietary technology not covered by copyright exceptions, Member States are invited to facilitate access to proprietary codes, keys and unlocked versions of technology on a non-profit basis".[105]

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97 R.E. Pantalony, *Dances with Intellectual Property. Museums, Monetization and Digitization*, in: B.L. Murphy (ed.), *Museums, Ethics and Cultural Heritage*, Routledge, London–New York 2016, pp. 72-73.

98 UNESCO Executive Board, op. cit., Annex I, pp. 6-7, para. 44.

99 UNESCO General Conference, *Charter on the Preservation of Digital Heritage*, Art. 2.

100 UNESCO Executive Board, op. cit., Annex I, p. 7, para. 48.

101 Ibidem, p. 2, para. 6.

102 Y. de Lusenet, op. cit., p. 166.

103 UNESCO General Conference, *Recommendation Concerning the Preservation…*, Annex V, p. 5, para. 4.6.

104 Ibidem, Annex V, p. 5, para. 4.8.

105 Ibidem, Annex V, p. 5, para. 4.7.

The role of memory institutions

In the pursuit of all the above-outlined strategies, cultural institutions such as libraries, archives, and museums play a crucial role. Whereas States are encouraged to provide them with the appropriate legislative frameworks to ensure their necessary independence,[106] it will essentially be the task of these institutions to build the necessary deep infrastructure "capable of supporting a distributed system of digital archives".[107] In these efforts, they are supported by a number of smaller specialized institutions with expertise in areas such as digital photography, broadcasting, audio, and art.[108]

The 2015 Recommendation refers to all of these institutions as "memory institutions",[109] which – when serving as digital archives – are considered to be trusted organizations.[110] This means that they must be "capable of keeping materials alive for the long term", which includes ensuring their integrity and authenticity, taking technical measures in time, and observing rights and restrictions on access.[111]

To fulfil these tasks, trusted organizations will not only have to adapt organizational structures, but will also have to redefine the tasks of staff. Furthermore, in order to avoid expensive mistakes, "cooperation and exchange of experience" as well as training programs for staff will be crucial.[112]

At the same time, trusted organizations are dependent on the cooperation of creators of digital materials as well as of software producers,[113] including in terms of setting common standards, compatibilities, and resource sharing.[114] Consequently, the preservation of digital heritage should not merely be seen as the task of the competent bodies specifically responsible for it, but *ab initio* as a comprehensive and shared responsibility of creators, providers, and owners as well as holders of digital heritage materials.

Finally, the "creation of a system of distributed archives" also requires national guidance and international cooperation.[115]

The issue of resilience

In light of the COVID-19 pandemic, the question arises whether the time frame for efforts to preserve digital heritage has shifted. On the one hand, UNESCO

106 Ibidem, Annex V, p. 4, para. 3.1.

107 UNESCO Executive Board, op. cit., Annex I, pp. 7-8, para. 51.

108 Ibidem.

109 UNESCO General Conference, *Recommendation Concerning the Preservation…*, Annex V, p. 3, chapeau.

110 UNESCO Executive Board, op. cit., Annex I, p. 8, para. 52.

111 Ibidem, Annex I, pp. 7-8, para. 51.

112 Ibidem, Annex I, p. 8, para. 53.

113 Ibidem, Annex I, p. 8, para. 54.

114 UNESCO General Conference, *Charter on the Preservation of Digital Heritage*, Art. 6.

115 UNESCO Executive Board, op. cit., Annex I, p. 8, para. 54.

estimates that 90% of the world's museums have been affected by temporary closures during the first months of the year, but especially from March 2020 onwards (March-May 2020). These lockdowns have brought about serious economic and social consequences that may affect museums in the long term.[116] Although measures taken to counter the virus have not directly impacted state funding for museums, a large number of them depend on income generated by visitors. Furthermore, the economic aftermath suggests that there will be a drastic decline in the number of donors and sponsors.[117] As a result, more than 80% of museums are expected to reduce their programs – nearly one third will downsize staff and more than 10% may be forced to close permanently.[118]

On the other hand, museums have proven their resilience in times of crisis by enhancing their digital activities in order to stay connected with their audiences.[119] Following a survey on the impact of the COVID-19 situation on museums in Europe, the Network of European Museum Organisations (NEMO) thus appealed to stakeholders:

