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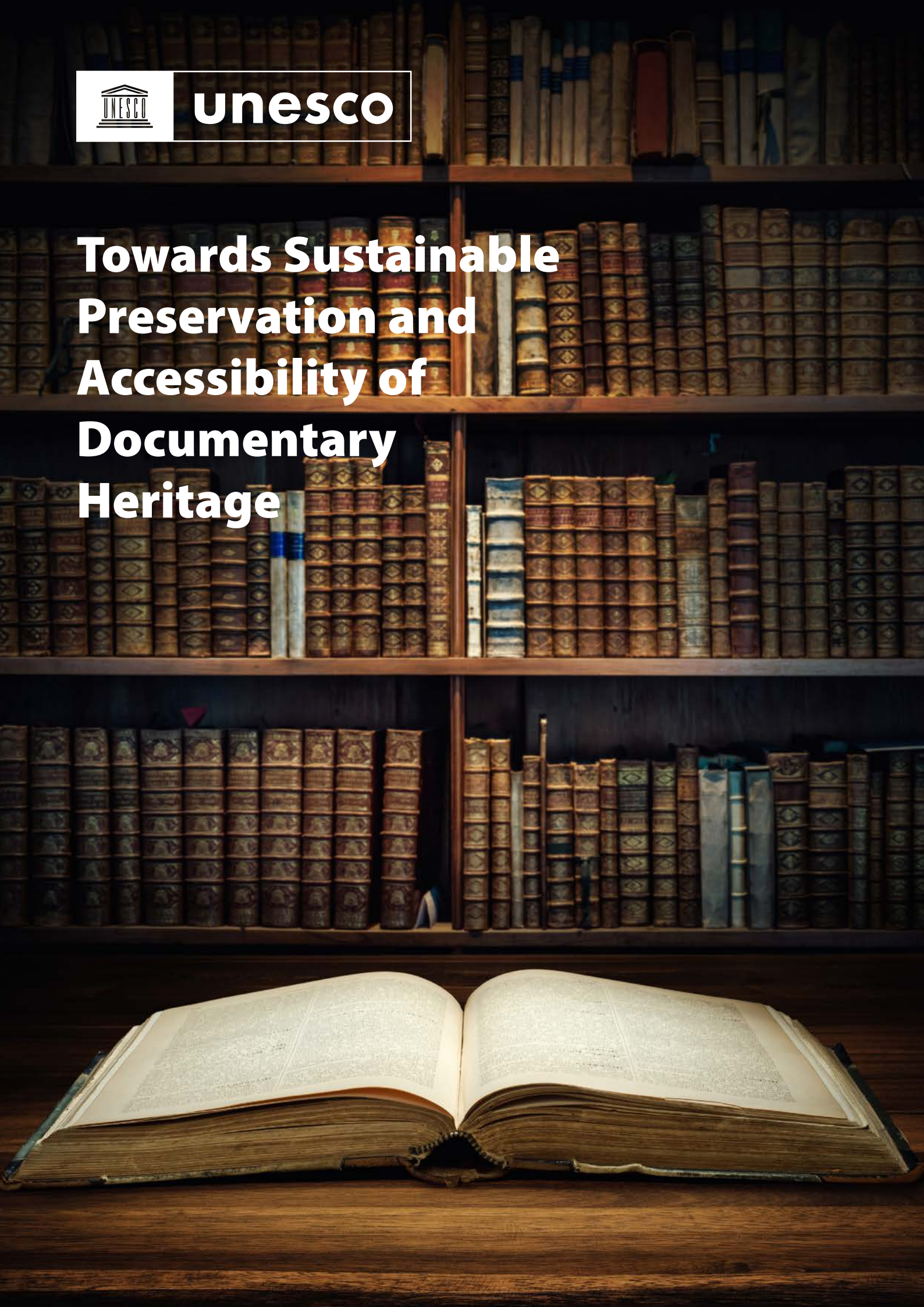
Towards Sustainable Preservation and Accessibility of Documentary Heritage



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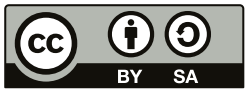

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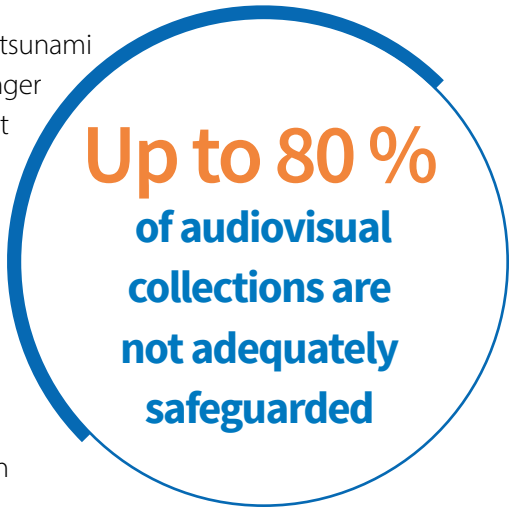
Short Summary

Preserve documentary heritage to protect the world's memory

A wildfire burned vast areas of Cape Town's iconic Table Mountain, historical landmarks and the nearly 200-year-old Jagger Library at the University of Cape Town that houses precious collections of Africa's history. Similarly, Brazil's National Museum, founded in 1818, was gutted, destroying some of Latin America's priceless collections of scientific and cultural artifacts.

It may be fires, hurricanes, earthquakes, tropical depression floods, tsunami and volcanic eruptions – they all represent a clear and present danger to the world's memory encoded in documentary collections that may be held in libraries, archives, museums and other holding places.

This publication documents how memory institutions from Africa, Asia and the Pacific, Europe as well as Latin America and the Caribbean have come to terms with, and are putting in place measures to reduce or manage, the risk that natural and man-made disasters pose to their documentary holdings. Possibly up to 80 per cent of audiovisual collections scattered at various research institutions or cultural bodies are not adequately safeguarded.



These experiences and measures include the elaboration of robust emergency preparedness plans and forging equally robust national and international cooperation for the preservation and accessibility of documentary heritage.

In this way, policy makers and memory institutions (libraries, archives, museums, etc.), along with the support of national and regional committees of UNESCO's Memory of the World Programme, can make the preservation of documentary heritage a key feature of sustainable development.

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'Since wars begin in the minds of men and women it is in the minds of men and women that the defences of peace must be constructed'

Towards Sustainable Preservation and Accessibility of Documentary Heritage

Edited by Fackson Banda

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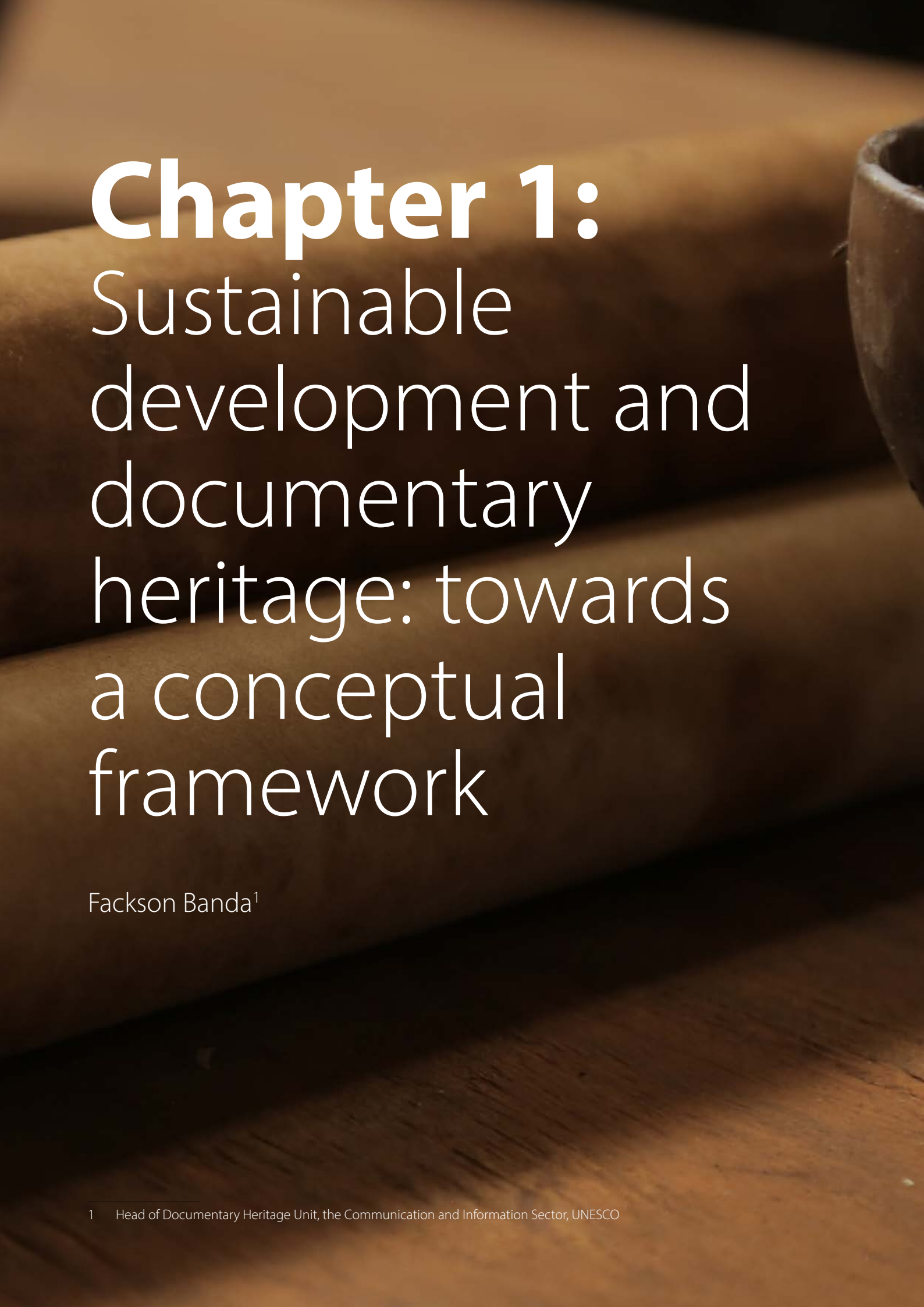

Chapter 1: Sustainable development and documentary heritage: towards a conceptual framework

Fackson Banda[1]

1 Head of Documentary Heritage Unit, the Communication and Information Sector, UNESCO

This introductory chapter sets out the contextual background to this publication. It then highlights the international framework for the protection of cultural heritage, of which documentary heritage is a key part. It proceeds to consider the linkage between documentary heritage and sustainable development. In so doing, it briefly describes how several papers included in this publication fit into the wider scheme of enhancing the preservation and accessibility of documentary heritage within the framework of sustainable development.

Contextual background

This publication is a result of two inter-regional conferences of the Memory of the World (MoW) Programme. The notion of 'inter-regional' conferences was conceived of in response to the ever-increasing need for the idea of 'memory of the world' to have a shared vision and understanding across all UNESCO regions. At the core of this notion is the fact that the MoW Programme operates through a network of national and regional committees, where these exist. Where they do not exist, some national commissions for UNESCO play the role of national committees, ensuring that memory institutions are linked to the work of the programme.

Two such inter-regional conferences were held in 2018 and 2019. The first was held on 24-27 October 2018 in Panama City, Panama. Its focus was on preservation and accessibility of documentary heritage from the perspective of using disaster risk reduction as a strategy for sustainable preservation of documentary heritage. It was during this conference that an attempt was made to analyze the conceptual linkages between sustainable development and documentary heritage, with a focus on the twin pillar of the UNESCO 2015 Recommendation Concerning the Preservation of, and Access to, Documentary Heritage Including in Digital Form. These are *preservation* and *accessibility*. More specifically, the conference harnessed the presentations in a way that would relate the implementation of the 2015 Recommendation to the implementation of the 2030 Agenda for Sustainable Development, particularly in terms of:

- Supporting national MoW committees as cooperative structures for regional MoW committees and as national frameworks for implementing the 2015 Recommendation.
- Stimulating collaborative practices in preservation and accessibility.
- Focusing on disaster risk reduction and management as a strategy for preservation and accessibility of documentary heritage.
- Strengthening the MoW Programme globally through a shared understanding of MoW practices, problems and prospects.

The second conference, held on 5-8 November 2018 in Cheongju and Daegu, Republic of Korea, focused on preserving and providing access to digital heritage. Within this framework, the conference highlighted current tools, initiatives, guidelines and best practices across a range of issues, including:

- The Digital Strategy for Information Sustainability (PERSIST).
- UNESCO Software Heritage Initiative.
- UNESCO/PERSIST Guidelines for the Selection of Digital Heritage for Long-Term Preservation..
- Executive Guide on Digital Preservation.

- Open-source and standards-based digital preservation systems.
- Initiatives to promote free and open access to digital documentary heritage held by libraries, archives, and museums.
- Regional cooperation and platforms for sharing digital documentary heritage.
- Creative commons and open data initiatives.

Key to both conferences is the standard-setting UNESCO 2015 Recommendation, which provides a national, regional and international framework for supporting the identification, preservation and accessibility of the rich documentary heritage, including digital heritage, held in libraries, archives, museums, educational institutions and other holding places.

International framework for the protection and promotion of cultural heritage

The primary concern of the Memory of the World (MoW) Programme is to enable people and societies to develop, in the words of the UNESCO Constitution, "mutual understanding and a truer and more perfect knowledge of each other's lives." In this respect, the Programme embraces memories of both positive and negative events and movements that remind us where we have been, of things that should never be forgotten, and that have shaped our global society for good or ill (Russell 2013: 7).

Set up in 1992, the Programme broadly seeks to preserve from degradation and destruction the documentary heritage that carries the world's memories into succeeding generations, and to make it accessible to keep those memories circulating in the world. A host of threats can conspire to keep such memories from circulating freely and optimally. Such threats can be categorized as institutional and non-institutional.

Institutional threats include poor policy environments, which may result in low or no budgets for the preservation of not only cultural heritage but also the memory institutions that hold such heritage (libraries, museums, archives, etc.). The lack of trained staff and rescue teams, especially in poorer countries in Africa, may further exacerbate such institutional problems.

Non-institutional problems could include vandalism and theft, armed conflict as in Syria and other conflict-ridden spots. Natural disasters, like earthquakes and flooding, have bedeviled cultural heritage in different parts of the world, especially Small Island Developing States (SIDS).

All these issues are anticipated in the 2015 Recommendation. In embracing the objectives of the MoW Programme, the 2015 Recommendation represents UNESCO Member States' common resolve to take appropriate actions aimed at achieving the different aspects of documentary heritage, including identification, preservation, access, policy mechanisms as well as national and international cooperation.

In framing sustainable development within the 2015 Recommendation, then, it is important to underline "the importance of documentary heritage to promote the sharing of knowledge for greater understanding and dialogue, in order to promote peace and respect for freedom, democracy, human rights and dignity."

The Recommendation also embraces the idea that "… the preservation of, and long-term accessibility to documentary heritage underpins fundamental freedoms of opinion, expression, and information as human rights."

Sustainable development, as a larger concept linked to the promotion of peace and respect for freedom, democracy, human rights and dignity, requires an assessment of the international normative and legal architecture which provides a cohesive framework for the recognition and promulgation of cultural heritage as a global good.

From the post-2nd World War period, the world has ordered its affairs based on a multilateral system of global governance, encoded in various documents, including the Universal Declaration of Human Rights (UDHR). Article 27 of the UDHR states that "everyone has the right freely to participate in the cultural life of the community, to enjoy the arts and to share in scientific advancement and its benefits."

Cultural rights are, therefore, inseparable from human rights, as recognized in Article 5 of the 2001 UNESCO Declaration on Cultural Diversity. Cultural rights – as an important pillar of open cultural heritage – can thus be defined as the right of access to, participation in and enjoyment of culture. This includes the right of individuals and communities to know, understand, visit, make use of, maintain, exchange and develop cultural heritage and cultural expressions, as well as to benefit from the cultural heritage and cultural expressions of others (UNESCO, 2001).

Other significant documents that could be cited in this respect include:

- The International Covenant on Economic, Social and Cultural Rights, which enjoins upon States Parties to guarantee that the rights enunciated therein will be exercised without discrimination of any kind as to race, colour, sex, language, religion, political or other opinion, national or social origin, property, birth or other status.
- The 2003 UNESCO Convention for the Safeguarding of the Intangible Cultural Heritage provides safeguards and promotes the practices, representations, expressions, knowledge, skills – as well as the associated instruments, objects, artefacts and cultural spaces – that communities, groups and, in some cases, individuals recognise as part of their cultural heritage.
- The 2005 UNESCO Convention on the Protection and Promotion of the Diversity of Cultural Expressions, which emphasises the importance of the recognition of equal dignity and respect for all cultures, including that of persons belonging to minorities, and of the freedom to create, produce, disseminate, distribute and have access to traditional cultural expressions (United Nations, 2010).

Ultimately, all these international agreements are linked to the 2030 Agenda for Sustainable Development, itself adopted by the United Nations in 2015 (United Nations, 2015). The 2030 Agenda is integrative and transformative, with its 17 Goals building towards a vision of "universal respect for human rights and human dignity, the rule of law, justice, equality and non-discrimination; of respect for race, ethnicity and cultural diversity; and of equal opportunity permitting the full realization of human potential and contributing to shared prosperity."

Within the 17 Goals, several key targets could be linked to the identification, preservation and accessibility of cultural heritage, of which documentary heritage is one of several classifications. These include:

- Target 4.7: By 2030, ensure that all learners acquire the knowledge and skills needed to promote sustainable development, including, among others, through education for sustainable development and sustainable lifestyles, human rights, gender equality, promotion of a culture of peace and non-violence, global citizenship and appreciation of cultural diversity and of culture's contribution to sustainable development.
- Target 11.4: Strengthen efforts to protect and safeguard the world's cultural and natural heritage.
- Target 16.10: Ensure public access to information and protect fundamental freedoms, in accordance with national legislation and international agreements.

Because of this, it can be argued that cultural heritage, particularly the extent to which it can be produced, openly accessed and used, has firm international grounding and recognition.

Framing documentary heritage in relation to sustainable development

But beyond presenting this international framework for the protection and promotion of cultural heritage, it is important to analyze how documentary heritage could arguably contribute towards sustainable development, as defined over the years and now within the framework of the 2030 Agenda for Sustainable Development.

The concept of sustainability was thrust into international prominence by the publication of the Brundtland report — *Our Common Future* — in 1983, which yielded the most widely used definition of sustainable development. The Brundtland report defines sustainable development as development which meets the needs of the present without compromising the ability of future generations to meet their own needs (Brundtland, 1987: 54). It emphasizes evaluating any proposed initiative with reference to the interaction of the environment, the economy and social issues. This was reaffirmed by the 1992 Rio Earth Summit which, through Agenda 21, reiterated that "we can no longer think of environmental and economic and social development as isolated fields" (Earth Summit and Agenda 21, 1992: 1). It can thus be argued that sustainable development incorporates the elements of economic prosperity, social responsibility, and environmental protection. More specifically:

- Economic prosperity: This means pursuing economic progress without stretching the natural resources beyond their capacity. It entails long-term economic wellbeing of global, local and corporate economies and not simply shot-run profitability for corporations;
- Social responsibility: This entails social equity and equality of opportunities for everybody. It calls for equitable resource allocation, which is not only ethical but also essential for the well-being of the larger community and the world at large; and
- Environmental protection: This entails ensuring that resources are healthily recoverable, so that they can be enjoyed by coming generations. Thus environmental sustainability requires long-term viability of our resource use (Cited in Hamangaba-Banda, 2009: 6-8).

Against this background, it can be argued that documentary heritage could possibly contribute towards the achievement of the 2030 Agenda for Sustainable Development in terms of environmental, economic and social sustainability. This may be easier to argue conceptually, but will require, over the long-term period, empirical justification. In this respect, UNESCO Member States' reports on national implementation of the 2015 Recommendation may prove useful, particularly if the questionnaire on the basis of which information for those reports is collected can incorporate data on various aspects of environmental, economic and social sustainability.

What follows, then, is a succinct analysis of the different elements of sustainability and the possible contributions of documentary heritage towards their realization as well as a reference to some of the papers included in this publication which highlight this conceptual symbiosis.

Environmental sustainability

Environmental sustainability refers to the ability to maintain things or qualities of value in the physical environment (Sutton, 2004). In this respect, it can include climate change prevention and mitigation. Mitigation refers to any activities that reduce the overall concentration of greenhouse gases in the atmosphere. This includes efforts to switch from fossil fuels to renewable energy sources such as wind and solar, or to improve energy efficiency. It also includes efforts to plant trees and protect forests, or to farm land in ways that prevent greenhouse gases from entering the atmosphere. Adaptation refers to activities that make people, ecosystems and infrastructure less vulnerable to the impacts of climate change (UNESCO, 2013). Within this, the idea of disaster risk reduction and management is distinguishable as a strategy for environmental sustainability, reinforced by the Sendai Framework for Disaster Risk Reduction (Kelman, 2015).

Applied to documentary heritage, environmental sustainability can be analyzed in several ways, including by establishing how:

- Documentary heritage is just as endangered by climate change as by conflict, technological obsolescence, etc. Examples of this abound, as is highlighted by some papers presented during the first inter-regional conference. In this regard, the case studies by Claudette Thomas and Mitsuru Haga, focusing on Small Island Developing States (SIDS) and Japan respectively, provide both a conceptual and empirical basis for arguing that disaster risk preparedness is a key ingredient in supporting the sustainable preservation and accessibility of documentary heritage and the memory institutions that hold such heritage (archives, libraries, museums, etc.)
- "Build Back Better" – the fourth priority of the Sendai Framework – can be applied in enhancing disaster preparedness for effective response and to "Build Back Better" in recovery, rehabilitation and reconstruction, especially after the destructive impact of natural disasters, such as hurricanes, floods, fires, etc. that can hit libraries, archives, museums and other physical holding places. For example, a wildfire burned vast areas of Cape Town's iconic Table Mountain, historical landmarks and the nearly 200-year-old Jagger Library at the University of Cape Town that houses collections of African antiquities. Similarly, Brazil's National Museum, founded in 1818, was gutted, destroying some of Latin America's priceless collections of scientifically and culturally invaluable artifacts.
- Documentary heritage can be a part of emerging eco-friendly modes of development, including eco-tourism. Here, it is arguable that digital preservation of documentary heritage, for example, can promote eco-friendly or sustainable use and re-use of such heritage, especially by reducing the environmental stress (e.g. higher carbon footprint) resulting from over-crowding in memory

institutions, such as libraries, archives, museums, etc. Using digitized copies of documentary heritage from the comfort of one's house or office can be sustainable. Arguments for sustainable tourism, as applied to cultural heritage protection, are presented in an article on *Sustainability assessment for cultural tourism sites: case study of Pingyao Ancient City in China* (2019).

Social sustainability

Social sustainability can be conceptualized in terms of several aspects of cultural participation by individuals. Key to this is the aspect of public access to information, which is guaranteed by target 16.10 of SDG 16, namely ensuring public access to information and protecting fundamental freedoms, including access to equity, justice, etc. Enjoying cultural heritage in archives, libraries and museums is a clear manifestation of social sustainability in this respect.

Related to this is the aspect of cultural empowerment or participation, including sharing cultural artifacts, some of which may document historically significant information, that enhance cultural identity (cf. Eizenberg & Jabareen, 2017).

Viewed this way, social sustainability in relation to documentary heritage would seem to represent the idea that societies strive to confront the risk of cultural loss, while addressing social concerns. As such, the history encoded in documentary heritage may serve to:

- affirm personal and collective 'memories' and identity (e.g. liberation struggle documents for most post-colonies).
- help forge a common future.
- promote an understanding of the present on the basis of a shared history.
- provide a sense of safety and confidence for national and international cooperation.
- be culturally empowering and affirming.
- enable participation in the cultural life of a polity on the basis of shared memories.

To varying degrees, these arguments are synthesized by Helena Asamoah-Hassan in her chapter on 'Institutions for the memory – their role and social impact' published as part of a collection of papers delivered at the 4th International Conference of the UNESCO MoW Programme held from 18 to 21 May 2011 in Warsaw, Poland. She argues as follows:

"If a society is desirous of developing and maintaining its norms and values, it is important that it has access to its own original information and access to information of other societies. These types of information help to maintain the national culture and memory as cultural heritage is seen as a key element for a nation's consciousness and continuity" (Asamoah-Hassan 2013: 91).

Economic sustainability

Economic sustainability goes beyond just economic growth, as measured by the gross domestic product of a country. It embraces the whole realm of human development that goes beyond just monetary capital, but also focuses on natural, social and human capital (Basiago, 1999). As such, in the exploitation of limited natural resources, future repercussions must be considered. Thus, in terms of the link between documentary heritage and economic sustainable, there are three key areas that may be highlighted, at least conceptually.

First, the demand for documentary preservation could be an opportunity for innovative technologies. As is demonstrated by IFLA's Digital Unification Project, included in this publication, over the past 20 years, the Internet's increasing potential for preserving and providing access to documentary heritage paved the way for digital unification projects. These projects take digital collections one step further by focusing not only on national or regional collections but on bringing together collections across borders, and thus amplifying their potential economic benefits.

In another paper, Dietrich Schüller demonstrates how scholarly interest in the study of spoken languages, dialects and ethnic music led to the development of audiovisual recording and reproduction technologies in the nineteenth century. This process continues today, particularly with the advent of the Internet and artificial intelligence. Interest in cultural heritage, whether from a scholarly, entertainment or other perspective, will continue to drive technological innovation, which in turn contributes towards economic growth in terms of return on investment in research and development as well as in the extent to which cultural heritage can circulate more widely and thus be used and re-used on a larger scale.

However, even as there is inherent economic value in such technologies, attention must be paid to the risks that may come with newer, cutting-edge technologies, especially to environmental or human health. They may also come at the risk of discarding older forms of media which encode heritage, such as magnetic tapes, due to technological obsolescence, as Schüller cautions in his paper, calling for a carefully planned and quicker migration of content from such old media formats to digital repositories.

Therefore, innovation in newer types of technologies must seek to be energy-efficient and incorporate interoperability features that will work across different media formats and systems of documentary heritage management. This represents investments – at the private and public levels – that might be linked inexorably to economic sustainability at different levels – national, institutional, and personal. This represents a significant technological transformation with economic implications for inventors, governments, memory institutions, and other stakeholders.

Second, documentary heritage contributes towards economic sustainability to the extent that new digital technologies that emerge for the preservation of cultural heritage may include a refinement of the knowledge and skills of the human power working in memory institutions (librarians, archivists, technologists, etc.). As Maria R. Osuna Alarcón's focus on designing a heritage repository model for medium-sized collections shows, data librarian training needs to adapt to include a range of competencies that embrace, among others:

- Documentation preservation
- Digital rights management
- Updating training on new forms of dissemination
- Interoperability management, etc.

Third, documentary heritage may include tourism-related cultural artifacts that attract high numbers of visitations from tourists who may go to the holding memory institutions, especially archives and museums. The tourist fees involved represent a contribution to the gross domestic product of a country. As Arlen Cannata Seed (2013:121) argues, tourism is an important source of hard currency, particularly when "cultural preservation improves the lives of local residents – their houses, their markets, their schools, their historical places."

In summary, it can be argued that the protection of documentary heritage – or cultural heritage in general – is rooted in internationally agreed frameworks, giving it a strong foundation as a contributor to sustainable development, as defined in its environmental, social and economic domains. Cultural heritage, including documentary heritage, in its preservation, dissemination and usage, can contribute towards the realization of the 2030 Agenda for Sustainable Development.

