

Title: **Digitization and Preservation of Academic Library Collections in Kenya: Issues, Opportunities and Lessons from Developing Societies.**

Sub theme: **Digital Archives/Preservation of documentary Information;**

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Abstract- Digitization can be described as the preservation of a library collection in a digital format to make the collection easily accessible and usable. Digitization is the process of converting documents and work of arts into digital image or conversion of hard copies to an electronic format. Digital preservation can be described as the process of preservation information in digital format to ensure durability, easy accessibility and even intellectual integrity. One of the main purposes of converting into digital format is to enhance access of information and knowledge and also to preserve the library collection for future generations. Digitization enhances information delivery since most users will not have to physically visit the libraries to search for materials. Most academic libraries have embraced digitization as the new trend in managing information materials and preserving their library collections, it has become one of the newest methods of managing information materials since this new technology is allowing users to access information from the comfort of their homes and offices. Digitization involves planning, funding and the process of digitizing. With the introduction of digital technology into the process of production and the storage of information most libraries are being made to go digital. Digitization has enabled users to access information for different purposes and has also ensured protection of information materials for their intrinsic value. Over the past years libraries are embracing digital preservation as a process of holding the electronic information and have even automated the library services, though in Africa digital preservation and digital development has been slow. Proliferation of electronic materials and the quest to access materials in remote areas are some of the reasons that have made digitization an important aspect in managing and preservation of information. Libraries are essential for academic institution, in order for libraries to promote teaching, learning and research they are expected to provide excellent information resources, digital preservation has totally revolutionized the way information is packaged, stored and disseminated and also how users are seeking and accessing the information they need. This paper aims to discuss the benefits of digitization and the issues that affect digital preservation in developing societies with particular emphasis on Academic libraries as its main objective. The research design is content analysis of case surveys of developing societies. This paper also attempts to uncover the challenges encountered by academic libraries in the digitization process. Some of the challenges include funding/economic challenges, legal aspects, and availability of skilled manpower, technological challenges and maintenance of the equipments for digitization. Other issues discussed has included the way forward to the challenges that have been mentioned while also considering the constraints that libraries and institutions have been working under. Digital preservation is one sure way of ensuring that libraries in Kenya contribute to the UN 2030 Agenda for Sustainable Development Goals (SDGs) to quality education by ensuring access of information and knowledge. The paper concluded that digital preservation is essential in modern day libraries because of the emerging trends in user behaviour, and that information managers must meet with the practical skills needed in order to implement the digital preservation process.

Key Words—Academic Libraries, Developing Society, Digitization, Information Materials, Library Collection, Technological Advancement,

INTRODUCTION

The 2030 agenda for sustainable development is a universal agenda that focuses on wiping out poverty through sustainable development by 2030. Education has been captured under goal 4 of the 17 SDGs, states. 'Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all'. Target number 7 under goal 4 states that, 'by 2030, ensure 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 culture of peace and non-violence, global citizenship and appreciation of cultural diversity and of culture's contribution to sustainable development.' (Nino, n.d.)

One major force that has been recognized as a major impact on the society is the digital revolution that has enabled the digitization of information materials. With most academic libraries embracing open source for delivering of information words like digitization have become common. Most academic libraries have adopted institutional resources as one way of reaching out to their users without the need for their users to come to the library physically. Digitization of information materials has led to access of information materials in large volumes. New technological advancements have also opened new horizons in terms of information creation, storage, access, distribution and presentation.

Digitization refers to all the steps involved in making historical collections and other materials available online. In the world of Information Communication Technology and globalization, digitization of materials is becoming the norm among libraries as they seek to contribute world (Jagboro, Omotayo, & Aboyade, 2012). There are two major forces that have been recognized as having major impact on the society. These are the internet which has led to digital revolution and the digitization of information from print to electronic format. These amazing technological advancements have opened new horizons for information creation, storage, access, distribution and presentation. The pace at which information sources have been produced and converted into an electronic form is marvellous (Shaheen & Alfia Fanilievna Abazova, 1999).

Digitization is one of the newest methods of managing information resources in the new information age, whereby information technology has assisted in making information accessible to people in their home (Pandey & Misra, 2014). Digital preservation ensures that digital information remains accessible and usable to the users. It involves the process of planning, allocating resources and use of computer technologies. Over time the goal of digital preservation is accurate rendering of authentic information, it also ensures that digital materials remain alive and usable and also ensures that materials can be accessed by many users at any given time. Traditional library materials in the form of books, papers,

manuscripts and documents are converted into electronic formats, while images are converted into digital representations using some type of scanning device so as to be displayed on the screen (Pandey & Misra, 2014).