> to increase their digital efforts in the future, following this period of extreme measures with unprecedented digital activity. Budgets and strategies should respond to these findings, take advantage of current efforts and allow for investments in digital offers, services and infrastructures in the future. Allowing digital services and activities of museums and the engagement of digital audiences as factors of success in assessment frameworks is proving more important every day.[120]

However, in this regard the pronounced digital divide, i.e. the gap between members of society who have access to computers and the Internet and others who do not,[121] has to be taken into account.[122] The UNESCO report on museums around the world in the face of COVID-19 clearly indicates that it is mainly

116 UNESCO, *Museums Around the World in the Face of COVID-19*, May 2020, p. 18, https://unesdoc.unesco.org/ark:/48223/pf0000373530 [accessed: 04.08.2020].

117 Ibidem, p. 13.

118 ICOM, *Museums, Museum Professionals and COVID-19. Report*, May 2020, p. 6, https://icom.museum/wp-content/uploads/2020/05/Report-Museums-and-COVID-19.pdf [accessed: 04.08.2020].

119 For a collection of initiatives and stories from across the globe in response to the COVID-19 outbreak, see UNESCO, *Explore Initiatives & Stories from UNESCO Networks*, https://en.unesco.org/covid19/initiatives [accessed: 04.08.2020].

120 NEMO, *Survey on the Impact of the COVID-19 Situation on Museums in Europe*, May 2020, p. 1, https://www.ne-mo.org/fileadmin/Dateien/public/NEMO_documents/NEMO_Corona_Survey_Results_6_4_20.pdf [accessed: 04.08.2020].

121 See S. von Schorlemer, *Telecommunications, International Regulation*, "Max Planck Encyclopedia of Public International Law", March 2009, paras. 124-131, https://opil.ouplaw.com/view/10.1093/law:epil/9780199231690/law-9780199231690-e998#law-9780199231690-e998-div1-4 [accessed: 04.08.2020].

122 As an example of efforts to bridge the digital divide, see UNESCO, *International Programme for the Development of Communication*, https://en.unesco.org/programme/ipdc [accessed: 04.08.2020].

the museums in Western Europe "that seem to have had sufficient investment to offer tools adapted to the lockdown experienced by the population".[123] By contrast, only 5% of museums in Africa and Small Island Developing States have been able to provide online content.[124]

Emerging Challenges: Privatization Tendencies

For years, an "incremental privatization of the cultural heritage record" has been observed.[125] Social Media – being privately owned – certainly has a great impact, however records in this respect are missing. Generally, Neil Silberman speaks of a "marketization of culture",[126] while David Throsby emphasizes the significance of "cultural capital" within the cultural industries.[127]

Traditionally, private actors such as individuals, trusts, associations or foundations, churches, companies, banks, or other non-governmental cultural institutions have always held a relatively large proportion of the movable and immovable cultural heritage in their custody. In addition, the administration of cultural heritage resources is nowadays "being gradually outsourced" to private companies and private associations, based on the belief that they will be "more efficient and economical than centralized bureaucracies in the performance of certain well-defined tasks".[128] As the Committee on Culture, Science and Education of the Council of Europe noted in 2005, this trend towards privatization of cultural heritage is related to the desire to "lighten the burden of State responsibility".[129] This also includes financial considerations.[130]

As far as UNESCO is concerned, close cooperation between private and public authorities, i.e. a "sharing of tasks and responsibilities" based on their different roles and respective expertise, is recommended within the UNESCO frame-

123 UNESCO, *Museums Around the World…*, p. 17.

124 Ibidem, p. 5.

125 S. Ross, op. cit., p. 158.

126 N.A. Silberman, *Cultural Heritage and the Information Technologies. Facing the Grand Challenges and Structural Transformations of the 21st Century*, in: F. Niccolucci (ed.), *Digital Applications for Tangible Cultural Heritage. Report on the State of the Union Policies, Practices and Developments in Europe*, Vol. II, Archaeolingua, Budapest 2007, p. 100.

127 For more on this, see D. Throsby, *Cultural Capital and Sustainability Concepts in the Economics of Cultural Heritage*, in: M. de la Torre (ed.), *Assessing the Values of Cultural Heritage. Research Report*, The Getty Conservation Institute, Los Angeles 2002, pp. 101-117.

