

## Case studies of Large-Scale Digital Preservation Initiatives (LSDIs) as a Conservation Strategy for Heritage materials in Africa

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### Abstract:

*Cultural institutions have rich heritage collections but not continuous in series due to different factors such as natural disasters, rodents, and acidified papers causing materials to become fragile. Many of the cultural artefacts were exported during colonial era while others were destroyed by natural disasters including fire, war and malicious ignorant people. Incomplete series affects the quality of information service delivery and hence the need for collaborative preservation.*

*This paper discusses large scale digital preservation initiatives (LSDIs) and their ability of sharing or distributing the available series thus providing an opportunity to have the complete information material at no extra costs for individual institutions. The paper demonstrates how Albert Cook Medical Library at Makerere University College of Health Sciences, Mulago Kampala and the Contemporary Medical Archives Centre at the Wellcome Institute for the History of Medicine (now the Wellcome Library), London, UK were able to create complete series of heritage material.*

**Keywords:** African Heritage Materials, Preservation and Conservation, Large-Scale digital preservation initiatives (LSDIs)

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## **Introduction**

The cultural heritage is an expression of the ways of living developed by a community and passed on from generation to generation, including customs, practices, places, objects, artistic expressions and values. It is often expressed as either Intangible or Tangible where tangible is the representations of the value systems, beliefs, traditions and lifestyles in form of built in environment (buildings, townscapes, archaeological remains), natural Environment (rural landscapes, coasts and shorelines, agricultural heritage) and, artifacts (books & documents, objects, pictures) (ICOMOS, 2002). Cultural heritage materials include published and unpublished texts, images if many types, work of art, artifacts, collectables, historical treasures and similar items which hold the significant identity of people. These materials contain memory of people, communities, institutions and individuals, the scientific and cultural heritage, and the products throughout our imagination, craft and learning (Mansor, Jaafar & Manaf, 2013).

The survival of these materials and even intangible heritage such as language, rites, poetry, song, and dance which is passed on to generations orally is greatly threatened and therefore preserving cultural heritage is central to protecting a sense of who we are as society as we contribute culturally to the diverse world (Ekwelem, 2011, Sekler (2001). Societies are faced with challenges of loosing these important materials due to different factors such as natural disasters, rodents, and acidified papers causing materials to become fragile. Many of the cultural artifacts were exported by colonial masters while others were destroyed by natural disasters including fire, war and malicious ignorant people. It so happens that materials taken by colonial masters serve as a backup for those destroyed by natural disasters and regularly referred to. Uganda has a tropical climate which is very hostile to paper documents due to humidity, moulds, water, dust and insects. On the other hand, the competing national priorities pose a threat of protecting a sense of who we are as society as we contribute culturally to the diverse world. Therefore every country should foresee the importance of supporting activities for preserving, conserving, accessing and use of their cultural heritage materials (Kaddu, 2015).

## **The Issue**

Several institutions have rich heritage documents but not continuous in series due to different factors mentioned above including limited resources. Incomplete series affects the quality of information service delivery and hence the need for collaborative preservation. The large scale digital initiatives (LSDIs) have the ability of sharing or distributing the available series thus providing an opportunity to have the complete information material at no extra costs for individual institutions. There are digitization initiatives that not only preserve cultural heritage materials, but also create opportunities for partnership working with other cultural heritage institutions and with commercial and educational organizations (Hoorn, 2006). These initiatives bring together scattered heritage materials found in different institutions but not continuous in series and creating complete items accessed in a single location (Kaddu, 2015; Kamusiime, 2012). They also contribute to the conservation and preservation of cultural heritage and scientific resources; creates new educational opportunities; encourage tourism; and provides ways of improving access by the citizen to their patrimony (Mulrenin, 2001; DigiCULT, 2003).

## **Aim of the opinion paper**

This paper demonstrates how LSDIs provides complete African heritage materials within cultural institutions.