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Chapter 2:
A focus on disaster risk reduction in national planning for documentary heritage: case studies

Claudette Thomas[2]

Preservation and Accessibility of Documentary Heritage: Disaster risk reduction and management for memory institutions, with a focus on Small Island Developing States (SIDS)

Introduction

Documentary heritage preservation and accessibility

According to the Glossary by Richard Pearce-Moses, preservation is the professional discipline of protecting materials by minimizing chemical and physical deterioration and damage to limit the loss of information and to extend the life of cultural property or that act of keeping it from harm, injury, decay or destruction -especially through non-invasive treatment; It is essential to the operations of any memory institution (Pearce-Moses, 2005). Preserving the collections of memory institutions will ensure the long-term sustainability of the archival programme to provide access to historical records of any country, while also supporting the Memory of the World Programme at the national, regional and international levels.

This paper uses the following ISO 15489-1:2016 definition of records: 'information created, received, and maintained as evidence and as an asset by an organization or person, in pursuit of legal obligations or in the transaction of business' (ISO, 15489-1:2016, 2016). It means that records are not limited to paper or hard copies but also include electronic formats such as websites and social media content.

A critical goal of the UNESCO Memory of the World Programme is to promote the preservation of the documentary heritage of humanity. This is based on the established practices and standards that are developed mainly through the influence of industrialized and developed countries. Memory institutions in Small Island Developing States (SIDS) continue to face challenges in adopting and adapting to standards and best practices due to a lack of supportive legislative, strategic and infrastructural frameworks for the preservation of digital records.

It is time for the entire library and archive professions of SIDS to raise awareness among decision-makers, professionals and the public to establish possible interim solutions. It is vital to bring greater clarity to the topic at hand.

What are SIDS?

According to UNESCO, Small Island Developing States (SIDS) are a distinct group of developing countries facing specific social, economic and environmental vulnerabilities, which were recognized as a special case both for their environment and development. There are 52 countries and territories presently classified as SIDS by the United Nations, 38 of which are UN Members (see Table 1- List of countries). Of those countries, 17 are members of the Memory of the World Latin America and the Caribbean Regional Register (MoWLAC) (see Table 2). The countries concerned cover four languages (Dutch, English, French and Spanish). This varied language situation influences the cultures of archive, record and information management prevalent in these countries.

2 Government Archivist, Archives and Records Department, Jamaica

Table 1- List of countries

38 UN SIDS Members	
1. Antigua and Barbuda	20. Federated States of Micronesia
2 Bahamas	21. Mauritius
3. Bahrain	22. Nauru
4. Barbados	23. Palau
5. Belize	24. Papua New Guinea
6. Cape Verde	25. Samoa
7. Comoros	26. São Tomé and Príncipe
8. Cuba	27. Singapore
9. Dominica	28. St. Kitts and Nevis
10 Dominican Republic	29. St. Lucia
11. Fiji	30. St. Vincent and the Grenadines,
12. Grenada	31. Seychelles
13. Guinea-Bissau	32. Solomon Islands
14. Guyana	33. Suriname
15. Haiti	34. Timor-Leste
16. Jamaica	35. Tonga
17. Kiribati	36. Trinidad and Tobago
18. Maldives	37. Tuvalu
19. Marshall Islands	38. Vanuatu

Table 2 – MOWLAC Register countries

Countries comprising the Memory of the World Committee of Latin America and the Caribbean (MOWLAC) Register			
Anguilla	Costa Rica	Jamaica	Saint Lucia
Argentina	Cuba	Mexico	St. Vincent and the Grenadines
Bahamas	Curacao	Montserrat	St. Maarten
Barbados	Dominican Republic	Netherlands Antilles	Suriname
Belize	Dominica	Nicaragua	Trinidad and Tobago
Bolivia (Plurinational State of)	Ecuador	Panama	Uruguay
Brazil	El Salvador	Paraguay	Venezuela (Bolivarian Republic of)
Chile	Guatemala	Peru	
Colombia	Guyana	Saint Kitts and Nevis	

Although they are diverse, SIDS face a common set of unprecedented challenges such as increasingly unpredictable and severe weather, the prospect of rising sea levels, biodiversity losses, geographic remoteness, small but growing populations and economic vulnerability (partly due to small markets and limited access to resources). Other challenges include the lack of business continuity and disaster recovery planning; absence of policies and standards for information and communication technologies (ICTs); shortage of ICT skills in Records and Information Management (RIM) and systems; lack of funding and limited collaboration for economies of scale within government, regional and international organizations. All of the above-mentioned challenges significantly increase the negative impact of natural disasters on memory institutions within these States.

Issues relating to natural disasters

These States are particularly vulnerable to the pervasive impact of natural disasters. Natural disasters, such as hurricanes, earthquakes, tropical depression floods, tsunami and volcanic eruptions, are a few of the common challenges. Related consequences include storm surges and landslides, which seem to be occurring more frequently and intensively. These States face much more significant economic, social and environmental consequences and higher costs of rehabilitation.

Hurricanes

Caribbean hurricanes are some of the most common natural disasters impacting the Small Island Developing States of Latin America and the Caribbean. A hurricane is a tropical cyclone that usually originates in the Atlantic Ocean with sustained winds of at least 74 miles per hour. They are created when warm water hits the troposphere and high pressure pushes warm, dry air down in the centre. This occurrence is particularly common in the Caribbean due to the high amounts of humidity and warm air that create the ideal conditions for hurricanes to form.

The Atlantic hurricane season runs from June to 30 November and peaks from August to September. The people of the Caribbean view hurricanes as a natural part of life. When a hurricane strikes a community, it leaves an obvious path of destruction. As a result of high winds and water from a storm surge, homes, businesses and crops may be destroyed or damaged; public infrastructure may be compromised; and people may be injured or killed.

Where a hurricane strikes a coastal area, it brings a number of serious hazards. These hazards include heavy rains, high winds, a storm surge and even tornadoes.

Storm surges push seawater onto shore during a hurricane, thereby flooding towns near the coast. Heavy rains cause flooding inland as well. There is no part of Caribbean life or history that is untouched by natural disasters.

Earthquakes

An earthquake or tremor is the shaking of the surface of the Earth resulting from a sudden release of energy in the Earth's crust that creates seismic waves. Earthquakes can range in size from those that are too weak to feel to those violent enough to propel objects and people into the air and wreak destruction across entire cities. At the Earth's surface, earthquakes shake, displace or disrupt the ground. When the epicentre of a large earthquake is located offshore, the seabed may move enough to cause a tsunami. Earthquakes can also trigger landslides and, occasionally, volcanic activity.

Haiti earthquake of 2010

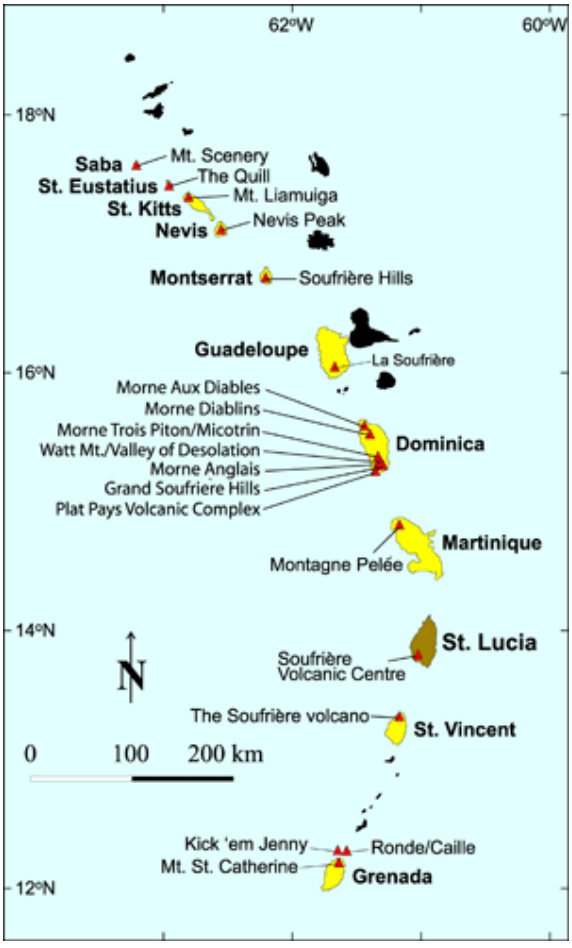
The Haiti earthquake of Tuesday 12 January 2010 was a catastrophic 7.0 magnitude quake, with an epicentre near the town of Léogâne (Ouest) and approximately 25 kilometres (16 miles) west of Port-au-Prince, Haiti's capital.

In Port-au-Prince, the earthquake damaged or destroyed many commercial buildings and several of the nation's main public buildings, including the National Archives. According to Jean-Wilfrid Bertrand, director of the National Archives of Haiti, speaking at an international gathering of Francophone archive experts in Haiti in 2013, 'More than 60 years of archives are badly stored, damaged or lost'. Also, because the nation lacked an inventory, it is unclear what has been lost.

Volcanoes

There are 19 live volcanoes (meaning those likely to erupt again) in the Eastern Caribbean. Every island from Grenada to Saba is under the threat of volcanic eruptions (see Figure 1 below). Islands such as Grenada, St. Vincent, St. Lucia, Martinique, Dominica, Guadeloupe, Montserrat, Nevis, St. Kitts, St. Eustatius and Saba have 'live' volcanic centres, while other islands such as Anguilla, Antigua, Barbuda, Barbados, British Virgin Islands, most of the Grenadines and Trinidad and Tobago (which are not volcanic) are close to volcanic islands and are therefore subject to volcanic hazards such as severe ash fall and volcanically-generated tsunamis.

Figure 1. Map of volcanic Small Island Developing States in the Caribbean



Source: The Seismic Research Centre, The University of the West Indies.

In 1989, Hurricane Hugo struck the island of Montserrat, causing massive destruction - with more than 90 per cent of the island's structures damaged. In 1995, just as the island began to recover, the Soufrière Hills volcano burst into life (see Figure 2). The resulting volcanic eruption in 1997 had an enormous impact on the island, killing 19 people and leaving two thirds of the island nation uninhabitable. The capital city, Plymouth, was completely buried under metres of volcanic rock, ash and mud. More than half the island›s 10,000 population were compelled to emigrate.

Figure 2. Soufrière Hills volcano bursting into life.

Despite the aforementioned challenges, the memory institutions of the Latin America and the Caribbean have identified the following great future opportunities for engagement:

- The MIGAN Project (Memory of the Island Gateway for Archives), which provides access to a low-cost database system for countries of the region (the International Council on Archives and its Access to Memory software (ICA-AtoM)).
- Strategic alliance between the Governments of St. Kitts and India for Indian descendants whose ancestors emigrated as indentured servants to St. Kitts. Through the digitization of these records, citizenship and identification cards were issued by India in 2016 based on immigrant records found in the national archives.
- Enhancing regional approaches to disaster recovery and heritage preservation by the Caribbean Archives Association.
- A project by the Coordinating Council of Audiovisual Archives Associations (CCAAA) on Archives at Risk: Endangered Audiovisual Archives and Global Preservation Efforts.
- Using the UNESCO SIDS Action Plan as a framework for preserving documentary heritage in the Small Island Developing States (SIDS), including through the MoW Programme.

The twentieth MOWLAC Conference was held from 11 to 13 September 2019 in La Paz, Bolivia (Plurinational State of). A number of strategic opportunities emerged from the Conference and the 2015 recommendations. The following opportunities are under consideration:

- Improving existing diagnoses of the status of documentary heritage;
- Intensifying regional and international cooperation;
- Expanding the dissemination of existing documentary heritage, whether at risk or not;
- Improving communication among memory institutions, initiatives and programmes that manage the protection of documentary heritage;
- Strengthening the national committees of the Memory of the World Programme by, inter alia, designing strategies to ensure the sustainability of such national committees;
- Intensifying human-capital training activities to protect and promote documentary heritage;
- Designing strategies to reduce the digital divide and include the topic of orality in discussions about documentary heritage;
- Increasing national budgets for documentary heritage policies;
- Strengthening institutional structures for the protection and promotion of documentary heritage;
- Stimulating legal reforms where necessary;
- Stepping up policies of access to public information;
- Developing natural disaster-management and risk-management policies; and
- Creating an observatory/platform/clearing house that covers the multiple themes, policies and initiatives of the documentary heritage ecosystem.

Below are a few cases studies of strategies for disaster-prevention plans or post-disaster intervention strategies for memory institutions seeking to preserve documentary heritage for accessibility.

Case study 1 - Impact of hurricanes on memory institutions in SIDS in the Caribbean (September 2017)

Based on relevant reports, Valérie Martens-Monier from the National Archives of Curaçao carried out damage assessment missions to islands most affected by the 2017 hurricanes Irma and Maria (St Maarten, Dominica and the British Virgin Islands) (Caribbean Regional Branch of the International Council on Archives (CARBICA), July 2018).

The CARBICA Executive Committee, led by President Rita Tjien Fooh, took part in the damage assessment mission to the memory institutions of St Maarten, Dominica and the British Virgin Islands in preparation for the working conference for Disaster Recovery and Heritage Preservation (which was scheduled to be held in St Maarten from 30 July to 3 August 2018).

Type of damage observed

St Maarten was hit by hurricane Irma, Dominica was affected by hurricane Maria and the British Virgin Islands (BVI) were battered first by Irma then two weeks later by Maria (with both being category-5 hurricanes). All three islands faced similar traumatic situations. These hurricanes started off as category 3 but turned into a catastrophic

category 5 a few hours before they hit the islands. As a result, governmental reactions and announcements were not as expected.

Hurricane Irma was characterized by heavy continuous wind blowing seawater onto land, knocking down trees, breaking windows and tearing off roofs. The wind was strong enough to lift cars, trucks and even fully loaded containers or ships over several metres of land.

Impact of hurricanes

The hurricanes resulted in a number of obstructing factors. They caused physical destruction followed by severe water damage from either seawater or muddy river water. Where there were missing roofs, water seeped through to lower floors along walls and joints (even concrete walls) and stagnated - causing minor flooding. This increases the Relative Humidity (RH) and triggers mould growth on walls and eventually documents. Mould will grow on humid or wet documents within 48 hours - especially in tropical climates that are warm and moist.

The hurricanes caused severe damage to the documentary heritage there. Due to climate change, in 2017 three hurricanes caused havoc in the same month. In September that year, there was Hurricane Irma on 6 September, Hurricane Jose on 9 September and Hurricane Maria on 19 September.

The primary objective of governments impacted by such a catastrophic event would be to save lives and secure homes. Subsequently, a country can begin thinking about work and getting back to offices. Often, transport is not then available at that stage.

Another delaying factor was the clearance carried out by the authorities to enable them to enter damaged buildings not considered safe for entry. In some cases, days and sometimes weeks passed before employees could get to work on the recovery. Employees in Dominica were even taking risks in order to save books from a library, but safety must remain an important issue during salvage.

Building issues

The memory institutions of these SIDS tend to be old historical buildings such as former residences, warehouses or churches. None of those buildings were designed to withstand category-5 hurricanes. This is why they suffered so much damage that resulted in a massive loss of documents and artefacts.

Recovery

The Caribbean Archives Association took a rigorous approach to disaster recovery and heritage preservation in the region. In the event of extensive water damage to records, the wet documents can be frozen and the work can then focus on drying damp records first. The damp records can be dried using fans or creative methods such as line hanging or fanning out. After a storm, however, electricity is often not available and freezers or fans cannot be used unless there is an alternative power supply. In the British Virgin Islands, a freezer was used for soaked documents. Unfortunately, they had been wet for weeks before freezing and had already shown signs of mould growth. In order to dry frozen documents, knowledge and specific equipment (like vacuum freeze drying units) is needed but this was not available on any of the islands visited.

Preservation

Preservation of documents and records starts by choosing a strong building in a safe and low-lying location. Proper climate control ensures stable temperatures and humidity day and night, while sturdy cabinets or vaults can house archival boxes to make it easier to find and handle documents (as in the Government complex in

the British Virgin Islands). Sadly, these archives consist of couple of rooms that are already full - with no scope for expansion.

None of the islands have a separate repository for their national archives except for St Martin (French side), which has suffered tremendously. These preventive measures are generally not applied to government records that might become archives. Museums and storage units containing historical documents or artefacts do not tend to have climate control.

Case study 2 - St. Kitts

A strategic alliance was formed between the Governments of St. Kitts and India for Indian descendants whose ancestors emigrated as indentured servants to St. Kitts. Through the digitization of these records, citizenship and identification cards were issued by India in 2016based on immigrant records found in the national archives.

Case study 3 – Jamaica

Jamaica has an undeniably incredible history of conquest, enslavement, emancipation, independence and post-independence. The Jamaica Archives and Records Department (JARD) and other institutions have helped to maintain the documentary heritage of Jamaica, including registers of return slaves (1817-1832) and current accounts (1809-1957) of deceased persons and manumission of slaves. These can be accessed from the Archives Unit in Spanish Town.

The main purpose of JARD is the preservation of records in paper, electronic and audiovisual forms through the use of modern technology. The role of this institution is very significant, as it is the sole Government entity mandated to preserve Jamaica's cultural and documentary heritage for posterity. In recognition of the outstanding value of the Jamaican heritage to the international community, a number of its collections were included on the UNESCO International and Regional Memory of the World (MoW) Register, which aims to safeguard and promote access to and use of rare documentary heritage. The records include the Protector of Immigrants Collection, the Silver Men of the Panama Canal and the Registry of Slaves of the British Caribbean 1817-1834.

The Protector of Immigrants Collection is the only one of its kind in Jamaica that covers the period of Asian indentured immigration from 1845 to 1958. It is especially useful in tracing Chinese and Indian ancestry, and provides rich information on the profiles of those indentured.

The Registry of Slaves is significant as the most comprehensive source of slave documentation in the English-speaking Caribbean. Information such as the Manumission of Slaves (1747-1834); Registers of Return Slaves (1817-1832); and Records of Slave Sale, Trials and Transfers can be found within this collection.

The Silver Men of the Panama Canal details the movement of thousands of Caribbean nationals to the Isthmus of Panama for the Construction of the Panama Canal - an invention that greatly improved the efficiency of commerce and travel of the twentieth century. The naming of this collection references the means of payment of the workers, whereby white people were paid in gold and black people were paid in silver.

The MoW strategy is used to improve conservation of documentary heritage, raise awareness and to resource the preservation, digitization and dissemination of collections. The introduction of a web-based, open-source application (**AtoM)** was another strategy used to digitize and increase access to collections of significant value in Jamaica.

Commitment of the Government of Jamaica

The Government of Jamaica has set out a comprehensive approach to modernize and transform the public sector. The five-year Public Sector Transformation and Modernisation Programme (PSTMP) was developed in 2014 to build on the previous plan and focus on public-sector efficiency and business facilitation. A critical component of the Programme is Information and Communication Technology Transformation, which aims to ensure the integrated, technology-enabled delivery of public services. The Government of Jamaica (GoJ) is committed to the development and implementation of an effective Government-wide Records and Information Management (RIM) Programme.

The development and implementation of the RIM Programme are motivated by increased demand for access, transparency and accountability in the management of government records. In keeping with the Government's ethos and emphasis on accessibility, good governance and transparency, the Office of the Cabinet (through the PSTMP programme) has collaborated with critical stakeholders in a Records and Information Management (RIM) Project targeting RIM reform throughout the public sector.

A Memorandum of Understanding (MoU) was signed in 2012 by the Office of the Cabinet (OoC) and the Office of the Prime Minister (OPM). The MoU was revised in 2016 and signed with the Ministry of Education, Youth and Information (MoEYI) and the Jamaica Archives and Records Department (JARD). The aim of the MoU was to support an integrated and harmonized government information infrastructure and system, and to modernize record and information management processes throughout the public sector. Specifically, the MoU established the framework for:

1. Improving digitization capacity - establishment of a digital archive database within JARD;
2. Developing a comprehensive policy framework; and
3. Implementing the policy - developing institutional capacity across government to implement RIM.

The new Government RIM Programme is being implemented by various ministries, departments and agencies. The legislative framework is being overhauled, and the Jamaica Archives and Records Department is being transformed - with a view to constructing new purpose-designed archives. The lessons learned are expected to inform the development of a template to be shared with other SIDS.

Conclusion

Preservation of and access to the documentary heritage of SIDS memory institutions require careful consideration in terms of managing the risk of natural disasters. Archival legal frameworks that adopt a broad definition of records will need to be introduced so that government entities and private bodies will make a commitment and transfer their digital records into archival custody.

This chapter may seem to omit a statement regarding the possible lack of infrastructure to place digital records into archival custody in Caribbean SIDS. Many public entities have migrated from one system to another using various types of software to execute multiple functions across the organization. This means that records might have been lost during migration. The study recommends that public entities should apply for exemption from archival legislation in order to develop an interim solution for the preservation of digital records. The National Archives and Records Service of South Africa (NARSSA) is also encouraged to develop a policy on distributed custody to allow government entities to create interim solutions for preserving digital records.

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Mitsuru Haga[3]

Preserving documentary heritage in tsunami-hit Japan: Lessons learned from the Great East Japan Earthquake in 2011 - preparing for the next disaster during the inter-disaster period

On 11 March 2011, North-East Japan was hit by an earthquake of magnitude 9.1 or IX (violent) on the Modified-Mercalli intensity scale, which caused many tsunamis reaching heights of between 40.1 metres and 43.3 metres. In this Great East Japan Earthquake, more than 24,590 people lost their lives. Its epicentre was located off the coast of Miyagi prefecture in the region of Tohoku.

The main thrust of the lesson learned from this huge earthquake is that preparedness is all that matters. One can do only what is already prepared, at the most. It is vital to bear in mind that humanity is always living in a temporary inter-disaster period. Disasters shall hit sooner or later, so one should be prepared.

Documental Heritage Rescue Network

In terms of measures to preserve documentary heritage at the time of disasters, it is strongly recommended that a documentary heritage rescue network be established in advance.

In Japan, after the Great Hanshin Earthquake (Magnitude 6.9) that hit South-West Japan on 17 January 1995, the Non-Profit Organization (NPO) Historical Documentary Network was established within the same year (Shiryo-Net) (http://siryo-net.jp). This network was the first of its kind, and was followed by others in various prefectures throughout Japan.

On 26 July 2003, the Great Miyagi Earthquake (Magnitude 6.4) hit Miyagi prefecture in North-East Japan, the same region that was hit again in 2011. After this 2003 earthquake, the NPO Miyagi Network for Preserving Historical Materials was established (Miyagi Shiryō Net) (http://miyagi-shiryou-net.blogspot.com) (https://www.youtube.com/watch?v=i74__L--sh4&app=desktop). This network has been very active. As a result, when the Great East Japan Earthquake hit Miyagi-prefecture and other prefectures of eastern Japan on 11 March 2011, the region was prepared to some extent. Immediately after the Great East Japan Earthquake and tsunami, the NPO Miyagi Network for Preserving Historical Materials (many volunteers led by specialists) began its operations in the field and indoors. This not only involved archives and university laboratories but also private houses and warehouses hit by the tsunami.

It is important not only to establish a documentary heritage network in a given region and to build a countrywide network of the regional networks, but also to prepare networks involving documentary heritage networks and local authorities, archives, libraries, museums and universities. The aim of these networks 'not only entails historical preservation, but also helping shattered and endangered communities recover their identity and dynamism by giving them back a sense of their continuity' (http://miyagi-shiryou-net.blogspot.com) The idea is to be prepared beforehand, for the recovery in the aftermath.

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Some practical suggestions for rescuing cultural heritage during disasters

Cultural Heritage Location Maps on Google Earth with active fault lines added should be prepared before disaster strikes. Herein, 'Cultural Heritage' refers to national treasures, important cultural heritage and not-yet designated cultural property, as well as historical institutions like temples and shrines and cultural institutions such as archives, libraries and museums. However, caution should be exercised in disclosing information, to prevent such maps from being used as 'treasure maps' by potential thieves in the confusion after a disaster. To avoid the risk of looting, a subscriber system regarding map access is recommended.

When a disaster hits, the most important initial steps are the functions of the State (in the form of the military and police) to protect and safeguard people. This is followed by law enforcement, administration of justice and economic considerations, which means that cultural preservation is at the bottom of the list. Therefore, at the time of a disaster, there will not be enough human resources to rescue cultural heritage. The people left to carry out this task will have to deal not only with documentary heritage but with many other kinds of cultural property such as works of art, historical architecture, folk crafts and specimens of animals, plants, minerals, fossils and rocks, while coordinating their activities over a large area. In quieter periods, the established networks should attempt to equip themselves with the skills and knowledge that will be necessary for emergency measures.

At the time of a disaster, tangible but also intangible cultural heritage (ICH) should be taken into account. In Japan, there is the International Research Center for Intangible Cultural Heritage in the Asia-Pacific Region (https://www.irci.jp) established in 2011 under the auspices of UNESCO as a Category 2 UNESCO Centre to enhance the safeguarding of ICH through instigating and coordinating research in the Asia-Pacific region.

Official rules, particularly in the job descriptions of the people concerned, should be defined in advance to fit the realities of a disaster. For example, 'to rescue cultural heritage at the time of disaster' should be clearly described. Otherwise, those who pursue rescue missions will have to work as volunteers, at their own risk, during their private vacation time, with their own money and without workers' insurance.

Another practical issue that needs to be addressed is the processing of tsunami-hit documents that are damaged by salt water. However, the question of how to treat documents with saltwater damage has not been thoroughly studied. As a first step in the process, the recommendation is to soak such documents in fresh water. In terms of detailed next steps, please consult the Japanese paper conservators at the NPO Miyagi Network for Preserving Historical Materials (http://miyagi-shiryou-net.blogspot.com) or any other network.

While documentary heritage could be rescued by amateur volunteers for free, works of art can only be treated by professional conservators at a high cost. Therefore, if there are no professional art conservators or no budget to fund one, works of art cannot be properly processed.

The Sendai Framework for Disaster Risk Reduction is the first major agreement of the post-2015 development agenda, and is highly relevant for optimizing the potential for disaster risk reduction for the State and local governments, the private sector and other stakeholders (United Nations Office for Disaster Risk Reduction (https://www.unisdr.org/we/coordinate/sendai-framework)).

Rescuing cultural heritage is an example of emergency care. After successfully leaving that emergency care, cultural heritage needs to recover and resume its previous existence. The rescue is just the first step of the long journey ahead.

Radioactive cultural properties

The Fukushima nuclear power plant was hit by a tsunami, which cut off the power supply and led to an explosion. As a result, Japan faced numerous serious issues including that of cultural property contaminated with radiation.

Some of the lessons learned from dealing with these materials are as follows:

- Because radioactive iodine in the air has a half-life of eight days, one should not approach the contaminated zone for at least eight days, preferably three half-lives (24 days).
- Because radioactive caesium is in the soil, one should study and analyse the current of the air, rain and geographical features of the land. Mapping the contamination status and related government announcements are all necessary.
- Walls of storage buildings should be thicker than 20 cm. Air-conditioners should be stopped so that radioactive contaminated air cannot enter rooms.
- Geiger-Mueller counters are needed in the field. If cultural properties are found with more than 1,300 cpm, they should not be touched but rather left behind.
- Workers in the contaminated areas should be males over 50 years of age who have low potential for procreation. A worker must monitor radiation exposure every hour and be careful of the total amount of exposure.

