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EXAMINING TECHNICAL ISSUES OF THE WORLD DIGITAL LIBRARY IN UGANDA: CHALLENGES AND PROSPECTS

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Abstract
With the agreement and subsequent signing of the Memorandum of Understanding between the Library of Congress (LC) and the National Library of Uganda (NLU) in 2009, NLU became an active partner institution of the World Digital Library (WDL). Since then, technical processes related to digitizing Uganda's cultural heritage have been managed. These include: identification of digitizable cultural materials/content selection, scanning, metadata, preservation and conservation and the creation of the Uganda Digital Repository.

The aim of this paper was to examine the challenges encountered in managing the technical activities and propose solutions for better management of the WDL in Uganda. Objectives included: to examine the technical services involved in the digitisation process; to identify challenges faced in executing the technical processes; and to identify solutions to the challenges. Data collection was effected through analysis of WDL literature relevant to technical activities in general and the WDL (Uganda) in particular; participant observation of technical processes; and a Focus Group Discussion with employees. Personal experience also applied in explaining some aspects of the research.

The paper should generate critical information and debate on the management of WDL technical processes, the challenges, and also strategies to overcome the challenges. The paper should benefit the project administrators, staff and other stakeholders in working towards better performance of the WDL in general and WDL (Uganda) in particular.
Keywords: National Library of Uganda, World Digital Library, digitization, cultural heritage.

Introduction

The World Digital Library (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). In 2005 the Librarian of Congress, Dr James Billington, approached UNESCO with a proposal to create an online collection of unique materials that would enable people from all over the globe to access the documented heritage that existed in various cultural institutions around the world. The LC and UNESCO entered into an agreement to develop a prototype of the Digital Library. Google, the Internet company, provided a grant worth US $3m at the start of the project. The prototype was developed by the two partners (LC and UNESCO) in collaboration with five others: 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.

The prototype was launched at the 2007 UNESCO General Conference. On 21 April 2009 at the UNESCO Headquarters, UNESCO and 32 partner institutions launched the World Digital Library, a web site that features unique cultural materials from libraries and archives institutions all over the world. The website features manuscripts, maps, rare books, films, sound recordings, prints, photographs and other materials. It provides unrestricted public access, free of charge, to these materials (World Digital Library, 2009).

Aim and principal objectives of the WDL

The WDL aim is to make available on the Internet, free of charge and in multilingual format, significant primary materials from countries and cultures around the world (World Digital Library, 2009). With its partner institutions worldwide the WDL is focused on achieving the following objectives, to:

- Promote international and intercultural understanding;
- Expand the volume and variety of cultural content on the Internet;
- Provide resources for educators, scholars, and general audiences;
- Build capacity in partner institutions to narrow the digital divide within and between countries (World Digital Library,2009).

The WDL in Uganda

The general objective of the WDL in Uganda is to trace and digitize the political, economic, social and technological history of Uganda. This has been guided by the theme "Unity in diversity - the coming together as a nation through documentation, preservation and dissemination of Uganda cultural heritage home and abroad".

Related to the above general objective, the WDL (Uganda) specific objectives include

- promoting Uganda's heritage worldwide;
- bringing together Uganda national heritage in one space for use by both intellectuals and the general Ugandan public;

- conserving and preserving Uganda's heritage; at present, documentation of Uganda's history and cultures is in a very bad state;
- contributing to the promotion of regional cooperation.

Objectives of the study

The study focused on the following objectives:

- examination of the technical services involved in the digitisation process;
- isolation/identification of challenges faced in executing the technical processes; and
- identification of strategies for improvement.

Methodology

Data collection was carried out through analysis of the WDL literature relevant to the technical processes in general and the WDL(Uganda) in particular; participant observation of the technical processes; staff /employees Focus Group Discussions and the authors' personal experiences.

Findings of the study

Findings of the study are reported under the following technical process-related sub-topics: identification of digitizable cultural materials; content selection; scanning, metadata, preservation and conservation of digitizable materials; and creation of the Uganda Digital Repository.

