

# Building Digital Content for Academic Libraries: The role of digitization in Knowledge Management.

(Conference ID: CFP/442/2017)

Raymond Sikanyika (CILIP)  
Electronic and Media Services Librarian  
Copperbelt University  
Kitwe, Zambia  
raymond.sikanyika@cbu.ac.zm

## **Abstract**

*The way the knowledge information is being passed on to users in the modern age, also known as the Knowledge Economy has led to the evolution of libraries from traditional libraries of book stacks to digital libraries. Academic libraries across the world have been at the centre of this evolution by creating digital library collections of local publications such as dissertations, theses, reports, scientific papers, speeches and newspaper articles as well as rare and important physical material. The growth of the digital platform has arisen due to the fact that modern libraries which are highly digitized contribute more significantly to research, a core activity in academic institutions, more than traditional libraries. Digital libraries attract users by not only providing content in digital form but because they also save on space and time.*

*This paper gives report steps involved in the process of building digital content in academic libraries for universities in Zambia. The paper focuses on the digitization process of scanning and creating collections. The papers goes to furthermore explain how institutional repositories (IR) are being converted into digitized forms and how academic libraries are moving to deliver information in the digital form using the web and open source software (OSS) such as DSpace. The paper finally brings out the potential that the development of IRs by innovations of information technology has the capability to strengthen academic libraries and make them a tool in knowledge management.*

## **Introduction**

Digitization projects are currently being conducted on a massive scale in academic libraries across Africa. Digitization of information materials is the process of converting analogue information to a digital format. Traditional library materials such as books, papers, manuscripts, are converted into electronic formats while images such as photographs and maps are converted into digital representations using scanning equipment (Noerr, 2003). Digitization this is one of the methods of managing information resources in the new information and knowledge age which is facilitated by ICTs. With projects like the Digital Innovation South Africa (DISA) project which has built a continual digital resource through content based on the initiative of local scholars offering expanded access to collections of various types of previously restricted materials via digital library systems, these efforts have assisted libraries and information services in Africa to increase African content online and its utilization (Pickover, 2011). Universities in Zambia such as University of Zambia and Copperbelt University have also taken steps to digitize some of its resources and scholarly access to preserved documents has been greatly enhanced through digitization. This is because digital institutional resources such as theses, manuscripts, research papers or images are of very high value to academic institutions. Therefore, in an effort to increase the visibility of content on an online platform by most academic libraries, information and communication technologies have been at the center of the drastic change influencing the building of digital content in academic libraries as well as the transforming and transmission model of this content leading to knowledge management (Rosenberg, 2004). This is very vital because cooperation, automation, and building of content for digital libraries for the enhancement of service delivery in support of teaching and research are the core drivers that shape the collective future of academic libraries as suppliers of information to the scholarly world.

## **Digital Content and Digital Libraries**

Digital content is a focused and organized collection of objects which have been digitized or are digital (Fabunni, 2006). These as earlier stated include texts, images, audio and video together with the methods for access, retrieval and selection, creation, organization, maintenance and

sharing of the collection making up the content. This digital content makes up a digital library and enables beyond the factors mentioned such as retrieval and sharing, the preservation of digital content and the ability for users to access and work directly with the digital content. This offers various significant benefits which include the time and space within which the collection can be accessed which is improved and wider because it is not limited (Ian, 2003). These important characteristics have led to the building of digital content and implementation of digital libraries in academic libraries in various subject areas. The creation of digital content and maintenance of digital libraries share common functional components which include document selection and acquisition; organization and loading, indexing and storage, a repository, search and retrieval, a digital library website.

## **Reasons for building digital content**

The main reason that underlies the building of digital content, digitization of library materials is for their preservation and easy access by any user or researcher. Digitization greatly improves the access to library resources by making the resources available to all, and not a specific group of users or researchers.

Digital content should be built on the basis of the continuing value of library resources especially those which are rich in content and frequently used. Digitization greatly reduces the handling and use of valuable and fragile documents and material. These include newspapers, reports, thesis which are old and have been overused and become brittle over the years and require less handling which might destroy them (UNESCO, 2002). These are material which are resourceful for teaching, research, for the public, are scholarly and therefore require preservation because they are important, of value might be useful in the future.

Digital content gives an opportunity for resources to be searched for anywhere and at any time. This is because digital content makes the invisible visible and ensures that many users have access to the same material at the same time without hindrance. The whole point of academic libraries is to reach their users wherever and whenever. Digital content in this case is seen as the reason which offers this opportunity.

Materials which are digitized also have a single access point especially for academic institutions that have satellite campuses and libraries. This not only limits the movement of information material which can lead to their loss and deterioration but also makes easy availability and use of information resources.

## **Factors to consider when building digital content**

The process of building digital content is very resourceful because it takes up a lot of time, requires a lot of money for the purchase of relevant equipment and training, and staff with the necessary training and skills should be in place. It is therefore important to take into consideration various factors before embarking on the process.

