Developing a strategy and action plan for sustainably digitising specific special collections: a case of Buganda Kingdom collection at the Makerere University Library, Uganda

Mini-dissertation by

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DECLARATION

I, Patrick Sekikome, declare that this mini-dissertation is as a result of my own work and that I have acknowledged and referenced all the sources that have used. I am confident that this work is original and has never been submitted for any academic award to any institution.

Patrick Sekikome

Date: 7th November 2016

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DEDICATION

To the entire family of the late Josephat Mwebe.

ACKNOWLEDGEMENT

ABSTRACT

The focus of this study was to develop a strategy for sustainable digitisation of the Buganda kingdom special collections at Makerere University Library, Uganda. A number of questions were formulated to guide the researcher in finding answers to the research question.

A literature review based on the research sub-questions was carried out. The review covered the approaches used when planning digitisation projects. These included the selection criteria, processes and technology requirements for digitising archival materials, resource requirements for sustainable digitisation initiatives, skills and competencies, possible framework for digitising archival materials, an overview of the Buganda Kingdom collection as well as the current digitisation equipment available at the Makerere University Library.

The study took a qualitative approach with a case study design. This was due to the need to collect in-depth and detailed views and experiences regarding digitisation projects. A purposive sampling technique was used to identify three institutions, located within the Kampala area, which are actively involved in digitisation of collections. Data were collected, using semi structured interviews, from three participants; one from each institution. The participants were selected because of their knowledge about digitisation and semi-structured interviews were preferred due to their flexibility. An interview schedule was used as the data collection instrument. Data was transcribed into Microsoft Word and later entered into Microsoft excel for easy analysis.

For ethical considerations, the researcher obtained clearance from the University of Pretoria and sought the consent of the participants before data were collected.

Findings that answered the research question and sub-questions were presented and interpreted in chapter four and conclusions as were well recommendations discussed in detail in chapter five of this research report

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LIST OF ACRYNOMYNS

CPD	Continuous Professional Development
CSIRO	Commonwealth Scientific and Industrial Research Organisation
CSV	Comma-Separated Values
CUUL	Consortium of Uganda University Libraries
DL	Digitising Line
DOI	Digital Object Identifiers
DPI	Dots Per Inch
HE	Higher Education
ICT	Information and Communication Technology
IFLA	International Federation of Library Associations and Institutions
ISO	International Organization for Standardization
IT	Information Technology
KNUST	Kwame Nkrumah University of Science and Technolog
LAN	Local Area Network
N.D.	No Date
NCHE	National Council for Higher Education
OAIS	Open Archival Information Systems
PDF	Portable Document Format
PURL	Persistent Uniform Resource Locators
TIFF	Tagged Image File Format
UNESCO	United Nations Educational, Scientific and Cultural Organisations
URN	Uniform Resource Names

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1. CHAPTER ONE: INTRODUCTION TO THE STUDY

1.1. Introduction

Scholarly communities are changing their habits and orientation by preferring to access documentation in electronic format. This allows librarians to play a leading role as access mediators (Genoni et al., 2006; cited in M'kadem and Nieuwenhuysen, 2010: 138). Digitisation has also introduced new options for preserving and conserving materials by reducing physical contact between users and fragile objects. It has also introduced new methods of access by providing simultaneous access to scholarly research and allows global access to special collections (Smith, 2006:3).

Makerere University Library has a huge collection of special materials like the archival materials but users have not yet enjoyed the benefits provided by digitisation due to absence of a strategy and action plan for sustainably digitising specific special collections. The digitisation of special collections at Makerere University Library has been complicated by issues related to limited financial and human resources and expectations that are larger than the available technology and expertise. As is the case elsewhere (Prochaska, 2009:13), the task of selecting materials worthy of digitisation has not been an easy one, thus prompting the researcher to seek a long term solution to the deteriorating, yet valuable Buganda kingdom archival collection at Makerere University Library.

Digitising must therefore have clear goals and a well-established strategy. It should aim to reduce the handling of fragile material (Southwell and Slater, 2012:457) and enhance the possibility of access to what previously was not accessible (Paul and Singh, 2014: 222). It should also consider the protection of the material from all kinds of risks and foster research. The study therefore aimed at developing a strategic action plan that would lead to the digitisation of valuable archival materials. This would in turn improve the way in which students and scholars at Makerere University; Uganda as a whole and researchers around the world access archival literature. Access could be either for research and study or simply for appreciating the beauty embedded in the Buganda Kingdom's cultural collection. Furthermore, by offering access to the special collection through Makerere University's Institutional Repository, the study would raise awareness of the rich archival collection among national and international scholarly communities that would form a basis for

conducting further or similar studies in related fields - similar to what was established in Morocco (M'kadem and Nieuwenhuysen, 2010: 138).

1.2. Central research question and sub questions

1.2.1. Research question

With the background provided in the introduction (section 1 above) the research aimed at answering the following question:

What elements should be included/ adopted in the strategic plan/approach and action plan to sustainably digitise the archival collection of the Buganda Kingdom?

This main question was underpinned by several sub-questions as indicated in the next section.

1.2.2. Formulation of sub-questions

1. What are the various strategies/approaches that could be used when planning archival digitisation projects?
2. Given the unique context, which strategy would work best when digitising the Buganda collection?
3. Once the approach is identified what selection criteria, to select specific archive artefacts for digitisation, could be applied?
4. What are the requirements for sustainable digitisation initiatives?
   a. What are the operational requirements for digitising archival collections?
   b. What processes (action plan) are required to be put in place to sustainably digitise the Buganda Kingdom's specific special collection?
   c. What is the technology infrastructure requirement?
5. What skills are required to make the project successful?

The above sub-questions resulted into the developing of a strategic and implementation plan as presented in section 5.4 and 5.5 respectively and shall be presented to the library management for endorsement.

The study was clearly demarcated for the researcher to focus on the areas of interest as indicated in section 1.3 below.

1.3. Demarcation of the field of study

Makerere University Library is a legal deposit centre and materials deposited are kept in the Africana section. Materials deposited include books written on Uganda or by Ugandans, audio-visual materials, newspapers and Buganda Kingdom archival materials.

The research focused on establishing a strategy/approach for sustainably digitising the Buganda Kingdom special collections maintained in the Africana Section of Makerere University Library.

The Buganda Kingdom archival materials, at the Buganda headquarters, were destroyed during the struggle for power after independence - making these materials at the Africana section the only point of reference. These materials were given priority because they are originals and one copy each meaning that they cannot be replaced once lost or damaged due to over usage or theft as noticed by Kusekwa (2012:11) in his study.

The materials from the Buganda Kingdom collection include handwritten diaries of Buganda Kingdom officials, correspondence between the Buganda Kingdom officials and the protectorate government and documents relating to allocation of land to different chiefs by the King of Buganda, among other documents. Documents related to land allocation are vital because the King of Buganda used to allocate land to different chiefs and recently there have been many land ownership disputes in Uganda

There is a variety of materials within the library that need to be digitised for example architectural plans, theses and dissertations but this research was limited to archival materials in paper and photograph forms. These were excluded from the Buganda Kingdom collection due to inadequate equipment and limited man power.

1.4. Justification for the research

As indicated earlier, in section 1.3, the Buganda Kingdom materials are originals and one copy each – a situation which holds the risk of complete loss due to over usage or theft. The researcher carried out the study to develop a strategy and action plan for a sustainable digitisation project. The outcome of the study was, therefore, a strategic plan (refer to section 5.4 of chapter five) that should guide the digitisation of the Buganda Kingdom collection maintained at Makerere University Library. Digitisation is intended to reduce physical contact of the original copies while making them more accessible to scholars, academics and the general public in a digital form. This should be done through uploading the digital content into the Makerere University's Institutional Repository. This is also intended to increase the university's online visibility and hence contributing to the University's webometrics ranking, by presenting a unique collection to the world.

The study identified approaches that could be used when planning digitisation projects. This is a new field of study at Makerere University and Uganda in general. Librarians from other institutions should thus be guided by the findings of the study when digitising their institutional collections. Researchers should be able to conduct related studies based on recommendations as indicated in section 5.6 of chapter five.

In order for the researcher to get clear insight into the topic under study, an overview of the literature was done as indicated in section 1.5 and expanded upon in chapter two of the research report.

1.5. Overview of the literature

It was established that there was no shortage of relevant literature to use. Only a few of the resources were mentioned below. The literature reviewed was structured according to sub-questions. Themes and sub themes were further developed in chapter two of the research. Below are the broad outlines and the details are discussed in chapter two of this research report:

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1.5.1. Approaches to follow

According to Smith (2006:10), researchers do believe that due to limitations in time and costs, the special collections cannot be "digitised in their entirety" and as such, approaches have been developed to guide the selection of materials for digitisation. These include:

- Materials- Based Approach
- Collections- Based Approach
- Disciplines- Based Approach

These approaches are further discussed in section 2.2 of chapter two

1.5.2. Selection criteria

Once an appropriate approach has been identified, there is a need to set the criteria for selecting materials for digitisation. Chmielewska and Wrobel (2013:326) identified uniqueness, value, issues of copyright (Vogt-O'Connor 2000 cited in Kusekwa, 2012:28) as factors to consider when selecting materials for digitisation. Riley-Reid (2015:4) conforms to the issues of copyright and adds sustainability and technology obsolescence as matters of concern when planning the digitisation work.

1.5.3. Sustainable digitisation projects

Maron and Pickle (2013a:21-24) identified six factors in the form of strategies for sustainably managing digitisation projects which include:

- Strong and dedicated leadership,

- Developing the value proposition through understanding the audience,

- Managing costs,

- Identifying diverse sources of funding,

- Setting metrics for success and assessing progress towards goals,

- Aligning with the host institution's mission.

1.5.4. The digitisation process

Federal Agencies Digitisation Guidelines Initiative (2009:3) summarises the processes necessary for conducting and managing digitisation projects. These include: selection, assessment, and prioritisation; project planning, management and tracking; copy status and records management; preparation of originals for digitisation; metadata creation and management; digitisation; data collection and management; and assessment and evaluation. However, there is a missing stage of providing access to the digitised content (Riley-Reid, 2015:4), a stage skipped by most institutions thus rendering the digitised content inaccessible. This gap was covered by this research under the recommended steps indicated in section 5.3.3 of chapter five.

Technology and skills are vital in the digitisation process. A brief overview of the technology requirements and the necessary skills are highlighted below.

1.5.5. Technology and skills required for digitisation of special collection

Storage, management and provision of access to digitised content were identified by Federal Agencies Digitisation Guidelines Initiative (2009:22) as part of the infrastructure required in digitising archival collection. Kusekwa (2012:21) identified scanners as the basic technology for digitisation projects. He went further to identify digital cameras, scanners and film scanners as appropriate for digitising materials and scanners can be selected based on the type and nature of materials to be digitised. Puglia, Reed and Rhodes (2004:1) noted that there must be the inclusion of people doing the actual scanning such as technicians and photographers as one of the primary audience for the digitisation project. Maron and Pickle (2013a:19) made it clear that the library must endorse the position of an archivist who should be part of the digitisation process to provide expertise in the selection and management of special collections.

However, elements of a sustainable digitisation strategy cannot be identified without a well-designed methodology. In order to yield positive results and meet the research intent, the research needs to be conducted systematically. For this to be achieved, the researcher needs to design an appropriate methodology. This is discussed briefly below and covered in detail under chapter three of this research report.

1.6. Research Methodology

There are two commonly used research paradigms - as is highlighted by Sarantakos (2005:47). These are qualitative (textual) and quantitative (numerical) research paradigms.

This study took a qualitative research approach with a case study design. This was due to the need to collect in-depth and detailed views and experiences as described by Babbie (2010:309) regarding digitisation projects. A purposive sampling technique was used to identify three institutions which are actively involved in digitisation located within the Kampala Area. Responses were collected from three participants; one from each institution using semi structured interviews. These participants were selected due to their knowledge about digitisation and semi-structured interviews were preferred due to their flexibility as Kombo and Tromp (2006:92) explained. An interview schedule was used as the data collection instrument. Data was transcribed into Microsoft Word and later entered into Microsoft excel for easy analysis.

All ethical issues were addressed where the researcher obtained clearance from the University of Pretoria and sought the consent of the participants before data was collected. Further details are provided in chapter three.

A well designed research methodology resulted into the collection of evidence based on findings that were valuable in different ways as highlighted in section 1.7 below.

1.7. Value of the study

There is a lot of information being generated by government ministries, institutions as well as by private individuals (Asogwa, 2011:2). This information is in high demand online but still maintained in the analogue form due to the absence of a digitisation strategy. The findings of the study and the subsequent recommendations identified the potential approaches, selection criteria, skills and the technology required and technical requirements for digitisation to take place as further discussed in chapter four. These could be used as a basis for other academic institutions and government parastatals to also digitise their collection.

The researcher developed a proposed digitisation strategic plan at the end of the study that could also be adopted and applied in different sections of the Main library for digitisation of other special collections which were excluded from this study.

The findings of the study resulted into recommendations that could act as a basis for scholars to conduct further studies and add to the available body of knowledge in the field of digitising special collections.

The values of the research can easily be understood when operational terms are defined. There were mainly two operational terms as used in the study that were clarified for the readers to have a proper understanding of their meaning. These two terms were clarified below.

1.8. Clarification of key terms

1.8.1. Digitising

Digitising is defined as the creation of digital objects from physical originals (Federal Agencies Digitisation Guidelines Initiative, 2009: 4; Paul and Singh, 2014: 22).

The above definition was adopted for purposes of this study as it excludes the objects which are "born digital" which the researcher intended not to consider.

1.8.2. Archival materials

Love and Feather (1998:215) cited in Agyen-Gyasi (2011:67); Potter and Holley (2010:148) and Dooley and Luce (2010:16) define special collections "as collections of materials which are distinguishable by their age, rarity provenance, subject matter or some other defining characteristics housed in a separate unit with restricted access".

The researcher found the above definition to be comprehensively defining the archival materials.

The mini-dissertation is composed of five chapters which each chapter covering specific elements. These elements contained in each chapter are highlighted in the section below.

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1.9. Division of chapters

Chapter one is considered as an introductory chapter and it comprises the background information about the research; the research question and the sub-questions; scope and limitations; justification of the study; overview of the literature; research methodology; value of the study; clarification of operational terms and an outline of the chapters as will be covered by the mini-dissertation.

Chapter two puts emphasis on the available literature on the subject. The researcher reviewed the various approaches that could be used when planning digitisation projects. Literature related to the criteria for selecting specific archive collections for digitisation, the requirements for sustainable digitisation initiatives, operational requirements for digitising archival collections, processes required to be put in place for the digitisation of archival collections, technology infrastructure requirements, skills and finally the strategy needed to ensure the sustainable management of digitised archival materials, will be investigated and results reported. A draft strategy for sustainable digitisation was developed from literature and preliminary selection criteria identified.

Chapter three covered the methodology that the researcher used to conduct the study. This chapter discussed the research paradigm with emphasis on qualitative paradigm; research design; data collection methods used and the relevant instruments; population of the study and sampling process and highlighted the steps in data analysis.