Identification of digitizable cultural materials

After discussions with partner institutions in the country and meetings with other stakeholders, the NLU further held consultative meetings with the Task Force Committee. This committee advises on the actual items and content to feature on the WDL website. The committee decided that material should include items related to religion, politics and culture, which are the three top issues in Uganda's history.

WDL (Uganda) staff visit partners, contributors and potential contributor institutions to sensitize contributors of digitizable materials about the WDL. They further select items that best represent Ugandan cultures. Meetings are held with contributors who later formalize the process of identification of digitizable materials by signing an agreement to have their materials digitized. A minimum of one month is given to return the materials to the individual or institutional contributor.

Some of the materials that staff have collected from the field include:

- books in the public domain from early missionary travels;
- agreements signed by the British with the various tribal rulers for example, Muteesa I, the King of Buganda, who wrote the letter to Queen Victoria of England inviting the missionaries to spread Christianity.

- other agreements, including: the Buganda Agreement, 1900; the Bunyoro Agreement; and the Toro Agreement, among others; and maps of Uganda at the time;
- maps by explorers; early printed maps; maps by indigenous peoples or that show geographic knowledge obtained from indigenous peoples; topical maps showing industry, transportation, ethnographic and linguistic distribution; maps from the pre-colonial era onwards; old maps of the original districts of Uganda; maps of islands such as those around Lake Victoria, including Mgingo and Ugingo islands which are the subject of hot debate between the Kenya and Uganda Government, among others;
- the first translations of the Bible into various languages, including the "Biscuit Tin Bible" currently archived at the National Museum; the first catechisms in the various Ugandan languages;
- pictures (drawings and photos) of the 1870s–1920s;
- first issues of newspapers in various languages;
- manuscripts and documents related to historical figures like Semei Kakungulu;
- the first stamps for Uganda as a Protectorate;
- the first Ugandan money;
- pictures that show the tribal rulers in the late 19th and early 20th centuries; traditional dress and Royal regalia of various tribes;
- pictures from the Independence Day celebrations;

Scanning /Digitizing of cultural heritage materials

Scanning/digitizing is the art of converting the contents of a document from hard copy into machine-readable format. Digitization implies conversion of documents and art works into digital images (Fabunmi, Paris, & Fabunmi, 2006) and makes materials available electronically. In the African context, digitization refers to "conversion of non-digital material to digital form" (Tsebe, 2005). Once identified and selected, digitizable materials are brought to the NLU to the Conservator to assess their physical state before they go to the scanners. He examines the items to determine whether they have been affected by insects, in order to treat them; whether the paper to be scanned is very brittle; and whether scanning could be done without any binding. Further instructions are given for the scanners to follow when scanning.

The basic hardware used in scanning includes computers to store and display the images as they are scanned. Using the scanner the computer controls the motor, the camera and the entire sequence of scanning and processing of images. Images may be saved to the hard disk of the computer connected to the scanner or to another computer via the network adaptor. I2S Suprascan II scanners/digital cameras are used and, at NLU, Digibook, xnview and Adobe Photoshop software are also used.

Scanning the materials, the scanner operators create digital images such as photographs which are saved in both JPEG (Joint Photographic Experts Group format) and TIFF (Tagged Image File Format). Other images are in TIFF, which is preferred because of high quality images, and compatibility with most graphics, desktop publishing, and word processing applications, TIFF files are large, however, and few web browsers can display them. Files may or may not be compressed.

After scanning, materials are post-processed for image enhancement by improving brightness, contrast, removal of dirt from the edges of digitized images, and checking the accuracy of the digitized images.

Metadata

Simply defined, metadata describes other data and provides additional information about the data (? Wrembel, and Bebel, 2005). Metadata describes the content, quality, condition and other appropriate characteristics of the data. At NLU, the metadata process requires the Metadata Officer to know Ms Access, MODS (Metadata Object Description Schema), a descriptive metadata standard, Oxygen XML Editor 11.0, Oxygen and Exist XML database.