It is great important to begin with, to assess if the documents to be digitized contain information which is valuable enough to warrant their digitization. It is not worth digitizing outdated documents although it is important to digitize material which is unique and is of historical value or heritage documents (Anunobi, 2008).

Another factor to consider is the users. These are the ultimate reason for the digital process. It is therefore important to consider the population and how they will access the material by judging the demand. This may to a greater extent demand the users opinion and take into consideration their priorities.

The purpose of building digital content is aimed at building a digital collection. It is therefore important to verify if the documents to be digitized form a collection. This means that documents to be digitized should have something in common such as subject area and focus of research (DLF, 2001).

The digitization process is a very difficult exercise to physically undertake especially since materials to be digitized can be of different physical characteristic and therefore not all of them can be converted to electronic format. The physical characteristics need to be checked to determine how easy it is to digitize such material.

## Steps of building digital content in academic libraries

The following stages are involved in the process of building digital libraries in academic libraries;

- **Planning Stage**

This the first stage of building digital content. The planning stage which is a very critical stage involves conducting a feasibility study to access the necessity and viability of the project. The need for building a digital library is largely driven by the end user and it is therefore to justify at this point that the users expressed the need. This is important because the users in the ultimately determine the usefulness of the service. The other purpose should be the justification to preserve rare materials and ultimately improve their access with the aim of reaching a wider audience while improving access (Tennant, 2000). The outcome of the feasibility study which can be submitted in form of a proposal for obtaining approval is one on which the success of the whole digitization process strongly hinges.

This stage also involves identifying the tasks that are involved in building the digital collection, identifying the necessary resources such as staff (who might require training) and equipment that will be required during the process. The necessary strategies for handling the necessary tasks as well as setting timeframes within which the process will be accomplished are another aspect to consider at the planning stage. Some of the strategies include, handling the necessary tasks defining the source material that will comprise the digital library collection as well as their key attributes (Noerr, 2003). This is achieved by defining the main features of the digital library content to be built. Policy is critical at this stage as it will guide the type or the portion of material to be digitized in line with guidelines such as copyright restrictions and permissions which have been set.

It is critical at this stage to also plan for the necessary human resource that will be responsible for building the digital library. It is important at this stage to identify who will lead the project and how the work flow will proceed during the digitization project.

- **Implementation and digitization of documents stage**

This is the stage at which the actual process begins after the factors in the planning stage have been approved and all the necessary resources made available for the project to build a digital library commence. With all this in place, the project starts in the following stages that have been identified and adopted from the Cornell University Library Department (2000).

- *Registration of documents*

This is the first stage of the digitization project and involves the registering of documents before they undergo the scanning process. This is a very important exercise because it allows for the tracking of documents to ensure that they are not misplaced, lost, and necessary steps are not skipped during duplication especially when there are too many documents to handle. It is therefore important to come up with a file system for this process. A filing system also helps to keep track of electronic versions of files because of being misnamed or saved in the wrong file location or directory (DLF, 2001). A good file system can also be easily used by members of the project team who know where they are supposed to go to find particular files and also follow the work flow of the digitization process.

- *Documents scanning*

The scanning process begins with cleaning and dusting the documents to ensure that they are free of any dirt or dust particles. If a sheet feed scanner is being used, the document will have to be dismantled carefully so that the sheets of paper can be fed into the scanner individually and then the document can be rebound later. Another option to avoid dismantling the document is making photocopies which can then be scanned. Scanning a document on a flatbed scanner can be done by placing the document face down on the scanner platen or placing the pages in a sheet feeder (Ian, 2003).

- ***Document conversation using Optical Character Recognition (OCR)***

Scanned documents can be converted into text files that word processors like Microsoft Word can read using optical character recognition (OCR). OCR can be bought or downloaded as open source software (OSS). Examples of OCR are FineReader, OMNIPAGE Ultimate, OCRopus, etc (Noerr, 2003). The purpose of this software is to break the text blocks down into lines or individual character. It then tries to match the image of each letter against the patterns it recognizes as letters. This is the first stage in cleaning the document which has been digitized.

- ***Proofreading***

Proof reading through and examining the document to make sure the text and layout of the document is correct and if it is not, make the necessary corrections. This is done by comparing the scanned document with the actual document (hardcopy) and then making the necessary adjustments using a word processor. Another way can be printing the scanned document and comparing it with the actual document and then mark the corrections on the printout and thereafter enter them into the computer.

- ***Document Reformatting***

This is done to make the document more readable and attractive. OCR may be used to produce a document that consists of texts, no columns, no headers and footers. It can be used to place these into the document where they appear in a document and also change the typeface to make a document look more appealing.

- ***Final Document***

It is at this stage that the document that has been digitized is described so that users can identify it. It is at this stage that what is known as metadata needs to be added to describe each document. This is important for identifying the document. Books are described using the title, author (or editor), the publisher and publication date. Chapters of a book will also include this information but in addition state the chapter

of the book. Journals and newspaper cutouts will include apart from the information a book will have, the volume or date of or volume of the original document.