Reports of the management of radioactive contaminated cultural properties were not made public by the Soviet Union after the Chernobyl incident. After the Fukushima incident, a report was published in an international journal (C. Sano, Y. Yamamoto, "Rescued Historical Objects: Revitalising the Local Community of the Fukushima Restricted Area", ICOM Museum International Vol.65, Issue 1-4, 2013 (https://onlinelibrary.wiley.com/doi/full/10.1111/muse.12036)). Japan is willing to share not just her achievements but also her failures with the world.

Record and memory: Internet disaster archives and disaster monuments

According to the definition by the International Council on Archives (ICA), 'Archives are the documentary by-product of human activity regarding for their long-term value' (https://www.ica.org/en/what-archive). Because the etymology of the word 'document' stems from 'docu' ('docere' 'to teach') and 'ment' (action, result, state, means, thing), 'document' means anything that teaches us about human activity. Therefore, every disaster by-product should be archived as a 'product of human activity regarded for its long-term value' that teaches us.

Education is needed for disaster mitigation. For this purpose, some disaster archives have been created as online disaster education materials such as: the 'Great East Japan Earthquake Archive Hinagiku' by the Japanese National Diet Library (http://kn.ndl.go.jp/#/) and 'Michinoku Shinrokuden: Great East Japan Earthquake Archive' by Tohoku University (http://shinrokuden.irides.tohoku.ac.jp).

However, tangible objects are rightly prized. This is particularly true of real objects in situ with information on events that take place in the real world (see Figure 1). This is why disaster monuments in situ are of great value: they are objects in the field that have been moved by the unimaginable power of tsunamis. They have to be seen to be believed. Some claim that the monuments should be demolished because they are constant reminders to the sufferers of cruel memories. Nevertheless, the concern for the happiness of future generations should outweigh the concern for the reduction of unhappiness of the present generation. For the safety of future generations, disaster monuments should be preserved in situ by all means.

Figure 1. A ship deposited inland by the tsunami - disaster monument

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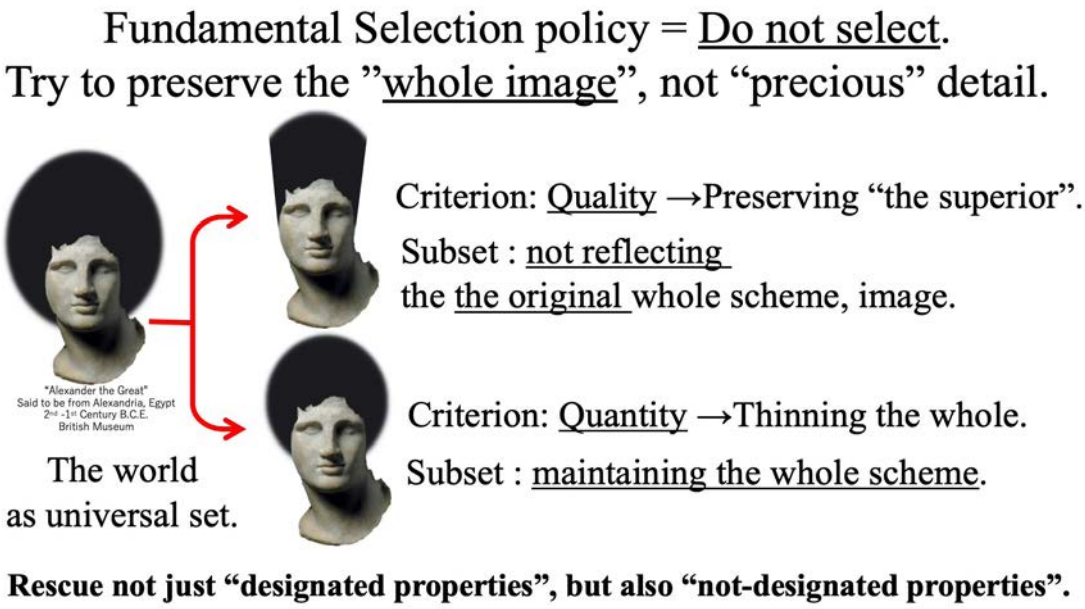
Selection Policy – 'Do Not Select'

Because human ability is limited, we cannot conserve everything. Even with digital media, we have to select what to conserve and transmit for the future and what to discard. Thus, one of the fundamental issues for documentary heritage preservation is the selection policy, or the principles that define regular operations but also emergency operations following a disaster.

From an archaeological point of view, one suggested selection policy is 'Do Not Select' (see Figure 2). What is important is to preserve the entire image, not specific details. When we attempt to preserve the world as a universal set using high quality as the selection criterion, neither the original whole scheme nor the image are reflected. If the criterion is quantity and we try to dilute the whole, there is no reflection of the entire scheme. Therefore, we should rescue not just designated property, but also non-designated objects.

Figure 2. Conceptual scheme of the 'Do Not Select' selection policy



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Additionally, family photographs found in disaster-stricken areas may not have universal or historical value but can be of immense importance for easing the pain of the victims (especially the family of the deceased). This is why a family photograph rescue project was implemented with great success.

Disperse system and "θαυμάζειν" - beyond human expectations, calculations and measurements

Human intelligence and imagination are limited. Whatever humans do and regardless of how well prepared people feel, what happens will be beyond human expectations, calculations and measurements. Disasters and damage are inevitable. What we can do is be prepared but with a disperse system. This is the guiding principle of disaster mitigation policy.

What effect would a disaster have in the mental and moral spheres? When people face a phenomenon beyond our expectations, calculations and measurements, they feel immense greatness, or 'the sublime (θαυμάζειν)'. This can be expressed through art, for example *Das Eismeer* (1823-24) by Casper David Friedrich and *Snow Storm: Steam-Boat off a Harbour's Mouth* (1842) by J.M.W. Turner. This was the case after the Lisbon earthquake with tsunami (Magnitude 8.5-9.0), which caused between 55,000 and 62,000 deaths in 1775. Just like religious art, art in general can be very effective as a form of spiritual salvation.

Build back better

Even though humans are weak in the face of mighty nature, people nonetheless aim high when they battle against fate. Immediately after the disaster, Japan was browbeaten. Soon after, however, citizens got back on their feet for recovery and the nation started to aim high once again. The motto was 'Not merely restoration, but building back better'.

Intergenerational ethics

When we talk about ethics and morals, this usually refers to human interactions or matters relevant to the present generation. However, it is future generations that should be taken as the reference point. In all matters, the impact on future generations should be considered. Future generations should matter more than the present generation. Therefore, intergenerational ethics should be the most fundamental concept of all. Of course, this is why humans build archives, libraries and museums - to preserve historical documents and material.

Would we abuse the concept of democracy? Unborn generations cannot vote today. The idea that sovereignty resides within people is a fundamental principle of democracy. The idea that sovereignty resides in the people of the future should therefore definitely be a principle. We preserve cultural heritage because the people of the future own the present (which is made up of assets from the past). This seems to capture the very spirit of 'sustainability'.

‘Generativity’ and ‘Visionary’ above ‘Creativity’ and ‘Revolutionary’

Humans pursue ‘Creativity’ and are encouraged to be ‘Revolutionary’. These are the concepts of seeking achievements where success within one generation is the main concern. One claims titles and rights (and money) but feels indifferent towards the consequences of new inventions in the future.

With ‘Sustainability’ and ‘Resilience’ in mind, we should be ‘Visionary’ and pursue ‘Generativity’. Intergenerational ethics are relevant to these concepts. One does not claim rights, but thinks of future generations and feels responsible for the consequences of the actions of today.

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Chapter 3: Digital heritage: digitization for preservation and accessibility?

Ingrid Parent[4]

UNESCO/PERSIST Guidelines for the Selection of Digital Heritage for Long-Term Preservation

What follows is an update on progress with an international digital preservation project called PERSIST and, in particular, the Content Selection Guidelines that were developed as part of this project.

The genesis of PERSIST was an international conference organized by UNESCO with a global team of cultural and memory institutions and associations on the topic of our digital heritage, its preservation and access. It was held in 2012 in Vancouver, Canada. It took a strategic, high-level view of digital preservation, and focused on the importance of developing policies, technical approaches and best practices related to digital content and description.

Figure 1. The UNESCO PERSIST Programme

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The founding members of PERSIST are UNESCO, the International Federation of Library Associations and Institutions (IFLA) and the International Council on Archives (ICA).

Since 2014, there have been several discussions about where PERSIST should belong in the global network of digital preservation activities. Fortunately, UNESCO gave approval for PERSIST to be part of the Organization's Memory of the World Programme, merging with the long-standing Sub-Committee on Technology (SCoT) to form the new Preservation Sub-Committee. The Chair of the Preservation Sub-Committee is Dr Lai-Tee Phang.

One point worth emphasizing is that PERSIST is a three-way effort and partnership. Not only are cultural and memory institutions key players in PERSIST, but governments at national and international levels and the information/computer industry are also essential participants to ensure the development of a sustainable and effective worldwide digital preservation network.

Three working groups were set up in 2014, and the Content and Best Practices Working Group produced the Guidelines for the selection of digital heritage for long-term preservation (IFLA, 2016).

Besides the many technical and financial challenges facing digital preservation, raising awareness of the critical importance of digital preservation globally at the highest levels, as well as facilitating partnerships across sectors and borders, are constant challenges that require dedicated effort and resources on the part of a great many people and institutions.

One such effort undertaken by the PERSIST Policy Working Group resulted in a collaboration with the Digital Preservation Coalition in the United Kingdom. This resulted in an Executive Guide on Digital Preservation, which is an online resource for decision makers to encourage action on digital preservation. The Guide provides a way for practitioners to advocate for digital preservation with policymakers and decision-makers in their institutions and governments (Digital Preservation Coalition, 2019).

Finally, it was gratifying to see UNESCO Member States approve the 2015 Recommendation on preservation of and access to documentary heritage. Governments are increasingly realizing the importance of preserving a nation's cultural heritage in all formats, but much more work remains to be done.

There is a deluge of digital information flowing all around us over the Internet. However, just as it is impossible to know how many fish there are in our oceans and rivers, it is also difficult to quantify how much digital data and information are out there. Nevertheless, it is well known that information is growing fast - exponentially fast. Will it be possible to capture and preserve all those data? Some have argued that it is feasible to sweep everything up now, and that some new generation of computers and Artificial Intelligence will be able to make sense of it all in the future. There is, nonetheless, increasing scepticism about this point of view.

So why not collect everything? One reason is that information professionals have always selected materials for long-term access in the print world. For example, archivists have always had a very logical and orderly process to appraise archival records and to schedule retention schedules on an ongoing basis. In the digital era, however, there are two major reasons why it is impossible to collect and save all digital information. The first reason is simply the sheer volume of information dealt with by cultural and heritage institutions. According to David Rosenthal from Stanford University (Rosenthal, 2012), digital storage demand increases by a factor of 60 per cent a year. In contrast, IT budgets increase by a paltry 2 per cent a year, if at all. Then there are technical issues such as software failure and physical media obsolescence, which add to the cost of managing digital information in the long term. The result is a sustainability crisis. In the words of William Kilbride, Executive Director of the Digital Preservation Coalition, 'Unless we do Selection to weed out Something, we can't preserve Anything!' (Digital Preservation Coalition,2019).

Given this state of affairs, the PERSIST Content and Best Practices Working Group set out to develop some meaningful and potentially useful Selection Guidelines for digital preservation.

The Guidelines were written and launched in 2016 by a cross-sector Working Group led by IFLA. They were produced on the basis of several surveys and studies that were carried out to provide a broader picture of the digital preservation environment at that time. The Guidelines were written for both high-level stakeholders and practitioners, and are intended to inform and orient national and local digital preservation policies and guidelines. It was impossible to develop strict rules for what to preserve, since every cultural institution has its own context of operation that will affect decisions about what resources to keep.

The Guidelines have been translated into eight languages so far. All of these translations are available on the IFLA website, as well as on the UNESCO website. Discussions are also under way with some individuals about translating the Guidelines into Romanian and Farsi.

What follows are some of the highlights of the Selection Guidelines. Evaluating and assessing digital heritage should be based on many of the same principles that underlie the selection of traditional analogue materials, but they must also consider new issues of long-term accessibility, use and preservation. The Working Group therefore identified three major criteria on which to base selection decisions.

The first is the significance of the digital heritage to an institution's mandate and the public it serves. Below are some questions to ask when considering whether to preserve a digital object or not:

- Does the digital object have significant social, cultural, historic or artistic value for the community served by the institution? and;
- How will the institution's stakeholders (clients, sponsors and society) be affected if this digital heritage is not preserved?

The second criterion is sustainability. Does the institution have the capacity, budget and resources to preserve the digital object for long-term access and use? Does the institution have the technical capacity to read, migrate and preserve the digital object? Are sufficient metadata available to access this piece of digital heritage over time?

The third criterion is availability. Availability refers to whether there are other institutions in the heritage community or network that are collecting and preserving digital resources. Is the digital object rare or unique, or is it widely duplicated? In which institution or region will the object be of most use or most benefit to the public? Is it at risk within other institutions? This criterion assumes that the host institution has some knowledge of what others are doing in their digital environment.

These are the three main criteria that were felt to be the most impactful in terms of best outcomes for preservation decisions. It is also important to mention that there are no set rules or instructions to help make selection decisions. The criteria are meant to be flexible. For example, a digital or other object that is significant to one institution may not necessarily be significant to another. The selection decision depends on the context, the type of institution, its mandate and mission and often on its geographical location and geopolitical environment.

To supplement these three criteria, another two concepts advocated by William Kilbride were put forward: people and opportunity. Selection for preservation is not only about bits and bytes, data or access. Rather, it is about the value of the digital object and its impact on the health and purpose of the organization. Material should be selected for preservation with people and opportunity in mind, so as to ensure a meaningful and

secure digital heritage for communities. These two words are not specifically in the current Selection Guidelines, but their meaning is certainly implicit in the text.

Once the selection criteria have been considered and appropriate questions asked about whether to preserve a digital object, the Guidelines then offer a decision-tree approach to assist the institution in making the appropriate decision for selection. There is also a section in the Guidelines outlining the importance of creating complete and accurate metadata that are essential to ensure that the digital material preserved remains accessible, intelligible and usable over time. If the digital heritage is the "content", then the metadata is the "context".

Finally, the Guidelines describe the impact that the legal environment can have on the selection of digital objects for preservation. Here again, this legal environment will vary by country and by jurisdiction. If, for example, the institution has a legal obligation to collect and preserve the digital object over the long term, then there is no need to use the Guidelines to make the decision. As so many cases in the digital ecosystem, however, answers are often not black and white, and the professional judgment of many people will be needed to make the correct decision about whether to preserve a digital resource or not.

Some analysis has been carried out into the usage statistics for the Selection Guidelines. There have been more than 600 downloads of the Guidelines from the IFLA website from all continents in the past two years following the publication of the Guidelines. In addition, the UNESCO PERSIST website has also recorded many downloads.

As mentioned previously, these Selection Guidelines are pitched at a general high level in order to guide individuals and cultural heritage institutions to develop their own selection policies for digital preservation. The Guidelines have also been used for global training purposes, including UNESCO workshops to promote digital preservation and access as expressed in the 2015 Recommendation.

While they remain useful, the Guidelines are now five years old. Five years is a long time in terms of digital developments. There are many new formats of digital documents that are being created and included in cultural heritage institutions collections. Ephemeral material, which is best described in the digital world as social media content, probably outstrips more traditional e-books and e-journals. Software has itself become an object to collect and preserve.

There is a recognition that inclusiveness and diversity in our communities are not well reflected in the current edition of the Guidelines and, from a moral and ethical perspective, there are several internal and external factors that impact an institution's decision on what to keep for long-term access and what can be permanently deleted. There is now much more connection within the community of practitioners, so that there can be more coordination of selection choices.

The Guidelines could also include a section on developing metrics around selection of digital resources for long term-preservation to assess their effectiveness, after several years of working with digital content. There are many other points to be made and guidance given in a future edition of the Guidelines.

Looking to the future, a Review Group is currently assessing the strengths and weaknesses of the current edition of the Guidelines, identifying any gaps, and preparing the next edition. This process will continue until the summer of 2021. Review Group members come from libraries, archives and museums, the software/data community, and other digital preservation networks. UNESCO is again an ex officio member of the group.
Promoting the Selection Guidelines in all countries and regions is essential to ensure that precious digital heritage is well preserved and accessible for future generations. The greatest hurdle to overcome in ensuring

long-term preservation is not the technical challenges or the financial implications. Rather, the challenge lies in raising awareness among governments, civil societies and the information and communication technologies (ICTs) sector about the fact that our digital heritage and our identities as human and social communities will be in danger if people are not able and determined to be creative and courageous in undertaking sustainable preservation activities.

Our preservation struggles could even be compared to what is happening with climate change, and the increasing efforts being made to raise awareness of what could happen if preventative measures are not implemented now.

The preservation of cultural heritage is the duty of information professionals. It is vital keep up the momentum and the advocacy for a sustainable and accessible digital future.

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Claire McGuire[5]

IFLA Guidelines for Setting Up a Digital Unification Project: Encouraging digital access to collections across distance and borders

Cultural heritage offers more than a link to the past – it offers human beings a link to each other. Libraries, museums and archives throughout the world hold collections and individual items that are of great cultural importance to all peoples. These collections document the undeniable interconnectedness of human history.

Over the centuries, due to factors including politics, human migration, sales, seizures and other means of exchange, many of these collections have become fragmented.

However, the significance of these collections may only be fully realized when they are brought together. Furthermore, this significance might be relevant for a broader audience, beyond those who have access to the collections in situ. Despite this, barriers of distance and borders have traditionally stood in the way of researchers and other users being able to take a comprehensive view.

In the light of the above, the International Federation of Library Associations and Institutions (IFLA) launched an initiative to help libraries and other memory institutions embark on projects to use digital means to unify their collections across distance and borders.

This article will introduce the tool created: the IFLA Guidelines for Setting Up a Digital Unification Project. These guidelines form a very practical document. It was essential to ensure they were flexible and adaptable enough to fit any type and scale of project.

It is hoped that these guidelines will help support future initiatives to bring together documentary heritage collections and inspire international cooperation.

From digitization to digital unification

Since the arrival of new technologies to facilitate the creation of digital libraries in the late 1990s, there have been many national initiatives for digital preservation. One example is the creation of Gallica, the digital library of the National Library of France and its partners, which was launched in 1997 (Bibliothèque nationale de France, n.d.).

A decade late later, regional initiatives emerged. This trend was spearheaded in 2008 by the European Digital Library, Europeana (Europeana, n.d.). The first global project was the World Digital Library established by the United States Library of Congress with the support of UNESCO in 2009 (World Digital Library, n.d.).

Over the past 20 years, the Internet's increasing potential for preserving and providing access to documentary heritage paved the way for digital unification projects. These projects take digital collections one step further by focusing not only on national or regional collections but on bringing together collections across borders.

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Better together

Pieces of documentary heritage involved in a digital unification project can be understood as belonging together based on theme, history or aesthetic. For example, these collections could be unified due to a shared language, religion, culture, colonial past or commercial trade route.

By digitally preserving and unifying documentary heritage collections, these items can begin to build a bridge. Bringing collections together allows people to learn from, understand and study these objects in the context of their stories, particularly in relation to the reasons for their movement.

Given the complex histories of these collections, it is vital that - alongside digital preservation - these items are enhanced by context. This serves to promote access and understanding for future generations, as well as to communicate the value of the project itself as an act of international cooperation.

Challenges to implementing digital unification projects arise from the same complex histories and political contexts. Ethical and religious issues around digitalization and access to artefacts must be considered, as well as different approaches to preservation, technical metadata standards, copyright/other legal issues and the varying levels of resources available. With that in mind, IFLA identified the need for a comprehensive guide for institutions of all sizes to be able to navigate these challenges.

The Digital Unification Initiative at IFLA

In 2017, IFLA brought together experts to help libraries and other memory institutions make their collections available to such projects.

The resulting Guidelines were produced by the working group for the IFLA digital unification key initiative (WGDU), chaired by Isabelle Nyffenegger (Bibliothèque nationale de France, IFLA National Libraries Section), and previously by Guy Berthiaume (Library and Archives Canada, IFLA National Libraries Section).

It was the working group's mission to produce a tool that was usable and scalable for institutions at a range of capacity levels.

Beyond raising international awareness of the issues and solutions around digital unification, this initiative aimed to establish an extensive international network involving all the relevant parties and to provide an overview of best practices.

The following is a brief introduction to the resulting guidelines, with the inclusion of selected case studies to inspire further initiatives.

Case studies

Case studies were received from 22 institutions to be included in best practices for these guidelines. Readers can find an overview of all case studies on the IFLA website.

Below is a summary of two case studies to illustrate the differences in scope that are possible in Digital Unification projects.

1: Codex Siniaticus

- Single document
- Sections held in the collections of four institutions: British Library, United Kingdom; Library of the University of Leipzig, Germany; National Library of Russia in Saint Petersburg, Russian Federation; Holy Monastery of the God-Trodden Mount Sinai (Saint Catherine's), Egypt
- Defined timeline for completion.

This project included the preservation, photography, transcription and publication of all pages and fragments. The results are now hosted on a dedicated website where users can access the codex in full.

2: Collection of Korean Rare Books Held Abroad

- 100,000+ documents
- 42 International partners
- Ongoing project.

The goal was to allow Korean students access to books and manuscripts held in collections abroad. The project includes examining, collecting and digitizing materials to establish a Korean Studies research information infrastructure.

Key questions for every project

These two examples, along with all the other case studies, differ in terms of scope, object type, number and relationship of partners and/or end results. In order for the IFLA Guidelines to be useful, they clearly could not be a static framework dictating a set of instructions. Instead, they are designed to guide the user through key questions that must be considered at each stage of the project-planning process, in order to give the project the best chance of success.

Step 1: Define

Sample questions: Why are you doing this project? What is the objective of this project?

Users are also guided through questions to help determine who their partners will be, the resources they might need and the project's timeline.

At the end of the Define stage, the user should have an overview of objects involved, a working group of experts, partnership agreement(s), budget and timeline.

Step 2: Manage

Sample questions: What is the current state of conservation of the objects concerned? How much preservation or stabilization work is needed to enable digitization?

This chapter guides the user through key questions relating to conservation and preservation, cataloguing and metadata, digitization, dissemination, enhancement and outreach. It helps the user consider the challenges arising from the complexity of objects held in different collections and countries.

Step 3: Finalize

The project must end with a plan for sustaining outcomes for the future. This includes reporting, management of resources and assignment of staff.

The expert working group suggests that partners determine who will be responsible for ongoing management at the beginning of the project, to ensure that expectations are clear.

Putting the guidelines to use

It is hoped that this introduction to digital unification and the Guidelines inspires readers to explore opportunities for digital unification in their future work. The Guidelines are downloadable in full in several languages on the IFLA website: Guidelines for Setting Up a Digital Unification Project.

Using digital technology not only to preserve objects but to bring collections back together - perhaps for the first time in centuries - strengthens the field of cultural heritage and the role it plays in people's lives. Documentary heritage stories, strengthened and unified through international cooperation, serve to illustrate the interconnectivity of all humankind for generations to come.

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Dietrich Schüller[6]

The Magnetic Tape Alert Project: Safeguarding documents of linguistic and cultural diversity[7]

Audiovisual documents and their specific importance for the work of UNESCO

Audiovisual documents play a substantial role in supporting one of UNESCO's main endeavours, namely the protection of the linguistic and cultural diversity of human kind. It is an almost trivial statement that audiovisual documents, better than any textual description, enable us to authentically record and reproduce cultural phenomena such as spoken language, music, dance, oral histories, and rituals, thus capturing such ephemeral phenomena for subsequent reproduction, study and analysis, or just for pleasure.

Audiovisual recording and reproduction technologies were already developed in the nineteenth century, sound recording in 1877, and film in the 1890s. Although audiovisual records are for the most part products of the audiovisual entertainment industry, the driving force behind the development of these recording technologies was the scholarly interest in the study of spoken language, dialects and ethnic music. The first "film" was produced to study the motion of a galloping horse. Consequently, it was also academic institutions that founded the first audiovisual archives: in Vienna (1899), Paris and Berlin (1900), and Saint Petersburg (1908).

While phonographic recording was technically demanding, filming was expensive. This kept the number of recorded documents from the first half of the twentieth century fairly low, but the situation changed with the advent of magnetic tape recording. Developed in the mid-1930s, it became the most widely adopted recording technology in radio and phonorecord production after the Second World War. From the late 1950s, academic research had benefited greatly from the availability of small and battery-operated portable tape recorders which permitted sound recording in good quality everywhere in the world. Because of the costs involved, the production of scholarly film documents of cultural expressions was the exception. But when small portable and affordable video cameras became available from the 1980s onward, these "handycams" were widely used in anthropological and sociological studies, even in linguistic documentation, permitting the inclusion of a systematic study of gestures and mimics.

In this new environment of affordable technology, audiovisual field work flourished immensely. Sound and subsequently video recordings have been made in all parts of the world and there is hardly any ethnic, social or language group that has not been documented to a greater or lesser degree. Over the past six decades, tens of thousands of articles and monographs have been published on the basis of audiovisual recordings. This makes these audiovisual originals key documents containing today's knowledge about the linguistic and cultural diversity of human-kind.

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6 Chairperson, Austrian Memory of the World national committee; Member, International Advisory Committee of the Memory of the World Programme, UNESCO

7 This paper follows the presentation as delivered at the Memory of the World 1st Inter-regional Conference in Panama City, October 2018. The project started in summer 2019 and ended on 30 June 2020. A first report is available at https://www.iasa-web.org/sites/default/files/publications/MTAP-Report-v.1.1.pdf.

Long-term preservation of audiovisual documents

Audio and video recordings are machine-readable documents. Their retrievability does not only depend on the physical and chemical condition of their respective carriers, it also requires the availability of the specific replay machines in operable condition. For digital documents the availability of the encoding scheme of the data stream or file is an additional requirement for their reproduction.

The earlier strategy for audiovisual preservation concentrated on the condition of the carriers. This raised several concerns because of their fragility and chemical instability. Measures consequently focused on optimising handling and storage conditions. With the introduction of digital audio and video recording technology in the 1980s, however, it became clear that the ever-accelerating development of new recording technologies, file formats, and their associated hard- and software posed an equal, if not greater threat to audio and video preservation. Further adherence to the traditional preservation paradigm – to preserve the original carrier – would ultimately be in vain, as it would also mean having to store warehouses of replay equipment and their spare parts to keep the ever-growing amount of formats accessible. For digital originals this would also mean maintaining the readability of the file formats including operation systems.

A paradigm shift in preservation models

Around 1990, this triggered a paradigm shift in preservation models, which had initially involved just sound recordings. Preservation should concentrate not on the original carrier, but on the contents by copying them from one preservation platform to the other. Copying must be lossless and therefore happen in the digital domain. Consequently, analogue contents have to be digitised first. In order to keep preservation of the ever-growing amount of audiovisual contents manageable, automated mass storage systems have been envisaged which permit the control of data integrity of the stored files, arrange their refreshment, if needed, and transfer contents to whatever new preservation platform in time, before obsolescence of hard- and software of the old system would endanger retrievability (Schüller 1992). The first public debates of this new concept attracted sceptical comments from conservative archivists, but already in 1992/93 German broadcast archivists had started a pilot project in this area (Häfner 1994). By the mid-1990s the concept had been fully accepted, and, in 1997, the International Association of Sound and Audiovisual Archives (IASA) issued the first version of the standard procedure, IASA-TC 03 (see IASA Technical Committee). From around 2000, when the high amount of digital video data became manageable, the concept of content migration was also applied to video preservation. Meanwhile, it has also been adopted for the preservation of traditional photochemical film[8].