## **Literature Review**

### **African Cultural Heritage Institutions**

A society's cultural heritage is its traditional way of life or behaviour including its ideas, acts and artifacts which are passed on from one generation to another (Banjo, 1997). Culture is the accumulated indigenous and adopted civilization of a nation or society (Kaddu, 2015). In Tanzania, cultural heritage materials range from the Pliocene period (is a period in geologic time scale) about for millions years ago to present and include; historical sites, historical towns, traditional settlements, historical buildings, natural features and structures, sites with special memories and archaeological or paleontological sites among others. Some of these materials also inscribed on the world heritage list including; Kondea Rock Art site, KilwaKisiwani and SongoMnara and Olduvai Gorge ([www.tzdpg.or.tz](http://www.tzdpg.or.tz)). The division of antiquities in Ministry of Natural Resources and Tourism is responsible for their preservation and conservation, protection and management. The resources that are movable and can be collected are preserved by National Museums and House of Culture, Tanzania National Archive and Tanzania Library Board Services while historical sites, historic buildings, historical towns and settlement, natural features and structures are managed and controlled by central government under the antiquities division. National Museum and House of Culture has five branches which include the village museum in Dar es Salaam, Mwalimu Nyerere Museum in Butiama, MajiMaji Museum in Songea, Natural Museum and Arusha Declaration Museum all are custodian of both the movable and natural heritage of the country with the role of preserving both tangible and intangible cultural heritage materials (Bagenyi, 2006). The Tanzanian structure of controlling and managing cultural heritage resources is similar in Uganda, Ghana and Nigeria.

In Uganda, institutions managing and controlling heritage resources include; The Department of Antiquities and Museums that derives its role from the Historical Monuments Act of 1967, which provides for the legal protection of sites of historical, archaeological and paleontological importance and is concerned with conservation, research and preservation of historical, archaeological, and paleontological sites within Uganda including traditional sites, buildings, signposts, and tombs; The Uganda Museum established in 1902 with branches in Kabale and Soroti, and became part of the Ministry of Culture and Community Development in 1954. The Uganda Museum stores a limited ethnographic collection of document information as well as artifacts that portrays the lands of Uganda and activities of its people, the culture, history and natural history of Uganda, and offers rich ethnographic displays of a wide range of traditional life of the peoples of Uganda; The National Library of Uganda (NLU), formally Public Libraries Board established in 1964 to act as a depository of national and foreign government documents, and compile and publish a national bibliography; The Makerere University Library (Africana Section) that collects and stores general African literature dating back to the late nineteenth century: books, papers, letters, notices, reports, diaries of events, church memoranda, registers, and manuscripts that are important to Uganda's heritage; The Documentation Centre at Uganda Management Institute for documenting routine government ministries business; The National Archives offers research service and enriches the cultural heritage of the country by preserving and disposing of

records and archives, and makes records available for consultation; The Radio Uganda and Uganda Television (UTV) established in 1962 and 1963 respectively to educate, entertain, inform and mobilize people using programmes related to culture and religion, entertainment, gender issues, education, and sports; The National Theatre established by Ordinance of the Legislative Council in 1959 as the main centre for developing and presenting performing arts in Uganda and preserving culture by educating the masses through music, dance and drama; The National Cultural Center (the Nommo Galley) established in 1964 to promote fine art especially textile designs, ceramics, and scripture; and The National Council of Sports that organizes African traditional games and sports to preserve Ugandan culture (Magara, 2005). Cultural heritage resources available in Nigerian academic institutions include; songs, crafts, moral, historical sites, artifacts, works of arts and cultural, archaeological sites, photographic slides, folklore, and images from books (Ekwelem, 2011). Doughan 2012 highlights the works of arts that are used in the preservation of history by the people of Winneba and Mankessim in the Central region of Ghana.

### **Role of Institutions in the Preservation of Cultural Heritage materials**

Traditionally, cultural heritage materials are usually kept in cultural institutions such as libraries, museums, galleries and archives. Several libraries have a public task in preserving and providing access to cultural heritage for example in Netherland, the national library, the *Koninklijke Bibliotheek* has a task to maintain, manage and provide access to the national cultural heritage (Hoorn, 2006). In all fields of information work technological advancement have changed the way information is created, collected, organized, stored, disseminated, accessed, shared and used. These new emerging technologies have brought the need for digitizing cultural heritage materials worldwide. Many institutions and other organizations of the world are striving to establish repositories of cultural heritage materials to enhance accessibility, improve storage and preservation. If the materials are captured in an electronic format so as to enable access through the network, they can be spread all over the world with the use of internet for learning and understanding the culture of our societies (Lalitha, 2005).