128 N.A. Silberman, op. cit., p. 100.

129 Council of Europe Parliamentary Assembly Committee on Culture, Science and Education, *The Private Management of Cultural Property*, 24 October 2005, Doc. 10731, para. I. 4.

130 G. Palumbo, *Privatization of State-owned Cultural Heritage: A Critique of Recent Trends in Europe*, in: N. Agnew, J. Bridgland (eds.), *Of the Past, for the Future: Integrating Archaeology and Conservation. Proceedings of the Conservation Theme at the 5th World Archaeological Congress, Washington, D.C., 22-26 June 2003*, The Getty Conservation Institute, Los Angeles 2006, p. 35.

work.[131] The Charter on the Preservation of Digital Heritage encourages States to urge cooperation between private actors such as "hardware and software developers, creators, publishers, producers and distributors of digital materials" and national libraries, archives, museums, and other public cultural institutions in preserving the digital heritage.[132]

In its 2015 Recommendation, UNESCO noted that the "avenues for providing access to documentary heritage are multiplying" due to the growth of technologies such as the Internet and social media.[133] To facilitate access to programs in the light of this development, the organization invites Member States to encourage partnerships, including public-private ones, provided that they are responsible and equitable.[134]

Furthermore, in the context of national heritage policies the Recommendation holds that Member States – in taking account of the needs of memory institutions – should encourage "logical partnerships and cost sharing with other entities in setting up shared facilities, processes and services".[135] This illustrates a general openness on the part of UNESCO towards cooperation with private actors at the intergovernmental level.

Public-private partnerships

The existing privatization tendencies appear to be intensifying via the establishment of new models of Public-Private Partnerships (PPPs).[136] It has repeatedly been noted that PPPs, and thus the private sector, are better suited to manage investments and operational risks than the public sector.[137]

Generally speaking, a PPP is a cooperation between the public and private sectors, through which the parties ideally achieve complementary objectives such

131 UNESCO General Conference, *Charter on the Preservation of Digital Heritage*, Art. 10.

132 Ibidem.

133 UNESCO General Conference, *Recommendation Concerning the Preservation…*, Annex V, p. 4, para. 3.2.

134 Ibidem, Annex V, p. 4, para. 3.4.

135 Ibidem, Annex V, p. 4, para. 4.2.

136 PPPs are not viewed the same as privatization *stricto sensu*, as the latter is a larger process, see R. Mason, *Thinking Critically about Privatization and Public-Private Partnerships in Built Heritage Conservation*, May 2013, p. 1, http://www.unesco.org/new/fileadmin/MULTIMEDIA/HQ/CLT/images/Mason_Hangzhou_presentation_notes.pdf [accessed: 04.08.2020]. During discussions in the Committee on Culture, Science and Education of the Council of Europe, it was rather recognized that PPPs are an alternative to privatization, see Council of Europe Parliamentary Assembly Committee on Culture, Science and Education, op. cit., Appendix, p. 7; for best practice examples of PPP for cultural heritage, see RICHES, *D7.3 Public-Private-Partnership Guidelines for CH*, May 2016, pp. 22-37, https://resources.riches-project.eu/wp-content/uploads/2016/06/RICHES-D7.3-PPP-Guidelines-for-CH_public.pdf [accessed: 04.08.2020].

137 Council of Europe, Parliamentary Assembly Committee on Culture, Science and Education, op. cit., Appendix, p. 6.

as the "development and operation of infrastructure for a wide range of economic activities".[138] PPPs are essentially seen as:

> innovative methods used by the public sector to contract with the private sector, who bring their capital and their ability to deliver projects on time and to budget, while the public sector retains the responsibility to provide these services to the public in a way that benefits the public and delivers economic development and an improvement in the quality of life.[139]

Assuming that PPPs generally allow for a complementary use of skills and assets and for a sharing of risks and rewards,[140] the question arises as to what benefits they offer in the field of digital heritage in particular. According to the EU-funded RICHES (Renewal, Innovation and Change: Heritage and European Society) project, PPPs in the field of cultural heritage enable "digitisation, online access and digital preservation"; the "conservation of immovable heritage"; and the management of cultural services.[141]

Moreover, as regards Europe the High-Level Expert Group on Digital Libraries of the i2010 Digital Libraries Initiative noted that:

> Public private partnerships (PPPs) can have an important role in helping the development of digital libraries (including Europeana[142]), and in implementing a strategy for digitisation, online accessibility and digital preservation of Europe's collective memory. Whilst libraries, archives, museums and galleries have preserved this collective memory and have experience of resource discovery and user requirements, private partners can bring to the table funding, technology, software and expertise required for large-scale digitisation. By working together public access can be enhanced.[143]

However, PPPs also bring potential risks. A risk in the implementation and execution of PPPs pertains to differences in the management style of the appointed

138 European Commission Directorate-General Regional Policy, *Guidelines for Successful Public-Private Partnerships*, March 2003, p. 4, https://ec.europa.eu/regional_policy/sources/docgener/guides/ppp_en.pdf [accessed: 04.08.2020].

139 United Nations, Economic Commission for Europe, *Guidebook on Promoting Good Governance in Public-Private Partnerships*, ECE/CECI/4, United Nations, New York–Geneva 2008, p. 1.

140 RICHES, *Public-Private Partnerships for Cultural Heritage: Opportunities, Challenges, Future Steps*, Think Papers Collection No. 7, April 2016, p. 4, https://resources.riches-project.eu/wp-content/uploads/2016/04/rch_thinkpapers_07.pdf [accessed: 04.08.2020].

141 Ibidem, p. 5.

142 For more on Europeana, see E. Manikowska, *Digitization: Towards a European Cultural Heritage*, in: A. Jakubowski, K. Hausler, F. Fiorentini (eds.), *Cultural Heritage in the European Union. A Critical Inquiry into Law and Policy*, Brill Nijhoff, Leiden–Boston 2019, pp. 417-444.

143 i2010 Digital Libraries Initiative High Level Expert Group on Digital Libraries, *Final Report: "Digital Libraries: Recommendations and Challenges for the Future"*, December 2009, p. 7, http://www.ifrro.org/sites/default/files/hlg_ppp_final_report_2009.pdf [accessed: 04.08.2020].

personnel, which can cause friction and jeopardize the success of a project.[144] In order to be successful, it is said that PPPs require a simplification of administrative procedures on the part of the public sector.[145]

Furthermore, the absence of citizen involvement may result in mismanagement, in particular when decisions are perceived as "top-down". This "may not be well received by the public and result in waste of resources and a duplication of effort".[146] Citizen engagement should therefore be encouraged, especially regarding decisions on the re-use of cultural buildings and sites, which could impact the daily life of people in the cities.[147]

The question of "re-usability"

In general, it can be assumed that the increasing influence of private actors affects the cultural heritage framework substantially. However, it is not only private actors that incrementally frame the cultural heritage in an economic perspective: its economic impact and potential has also become an important issue for international organizations such as the European Union (EU).[148] With the involvement of economic interests, there will be a growing trend towards commercialization. In terms of the digital heritage, questions on the "re-usability" of digital materials appear to be decisive in this regard.

Put simply, "re-usability" enables using and building upon digital cultural heritage material in other sectors, such as education, research, tourism, or the creative industries.[149] The Time Machine initiative, for example, harnesses "the potential of European heritage as a resource for creative reuse" by extracting individual aesthetic features and concepts of digital objects and re-appropriating them for new creations, from fashion to architecture.[150]

This practice may interfere with the objective of securing an authentic record. Furthermore, despite creating opportunities for innovation and development it may lead to copyright issues. While the re-use of content is often prevented by copyright laws, copyright restrictions have trouble keeping pace with the movement to share information in the digital era. Facilitated by new digital practices and

144 RICHES, *Public-Private Partnerships…*, p. 6

145 Ibidem, p. 7.

146 Ibidem, p. 4.

147 Ibidem.

148 E. Manikowska, op. cit., pp. 429-431.

149 UNESCO, *Europeana*, https://en.unesco.org/creativity/policy-monitoring-platform/europeana [accessed: 04.08.2020].

150 Time Machine, *Time Machine Manifesto. Big Data of the Past for the Future of Europe*, p. 19, https://www.timemachine.eu/wp-content/uploads/2019/06/Time-Machine-Manifesto.pdf [accessed: 04.08.2020]; for more information on Time Machine, see the initiative's website at https://www.timemachine.eu/about-us/ [accessed: 04.08.2020].