8 In contrast to audio and video, digital film preservation was not enforced due to obsolescence of replay equipment, but because of the declining availability of raw film material, which is a prerequisite for classic analogue film preservation. The increasing shortage of raw film production, however, was a direct result of the introduction of digital film projection. For an overview of digital audiovisual preservation see Schüller 2020.

Obsolescence of magnetic tape recording and reproduction equipment

With the development of digital technology, preservation, along with audiovisual recording and post-production, gradually moved over to the computer world. At the same time, the use of dedicated magnetic tape formats, audio and video, analogue as well digital, faded. Consequently, the production of new equipment and spare parts, and ultimately also professional service, ceased.

The limited future availability of magnetic tape replay equipment was apparent from around 2000. Radio, television and national audiovisual archives began the systematic digitisation of their holdings. Today, most of the large collections have already been transferred to digital repositories, or there are plans to do so, before regular retrieval of contents from their original carriers ends in a couple of years. 2025 is an oft-quoted deadline. Forward-looking archives and service providers have collected tape replay machines in time, so that the window may remain open for a few more years for some formats. For other formats, however, such as video in the 1980s, it is already too late.

The longer that content migration is delayed, the more difficult and expensive safeguarding becomes. The documents representing the linguistic and cultural diversity of human kind are specifically under threat. Typically, these documents are unique and irreplaceable originals, representing languages, music, dances, rituals and cultural practices that may have substantially changed since their documentation. Some may have even become extinct. Only a small proportion of these records is adequately safeguarded. The greater part – possibly up to 80 per cent – is kept as small and scattered collections at the research institutions or cultural bodies that originally recorded them. Typically, such research bodies lack resources to properly preserve their holdings, let alone finance their digitisation and the permanent costs of digital preservation. Also, original field tapes are often still kept in the private homes of the researchers. And several collection holders do not even seem to be aware of the immediate threat.

Framework of UNESCO – IASA cooperation

In order to prevent the loss of a significant part of these unique and highly important originals, the Working Group of Information Preservation of UNESCO's Information for All Programme (IFAP) and the International Association of Sound and Audiovisual Archives (IASA) joined forces for the Magnetic Tape Alert Project. The project which is jointly funded by UNESCO and IASA has a twofold aim: primarily, to alert stakeholders, administrative bodies and governments to the considerable threat, and to quantitatively assess the extent to which rescue measures would have to be organised and financed to prevent the loss of irreplaceable documents.

The main tool of the project is a questionnaire to qualitatively and quantitatively assess audiovisual collections, their state of preservation, the need for assistance, as well as the readiness to assist other collections in safeguarding their holdings in a timely manner. The survey concentrates on magnetic tape collections.

A specific feature of the project is the reciprocity among the partners: IASA (International Association of Sound and Audiovisual Archives) has close contacts with its members, but little or no knowledge about small

and hidden non-member collections, attached to (paper) archives and libraries, local museums, or research institutions, often part of universities or cultural agencies. Contact with those is established through UNESCO infrastructure (including the National Commissions and the UNESCO Field Offices), organised as part of a top-down process between UNESCO and Member State government authorities. This keeps national administration informed of any imminent threats in order to raise the alert about an emerging situation and escalate it to the national level, if necessary.

The main stakeholder within IASA is the Sound and Vision Department of the British Library. Having ample experience in spotting small and hidden collections in the recent national project "Save our Sounds", Sound and Vision aims to complement UNESCO by establishing a bottom-up process through international, regional and national non-governmental organisations (NGOs), focusing on typical contents of audiovisual collections, such as (endangered) languages, music, folklore, dance, oral history, etc.

Expected results

It is hoped that this project will not only alert stakeholders and decision makers to the pending threat but also provide a rough overview of the scale of magnetic tape documents and their state of preservation outside professional archives. This would provide a basis for the realistic planning of administrative, logistic and financial measures to safeguard important endangered collections.

Without a decisive commitment to discover and safeguard these hidden and scattered documents, we would face an unprecedented situation in the five thousand years' history of document preservation: we would be able to read thousands of descriptions and analyses of languages, dance, rituals, or music transcriptions, based on original audiovisual documents, but we would be unable to view and listen to the originals.

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Design of a Heritage Repository model for medium-sized collections and foundations

Definition and management of Heritage Repositories

General digital repositories and those that disseminate and protect documentary and bibliographic heritage have very different descriptions. This section sets out a development model to outline respective tasks and define the different types of repositories (at the same time as contributing to dissemination and improvement).

There are different types of digital repositories functioning as databases in which digital or digitized documents are arranged in collections for easy access. OpenAIRE includes the following types of repository:

Types of OpenAIRE repository
Institutional Repository
Thematic Repository
Publication Repository
Institutional Repository Aggregator
Thematic Repository Aggregator
Publication Repository Aggregator
Data Repository
Data Repository Aggregator
CRIS System
Publication Catalogue
Software Repository
Software Repository Aggregator

Source: OpenAIRE Explore.

For the present analysis, document content is used as a basis for simplifying the typology of digital repositories into the following categories:

- Institutional repository (IR)
- Scientific repository (SR)
- Heritage repository (HR).

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A scientific repository (SR) manages sets of collections of open-access scientific and academic texts that are useful for scientific research. Institutional Repositories (IRs) can be defined as libraries of digital objects and associated metadata, usually belonging to a single institution. The term institutional repository is used to differentiate between systems and services that allow digital content from a single institution, company or organization to be collected and disseminated. One example is academic institutional repositories. They provide digital and digitized content produced and preserved by the academic community, including peer-reviewed articles written by professors, research project reports, theses in digital format and dissertations or academic papers by students. Sometimes they may even house the institution's heritage documents.

Heritage repositories only collect documents that have "heritage" characteristics. These mainly take the form of digitized artefacts and their images or documents and their metadata, which may be from the collections of a wide variety of institutions.

> *'For the purposes of this Recommendation, a document is an object comprising analogue or digital informational content and the carrier on which it resides. It is preservable and usually moveable. The content may comprise signs or codes (such as text), images (still or moving) and sounds, which can be copied or migrated. The carrier may have important aesthetic, cultural or technical qualities. The relationship between content and carrier may range from incidental to integral' (UNESCO, 2015).*

Heritage repositories allow access to digital objects, digital images and so forth from special collections such as libraries, archives and museums (LAM). The main goal of HRs is to ensure the accessibility of documents kept in very different institutions that have heritage value as defined by UNESCO:

> *'Documentary heritage comprises those single documents – or groups of documents – of significant and enduring value to a community, a culture, a country or to humanity generally, and whose deterioration or loss would be a harmful impoverishment. Significance of this heritage may become clear only with the passage of time. The world's documentary heritage is of global importance and responsibility to all, and should be fully preserved and protected for all, with due respect to and recognition of cultural mores and practicalities. It should be permanently accessible and re-usable by all without hindrance. It provides the means for understanding social, political, collective as well as personal history. It can help to underpin good governance and sustainable development. For each State, its documentary heritage reflects its memory and identity, and thus contributes to determine its place in the global community. Memory institutions may include but are not limited to archives, libraries, museums and other educational, cultural and research organizations' (UNESCO, 2015).*

Heritage Repositories (HRs) provide a specific digital repository model used for the dissemination of heritage collections and are a powerful tool in the protection of documentary heritage, as supported by UNESCO through the Memory of the World (MoW) Programme since 1992.

'The mission of the Memory of the World Programme is to increase awareness and protection of the world's documentary heritage, and achieve its universal and permanent accessibility' UNESCO, MoW, 2017.

In addition to the general objectives common to all Heritage Repositories, we must consider and respect the specific objectives of every model and service within each institution where the repository is located.

As digital repositories, HRs share common characteristics, but their specificity is focused on the preservation and dissemination of special heritage collections. The librarians of these collections are the first to promote HRs, and the use of these repositories is becoming more widespread because of the advantages they offer. These services are expanding to include archive and museum documents. Information technology helps these institutions to work closely together. In the field of heritage, this cooperation is already under way. Collectively referred to as LAMs, different institutions are calling for integrated access to facilitate the recovery of digital heritage objects in the same repository but in different collections.

'The memory institution has captured the imagination of policy makers as a powerful metaphor for the social role of libraries, archives and museums. Charged with giving access to and shaping shared cultural heritage, memory institutions are sometimes characterised as storehouses, reservoirs to be tapped for many different purposes, from education to entertainment. Drawing on the desire that all information be available to anyone, anywhere, the vision of an integrated cultural web is portrayed as a powerhouse, latent with the potential of unrealized knowledge' (Trant, 2009).

Information technology allows these collections to be kept separate but accessible from a single HR entry point or interface. Heritage Repositories provide an automated service model with open access to LAM special collections. These collections, organized into HRs, provide digital access to documents whose originals are stocked in libraries, archives or museums and which, through the heritage repository, are found in specific sections called collections. The digitized heritage collections to which HRs give access can be of many different types, and documents held by one institution can be the result of a collaboration between several institutions. HRs can also collect documents that were "born digital". This is why HRs are becoming a very useful tool in the management of hybrid collections. Memory institutions are increasingly interested in displaying their cultural registers online in order to guarantee their historical continuity, and also to meet growing demand: to manage documents that are physical, digitized and born digital as complementary parts of the fabric of knowledge. UNESCO encourages 'memory institutions' to establish and maintain them:

'Member States are encouraged to support their memory institutions in establishing selection, collection and preservation policies by research and consultation, guided by internationally established and defined standards regarding documentary heritage in their territories. The documents, holdings and collections should be managed in a way that ensures their preservation and accessibility over time, and assigns means of discovery, including cataloguing and metadata' (UNESCO, 2015).

Primary functions of a Heritage Repository
Collection: Licensed resources, printed works, digitization and storage, special digital collections, public domain
Building: Special collections that are integrated and homogeneous at the retrieval level
Digitization and publication: Heritage collections with prior preservation programmes
Indexing: Documents, the assembled documentary units and the collections based on ontology
Preservation: Digitized collections, records and their metadata
Establishment: Different types of documentary sources in collections, microsites, services, conservation warehouses
Access: Establishment of access, user types and rights management
Consultation: Establishment of the exchange of resources and delivery tools
Maintenance: Updating of URLs and curating of content
Assessment: Return on investment, altmetrics and data visualization (vis), documentary information system feedback

The model is of use for medium or small collections, such as those within cultural foundations that can be managed with the most accessible tools. To that end, it involves professionals who can be trained or have their skills upgraded in a simplified manner. This model is suitable for all types of documentary heritage collections, especially those where material preservation and accessibility needs are considered more urgent by citizens.

HR management, task-setting
Establishment of HR framework for action
Legislative framework
Policy framework
Media and formats for digitization and description
Software for implementation of HRs
Searches and retrieval
Interoperability
Assessment

Managing the repositories of the aforementioned special collections requires a framework for action that includes the task setting and workflow to be carried out by these tools that are so useful in heritage management. The design and management of an HR require such a framework to be established at the outset. Heritage repositories can be part of institutional repositories or can themselves be digital libraries for documents that are static and/or dynamic and that have other characteristics relating to type of access and dissemination. The tasks at hand, the workflow and task assignment, together with the regulations and rules, will be included in the HR guide or procedures manual.

It is vital to be familiar with the national legislation and international regulations of the national and international programmes that promote and safeguard access to documentary heritage. International cooperation plays a decisive role in the development of this type of collection, since it helps to protect and disseminate documentary heritage by considering the document a medium for information in its broadest sense. This contributes to the United Nations Sustainable Development Goals (SDGs), specifically, target 7 of SDG 4 (inclusive and quality education in support of cultural diversity) and target 10 of SDG 16 (ensuring public access to information) (United Nations, 2015). Cooperation makes it possible to save resources, for example, with regard to digitization or technological investment associations.

The professional standards for managing an HR include: UNESCO recommendations such as the Charter on the Preservation of Digital Heritage (UNESCO, 2003); standards of the International Organization for Standardization (ISO), essentially those related to Technical Committee 46 and the committees which work with it (ISO/TC 46 standards); and local regulations. From an IT perspective, a repository is a digital service through which a collection of data is kept in an organized manner and that allows storage on its own servers, maintenance of storage space in the cloud or delegation to external servers (Internet hosting service). All the possibilities can be combined, thereby enabling the development of long-term preservation policies.

It is crucial to specify and establish the various media and formats for the digitization and description of the special materials, their differences and the implications for HR management policies. The collections within the repository will be defined by the technological medium (which must be homogeneous) and the type of content. The same applies to the metadata schemes. These define each of the collections that make up the repository and they may increase in number.

Different software packages are available for HR implementation. As a result, it is vital to establish their structure, tasks to be performed and the best practices for management. This will improve analysis and understanding, thereby assisting with the key decision of selecting HR software.

In terms of searches and retrieval, HR effectiveness will largely be measured by its usability (which can be determined through the Internet Protocol (IP)): the number of users, the documents viewed, the documents downloaded and so forth. There are many application programme interfaces (APIs) that measure these aspects, process the data (data analytics tools) and present the information collected in data visualization models (data vis). They are available in the marketplace, as well as in open code. Because searches and relevance in retrieval are fundamental HR tools, it is vital to establish mechanisms to assess them and feed into their development. The new metrics are very effective for discovering and assessing Heritage Repositories. The use of altmetrics and their application to these collections is analysed by Osuna Alarcón (2017).

Interoperability is also a requirement for establishing and managing an HR. Repositories must be retrievable by harvesters. These are servers external to the repositories that allow the user to search, find and access information and material through a single interface in a standardized way. The harvester does not contain original documents, just their metadata. Harvesters are important because they facilitate searches in all the documents of various

repositories as a whole, thereby enabling retrieval, access and analysis of information - as well as providing other services. The protocol that enables harvesters to retrieve data from the repositories is promoted by the Open Archives Initiative Protocol for Metadata Harvesting (OAI-PMH). There are two groups of actors in the OAI-PMH context: data providers and service providers. Data providers (open archives, repositories) manage metadata and may offer free access to the complete text or another type of resource. OAI-PMH offers data providers a solution that is easy to implement. Service providers use the data providers' OAI interfaces to harvest and store their metadata. The services offered are based on the data harvested through OAI-PMH. Service providers can select some of the data providers' subsets (for example, by set hierarchy or by date). Service providers offer (value-added) services based on the metadata harvested and can enrich the metadata for that purpose.

The HR may need to be redesigned and updated as a result of assessment. This requires the implementation of assessment indicators. All the aspects of repository functioning can be assessed, but criteria must be selected on the basis of importance. Basic ones include retrieval, standardization and interoperability. Measurement indicators of return on investment (ROI) are also relevant: HR document citations, links that promote the HR, theses, educational documents and resources of different typologies based on HR documents can be used as a basis for ROI assessment indicators.

According to Semple's definition (2006), Heritage Repositories constitute digital archives and a type of digital library:

'Digital Repositories offer a convenient infrastructure through which to store, manage, re-use and curate digital materials. They are used by a variety of communities, may carry out many different functions, and can take many forms. The meaning of the term "digital repository" is widely debated. Contemporary understanding has broadened from an initial focus on software systems to a wider and overall commitment to the stewardship of digital materials; this requires not just software and hardware, but also policies, processes, services, and people, as well as content and metadata. Repositories must be sustainable, trusted, well-supported and well-managed in order to function properly. Digital Repositories are also commonly referred to as "institutional repositories" or "digital archives"'.

A Heritage Repository is a type of digital library where heritage documents are stored for preservation and dissemination. According to the model for its management, the HR is understood as a documentary information system (DIS) whose elements are integrated to achieve a common objective related to heritage conservation.

Professionals in the field of Heritage Repositories

Professionals in this field who receive a request for HR access are obliged to respond. The position of data librarian has emerged as a result. In this role, new skills combine with the familiar skills of special collection librarians. The skills of the data librarian are here to stay and are increasingly required in job descriptions for new HR librarians.

While preservation has been fundamental to the creation of heritage repositories, it is not the only relevant concept. What is also key is accessibility to heritage documents and what these services mean for citizens. Many libraries see them as reinforcing the idea that libraries are, above all, a service. New university programmes will have to take into account the new skills these services require.

In repositories in general, copyright management is one of the most complex skills to master and manage. A comprehensive overview of copyright, intellectual property and the corresponding laws requires specific knowledge from those responsible for managing HRs. It is essential to master the legal precedents on the use and protection of works on the Internet and to learn practical ways to protect the intellectual property of digitized works. New licences and options are constantly becoming available and need to be studied to select the best methods for disseminating HR documents.

Repositories are leading some to reflect on the role of libraries in today's world. Repository services are at the heart of open access to knowledge, as they make it possible to access heritage collections that, although covered by rights management, are not subject to the same copyright rules that govern the dissemination of academic papers and scientific literature. In that regard, in 2020 the National Library of Spain launched a programme to manage and open up copyright in the public domain. In Spain, works are protected by copyright for up to 70 years after the death of the author.

'Each year, especially interesting authors are selected for digitization and their works are made available in the Hispanic Digital Library, the portal for access to digitized library holdings. The Escritores en la BNE (Writers at the Hispanic Digital Library) portal also provides short biographies of authors who are not necessarily current or famous, with links to the catalogue and other websites, so as to publicize them and help citizens rediscover their work. This is an open and collaborative list, so anyone interested can help with its preparation' (Spain, National Library, 2020).

Data librarian training: Competencies
Documentary preservation
Digital rights management, licensing and copyright, public domain
Description using Extensible Markup Language (XML) metadata
Semantic web technology and ontology for the configuration of search and retrieval languages
Management of digitization projects
Updating training on new forms of dissemination
Interoperability management, OAI-PMH
Assessment using ROI and altmetrics
Data visualization models (data vis).

HRs also serve to establish a participatory framework where new initiatives and contributions can create more user-friendly spaces for cultural services. Digitization using open licences is recommended. The aim should be to extend the concept of "free cultural works" (FreedomDefined.org).

'The intellectual property that is a literary, artistic or scientific work belongs to the author by the mere fact of its creation. It is not necessary to register the work for it to be protected by copyright. The author enjoys personal (or moral) rights that cannot be waived and are inalienable, as well as exploitation (or economic) rights. Moral rights include the decision to publish or not to publish a work and the way to do so or to ensure the recognition of authorship and the respect of the integrity of the work. Economic rights include the exclusive right to publish the work, to its reproduction, to its distribution, to its public dissemination and to its transformation. However, the Spanish Intellectual Property Act allows the author to transfer the exploitation rights to a third party, therein known as the 'holder of the rights'. The author's economic rights last for the author's entire life plus 70 years after his or her death' (Valverde Berrocoso, 2013).

Open Data Commons was created to provide legal solutions for the management of open data. In March 2008, it launched the first open data licence: the Public Domain Dedication and License (PDDL). Open Data Commons is a project of the Open Knowledge Foundation administered by its advisory board and, like the foundation, is a non-profit organization working for the benefit of the open knowledge community: 'Open means anyone can freely access, use, modify, and share for any purpose (subject, at most, to requirements that preserve provenance and openness)' (Open Data Commons, 2008).

The Rights Statements consortium can also help in this regard, as it currently provides 12 different rights statements that can be used by cultural heritage institutions to communicate to the public the copyright and reuse status of digital objects (RightsStatements.org). The rights statements have been specifically developed for the needs of individuals and search engines, and are available as linked data. Each rights statement is located

at a unique Uniform Resource Identifier (URI). The rights statements have been specifically developed for the needs of cultural heritage institutions and online cultural heritage aggregation platforms, and are not intended for use by individuals seeking to license their own creations. For that purpose, it is more appropriate to use licences such as those of the Creative Commons.

Rights and licences for databases are often significantly different from those for content, both because of the existence of additional intellectual property (IP) rights (such as database rights) and because normal copyright applies differently and less significantly to databases than to content.

An open digitization policy is recommended for HRs. This involves a commitment to providing users with the best possible access to digitized (or digital) heritage collections and supporting their use. To this end, the spirit of open access encourages the publication of digitized versions of holdings in collections that are no longer subject to copyright and can be used without restriction. Such items include works in the public domain that have been digitized without known copyright restrictions and are therefore designated with the Public Domain Mark.

In the interests of good HR management practices, users of the digitized content may be asked to include full source references. Also, whenever digitized content is used on websites, it is good practice to ask users to forward the link via email to the HR, as well as to send a copy of the (appropriately cited) publications that contain documents stored in the HR.

If copyright restrictions for digitized works in the public domain cannot be ruled out, such works are published under the Creative Commons CC0 1.0 licence. As a result, the library waives all copyright and derived rights associated with these digitized works and makes them available to the public without restriction. Metadata related to digitized works (bibliographic data, structural data and so forth) are published under the Creative Commons CC0 1.0 licence.

Licences developed by the Creative Commons and recommended for use by Heritage Repositories
Creative Commons Zero (CC0): This is a public domain option based on the idea that a person can waive all copyright and related rights that the person has in a work. This licence is used, for example, by Europeana.
Attribution (by): Any use of the work, including for commercial purposes, is permitted, as is the creation of derived works, the distribution of which is also permitted without any restrictions.
Attribution-Share Alike (by-sa): Commercial use of the work and possible derived work is allowed, the distribution of which must be done through a licence equal to that which regulates the original work.

Source: Creative Commons licence types.

The International Organization for Standardization (ISO) (through Subcommittee 9, Working Group 18) is developing a standard for the identification of digital content. It will soon be possible to include this standard along with existing publication codes that help preserve copyright and document identification:

ISCC - International Standard Content Code, under development

ISBN - International Standard Book Number

ISSN - International Standard Serial Number

ISRC - International Standard Recording Code

ISAN - International Standard Audiovisual Number

DOI - Digital object identifier (including Entertainment Identifier Registry (EIDR), CrossRef DOI)

ISWC - International Standard Musical Work Code

ISCI - International Standard Collection Identifier

ISNI - International Standard Name Identifier.

Furthermore, focusing on certain special collections ensures that the public is better represented by making it possible to collect and make accessible a wide variety of collections and thus cover culturally diverse environments. Aspects such as grant application, improved HR design, choice of technical support, preparation of support materials, selection of different document formats and the creation of user contact spaces (such as service blogs and social networks) will depend on the management of the HR and the team.

Regulatory environment of Heritage Repositories

The European Commission Recommendation of 27 October 2011 on the digitisation and online accessibility of cultural material and digital preservation (2011/711/EU) calls on Member States to:

> *'Further develop their planning and monitoring of the digitisation of books, journals, newspapers, photographs, museum objects, archival documents, sound and audiovisual material, monuments and archaeological sites (hereinafter 'cultural material')" and to contribute to the further development of "Europeana, Europe's digital library, archive and museum'".*

This recommendation continues on from the European Commission Recommendation of 24 August 2006 on the digitisation and online accessibility of cultural material and digital preservation (2006/585/EC). Paragraph 8 of Recommendation 2011/711/EU, moreover, encourages Member States to 'reinforce national strategies for the long-term preservation of digital material' (Recommendation 2011/711/EU).

As we can see in Recommendation 2011/711/EU, these different document types are called 'cultural material'. This unifying definition of the different documentary formats, which range from museum documents to archival documents and bibliographic documents, brings us to our next point, which was addressed by Leresche (2008):

> *'Libraries and archives have long existed as two separate universes living side by side, with no genuine dialogue or cooperation. This compartmentalization is tending to break down today and areas of commonality are being recognized among institutions and the professions. In this regard, Canada is leading the way, having transformed its National Library and its National Archives into one and the same institution in 2004 – Library and Archives Canada'.*

Libraries and museums generally catalogue or describe holdings in terms of items. For example, there is a one-to-one relationship between a book and a machine-readable cataloguing (MARC) record or between a painting and its catalogue record. Conversely, several items of a set in a collection of archive records may have a single catalogue record. This shows the importance of the location of research and the source of the collection, which provide the necessary context for interpretation. One solution to this problem comes from the Ohio Memory Digital Collection (https://ohiomemory.org/digital/), a collaborative project that aims to connect the history of the state of Ohio in the United States of America with the digitization of the most representative works in the state's libraries, museums and archives. This Heritage Repository thus brings together digitized documents of a bibliographic, archival and museographic nature. The online interface must reconcile the differences in descriptions that can occur in professional practice. To solve this problem, the practices at libraries and the traditions at museums, where most items are described individually, have been brought closer together. This is a decision that deviates from standard archival practice. Because users navigate through large collections page by page, there are links that group together collections or files. As there is a field with a hyperlink for the name of the collection, the connections between related elements are preserved, and so are the intellectual relationships. On retrieving the name of an item, the entire collection indexed under the file name is shown (Nelson and Gemmill, 2005).

Heritage Repositories can provide access to different types of documentary collections. Antonella Fresa calls these 'memory institutions':

> *'Memory institutions (museums, archives and libraries, archaeological sites, audiovisual repositories) are digitizing their content, both for preserving it in a digital format and for granting and enlarging the access to them by researchers, students and citizens' (Fresa, 2013, p. 30).*

The author calls the services that are performing the transformation and providing a digital medium for documentary heritage the digital cultural heritage (DCH) sector (Fresa, 2013).

In Spanish we refer to the "sector del patrimonio digital cultural", or digital cultural heritage sector, which is closely related to the digital humanities. There is a growing number of Heritage Repository projects that consider the complementarity of different heritage institutions and combine the collections of libraries, archives and museums.

> *'These initiatives, which enable digitized forms of documents to be accessed directly, are still dependent nonetheless on online descriptions of these documents. The interoperability of descriptions, and more particularly the harmonization of access points, are proving today to be major challenges' (Leresche, 2008).*

These collections include all kinds of documents, photographs, letters, works of art, journals, oral histories, films, advertisements, musical recordings and many other kinds of material. This model of collection management can be seen on Calisphere (https://calisphere.org/), where documents have been digitized and added by the 10 campuses of the University of California and several important libraries, archives and museums throughout the state. Calisphere uses many technologies to collect and present digital collections. The public interface uses:

- Django templates to create pages,
- Sass for the cascading style sheets (CSS),
- Backbone.js to maintain and manage queries,
- Jquery-pjax to manage the Uniform Resource Locator (URL) history as parts of the pages are updated.

Article metadata in Calisphere are obtained from a variety of platforms using code adapted from the Digital Public Library of America. The data is indexed in Solr. Collection and institution data are kept in a register based on Django. Some of the items listed in Calisphere are hosted in a customized Nuxeo digital asset management system. The platform's entire code is publicly available on GitHub.

Access to image-based resources is fundamental to research and the transmission of cultural knowledge. Digital images are the form of delivery for much of the information in web-based images, books, newspapers, manuscripts, maps, scrolls, loose-leaf collections and archival materials. However, much of the image-based resources on the Internet are locked up in data silos, with restricted access to locally built custom applications.

A growing community of research libraries and image repositories is involved in producing an interoperable technology and community framework aimed at image delivery. The International Image Interoperability Framework (IIIF) was created to facilitate the interoperability of images on the Internet. The IIIF is driven by a research community, national and state libraries, museums, businesses and image banks committed to providing access to high-quality image resources. They promote equal access to image-based resources hosted on any server in the world. They seek to define a set of common application programming interfaces that support interoperability between image repositories, and also promote and document shared technologies such as image servers that allow the display, comparison, manipulation and annotation of images. It is important to implement this technology in HRs (IIIF Consortium).