Many academic libraries in developing countries have adopted digitization as a way of preserving information. While many libraries in developing world adopted to the challenges of global information explosion and the need to preserve useful information for prosperity, libraries in Africa and in the developing countries continually face serious problems in the digitization and preservation of their valuable information (Mapulanga, 2013). The demand for new and current information systems has necessitated the need for organization of information in such a way that it can quickly and easily access and retrieved.

Digitization has many benefits which may include support for preservation, access, institutional and strategic benefits, collection development, and research and publication (Anderson and Maxwell 2004). The major advantage of digitization is to enhance accessibility of information to a wider community. (Hughes, 2004). During digitization librarians should be able to select only the important materials for digitization. The uniqueness of the material, the demand for their usage and the physical fragility count in the digitization process (Anderson and Maxwell 2004).

Realizing that Africa cannot ignore digitization because of its resources and the knowledge-based economies of the world, academic libraries have engaged in the digitization projects to preserve heritage materials (Mapulanga, 2013).

With the emerging technologies in the way users are seeking information and delivery of information libraries have been forced to adapt to the new changes by adopting digital preservation digital preservation as one of the way of managing information. Digitization is one of the most important aspect of current global information trend, by fitting into the library and information services for effective information dissemination, preservation of information resources and facilitating the integration of library services into the learning process (Nnenna & Ume, n.d.).

The world is experiencing a paradigm shift from traditional way of documenting information to the new digital era. Digital preservation has drastically improved access to information materials as it has allowed users to search for information from anywhere at any given time. It has also lessened the burden of having to physically travel to go and find information. Academic libraries have digitized materials because they are aware of the continuing value of library resources for learning, teaching, research, scholarship, documentation and public accountability. (Pandey & Misra, 2014). Digitization has brought about online public access catalogue (OPAC) and the Institutional repositories. These

have made searching of documents easier and have also allowed to access the documents in other different formats like images and videos. (ibid)

Objectives of the study

This paper aims to discuss the benefits of digitization and the issues that affect digital preservation in developing societies with particular emphasis on academic libraries.

Digital Preservation

Digital preservation is the process whereby information is preserved in digital format to as to ensure that the information is durable, accessible and also usable. The storage, maintenance, and accessibility of digital object (include any material such as text document, an image file, a multimedia CD-ROM or a database) over a long term, usually as a consequence of applying one or more digital preservation strategies. (Russel, 1999).

Digital information has fundamentally reshaped the production, dissemination, use and re-use of information and knowledge in the society. (Evens & Hauttekeete, 2011). Digital preservation assures access to cultural heritage, but this accessibility is challenged by rapid technological and organizational advances. Owing to this dynamics (e.g. technological obsolescence), digital preservation should be seen as an ongoing activity (L, 2004)

Digitization has helped libraries in putting their documents in a secure place in their original format. This has ensured that only the authorized personnel can be able to access the materials. Digitization allows for the existence of a surrogate record or document thereby ensuring the original document is free from alterations, damage and even theft.

Digital preservation keeps the digital information in perpetuity, the real issue can also be termed as technical obsolescence.(Cleveland, 1998)

Why Digitization?

With the proliferation of information, poor funding in the libraries for acquiring new materials, there has been an increase in the request and need for library materials to be accessed remotely. The quest for collaboration, partnerships and resource sharing and the increase in the cost of preserving manual materials have been some of the forces driving libraries into digitization. (Pandey & Misra, 2014). The major reason for digitization library materials is to preserve the material especially the original document. When documents are digitized the original document is usually not used and as a result it is saved from wear and tear. There are library materials that are only copies in the libraries and need to

be preserved for the intrinsic value, and therefore digitizing such materials would ensure their historical preservation. Another reason for digitization is to ease the access of library materials. When a library collection is digitized it is accessible to a large group of users in any geographical area. And this also means that accessibility of digital materials is 24 hours.