techniques, this makes the infringement of copyright laws more common than ever before.[151] As there are different groups interested in the copyright of cultural heritage in the digital environment – most notably the authors, the owners, and the users – it is crucial for policymakers to achieve a fair balance between their rights and diverging interests.[152]

Some actors, including the EU, have already opened the doors towards the "re-usability" of digital cultural heritage material. For instance, by extending the scope of the Directive of the European Parliament and the Council of 26 June 2013 on the re-use of public sector information to certain types of cultural establishments, namely libraries, museums, and archives, re-use was strongly promoted.[153] The rationale behind this incentive is that "cultural heritage resources are seen as documents on which added value can be built for commercial gain and the public benefit".[154]

The Directive of the European Parliament and the Council of 25 October 2012 on certain permitted uses of orphan works also had a positive impact on the openness towards the re-use of digital heritage at the EU level,[155] and ultimately led to the determination of the Council of the European Union to consider legal initiatives to facilitate the digitization of out-of-commerce works and make them available online across the EU.[156] In the same document, the Council also underlined that the "re-use and sharing of content and access to it must be carried out in full compliance with copyright and related rights".[157]

Given the various complex issues relating to the "re-usability" of digital resources, this appears to be one of the major regulatory challenges for the cultural sector and requires more research in the future.

151 M. Ioannides et al., *3D Digital Libraries and Their Contribution in the Documentation of the Past*, in: M. Ioannides, N. Magnenat-Thalmann, G. Papagiannakis (eds.), *Mixed Reality and Gamification for Cultural Heritage*, Springer, Cham 2017, p. 184; A. Lauber-Rönsberg, *Raubkopierer und Content-Mafia: Die Debatte um das Urheberrecht*, "Aus Politik und Zeitgeschichte" 2012, Vol. 41-42, pp. 32-38.

152 Ibidem, p. 183.

153 Directive 2013/37/EU of the European Parliament and of the Council of 26 June 2013 amending Directive 2003/98/EC on the re-use of public sector information, OJ L 175, 27.06.2013, p. 1.

154 P. Keller et al., *Re-use of Public Sector Information in Cultural Heritage Institutions*, "International Free and Open Source Software Law Review" 2014, Vol. 6(1), p. 2.

155 Directive 2012/28/EU of the European Parliament and of the Council of 25 October 2012 on certain permitted uses of orphan works, OJ L 299, 27.10.2012, p. 5.

156 Council of the European Union, *Council Conclusions on the Role of Europeana for Digital Access, Visibility and Use of European Cultural Heritage*, 1 June 2016, 9643/16, CULT 52, AUDIO 74, DIGIT 61, TELECOM 105, PI 65, Annex, p. 3, para. 5. Out-of-commerce works are defined as "works that are still protected by copyright but are no longer commercially available because the authors and publishers have decided neither to publish new editions nor to sell copies through the customary channels of commerce", see European Commission, *Memorandum of Understanding (MoU) on Key Principles on the Digitisation and Making Available of Out-of-Commerce Works – Frequently Asked Questions*, https://ec.europa.eu/commission/presscorner/detail/en/MEMO_11_619 [accessed: 04.08.2020].

157 Council of the European Union, op. cit., Annex, p. 6, para. 11.

The question of contextualization

The future development of re-use practices does not depend only on regulation; it also requires that attention be paid to the issue of adequate contextualization. When a digital resource is re-used, it is being put into a specific context "to create a meaning for the user".[158] Without thorough and reliable background information, it will then be hard to understand and place.[159]

Therefore, rich metadata (i.e. "data about data"[160]) regarding its content, technical or administrative information, and the "related story and knowledge associated with it" are crucial.[161] It must be specified "how and when the material came into being, who has held it, and how it relates to other information".[162] This process resembles some sort of in-depth provenance research, as known from the field of material heritage protection (e.g. for objects in museums). In this regard, contextualization aids preservation, as information is of limited use if its provenance is unknown or its significance unclear.[163] Contextual information is therefore decisive in order for future generations to understand the value of preserved digital cultural heritage resources.[164]

One example of contextualization is storytelling, which is also an important method for cultural heritage institutions to communicate content to the public. It has been observed that:

> In general, a story helps the visitor to interpret an artwork in the context of the life of the artist or the social and political context in which the artwork was created. Visitors can also tell their own stories, making connections between the artwork and their own concerns, knowledge and interests.[165]

Technologies such as 3D and AI provide cultural heritage institutions with new possibilities in this regard. With the support of smartphones and other personal devices, they offer opportunities to personalize, engage, teach, involve,[166] and even

158 Virtual Multimodal Museum, *The ViMM Manifesto for Digital Cultural Heritage*, p. 8, https://www.vi-mm.eu/wp-content/uploads/2018/09/ViMM-Manifesto-for-digital-culture-heritage.pdf [accessed: 04.08.2020].

159 UNESCO Executive Board, op. cit., Annex I, p. 5, para. 31.

160 M. Ioannides et al., op. cit., p. 176; see also their whole subchapter on "Metadata and Interoperability" at pp. 176-178.

161 Virtual Multimodal Museum, op. cit., p. 8.

162 UNESCO Executive Board, op. cit., Annex I, p. 5, para. 31.

163 G. McCarthy, *Finding a Future for Digital Cultural Heritage Resources Using Contextual Information Frameworks*, in: F. Cameron, S. Kenderdine (eds.), *Theorizing Digital Cultural Heritage: A Critical Discourse*, The MIT Press, Cambridge, MA–London 2007, p. 247.

164 Ibidem, p. 251.

165 S. Valtolina, *A Storytelling-Driven Framework for Cultural Heritage Dissemination*, "Data Science and Engineering" 2016, Vol. 1, p. 115.

166 Virtual Multimodal Museum, op. cit., p. 8.

immerse the users in the storyline, e.g. by intermingling real objects with the virtual environment for real-time interaction ("immersive storytelling").[167] In order to provide for such personalized experience, the Virtual Multimodal Museum Coordination and Support Action advocates for the exploration of new areas of creating and representing meaning "along with increased interaction through research programmes and commercial development".[168]

Still, commercialization tendencies seem to be a driving force in the creation of selective narratives in the process of storytelling. While on the one hand this may correspond to the perceived needs of clients, on the other it risks impairing the accuracy of the scientific sources.

Put in perspective, these challenges relating to increased privatization and commercialization also require adequate and innovative responses on the part of UNESCO, including a revision of its strategies for the preservation of the digital cultural heritage.

Conclusions

Just a few years ago, it was noted that the "[p]reservation of digital heritage is as yet an unknown territory for most institutions".[169] Today, it can hardly be referred to as *terra incognita* anymore. In fact, awareness is growing that the issue is turning into one of the central questions of the 21st century.

As has been outlined, the preservation of digital materials can take different forms, depending on the content and the properties that need to be represented in future systems. On the one hand, optimal functionality and access are primary goals. This might necessitate upgrades to future requirements and the development of systems capable of incorporating technological improvements.[170] On the other hand, the aim is to "retain as much as possible of the original, so that future users can experience the material as we experience it now".[171]

Even though the capabilities for managing digital heritage resources have increased, the challenges remain complex: They range from technological advances and the emergence of new standards, tools and ways of presenting information, to coordination among researchers from different disciplines. Additionally, accelerating trends towards increased privatization and commercialization have brought about new challenges that require timely and innovative responses.

167 S. Valtolina, op. cit., p. 115.

168 Virtual Multimodal Museum, op. cit., p. 8.

169 UNESCO Executive Board, op. cit., Annex I, p. 8, para. 53.

170 Ibidem, Annex I, p. 4, para. 28.

171 Ibidem, Annex I, p. 5, para. 29.

UNESCO warned rather early on of the risk of losing the digital heritage.[172] With the Charter on the Preservation of Digital Heritage and its supplemental Recommendation Concerning the Preservation of, and Access to, Documentary Heritage Including in Digital Form, UNESCO has provided valuable guidance on how to counter challenges and respond to threats.

As new challenges arise, this framework must be continuously revised, extended, or specified. UNESCO, as the organization responsible for addressing issues relating to the cultural heritage on a global scale, should be encouraged to continue its proactive work and to provide further standards and guidance on how to preserve the digital cultural heritage for the benefit of humanity.

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[172] UNESCO General Conference, *Charter on the Preservation of Digital Heritage*, Preamble.

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