The Dublin Core (DC) Metadata Initiative is one of the most widely used digital bibliographic description initiatives that is increasingly implemented by the LAM community at large. For curators of digital collections, there are two main advantages to using Dublin Core as a tool for presenting their digital collections to users, especially in terms of metadata creation. First, it is easy to customize elements of the metadata according to local practices. Collection curators can use any element that best describes the items in the collection without being tied to any standard metadata. Secondly, metadata are readily available to aggregators. For example, metadata harvesting can be easily enabled through OAI-PMH and can also be disseminated in two other ways: through the Digital Collection Gateway of the Online Computer Library Center (OCLC) (which allows the export of metadata to WorldCat) and the Z39.50 information retrieval protocol for transferring metadata. The contents of the fields must be unambiguous.

For this purpose, the services of Open Access Infrastructure for Research in Europe (OpenAIRE) are effective.

OpenAIRE (Open Access Infrastructure for Research in Europe)

OpenAIRE-Field	Metadata Element
1 Identifier (M)	datacite:identifier
2. Author (M)	datacite:creator
3. Contact Person (O)	datacite:contributor
4. Contact Group (O)	datacite:contributor
5. Name (M)	datacite:title
6. Repository (R)	datacite:publisher
7. Software Type (M)	datacite:resourceType
8. Subject (R)	datacite:subject
9. Release date (R)	datacite:date
10. Description language (O)	datacite:language
11. Alternate identifier (O)	datacite:alternateIdentifier
12. Landing page (R)	datacite:alternateIdentifier
13. Distribution location (R)	datacite:alternateIdentifier
14. Documentation (R)	datacite:relatedIdentifier
15. RelatedIdentifier (O)	datacite:relatedIdentifier
16. Programming Language (R)	datacite:format
17. Version Number (R)	datacite:version
18. Access Rights (M)	datacite:rights
19. Licence Condition (R)	datacite:rights
20. Description (R)	datacite:description
21. Tool (R)	datacite:description
22. Funding Reference (R)	datacite:fundingReference
23. Distribution form (O)	datacite:description

Source: OpenAIRE Guidelines for Software Repository Managers.

According to Leresche (2008, p. 1),

> *'With the arrival of the Web, the various heritage institutions are increasingly aware of their areas of commonality and the need for interoperability between their catalogues. This is particularly true for archives and libraries, which have developed standards for meeting their specific needs regarding document description, but which are now seeking to establish a dialogue for defining a coherent set of standards to which professionals in both communities can refer. After discussing the characteristics of the collections held respectively in archives and libraries, this presentation will draw a portrait of the standards established by the two professional communities in the following areas:*

- Description of documents
- Access points in descriptions and authority records
- Description of functions
- Identification of conservation institutions and collections'.

Technical framework behind the Heritage Repository

Interoperability is the capacity that all repositories (and Heritage Repositories in particular) must have, since they were created for the preservation and digital dissemination of heritage documents. Their interoperability must enable them to cooperate with national repositories such as Hispana, so that their collections are also visible, for example, in Europeana. Spain's National Interoperability Scheme refers to the minimum mandatory metadata scheme that must accompany any electronic document and to the technical standard for developing metadata that must be linked with any electronic document (Spanish Royal Decree 4/2010 of 8 January Regulating the National Interoperability Scheme in the Field of Digital Administration).

> *'Interoperability is the ability of information systems and the procedures which they support to share data and to facilitate the exchange of information and knowledge among themselves. It Is necessary for: cooperation, development, integration and delivery of joint services on the part of public administrations; for the execution of the various public policies; for different principles and rights; for technology transfer and reuse of applications for the benefit of a better efficiency; and for cooperation between different applications that enable new services. All of the foregoing facilitates the development of digital administration and the information society' (Spain, Royal Decree 4/2010, 19).*

The choice of software will depend on different factors such as library budgets and the possibility of having the storage medium integrated into HR management equipment.

Open source software DSpace (http://dspace.org/), developed by the Massachusetts Institute of Technology (MIT) and Hewlett Packard, is widely used for this type of heritage collection.

Other examples of software, such as EPrints (http://www.eprints.org/uk/) and Fedora (www.fedora.info/), are more suitable for research repositories. We must not lose sight of the fact that the software must be well suited to the characteristics and diversity of the formats and media of the documents that will be stored in the heritage repositories.

Greenstone (http://www.greenstone.org/) has the ability to take over where Computerized Documentation System/Integrated Set of Information Systems (CDS/ISIS) left off with regard to the management of digital libraries. Greenstone has proven to be an excellent choice in terms of flexibility and functionality, and only needs limited maintenance staff because of its easy management.

The software chosen will allow the implementation of the Open Archives Initiative Protocol for Metadata Harvesting (OAI-PMH).

The choice of software is a key issue in creating and managing repositories of digital objects. There are different models of technology, depending on origin and form of acquisition:

- Free or open-source software
- Commercial, or proprietary, closed-source software.

In any case, they must meet the following requirements:

- Support different file formats, scalability, extensibility and system maintenance
- Acceptance of metadata; descriptive, conservation and administrative standards
- Interoperability, as there must be compliance with the main protocols for the exchange of information records (OAI-PMH, Z39.50, Simple Web-service Offering Repository Deposit (SWORD))
- Permanent tracking of documents, by incorporating persistent digital object identifiers such as DOI
- Applications for the search and display of metadata
- Full text search interface
- User authentication and authorization
- Support for software customization via APIs.

Some examples of the best-known software for institutional repositories are:

- Free/open-source software:
  - Greenstone, free and multilingual open-source software, licensed under the GNU General Public License
  - DSpace, free open source software developed by MIT and Hewlett Packard Labs
  - EPrints, open source software developed by the University of Southampton
  - OMEKA, a project of the Roy Rosenzweig Center and George Mason University, with funding provided by several organizations.
- Proprietary software:
  - Assembla, a global provider of Enterprise Cloud Version Control
  - Digital Commons by Bepress, commercial software, payment of licences and subscription fees
  - CONTENTdm, commercial software, developed by the Online Computer Library Center (OCLC).

Medium-sized and large repositories should be built on database systems such as Oracle, Microsoft SQL (Structured Query Language) or MySQL to ensure long-term growth and flexibility. When managing large amounts of data, the requirement is the same: description using standard formats, such as XML (Extensible Markup Language).

Spain uses the Europeana Semantic Elements (ESE) metadata scheme and other guidelines required to enable harvesting by Europeana through Hispana. The same applies to the implementation of the Europeana Data Model (EDM). The underlying concepts of EDM designs are based on the fundamental principles and good practices of the semantic web and linked data. The model is built on established standards such as Resource Description Framework (RDF), Open Archives Initiative Object Reuse and Exchange (OAI-ORE), Simple

Knowledge Organization System (SKOS) and Dublin Core. It acts as a high-level common ontology that allows interoperability while maintaining the original data models and their information perspectives.

A report on the applications of information technology (IT) is necessary before implementing the technological aspects of a repository. The possible solutions will range from having IT staff, if the local option is selected, to free open-source software. The staff should be part of the wider team and will be responsible for the project's IT implementation. If the services are outsourced, there must also be IT staff support. There are two main options: the implementation of free open-source software with a focal point within the wider team, and the use of proprietary software with a permanent contact as well.

The IT study of technological implementation must include these fundamental aspects:

- Assessment of the technical and economic differences between the existing IT environment and alternative solutions
- Operational costs, training expenses, migration, server upgrades and maintenance
- Business key performance indicators (KPIs) and service commitments, service-level agreement (SLA), security, flexibility and storage and retrieval capacity
- Workload consolidation, server utilization and performance efficiencies
- Return on investment and payback.

KPIs are known as quality indicators and are very common in online marketing. The ultimate goal of a KPI is to help make the best decisions regarding the current state of a process, project or strategy, and thus to help define future action. SLAs are a must when IT services are contracted or developed.

Since the 1990s, UNESCO has been promoting software for document management as a fundamental element in development and education. The success and experience amassed by the CDS/ISIS software for library management can now serve as a starting point for Greenstone. The goal is to establish heritage repositories to help achieve the objectives of documentary heritage preservation where it is needed.

> *'UNESCO and Software: In the digital age, software is essential for knowledge management and sharing. UNESCO has therefore accumulated significant experience in facilitating the development of some key software tools for processing information. These software tools are distributed free-of-charge and the objective is to empower the users by giving them access to some key technology for development and knowledge sharing, that most of them otherwise could not afford. The development model is based upon international cooperation and the software tools are continuously enriched, modified and updated with the co-operation of a community of experts from different countries. The most popular UNESCO software tools are CDS/ISIS, Greenstone and IDAMS' (UNESCO, 2004).*

UNESCO, through its Memory of the World (MoW) Programme, can again take up the leadership role it had with regard to the CDS/ISIS proposals. Through Greenstone, it can provide technological support for the recommendations regarding the management of Heritage Repositories. Greenstone is a tool for building and managing digital library collections. Because of its versatility, it can work on both Windows and different "flavours" of UNIX (Uniplexed Information and Computing System). It also provides the means for easy searches. In addition, it allows the creation of navigable interfaces via the Web to digital library collections. One of its features is to facilitate the saving of collections to CDs. This way, HR collections can be distributed to people with limited Internet access. Greenstone can create collections from "standard" files or in Hypertext Markup

Language (HTML), e-mail messages, Portable Document Format (PDF) documents, images in the following formats: Joint Photographic Experts Group (JPEG) and Graphics Interchange Format (GIF), Word documents and plain text files. The look of Greenstone can be customized through a template language similar to HTML3. Greenstone, in short, is a set of software programmes designed to build and distribute digital collections, providing a way to organize and publish information via the Internet or in the form of CD-ROMs.

> *'Greenstone was created by the New Zealand Digital Library Project of the University of Waikato and has been developed and distributed in collaboration with UNESCO and the Human Info NGO, based in Antwerp, Belgium. It is open software available in several languages and distributed under the terms of the GNU General Public License' (UNESCO, 2010).*

Ian Witten has been the driving force behind Greenstone through the New Zealand Digital Library Project, which was established as a research programme at the University of Waikato. Witten and his team can assist in the establishment and development of Heritage Repository software with Greenstone support.

> *'We believe that digital libraries are a key aspect of civil society. Their importance grows with every passing day. People are beginning to recognize the dangers of relying on one or two giant universal search engines for access to our society's treasure-house of information - which constitutes our entire literary, scientific, and cultural heritage. What the world needs, we believe, are focused collections of information, created and curated by people with an intellectual stake in their contents. We mean digital libraries, built by librarians! We are proud and very pleased that the Greenstone Digital Library Software is playing a part in this international endeavor' (Witten, Bainbridge and Nichols, 2010, p. 587).*

The principles and strategies set out by Clobridge (2010) are intended for university library repositories that serve the needs of users. Since they are guiding principles that need to be taken into account when contemplating a repository programme in general, they can be useful at design stage of an HR.

In the following table, we have listed the guiding principles that can help us to shape a manual of HR good practices.

Guiding principles for the design of Heritage Repositories	
1.	The Heritage Repository (HR) must help to achieve the objective of the institution it serves. Its principles must be set out in a foundational document, which is the basis for the repository. This document, a guide to or manual for the system, must be kept open and be updated continuously.
2.	The HR must be open to change. This means that it must be prepared for technological changes and have qualified personnel to that end.
3.	The HR must be simple. The simplest project works best.
4.	Technology must always be at the service of the HR.
5.	The HR must adapt to the majority of the documents comprising the collection, and not to the exceptions.
6.	The HR must plan by setting macro-objectives and micro-objectives, and do so in that order. The micro must be at the service of the macro, and not the reverse.
7.	Identify the HR's potential users and work also for that target audience. Establish measures for use of the repository and for analysis and visualization of the data generated by the HR (data vis), as well as operating according to interoperability principles.

Model proposed

The repository must have a mission statement that includes a commitment to the preservation, long-term conservation and management of and access to digital heritage information, which is set out in the system guide or manual.

A strategic preservation plan is required. It must define the approach that the repository will adopt in the long-term support of its mission. The repository must have an appropriate succession plan, contingency plans and/or valid storage agreements in the event that the repository should cease to function or that the governing or financial institution should substantially change its scope.

The repository should also have an aggregation and digitization policy that specifies the type of information it will conserve and administer and to which it will provide access.

The following are the fundamental aspects of an HR:

- Organizational and personnel structure
- Policy on responsibility and preservation of digital objects and procedures
- Regulatory reference framework
- Financial sustainability
- Sustainability of contracts and licences, rights management
- Planning and management of digital objects.

Drawing on the above and previous work to define the bibliographic information system (BIS) (Osuna Alarcón, 2000), the documentary information system (DIS) is put forward as a model for a Heritage Repository. The model is based on the systemic design of information systems where each element of the model serves the objectives of the system to which it belongs. This system is one of many elements in a larger system whose objectives it helps to achieve. For this reason, interoperability and regulations are essential requirements for a DIS. The Heritage Repository, according to the model proposed, is intended as a documentary information system whose elements are integrated to achieve a common objective. Cooperation is the aim of this model and various other relevant projects under way. The goal is to help develop the guidelines established by relevant regulatory frameworks, such as the UNESCO Memory of the World Programme.

Heritage Repository model
1. Objective, definition of the framework for action, regulations, guide
2. Financing, definition of budgetary policies
3. Management, establishment of work team, tasks and flow chart of the HR
4. Collections, establishment of programme for digitization, metadata, harvesting, rights
5. Users, actual and potential, communication design
6. Assessment, temporality, ROI indicators, altmetrics, data vis, feedback and redesign, DIS.

Source: Osuna Alarcón, 2000.

Conclusions

Our proposal is based on defining and analysing a type of digital repository that has not been given much attention to date, namely the Heritage Repository. This is despite the fact that Heritage Repositories are a very versatile technological tool for the preservation and dissemination of special heritage collections.

Based on its main characteristics, this document presents a proposal for the design and implementation of a Heritage Repository model suited to small and medium collections. Documentary analysis techniques have been used to produce the theoretical criteria for the formulation and design of the proposal.

The synthesis method was used to structure the methodological bases for the implementation of the Heritage Repository model. In each country, region and geographical area, it is necessary to revise the corresponding regulatory framework. It is also vital to keep abreast of international recommendations regarding preservation, open access, interoperability, copyright and so forth.

As a result, the structure of the repository is based on the main concepts: selection of documentary typology and structure of the contents; workflows; and training of participants.

It is possible to work with open source software such as Greenstone. To that end, UNESCO is encouraged to take on the leadership role it held as a supporter and disseminator of free library software (CDS/ISIS). This is important, given that UNESCO has collaborated with Greenstone and a relaunch can now be undertaken with that aim for the establishment of heritage repositories. Greenstone is a very appropriate choice of software because of its advantages in terms of configuration, accessibility, retrieval, portability and so forth.

The use of metadata schemes, such as the Dublin Core Metadata Initiative, is essential for the application of interoperability. Although it is possible to use other metadata schemes to include different types of documentary collections in the repository, it is vital to establish the use of metadata models that are compatible with tools such as OAI-PMH for visualization and retrieval by harvesters.

It is important to establish strategies for cooperation and outreach that link repositories to open access and that promote their use nationally and internationally.

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Rosana Lanzelotte[10]

Music as memory of the world: Digitizing scores for greater access to musical heritage

Introduction

Music is one of the most potent expressions of cultural heritage, bypassing language barriers and connecting different cultures. There are several forms of music representation, such as symbolic notation or recorded audio. Symbolic notation was the first method of capturing music and is meant to be decoded by musicians. Western music notation developed through the Middle Ages and reached its current form by the fourteenth century.

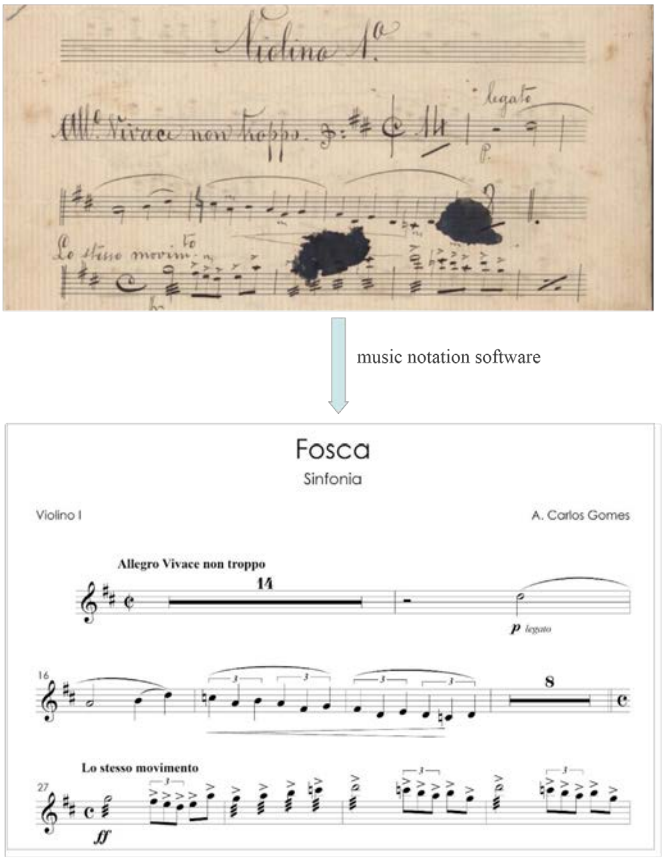
Several musical score collections are part of the Memory of the World (MoW) register. They include ones by great composers such as Franz Schubert (1797 — 1828), Frédéric Chopin (1810 – 1849), Johannes Brahms (1833 – 1897), Leoš Janáček (1854 —1928) and Arnold Schoenberg (1874 – 1951) (MoW, 2020). The vast majority of the musical documents registered as MoW are autograph manuscripts.

Democratizing access to the world's documentary heritage is one of the goals of the MoW Programme. As musical scores are only comprehensible to performers, universal access is only possible if the music is played. Because musicians favour playing from edited scores rather than manuscripts, preserving and making available the original documents is not enough. Modern editions must ideally be provided, with separate parts for each instrument.

One of the most outstanding Brazilian composers is Carlos Gomes (1836 – 1896), whose documents are registered in the international MoW listing (UNESCO, 2017). Figure 1 shows two different versions of a fragment of the first violin part of his opera, *Fosca*. It is straightforward to grasp the reason why manuscripts do not fit the musicians' needs. Carlos Gomes is the only non-European who succeeded as an international opera composer, and his works have premiered at the Alla Scala Theatre in Milan to huge applause. One of his masterpieces, the opera *Il Guarany*, has been performed and recorded by Placido Domingo (https://youtu.be/axCyYA6v7bQ). Nevertheless, piano reductions of the opera are out of print and unavailable online, which makes it difficult for the work to be rehearsed and staged.

10 Director, Musica Brasilis

Figure 1. Music Notation Software



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Large-scale music publishing began in the mid-fifteenth century, with the development of mechanical techniques for printing music. The earliest example is a set of liturgical chants dating from 1465, shortly after the Gutenberg Bible. Sheet music printing is now declining as a result of reduced demand, while digital editions are replacing printed music. Moreover, musicians are increasingly using tablets in their performances, which is a major motivation for creating digital versions of musical scores. Furthermore, the vast majority of contemporary composers are producing born-digital works.

Online availability is a modern way to bridge the gap between performers and musical scores. Sheet music websites, such as the International Music Score Library Project (IMSLP, 2020), are increasingly used by musicians worldwide. The website provides access to 513,519 works by 18,768 composers, among which only 224 are Brazilian. Since its creation in 2009, the Musica Brasilis portal (2020) has assembled 1,548 scores by 270 Brazilian composers across ages and genres and is accessed by more than 30,000 users per month worldwide.

Digitizing documentary heritage is aligned with United Nations Sustainable Development Goal 11.4, aiming at protecting and safeguarding the world's cultural and natural heritage (SDG, 2020). Digitization must comply with the best practices proposed in the scope of the LAM community (Libraries, Archives and Museums). One example of the attention paid by UNESCO (2003) to the preservation and accessibility of digital heritage has been the second Inter-regional Conference for the Memory of the World (2019). Meanwhile, the Organization has issued a Recommendation concerning the preservation and access to documentary heritage, including in digital form (UNESCO, 2016).

The remainder of this section covers the challenges involved in making digital documentary heritage available, focusing on Internet best practices. Although the examples refer to music, the issues are also relevant to other types of documentary heritage.

Libraries, Archives and Museums go digital

Heritage institutions must embrace digitization as a way of making their resources fully available. Furthermore, a significant part of the cultural heritage is now born digital, especially music compositions.

The International Federation of Library Associations and Institutions (IFLA) has proposed guidelines for planning the digitization of rare book and manuscript collections, which can be extended to other types of documentary heritage (IFLA, 2014). The steps are outlined below.

1. Selection of originals: this step requires a new role, the digital curator, who is responsible for choosing the documents to be digitized. Copyright issues must be considered as part of this step. As a result of inclusion in the MoW register, the Brazilian National Library has decided to digitize Carlos Gomes' documents in its collection that is in the public domain. The manuscript of the opera *Il Guarany* is now available in the Brazilian National Library's digital collection (http://objdigital.bn.br/acervo_digital/div_musica/mas617632.pdf). As stated previously, in the case of musical scores, making manuscripts available is not sufficient to enable musical performance. The piano reduction of *Il Guarany* edited by Ricordi and currently out of print, for instance, is vital for rehearsing the opera.

2. Workflow for creating the collection: this step includes document preparation, digitization, post-capture image processing and system entry. To improve readability for music performers, the digital musical material should be displayed in a black and white version, as opposed to other kinds of documents.

3. Metadata: this means information that describes, explains, locates or makes it easier to understand, retrieve, use, manage, control or preserve an item or information resource through time (UNESCO/PERSIST, 2016). In addition to existing bibliographic and structural metadata used for cataloguing the original physical documents, new sets of administrative metadata are essential to describe the digital versions, facilitate online access and provide the information needed for long-term preservation. Cross-references must exist between the metadata of the physical document and its digital version to establish provenance. Libraries are recently progressing towards a new metadata model, the Library Reference Model (IFLA/LRM, 2017). The LRM is from the Functional Requirements for Bibliographic Records (FRBR) family of models, which are three entity-relationship models based on a well-established database model (Chen, 1976). The following section provides an example of this model in action.

4. Display: users are looking for open and free access, ease of searching, user-friendly interfaces, tagging functions (for later retrieval), individualized annotation, printing options and the ability to download, reuse and combine works. Terms of use should be explicit, preferably under a Creative Commons license. Permanent access to a digital resource depends on the assignment of a persistent identifier such as a handle or Digital Object Identifier (DOI) that does not change over time.

5. Dissemination, promotion and reuse: the bibliographic descriptions of the digitized items – metadata – must be available, reusable and linked to the originals. One way to increase access and visibility is to make digitized resources available through the use of portals and aggregators such as the World Digital Library (WDL) (https://wdl.org), Europeana (https://www.europeana.eu/) and the Digital Public Library of America (DPLA) (https://dp.la). There are hardly any musical scores in these collections, which

is because the search parameters for music resources are very domain specific. Carlos Gomes' works are not found in WDL or Europeana, whereas DPLA only displays metadata referring to some of his works in United States libraries.

6. Evaluation: it is crucial to measure the diffusion and impact of digitization projects and programmes through the number of portal visits, digital downloads and citations or links.

7. Long-term preservation: digital preservation is a combination of policies, strategies and actions to ensure permanent access to digital heritage content, regardless of the challenges of media failure and technological change. The goal of digital preservation is the accurate rendering of authenticated content over time (UNESCO, 2015).

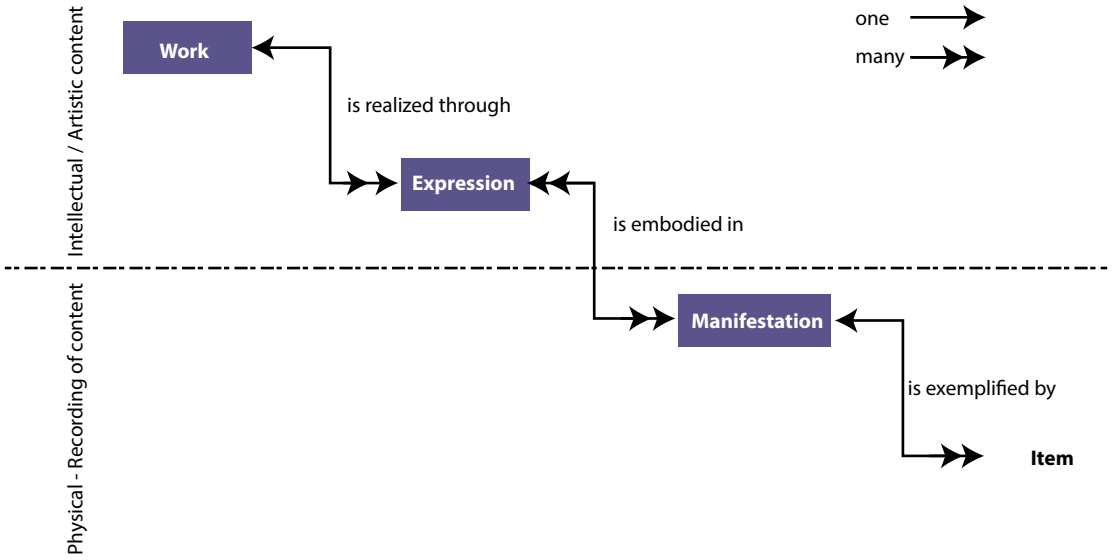
Some of these issues are also relevant in other contexts, especially in terms of metadata, Linked Data and the principles of Findability, Accessibility, Interoperability and Reuse of digital resources (FAIR).

Musical scores as documents

A musical score is a particular kind of document. Scores are written by one or more authors and described by a title, a composition date and other attributes of intellectual production. They are also categorized by music-specific information such as instrumentation, key and genre. Describing a musical score is therefore a more extensive task than describing any other kind of document. Given the specialized knowledge required, music libraries are a dedicated subsector focusing on the standards and practices needed to classify and describe musical works and documents.

The international library community is currently adopting LRM-based standards (IFLA/LRM, 2017). This change is motivated by a viewpoint that prioritizes users' interests (search, identify, acquire and explore) over library operations. Compared to previous cataloguing practices to describe a document, the main change proposed by LRM is to separate the conceptual description of intellectual work from its physical implementations. Figure 2 shows the four aspects of intellectual work, its representations and materializations: Work, Expression, Manifestation and Item (WEMI).

Figure 2. Four aspects of intellectual work, its representations and materializations: Work, Expression, Manifestation and Item (WEMI).



Source: International Federation of Library Associations and Institutions.