Most scholarly journals have now gone to open access; this is because most authors now prefer to publish their works in the internet because of its low subscription costs. Open access publishing has picked up since the early 2000's when the annual average growth rate has been 18 percent for the number of open access journals (Hippenhammer, 2013). Change in user behaviour has also prompted academic libraries to go digital. Users have now shown an interest in the digital information. More and more library users now prefer to do their research online and this has made librarians come up with ways of satisfying their user's needs. Digitization has also helped solved the problem of browsing through so many books and table of contents. With digitization users only need to type in key words and search through the database. This also has the advantage of saving users time in searching for a document. Academic libraries have embraced digitization because of the continuing value of library resources for the purposes of learning, teaching, research, accountability, scholarship and documentation. (Pandey & Misra, 2014). Some of the reasons for digitization are;

- Preservation of library materials, this allows for the protection of the original document from wear and tear.
- Allow easier accessibility to the materials.
- Saves time for users when searching/browsing through the library collection.

The process of digitization is time consuming and takes a lot of money. It is therefore important to consider if digitization is a worthy course for the library. Therefore, the following are some of the reasons that should be considered before embarking on digitization.

Factors to consider before Digitization

It is important to consider if the information contained in the document is valuable. Value of a document may be based on the date of publication. If a document is out of date then it should not be digitized. Librarians should also consider the relevance the document to the library collection. Depending with the courses being offered in an institution then librarians should be able to digitize materials that are of relevance to the users. It is not all manual documents that can be digitized easily; therefore it is important to consider how easy it will be to convert the document into a digital format. Also consideration of factors like, will the digitization damage the item? It is also important to

consider the financial aspect. Most academic libraries are poorly funded and therefore before digitization it is important to consider where the money for the digitization project will come from. The audience for the digital collection is also very important. It is important to consider how the targeted audience will be able to access the collection. There are documents that have intrinsic value or the historical value. Such documents are important to preserve them in a digital format because of their heritage. The last thing libraries should consider before digital preservation is the policy. It is important to have a policy in place before embarking on digitization as it will be the guiding principle of the digitization process.

Benefits of Digitization/Digital Preservation

Digital preservation has a number of benefits.

Protects from theft and vandalism

Most academic libraries in developing societies do not have a security electronic system to prevent theft of information materials, by digitizing the library collection it prevents loss of materials. Digital preservation also ensures that most records are put in a secure place to prevent unauthorized access. This would mean that there is restricted access to the original document and that most users may end up using the digitized materials therefore preventing users from accessing the original document.

Preservation of materials with intrinsic values

Through digitization, materials which would have otherwise become extinct or obsolete are preserved for future reference or use. Overtime print materials when used for a long time they wear and tear but digitizing such materials helps in preservation of their life span. Historical materials which are valuable to a society are more likely to be lost or damaged thus making the future uncertain, there is need to preserve such materials for future references and use by generations to come.

Multiple accesses

Digital preservation allows materials be accessed by many people at the same time even in different geographical area. Digitization allows users to search for materials from anywhere in the world. It has also taken care of the issue of distance because users will not have to travel to the libraries to get the materials that they may need. *Digitization entails that the digital library would be open at any time for consultations of materials. Materials which have been put up on website will always be there for people to consult, except when erased by the website administrator* (Pandey & Misra, 2014).

Digitization has also helped in creating one point of accessing different types of library materials from different institutions.

Enhancement of service delivery in support of teaching and research

Digital collections can be accessed at any given time of the day. This means that that a researcher can be able to access the information any time they feel they want to do their research. Digitization also means that librarians can do a literature search for their users and email to their users the materials that they have found relevant for their users. Researchers only need to put their request through emails or ask a librarian. Digitization has improved efficiency in that researchers do not need to wait for long periods to get their results because librarians will only need to search through the library repository and get instant results. With the right key words one only needs to type what they want and by a touch of the button they get results instantly.

Saves on space

Traditionally libraries have been limited by shortage of space; digital preservation has the capability of storing more information. While a traditional would require shelves, boxes and cabinets for storage, digital storage would only require a repository or database for storage of the data. While a book shelf would hold a number of copies for users a database or repository would only require one copy of the material. Accessing records in digital formats requires a computer, in that a computer can be used by a number of people at the same time and also the space occupied by a computer cannot be compared to the space used by book shelves. Therefore digitization saves on space which could otherwise be used for other services.

Challenges Faced In Digital Preservation/Digitization

Most libraries have accepted the fact that they face a series of complex and difficulties in the choices they make based on the format of the materials that is to digitized. Some of the anticipated difficulties are financial resources, technical resources among others.

Funding/economic

Digitization is a very expensive venture that will require adequate planning and monitoring. (Fabunmi, Paris, & Fabunmi, 2009). Digitization will require enormous funding due to the type of equipment that will be needed for such a project. A well-funded digitization project assures new and improved services and sustainability of the project. (Nnenna & Ume, n.d.)