Preservation and Conservation of Digitizable Materials

The American Institute for Conservation of Historic and Artistic Works (AIC) defines three relevant terms:

- Preservation: the protection of cultural property through activities that minimize chemical and physical deterioration and damage and prevent loss of informational content.
- Conservation: activities include examination, documentation, treatment and preventive care, supported by research and education.
- Restoration: treatment procedures intended to return cultural property to a known or assumed state, often through the addition of non-original material.

Selection for Preservation

According to the Northeast Document Conservation Center (2006), it is not possible to preserve every brittle item. Consequently various strategies have been developed:

- Vulnerability to loss or deterioration: materials that are particularly subject to deterioration, such as newspapers or items to be exhibited, are identified for attention.
- Value or uniqueness: items that are unique or particularly valuable (in monetary or other senses) are identified for attention.
- Condition and use: items that have deteriorated and are in need of attention are identified as they are returned after circulation, or pointed out to staff by users or stack maintenance staff.

Preservation and conservation process at NLU

- Assessment prior to scanning: when digitizable materials are brought to NLU, the Conservator assesses them before they are scanned. During the assessment the nature of the materials are established; the likely dangers are identified that might affect the materials during scanning; and the materials are cleaned by removing the unwanted materials like tape, staple wires, food and dust.

- Strengthening the items: small repairs are made to materials before scanning. These aim to strengthen the material for holding, to make the scanning work easier and to avoid more damage.

- The Conservator treats the items after the scanning process, fixing new covers, strengthening spines, cleaning spines, providing new housing such as boxing, encapsulating and binding the items. For photographs, frames are provided.

Commenting on the preservation and conservation process, the NLU Conservator has said "I do general treatment on the dirty documents, insect infected materials and on materials that have been affected by the atmosphere around them. We manually dehumidify documents because we lack special machines that would perform this task." (Personal communication, 2011). Asked further about the preservation process, the Conservator has said that not much preservation takes place at NLU because many people are not aware. Many items received are dog-eared, infected, contaminated with foods and liquid and dusty.

Creation of the Uganda Digital Repository

NLU is creating a Digital Repository of the WDL (Uganda) output from all stakeholders. This will be accessible free to end-users both within and outside of the institution. Creating effective digital repositories poses serious challenges for existing and future technologies. Organization of digital libraries and repositories is characterized by the activities carried out, as outlined by Mutula & Ojedokun (2008); such activities include: electronic publishing, digitization, indexing, classification, cataloguing, information storage and retrieval, updating and annotating documents, searching and browsing, and the whole array of information management operations.

Challenges

Several challenges are faced by WDL (Uganda) in the digitization process and those that are outstanding are discussed briefly below:

Legal Aspects

These relate to intellectual property rights. The major challenge is complying with intellectual property rights legislation such as the Uganda Copyright and Neighbouring Rights Act, 2006 and related issues like plagiarism. There is increasing unease among

members of the library community that copyright changes will adversely affect the ability of libraries to provide digital collections and services (Warraich, 2008). Kuny (2009:8) concurs:

> If libraries do begin to systematically collect digital information on a larger scale, the provision of effective access could be questionable. In fact, copyright could end up preventing libraries from providing open access to the digital information they collect. Questions of copyright must be managed so that digital information can be created and distributed throughout "digital libraries" in a manner that is equitable for both information producers and information customers. Copyright could become an insurmountable barrier to the development of digital collections (Kuny, 2009: 8)

Technical Support

WDL (Uganda) has two computers for both scanning and post-processing activities. The post-processing scanner broke down and this slowed post processing activities. In addition, Uganda experiences power rationing (load shedding) which affects scanning activities.

Difficulty in digitizing materials

Some digitizable materials are in hard-bound format, which makes them difficult to digitize. Many materials are too brittle to be digitized. In addition, institutions insist that their digitizable materials are scanned on their premises for security reasons. One contributor was clear on this: "If you want to digitize our materials, you need to do it here. For security reasons, we cannot allow our materials out of our premises." (Personal communication, 2011).