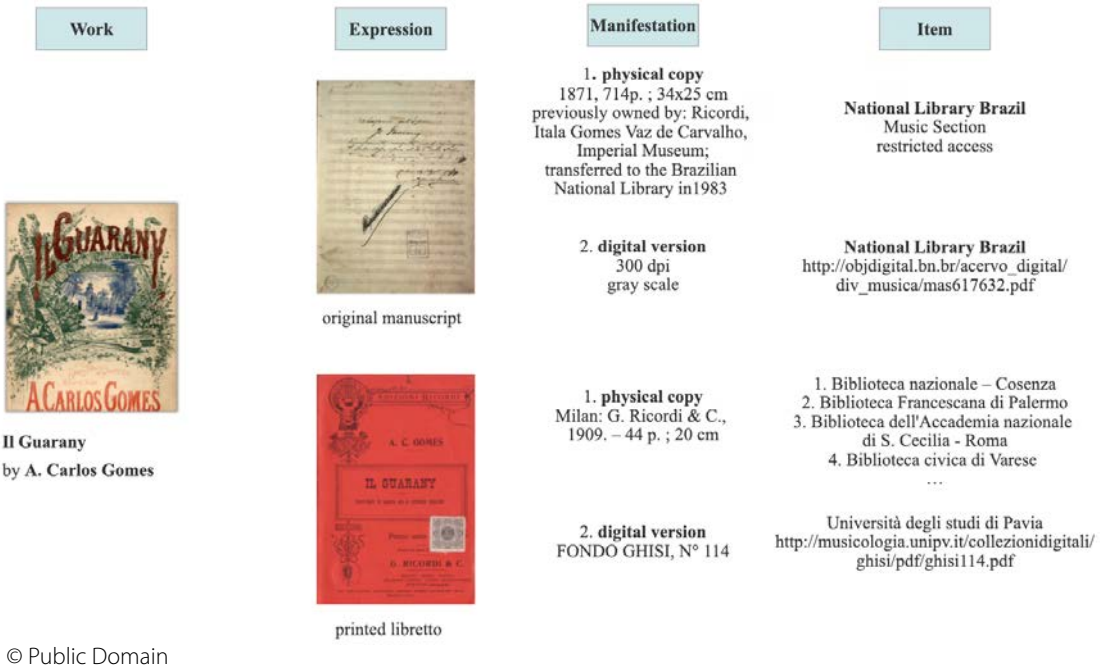
A work is defined as a distinct intellectual or artistic creation. It is an abstract entity (such as *Il Guarany*) and is identified by attributes including title and date. The author or composer, referred to as the Agent in LRM, is not an attribute of the work. Authority information is managed as a relationship between the work and one or more agents.

An expression is a fixed representation of a work. The attributes of an expression include title, form (such as manuscript or edited score), date, language, type of musical score (including staff notation or tablature) and performance medium (musical notation or recorded sound, for instance). If one expression refers to one edition, it also has other attributes such as the edition number, publisher location and so on. For example, the work *Il Guarany* takes the form of several expressions: the original opera by Carlos Gomes, a Ricordi edition, a transcription, a recording, a performance and so forth.

A manifestation is the physical embodiment of a work's expression produced by one or more agents. Manifestation attributes are title, form/extent and dimensions of carrier, date, statement of responsibility, terms of availability, mode of access and so on. If one manifestation corresponds to a specific edition, it is embodied in many identical items in the form of copies. An item is a concrete entity such as a single physical copy of one edited score.

Figure 3 summarizes examples of the application of the WEMI model to the opera *Il Guarany* by Carlos Gomes.

Figure 3. Examples of the application of the WEMI model to the opera Il Guarany by Carlos Gomes.



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The threads for the agents' names, titles and institutions will come under authority files established in the Linked Open Data universe, as discussed in the following section.

One global web of linked resources

The two main objectives of the Memory of the World Programme are to preserve documents and collections and ensure access to them. These two goals were the impetus for the UNESCO/IFLA survey on digitization and preservation, which was carried out in 1998.

Ebdon (1999) referred to 'the urgent need to create a worldwide, comprehensive database of digitized collections is therefore clear'.

This statement was the driving force behind the World Digital Library - an international digital library proposed by UNESCO and the United States Library of Congress (WDL, 2009). Its main goal was to expand the volume and variety of cultural content on the Web by increasing the number of non-English and non-western resources. The library intends to provide online availability for meaningful content from different countries, including manuscripts, maps, rare books, musical scores, recordings, films, prints, photographs, architectural drawings and other significant cultural materials. It presently contains 19,147 items from 193 countries, including just 135 musical scores (with none by a Brazilian composer).

Twenty years after the launch of WDL, the World Wide Web has changed. Instead of centralized initiatives such as WDL, the Internet is becoming interconnected and interoperable through Linked Data practices. Linked Data lies at the heart of what the Semantic Web is all about: large-scale integration and processing of online data by humans and also by computers (W3C, 2015).

Linked Data is a method for publishing and interlinking structured data online. Linked data establishes relationships between resources, thereby exposing new connections that enable information to be contextualized and queried, as well as creating various possibilities for discovery, access and use.

Linked data is evolving into a global web in the form of Linked Open Data (LOD), which is freely accessible, downloadable, usable and reusable. To be considered LOD compliant, an online resource must follow the five-star schema conditions (Berners-Lee, 2015):

✶ Available on the Web, in whatever format, under an open license;

✶✶ Available as machine-readable structured data (such as Portable Document Format (PDF) and not scanned images);

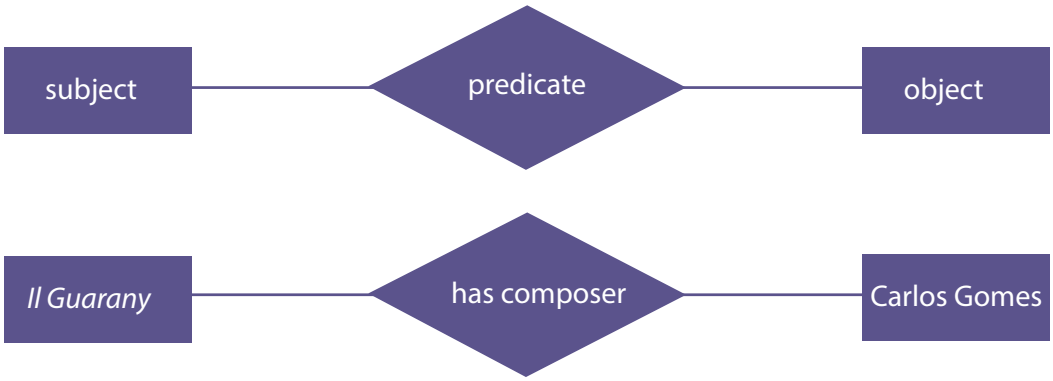
✶✶✶ Available in a non-proprietary format (such as MusicXML (2017), the standard open format for exchanging digital sheet music);

✶✶✶✶ Published using open standards from the World Wide Web Consortium (W3C) (such as Resource Description Framework (RDF));

✶✶✶✶✶ Also connected to other Linked Open Data to provide context.

The three first requirements are straightforward. The fourth LOD condition is related to the semantic web paradigm, in which the meaning of a web page is expressed so that computers can grasp it (W3C, 2015). The W3C Consortium proposes standards to meet this objective, including RDF - Resource Description Framework (W3C, 2004). In RDF, semantics are represented by triples, as shown in Figure 4.

Figure 4.



Data that refer to people, organizations, places, subjects and the relationships among them should all be uniquely named through a Uniform Resource Identifier (URI). URIs not only reliably identify and disambiguate real-world objects and abstract concepts, but also allow us to access information about them online in a human-readable and computer-processable way. For example, the Virtual International Authority File (VIAF) is a portal that aggregates the authority files from libraries and cultural heritage institutions worldwide and provides URIs for name and title values (VIAF, 2020). The URI http://viaf.org/viaf/24816997 is associated with the name *Carlos Gomes*, and is also a web address that provides relevant information about the composer such as dates of birth and death. Thus, in a LOD environment, the triple in Figure 4 would translate the triple shown in Figure 5.

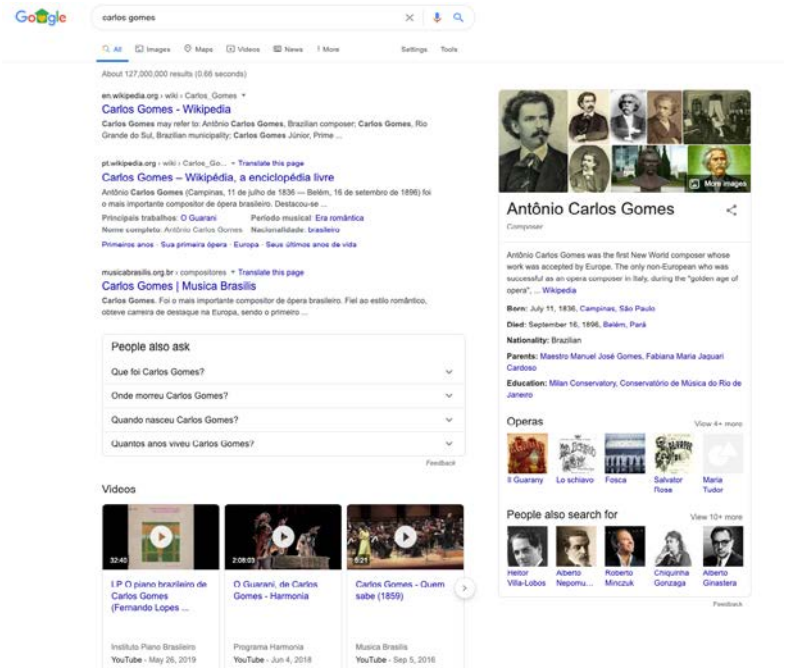
Figure 5.

When published as linked open data, the triple becomes explicit to machines, and the knowledge it embodies is shareable. Relationships are established by reusing and referencing URIs from other data sources (LOD 5th star). Through LOD, the World Wide Web is becoming a rich web of semantically connected information.

When Google and Wikipedia join LOD

Google is adopting linked data to provide users with a broader experience. When searching for Carlos Gomes, Google understands the user is interested in the Brazilian composer and, to the right of the search result, displays a knowledge panel showing the composer's images, a summary of his Wikipedia bio and a list of works (see Figure 6). Google generates knowledge panels by extracting information from various Internet sources such as Wikipedia.

Figure 6.

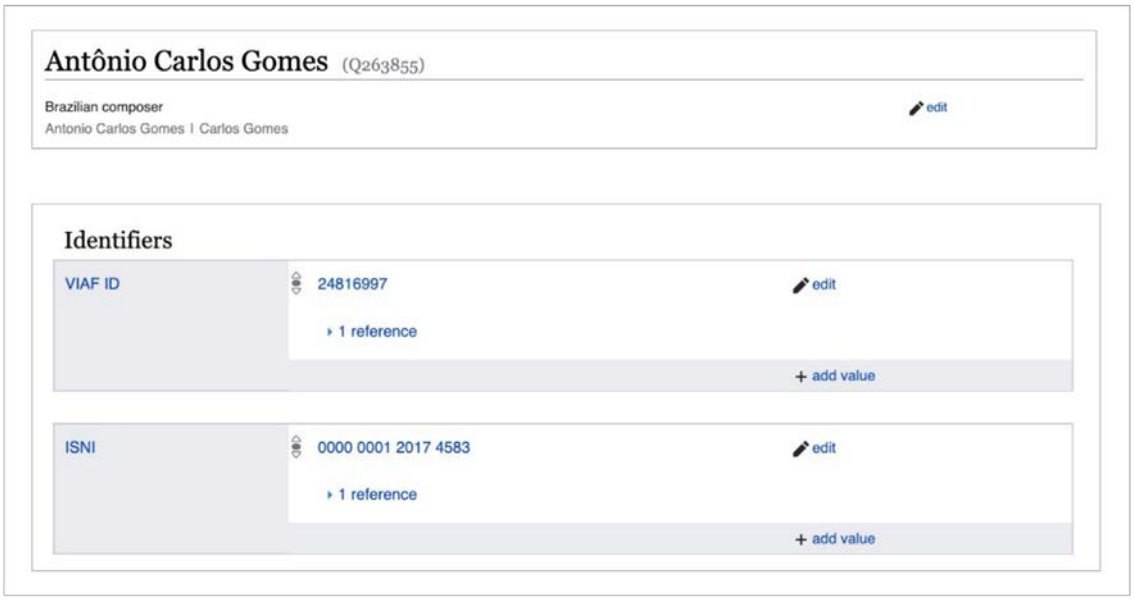


Wikipedia is also progressing to linked open data. For example, at the bottom of a page referring to a person (such as a composer), several identifiers - including a VIAF one - are displayed (see Figure 7).

Figure 7.

Wikidata (2020) is a sister project of Wikipedia that was created in 2012 as a repository of structured and linked data . Wikidata is a collaborative community-driven project that is fully editable by people and machines. Unlike Wikipedia, where a contribution is textual, a contribution to Wikidata is a structured metadata record describing an entity. Figure 8 shows part of the Wikidata entry for composer Carlos Gomes, connecting and depicting some of the Ids relating to him in other sources and pointing to data about him elsewhere.

Figure 8.



There has been a growing interest in Wikidata on the part of libraries and other cultural heritage organizations. Its many potential applications include its use as a hub for institutional identifiers, thus serving as a bridge, in fulfilment of the fifth LOD condition (Allison-Cassin, 2018).

Other than authority data, national libraries are contributing to the LOD web in many ways. Since 2009, for instance, the United States Library of Congress has been publishing its controlled vocabularies as linked data services (https://id.loc.gov). In 2011, the French National Library (BNF) launched its linked data resource, becoming a LOD service. It uses technical standards in compliance with the semantic web and in line with W3C open licensing, which allows free reuse (including commercial use) with attribution to the owner. Each resource within the entire database (http://data.bnf.fr/) is described through RDF triples, which in turn provide linked open data. The Deutsche National Bibliothek (DNB) started publishing authority data as linked open data in 2010, and bibliographic data in 2012. The goal is to publish its library data on the web in a way that makes the semantic relationships available to other institutions.

Improving web availability: FAIR principles

Digital resources must be FAIR: Findable, Accessible, Interoperable and Reusable. FAIR principles relate to and extend LOD 5-star open data requirements by providing guidelines to improve the Findability, Accessibility, Interoperability and Reuse of digital resources. The principles emphasize machine-processing capabilities because humans increasingly rely on computational support to deal with data as a result of the increase in volume, complexity and creation speed of data (GO-FAIR, 2020).

FAIR principles refer to the resource properties as well as to their metadata. To be compliant with the FAIR principles, a digital resource and its describing metadata should meet the following recommendations:

- Findable: the resource and its metadata should be easily findable by both humans and computers, through:
  - Assignment of a globally unique and persistent identifier;
  - Description by rich and machine-readable metadata;
  - Registration or indexing in a searchable catalogue;
- Accessible: once the resource is located, the user needs to know how it can be accessed, possibly including authentication and authorization; this requires the resource to be:
  - Retrievable by its identifier using a standardized open, free, and universally implementable communications protocol;
  - Permanently accessible by sustainable storage (hardware, storage medium), open universal access protocols, version management and backups;

N.B.: As initially proposed, this principle emphasizes the permanent preservation of metadata only. Once extended to cultural heritage, permanent digital preservation of the resource itself is fundamental (Koster, 2018);

- Interoperable:
  - The resource and its metadata are described adopting a formal, accessible, shared and broadly applicable language for knowledge representation;
  - The resource and its metadata are linked with another resource/metadata;

- Reusable: the resource and its metadata should be well described, so that they can be replicated and/or combined in different settings:
  - Digital resources have a license for reuse, which is available in a machine-readable form;
  - The resource and its metadata are associated with detailed provenance;
  - The resource metadata meet domain-relevant community standards.

It is vital to make documentary heritage collections available through web-based end-user interfaces, as well as ensuring interoperability of descriptive metadata. Reuse is an essential requirement to meet some of the United Nations Sustainable Development Goals (SDGs, 2020).

Within SDG 4 on quality education, item 4.4 calls for a substantial increase in the number of young people and adults who have relevant skills, including technical and vocational skills, for employment, decent jobs and entrepreneurship. It has been proved that music training in childhood fosters the development and maintenance of specific executive function skills (Zuk, 2014). By enhancing cognitive skills, classification and analogical abilities, musical training contributes to academic achievement (as proposed by SDG 4).

This section's subject is strongly connected with SDG 11.4, which relates to protecting and safeguarding the world's cultural heritage, as well as with SDG 16.10, which enforces public access to information.

An open-access repository for Brazilian musical scores

The ideas discussed herein will form the basis for extending the Music Brasilis portal by adding additional 5,000 Brazilian digital musical score editions of works by Carlos Gomes and other classical Brazilian composers. The three-year project will be implemented in conjunction with the Brazilian National Archive and UNESCO. Beginning with manuscripts and editions belonging to 11 institutions, specialized teams will be in charge of editing the works, all made available as open-access resources.

The project will provide an opportunity to test new practices in the country. Descriptive metadata will align with LRM by means of specialized ontologies. Significant attention will be given to controlled vocabularies for instruments, genres, musical forms and so forth. Other project requirements are interoperability, as proposed in the scope of the Semantic Web, as well as the use of free software. The digital repository will be modelled using consolidated structural and preservation metadata standards, thereby guaranteeing open access.

Digital preservation will be the responsibility of the Brazilian National Archive. It will play a new role as the guardian of digital collection that has not been generated from its physical collections. By sharing its preservation infrastructure with another memory institution, the National Archive meets one of UNESCO's recommendations to actively encourage consistency of best practices and preservation standards across memory institutions (UNESCO, 2016).

An important goal is to increase international access to Brazilian musical legacy through reuse. Surprisingly, even the music of renowned composers such as Carlos Gomes is absent from most international contexts. Other than IMSLP, a striking example is the RISM (2020) database (the online catalogue of western musical sources). The search for Carlos Gomes works returns to two records (both pointing to manuscripts in Italian libraries), whereas 95 per cent of his almost 200 works belong to Brazilian archives. The adoption of the FAIR principles reinforces reuse, which is one of the primary outcomes of the project (GO-FAIR, 2020).

Reuse will also be boosted by publishing metadata in Wikidata and the digital scores in Wikimedia Commons, as a result of the partnership between Musica Brasilis and Wiki Movement Brazil (WMB, 2021).

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Gabriela Andaur Gómez[11]

Challenges of configuring and preserving digital documentary heritage: reflections on the transfer and preservation of electronic records of public institutions in Chile

Introduction

In 2003, UNESCO published the Charter on the Preservation of the Digital Heritage, which warned of the risk to all digitally generated information that make up our digital documentary heritage (UNESCO, 2003). The risk remains, and the loss of many electronically generated records in recent decades will probably be difficult to reverse.

As stated in Article 1 of the Charter, the concept of digital documentary heritage includes a great number of resources that:

> *'Have lasting value and significance, and therefore constitute a heritage that should be protected and preserved for current and future generations. This ever-growing heritage may exist in any language, in any part of the world, and in any area of human knowledge or expression.'*

Although the term 'heritage' may make us think of ancient records, we must remember that it is a relative notion established in the present. In fact, the records that we generate today may constitute future documentary heritage. This is why those within heritage organizations feel concerned and responsible for current methods of creating and managing the electronic records that will be part of the collective heritage.

Although digital preservation is an issue for all types of institutions and organizations, it is vital to consider how it is addressed in the public sector. The institutions responsible for State administration produce an increasing number of electronic records as a result of the ordinary adoption of new technologies and the implementation of regulatory reforms that eschew paper in favour of electronic or digital environments. These records are an excellent source of information on States' actions and their administrative bodies. Failure to take steps to preserve them therefore has a significant impact on their capacity to conduct and be accountable for their business, and also on the legacy left behind as future evidence of their actions.

This article will examine the electronic transfer of documents from public institutions to the National Archives of Chile. The first part describes the background to the Chilean situation and outlines the main ways in which the problem has been approached. The second part describes some of the challenges in the Chilean case, focusing on those that might also be found in other countries of the region. Finally, the last section provides some reflections on preventing the loss of public institutions' documentary heritage, taking into account the particular characteristics of the region.

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Transfer and preservation of electronic records in Chile

Background

A 2016 report for the Ministry of Finance and the Ministry General Secretariat of the Presidency of Chile described the shortcomings in management of records by Chilean public institutions (Chile, 2016a). This report confirmed what was commonly known in the country's professional document management sphere. In addition, the report provided relevant data on the cost to the State of such lack of management, calculating that "according to the most conservative estimates, the time spent by staff on document processes alone accounted for over USD 1 billion' annually (Chile, 2016b).

As the report made clear, document management problems pose a challenge that can be economically relevant. However, the damage of document management deficiencies in the management of records is not limited to their cost to the State or the problems caused for internal daily management in public institutions. Such shortcomings also result in an incomplete record of the functioning of public institutions. This record has great value for posterity, as it makes it possible to document, study and assess the State's actions and its interactions with other entities and citizens in the medium and long term.

In Chile, the records created and managed by many public administration institutions must, by law, be transferred to the National Archives for safekeeping and preservation and to be made available to the public. There are currently almost 1,920 public institutions that are obliged to transfer their records to the National Archives. These include ministries, offices of intendants, governors' offices, city halls and other types of public bodies (Ministry of Public Education, 1929). Every year, these institutions must transfer a portion of the records they produce, once the corresponding period stipulated in the regulations has elapsed. The length of time ranges from 5 to 80 years, depending on the type of institution that has produced the documents. There are guidelines on how these documents are to be prepared for transfer to the National Archives. The guidelines cover their binding into volumes, which is why all the documents that institutions have sent to the National Archives to date are in paper format. Thus, even if an institution manages its records electronically, it must still print them and follow the same guidelines drawn up for records traditionally created on paper and managed in that medium.

This constitutes a major problem given that, for at least the past two decades, records management at public institutions has increasingly been carried out electronically to some extent. Unfortunately, the country does not have a regulatory framework to establish the minimum conditions and requirements for the proper management of electronic records. Furthermore, there are no regulations governing the way document management is conducted in general beyond the media used, or public institutions' specific responsibilities in relation to the management of their archives. This is probably one of the main reasons for the inadequate management of records described in the above-mentioned report. The combined effect of this and the paper transfer of electronic records to the National Archives is that a register that is already hampered by those management problems is incompletely preserved, in a way that compromises its integrity, authenticity and reliability. Moreover, these circumstances prevent people from seizing the benefits of working with digital records. This denies them the benefits in terms of records' discovery, data analysis and their accessibility and availability beyond the physical limitations imposed by paper.

In the past, there have been initiatives seeking to address this problem. For example, there was an attempt to implement the document management model put forward by the Network for Transparency and Access to Information for use by public institutions (Chilean Transparency Council, 2016). However, such initiatives do not seem to have changed the situation. Moreover, the urgent need to deal with this issue has been heightened by the publication in October 2019 of the Law on Digital Transformation of the State, which stipulates that 'any administrative procedure shall be expressed through the electronic means established by law, save for legal exceptions', and assigns to the National Archives of Chile the responsibility of developing an electronic archive enabling the preservation of said documents (Ministry General Secretariat of the Presidency, 2019). Thus, there is expected to be a significant increase in the currently high volumes of electronic documents being generated. This makes it essential to ensure that such documents are properly created, managed and preserved in accordance with criteria that guarantee authenticity, integrity, reliability and usability over time.

The National Archives Modernization Project

Even before the Law on Digital Transformation was adopted, in 2017 the National Archives of Chile launched its Modernization Project to deal with the problem of the electronic transfer of records. The Project was funded by the Inter-American Development Bank (IDB) and the Ministry of Finance (through its Secretariat of Modernization). The project's aim was to provide the National Archives with a system for receiving electronic records. The project involved implementing a technology platform based on the Open Archival Information System (OAIS) reference framework, and followed archival guidelines for the long-term digital preservation of records transferred.

To achieve this goal, the project has focused on various elements including the technical aspects of transferring, preserving and providing access to documents. To this end, a system has been developed based on three main components. The first is an electronic-transfer platform that allows institutions to transfer records in a controlled and secure manner, either online or by integrating their electronic records management systems with the transfer platform. The second component involves the secure storage of records and taking steps to preserve them over time. This is achieved by integrating digital preservation software (Archivematica). The third and final component is an access platform for accessing the transferred records. Legacy databases have also been integrated to facilitate the gradual consolidation of a single portal to search and retrieve records preserved by the National Archives.

The challenges faced by the project have included ensuring that documents are transferred according to criteria that enable them to be stored with enough contextual information for them to be retrieved, understood and used in the long term. To that end, a series of archival procedures have been developed to apply prior to transfer. The guidelines enable institutions to appraise their records to ensure that the only documents electronically transferred are those deemed to be worthy of permanent preservation. The procedures developed also cover the transfer process itself, to ensure that public institutions are able to perform this activity within controlled parameters and in the most automated way possible.

Given that the definition of requirements does not guarantee their fulfilment, and to ensure that procedures established are implemented by the relevant public institutions, direct collaboration with public institutions has always been a key component alongside the development of technological components and processes. Five public institutions have participated at the pilot stage: the Administrative Unit of Tax and Customs Courts, the Casino Supervisory Authority, the Production Development Corporation (CORFO), the Directorate of Labour and the National Roads Department of the Ministry of Public Works. The institutions have received assistance

on implementing procedures for the processing and electronic transfer of records. This has made it possible to monitor the process and identify the main difficulties encountered now and in the future. This work will also allow the National Archives to improve the technological components, as well as the design of transfer processes and procedures. These steps minimize the number of barriers, so that the entire process can take place in the simplest and most automated way possible - without compromising the quality standards that are so central to this initiative.

By June 2020, the entire technological system for records transfer, preservation and access had been developed, and work was under way on adjusting and improving the components. The first complete and functional version of the system is expected to be released by the end of 2020. In terms of procedures, two preliminary versions were launched. They then underwent internal and public consultation processes, and work is being carried out to launch the final official version of the document transfer procedures for public institutions. Finally, the work to support pilot institutions will soon come to an end. This will take the form of an initial test transfer, subject to compliance with the legal time limits for the official transfer of electronic documents.

However, the initiative does not end with the achievement of its main objective, as there needs to be ongoing efforts towards all the main project aims. First, the technological system will undergo a continuous improvement process, especially while new institutions adopt the electronic transfer process, and also as a result of the technological development of the environment itself.

Second, it will be vital to develop institutional guidelines and policies to define how the electronic records transferred are to be processed, depending on the legal changes taking shape in terms of archival regulations and personal data protection. Personal data protection will also be considered in the development or adjustment of the electronic platform because of any emerging requirements relating to the identification and protection of personal data contained in records.

The work done with the five pilot institutions is only the initial stage of the electronic transfer roll out. It will gradually include other public institutions obliged to transfer their electronic records to the National Archives. Through implementation of the Law on Digital Transformation and its regulations, this will herald the start of the transition towards fully electronic records management and preservation. All these aspects come together to form the mission of the Electronic Archives, which the Law establishes as a component of the National Archives responsible for the preservation of electronic records. The institutionalized nature of this project as part of the National Archives will involve expansion, including the recruitment of new professionals who will ensure the continuity of this endeavour to preserve the electronic documentary heritage of Chile's public administration institutions.

Regional factors

The National Archives Modernization Project and the transfer, preservation and access to records of public institutions have highlighted key elements to the success of such initiatives. There seem to be common factors that are relevant from a regional and even global perspective.

First, the regulatory framework for public document transfer, preservation and access is evolving against a backdrop of rapid technological progress. The regulations that encourage or require the use of electronic records creation (like the Chilean ones) are highly relevant. This makes it necessary to work with other legal bodies in order to ensure that electronic records are legally valid and kept in electronic media throughout their entire life cycle, including their historical phase. Since paper and electronic records will clearly continue to coexist for a

long time, standards that enable the transition from hybrid environments to electronic environments are also significant. Such standards include those relating to the digitalization of records and the equivalence of digital surrogates with their paper originals. There are other relevant standards such as those relating to interoperability, transparency of public information and the protection of personal or sensitive information.