Most libraries in developing societies receive insufficient budget from the mother institutions, digitization will require ongoing sustainability that will require constant financial support. In the absence of financial support libraries may not be able to successfully work on a digitization project. According to (Jagboro et al., 2012) funding for the purchase and maintenance of modern and state-of-the-art digital equipment remains a major constraint.

Legal aspects

Most information managers are uncertain about the legal requirement that surrounds digital preservation. Any material being put up in the digital library will always require permission from the copyright holder. *Copyright matters are serious issues that digital librarians should always consider about. Research scholars usually include graphs, data from books and journals without prior permission of the author. In a digital library, users are always demanding back issues of journals and rare historical archives for which the library has no copyright. This may lead to serious dissatisfaction about digitization among users, as final solution to this matter; librarians must be given permission to digitize copyrights works in connection with digitization.* (Nnenna & Ume, n.d.)

Permission which would be granted would include digitization of works, storage of the digitized materials, moving of the digital images from one library to another, change file format, change storage and also delete the digital image. Copyright is a major factor in determining the materials for digitization, some of the issues that arise from copyright include copyright law and fair use.

Copyright and other related rights issues have remained as one of the major obstacles in digital preservation information. Intellectual property right presents obstacles at almost all stages of digital preservation. From the creation stage, selection stage, and even the selection of materials to be digitized, copyright has to be considered at all stages. Some of the issues that need to be considered when digitizing are how libraries can provide access to information while at the same time protect the copyright of the author. Increasingly restrictive intellectual property and licensing regimes have ensured that many materials never make it to the library collections for preservation. These are corporate assets and will not be deposited into libraries without substantive financial and licensing arrangements that few libraries will be able to afford. (Kuny, 1998)

Availability of skilled manpower

This is one of the major handicaps in the digitization process. The major problem is lack of technical-know-how; hence most digitization projects run into problems. (Fabunmi et al., 2009). Libraries in developing societies experience lack of technical expertise. There is shortage in the number of experienced personnel. Most libraries do not have systems librarians and therefore when the

equipment breaks down services come to a halt since there is no expertise in the library to work on them. This also leads to the disruption of digitization process. In many developing countries, human resources with appropriate skills, competences and attitude are not readily available to initiate, implement and sustain digitization project, and most African countries are still lagging behind in technological and telecommunication infrastructure. (Pandey & Misra, 2014).

Technological challenges

Most traditional librarians do not have the technological skills needed for digitization process. This has made it difficult for librarians to embrace the new technological advancements. According to Nnenna & Ume,(n.d.) ‘Due to inadequate skills in information technology in Africa, many traditional archivists are conservative and have phobia for computers. Because of generation gaps between the new and old professionals, computers are perceived as a threat to their status as experts.’

The fact that technology changes continuously also poses as a threat for the libraries that don’t adopt to new technological advancement. If the current technology being used by a library becomes obsolete then access to information becomes a challenge. According to Emmanuel Baro, Gboyega Oyeniran, & Ateboh, (2013) ‘Digital librarians have to constantly upgrade software and hardware from system to system as new technology warrants, and learn to adopt resource shaving in order to preserve materials.’ Technological advancement continues at a rapid pace. Devices, processes and software for recording and storing information are being replaced with new products and methods at regular three to five year cycle, driven primarily by market forces (Bulu & Panda, 2001)

There are also the usual power outages in developing states; this is a serious setback for the digital projects in these societies. According to (Pandey & Misra, 2014) ‘frequent outage constitute serious bottleneck to digitization in Africa. This has the effect in damaging digital equipment and where there is generating set the cost of running them is prohibitive.’

As a result archivists will be under pressure to try to balance collection management and upgrading operating systems, programming language application and storage media (Mudzaki, 2013).

Maintenance of the equipments for digitization

Maintenance of the equipment used in digitization poses a great challenge to librarians. Most of this equipment will need funds to maintain them. As earlier stated most libraries are poorly funded and therefore making maintenance of this equipment a challenge.

This equipment will also need an expert to maintain them, due to lack of technical-know-how this may also pose as a great challenge as there are no experts to repair the equipments when they break to

continuously maintain them. For efficiency and effectiveness in their performance these equipments will need continuous maintenance by experts. In absence of an in-house expert library may be forced to outsource for experts which in itself is an expensive affair.