Chapter four focused on the analysis and interpretation of the study findings and it is upon the findings that the researcher was guided to develop the actual strategic plan for sustainably digitising the archival collection of Buganda Kingdom.

Chapter five was the final chapter and it covered the summary of the findings, conclusions and recommendations meant to ensure sustainable digitising of the Buganda Kingdom collection at Makerere University Library.

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1.10. Conclusion

Makerere University Library has a huge collection of special materials that needs to be digitised. However, the available resources cannot allow for the digitisation of the entire collection, hence the need to put in place a sustainable strategy and approach for preservation and access to the material.

This chapter has given an indication of the process that was followed while conducting research into a sustainable option that Makerere University should follow when considering to digitise one of the special collections: the Buganda Kingdom collection.

2. CHAPTER TWO: LITERATURE REVIEW

2.1. Introduction

Special collections, for a long time, have been of great historical and archival value to academic libraries (Agyen-Gyasi, 2011:67). The role played by special collections has become significantly important to the extent that they have attracted the attention of librarians, information scientists and researchers in different fields (Agyen-Gyasi, 2011:66).

Digitised special collections offer expert users greater access to rare and archival materials (Maron and Pickle, 2013b:5). Librarians are placing emphasis on digitisation to increase access for users via the web (Maron and Pickle, 2013a:4; Rafiq and Ameen, 2013:43). It is also claimed that The archival materials and other special collections give "unique research strengths and distinction" to libraries; a case in point is Kwame Nkrumah University of Science and Technology (KNUST) Library as justified by (Agyen-Gyasi, 2011:67).

Digitisation in libraries is carried out for several purposes such as promotion of online access/electronic accessibility (Doculabs, 2009:2), republishing, re-use of the material, opening up of formerly closed collections, and digitising as demanded by the users (Groenewald, 2013:4).

The researcher, therefore, found it justifiable in this chapter to identify the different approaches used in planning digitisation projects, criteria for selecting materials for digitisation, review the requirements and other technicalities necessary for making the digitisation of special collections a success. The chapter is arranged into seven sections and related subsections, which address specific topics as discussed below:

2.2.   Approaches used in planning digitisation projects

CSIRO (2012:33) cited inadequate resources as one of the challenges that prevent the digitisation projects from being initiated. This, therefore, calls for an appropriate approach to be used in selecting the collections to be digitised as the available resources, in most cases, do not favour the digitisation of the entire collection.

Smith (2006:10) described several approaches which can guide the selection of materials for digitisation depending on the nature of the library and the resources available. These include:

2.2.1. Materials-Based Approach

Reed-Scott (1999:10) cited in Smith (2006:10) describes a materials-based approach as an approach where the "digitisation priorities are assigned to those materials considered most at risk within an individual institution's collections". The approach considers materials at most risk of deterioration as the case may be with the National Library of New Zealand (2010:4) and in the poorest state and highly demanded by users. Burrows (2000:146) cited in Smith (2006:10) criticised the materials based approach for eliminating materials that could be of value to researcher thus paving way for collection based approach.

2.2.2. Collection-Based Approach

In the collection-based approach, a unique or important collection is identified and digitised as a whole. This approach is criticised by De Stefano (2001) cited in Smith (2006:10) for lack of selectivity which results into inclusion of rarely used collection in the digitisation process which is very expensive and inappropriate. It can also lead to information overload as the collection is digitised in its entirety (Burrows, 2000:146 cited in Smith, 2006:10).

2.2.3. Discipline-Based Approach

The discipline based approach is user centred where the experts in a particular discipline together with librarians prioritise the collection to be digitised in a particular discipline. Scholars and researchers' input is vital in this kind of approach (Reed-Scott, 1999:10 cited in Smith, 2006:10). However, it is not commonly practiced due to the multi-diversity in user needs as observed by De Stefano (2001) cited in Smith (2006:10).

2.2.4. Formatting Decisions Approach

With formatting decisions, the librarians choose the special collections to digitise based upon the format of the digital files. Librarians are living in an environment of rapid technological developments and they have to continually respond to change (Graham, 1996:322 cited in Smith, 2006:10). Kennedy (2005) as cited by Smith (2006:10) noted that "digital files will

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require repeated reformatting over time, and expressing the need for deep curatorial commitment on the part of collection management and preservation departments" of the library. However, this approach may not apply to Makerere University Library as most of the collection for Buganda Government are still in paper form but may be applicable at a later stage when most of the collection is converted into digital.

In addition to the above approaches, there are also the selection criteria that can be based on to identify materials for digitisation. The criteria are discussed below:

2.3.   Criteria for selecting specific archival collections for digitisation

Selecting materials for digitisation is considered to be the most difficult stage in the entire digitisation process (Prochaska, 2009:17) especially when the library is faced with high demand and limited resources (IFLA, 2014:7).

Care should be taken when selecting materials for digitisation as not all materials held in a specific collection necessarily require to be digitised. Anderson and Maxwell (2004) cited in Mapulanga (2013:636) observed that the materials which are unique and physically fragile in nature are worthy of being selected for priority digitisation.

Baro, Oyeniran and Ateboh (2013:23); Birrell, Dobreva, Dunsire, Griffiths, Hartley and Menzies, (2011:33); Rafiq and Ameen (2013:42); Paul and Singh (2014:227) identified a number of factors that can guide the library in selecting materials or digitisation. These are summarised as the following criteria used in the selection of materials for digitisation:

- Demand and frequency of use of the material. (This was given emphasis by most authors (Asogwa, 2011:6-7; Mapulanga, 2013:636). However, Cullen (2001) cited in Smith (2006:10) stated that in most cases, high demand for a material does not translate into its value thus concluding that research value should also be given consideration while selecting materials for digitisation.
- Reduction of damage to the original.
- Preservation of materials.
- Saving of library's physical space.
- Age of the material.

- Increasing access to the material.

- Academic importance

- Historical value.

- Uniqueness or rarity of the material.

In addition Chmielewska and Wrobel (2013:326) suggested that any digitisation project should put emphasis on materials of value to the national heritage that promote history and culture of a particular region. Taking this research case study into consideration, emphasis should be put on those materials that promote the history of the Buganda Kingdom; also considering materials that support the curriculum of the university.

The issue of copyright and intellectual property rights is worthy considering when selecting materials for digitisation. Kusekwa (2012:45) advised that it is important to select materials whose copyright and intellectual property rights are owned by the institution intending to digitise. Buganda Kingdom transferred the copyright to Makerere University Library upon the deposit of its collection and as such, the library has got full rights to digitise and provide access to the collection.

Birrell…et al (2011:37) graphically illustrated the criteria that can guide the selection of materials for digitisation as shown in the figure below:

Figure 1: Criteria for selecting materials for digitisation
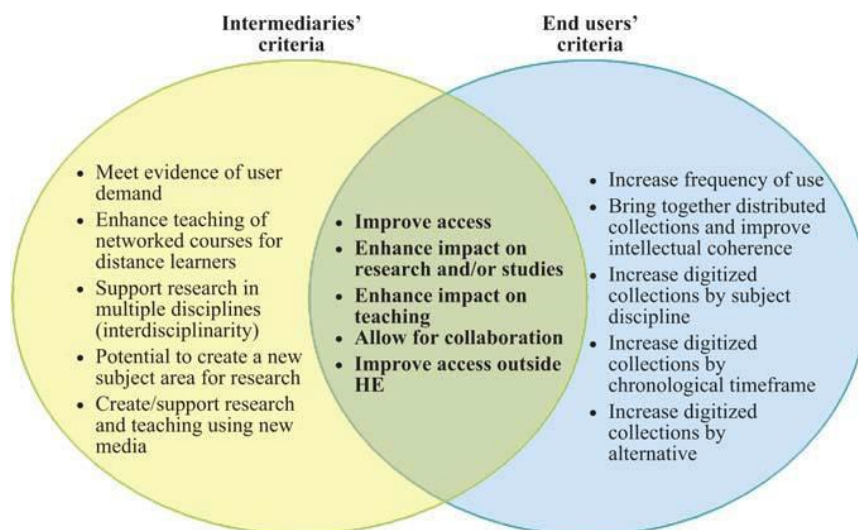
(Source: Birrell…et al, 2011:37)

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In figure 2 above, five cross cutting factors that librarians should consider when selecting materials for digitisation are highlighted. These factors intersect between the intermediaries' criteria and the end users' criteria and they include i. to improve access, ii. Enhance impact on research and/or studies, iii. Enhance impact on teaching, iv. Allow for collaboration and v. improve access outside higher education (HE)". These factors should be given priority during the selection phase of the materials to be digitised.

2.4. Process and technology requirements for digitising archival collections

This section is subdivided to provide details regarding the processes, technology and material type / format requirements.

2.4.1. Processes/stages involved in the digitisation of archival collections

The success of digitisation projects in academic libraries does not depend on expensive technology, but rather on well established procedures and purposefully designed effective workflows (Asogwa, 2011:6-8). This will also be true for libraries in Africa!

IFLA (2014:4) indicated that "While many libraries have procedures in place for participating in mass digitisation projects, the needs of unique, rare, and non-print format materials require special consideration and different procedures". IFLA (2014:9) adds that the process of digitising a specific collection is handled differently by different institutions but the basic procedures remain the same. The point then is to establish exactly what these processes and procedures are.

Federal Agencies Digitisation Guidelines Initiative (2009:11-12; Asogwa 2011:6-8) identified a number of processes necessary for conducting and managing digitisation projects and the subsequent activities involved therein. These processes are discussed below:

i. Selection, assessment, and prioritisation aimed at determining the materials to be digitised, particular projects to be approved and prioritised.

ii. Determining the access and or use restrictions and copyright, physical conditions of the archival materials to be considered for digitisation, appropriate approach to digitisation and metadata. Groenewald (2013:5) concurs with this stage and adds

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that if the copyright issues are not settled, the institution should not go ahead with digitising the material.

iii. Review and approval of the digitisation projects, technical and metadata approaches. At this stage, Asogwa (2011:7) states that good metadata helps in identifying the digitised work as well as other descriptive information related to the digital files.

iv. Project planning, management and tracking that involves determining the required as well as the available resources for the intended project, clarification about the coordination activities of the project and finally how records will be tracked throughout the digitisation project. To Asogwa (2011:6), planning enables the library to identify risks and opportunities to make the entire project a success. In planning, necessary steps taken in digitising are stated and the gains of digitisation are identified. Project goals and objects are also spelt out in the planning stage.

v. Digital copy status and records management which covers the review of reasons for digitisation and evaluation of the status of the originals; determining appropriate metadata and updating the status of the original records to be digitised.

vi. Preparation of the originals for digitisation and this stage includes both archival/bibliographic and preservation preparation. This is followed by assigning of metadata and identifiers for standardisation purposes.

vii. Digitisation and verification of digital copies. Having selected the materials for digitising, the next step is to verify whether the digital copies of the selected materials already exist. Ayris (1999) cited in Asogwa (2011:6) supplements that librarians should avoid duplication of efforts by not digitising materials whose digital copies already exist. Contrary to this, the University of Michigan (2014:1) recommends that at least two or more copies of the digital files should be made such that one copy is stored offsite to ensure long term access. At the digitisation stage, Chapman and Leonard (2013:410) add that there are quality control visual checks which need to be made. These include image skew and orientation; order; missing and or duplicated scans; filing, type; size and dimension. Similarly the Government of Alberta (2013:5) advised that quality control checks should be

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documented in the digitisation procedure manual so as to eliminate the risks associated with insufficient image quality and inaccurate indexing information.

viii.   Submission of digital files to "access and delivery systems" as well as to institutional repositories for storage and access. The Government of Alberta (2013:4) emphasises the need to rescan/recapture if the image quality fails to meet the quality assurance checks before they are submitted to any access and delivery systems.

ix.   Data collection and management that includes among others link digital files to appropriate Information Technology systems. Once the stages are identified and adopted, it is essential to identify the necessary and required technological infrastructure to drive the digitisation process. The technology infrastructure for digitisation of the archival materials is discussed in the section below.

2.4.2.   Technology infrastructure requirements for digitisation projects

CSIRO (2012:54) stated that the technology required for digitisation projects differ depending on a number of factors that include:

- Resources available in terms of budgets, number of staff members involved in the project, storage for the digital files and currently available equipment.
- Materials/objects to be digitised as particular objects require specific equipment.
- Type of digital conversion for instance photographic or video conversion.
- Nature of the digitisation project undertaken that is whether digitisation is to enhance the current digitisation activities or to digitise an existing collection.
- Estimated timeframe of the project that is long term digitisation projects require high throughput technology to accomplish the tasks in the set timeframe while short term projects require low throughput equipment.
- The general approach selected to digitisation for example use of volunteers of archivists.

Federal Agencies Digitisation Guidelines Initiative (2009:22) categorised the Information Technology requirements for digitisation as infrastructure relating to access and storage. For this case, Vrana (2011:591) states that "successful completion of digitisation projects requires a good technological infrastructure".

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In terms of access, Federal Agencies Digitisation Guidelines Initiative (2009:22) states that there is a need for IT infrastructure that:

- Enables access to digital files and metadata by both the public through online access and to staff within the library and the university at large for purposes of research, exhibition and publication.
- Provides a central IT workspace so that copies of the digitised materials can be made accessible to all staff during the work process for purposes of proper description and quality control. However, Groenewald (2013:20) stated that it is not advisable to rely on only one person for quality control as this might bring in several errors in different stages of the digitisation process.
- Facilitates migration of digital files and metadata into other systems for access, display and presentation
- Reduces duplication of digitisation efforts by identifying "new digital versions in management systems"
- Assign and/or register identifiers.

For Storage, there is need for infrastructure that:

- Stores, manages and provides access to digital copies.
- Manage data migration issues.
- Ensures the integrity of data, disaster recovery and the authenticity of the digital files created.
- Plans and budget for systems upgrades.
- Updates metadata and digital objects.
- Defines server requirements and develop configuration management plan.
- Manages network security issues.
- Ensures systems documentation.
- Site licenses and hardware/software maintenance contracts.
- Performs backups and redundancy to ensure data integrity and
- Disaster recovery.

Vrana (2011:591) states that "successful completion of digitisation projects requires a good technological infrastructure". A number of technological requirements were singled out that covered:

- Web servers,
- Scanners, and
- Digital cameras.

Each of these is mentioned in some detail below:

2.4.2.1. Web servers

Web servers are defined as computers/systems that deliver information in form of web pages to the end users via the internet (Beal, 2016; Techopedia, 2016). A study by Kusekwa (2012:62) indicated that the library need a web server in order to store the digitised archival materials for long term storage and access that forms part of the purpose for which digitisation is carried out. Maron and Pickle (2013b:44) advise that libraries should have more than one server to ensure offsite storage of digital copies to eliminate risks associated with data loss in case of any disaster.