Second, progress is clearly needed in the areas of professionalization and specialization. The lack of training opportunities in the fields of electronic records management and digital preservation hamper the implementation of initiatives with nationwide deployment. It is therefore necessary to step up capacity-building, not only within memory institutions but also within the organizations responsible for creating and managing records during their active phase. This is significant because the adoption of technical procedures and processes for transfer and preservation must be accompanied by an implementation capacity. It is also important because the time frames for records transfer in countries like Chile (up to 80 years) require institutions to preserve the electronic documents generated until the time of transfer. In Chile, this will be addressed by creating virtual training spaces to enable institutions to tackle the main aspects of the transfer process. Given the large number of institutions involved at the national level, this is a question of developing the minimum capacities necessary to provide appropriate coverage (rather than full training programmes).

In the case of memory institutions, continuous updating and training are essential to develop processes that keep pace with the complexities of today's electronic environment and that consider the preservation of records, data and other forms of information that might arise from future technological advances. Capacity-building will also enable us to narrow gaps in relation to other world regions and to reduce dependency in terms of technological innovation and development for records management, preservation and access.

Last but not least, cultural change within organizations is needed to move forward despite the resistance and traditions prevalent in some old and complex institutions. Albeit belatedly, there is a paradigm shift under way in terms of conveying the complexity of the issues at hand to the various stakeholders involved. This also requires finding solutions that move away from the traditional methods of working with paper records, given that technological progress offers new ways of accessing and communicating the information preserved.

This change also implies an acceptance of digital preservation as a compulsory task (especially when dealing with public information) and one that must be understood as a continuous and long-term effort that requires permanent funding. The field is an evolving one by its nature, and also involves various obstacles in the form of regulatory, capacity-related and budgetary restrictions. Nevertheless, it is vital to raise awareness about the necessity of advancing digital preservation initiatives, because their delay only continues to jeopardize the longevity of digital documentary heritage.

Final observations

The term 'documentary heritage' has connotations of ancient records created on paper or older media, in the form of relics that we have managed to conserve despite the passage of time. Although this is logical, in the electronic environment it is essential to change tack and stop thinking of documentary heritage in exclusively retrospective terms. Records generated today within public or private institutions, communities and even in our private lives has the potential to be considered 'heritage' in the future.

It is well known that we cannot expect these 'relics' to withstand the passing of time on their own, for we understand that - in the electronic environment - to wait is to allow them to perish. We must therefore take timely action based on the principle of digital preservation beginning with document creation itself (and even before

that). In Chile, this change has required direct links with the public institutions that will be transferring their electronic records to the National Archives so that they can be preserved and accessed by future generations as sources of evidence and information.

Article 11 of UNESCO's Charter on the Preservation of Digital Heritage warns that the digital divide in various parts of the world increases the risk of heritage loss. This case shows that there are other types of divide that also need to be addressed. This section has pointed out the need for progress in certain areas, such as the development of standards and the formulation of requirements. However, it is also true that the only way to begin closing the aforementioned gaps is by overcoming the paralysis caused by uncertainty and underdevelopment and by starting digital preservation work, even if this can only be done on a modest scale or if only the minimum feasible steps are taken.

Fortunately, we are tackling this challenge collectively as part of a generous community that is constantly growing. This community cooperates, assimilates knowledge and experiences from diverse fields and understands that sharing experiences and lessons is a powerful tool for advancement. UNESCO has also noted the role of such cooperation in the Charter and reinforced it in the subsequent UNESCO and University of British Columbia (UBC) Vancouver Declaration - The Memory of the World in the Digital Age: Digitization and Preservation.

For memory institutions, change is not only a matter of implementing certain technological solutions, but also of rethinking traditional ways of working. It requires adopting a more active and visible role vis-à-vis the institutions generating the electronic records that will be preserved. The aim is to continue to perform the duty of documentary heritage preservation by ensuring the existence of a complete and reliable record of the State's actions and its relationship to people, which can then be passed on to future generations.

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Chapter 4: The 2015 Recommendation: national and regional committees as implementation levers for the preservation and accessibility of documentary heritage

Tomasz Komorowski[12]

Implementing the 2015 Recommendation in Europe, including efforts to create a European MoW Regional Committee

The 2015 UNESCO Recommendation concerning the preservation of, and access to, documentary heritage including in digital form is the only global instrument specifically addressing the issue of documentary heritage.

The Memory of the World Programme plays a prominent role in the Recommendation's provisions in terms of 'Identification of documentary heritage', 'Preservation of documentary heritage', 'Access to documentary heritage', 'Policy measures' and 'National and international cooperation'. The Programme's origins, rationale, role and goals are emphasized in the Recommendation's Preamble.[13]

1. The level of European implementation of the 2015 Recommendation can be properly assessed when the country reports are submitted by UNESCO Member States for analysis.[14] This is particularly relevant as Europe has no regional Memory of the World committee or similar body for regional or subregional cooperation within the Programme.

Pending the reports, the Council of Europe (with its 47 Member States) and the European Union (with 28 Member States as of 2018) have regulations, programme- and cooperation frameworks that to some extent are the regional equivalent of the UNESCO Recommendation's goals and principles in several core areas. This means they are reflected in national legislation, policies and practices, especially regarding access to documentary heritage, its use/reuse and promotion.[15] The framework of UNESCO culture conventions is also a supporting factor. The active participation of European memory institutions in professional non-governmental organizations (NGOs) such as the International Federation of Library Associations and Institutions (IFLA), the International Council on

12 Polish National Commission for UNESCO; Polish Memory of the World national committee

13 'Recognizing also that over time considerable parts of documentary heritage have disappeared due to natural or human disasters or are becoming inaccessible through rapid technological change, and underlining that lack of legislation impedes memory institutions to counter irreversible loss and impoverishment of that heritage, Recalling that, in response to this challenge, UNESCO established the Memory of the World Programme in 1992 to increase awareness and protection of the world's documentary heritage, and to provide for its universal and permanent accessibility'.

14 At the time of the Conference in Panama , the country reports were not available. According to the document 206 EX/25.VI and corr., out of the total of 37 country reports submitted by Member States that year, 21 were submitted from the Europe Region.

15 See the following examples:

1. The Council of Europe:
European Cultural Convention (1954);
European Convention for the Protection of the Audiovisual Heritage (2001);
Council of Europe Framework Convention on the Value of Cultural Heritage for Society (Faro Convention; 2005);

2. The European Union:
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;

Directive 2012/28/EU of the European Parliament and of the Council of 25 October 2012 on certain permitted uses of orphan works;
Council Recommendation of 14 November 2005 on priority actions to increase cooperation in the field of archives in Europe (2005/835/EC);
European Parliament resolution of 8 September 2015 towards an integrated approach to cultural heritage for Europe;
The Europeana Foundation: Europeana Collections (https://www.europeana.eu/portal/en/);
Archives Portal Europe (https://www.archivesportaleurope.net/home; in Polish: https://www.archivesportaleurope.net/).

Archives (ICA) and the Coordinating Council of Audiovisual Archives Associations (CCAAA) is also conducive to the implementation of the Recommendation at the national and regional levels.

By way of example, the Polish State Archives carry out several activities related to the Recommendation such as policy guidelines and investment to improve physical conditions for document preservation (including construction and upgrading of buildings); a new tele-informatics system and IT infrastructure to collect electronic documents; identifying and digitizing audiovisual materials preserved in the State archives as at-risk heritage; advice and financial support for the non-State keepers of documentary heritage including social archives and Church archives; developing online services to provide searchable access by all to digitized documents (around 35 million ~~State~~ documents from State archives available in 2018 through "Szukaj w Archiwach" [Search in the archives] portal);[16] and cooperation through the Archives Portal Europe.[17]

The MoW Programme-focused developments have been important in promoting documentary heritage and the Programme, such as publishing of the Polish National MoW Register at ceremonies organized under auspices of the President of Poland that generated ~~huge~~ media interest and were accompanied by open days in the Presidential Palaces in Warsaw and exhibitions in Warsaw and countrywide, especially in places related to inscribed heritage items. The publishing years of the Polish MoW Register issues were 2014, 2016 and 2018.[18]

2. The MoW Programme is an important part of the Recommendation, and obviously is not much focused itself in European Union and Council of Europe frameworks. It might therefore be even more relevant to pay attention to cooperation for the Programme within Europe. In terms of the notion of creating a European MoW Committee, this chapter is intended to contribute to a wider inter-regional reflection on cooperation modalities and capabilities within the MoW framework and in the context of an ongoing review of the Programme.

The idea of a regional European committee and register or subregional mechanisms for cooperation within the Memory of the World Programme in Europe has been circulating for several years. For instance, the 2003 Baltic Sea consultations at margins of the Sixth Meeting of the International Advisory Committee (IAC) in Gdańsk, Poland, focused on the *Mare Balticum* as a cultural and historical space with the potential for Baltic cooperation within the Programme.[19] The idea of a broader, regional cooperation framework was mooted back then. Eleven years later, in 2014, meetings in Germany (Frankfurt am Main) and Poland (Warsaw) brought together representatives of European MoW national committees and National Commissions for UNESCO to discuss and plan for a European committee and register. Finally, it was not decided to formally create a committee (and register), as there were doubts about whether such a body (and register) would be sustainable or representative enough for regional cooperation. Subsequently, the idea of a European body and register was discussed at annual meetings of an informal European Network of National Commissions for UNESCO[20] in Bonn, Germany (2015); Krakow, Poland (2016); and Thessaloniki, Greece (2017).

16 Available at https://www.szukajwarchiwach.gov.pl/en/strona_glowna and the search tool at https://szukajwarchiwach.pl/.
17 Information conveyed on 21 October 2018 by Dr Wojciech Woźniak, General Director of State Archives, President of Polish MoW Committee. After the Meeting in Panama, the Polish country report was delivered to UNESCO. It confirms and expands on the above, as well as providing more information on digitization and the activities of libraries in Poland.
18 More information is available at https://pamiecpolski.archiwa.gov.pl/en/the-memory-of-poland-the-idea-behind-the-project / (the Head Office of State Archives website) and, in Polish, at https://www.unesco.pl/komunikacja-i-informacja/pamiec-swiata/ (website of the Polish National Commission for UNESCO).
19 Cf. 32 C/REP 17 Add., para. 7 (p.1).
20 Established in 2015 as a forum for cooperation gathering national commissions from Member States of the European Union (EU) and European Free Trade Area (EFTA), as well as European microstates using the euro.

Given the ongoing review of the MoW Programme under way since 2015 (including new IAC Statutes and pending General Guidelines for the Programme), it does not seem like the right time to make decisions on a new regional body or register. However, these may not be the only reasons, as there are many substantial issues that require further discussion and resolution. Arguments for and against a European committee and register are relevant beyond the region, as they speak to the strengths and challenges of regional and inter-regional cooperation within the Programme and its role in implementing the 2015 Recommendation. What follows is a summary of the pros and cons that emerged from the discussions.[21]

1. The arguments in favour of establishing a European committee and register can be grouped into three categories:

    a. General advantages for the MoW Programme: while encouraging Europe's participation, an active European committee would promote inter-regional cooperation within the MoW Programme. That seems to be particularly important for the Programme's role in implementing the 2015 Recommendation – especially as a platform for professional dialogue and cooperation and a forum for debate and communication among different professionals representing different memory institutions (libraries, archives and museums). While these professions may be separated on other fora, issues such as disaster risk reduction or promotion of documentary heritage seem to call for this kind of broad cooperation and dialogue;

    b. Advantages for the MoW and documentary heritage preservation, accessibility and promotion in European countries:

    - A regional committee would be useful to promote cooperation on joint nominations to the MoW International Register, joint projects to highlight important heritage within different countries and interdisciplinary cooperation on documentary heritage. It might also be possible to include heritage of European significance (between local and international relevance) on a MoW register that goes beyond the national level. The same might apply to the subregional level;
    - An active regional committee could become a forum for debate and advocacy on documentary heritage issues within governments and European bodies;

    c. Advantages for Europe as a common cultural and historical space, as a community and a cultural, historical, social and political concept:

    - A European register may inspire reflections on European identity/identities by raising awareness of the links between different European cultures, thereby increasing understanding of 'the other(s)' (their experiences, memories, history and culture) and valuing diversity.

      As well as generating more joint nominations to the international Register, a European regional register could raise awareness of a diverse yet common European identity and a spirit of community within the region. Ongoing reflections and understanding of European identity/identities are key to the process of European integration. Cooperation on European documentary heritage can help Europeans progress, reinvent themselves or be reminded of the rich tapestry that binds European societies in a shared integrated space of values, debates, dialogue and memory. Cooperation in these areas could benefit from an active European committee as the foundation for a European register.

21 Largely based on the author's presentation on *European cooperation within the Memory of the World Programme: on some of its possible forms and its significance*, delivered at the Annual Informal Meeting of the European Network of National Commissions for UNESCO, Thessaloniki, Greece, 2 - 5 April 2017.

- One interesting topic is how the Memory of the World Programme and registers relate to relevant European initiatives on documentary heritage and relevant cooperation. Perhaps it would be possible to improve synergies between MoW and its registers in Europe with initiatives such as Europeana, the Archives Portal Europe or the European Heritage Label (EHL) (a European Union register for heritage of different kinds[22]). Would a European MoW committee ensure synergy with European projects? What could be its added value? When considering the establishment of a Memory of the World European body and register, these are the questions that must be considered.

  As well as the well-known Europeana and the Archives Portal, this section has also mentioned the European Heritage Label. Would there be an overlap or a synergy between a European MoW register and the EHL?

  There are clear differences between the EHL and the MoW registers, because the latter concentrates exclusively on documentary heritage. However, UNESCO's global reach can raise the profile of national and regional registers beyond their place of origin.

  This points to the great opportunity and potential to make all the registers known worldwide and to include all of that documentary heritage inscribed in the global circulation of knowledge. This perspective is enshrined in the General Guidelines, the 2015 Recommendation and the name of the Programme itself. These inputs would contribute to the 'memory of the world', which is much more than a slogan in the age of global, digital communication where an evolving global memory includes 'new' memories from diverse individuals, peoples, communities and cultures.[23]

  Documentary heritage that meets the EHL criteria could be inscribed on the MoW European register in the interests of wider dissemination within and outside Europe. Some objects inscribed on the MoW European register (and other MoW registers) could be included in the EHL as well, and that could strengthen their preservation, accessibility and management plans. Although this practice of listing the same object in both the MoW and the EHL already happens, there is further scope to expand and promote the resulting benefits. A European MoW committee could also be helpful in this respect.

2. There are a few reservations or arguments against a European committee.

   a. Against a European committee: the main concerns were that it could become another heavy, bureaucratic and inefficient structure that could impede the communication with the MoW secretariat and IAC by introducing a kind of hierarchy or an intermediary body between them and national MoW committees or National Commissions for UNESCO. This is a concern despite what the 2002 General Guidelines say about the regional committees being cooperation bodies in which national committees are not forced to participate and not being regarded as a hierarchical level between the national and international bodies of the Programme.[24]

22 Currently 25 Member States of the EU participate in the initiative. See the EHL website for detailed information and further links: https://ec.europa.eu/programmes/creative-europe/actions/heritage-label_en

23 Tomasz Komorowski, *Safeguarding documentary heritage – the Polish Memory of the World*: presentation delivered on 21 August 2017 in Wrocław, Poland, during the UNESCO Open Session at the eighty-third World Library and Information Congress (WLIC) of the International Federation of Library Associations and Institutions (IFLA) (https://www.ifla.org/node/11698), pp.2-3 (paper).

24 See 2002 General Guidelines, para. 5.8.4.

b. Against a European register: a separate European register could be seen as unnecessary and possibly overlapping with national registers. There were also concerns that a regional register could be used as a reason to reject nominations fulfilling the criteria for the international Register (despite what the 2002 General Guidelines say about it being possible for the same object to be placed on national, regional and international registers in parallel).25

c. In terms of a European register and committee: a question was raised about mechanisms and resources to ensure they were both efficient and sustainable. The latter is especially important in the case of a register, as it must be a long-term, 'perennial' list of renown among professionals and the wider public. Those requirements demand procedures and practices that are professional and high quality (in terms of receiving and assessing nominations, consulting external experts and holding meetings without undue constraints).

The above shows that there remains a need for debate and a discussion of practical issues before a regional committee and a register can be established. In the meantime, there are other forms of MoW cooperation in the region. These include joint nominations to the international Memory of the World Register (with about 40 joint nominations on the Register including nominators from Europe) and cooperation over other documentary heritage shared or of common interest for different countries/societies.

One new experience was the online consultation on the Implementation Guidelines (IGs) for the 2015 Recommendation. This was carried out in 2018 within the European Network of National Commissions for UNESCO, as there had been no consultation meeting on implementation in Europe to date. Some nine National Commissions and MoW committees took part, thereby showing a heightened interest in the instrument itself.

The consultation covered the structure, definitions and target groups of the IGs, as well as more general observations on the Programme and preservation issues.

One general observation from the consultation was the need to raise awareness about the legal status of UNESCO standard-setting instruments such as recommendations to Member States or international declarations. Even experts do not always distinguish between standard-setting texts and other recommendations or declarations such as those adopted by conferences and the like. As a result, people do not always fully realize that there are legal instruments that can be referred to for national policy-making processes.

Forms of ad hoc MoW cooperation are extremely important, particularly when there is no regional committee in an area. However, an active body of this kind would encourage greater continuity, stability and efficiency of efforts, as well as systematically monitoring the situation. This would also mean an identifiable focus for inter-regional MoW cooperation in Europe.

3. As shown above, some of the concerns surrounding a European MoW committee and register point to a number of structural, practical and overarching issues that can be usefully examined in general and as part of the Programme's review.

It seems key to avoid a sense of competition, as that would run contrary to the Programme's tradition and to its General Guidelines. The aim should be to maintain the Programme's synergetic and horizontal democratic structure that facilitates communication and cooperation by creating a spirit of community.

25 See 2002 General Guidelines, para. 4.1.2.

In terms of regional committees, the focus would be:

- Maintaining voluntary participation of national committees in the regional ones (most would probably participate in an active and consensual regional structure);
- Not regarding regional committees as an intermediary structure between the national committees and IAC or the MoW secretariat.

Regarding the regional registers, the goal would be:

- As in the 2002 General Guidelines, para. 4.1.2 (and less explicitly in the draft General Guidelines elaborated in 2017, para. 5.10.3), to make it clear that the same document or collection can appear in national, regional and international registers in parallel. The inscription of a documentary heritage item on a register of one kind should not prevent its inscription on other registers if the criteria are also fulfilled. The three kinds of registers should not be considered as a hierarchy in terms of declarations but also because they express different aspects rather than 'levels' of significance (or 'influence' to use a term from the 2002 General Guidelines): the country-wide/national, the regional and the international. A documentary heritage object can be inscribed on a MoW register because of its particular national significance/influence – and in such a case it is inscribed on a national register (or on different national registers). The same object can be inscribed because of its particular international significance/influence – in this case it is included on the international Register. The same object can be inscribed on a register because of its especially regional significance/influence for a given continent or cultural circle – in such a case it is included on a relevant regional register (or registers).

  This kind of flexibility and inclusiveness can be important for encouraging the creation of new national/regional (and even subregional) registers. It can also have the potential for promoting documentary heritage and raising awareness of its complex significance and impact, thereby emphasizing its value for different cultures, societies and communities. This can in turn help to build awareness and a sense of community - thereby furthering intercultural dialogue and understanding. The Memory of the World Programme has an important potential as an asset to UNESCO in its mission to construct the defences of peace in people's minds;
- Subregional cooperation is also relevant here: is the present framework sufficient and clear enough to facilitate subregional cooperation, subregional committees and registers? Is there a need to stipulate that the rules on regional cooperation and registers apply, mutatis mutandis, to subregional levels?

Papa Momar Diop[26]

Implementing the 2015 Recommendation in Africa

Introduction

The part of Africa covered in this section is situated south of the Sahara, and corresponds to UNESCO's electoral Group V(a). The northern part of the continent (the Maghreb and some Horn of Africa countries) falls within Group V(b) - the Arab States. Group V(a) consists of 44 of the 195 Member States and is the largest electoral group in terms of size.

Proportionately speaking, this group has also had the least involvement in the Memory of the World Programme. The challenges to implement UNESCO's 2015 Recommendation *concerning the Preservation of, and Access to, Documentary Heritage including in Digital Form* are particularly acute on the African continent. In this respect, an African consultation was organized by UNESCO in Abuja, Nigeria, from 25 to 27 June 2018.

This section is divided into three subsections: the Memory of the World Programme in Africa before the adoption of the 2015 Recommendation; the status of the Memory of the World (MoW) Programme after 2015; and the outputs of the Abuja consultation and the prospects for improved African implementation of the 2015 Recommendation.

1. The Memory of the World (MoW) Programme in Africa before 2015

The parameters for assessing the adoption of the MoW Programme are the number of MoW committees and the number of properties listed on MoW registers, including the International Register.

1.1 MoW national committees

The 67 MoW national committees created before 2015 were distributed among the UNESCO electoral groups as follows:

10 in Group I[27]
13 in Group II[28]
18 in Group III[29]
13 in Group IV[30]
9 in Group V(a)[31]
4 in Group V(b).[32]

26 Vice-President, the Africa regional committee of the Memory of the World Programme (ARCMOW)
27 North America and Western Europe.
28 Eastern Europe.
29 Latin America and the Caribbean.
30 Asia and the Pacific.
31 Sub-Saharan Africa.
32 Arab States, including the Maghreb countries and some States in the Horn of Africa.

Given the ratio of group size/number of national committees, we note that the African continent's network of national committees is very small.

The nine African MoW national committees have been established in South Africa, the Central African Republic, the Democratic Republic of the Congo, the United Republic of Tanzania, Malawi, Cameroon, Mali, Nigeria and Senegal.

Despite their small number, most of them are not as active as one might hope.

1.2 Africa Regional Committee of the Memory of the World Programme (ARCMOW)

In terms of regional committees, the Africa Group is one of the three groups to have created such a committee. The Africa Regional Committee of the Memory of the World Programme (ARCMOW) came into being after the Memory of the World Committee for Asia and the Pacific (MOWCAP) and the Memory of the World Regional Committee for Latin America and the Caribbean (MOWLAC). ARCMOW was established on the sidelines of the eighth session of the International Advisory Committee of the Memory of the World Programme held in Pretoria, South Africa, from 11 to 15 June 2007, and inaugurated with the Tshwane Declaration.

It was recommended that the Africa Regional Committee of the Memory of the World Programme (ARCMOW) be established, if possible, before December 2007.

South Africa, host country of the Tshwane Declaration, offered to host, organize and take full charge of ARCMOW's constitutive meeting. The meeting took place in Pretoria one month after December 2007 on 30 and 31 January 2008, and resulted in the creation of the Africa Regional Committee of the Memory of the World Programme (ARCMOW).

In essence, the Tshwane Declaration sets out the following objectives of ARCMOW:

- To raise awareness of the MoW Programme and of Africa's documentary heritage in the Africa region;
- To encourage the establishment of MoW national committees throughout Africa;
- To support and complement the work of the MoW national committees of Member States;
- To promote, facilitate and monitor the MoW Programme in the Africa region;
- To represent the Africa region at the international level;
- To create and manage a regional MoW register and determine the criteria for selection and registration;
- To support submissions from Africa to the MoW International Register, both State-specific items and documentary heritage that may belong or be common to a group of African States;
- To support elements submitted by one or more Member States for nomination for prizes such as the UNESCO/Jikji Memory of the World Prize funded by South Korea;
- To encourage increased representation of Africa's documentary heritage in the MoW International Register.

Pending the expansion of ARCMOW's membership, a provisional bureau (still in force) was formed as follows:

President: Ms Mandy Gilder, South Africa

Vice-Presidents: Mr John M'reira, Kenya

Mr Simao Jaime, Mozambique

Mr Papa Momar Diop, Senegal.

Secretary General: Ms Ellen Ndeshi, Namibia.

ARCMOW has not kept pace with the other two regional committees. It has organized one important event: the meeting in Windhoek, Namibia, from 18 to 20 November 2008, which brought together the members of the ARCMOW Bureau.

During this meeting in Windhoek, the Committee's Charter, an action plan, the Statutes of the Bureau, the Rules of Procedure and a strategy for adding items to an African regional register and the International Register were all adopted.

It should be noted that, unlike MOWCAP and MOWLAC, ARCMOW has not yet established its regional register.

1.3 African documentary heritage included in the International Register

Of the 296 items of documentary heritage added before 2015 to the International Register, Africa had only 15 items inscribed, distributed as follows:

South Africa	5 items in 1997, 2003, 2007 and 2013
Angola	1 item in 2011
Benin	1 item in 1997
Ethiopia	1 item in 1997
Ghana	1 item in 2011
Madagascar	1 item in 2009
Mauritius	1 item in 1997
Namibia	1 item in 2005
Senegal	1 item in 1997
United Republic of Tanzania	2 items in 1997 and 2003

The figures again speak for themselves, showing the low level of International Register entries despite the continent's rich documentary heritage. This confirms the low level of adoption of the MoW Programme.

2. The status of the MoW Programme after 2015

After 2015, the situation of the Memory of the World Programme in Africa improved modestly, and the implementation of the Recommendation concerning the Preservation of, and Access to, Documentary Heritage, including in Digital Form is still in the early stages.

2.1 MoW national committees

Since the adoption of the Recommendation, only two MoW committees have been added to the nine established before 2015. These are the national committees of Côte d'Ivoire and Gabon.

To date, the Africa Group, Group V(a) (which is the largest in size among UNESCO's electoral groups) has just 11 MoW national committees.

2.2 Africa Regional Committee of the Memory of the World Programme (ARCMOW)

There is not much to report in terms of the Africa Regional Committee of the Memory of the World Programme (ARCMOW), as the situation has hardly changed since 2008.

The Africa Regional Committee of the Memory of the World Programme (ARCMOW) is one of three regional Memory of the World committees. Compared to the other two committees, ARCMOW has admittedly been less active due to organizational and management issues, but above all a lack of financial resources.

2.3 African items included on the International Register

During the 2015 and 2017 sessions of the International Advisory Committee (IAC) of the Memory of the World Programme, Africa submitted just 7 of the 128 items nominated for inclusion on the International Register (48 in 2015 and 80 in 2017). The seven new African items were distributed as follows:

- Senegal: 2 items in 2015;
- Mali: 3 items (including 1 jointly with Nigeria) in 2017;
- Zimbabwe: 2 items in 2015 and 2017.

Today, the International Register has a cumulative total of 424 documentary items, with Africa accounting for just 22 of them (which represents 5.19 per cent of the total). While there has been an increase, it is still relatively small.

3. The Abuja consultation and prospects for improved implementation of the 2015 Recommendation in Africa

UNESCO initiated a series of regional consultations for the implementation of the 2015 Recommendation. Africa held its consultation in Abuja, Nigeria, from 25 to 27 June 2018. In collaboration with the Secretariat of the Memory of the World Programme and with the participation of the African Union, it was an opportunity for Africans to reflect on a strategy for implementing the Recommendation, and also on how to strengthen ARCMOW.

3.1 African strategy for implementing the 2015 Recommendation at the national and regional levels

The work of the focus groups and plenary sessions of the Abuja consultation resulted in the adoption of an action plan for implementing the 2015 Recommendation at the regional and national levels.

The strategy has five main thrusts:

1. Identification of documentary heritage
2. Preservation of documentary heritage
3. Access to documentary heritage
4. Measures for preservation and access to documentary heritage
5. National and international cooperation.