New challenges in metadata creation and management

The ever-growing universe of digital library projects demands a broad community of information professionals with the up to date knowledge, skills and competencies needed to address new challenges in metadata creation and management. The rapid growth of digital repositories has led to an acute awareness of metadata as the principal building block in facilitating effective resource description, access, and sharing. New metadata standards and digital library technologies are being developed at a rapid pace as diverse communities of practice seek new ways to organize massive quantities of digital resources. The pace of change in the metadata environment creates an increased demand for continuing education programmes that are designed to allow cataloguing and metadata professionals to stay up to date with current and emerging standards and technologies for describing networked and digital resources.

Commenting on the metadata process, the Metadata Officer has stated that the Metadata process is very tedious: mastering metadata standards and process is very demanding, good descriptions call for a reading culture, scanty information makes it very difficult to

describe the materials comprehensively and some languages in which materials are produced are not comprehended.

Metadata standards and schemas include: MARC, MODS, Dublin Core, METS (Metadata Encoding and Transmission Standard), TEI (Text Encoding Initiative), and EAD (Encoded Archival Description). The e-Government Metadata Standard (E-GMS) exists and may create confusion. At NLU Oxygen XML Editor and MODS are used.

Other challenges experienced by WDL (Uganda) include

- the problem of scattered collections, where many institutions that hold unique items are scattered all over the country. It is not easy to know who has which materials because there is no tracing guide. The only alternative is to enquire from different historians and administrators, who are often un-cooperative or are not sure;
- demand for compensation in exchange for ideas and digitizable materials which drains the limited financial resources;
- ignorance and neglect of indigenous knowledge and its documentation, leading to unsystematic collection and digitization;
- harsh climatic conditions, making materials brittle or susceptible to fire and other risks;
- lack of guidelines in applying metadata to African-based information resources;
- maintenance of metadata records, such as failing to insert a "see" reference where changes have occurred;
- lack of preservation materials, tools and equipment, coupled with technical inabilities also contribute to the great loss of records. Maintenance of the most essential equipment is limited, with spare parts hardly available. Such pieces of equipment are more museum pieces than functioning preservation tools;

The absence of model regional centres that continuously offer training to young professionals (especially conservators) is another hindrance to having skilled staff within most institutions and archives.

The way forward

This section is a discussion is of plans and their implementation to fulfill the prospects of WDL.

WDL (Uganda) Marketing and Public Relations

After two years the existence of WDL (Uganda) and its functions are not yet spread throughout Uganda. As a result, the services offered are not well known by all, and consequently not widely used in Uganda. This situation calls for wide and intensive marketing and public relations.

Participation of key stakeholders

For selfish reasons, a few institutions are unwilling to surrender digitizable materials which were acquired under surrogate responsibility before WDL (Uganda) was established. This calls for the sensitization of such institutions to cooperate in this venture, which ultimately should benefit Uganda and the world.

WDL (Uganda) infrastructure and facilities

WDL (Uganda) infrastructure, incorporating buildings and ICTs, is still inadequate. There is therefore an urgent need to expand these facilities by expanding bandwidth, purchasing hardware and software, etc. to provide efficient services.

Training of required personnel

As the services of WDL (Uganda) expand, there is a need for well educated, trained and experienced personnel such as conservators, metadata specialists and scanner specialists, to plan, execute and evaluate WDL (Uganda) services nationally and worldwide. To this effect would it be possible to have a regional education and training programme dedicated to WDL activities?

Funding

Currently WDL (Uganda) is funded by the Library of Congress. The question is, what will happen if such funding were to cease? This issue should be resolved in such a way that the sustainability of WDL (Uganda) is assured through alternative funding by the Uganda Government or income-generating ventures.

Conclusion

Although there are challenges in the WDL (Uganda) project, management, staff and other stakeholders are determined to make it successful so that Uganda participates in the international network of cultural exchange and development. "The struggle continues -- A luta continua".

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