2.4.2.2. Scanners

In terms of scanning, Peterson (2005:1) noted that the type of scanner, the technical capabilities of a scanning system and the budget for the scanning equipment are essential in selecting appropriate technology for the planned digitisation project. Flatbed scanners, digital camera and a film scanner were considered as suitable for digitising photographs. IFLA (2014:10) on the other hand recommends high-resolution digital cameras for "medieval manuscripts and other materials for which researchers will want to study minute details" while special book scanners were recommended for digitising printed books. Kusekwa (2012:21) identified several scanners which can be used to digitise different kinds of materials. Some of these include a Digitising Line (DL 3000) scanner suitable for bound works and is equipped with "an automatic page turning system" which can scan up to 2500 pages per hour". Flatbed scanners were also identified as being appropriate for the digitisation of unbound documents.

2.4.2.3. Digital cameras

As earlier stated by IFLA (2014:10), digital cameras are suitable for digitisation of "medieval manuscripts and other materials for which researchers will want to study minute details"

The BookDrive DIY book scanner is an example of the technology that uses digital cameras which are mounted on either sides of the book cradle for purposes of producing high quality images as indicated in the figure below.

Figure 2: Book scanner

Source: Atiz (2015:1)

The book scanner presented in figure 1 above is suitable for large newspapers and text books but not appropriate to correspondence, photographs and other archival collection hence the need for particular type of scanners as discussed in the subsequent section.

It is important to note that specific materials selected for digitisation require specific kind of technology as not all technology is fit for all special collections. It is, therefore, worth identifying specific technologies for digitising specific material types as discussed in the next subsection.

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2.4.3. Specific requirements linked to material types

There is a need to identify particular requirements that are suitable for materials that the library intends to digitise and those that best suites the goals of the digitisation project (IFLA, 2014:10).

Taking prior knowledge regarding the Buganda collection into consideration the requirements for only paper based documents and photographs are discussed below:

2.4.3.1. Paper based documents

Puglia, Reed and Rhodes (2004:46); Oregon Institute of Technology (2012:1) stated that 600 dots per inch (dpi) and1-bit text setting are considered to be ideal for text based documents which need to be converted into searchable text and appropriate for archival purposes as documents do not become obsolete with data migration or any change in technology.

When colour is considered important for the production of the most accurate representation of the text based document, scanning in colour is recommended (Puglia, Reed and Rhodes, 2004:47; Oregon Institute of Technology, 2012:1) especially when the document contains some features such as the stamp and seal as indicated in the figure below.

Figure 3: An archival document

(Source: Puglia, Reed and Rhodes, 2004:47)

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IFLA (2014:10); Crown (2016:7) recommended "high-resolution digital cameras" for the digitisation of handwritten manuscripts and other printed collection for which scholars would need to study minute details. The use of "Special book scanners" was also recommended for the digitisation of a wide range of printed materials.

2.4.3.2. Photographs

In terms of equipment, IFLA (2014:10) and Crown (2016:7) recommended a flatbed scanner as being suitable for the digitisation of photographic materials.

A study by Kusekwa (2012:18) revealed that master files of photographic materials require a pixel dimension of 3000 pixels long with a resolution sufficient to achieve the desired pixel dimensions. This was confirmed by Oregon Institute of Technology (2012) which stated that 3000x2400 pixels is appropriate for maintaining good quality scans and 5100 x 3300 pixels for archival quality. This is because archival master files are intended to be of high quality digital images as they are used to "generate derivatives files" for online delivery and future uses as reported by Riley (2004:2). He went further to state that uncompressed TIFF, Intel byte order with 24 bit depth and 8 bit grey scale colour as appropriate specifications for digitising photographs.

2.5. Resource requirements for sustainable digitisation initiatives

To meet the intended purpose of digitisation, there are particular non-technical requirements and issues that need to be identified and addressed to make a digitisation project a success. These requirements take different forms as discussed in the subsequent sections below.

2.5.1. Funding

Sustainable funding is considered to be a major requirement as well as a challenge (Novara, 2010:173). This could affect the effective management of digitisation projects as these projects appear to be very expensive (Asogwa, 2011:9). Agyen-Gyasi (2011:71) concurs with Asogwa by stating that digitisation requires long term investment purposely to keep digital content accessible.

To Baro, Oyeniran and Ateboh, (2013:23) funding is essential for the purchase of digitisation resources and equipment. However, there should also be allowances for consumables as well as for systems repair and maintenance. Resources and equipment that may need funding according to CSIRO (2012:82) include:

- Software and hardware.
- Training.
- Repair, maintenance and replacement of digitisation equipment.
- Consumables (items for handling materials such as gloves, pins, pin boards).

In sub-Saharan Africa, many libraries mostly depend on grants (Petersohn, Drummond, Maxwell, Pepper, 2013:486) and collaboration with other libraries to facilitate their digitisation projects (IFLA, 2014:7; Maron and Pickle, 2013b:12).

The situation is different in some university libraries of other parts of the world. For example in Pakistan library, projects are facilitated by the Higher Education Committee. It provides grants for libraries to initiate ICT-based infrastructures (Rafiq and Ameen, 2013:38). Similarly, at Warsaw University Library, funding for the different projects is provided by governments and unions (Chmielewska and Wrobel, 2013:327).

A study by Rikowski (2011:11) revealed that donations from government, businesses, and individuals form part of funding in United States of America. For example in 1994, the Library of Congress initiated the "National Digital Library Programme" with the purpose of providing access to five million American historical items taken from more than ninety collections and different United States institutions on the American memory website.

Funding is not the only requirement. Digitisation activities should be managed effectively by appropriate human resources and this is discussed in the following section.

2.5.2. Human resource/staffing

CSIRO (2012:31) proposed that all staff involved in the digitisation process should have well defined duties and responsibilities and they should familiarise themselves with such responsibilities. A digital collection manager was suggested to be appointed to take charge of the digital collection and implement digitisation programmes that the library can develop.

Makerere University appoints staff as need arises and the library can forward the post of the digital collection manager to the university's appointments board for consideration.

However, to effectively perform the duties and responsibilities, there is a need to also train librarians in "computer operations, networking, database management and internet applications - in addition to their professional training in Librarianship or Information Studies (Iwhiwhu and Eyekpegha, 2009:533). In Africa personnel, involved in digitisation, are often not fully equipped with adequate skills in technologies related to digitisation and other ICTs (Mapulanga, 2013:636; Igun, 2006 cited in Iwhiwhu and Eyekpegha, 2009:533). This also manifested in a study by Asogwa (2011:9); Baro, Oyeniran and Ateboh (2013:24) who revealed that digitisation projects in African libraries are still lagging behind due to inadequate ICT skills and, therefore, recommended training and retraining as a measure to reduce ICT illiteracy.

Most successful projects involve scholars, users, administrators, library staff (cataloguers, curators, conservators) and technologists in the planning process. Workflows affect many departments within the library, and it is important to include everyone in making decisions that will affect their on-going work" (IFLA 2014:7) and hence concludes that "teamwork is essential for an effective project. Digitisation staff should be governed by well laid down policies and procedures which are clearly defined. These have been discussed by different scholars as indicated here under.

2.5.3. Policies and procedures

Rafiq and Ameen (2013:41) argued that a digitisation policy is a "basic element in any formal digitisation programme" and its absence is an indicator of unplanned strategy of the libraries towards digitisation initiatives. Agyen-Gyasi (2011:72) stated that a digitisation policy presents a means of preserving the library collection especially the worn out and rare materials.

As such, a digitisation programme should be supported by policies and procedures which are well documented and should be availed to all staff involved in the digitisation process. The policies and procedures should be reviewed and kept up to date throughout the digitisation process (State Records Authority of New South Wales, n.d.)

Asogwa (2011:6-8); Smithsonian Institution (2010:12) Iwhiwhu and Eyekpegha (2009:534) proposed the development of digitisation policies that could guide the selection of materials for digitisation. The availability of a digitisation policy helps the library in determining whether the:

- available materials are worth digitising by determining their value,
- Materials digitised will promote access and enhance usage
- Permissions and rights for distribution of digital files are secured to eliminate copyright infringement,
- Staff to be involved in digitisation have the necessary expertise to carry out the operations and
- Infrastructure is adequate to support digitisation.

Procedures operationalise a policy. They provide the steps to follow in any of the activities associated with the digitisation process. For example Angeles (n.d:46) revealed that before scanning is made, one of the procedures is to prepare an inventory list at the item level. In case of digital objects, each digital file should be accompanied by a copyright statement and if the digital files are accessed from the website, the copyright statement should clearly be displayed on the website as part of the procedures governing digital access. The researcher, therefore finds it justified for institutions to have a combination of policies and procedures to ensure sustainable digitisation projects. If not in place, recommendations shall be made accordingly in chapter five of this research report.

2.5.4. Giving access to the digitised collection

A repository as the content holder

As earlier stated by, one of the main purposes of digitisation is to provide access to digital files via the web (Maron and Pickle (2013a:4); Rafiq and Ameen (2013:43). To Mapulanga (2013:636); Dooley and Luce (2010:61); Novara (2010:168), access to the digital collections can be facilitated in a number of ways - including an institutional repository.

Mapulanga (2013:641) proposed the selection of appropriate software for running the institutional repository where digital objects are preserved. He suggested the use of

Greenstone, Dspace and Procite/Endnote as recommended to the University of Malawi Library.

Metadata as descriptors for access

Groenewald and Breytenbach (2011:241) argue that, "a digital object does not have any meaning to a human being unless the content is described with descriptive, structural and technical (or administrative) metadata". The National Information Standards Organization (2004:2) adds that metadata is vital in ensuring continued access to digital resources in the future.

Librarians, therefore, need to identify appropriate metadata standards so as to enhance access to digitised objects (National Information Standards Organization, 2004:1) and to provide the required information to ensure long-term preservation (IFLA, 2014:13). On this note, Prochaska (2009:23) states that no digitisation should be carried out without careful consideration of the metadata that will facilitate access and preservation.

The National Library of New Zealand (2010:4) concurs with IFLA where it stated that high quality metadata supports user experiences with online digital files. Dublin Core was identified by Trifunovic (2013:33) as appropriate metadata standard due to its "simplicity, and its optionality of elements and allows the library to easily connect and exchange metadata between other library projects.

In order to promote fair use of the digitised objects, IFLA (2014:14) recommends librarians to clearly display restrictions and "terms of use" attached to digital objects. The use of Creative Commons license was proposed as a standard measure for conveying copyright information.

The National Information Standards Organization (2004:2) proposes the use of file names and Persistent Identifiers to uniquely identify objects to which the metadata refers. Persistent Identifiers include:

- Persistent Uniform Resource Locators (PURL),
- Uniform Resource Names (URN),
- Digital Object Identifiers (DOI), and

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- Handles.

"The Persistent Identifier not only facilitates access when local Uniform Resource Locaters to the unique digital object are changed, but it also provides a convenient method for citation and future verification. It will also be critical in any future linked data environment" especially when stored in the institutional repository as proposed by Dooley and Luce (2010:61).

2.5.5. Risks and security

There are risks associated with the digitisation of archival materials such as damage of the original copies, copyright infringement and interfering with the original order. Issues with copyright infringement have interfered with the delivery of digital objects as most organisations do not know how to proceed when faced with such issues. (Riley-Reid, 2015:92). Groenewald (2013:6) proposed that emphasis should be put on preserving the authenticity and integrity of the originals as well as protecting their intellectual rights. The principle of original order was also emphasised in order to avoid risks related to loss of materials.

Scanning errors were also identified by Chapman and Leonard (2013:411) as part of the risks associated with not only digitisation of special collections but the entire digitisation process. Some of the identified errors include:

- Image tilt and rotation;
- Scanning of unnecessary pages that result into duplicates;
- Missing pages;
- Errors in naming of files which eventually affects file retrieval;
- Image order; and
- Issues with the image quality such as blurriness, lines through scans, and other issues related to readability. Most of these errors can result into severe user experiences when digital files are posted online. This justifies the need for multiple quality control measures in form of several persons doing the verification as justified by Groenewald (2013:20).

In order to minimise risks as identified above, there is need for librarians to have adequate skills in digitisation of archival materials. These skills are identified in the next section.

2.6. Skills required for digitisation of archival collections

There are specific skills required by library personnel to effectively execute the digitisation of archival collections. For example Vrana (2011:591) indicates that librarians and other individuals involved in the digitisation and "development of digital collections and their integration into library systems must have an understanding of the underlying concepts of information technology and computing". To Mapulanga (2013:638), "rasterisation, book marking, digital signature, web linking and internet skills" are essential skills in digitisation of archival collection especially when intended for online access.

Prochaska (2009:24) stated that librarians need to develop skills in digital curation and mirroring traditional functions in Open Archival Information Systems (OAIS) models to effectively manage archival digitisation projects in addition to project management skills as identified by Petersohn… et al (2013:488).

Jisc (2016) indicates that for the project to be successful, a project manager with previous experience in running the digitisation projects should be employed. State Records Authority of New South Wales (n.d) in addition to Jisc (2016) extensively identified skills needed by the digitisation staff and were categorised as presented below:

Management skills

These skills are needed in carrying out specific tasks in digitisation that include:

- Assessment of the business case for archival digitisation.
- Negotiations in the purchase, continuous service and maintaining of digitisation equipment and supplies.

Skills in business analysis

These skills are essential in executing digitisation activities such as:

- Defining a digitisation process workflow.

- Integration of digital images into the existing workflows.
- Identification of appropriate image formats.
- Determining requirements for enhancing images.
- Selecting the information architecture that supports the digitisation process.

Skills in systems analysis

With these skills, the digitisation staff can be able to:

- Select the equipment to be used in digitisation.
- Define requirements needed for the storage of digital objects.
- Integrate hardware, scanning equipment and software.
- Integrate the digitisation requirements into the available Information Technology (IT) infrastructure for the organisation.
- Ensure that the equipment comply with the IT standards for nation and the organisation.
- Test system configuration.
- Define policies and procedures for ensuring the authenticity and integrity of digital objects

Skills in record keeping that covers:

- Compliance with available legislations.
- Integration of digital objects with the existing regimes in classification and disposal.
- Definition of the file naming convention.
- Developing and implementing the object disposal process.
- Metadata definition.
- Monitoring the quality of object metadata
- Managing the originals during and after the digitisation process.
- Keeping records of the digitisation programme.

Skills in operating the digitisation equipment

With these skills, the digitisation staff can be able to:

- Operate the scanners, photocopiers, digital cameras and other equipment involved in the digital conversion.
- Put to use the desired criteria specified in selecting materials for digitisation.
- Control the quality of digital objects.
- Add metadata to digitised objects.

Vrana (2011:591); Iwhiwhu and Eyekpegha (2009:533), therefore, conclude that appropriate education and training of library staff is essential in preparation for any digitisation projects. This is applicable to libraries in Uganda and the region!