Each of these points was discussed in order to answer the following four questions:

1. What are the main challenges for your country and region in terms of establishing an effective framework for national and international cooperation on safeguarding documentary heritage?
2. What action should different stakeholders take to address those challenges?
3. How can regional cooperation help to address those challenges?
4. What action should be taken at the regional level beyond 2018?

To summarize this strategy, the focus will be on the replies to questions 2 and 4.

For question 2, on stakeholder actions to address challenges, participants agreed to:

- Establish MoW national committees comprising members from memory institutions, civil society, governments, universities and independent experts;
- Hold periodic meetings with the memory institutions;
- Create joint programmes between different agencies;
- Share facilities (including infrastructure such as archival repositories);
- Encourage and fund bilateral or multilateral engagement for access to copies and, in certain cases, their repatriation;
- Encourage institutions to develop and share catalogues;
- Provide incentives, raise awareness and support community archiving;
- Involve private individuals and institutions as members of the MoW national committees;
- Encourage collaboration among institutions within countries and create incentives for sharing documentary heritage;
- Encourage governments to consider drafting legislation and updating relevant regulations in line with international standards on access to public information;

- Advocate for and support the participation of memory institutions and civil society in developing or updating legislation and/or policies;
- Encourage the translation of documentary heritage, descriptions and metadata into other languages;
- Develop a multilingual website;
- Advocate for the definition of documentary heritage as a national asset (good governance, tourism, culture, history and so on);
- Raise awareness through educational and outreach programmes, public events in schools, museums, libraries and so forth.

With regard to question 4 on regional action beyond 2018, participants agreed to:

- Support the establishment of MoW national committees and registers;
- Develop regional training programmes on submitting nominations to the MoW registers; participate in ARCMOW meetings, when possible hosted by relevant national governments;
- Communicate on and publish the different models of MoW national committees in the Africa region, including methods of good practice from other regions (such as MOWCAP);
- Organize regional training on joint nominations, which would clarify the ways to develop such submissions;
- Organize meetings of experts on the identification of documentary heritage suitable for joint nominations;
- Organize a regional conference on cataloguing, possibly in Nairobi in 2019;
- Identify countries in need of financial assistance and countries that can help;
- Identify countries in need of assistance with preservation facilities and countries that can help;
- Share the PERSIST digital preservation guidelines and disseminate the PERSIST and Digital Preservation Coalition's information on digital preservation; support training in digital preservation;
- Support the translation of UNESCO's 2015 Recommendation on documentary heritage into local languages;
- Reaffirm the principles contained in the 2011 Universal Declaration on Archives, recognizing the role of archives in the safeguarding of memory;
- Organize MoW exhibitions on regional documentary heritage;
- Promote regional and national celebrations of the International Day of Universal Access to Information on 28 September each year;
- Promote regional and national celebrations of the World Day for Audiovisual Heritage on 27 October each year;
- Strengthen the role of ARCMOW in coordinating MoW national committees; request UNESCO support for awareness-raising at the regional level in order to encourage national, regional and international collaboration.

The implementation of this action plan is a challenge to be taken up by Africa's governments, institutions in charge of documentary heritage, stakeholders in documentary heritage and civil society, as well as by regional and international non-governmental organizations and UNESCO.

Immediately after the Abuja consultation, Zambia and Cape Verde announced the future establishment of their MoW national committees.

The other major focus of the consultation discussions was the revitalization of ARCMOW.

3.2 Revitalization of ARCMOW

A closer look at ARCMOW's low level of activity revealed that the main causes are the lack of financial resources, the small network of MoW national committees on the continent and the large size of the region. Solutions to these problems must be found to get ARCMOW back on track.

It has been difficult to collect data on the challenges and opportunities of preserving digital heritage. In order to reflect the realities on the ground, we are using the results of a brief survey addressed to all ARCMOW members who participated in the African consultation held in Abuja for on the implementation of the 2015 Recommendation concerning the Preservation of, and Access to, Documentary Heritage including in Digital Form. Owing to the short time frame of the survey, we received only six responses to the following three questions, which we have used for this presentation:

- Does your country or organization have a national strategy for the long-term preservation of digital heritage?
- What training/tools/information would you like to have to support your work or projects in the preservation of digital heritage?
- What are the main challenges you face in the preservation of digital heritage in your country/organization?

The six responses came from the following countries: Benin, Eritrea, Gabon, Mauritius, Nigeria and Seychelles.

3.2.1 National strategies for the long-term preservation of digital heritage

Of the six countries that responded to the questionnaire, two countries have a national strategy for the long-term preservation of digital heritage: Nigeria and Mauritius. Our colleagues in Nigeria are encountering facing problems when implementing these strategies, while our colleagues in Mauritius know where they are heading and are heading in the right direction with the support of the Government there.

They nonetheless face some difficulties relating to the lack of good best practices, funding models and technical expertise. The remaining four countries do not yet have a strategy. By country, the main challenges faced are as follows:

Nigeria:

- Implementation of the existing strategy

Seychelles:

- Lack of good best practices/models
- Lack of funds
- Lack of technical expertise

Eritrea:

- Lack of administrative support

Gabon:

- Lack of good practices/models
- Lack of funds
- Lack of technical expertise
- Lack of administrative support

Benin:

- Lack of administrative support.

Mauritius alone has implemented a national strategy, despite encountering a few difficulties.

3.2.2. Training/tools/information required to support the work of preserving African digital heritage

None of the six countries have schools or tools to train people in the preservation of digital heritage. Gabon, however, has a project to set up an electronic document management (EDM) system called "Gabon Digital 2025".

The countries are therefore requesting:

- Administrative support from governments
- Regional cooperation on digital sustainability
- Best practices/models
- Funding
- Technical expertise
- Sharing of information and solutions
- Definition of content and metadata standards
- Shared tools/, repositories/etc. and so forth.

3.2.3. Main challenges facing the work of preserving Africa's digital heritage

The main challenges are the same as those described in part 1:

- Uncertainty about how to begin
- Funding requirements
- Training requirements
- Need for administrative support
- Lack of support and guidance
- Lack of good best practices/models
- Strategic partnerships at the (inter)national level
- Sharing of information and solutions
- Information on the effectiveness and costs of long-term conservation
- Definition of content and metadata standards
- Regional cooperation on digital sustainability
- Lack of technical expertise.

Based on the questionnaire, Mauritius appears to be the most advanced African country in terms of digital heritage preservation. It is a good example to highlight in the African context, although it still needs support. The country knows where it is heading and its Government provides administrative support to the work of preserving its digital heritage. In the case of external support, Mauritius would be a worthy recipient. This would encourage the country, which could then be promoted as an African example of good practice, and make it a focus for continent-wide training.

On a more general level, in terms of the lack of MoW national committees, a decision was taken to identify countries without committees and encourage national documentary heritage stakeholders to hold constituent general assemblies. If these countries have difficulties, they can be supported by nations that have had successful experiences. They can also model themselves on the flagship MoW national committees of the region and even those of Asia and the Pacific or Latin America and the Caribbean.

In addition to members of memory institutions, there should also be involvement from national professional associations, representatives of civil society, governments, universities, researchers, friends of documentary heritage, independent experts and private institutions. ARCMOW's role in coordinating MoW national committees should be strengthened, and national governments should be encouraged to host MoW regional meetings.

In terms of finances, national documentary heritage managers should lobby their governments about funding within the framework of their annual budgets, which could enable them to make an annual contribution to the financing of ARCMOW. Regional integration organizations (African Union) and sub-regional organizations (Southern Africa, Central Africa, East Africa and West Africa) should be approached about supporting ARCMOW financially. Public-private partnerships and fund-raising are also required.

Pending the establishment of these support mechanisms, and to promote ARCMOW activities, it was agreed to create four sub-regional committees for the sub-regions of Group V(a), made up of economic integration organizations: Southern Africa, Central Africa, East Africa and West Africa.

Conclusion

This section provides an overview of the implementation of the 2015 Recommendation concerning the Preservation of, and Access to, Documentary Heritage Including in Digital Form.

It is hoped that the Ambassadors and Permanent Delegates of African States to UNESCO, the African Members of the Executive Board of the Organization, the African National Commissions for UNESCO, the African institutions in charge of documentary heritage and all stakeholders will be able to convince governments to ensure efficient implementation of the 2015 Recommendation.

In terms of adoption of the Memory of the World Programme, the Abuja action plan clearly states that Africa is learning from the good practices witnessed in Asia and the Pacific, Latin America and the Caribbean and other regions. ARCMOW would welcome cooperation and partnership with MOWLAC and MOWCAP colleagues.

América Santos Riveras[33]

Programme for the Preservation of Documentary Heritage: A Cuban Experience

For the Cuban State, the preservation of documentary heritage is a priority, as it is the basis on which the memory of the Cuban nation and its identity have been preserved: it is our DNA.

In 2006, at the request of the country's leadership, the National Committee for Historical Memory was created to implement a short-, medium- and long-term programme for the conservation and preservation of the nation's documentary heritage through a strategy geared towards mitigating damage to, and ensuring the durability of, the documentary collections that are part of Cuban historical memory. The Committee is made up of representatives from the public administration's institutional archives, documentary heritage institutions, historical archives and public libraries and museums.

The National Committee for Historical Memory is a coordinating body of the National System of Documentary Management and Archives (SNGDYA), chaired by the Minister of Science, Technology and the Environment. It is responsible for promoting the preservation and dissemination of Cuba's documentary heritage through a priority national programme for historical memory. It is worth emphasizing that the President of Cuba regularly checks in on this programme.

In January 2019, Cuba adopted a policy improving SNGDYA through the objectives, activities and tasks provided for in the strategic programme of work for 2017-2021. This has an impact on the Guidelines of the Economic and Social Policy of the Party and the Revolution, Sustainable Development Goal (SDG) 16 and the National Plan for Economic and Social Development until 2030 in the following strategic areas: effective and efficient socialist government and social integration; human potential; science, technology and innovation; and sociocultural matters.

Furthermore, it is in line with the provisions of the Constitution in the following articles:

> '**ARTICLE 53**: All people have the right to request and receive information from the State that is true, objective and timely, and to access the information generated by organs of the State and its entities, according to the established regulations.
>
> **ARTICLE 90**: The exercise of the rights and freedoms provided for in this Constitution implies responsibilities. It is the duty of Cuban citizens, in addition to the other duties established in this Constitution, and the laws include: [...] k. to protect the country's cultural and historical heritage.
>
> **ARTICLE 97**: The State recognizes the right of all people to access their personal information in public registers, archives, or other databases, and to request its non-disclosure or obtain a due correction, rectification, modification, update, or deletion. The use and processing of this data is carried out in accordance with the provisions of the law'.

The National Committee for Historical Memory works in the following areas:

- Encouraging the exchange of experience and accountability for its management;
- Analysing and approving management techniques, planning and raising financial resources to ensure the sustainability of the National System of Archives;

33 Former Vice Minister of the Ministry of Science, Technology and Environment, Cuba

- Generating guidelines that allow entities to achieve higher rates of effectiveness, efficiency and transparency;
- Promoting the integration of all the archives that make up the National System of Archives;
- Coordinating strategies to promote a planned protection of documentary heritage through the management of risk-mitigation actions;
- Validating and organizing the use and implementation of technologies that increase dissemination, access and protection to preserve heritage in all types of medium, through the standardization of technical norms.

In addition, activities to promote the preservation of the nation's documentary heritage include the following:

- Updating and disseminating the manual on disaster risk management, prevention and mitigation for documentary heritage;
- Working on the procedure for developing disaster risk reduction plans;
- Establishing training and professional development activities for staff members of SNGDYA on diploma courses organized by the National Archives of the Republic of Cuba; as well as a Master's Degree in the preservation of documentary heritage offered by the Centre for Conservation, Restoration and Museology at the University of the Arts. Furthermore, a document management technician has been training staff within organizations and entities that use these methods for their archive system;
- Preparing information literacy programmes on document management through media and educational programmes at the appropriate levels and in the training of State and Government decision-makers. Besides this, work is under way to include this theme in various sectors of education and to promote courses, workshops and conferences to improve education in this area;
- Holding events concerning the study and dissemination of the nation's documentary heritage;
- Publication of a manual on archive buildings as a guide for adapting buildings for such purposes, following established requirements.

One key aspect is trafficking in cultural property, which has been prevalent in all regions of the world since the late 1960s and early 1970s. In terms of cultural property, historical documents in the Ibero-American region are currently at risk of looting, theft and illegal export. This affects archives, libraries and museums equally - and can cause irreparable damage to the historical heritage of all peoples.

The profits from the trafficking of heritage documents are estimated at millions of dollars. Beyond the figures, however, what is most worrying is the theft of a people's culture, identity and history - as well as the fact that it deprives society of a physical testimony of its past.

Cuba has joined the UNESCO 1970 Convention on the Means of Prohibiting and Preventing the Illicit Import, Export and Transfer of Ownership of Cultural Property, which promotes preventive measures such as compiling inventories, ensuring export control of cultural property, using criminal or administrative sanctions against citizens who violate the law and developing information campaigns. However, although there has been commendable work to fight this scourge through this instrument, actions are mostly focused on archaeological objects. It is therefore vital to strike a balance between actions relating to documentary heritage and other forms of heritage.

In Cuba, the Ministry of Science, Technology and the Environment has worked with the Ministry of Culture, Ministry of Justice, Ministry of Tourism, General Customs of the Republic and the National Revolutionary Police

to ensure that tourists and visitors are aware of the regulations in force to prohibit removal of historical or institutional heritage documents deposited in archives or entrusted to the custody of an official for their official conservation.

Cuban legislation also contains relevant prohibitions regulated by Decree-Law No. 265/2009 'Of the National System of Archives in the Republic of Cuba', which includes a new chapter on liability for damage to the documentary heritage of the Cuban nation. It states that, in the event of non-compliance with the provisions of the Decree-Law, its regulations and its complementary standards, administrative measures shall be applied, as appropriate, regardless of any other type of civil or criminal liability that might apply. In addition, the Criminal Code defines the crime of 'theft and damage to documents or other objects in official custody and violation of official seals', as well as specific rules for documents considered to be cultural heritage of the nation, where the theft is treated as a criminal offence.

Priority has been given to implementing actions to mitigate damage to documentary and cultural heritage associated with climate change, and this requires research on protecting heritage and the health and safety of archival workers. With this in mind, the results of hazard, vulnerability and risk (HVR) studies carried out in Cuba's provinces and 168 municipalities have been harnessed to reduce disaster risks associated with facilities and documents.

These studies have made it possible to develop various activities, namely: identifying those entities that safeguard documentary heritage and that are located in vulnerable areas according to HVR studies and proposing short-, medium- and long-term solutions; strengthening the capacities of those in charge of managing heritage, including government officials and communities, in order to implement plans and programmes to address climate change; and developing, disseminating and ensuring the use of standards and tools for the assessment, prevention and mitigation of disaster risks for heritage and early recovery.

The Government has taken into account the conditions of document conservation areas, which tend to have significant levels of dust and humidity, high temperatures and inadequate ventilation and lighting. These factors that lead to high morbidity rates from respiratory, ocular and dermatological diseases are correlated with exposure to different species of fungi.

In the light of the above, the Ministry of Science, Technology and Environment and the health authorities pay special attention to the impact of environmental conditions on the health of people working in archives, libraries and other institutions linked to the preservation of documentary heritage. As a result, a decision was made to develop action protocols based on scientific research to protect the health and safety conditions of personnel responsible for heritage management and safeguarding. To this end, a research project was launched on 'Fungal diversity and distribution in the Cuban archival environment: Its impact on the preservation of heritage and human health'. Other ongoing research includes a project on 'The impact of the archival environment on the health and safety of workers'.

All these actions are part of the healthcare programme relating to the impact of archival environments on the health of workers. This is a national programme implemented by the Ministry of Public Health in which the provincial and municipal centres of hygiene, epidemiology and microbiology work with the National Institute of Workers' Health and the National Institute of Hygiene, Epidemiology and Microbiology. The programme is based on scientific studies carried out by groups of experts alongside other scientific institutions in Cuba. The main focus of this programme is to improve the quality of working life by organizing medical care for workers that guarantees the professional development of activities with optimum well-being and health in a sustainable way.

Medical care for archive workers impacted by work environments is governed by Law No. 116 of 2013 and the Labour Code, in which chapter 1, paragraph A, establishes the right of workers to health and safety at work, through the adoption of measures for the prevention of occupational accidents and diseases.

In conclusion, there is an existing relationship between the programme for the preservation of historical memory and UNESCO's Memory of the World Programme. This has ensured the exchange of experiences among specialists in the safeguarding of the documentary heritage and the work to determine which elements of Cuba's documentary heritage can be included on the national, regional and international registers. This is Cuba's contribution to making the legacy of the past more visible to the global community of today and tomorrow.

Yolia Tortolero-Cervantes[34]

Preservation of and access to documentary heritage in Latin America and the Caribbean

In the context of the current review of the Memory of the World Programme (MoW) and the implementation of the Recommendation concerning the preservation of, and access to, documentary heritage, including in digital form, it is worth reflecting on good practices as implemented by the Latin American and Caribbean Regional Committee (MOWLAC), which has listed a total of 187 inscriptions on the Regional Register between 2002 and 2018.

MOWLAC under the current Recommendation

Today, one of the challenges for MOWLAC is the urgent need to review whether each registered heritage item is accessible and well preserved. The question is whether the MoW Programme, in years to come, will still provide the recognition that encourages preservation of and access to our documentary heritage.

What can happen when all stakeholders (governments, memory institutions and MoW committees) interact to promote this Programme, preserve documentary heritage and make it accessible?

Governments need to invest money, of course. However, they must also make better use of their institutional resources (political networks; public spaces: buildings, laboratories, facilities; the experience and knowledge of their human resources) to promote the Memory of the World Programme in their countries and with other Member States.

In addition, memory institutions (archives, libraries and museums) need stable budgets to ensure long-term commitments to cooperate on the national, regional and international levels.

The fact is that, for governments and memory institutions, MoW is not currently a priority. MoW is undoubtedly a showcase, a precious asset and a privilege. However, governments and memory institutions do not publicize the programme more widely because they are not obliged to. Based on their legal framework, they carry out their own responsibilities and substantive functions. Therefore, when setting priorities, they have no time to promote the Memory of the World.

Furthermore, most experts who serve on MoW committees and usually work in different memory institutions around the globe are volunteers who are not dedicated full time to promoting, delivering workshops, writing articles, posting news or organizing other activities, in addition to their work assessing nominations for national or regional registers.

The question is how to build a sustainable network of experts, institutions and governments that are formally committed to approving and pursuing a legal framework to promote MoW.

34 First Vice President, Latin America and the Caribbean regional committee of the Memory of the World Programme (MOWLAC)

To find answers and enrich the discussion about expectations for implementing the recommendation, the following chart shows some good practices carried out by MOWLAC in recent years:

Good practices in MOWLAC	Positive results	Challenges to implement the recommendation
Joint agreements between MOWLAC members and the UNESCO Secretariat.	Dialogue and communication to achieve results.	The frequency of communication between members and the Secretariat should increase.
Experts perform specific functions. The main one is to assess nominations for the regional register.	Achievement of MOWLAC's annual programme goals.	Experts will need to devote more time to pursue new activities and functions in MoW.
Organize and deliver workshops and training programmes.	MOWLAC has integrated networks of experts in the region.	Strengthening stable networking among national and regional MoW committees and among experts and trainers in the region.
Some MOWLAC members have participated in other international organizations (International Council on Archives, International Federation of Library Associations and institutions and so on).	Reinforcing international and inter-institutional cooperation.	Collaborate more with experts from other organizations and find new ways of cooperation in the light of economic, legal, technical and political obstacles (such as membership fees paid for some of them).
Consolidation of MOWLAC Register.	187 inscriptions registered in 16 years (2002-2018).	More promotion of the programme means more nominations to assess. Consequently, MOWLAC need to adjust its rules and procedures and possibly to increase the number of experts on the Committee.
Implement new projects.	10 years ago, MOWLAC created its own blog and 5 years ago the Committee began producing a book to publish all regional registers inscribed in MoW.	MOWLAC may have to reduce some sustainable projects to devote more time to administrative tasks.

Based on the above chart on Recommendation implementation, it seems that there is smooth coordination and communication between MOWLAC experts and the UNESCO Secretariat in Montevideo. It is less clear which additional activities and roles will need to be carried out by experts (besides the usual tasks of promoting the programme, assessing nominations, publishing results and participating in workshops).

The question is: how will experts solve the lack of time in order to be more active in MOWLAC? One solution may be to select and invite more experts or volunteers to collaborate. Another alternative would be to change the Committee's rules and procedures to specify its capacities, objectives and activities more clearly.

The above chart also mentions organizing workshops and training activities in MOWLAC to disseminate the programme and expand expert networks in the region. However, implementing the recommendation has prompted reflections on how to reinforce stable networks of experts and trainers from Latin America and the Caribbean who could eventually collaborate with other national or regional committees around the world (at least through social networks).

Another good practice is the fact that some MOWLAC experts are/were also active members on their own national MoW committees. Others have been involved in the International Advisory Committee, the MoW Register Sub-Committee or with other international organizations such as the International Council on Archives (ICA) or the International Federation of Library Associations and Institutions (IFLA). For example, Vítor Fonseca (Brazil), Rita Tjienfooh (Suriname) and Lourdes Blanco (Bolivarian Republic of Venezuela) have recently reinforced regional and international cooperation through their involvement in working groups, regional projects or executive boards in some of those organizations.

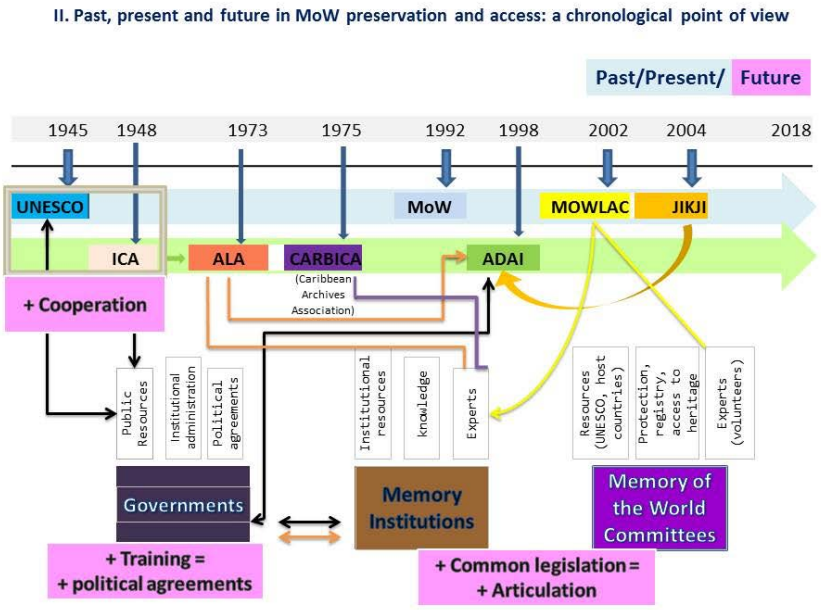
The current challenge is how to modify some economic, legal, technical or political aspects to increase MoW presence in other international organizations or vice versa. Relevant examples might include paying membership fees to ICA in order to collaborate with or reinforce expert networks.

Another good practice in MOWLAC focuses on promoting the Programme. In fact, implementing the MoW recommendation requires a stepping up of dissemination efforts. This could bring in more nominations to assess each year, as MOWLAC did in 2018, when the Committee had to review 33 proposals in two days during its annual meeting held in Panama City. In this respect, MOWLAC needs to adjust its rules of operation, for example by reducing the number of nominations accepted per year, instead of spending a higher budget to cover an annual meeting.

Furthermore, MOWLAC has carried out specific projects such as the blog created by Vítor Fonseca or processing data from the entire MOWLAC registers to design a book (by Lourdes Blanco). Consequently, implementing the recommendation would probably mean reducing or halting any sustainable projects in order to concentrate more on administrative tasks such as writing reports, managing records, preparing official correspondence for memory institutions or governments and so on.

Past, present and future in MoW preservation and access: a chronological point of view

The chart below shows a timeline for the main dates when UNESCO, Memory of the World, MOWLAC and the Jikji Prize were created.



The green arrow shows the parallel evolution of the International Council on Archives and two of its regional branches: the Latin American Archives Association (ALA) and the Caribbean Branch Association (Carbica).

This chart briefly shows some elements relevant to implementing the MoW Recommendation. First of all, there is a close link between UNESCO and governments (Member States). Governments' main driving force involves their financial capacity, their institutions and their political agreements. They are also responsible for memory institutions, which are robust thanks to their public resources, experts, technical knowledge and institutional assets such as documentary heritage, equipment and so on.

Additionally, MoW committees exist thanks to cooperation among UNESCO, governments, the MoW Programme and experts. This is a kind of chain or network that links them all together: experts working voluntarily for their committees and with their UNESCO representatives in their countries, with their Ministries of Foreign Affairs, their UNESCO representatives in their region and with the MoW Secretariat at UNESCO Headquarters in Paris.

Another example shown in this chart is the Support for the Development of Archives in Ibero-America (ADAI) programme, which was created in 1998 during a meeting of Heads of State and Government. After that, ADAI was consolidated with the legal and financial support of the Latin American Archives Association (ALA) and Spain's Ministry of Culture. The programme has grown and has been yielding results for the past 20 years, thanks to active institutional cooperation and the funds provided by the main memory institutions (National Archives) in Latin America, the Caribbean, Spain and Portugal (in other words, public governmental resources).

In 2016, ADAI received the UNESCO Jikji award in recognition of its achievement in the preservation and accessibility of Ibero-America's documentary heritage. Furthermore, many of the experts who had participated in ADAI had also temporarily joined MoW committees or had been active in presenting and preparing nominations for international, regional or national MoW calls for proposals.

Good practices to apply in the future

While implementing the recommendation in MoW, these are some of the good practices that the Programme could implement in the near future:

- UNESCO and other international organizations can exchange institutional resources, as well as reinforcing cooperation, technical knowledge and expert networks.
- UNESCO and Member State governments can provide training about documentary heritage as public-domain fixed assets and a non-renewable resource in which they must invest a stable budget to consolidate sustainable projects at the national level.
- Memory institutions and MoW can reinforce a binding legal framework for international cooperation.
- MoW national and regional committees can engage in an ongoing exchange of knowledge, experiences and information; formalizing their expert networks; training; and disseminating good practices.
- MoW members can link with experts from other international, regional or national organizations related to documentary heritage to reinforce an expert network that can work sustainably over time.

Conclusions

Implementing the UNESCO Recommendation must involve the maintenance of smooth channels of communication among governments, memory institutions and MoW committees to increase cooperation between UNESCO and Member States within the MoW Programme.

There is also an urgent need to train governments to improve their understanding of MoW and highlight the importance of documentary heritage in terms of the benefits it brings to their nations and to their political and administrative efficiency.

Finally, a common legal framework must be reinforced among memory institutions and MoW national and regional committees, to work together in sustainable binding agreements and collaborative projects.

Towards Sustainable Preservation and Accessibility of Documentary Heritage

Natural and man-made disasters represent an imminent danger to the world's memory, which is largely held in libraries, archives and museums among other holding places. This publication documents how memory institutions from different parts of the world have coped with this reality and sought to reduce risks. Measures include robust emergency preparedness plans, preservation policies and national and international partnerships. In this way, policymakers, experts and memory institutions can ensure that the world's documentary heritage remains permanently accessible to all.

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