Creating digital collections

One of the largest issues in creating digital collections will be building of digital collections (Cleveland, 1998). Creating a digital collection is not just about having library material in the digital format but also making the collection useful to users by making it seen and easier to access. In order to make the collection Cleveland (1998), states three methods of building a digital collection;

- *Digitization, converting paper and other media in the existing collections to digital format.*
- *Acquisition of original digital works created by publishers and scholars*
- *Access to external materials not held in-house by providing pointers to web sites, other library collections, or publishers' servers.*

Constraints That Libraries Have Been Working Under

Academic libraries in developing societies have been working under difficult situations which are mainly caused by lack of enough funds to run the libraries. Most university libraries are poorly funded and therefore cannot be able to fund a digitization project. Another constraint is inadequate power supply, poor internet connectivity and low band width.

Way Forward to the Challenges

Due to many challenges that libraries face in the process of digital preservation it has become important for libraries to come up strategies that would help in coping with the challenges that they are facing. One of the strategy for digital preservation is to preserve the digital information in the simplest possible digital format in order to minimize the requirement for specific retrieval software and to avoid problems of software obsolescence. (Hedstrom, 1997)

Migration

As new media and storage formats are introduced, the data can be migrated without any significant change in their logical structure. This approach has the distinct advantage of being universal and easy to implement. It is a cost-effective strategy for preserving digital information in those cases where the content is paramount, but display, indexing, and computational characteristics are not critical. (Hedstrom, 1997).

Migration of information will preserve the physical presence and the content, but it may not preserve functionality, presentation and content. Migration has not been tested in the management of complex multimedia objects. Migration is also time consuming, costly and complex.

Preserving Technology

Another strategy that would ensure an ongoing process in the access of digital objects would be to retain the old technology available for use. (Bulu & Panda, 2001). Librarians should ensure that documentary information is preserved in its original format so as to preserve the environment used to create and use the resources. This ensures that the material is accessible by preserving the access tools as well as the object itself. However issues of space, maintenance of hardware and cost may make this method difficult. (Bulu & Panda, 2001)

Emulation

Technology Emulation is another strategy that may be applied to counter the challenges of digitization. It is the process of creating new software that mimics the operation of older hardware or software in order to reproduce its performance. This has ensured that physical presence, content and digital objects could display original features and functionality available with the older software. (Bulu & Panda, 2001). Emulation is used to provide “backward compatibility” for digital objects in subsequent technological environment.(Bulu & Panda, 2001). Emulation is like the ‘just in time’ option whereas, in technology preservation we will have the necessary hardware and software ‘just in case’ (Russel, 1999).

Skilled Personnel

In this new era of technology and increasingly electronic records information managers will need new skills to manage these new records in form of electronic format. Some of the skills that information managers will require include basic ICT skills. Digital preservation is all about preservation of materials that are in digital format. This would mean use of institutional repositories and the database available for digital preservation. This will require staff to have knowledge in ICT to be able to create records in a digital format or convert records from manual records to digital formats. Induction of information technology in the pedagogical process has brought new challenges for academicians (Shaheen & Alfia Fanilievna Abazova, 1999), there is need for computer literacy among users and librarians.

CONCLUSIONS

Digital preservation is one way of meeting the present demands of information users. With the changing needs of users libraries have to embrace digitization in order to satisfy the needs of their users. The installation cost of the digital preservation process is usually very high but the maintenance cost is cheaper. The future of academic libraries will be dependent on the ability of the libraries to help in teaching, learning and research by being able to preserve most of their information in a digital format. In order to preserve the scholarly articles of their various institutions libraries should be able to digitize most of its scholarly materials. Most library users are using the internet for their researches and if librarians need to meet the needs of such users they will need to move with the new trend of users. Search engines such as google are user friendly and that is one of the reasons that most users find it easier to use google, libraries need to come up with ways electronic data bases more user friendly and easier to use so as to encourage users to use the. Libraries have been tasked with responding to the demands of the new era. It is also the duty of the librarians to advocate for the funding towards digitization, this means that they should market the digitization concept to the university management to make the management see the benefits and importance of digital preservation.

SUGGESTIONS AND AREAS FOR FURTHER RESEARCH

Libraries should be able to come up with policies and procedures that would help in establishing a mechanism for moving into the digital era. Workshops and trainings should be held for librarians on digital preservation. This will equip them with the necessary skills required for the digital era. Also digitization should be added as a unit, course or area of specialization for students pursuing Information Science

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