2.7. Possible framework to consider when digitising the Buganda collection

CSIRO (2012:13) identified seven activities that need to be put in place for effective digitisation to take place. These could be adopted and put into practice when digitising the Buganda collection. The activities include:

- Developing a digitisation strategy
- Establishing the core digitisation procedures that include digital conversion, inclusion of digital objects in the database, managing digital objects for long term preservation and access, sharing of the digital objects, use of technology to support other core activities and governing other core activities associated with digitisation
- Identifying resources for digitisation based on the nature of the collection
- Developing a digitisation plan
- Controlling the digitisation activities
- Managing the performance of the digitisation unit. This could be monitored using a digitisation maturity model as further described by CSIRO (2012:16).

CSIRO (2012:13) further proposed a "just do it" approach which puts emphasis on digitising a manageable scope of work and the outcome can be used to inform further digitisation activities.

2.8. An overview of the Buganda Kingdom archival collection

In 1966, Milton Obote, the President of Ugandan at the time, ordered the attack of the headquarters of Buganda kingdom at Mengo, Kampala due to political reasons (Adhola, 2012:8). The kingdom was attacked and most of the structures demolished which ended with the escape of the king into exile to the United Kingdom (Buganda Kingdom, 2016; Mugalu, 2012).

Due to the prevailing political instabilities in the kingdom between 1966-1986 as reported by Afritorial (2013), there was the collapse of the cultural institutions, social services and infrastructure, libraries and records centres inclusive that resulted into Buganda chiefs carrying vital records to their individual homes.

When peace was restored in Uganda, the rule of kingship was restored and the current king locally known as Kabaka Ronald Muwenda Mutebi II, was installed on 31st July 1993 (Buganda Kingdom, 2016). Since structures were demolished at the kingdom headquarters as earlier reported by Afritorial (2013), relatives of chiefs who had kept the Buganda Kingdom vital records deposited them at Makerere University Library as gifts and donations. The salvaged documents were taken into library custody and became part of the Africana Special Collections at Makerere University. This collection is of great historical and research value as the researcher has witnessed his stay at Makerere University Library. The demand for access to these documents has been on the increase over the years which puts the documents at risk of deterioration due to the increase in physical contact. There are only single copies of the documents and each is irreplaceable once damaged. This, therefore, motivated the researcher to conduct a study to develop a framework for sustainably digitising the available Buganda kingdom archival collection to enhance access and prolong their lifespan.

The Buganda kingdom archival collection is basically paper based and consists of:

- Photographs which are currently stored in photo albums;
- Handwritten diaries of important personalities in the Buganda kingdom who were chiefs then;
- Correspondence between different personalities in the Buganda Kingdom including the king. Of great importance is the letter which King Mutesa I wrote to the Queen of

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England requesting missionaries to come to Uganda to spread the word of God. It was this letter that paved the way for the western education system in Uganda;

- Minutes of different meetings of the Buganda kingdom officials;
- Reports of different activities within and outside the kingdom;
- Manuscripts on the history of Buganda and other regions;
- Architectural drawings/plans of official residences and housings; and
- Local Newspapers dating as far back as 1900.

2.9. Current digitisation facilities at Makerere University Library

The work of digitising Makerere University Library collection started way back in 2006 following the establishment of the Makerere University Institutional Repository running on Dspace (Musoke, 2012:10).

With funding from the Carnegie Corporation of New York, Makerere University Library was able to acquire ICT facilities to enhance digitisation. These according to State (2012:18) include:

- Three hundred (300) computers to establish the Research and learning Commons
- The installation of a Local area network with 28 data points intended to enhance online access to digitised collections.
- Software (Jaws and Magic) for users with disabilities.
  Nine document scanners. Most of the materials in the Buganda kingdom collection are paper based and equipment and the available scanners can be used to initiate the digitisation process.
- Six printers

With no substantive budgets for ICTs, concerns related to sustainability of the available facilities have been raised Failure of the Makerere University Council to remit 10 percent of the total budget to libraries as recommended by the National Council for Higher Education (NCHE) in Uganda (Makerere University Library, 2011:13) has not helped. This brings out budgetary constraints and, therefore, a need to review funding possibilities as discussed in section 2.5.1.

2.10. In summary

The Materials-Based Approach was considered as the appropriate approach to be used at Makerere University Library as it takes into account the physical state of the archival materials to be digitised. The Collections-Based Approach, Discipline-Based Approach and the Formatting decisions could turn out to be expensive if considered and implemented for this research.

The appropriate criteria, for selecting materials from the Buganda kingdom collection for digitisation, are essential. Considering the materials' physical state the criteria should take into account materials which are highly in demanded and in a poor state. Such documents would need urgent attention.

Information Technology and Metadata were identified in the literature as key factors in promoting access to digitised archival collection thus the need to select metadata standards and technology that promotes migration to newer versions.

Funding, human resource, policies and procedures, giving access to the digitised objects were identified among the requirements for archival digitisation projects. Specific skills needed for effective digitisation were also identified and these could be used as a basis for forming the digitisation project team. The possible framework to consider when digitising Buganda Kingdom archival materials were reviewed followed by the collection overview and the digitisation facilities currently available at Makerere University Library.

Inadequate skills in ICTs was identified as a main challenge that interferes with effective management of archival digitisation projects and training was recommended as a measure to equip librarians with adequate ICT skills related to digitisation.

3. CHAPTER THREE: RESEARCH METHODOLOGY

3.1. Introduction

This chapter highlights the steps that were taken to gather data aimed at answering the research question. The research question sought to identify the elements that need to be included/ adopted in the strategy and action plan to sustainably digitise the archival collection of the Buganda Kingdom.

In this chapter, the researcher discusses the methodological components that include the research paradigm, research design, data collection methods and instruments, target population, sampling technique and size, data analysis and interpretation procedures as well as ethical considerations.

3.2. Research Paradigm/approach

Creswell (2014:12) defined research paradigm basing on the three types used in making inquiry that include qualitative, quantitative, and mixed paradigms which direct the research process.

Sarantakos (2005:47) indicated that among these three research paradigms, two of them are used most. These are qualitative (textual) and quantitative (numerical) research paradigms. Vaus (2006:10); David and Sutton (2011:96) concurred with Sarantakos' (2005:47) view by clearly indicating that there can be no clear demarcation between qualitative and quantitative paradigms in research, stating that there are no fixed principles of differentiation but may be defined by tension of the research to be conducted.

To David and Sutton (2011:96), each research paradigm has got its own advantages that could be used as a basis for the researcher to select the most appropriate paradigm. For example, in qualitative research, the researcher is able to widely explore and gain greater insights of the population being studied. Similarly, in quantitative research, the researcher has got a tighter focus that promotes the collection of data that is reliable and can be easily used for generalisation purposes. However, when the research involves tapping the views of the selected population under study, quantitative approach may not be considered a good method (Vaus, 2006:10).

Putting this research in perspective, a qualitative research paradigm was adopted. This was because the researcher used a small sample from which views and experiences regarding the digitising of Buganda Government archival materials were identified. A qualitative paradigm was preferred to quantitative paradigm because it enabled the researcher to cover the research area in much more detail; effectively analyse meanings and contexts and understand the interviewees' experiences regarding the digitisation of archival materials. These advantages were discussed in relation to Patton (2002:21); Kothari (2004:5); Ellis (2010:10); Yang (2010:32); David and Sutton (2011:95).

However, being longer and more detailed, qualitative findings are hard to analyse due to lack of uniformity and standardisation in responses as (Patton, 2002:20). The researcher, therefore, applied specific analysis techniques as discussed in section 3.8.

3.3. Research design

In every research, there is a design that is used in strengthening the validity of the study and ensuring that the data that the researcher intends to collect addresses the research question (Yin, 2011:75). Kothari (2004:14) concurs with Yin (2011:75) and added that research designs can take different forms that include experimental and non-experimental designs. Yin (2011:75) went further to state that when conducting qualitative research, there are several designs that can be applied.

In support of Yin (2011:75), Sauro (2015) identified five qualitative research designs that can be used in qualitative studies which were categorised according to areas of focus, sample size and data collection methods. These are indicated in the table below:

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Table 1: Sauro's five qualitative methods

Method	Focus	Sample Size	Data Collection
Ethnography	Context or culture	--	Observation & interviews
Narrative	Individual experience & sequence	1 to 2	Stories from individuals & documents
Phenomenological	People who have experienced a phenomenon	5 to 25	Interviews
Grounded Theory	Develop a theory from grounded in field data	20 to 60	Interviews, then open and axial coding
Case Study	Organization, entity, individual, or event	--	Interviews, documents, reports, observations

Putting this study in perspective, a case study research design was adopted. Creswell (2013:119); Babbie (2010:309) and Yin, 2011:307) stated that case study design enables the the researcher to get an in-depth understanding of the topic under study and that it identifies views of a small sample or group of respondents. Kumar (2011:126) adds that a case study design involves identifying a particular instance and a few carefully selected cases are studied intensively. This, therefore, fitted well in the proposed research that intended to carefully study the digitisation experience at Makerere University College of Health Sciences where the digitisation of archival materials has been taking place; National Library of Uganda and the Bank of Uganda where digitisation has intensively been taking place.

3.4. Target population

Odiya (2009:155) defines a target population as the group of individuals which the researcher wishes to generalise his or her research findings. Kombo and Tromp (2006:76) state that for the population to be effective they must have some common characteristics and it was from this population from which the sample was taken.

The target population for this particular study included institutions within the boundaries of Kampala that are actively involved in digitisation projects. There are several universities

within the boundaries of Kampala that include Makerere University College of Health Sciences specifically Sir Albert Cook Medical Library, Kampala International University, Kampala University, National Library of Uganda, Bank of Uganda. However, based upon the informal survey and purposive visits carried out by the researcher, only three of the above institutions were involved in digitisation projects. These included Makerere University College of Health Sciences specifically Sir Albert Cook Medical Library, the National Library of Uganda and the Bank of Uganda.

The criteria for selecting the institutions and interviewees to participate in the study as well as the sample size are fully discussed in the next section.

3.5. Sampling size and technique

Kombo and Tromp (2006:77); Odiya (2009:156) define sampling as a process of selecting a specific number of people or objects from the study population in such a way that the selected people or objects represent the characteristics of the entire population.

Due to the qualitative nature of this study and constraints related to people, finance and time as identified by Flick (2009:124), staff from the entire target population could not be interviewed. The researcher, therefore, used a purposive sample of three (3) interviewees; who were selected from the three different institutions which were actively involved in the digitisation projects. These were selected based on the interviewees' knowledge of the administrative and operational activities of the previous/current digitisation projects. For example on the side of administration, the interviewee was expected to have knowledge about the approaches used when planning the digitisation projects, costs involved and the sustainability strategy, issues related to human resource as well as policies and procedures related to digitisation. Operational knowledge related to the steps taken while carrying out the actual digitisation; technology requirements in form of hardware and software used; metadata standards used and how access is provided to digitised materials. This also included risks involved in digitisation as well as security for both the originals and the digitised materials. Based on the above criteria, the study comprised of:

    i.   One librarian from the National Library of Uganda who directly dealt with digitisation. National Library of Uganda was preferred because it has been

actively involved in digitisation projects and the researcher hoped that the librarian from this institution had adequate knowledge regarding the research sub questions that enabled the answering of the central research question.

ii. One Librarian from Sir Albert Cook Medical Library who coordinates the digitisation of medical archival materials. Sir Albert Cook Medical Library was considered because it deals in digitisation of special collections which the researcher also intends to digitise after the successful completion of the study. Similar collection is digitised technology as well as policies and procedures may be applied while digitising Buganda Kingdom collections.

iii. One archivist from the Bank of Uganda who controls the overall activities of the digitisation project was also interviewed. Bank of Uganda was selected for this study because for a long time, it has considered digitisation as part of the core functions of the records and archives management department. For this reason, interviewing a respondent from this institution provided the researcher with rich and detailed information regarding digitisation.

Though there are various techniques that could be used in selecting a sample from the identified institutions while conducting qualitative research such as convenience sampling (Kombo and Tromp, 2006:82; Odiya, 2009:161; Yin, 2011:88-89); quota sampling (Odiya, 2009:161; Kombo and Tromp, 2006:82), in this study, a purposive sampling technique was used.

Purposive sampling refers to the selection of participants based on their anticipated knowledge about the phenomenon under study (Ellis, 2011:35). The knowledge possessed by the participants selected purposively is meant not only to answer the research questions but also challenge the researcher's thinking about the study (Yin, 2011:88-89; Kothari, 2004:15). It was selected among other techniques because it was estimated to result into the collection of rich data since relevant interviewees to the study were selected.

3.6. Data collection method

In order to collect data that provide answers to the research question, the researcher identified and applied data collection methods that suited the study. Ellis (2010:33); Yin (2011:130); Sauro (2015) identified specific methods associated with qualitative research that include:

- Interviews which are referred to as discussions, in most cases one on one between the interviewer and the individual from who data is to be gathered based on specified topics (Harrell and Bradley, 2009:6 elaborated more on interviews as a data collection).

- Participant observation where no interactions are involved in the process of data collection. However, instances of influence to participants upon the presence of the researcher during data collection may arise (Harrell and Bradley, 2009:6).

- Content analysis in which the human communications in a recorded form are studied. Kohlbacher, (2006) provides detailed information about content analysis as a qualitative research method.

The above methods were categorised by Odiya (2009:172) as ethnographic research techniques. Given the nature of this study - that sought to collect detailed data, interviews were used.

As a research method, the interview involves face to face interaction between the researcher and the participant/respondent. The researcher by asking questions and the participant by responding orally (Kombo and Tromp, 2006:92; Odiya, 2009:173). Interviews take different forms that according to Kombo and Tromp (2006:92) include:

- Structured interview - where questions to be asked and their order are determined prior to the interview with no possibility of deviation (Ellis, 2010:48).

- Semi-structured interview - which is based on an interview guide and which allows the researcher to prompt for more detail when necessary; and

- Unstructured interview - where the questions to be asked may be changed and altered according to the need of the interviewer.

For purposes of this research, the researcher used the semi-structured interview. A semi-structured interview included a list of questions which the researcher covered. The researcher

had the freedom to adapt and augment the questions whenever the need arose so as to collect relevant data as Kombo and Tromp (2006:92) discussed.

Semi-structured interviews were preferred for this study because as discussed by Kumar (2011:150); Kombo and Tromp (2006:93-94); Babbie (2010:274) and Ellis (2010:43) Semi-structured interviews:

- Are flexible as they contained both open and closed ended questions.
- Facilitate the collection of in-depth information because the researcher probed further whenever necessary.
- Enable the interviewer to supplement information collected from interviews with the information gained through the observation of non-verbal cues and by visiting the digitisation room where equipment were viewed.
- Enable the interviewer to explain the questions in case they were misunderstood or misinterpreted by the interviewee.

On the other hand, data collected with this method was hard to analyse as the researcher had to go through two main stages which included transcription, entry of findings into excel with the subsequent creation of themes before the final analysis was done.

Though Kumar (2011:150) ; Kombo and Tromp (2006:92) stated that it is possible for the researcher to introduce his bias in the process of interpreting responses with this data collection method, the researcher remained neutral for the purpose of collecting balanced data.