Over a decade ago, libraries began to digitize their collection for purposes of preservation and went ahead to collect digital objects including heritage materials through deposit, purchase and web harvesting to form institutional repositories of digital content. Currently, large libraries collaborate in networks in order to achieve digital preservation by setting up trusted digital repositories and developing preservation strategies of shifting from mere digitization of the collection towards guaranteeing permanent access (Verheul, 2006). Institutional repositories enable access to heritage materials through digital preservation that has the main goal of accurate rendering of authenticated content over time (Mark, 2008). It is an initiative to ensure that electronic information of future value remains accessible and usable (Digital Preservation Coalition, 2008).

National archives of Australia (2011) identified some barriers that might affect the digitization and preservation as: cost, hardware and software, file format change overtime, loss of digital records because of disasters (fire, flood, equipment failure, virus attack, and operating system failure), access barrier such as password protection, copyrights, identification of records, and loss of contextual records.

In Africa, methods used by libraries to preserve heritage materials include among others; deacidification, photocopying, binding of loose sheets, microfilming and digitization; although very few libraries are engaged in meaningful digitization of heritage materials because of the cost of digitization, inadequate infrastructure facilities, trained manpower, non-existence of software, and harsh environment conditions among others as stated by (Ekwelem, 2011). Digitization is able to take care of further distribution of material and

attract greater numbers of visitors and users. During digitisation, the National Library of Uganda pre-assesses materials before they are scanned by establishing the dangers that might occur during scanning remove cello tapes, staple wires, food, and dust among others and make small repairs for holding the material during scanning. Materials are treated, cleaned and strengthened after scanning and better acid free, fire and water proof housing is provided. There is manual dehumidifying of documents because they lack the necessary equipment (Kaddu, 2015).

### **African Heritage Digitisation Initiatives**

According to the *Harrod's Librarian Glossary*, digital preservation is the method of keeping digital material alive so that they remain usable as technological advances render original hardware and software specification obsolete (Ray, 2005). The initiative includes among others; planning, resource allocation, and application of preservation methods and technologies, and it combines policies, strategies and actions to ensure access to reformatted and "born-digital" content, regardless of the challenges of media failure and technological change (Michael, 2006).

Establishment of digital cultural heritage materials repository differs from country to country since the initiative is not a simple task; it requires expertise in information technology, project management, resource description, high investment (an ongoing investment) for maintenance of resources. There is a slow adoption of this initiative in developing countries compared to developed countries due to lack of enough resources required to undertake the activities. For example, Nigeria has a total of one hundred and forty one (federal, state and private) owned universities. However according to Open DOAR.org (2015) only eleven (11) consisting of (15.5%) universities have digitized some of their holdings and uploaded to open access. These include; Amadu Bello University Zaria, Covenant University Ota, Federal University Ndufu-Alike Ikwo, University of Technology Akure, Federal University OyeEkiti, Landmark University Omu-Aran, University of Jos and University of Nigeria Nsukka among others.

Although there is slow adoption, there are initiatives that have invested a lot in establishing institutional repositories of heritage materials. For example; In Nigeria, the University of Nigeria Nsukka uploaded 20, 207 of digitized materials (Ezeani and Ezema 2011); Tanzania Heritage Project which works to digitize old Tanzania music from Radio Tanzania's music archive recorded in magnetic tapes that is out of reach for anyone growing up in this world of digital media; Mara Cultural Heritage Digital Library (MCHDL) of Mara region that attempts to repatriate oral traditional in digital media; the National Library of Uganda that uses Suprascan II where the computer controls the entire sequence of scanning including the motor and camera and images are saved via a network adaptor. Adobe acrobat suite together with Digibook and Xnview are also used for image manipulation and compression, where they are finally saved in high quality formats such as JPEG (Joint Photographic Expert Group) format and TIFF (Tagged Image File Format) that are compatible with most graphic applications. Over 800 heritage materials were digitized including; colonial agreements, bible and catechism translations, maps, newspapers, drawings and photos, manuscripts/documents related to historical figures such as Semei Kakungulu, first stamps for Uganda protectorate, first Ugandan money, traditional clothes and royal regalias among others. Universal metadata standards were used to describe the heritage materials in the repository including; Ms Access and Metadata Object Description Schema (MODS) (Kaddu, 2015).