## **Institutional Repository Using DSpace**

The final document can be uploaded to the institution repository for access to users. DSpace is a good example of software that is used to for institutional repositories (IR). University of Zambia and Copperbelt University are currently using this software. Another reputable free software available for building and distributing digital content is Greenstone used by University of Zimbabwe and Muzuzu University in Malawi. However DSpace which is adopted in this paper is a free OSS which is widely used to build digital libraries and facilitates the organization distribution of the digital content onto the web and onto a network. Access to the digital library on DSpace can be provided online, on the Internet or Intranet. All a user needs to access the software is a web browser such as Internet Explorer, Mozilla or Google Chrome. DSpace works with the web browser in providing various digital library functionalities such as creating, organizing, maintaining, indexing, searching and retrieving of documents (Anunobi, 2008). It is however important that the necessary personnel receive adequate training in the use of DSpace before it is adopted for building the IR.

## **Digital Libraries as a Knowledge Management tool in academic libraries.**

Institutional repositories provide an opportunity for knowledge to be electronically preserved in digital form. The main objective of knowledge management in libraries is to promote knowledge innovation. This is vital because knowledge innovation is the core of the knowledge economy society (UNESCO, 2002). As a foundation of collection, processing, storage and distribution of knowledge and information through digital content, libraries represent an indispensable link in the scientific system chain which is an important link in the scientific innovation. Furthermore, libraries are a critical part in scientific research in which they directly take part. Digital content is therefore a component of knowledge innovation. It is for this reason that libraries in their role of diffusing and converting knowledge should aim to promote relationships among libraries, between libraries and users to quicken the knowledge flow.



## Conclusion

Academic libraries play a critical role in educating citizenry by making them become more knowledgeable, aware, imaginative and innovative. This is only possible if people have access to knowledge. Through knowledge, people are empowered. Academic libraries should therefore play a vital role in crossing the borders which is key to opening the gateways to knowledge. Digital content has created an opportunity for these gateways to be opened through the evolution of services that attract new users for libraries in the way they access knowledge. It has become necessary for academic libraries to integrate into their plans and policies of building digital content to maximize on their effectiveness for this reason. Though digitization is a complex process with a lot of critical stages, it gives the academic libraries greater advantage. The digitization process if followed effectively can help build a successful and sustainable digital library. This is important because libraries are in this era considered beyond being custodians of knowledge but also responsible for how knowledge is managed. In academic libraries the documents such as dissertations, theses, publications and reports are digitized to make them available online where they can be viewed by scholars, researchers and students. Knowledge technologies such as IRs are serving a global society in the knowledge economy where the traditional boundaries of time and space have dispersed and paved way for a world within reach of anyone who has the resources and the skills needed for seeking knowledge.

## **Acknowledgment**

A large part of the information in this article was taken from a proposal submitted to the Copperbelt University for the digitization project as well INASP Research and case studies for building a digital library at University of Zimbabwe.

## REFERENCE

- [1] Anunobi, C.U., Okoye, I.B.,(2008). *The role of Academic Libraries in universal access to print and electronic resources in the developing countries, Library philosophy and practice.*
- [2] Cornell University Library/Research Departments. (2000). *Moving theory into practice: Digital image for libraries and archives.* Research Libraries Group. Retrieved from <http://www.library.cornell.edu/preservation/tutorial>
- [3] Digital Library Federation, (2001).*Registry of digitized books and serial publication.* Retrieved from <http://www.digilib.org/collections>
- [4] Fabunni, B.A., Paros, M., &Fabunni, M. (2006).*Digitization of library resources: Challenges and implications for policy and planning. International Journal of Africa & African American Studies, 5 (2), 23 – 36.*
- [5] Ian, H.W., (2003), *How to build a digital library.* London: Morgan Kaufman
- [6] Lombardi, J.V. (2000). *Academic libraries in a digital age.,D-Lib Magazine 6 (10)*Retrieved from <http://dlib.anu.edu/au/dlib/october00/lombardi/10lombardihtml>
- [7] Noerr, Peter (2003). *The digital library tool kit.* California: Sun Microsystems
- [8] Pickover, Michele (2008). *The DISA project: packaging South African heritage as a continuing resource: content, access, ownership and ideology. IFLA Journal, vol. 34. no.192*
- [9] Rosenberg, Diana (2004). *Towards the digital library in Africa.*Retrieved from [www.emeraldinsight.com/0264-0473.htm](http://www.emeraldinsight.com/0264-0473.htm)
- [10] Tennant,R.(2000). *Selecting collections to digitize.**Library Journal, 125 (19),26*
- [11] UNESCO, IFLA & ICA, (2002).*Guidelines for digitization projects.* Retrieved from <http://portal.unesco.org>