3.7. Data collection tool

Interview guide

The researcher designed an interview guide (see Attachment 1) since a semi-structured interview was selected as an appropriate data collection method.

Odiya (2009:186) defines an interview guide as a document that provides information to guide the research process. It can also be defined as a set of questions that the researcher

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intends to ask the interviewees or a list of themes from which questions are derived to guide the interviewing process (Patton, 2002:343).

An interview guide was preferred because the interviewee could seek clarification from the interviewer that resulted into probing into issues leading to deeper exploration by the researcher as explained by Odiya (2009:187). The interviewees were motivated to provide additional information when they saw the researcher holding the guide and felt part of the formal inquiry. This resulted into provision of valid and relevant information that corresponded to the research questions.

3.8. Data analysis and interpretation

Data analysis involved examining the data collected and making deductions and inferences. Through data analysis, important variables were identified and anomalies detected as discussed by Kombo and Tromp (2006:82). Data was analysed by listening to the recordings and transcribed into Microsoft Word. Data was then entered into Microsoft Excel. Microsoft Excel was used because it could offer graphical representation of the results in cases where the researcher needed them. Once data was entered into Excel, the researcher identified chunks of data that demonstrate some commonalities and assigned them. These themes were based on the research sub-questions and were interpreted within the context of the study as described by (Sarandakos, 2005:345 and Flick, 2009:232).

3.9. Ethical considerations

There were specific codes of ethics which the researcher needed to consider before data was collected. Flick (2009:36) indicates that the code of ethics is formulated to control the relationship between the researcher, the research field and the people from whom data is collected.

In order to adhere to the research ethics, the researcher sought clearance from the University of Pretoria as a permit to enable him to proceed with the process of data collection prior to the approval of the data collection instrument. Odiya (2009:98) indicated that a research permit is needed by the researcher before embarking on the study and it was upon this that permission was sought from the university before data was collected.

The researcher also obtained consent of the interviewees and they were requested to sign the consent form that granted the researcher permission to collect data from them (see Attachment 2). The consent form made it clear that the interviewees' participation in the study was voluntary- as advised by Flick (2009:37); Kombo and Tromp (2006:82).

The researcher also undertook to maintain the anonymity and confidentiality of the interviewees so that once the findings are presented; the readers could not able to discover the identity of the interviewees.

3.10. Validity and reliability

In order to ensure validity and reliability of the findings, the researcher interviewed different respondents within the same department of the institution where data was collected. This was done to confirm the responses obtained from the original respondents - as advised by Leung (2015). The researcher also carefully recorded the responses and kept them to ensure that they can be referred to while analysing and interpreting findings. Consistence and transparency was also demonstrated while interpreting findings as Noble and Smith (2015) explained. Data collected was compared to literature, where feasible to do so, to determine the validity and reliability of the statements.

3.11. In summary

A qualitative research paradigm with a case study design was adopted for this particular study. These were selected due to the size of the sample and the need to collect in-depth and detailed views and experiences regarding digitisation projects.

Institutions which are actively involved in digitisation located within the boundaries of Kampala were considered as the target population for this research. For this case, the purposive sampling technique was used to identify Makerere University College of Health Sciences, National Library of Uganda and the Bank of Uganda as case studies. They were selected due to their continued involvement in digitisation projects.

From the above institutions, three interviewees were selected to participate in the study. The interview method was used as a data collection method due to its flexibility and the need for the researcher to collect in-depth information. These qualities were seen as the most useful,

among other, advantages. An interview schedule was designed to solicit responses from the interviewees.

Data in form of responses were analysed by reading through the record of the notes taken while conducting the interviews. The information gained was then entered into Microsoft Excel and organised into themes to ease interpretation and representation.

In order to abide by the ethics related to research, the researcher obtained clearance from the University of Pretoria to conduct research. The researcher also used an informed consent form to make sure that participants understood their rights. As will be seen in the next chapter, the identities of the interviewees were not revealed and no confidential information was captured or shared.

In order to ensure validity and reliability of findings, different respondents were interviewed to confirm the appropriateness of the data collected from the original respondents. Responses were also recorded and kept for reference purposes. Data was also compared to literature reviewed to determine its validity and reliability.

4. CHAPTER FOUR: DATA ANALYSIS AND INTERPRETATION

4.1. Introduction

This chapter presents the data that was gathered and interpreted to extract meaning for purposes of finding solutions to the central research question and sub questions that sought to identify the:

1 Various strategies/approaches that could be used when planning archival digitisation projects.
2 Selection criteria, to select specific archive artefacts for digitisation.
3 Requirements for sustainable digitisation initiatives that cover the:
    a. Operational requirements for digitising archival collections.
    b. Processes (action plan) required to be put in place to sustainably digitise the Buganda Kingdom's specific special collection.
    c. Technology infrastructure requirement.
4 Skills required to make the project successful; and finally

5 Develop a strategy and action plan to be submitted to library management for endorsement.

Data collected was also compared to the literature reviewed in chapter two to ascertain the relationship between the primary data as obtained from interviews and the secondary data identified in the literature that was interrogated.

Three Ugandan institutions (Sir Albert Cook Medical Library, Makerere University College of Health Sciences, National Library of Uganda and the Bank of Uganda) were approached to establish the elements that should be included/ adopted in the strategy/approach and action plan to sustainably digitise the archival collection of the Buganda Kingdom.

As earlier indicated in section 3.5, these institutions were selected because: National Library of Uganda has been actively involved in digitisation projects and the researcher was able to gather adequate knowledge regarding the research sub questions that enabled the answering of the central research question. Sir Albert Cook Medical Library was considered because it deals in digitisation of special collections which the researcher also intends to digitise after

the successful completion of the study. The researcher thought that since similar collection is digitised, similar technology, policies and procedures would apply and the researcher discovered that most equipment used are similar to what is currently available at Makerere University Library where digitisation is intended to take place. Bank of Uganda was selected for this particular study because for a long time, it has considered digitisation as part of its core functions of records and archives management department and for this reason, data from this institution provided the researcher with rich and detailed information regarding digitisation. These were the only institutions actively involved in digitisation and, therefore, considered by the researcher to participate in the study as earlier stated under section 3.5 of chapter three.

4.2. Data analysis

The data analysis follows the structure of the interview schedule (see Appendix B) that was used to collect data from the institutions that were selected for the research. Data, collected from the three institutions, were anonymised and identified by letters that is A, B and C. Ethical clearance required the researcher not to reveal the names of the institution where data was collected. The analysis was done in the order of the questions asked during the interviews but in certain circumstances, questions were combined to ensure logical flow of ideas. These questions were also changed into themes as presented in the next subsection and as earlier indicated in section 3.8 (Sarantakos, 2005:345 and Flick, 2009:232 had earlier proposed thematic analysis under section 3.8 of chapter three).

4.2.1 Approaches used when planning digitisation projects

The study findings revealed that there are three approaches (see section 2.2 of chapter two) that could be used by institutions when planning digitisation projects. Among the three institutions, A and C adopted the 'collections' based approach while institution C implemented the 'discipline' and 'materials' based approaches.

The collections based approach was dominant in the two institutions while one institution used a combination of the materials and discipline based approaches. The adoption of the collections based approach by the two institutions was attributed to funding from the external sources and the financial stability of the institutions respectively. Institution C also adopted

the discipline based approach due to the conditions that accompanied the funding obtained from United Nations Educational, Scientific and Cultural Organisations (UNESCO) to support the documentary heritage digitisation project.

The implementation of two approaches by institution C was viewed as a unique experience as such a circumstance was not revealed anywhere in the literature reviewed under section 2.2 where approaches were discussed. The findings, however, revealed that the combination of the two approaches was attributed to the variations in the sources of funding where by the discipline based approach was as a result of the conditions set by UNESCO as earlier mentioned that put emphasis on the digitisation of only materials of cultural value to Uganda.

On the other hand, the materials based approach was used to identify materials for which the institution was to cover the digitisation costs and such materials include those with limited copies but highly demanded as well as materials in their poor physical state as revealed by literature in section 2.2.1. This therefore indicates that there is a relationship between the financial status of the institution and the approaches used when planning digitisation projects.

For example, the collections and discipline based approaches are mainly used when the institution is financially stable and with adequate external support while the materials based approach is used when the institution is financing its own digitisation projects. (This confirms the literature by Smith (2006:10) of section 2.2.2 that views the collections based as being an expensive approach since it includes materials which are rarely used).

Institution B indicated that by considering the size and nature of the collection from the various affiliate institutions and the financial status of the institution, a materials based approach was preferred since it puts emphasis on specific materials as opposed to the entire collection. Materials based approach was also deemed to be sustainable in terms of costs and staff. Putting the institution where the proposed strategy/action plan is to be implemented, a materials based approach would also be considered appropriate especially in terms of costs and human resource.

In addition to the approaches used by institutions, there were also selection criteria set to identify materials for digitisation. The criteria are discussed below:

4.2.2. Criteria used when selecting materials for digitisation and the attached value

The researcher sought to identify the criteria used by each institution to select materials for digitisation as well as the value of each criterion for purposes of establishing appropriate criteria for selection materials from the Buganda Kingdom collection to be digitised. As earlier mentioned in section 4.1, two questions were combined because each question supplemented the other.

The researcher noted that the level of comprehensiveness of the selection criteria used in the studied institutions was based on the approaches used. For example institutions A and C which used a collections based approach had a brief and short selection criteria while institution B which used a combination of discipline and materials based approaches had long and comprehensive selection criteria as indicated in the subsequent study findings.

At Institution A, archival materials were selected basing on their type. For example all medical archival materials were considered for digitisation. This is because the project was aiming at saving the endangered medical archival materials and according to the coordinator of the project, all medical archival materials, considering their age and physical state, were worth digitising. Therefore, no specific criteria were established to select materials for digitisation other than their nature.

For institution B, a comprehensive list of criteria was developed to select materials for digitisation. The comprehensive selection criteria was attributed to the combination of the two different approaches that included discipline and materials based approaches as indicated in section 4.2.2. Some of the factors considered when selecting materials for digitisation were developed by the institution while the majority of the factors were based on the UNESCO criteria for identification of documentary heritage. These factors are discussed below together with the value of each criterion.

4.2.2.1 Number of available copies

With this criterion, the institution selects materials for digitisation that have fewer copies and are expected to deteriorate due to over usage. Institution B came up with this criterion with the aim of enabling multiple accesses through the creation of digital copies to materials which

are limited in numbers. Digital copies are created to meet the ever increasing number of users who subscribe to the institutional services and facilities.

4.2.2.2. Physical state of the materials

This is also an institutional generated criterion that puts emphasis on the selection of materials based on their physical state. In this criterion, only materials which are assessed and considered to be in their poorest state are selected for digitisation. For example bound materials with loose pages; documents with loose covers; and fading pages among other considerations. The criterion is considered important because it prolongs the life span of deteriorating materials by reducing physical contact between the library users and the originals.

This criterion, according to the researcher is believed to be labour intensive. The Buganda Kingdom collection is stored in boxes so the librarians have to inspect each archival box where materials are currently stored to assess their physical state for purposes of identifying those which are in poor state. However, there are library assistants who closely work with such collection to help sort out materials based on this criterion.

4.2.2.3. Unique and irreplaceability

According to this criterion, institution B identifies materials which are rare and once destroyed or deteriorated cannot be replaced. This is one of the UNESCO's criteria for identifying Documentary Heritage aiming at making them visible online.

The findings revealed that institutions which contain such materials, limit access to them due to the fact that once destroyed, users can never gain access to them. This, therefore, makes it justifiable to digitise them for open and wider access.

Basing on the above findings, the researcher realised that most of the Buganda Kingdom archival materials are unique and irreplaceable thus making the criterion relevant. The challenge that might arise out of this is that if this criterion is put into consideration, all archival material may be eligible for digitisation as the case was with institution A. However, due to limitations in resources, only a few of the unique and irreplaceable materials shall be selected for digitisation once the criterion is put to use.

4.2.2.4. Time

The findings also revealed time as one of the criteria used for identifying materials for digitisation at institution B. Time criterion relates to materials that describe a particular period characterised by crisis or outstanding achievement. The researcher requested the interviewees to state some of the materials that relate to time criterion and those that describe the incidence of the burning of the Kasubi tombs could clearly fit in this criterion. Such materials are digitised for research and historical purposes.

By putting this study in perspective, the Buganda Kingdom collection have specific archival materials linked to time criterion such those that reflect the 1966 crisis which was characterised by political instabilities that resulted into the exiling of the then King of Buganda as told in literature by Buganda Kingdom (2016) and Mugalu (2012) (as was reported in section 2.8 of this document). This time period is quite memorable in the history of Buganda Kingdom and materials describing such a period are worth digitising.

4.2.2.5. Place

Institution B engages in the selection of materials that contain information of historical and/or cultural importance to a specific locality in Uganda. These materials could also be describing a geographical location, or institution that might have ceased to exist. By using this criterion, the librarians from institution B compile lists of possible historical and cultural places and match them with institutions which might be maintaining them. Such institutions are visited and a discussion held with how such materials can be preserved with digitisation proposed as an alternative. These institutions are convinced to release such materials on condition that torn materials shall be repaired upon their return. This is the reason why conservation is included as one of the steps followed when digitising materials as shall be discussed in section 4.2.3. This criterion is considered relevant to the collection intended to be digitised since the Buganda Kingdom has different historical and cultural locations of interest to both local and the international community and therefore worth identifying materials that relate to them for digitisation.

4.2.2.6. People

With people, only materials that describe personalities of historical significance are selected for digitisation. The institution selects materials written by or describing notable personalities in the history of Uganda especially in the struggle for protection and restoration of cultural

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institutions such as kingdoms. This criterion cannot be ignored for this particular study when developing an action plan for sustainably digitising Buganda Kingdom collection since notable personalities form part of the materials that are archived at the intended institution where the collection is maintained.

4.2.2.7. Form and Style

Findings from the interview at institution B indicated that the selection of materials based on this criterion puts emphasis on the materials of aesthetic value or materials that depict an example of a format that is disappearing or already disappeared. However, it was reported that the format of materials identified under this criterion are in most cases unique such as wood. Therefore, several of them are left out since the institution does not have specific equipment to digitise materials in such formats other than paper. Similarly, though most of the Buganda Kingdom collection are basically paper based as earlier indicated in section 2.8 of chapter two, there are also materials in other formats such as wood which would be of significance once digitised.

The selection criteria at institution C is not any different from that of institution A in terms of length where by the selection of materials from this institution is based on retention schedules. With retention schedules, a specific collection is allocated a time period which is normally five years from the date of receipt. After this period, such materials are considered eligible for digitisation. Retention schedules are relied upon as selection criteria because there is limited space at the institution and materials maintained after five years have to be digitised and the original copies transferred to an off-site storage locations to create space for the incoming materials.

In the interview, the researcher noted that the selection criterion used by institution C is not sufficient as there are some cases when a request is made by the officials of the institution to digitise specific materials within the collection without following the retention schedules.