The Makerere University Library Digital Music Archive in Uganda launched in 2009 is one of the repositories of cultural heritage and is accessed through a the Dspace sub-

community under the Department of Music, Dance and drama (MDD) of Makerere Institutional Repository (MakIR) formerly known as the Uganda Science Digital Library (USDL). The collection has over 2,039 sound recording, 119 video recording, 286 photographs, and 1015 documented items accessed free of charge to library registered users. Viewing and reading are available for photographs and videos and copying and photocopying services are subject to copyright law. The digital project collects and documents all kinds of Ugandan music and dance, digitizes Ugandan music recorded on analogue formats, provides access to music materials that can no longer be accessed in their original formats, and enhances preservation of records by reducing wear and tear on the originals. The project transformed Textual materials such as music scores, newspaper clippings, sheet music and photographs into digital items. 227 gramophone records, 241 video tapes, 20 film strips and 50 audio CDs, approximately 50 music scores, 10 reel-to-reel tapes, and 127 compact cassettes were also transformed into digital forms using a reel-to-reel player, Apple computers and 2 PCs, printer, scanner, stereo cassette player, amplifier, turntable, field recorders and earphones and Amadeus Pro used as multi-track audio editor because it supports a variety of formats using the Audio Interchange File Formats (.aiff). Toast II Titanium is used to capture, burn, copy and convert CDs and share digital files mostly mp3 for digital copy and Compact Disc-Recordable (CD-R) for archival copy. The organization of play lists, editing file information, backing up songs onto CDs and encoding music in different formats is enabled by iTunes. Each recording is converted to one or more computer files using a sampling rate of 44.1 kHz and sample size of 16bit in mono or stereo as appropriate and stored on both backup and archival servers. It takes 2 hours and 30 minutes to digitize one compact cassette. Textual materials are scanned at archival quality 8-bit gray scale (black and white); and 24-bit for colored and images saved in TIFF and JPEG for reference. Default template of machine readable cataloging (MARC) metadata was customized for accuracy which is vital for a music repository so that incorporated futures as music formats, genre, composition, ethnic group, location of event, costume, collector and performer are not missed out. The metadata record is then entered into the library OPAC as an alternative access to MakIR. Awareness and marketing the archives is done through training workshops, conference presentations, peer reviewed publications, mailing listserves, academic meetings bulletins, social media among others (Namaganda, 2011). Another cultural repository is the Uganda Christian University Archives collection with over 50,000 images of the Province of Church of Uganda on the religious history from as far as 1880s (Kamusiime, 2012).

### **Case studies of Large-Scale Digital Preservation Initiatives**

Due to the expensive nature of digitization projects characterized by not-for-profit services such as open access, libraries in Africa use collaboration as a strategy of digitizing cultural heritage materials in order to sustain or maintain wider access and sharing of information at no extra cost. Most cultural institutions were digitizing to have copies as backups for works in case they go out of print, deteriorate, or are lost and damaged. And now many institutions have begun or are about to begin Large-Scale digital preservation initiatives (LSDIs). The main players in LSDIs are cultural institutions, commercial companies such as Google and Microsoft, and non-profit groups including the Open Content Alliance (OCA), the Million Book Project (MBP), and HathiTrust. The primary motivation of these groups is to expand access to heritage and scholarly resources.

In Uganda, digitization of cultural heritage is done through cooperation between World Digital Library (WDL) and the National Library of Uganda (NLU) so as to conserve and preserve them. WDL is an Internet based information resource that is co-sponsored by the

Library of Congress (LC) and the United Nations Educational, Scientific, and Cultural Organisation (UNESCO) with a purpose of creating an online collection of unique materials that would enable people from all over the globe to access the documented heritage that exists in various cultural institutions around the world. LC, UNESCO and other five libraries namely; the Bibliotheca Alexandrina of Alexandria, Egypt; the National Library of Brazil; the National Library of Egypt; the National Library of Russia; and the Russian State Library partnered with Google and developed a prototype for open access digital library for heritage materials with inspiring features for the young generation, that was launched at the 2007 UNESCO General Conference ([www.wdl.org](http://www.wdl.org)). Specifically, the library promotes international and intercultural understanding, expand the volume and variety of cultural content on the Internet, provide resources for educators, scholars, and general audiences, and build capacity in partner institutions to narrow the digital divide within and between countries (Kaddu, 2015).