After the materials are selected, they have to be digitised and this involves a number of steps as discussed in section 4.2.3 below:

4.2.3. Steps followed when digitising materials and the value of each step

During the interviews, the researcher was able to identify a number of steps followed by each institution while digitising the materials. It was noted that each step is undertaken for a specific purpose and the researcher; therefore, found it worth combining each step with its intended value or purpose. These are presented below:

For institution A,

- Materials are identified to ease the digitisation process as well as to save time.
- Entry into Excel for purposes of having a record of what is digitised.
- Validation aimed at preventing duplication of efforts and double entry of items in the institutional repository.
- Scanning is done to change the format of the materials from analogue to digital format for preservation and facilitate online access.
- Quality control is done to limit errors and risks associated with digital objects such as missing pages and any information associated with individual identification is covered at this stage for confidential purposes.
- Uploading is carried out after quality control to facilitate and ensure permanent online access to digitised materials.
- Original copies are then re-shelved to ensure that once the digitised copy is interfered with, the original copy can be easily accessed and rescanned

For institution B, the steps include:

- Identification of materials to be digitised based on the identified criteria .This first step is essential in ensuring that only valuable materials and those which fit within the criteria are selected for digitisation.
- Conservation that involves cleaning of papers, repair of torn materials before digitisation. Conservation ensures that materials are restored in their original physical state so as to obtain high quality digital objects out of them in the process of scanning.
- Materials are then put in boxes and carried to the digitisation room. Putting materials in boxes eases transportation as they are transferred to the digitisation room with little or no damage.

- Materials are then scanned. The scanning stage ensures that the physical materials are converted into digital format for digital preservation and access.

- Editing of scanned images. During editing, images are straightened and brightness set to required levels. At the editing stage, individual pages are also merged or combined into a single document for logical flow.

- Uploading of digitised materials. After editing is done, digitised materials are uploaded on two platforms that is the UNESCO online platform and the institutional Dspace platform. This is done to ensure that materials are effectively preserved and gain greater access from their users. However, the institutional platform is not yet hosted online due to challenges associated with costs of subscribing to Internet.

- The last process involves returning originals to their respective storage areas. This is done to ensure that users who cannot access digital content can gain access to physical copies since the institution is public and serves users who are not computer literate.

Institution C follows the following steps in the digitisation process:

- Sorting records from documents: Documents in this case refer to any piece of information received by the institution while records are recorded information maintained as evidence of the business transaction.

- Appraisal of records while at the place of custody. Appraisal is done to determine whether the identified documents have been maintained by the bank for a specified period mostly five years.

- Preliminary preservation: At this stage, the torn materials are repaired so that the damages on the originals are not reflected on the digital copies.

- Putting identified materials in boxes: This ensures that records to be digitised are kept together for easy delivery to the digitisation room.

- Accessioning: This involves assigning a unique number (barcode) to each record before it is digitised so that that it can easily be identified from other records after digitisation. Accession numbers also facilitate access to digital copies as well as to the originals after digitisation is completed.

- Preparation: At the preparation stage, staples are removed from records to be digitised and folded papers are straightened to ease the scanning process.

- Digital conversion: At this stage, the actual scanning is done and it is where the form of the material is changed from print to electronic though the original is maintained as well.

- Quality control: After scanning is made, the scanned objects are checked against errors and noise. Quality control of the digital objects starts immediately after scanning and runs through verification to indexing.

- Indexing: The indexing stage in the digitisation process is aimed at facilitating retrieval of original copies of the materials being digitised.

- Filing and storage of the original copies are last stages of the digitisation process and are intended to permanently maintain the originals for future use.

Among the three institutions studied, institution C had a comprehensive list of steps that it goes through while digitising materials. Unlike institution A and B where the same members of staff carry out all the steps, institution C has different staff members at each stage of the digitisation process. The researcher found this to be advantageous since errors can easily be identified and fixed to ensure quality output compared to when the same staff does all the work.

The findings revealed similarities in most of the steps/processes followed when digitising in the three institutions. (This also compares favourably with the process revealed by IFLA, 2014:9 in section 2.4.1 of the literature review). The researcher did not deviate from the above mentioned stages while making recommendations. The researcher synthesised all the stages to come up with a comprehensive list of stages appropriate for the digitisation of Buganda Kingdom collection. This list is presented under recommendations in section 5.4 of chapter five.

As indicated above, scanning/digital conversion was part of the steps followed by institutions while digitising their collections. For scanning to be carried, a number of equipment were used at different institutions as discussed below:

4.2.4. Equipment used and the specific materials digitised

In this section, the researcher presents the different equipment used for scanning materials at the three institutions, determine whether general or specific equipment are used and if used, such equipment shall be identified and the specific materials they digitise.

Study findings indicated that there are variations in the types and nature of equipment used at the three institutions depending on the nature of materials that the institutions gives priority when it comes to digitisation.

By considering the selection criteria and the available equipment at the three institutions, the researcher realised that it is important to pay much attention to the materials selected so that the available equipment can effectively scan them. This means that though certain materials could meet the selection criteria, the equipment if not considered could not digitise them

In this study, only institution A had different equipment used to digitise specific materials that included Flatbed scanners, An Automatic Document Feeder, handheld scanners and an Atiz Book Drive Pro scanner.

In this institution, a flatbed scanner is used specifically to digitise photographs and A4 sized loose papers which are small in number simply because materials have to be manually turned while scanning which is tedious. Meanwhile, an Automatic Document Feeder is used to digitise manuscripts with several pages since the staff digitising do not necessarily need to constantly remove and add materials during the process of scanning. However, for this scanner to be used effectively, staples have to be removed from papers prior to digitisation which at times damages the originals.

The handheld scanner is used for scanning materials which are in a very poor physical state that if scanned with a flatbed or Automatic Document Feeder, the rate of deterioration would be accelerated. However, it is not considered appropriate while scanning materials with large volumes as it takes much of the staff time who are charged with other library activities such as classification and cataloguing.

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The Atiz Book Drive Pro is used in scanning bound materials such as volumes of medical archival materials, newspapers and some oversized materials such as architectural plans of different hospitals linked to the institution where medical archival materials are maintained.

It was noted that the settings of the two cameras mounted on the Atiz Book Drive Pro need to be reset every time a material of different size is to be digitised. This was attributed to limited training that was given to staff by the supplier upon the delivery of the equipment because the cameras have the capacity to be set once to scan materials of various sizes.

Well as institution A had a variety of equipment used in digitisation, institution B and C had general equipment used for digitisation. For example institution B had a Digibook SupraScan II while institution C had a Kodak Automatic Document Feeder that it used to digitise most of the materials.

The researcher observed that the scanner has a large glass that needs to be lifted up every time a page needs to be turned. This was reported to be reducing on the daily output in terms of the number of items scanned per day. It was also reported that though the glass holds the materials to be scanned together, it is not appropriate for scanning of delicate items as they easily get torn.

Figure 4: Digibook SupraScan II

(Source: Photograph taken at Institution B)

The Kodak Automatic Document Feeder was used to digitise the institution's collection. The institution only uses this equipment because most of its collections come in A4 and other reasonable sizes which are easily scanned. Majority of the collection comprises of cheques, financial statements, correspondence addressed to the institution and other financial records.

Figure 5: Kodak Automatic Document Feeder

(Source: Photograph taken at institution C by the researcher)

The Kodak Automatic Document Feeder was preferred at this institution because it automatically scans both sides of the paper being scanned that reduces on the staff efforts wasted while turning pages. However, it increases on the time wasted while editing digital objects whose content appear on only one side though few cases of such incidence are experienced making it still the appropriate scanner for the institution.

Table 2: Different equipment used at the three institutions

No	Institution	Equipment	Materials digitised
1	A	Flatbed scanner	• Photographs, • A4 sized loose papers
		Automatic Document Feeder	• Manuscripts with loose papers
		Handheld scanner	• Materials which are in a very poor physical state
		The Atiz Book Drive Pro	• Bound materials such as volumes of medical archival materials
2	B	Digibook SupraScan II	
3	C	Kodak Automatic Document Feeder	• Cheques, • Financial statements, • Correspondence

As indicated in the table above, Institution A had a number of equipment used to digitise the institutional collection while institution B and C had generalised equipment for digitising most of the collection. The availability of different equipment at institution A makes it possible to digitise a wide large of archival materials compared to B and C where only a few archival materials of specific sizes can only be digitised.

In order to maintain the digitisation equipment and managing other digitisation activities, institutions need to incur some costs. These costs are discussed in the next section.

4.2.5. Costs involved in digitisation projects and the sources of funding

4.2.5.1. Costs incurred

During interviews, the researcher noted that institutions incur a number of costs while undertaking digitisation projects. Findings indicated that some costs are specific to some institutions while other costs occur at all institutions.

Based on the analysis above, institution A and B incur costs in staff motivation. The researcher believes that such institutions incur these costs because digitisation is run as separate projects and not part of the routine activities performed by staff. Therefore, staff had to be motivated by paying them some extra allowances to boost their performance and ensure that the projects are completed within the stipulated time.

Costs related to the purchase of stationary were also identified from institution A and C. Such stationary include papers for printing inventory lists for institution A and barcodes together with indices for institution C. Maintaining hard copies of inventory lists and indices are meant for record keeping and retrieval purposes especially for the original copies.

In regard to equipment, institution B and C incur costs for repairs and maintenance. Daily usage of the scanning equipment in some cases results into faults that need to be repaired. In the same way, in order to keep the equipment working and in good conditions, they need regular maintenance and this comes with associated costs (CSIRO, 2012:82). For example institution C regularly cleans its equipment using a liquid detergent to wipe out the dust that accumulates on the surface of the scanner since dust can cause white spots on the scanned objects which affects their quality. However, the exact figures as spent were not revealed due to the fact that the respondent had to go through accountability files to find the exact costs of different items which were assumed to take too much time beyond what was requested.

Costs specifically incurred by individual institutions include purchase of hardware such as computers scanners, hard drives for data transfer, data servers for storage and access of digitised content (Baro, Oyeniran and Ateboh, 2013:23). Such costs include training of staff to get involved in digitisation, costs in establishment of Local Area Network (LAN) for online access of digitised materials; costs involved in communicating between project coordinators and project staff. All these costs were incurred at institution A during the digitisation process. It was also noted that institution B incurs additional costs in subscribing

to Internet. This has made it difficult to host the Dspace platform online as earlier indicated in section 4.2.3.

At institution B, there are costs incurred in transportation of materials to and from different branches and affiliate institutions. Institution B works in such a way that it has branches and affiliate institutions and in case of the branches or affiliate institutions have materials that follow with the criteria, they are collected and returned after digitisation is done. Movement from one institution to another, therefore, requires money. Considering the situation at Makerere University Library, all Buganda Kingdom collections are on site and, therefore, no transportation costs would be required. Other costs include subscription fees for Internet access, costs involved in acquisition of preservation and conservation materials such as masking tapes, glue among other preservation items.

The researcher found the analysis of costs useful as they give an indication of what Makerere University Library would need to budget for to make the digitisation of not only the Buganda Kingdom collection but the entire collections sustainable.

4.2.5.2. How costs are covered and the sustainability plan

At institution A, the costs of digitisation were covered by the British Library under the endangered archival materials' project. However, in the initial stages of planning for the project, the institutional management was involved with the purpose of making budget allocations to the digitisation activities once the donor funding ends. This is part of the sustainability plan.

For institution B, there are two main sources of funds. Some funds were obtained from the United Nations Educational Scientific and Cultural Organisation (UNESCO) through the Documentary Heritage project while some funding is obtained from the Government of Uganda. The funds from UNESCO are specifically used to digitise materials selected basing on the UNESCO criteria while the funds from the Government of Uganda are used to digitise materials selected based on the institution's criteria and the institution has full control over such materials.

As part of the sustainability plan, institution B gets annual funding from the recurrent government budget allocations that is used in hardware and software maintenance as well as covering other identified costs including staff motivation. In addition to Government

Funding, the institution also charges a fee of two thousand Ugandan shillings (less than a dollar) for any user who intends to access materials at the National Library of Uganda and this fee is partly used to sustain digitisation projects at the institution.

From the two institutions, it can be observed that most of the digitisation projects are supported by grants from donors (Petersohn…et al, 2013:486 revealed this fact as a trend in the literature review under section 2.5.1). This at times results into sustainability issues when the project comes to an end.

The situation is different from institution C where all the digitisation costs are covered by the institution itself. Annual budget allocations are made to the archival materials' department where digitisation is intensively carried out. The institution makes available funding to provide the necessary requirements to digitise materials due to their sensitivity and importance to national development.

The costs, equipment, steps and the selection criteria as discussed in the previous sections can be well maintained with human resources in place. The researcher discovered that most institutions involve permanent members of staff as narrated in section 4.2.6 below:

4.2.6. Human resource management for digitisation projects

Since digitisation is run as separate projects in most of the institutions, the researcher had assumed that new staff would be hired to run most of the activities. However, this was not the case.

It was discovered that institution A and B involve their permanent staff to engage in digitisation projects. Specific staff members are selected depending on their levels of skills in Information and Communication Technology and such staff are paid from the overall financial resources of the institution as salaries.

 In order to create a balance between the routine library activities and digitisation, a time table is drawn that indicates when to classify, catalogue and perform other routine activities as well as indicating the time when the staff must carry out digitisation.

In the same way, the staff members that participate in the digitisation projects are selected from different departments or sections other than one section. Such arrangements are made to

ensure that there is continuity of library operations in all departments or sections of the library.

As for institution C, some members of staff who work on digitisation projects are permanent while others work on a contract basis. The institution recruits staff to work on contractual basis specifically to improve efficiency and productivity in digitisation since their contracts is renewed basing on their performance. With this system, the institution has greatly achieved greater productivity from the staff.

The researcher, however, noted that the system of recruiting contractual staff works well with institutions which are financially stable as most of the institutions cannot sustainably meet the financial obligations of both permanent and contract staff considering their financial status and budgetary constraints. This option cannot, therefore, be recommended for Makerere University Library. Use, of permanent members of staff, is considered appropriate.

In order to competently carry out digitisation activities, members of staff need to have specific skills and competencies. Each institution required particular skills and competencies as indicated in the next section.

4.2.7. Skills and competencies required to participate in digitisation projects

In all the three institutions, it was revealed that for any member of staff to participate in digitisation projects, the minimum requirements is a Bachelor's degree in Library and Information Science or Information Technology related courses. However, there are specific skills and competencies required by individual institutions as indicated below:

 For a staff member to participate in any digitisation project at institution A, he/she must be competent in running particular hardware and software packages such as Microsoft office package. The staff must also have knowledge of scanning documents and working knowledge of Adobe professional. Knowledge of uploading content in Dspace is also a requirement.

At institution B, librarians are expected to possess computer skills that encompass management of hardware and software of any kind as staff with basic knowledge of hardware and software can easily adapt to new ones being introduced. They are also expected to have preservation and conservation skills since material that are torn must be repaired before they are digitised as indicated in the steps under section 4.2.3. Librarians are also expected to have

skills in records management so that proper records regarding the institutional digital projects are effectively managed for reference and accountability purposes. Digital skills are also required especially those that relates to access and retrieval of digital content. This is required because there are users who are not competent in information retrieval and they are expected to seek assistance from the staff members who are specifically involved in digitisation. Digital skills can also enable staff to safely protect digital content from unauthorised users.

Institution C requires staff to have skills and competencies in repair and maintenance of digitisation equipment such as scanners. Similar to institution A this institution also requires the staff to be competent in working with Adobe Acrobat since editing of digitised objects to ensure quality is done using this specific software.

It was noted that not all staff involved in digitisation of materials at the three institutions have the required skills and competencies. This means that on-the-job and refresher training are provided to equip staff with the required skills. For example institution A and C use Adobe Acrobat Pro for editing digital objects while institution B uses Suprascan II. Once members of staff are identified to participate in digitisation, they are trained to acquire all the skills required for a particular digitisation project.

The researcher, therefore, realised that it is not necessarily mandatory for staff to have all the required skills and competencies before being selected but training can be provided prior to digitisation.

In order to maintain standardisation and ensure that staff are guided throughout the digitisation process, some institutions put in place policies while other institutions were running without digitisation policies in place. This is further discussed in detail below.

4.2.8. Policies and standards that have been put in place

Among the three institutions, it was discovered that only institution C had policies and standards that directly relate to digitisation of the institutional collections. Institution A referred the researcher to some policies which aim at enhancing research but do not specifically relate to digitisation. These included Research and Innovation Policy approved in 2008; Information and Communications Technology Policy approved in 2013. On the other

hand, institution B did not have either a policy or any standards in place to guiding the digitisation process.

When asked about the absence of policy, the project coordinator of institution B stated that they had no intention of developing a policy and were not aware that digitisation would be effectively carried out with a policy in place. The project coordinator instead thanked the researcher for introducing such an idea that aims at streamlining digitisation activities at the institution.

Institution C was doing quite well when it came to policies and standards. For example the institution had well developed policies and a combination of both internal and externally adopted standards to help in providing guidance to the digitisation process. Some of the internal policies include: The Document Management Policy 2013;

The Document Management Guidelines while the standards include: The ISO 15489: International Standard on Records Management and the ISO 16175 Principles and functional requirements for records in electronic office environments.

Based upon the researcher's experience, it takes quite a long period of time for any policy to be approved in most of the institutions in Uganda. The researcher is a member of the programmes functional committee of the Consortium of Uganda University Libraries (CUUL) as the issues associated with delayed policy approval were heard among several institutions. This may partly contribute to reasons why institution A and B do not have policies that directly impact on digitisation. However, like institution C, institution A and B could also opt for some external standards which can easily be recommended and endorsed by management to guide the process as policies are being drafted and presented for approval.

The impact of digitisation in institutions can be greatly felt when the digitised materials can be accessed by the intended users. Institutions put in place different strategies to provide access to the digitised collection and these are discussed in section 4.2.9 below.

4.2.9. How access is provided to the digitised materials at the institutions

Though institutions indicated that they provide access to the digitised materials, not all users who would be expected to access them do so. Access is limited to a certain extent. For example:

At institution A, all the digital objects are uploaded in the institutional repository running on Dspace where all registered users are eligible for gaining access to it. However, some materials were digitised before obtaining copyright permission and as such, only bibliographic details are displayed and the user has to physically visit the library or send an email to library staff to access a particular content located online.

In the researcher's view, this is not ideal as one of the reasons for digitisation is to enhance access to the collection and considering that digitisation is expensive, it would be a waste of time, money and energy if it is done and access is not provided.

At institution B, there are two platforms where digital objects are uploaded that is the UNESCO online platform where the content can be accessed by the general public and the institutional server running on Dspace. The content uploaded on this platform can only be accessible to fully paid up library users and they have to physically visit the library since the platform is not hosted online due to challenges associated with internet costs as earlier indicated under section 4.2.5 of this chapter.

The access conditions at institution C are unique as the digital objects are only accessed by a few members of staff upon the approval of the institutional archivist.

Institution C has a more controlled access because of the nature of the materials held as they are confidential and not intended for public use.

The researcher, however, shall develop a very proactive strategy by ensuring that all materials to be digitised are free from restrictions and are worth of public consumption based on the criteria as shall be recommended and endorsed. He intends to upload all the digital objects into the institutional repository so that the effect of digitisation is effectively felt by the academic and research community worldwide.

In order to facilitate access, the digitised materials need to be assigned metadata and institutions have to select appropriate metadata standards. The researcher noted that two metadata standards were used as discussed below:

4.2.10. Metadata standards used for describing the digitised materials

During interviews, it was found out that institution A and B used Dublin core as a metadata standard. Dublin core was chosen as a metadata standard on grounds that it is standardised and contain basic elements that fully describe the digitised materials (While reviewing literature under section 2.5.4 of this report, Dublin core was also identified as an appropriate metadata standard by Trifunovic, 2013:33).

The researcher noted that the institutions which were using Dspace as a platform for uploading content were also using Dublin core as a metadata standard. Currently, Makerere University Library is using Dspace to run its institutional repository as well as Dublin Core as metadata standards for describing the digital objects. This means that the researcher shall recommend adopting the already available standard of digital description while digitising Buganda Kingdom Collection for uniformity purposes.

For institution C, an in-house metadata standard was developed to cater for the unique data contained by most of the collection maintained by the institution. The researcher could not reveal some of the collection and the nature of the metadata used since revealing the collection could result into making the institution known which is contrary to what the researcher agreed with the institution prior to interviews.

After metadata is assigned, digitised materials are archived for long term access. The digitised materials are archived in a number of formats for a particular reason as the research findings indicate in the next section.

4.2.11. Archival formats

In the three institutions (A, B and C), all the digitised materials are scanned in Tagged Image File Format (TIFF) for archival preservation. TIFF format was preferred because it is conducive for archival preservation as its quality does not fade over time when converted to other file formats.

In addition to TIFF, institution A and B further converted the digital objects into Portable Document Format (PDF) prior to uploading into Dspace for online access. PDFs are preferred

for online access because they take less time to download since the files are not as large when compared to TIFF files.

At institution C, the digital objects are converted into Comma-Separated Values (CSV), a format that is used in storage of information which is specifically presented into tables and numbers. There was no doubt by the researcher that CSV format was appropriate for digital objects at this institution since most of the archival materials had numbers as observed during the guided tour by the respondent.

The researcher, therefore, intends to recommend the use of two file formats as used by institution A and B that is TIFF for archival preservation and PDF for online access.

Once the originals are digitised, institutions tend to ignore them and concentrate on the digital content. However, this was not the case with the institutions studied. Strategies were put in place to provide access to originals as indicated below:

4.2.12. Provision of access to <u>originals</u> after digitisation

Access to originals is handled differently at different institutions. However, the crosscutting activity is that after digitisation, originals are returned to their respective storage locations and access is provided as described below:

At institution A, once items are digitised, the original copies are reshelved. However, access to original copies is restricted to limit the rate of deterioration. Library users are encouraged to access digital copies as opposed to originals and the originals can only be referred to when authenticity of the digital copy is compromised. This is intended to prolong the life span of the originals.

Similarly, originals at institution B are also reshelved. The difference between originals at institution A and B is that at B, library users are allowed to access the originals especially those who are computer illiterate and cannot access digital content since they form part of the library users at this institution. However, the institution also intends to limit access to originals in future due to the presumed rate of deterioration of the materials as a result of the increased physical contact with the users.

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According to the researcher, the institution needs to conduct intensive training in computer applications so that all library users are trained in how to access digital content. Once this training is done, access to originals can then be strictly limited.

The originals at institution C are transferred to the repository where they are stored in the movable shelves after being digitised and it is at this stage that only authorized users specifically the repository staff can gain access to them. After a period of five years, they are transferred to offsite storage location in the Western District of Uganda for permanent storage. While at this location, access can only be authorised by the senior archivist upon the request of the institution's Board of Directors or senior members of management for high level decisions.

Currently, the Buganda Government Collection are maintained in acid free archival boxes and after digitisation, the researcher intends to continue maintaining the collection in their boxes with controlled access so that their lifespan is prolonged for future use in case the authenticity of the digital copies is interfered with.

The researcher realised that the digitisation of archival materials is not a smooth process. A number of risks were identified during the study as the next section indicates.

4.2.13. Risks associated with digitisation of archival materials in the institution studied

The researcher sought to find out the risks associated with digitisation of archival materials in the three institutions so as to propose strategies for effective digitisation of Buganda Kingdom collection with minimal risks. Certain risks were identified as discussed below:

The instances of dark images due to inappropriate book scanner settings were recorded as part of the risks associated with current digitisation of archival materials at institution A. Dark images affect the quality of the digital objects uploaded online and to ensure quality, rescanning has to be done which is time consuming and tedious. The initial settings were made by the product supplier and not mastered by the digitisation staff.

There are also risks associated with damaging of the originals in the process of preparing them for scanning. This relates to removal of stipples from papers and unfolding of papers that result into tear and wear of the originals. This was a crosschecking risk in all the three institutions and it is so serious since it has a direct effect on the originals.

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At one of the institutions, there were risks associated with staff accessing confidential information especially for materials such as medical records which contain patients' information.

At institution B, certain information materials are brought from other institutions to be digitised at a fee and these in most cases contain confidential and private information which do not need to be accessed by all the digitising staff. This puts patients' information at risk of being revealed if staff members are not well cautioned. However, though staff gain access to confidential records, no cases of sharing such information has ever been reported though scanning them puts the entire institution at risk if the information is leaked before quality control is done as earlier indicated in the steps under section 4.2.3.

However, the risks as identified in the previous section do not prevent digitisation from taking place in institutions. A number of security measures were put in place to ensure security of the digital objects. These measures are indicated in the next section.

4.2.14. Security of the digital objects

In order to maintain the safety and authenticity of the digital materials, a number of possible options have been put in place by different institutions.

All the three institutions reported the use of passwords as a measure for ensuring the security of digital objects. Individual desktops are protected with passwords to limit unauthorized access while library users are issued with user names and passwords so that only authorised users can gain online access to the digital content.

There is also controlled access to the server rooms. For example in all the institutions, not all staff have access to the server room but there is only one individual authorised to access it so that in case of any interference with the server, the individual can easily be traced.

The researcher found the above security measures to be applicable and intends to apply them while digitising Buganda Kingdom collection.

4.2.15. Other issues discussed

The researcher sought to find out whether there could be any other issues that would enable him develop a framework/action plan for sustainable digitisation of the Buganda kingdom collection at Makerere University Library that might have not been discussed. A few issues were identified that the researcher noted as being of importance. The interviewees stated that:

There is a need to introduce the use of permanent identification marks on already converted originals so that staff do not need to go through the validation stage to identify which materials are already digitised and uploaded to the institutional repository. However, staff need to be cautioned when placing identification marks so that the originals are not damaged. Placing marks on originals shall go a long way in saving staff time and increase on the output.

There is also a need to explore the capabilities of the different scanners so that more efficient scanners such as those which can automatically open the book in the process of scanning. This can be considered appropriate for further studies.

All the above findings are summarised as below:

4.3. In summary

The collections based approach was the most used among the three institutions when planning the digitisation projects. The discipline and materials based approaches were also used but for this particular study, a materials based approach was preferred since it appears to be effective in terms of money and staff time.

It was noted that the number of selection criteria, used in the studied institutions, were influenced by the approach. When an institution used the collections based approach they made use of a short list of selection criteria while the institution which adopted disciplines and materials based approaches had comprehensive lists of selection criteria as discussed in section 4.2.2.

The nature and the physical state of the materials were considered most important for the researcher when selecting materials for digitisation.

Different steps are followed when digitising materials at different institutions. However, they are common in some way ranging from sorting materials to be digitised to reshelving the originals for continued preservation.

Different equipment were used to digitise particular materials as indicated in table 1 of section 4.2.4 and these included hand held scanners for the digitisation of delicate materials, flat bed and automatic document feeder scanners for digitisation of loose papers and photographs. Atiz Book scan pro and Digibook SupraScan II were used in the digitisation of oversized and bound materials. The handheld scanner, automatic document feeder and Atiz Book Drive Pro are available at Makerere University Library and shall be used as a basis for initiating the digitisation of Buganda Kingdom collection.

A number of costs were identified that are incurred in the process of digitising materials. Repair and maintenance costs as well as costs associated with the purchase of stationery were considered relevant for purposes of this study.

Permanent members of staff are included as part of the project team and schedules are made to create a balance between routine library activities and activities related to digitisation. This shall also be recommended when digitising the Buganda Kingdom collection.

It was observed that staff involved in digitisation need to have basic computer skills and other skills related to digitisation are imparted to staff through training.

Two of the three institutions did not have direct policies related to digitisation. The researcher is however, of the opinion that there is a need to recommend that a preservation and conservation committee is established and that the committee is charged with developing a digitisation policy to govern the digitisation activities.

Access to digitised materials is by authorised users only and most of the content is uploaded into online platform such as the institutional repository for institution A, UNESCO platform for institution B and institutional server for institution C.

Dublin core was used at the two institutions as a metadata standard because of the standardised elements that can effective describe the items and institution C developed its in-house metadata to cater for its unique materials. The researcher intends to apply Dublin core

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while describing the Buganda Kingdom collection since it works well with Dspace which is currently being used at the library.

All three the institutions studied used TIFF as a format for archival preservation because materials do not fade or lose quality once converted to other file formats. PDFs and CSV were also used as formats for easy access.

In all the institutions studied, access to originals is limited and restricted in a bid to prolong their lifespan. In some cases, the originals are transferred to off-site storage for permanent preservation.

With regard to risks associated with digitisation, the researcher noted dark images due to inappropriate scanner settings, damages to originals and access to confidential information as being experienced by institutions engaged in digitisation. The researcher, therefore, has to take note of them while digitising the Buganda Kingdom collection.

In terms of security for the digital objectives, user names and passwords are issued to all authorised users so as to limit access. There is also controlled access to server rooms where digital content is stored. This shall also be applicable to Digital objects of the Buganda Kingdom collection.

Other issues of concern identified by the researcher include the introduction of the use of permanent identification marks to be put on the already digitised originals to save time taken at the validation stage and explore the capabilities of acquiring a scanner that can automatically open the book in the process of scanning. However, care needs to be taken to avoid causing damage to materials onto which marks are placed.

5. CHAPTER FIVE: CONCLUSION AND RECOMMENDATIONS

5.1　Introduction

This is the final chapter of the research report and it covers the research intent, a review of the main research question, the research sub-questions, the key findings and recommendations that arouse out of the findings, the recommended strategy and implementation plan, recommendations for further research as well as the summary of the entire chapter. All these are aimed at sustainably digitising the Buganda Kingdom archival materials at Makerere University Library. Each of the sections is further discussed below:

5.2　Research intent

The researcher intended to develop a recommended strategic and action/implementation plan that would work best when digitising the Buganda Kingdom collection. The study could be regarded as successful because the research questions could all be addressed. From the research conducted the researcher was able to reach conclusions that resulted into the design of the strategic and action plans.