The 2006 microfilming project between Yale University Library Digital Repository Service and Uganda Christian University Archives is another collaboration strategy where three archival collections were digitized including; the church of the province of Uganda collection of reports, minutes of meetings, correspondences, plans, photographs, marriage registers, newspapers, oaths and declarations from 1882 to 1995; Bishop Tucker Theoretical College collection from 1913 to 1997 and Uganda Christian University collection of staff university records 1997 to 2005. The pilot project was funded by Latourette initiative and performed by IDC publishers of Leiden between December 2006 and July 2007 to produce 50 reels of microfilms. Digital files providing 50,000 images were created from the reels in September 2007 and housed in the digital repository services of Uganda Christian University (Kamusiime, 2012).

The digital collection of East African recordings consisting of over 1,600 discrete musical performances throughout Uganda has a collaboration with the Global Music Archive (GMA) a multi-media archive and resource centre for traditional and popular song, music, and dance of Africa and North and South America, with particular emphasis on the African Diaspora to maintain its digital collection and reduce costs and allows users throughout the world to stream audios off the primary resources (Nordstrom, 2008). Digitization projects were initiated in Makerere University Library in 2004 through collaborative linkages with Tufts University, University of Tennessee, Knoxville and the University of Bergen, Norway where the Makerere Institutional Repository (MakIR) formerly known as the Uganda Science Digital Library (USDL) was created using Dspace as a preservation strategy to guarantee permanent access to scholarly materials, digitize cultural heritage materials and provide wider and easier access to these materials, conserve the originals, possibly add value to images and collections, and provide opportunities for income generation.

In Nigeria, the University of Jos and Obafemi Awolowo University are collaborating with Database of Theses and Dissertations (DATAD) and Carnegie Cooperation of New York and they are beginning to digitize their holdings anytime soon (Mohammed, 2013).

### **How LSDIs Provide Complete African heritage materials**

Albert Cook Medical Library at Makerere University College of Health Sciences, Mulago Kampala had rich heritage documents called Mengo Notes. These are hospital records created by Sir Albert Ruskin Cook, a medical missionary in Uganda who founded Mengo Hospital in 1897 and was the first person to diagnose sleeping sickness in East Africa. There were other collection of Sir A R Cook given by Sir Albert's grandson Richard Bax in 1984, to the Contemporary Medical Archives Centre at the Wellcome Institute for the History of Medicine (now the Wellcome Library) consisting of; correspondence, 18-1951, giving

many details of the Cooks, life and work in Uganda; large collection of diaries, 1855-1951; a number of photographs of Uganda and holidays abroad, 1896-1930s; family and personal papers, 1882-1951; and small amount of printed materials, 1896-1947. The two cultural institutions had a collection of the same person with missing series. The strategy was to use collaboration as a strategy of digitizing cultural heritage materials in order to sustain or maintain wider access and sharing of information at no extra cost.

With mass digitization and processing, a new collection consisting of correspondences and hospital notes was created and shared by both institutions using limited support from Wellcome Trust. The complete collection is indexed as follows;

- A: LETTERS FROM ALBERT RUSKIN COOK 1881-1951
- B: JOURNAL LETTERS FROM A.R. COOK (SOME IN A) 1896-1921
- C: JOURNAL LETTERS FROM KATHARINE COOK 1897-1910
- D: CORRESPONDENCE RECEIVED BY A R COOK
  - 1-525 family 1881-1942
  - 525-648 friends 1889-1950
  - 649-658 business 1916-1943
- E: FAMILY LETTERS NOT CONCERNING A R COOK 1812-1910
- F: MISCELLANEOUS CORRESPONDENCE 1897-1943
- G: DIARIES OF A R COOK 1884-1951
- H: DIARIES OF HARRIET BICKERSTETH COOK 1864-1888
- I: DIARIES OF CHARLOTTE BICKERSTETH 1855-1863
- J: FAMILY AND PERSONAL PAPERS 1882-1951
- K: PHOTOGRAPHS c.1896-1930s
- L: MISCELLANEOUS PRINTED MATERIAL RELATING TO UGANDA c.1896-c.1947
- M: MICROFILMS OF HOLDINGS (MENGO NOTES) AT Albert Cook Medical Library, College of Health Sciences, Makerere University, Kampala 1897-1959

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