Looking in more detail at the research that was conducted it is possible to report that greater success manifested in areas such as the digitisation approach; the selection criteria to guide the selection of materials for digitisation; the steps followed when carrying out digitisation and an indication of the costs involved in digitisation as well as how they could be covered.

However, the researcher received inadequate information regarding policies and standards that govern digitisation. This was because only one of the three institutions consulted had fully functioning policies and was using standards that were directly linked to digitisation. This is therefore the only area where the researcher struggled to reach conclusions and make reasonable recommendations.

All in all, the data collected was adequate for the researcher to guide the sustainable digitisation of the Buganda Kingdom collection hence the conclusion that the study was successful.

In order to ensure that this conclusion is correct the next section will review the main and sub-research questions and the results achieved.

5.2.1 Main research question:

In this study, the researcher aimed at answering the research question as stated below:

What elements should be included/ adopted in the strategy/approach and action plan to sustainably digitise the archival collection of the Buganda Kingdom? Sections 5.5 and 5.6, below, provide the detailed response to this question.

The above question was underpinned by a number of sub-questions as indicated in the section below.

5.2.2 Sub-questions

As indicated in the previous section, the research question was divided into sub-questions as stated below:

1. *What are the various strategies/approaches that could be used when planning archival digitisation projects?* Section 2.2 discusses these options in detail. The research resulted in the researcher identifying the 'materials based approach' for digitizing the Buganda collection.

2. *Given the unique context, which strategic plan would work best when digitising the Buganda collection?* This question was addressed under section 5.4 where a five year strategic plan was developed.

3. Once the approach is defined, *what selection criteria, to select specific archive artefacts for digitisation, could be applied?* Recommended selection criteria were stated under section 5.3.2 of this chapter.

4. What are the requirements for sustainable digitisation initiatives?
   a. *What are the operational requirements for digitising archival collections?* A number of requirements were identified in relation to funding where it was noted that most of the funding for digitisation projects in institutions comes in form of grants. The issue of human resource was also discussed where permanent staff are mostly involved in digitisation with little involvement of

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contract staff. Recommendations on the sustainability of funding and human resource are made under section 5.3.6 of this chapter.

b. *What processes (action plan) are required to be put in place to sustainably digitise the Buganda Kingdom's specific special collection?* Several steps were recommended under section 5.3.3 and an implementation plan developed under 5.5 aimed at sustainable digitisation of Buganda Kingdom collection. The processes range from identifying and prioritising materials for digitisation to reshelving the originals.

c. *What is the technology infrastructure requirement?* The researcher put emphasis on basic technology infrastructure that covered scanners. A number of scanners were discussed in section 4.2.4 of chapter four and recommendations made under section 5.3.3 of chapter five.

5   *What skills are required to make the project successful?*

A number of skills were identified that are required for staff to participate in digitisation. Most of them were directly related to skills in hardware and software operations. Preservation and conservation skills needed were not identified in the literature consulted but discussed among the findings under 4.2.7. It was, therefore, included among the recommended skills together with other skills as indicated in section 5.3.7.

The above sub-questions resulted into the development of a strategy and action plan/implementation plan to be submitted to the library management team for endorsement.

Conclusions and recommendations were made out of the data analysed under chapter four and from literature reviewed. These are presented in section 5.3 below.

5.3   Conclusions and recommendations

The findings of the study changed the researcher's general views about the entire digitisation process and as such, new ideas were generated, conclusions drawn and recommendations made regarding different aspects as discussed below.

5.3.1. Approaches for the digitisation projects at Makerere University Library

Three different approaches were identified as being used by institutions when planning digitisation projects (that is the collections, discipline and materials based approaches). Without a definitive best practice it is recommended that Makerere University follows the materials based approach. This recommendation is made because the 'collections' and the 'discipline' based approaches were used on the basis of the availability of financial resources. The 'materials' based approach is recommended when considering the financial status of the institution where the proposed strategy and action plan is to be implemented. This is because it prioritises materials which are (1) in a deteriorating state and (2) those which are in high demand. A similar approach was adopted and implemented by the National Library of New Zealand (2010:4) as indicated in the reviewed literature under section 2.2.1.

However, in future, when the institution secures funding, the 'collections' based approach could be implemented so that the entire collection could be considered for digitisation to enhance access the whole of the Buganda Kingdom collection.

An approach needs to be supported by appropriate selection criteria as recommended in the next section.

5.3.2. Criteria to be used when selecting materials for digitisation

After the researcher thoroughly analysed the criteria for selection of materials for digitisation, it was noted that most of the factors used by institution B are applicable and worth recommending when selecting materials from the Buganda Kingdom collection for digitisation. These include but not limited to:

- Physical state of the materials.
- Demand for the material.
- Time covered by the materials.
- Place described by the materials.
- People/personalities described.
- Number of available copies.

These were considered relevant in the identification of archival materials for digitisation from the Buganda Kingdom collection. However, the selection criteria should be kept flexible to accommodate materials which are out of the selection criteria but worth digitising depending on the prevailing circumstances. The relevant guidance on selection criteria, as recommended by Asogwa, (2011:6-7) and Mapulanga (2013:636), was discussed in detail under section 2.3 of this report).

The selection of the archival materials should be followed by the application of specific steps or workflows - as discussed under 5.3.3 below.

5.3.3. Steps to be followed when digitising Buganda Kingdom collection

The researcher synthesised the stages followed by the three institutions to create a comprehensive list which could be followed by Makerere University Library when digitising the Buganda Kingdom collection. The following synthesised stages are recommended:

- Identification of materials for digitisation based on the recommended criteria.
- Recording of the identified materials for record keeping purposes.
- Validation to determine whether the digital copies of the identified copies do not already exist. (This is based on Asogwa, 2011:6 as indicated in section 2.4.1. of the literature review).
- Preparation and conservation of the materials to be digitised - which involves cleaning and repair of the worn-out originals identified as part of the collection to be digitised.
- Putting materials in boxes for easy transportation to the digitisation room.
- Scanning of the material and quality control of the electronic output. Other than correcting errors, the digital copy can be changed to different formats depending on the need such as PDFs for online access.
- Assigning of metadata and uploading the metadata to the relevant repository.
- Verification of the originals and re-shelving. Verification should be done to ensure that the original/physical copies tally with the recorded list as compiled in the second stage. Efforts should be done to ensure that all original copies are returned to the shelves after digitisation is done and access to them should be limited to prolong their life span.

Some steps, such as scanning, require the identification of equipment to be used to execute the activity. A number of recommendations regarding the digitisation equipment have been made by the researcher as indicated in section 5.3.4 below.

Other issues to consider when planning sustainable digitisation projects, it was suggested that permanent marks stickers/marks should be placed on the already digitised materials to avoid duplication of efforts at the validation stage

5.3.4. Equipment that can be used when digitising materials

Considering the fact that material could be damaged when removing staples from papers before scanning is done, a handheld scanner is recommended as appropriate equipment regardless of the time taken so that the physical state of the originals is not interfered with.

There is a need to explore the possibility of acquiring equipment which is more efficient in terms of human efforts to increase the daily output. Digitisation projects are in most cases time bound. Therefore, the library should consider acquiring a Digitising Line (DL 3000) as earlier recommended by Kusekwa (2012:21) and discussed in chapter two as it is equipped with "an automatic page turning system" which can scan up to 2500 pages per hour". This scanner is considered efficient and appropriate for scanning the bound materials within the Buganda Kingdom collection.

In all three institutions consulted for this research, different scanners were used for digital conversion. The researcher recommends a Memorandum of Understanding with these institutions so that the scanners could be shared when need arises. This not only reduces the operational costs but also results into institutional collaboration that promote resource sharing.

5.3.5. File formats when digitising materials

The researcher recommends the use of two file formats: that is TIFF for archival preservation and PDF for online access. This recommendation is aligned with the practice at the studied institutions as indicated under section 4.2.11.

In order to maintain the equipment and meet other costs as discussed under section 4.2.5, there is need to put in place sustainable sources of funds. These are recommended in the next section.

5.3.6. Sustainability in terms of funding and human resources

Different costs are involved in the digitisation process such as those involved in the repair and maintenance of equipment, staff motivation among other costs as stated in section 4.2.5,

Makerere University Library should consider writing proposals for the funding of library digitisation projects so that the entire Buganda Kingdom collection, given its uniqueness, can be considered for digitisation. Grants have been viewed as the main source of funding for digitisation projects in the Sub-Saharan Africa (Petersohn… et al, 2013:486). This was extensively discussed under section 2.5.1 of the literature review.

The researcher also recommends the use of permanent members of staff while digitising the Buganda Kingdom collection. .This would, promote project sustainability as staff can continue with the project activities when the proposed project time comes to an end.

There is also a need to consider digitisation as part of the routine activities of the library just like cataloguing and classification instead of running it as an independent project. This means that it will be budgeted for by the library and staff shall digitise without any prospects of additional payments. In this case, digitisation shall become a continuous and an ongoing activity within the library, and hence sustainable.

Sustainability in terms of funding and the management of the entire digitisation process requires the possession of adequate skills and competencies. In relation to skills, the researcher makes recommendations as the next section shows.

5.3.7. Skills and competencies

Comprehensive staff training is needed in the use of newly acquired or the already available equipment by the experts so that in the process of digitisation, so that the equipment could be used with ease and settings easily changed to fit the archival material in hand.

As earlier indicated in section 4.2.7 of chapter four that not all staff have the required skills and competencies to participate in digitisation, the researcher concludes that some skills are learnt on the job and, therefore, recommends that librarians need to be regularly trained to equip them with the necessary skills to become competent in a particular activity that the library intends to execute.

The researcher compiled a list based on the study findings and these include:

- Skills and competence in running particular hardware and software packages such as scanners, Microsoft office package and Adobe professional.
- Knowledge of scanning documents.
- Knowledge of uploading content in DSpace.
- Skills and competence in preservation and conservation of materials.
- Records management.
- Skills and competencies in maintenance and repair of digitisation equipment.

The researcher also recommends Continuous Professional Development (CPD) programmes for librarians so that they keep abreast of the latest developments in digitisation that relate to metadata standards, software packages to support access to digital content, scanners among other issues associated with digitisation.

Skills and competencies alone cannot lead to successful digitisation projects. Digitisation policies play a significant role in guiding the digitisation process and recommendations regarding policies are discussed in the next section.

5.3.8. Policies and standards to ensure effective digitisation

The researcher recommends that two standards (that is the ISO 15489: International Standard on Records Management; the ISO 16175 Principles and functional requirements for records

in electronic office environments) are adopted by the digitisation team. These two standards should also be reviewed by the Makerere University Library to determine whether they could be adopted for the digitisation of the general collections. It may be necessary to incorporate the use of these standards in the Institutional Repository Policy awaiting senate approval.

Secondly, the library should establish a 'preservation and conservation committee' purposely to develop a digitisation policy and control the digitisation activities of the library including effective management of the originals after digitisation is done to prevent deterioration. The researcher recommends involvement of the staff from the current digitisation and the Africana sections where archival materials and special collections are maintained.

5.3.9. Collaboration with other institutions

The researcher also recommends that a Memorandum of Understanding is created among the institutions that actively digitise materials. This would facilitate sharing of the available equipment at a fee instead of each institution buying expensive equipment. This shall help to save on the costs and increase inter-institutional relationships. The researcher considers such collaboration as a two way benefit in terms of sustainability as the fee collected can help to maintain the equipment while the institution that pays gets its collection digitised.

In order to have a smooth digitisation process, a strategic plan needs to be put in place. The strategic plan assesses the library's current status in terms of staff and equipment and specifies where the library would like to be in a specific period of time. The next section discusses the recommended strategic plan that shall be presented to library management for endorsement as earlier stated under section 1.2.2 of chapter one.

5.4 Recommended strategic plan

There is already an established digitisation section in the library and the researcher hopes that by developing a sustainable strategic and implementation plan, the digitisation of the Buganda Kingdom collection shall be a smooth process given the enthusiasm and cooperation of the library staff.

As earlier stated in section 2.9 of chapter two, Makerere University Library has a number of equipment that can facilitate successful digitisation projects including servers and scanners.

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Since conservation was recommended as one of the steps to be followed when digitising Buganda Kingdom collection as indicated in 5.5.5, the researcher intends to involve the staff in the bindery section so that worn out or torn materials can easily be repaired before they are digitised. Involving staff in the Bindery section is advantageous as extra training shall be needed only when specialised conservation is required. No extra costs shall be incurred when straight forward repair or binding is necessary as the library makes provision for conservation of all information materials in the library budget.

As part of the digitisation strategic plan, continuous training shall be conducted to impart skills related to scanning, editing and uploading of content into the Makerere University Institutional Repository. Similar training was used by the three institutions studied as indicated in section 4.2.7 of Chapter four and Asogwa (2011:9); Baro, Oyeniran and Ateboh (2013:24) had earlier recommended training of staff to reduce digital illiteracy (see section 2.5.2 of chapter two).

The staff in the digitisation section could handle training in digitisation related activities while archival staff in the Africana section could handle training in material selection since they regularly work with unique and rare materials and would, therefore, be able to advise on working with material that require unique handling to prevent damage due to physical contact.

The strategic plan shall take into consideration the recommended steps to be followed while digitising not only the Buganda Kingdom collection but the entire library collection. Each step shall be allocated a specific time adequate to ensure quality with particular activities that accompany each step. This shall be extensively covered in the recommended implementation plan under 5.5 of the next section.

The researcher recommends a five year strategic plan for effective digitisation of Buganda Kingdom collection given the size of the collection and keeping in mind the recommended selection criteria as indicated in section 5.3.2 of this chapter.

5.5　　　Recommended action/implementation plan

The implementation plan shall compromise of the recommended steps as earlier stated in section 5.4 and as indicated in Table 3 on the next page.

A digitisation team shall be formed headed by the project coordinator to manage the entire digitisation process. Maron and Pickle (2013a:21-24), discussed under section 1.5.3 of this report, recommend the availability of strong and dedicated leadership as a drive towards sustainable digitisation projects which the researcher intends to implement prior to the digitisation of Buganda Kingdom collection.

Table 3: Recommended implementation plan for the five year strategic plan

Step No.	Steps	Activities involved	Person (s) responsible	Time period
1	Identification and prioritising of materials for digitisation	• Revisit the recommended approach • Review of the selection criteria • Physical analysis of the entire Buganda Kingdom collection • Select particular archival materials eligible for digitisation keeping the five year strategy in mind	Digitisation team	Year 1 (12 months)
2	Developing processes	• Documenting processes and workflows taking into consideration all of the steps mentioned below		Year 2 (3 months)
2.1	Recording of the materials	• Record entry of the identified archival materials into Microsoft Excel for record keeping purposes.	Digitisation team	Ongoing
2.2	Validation	• Using the recorded information in step 2 to determine whether the identified materials already exist into the institutional repository	Digitisation team	Ongoing
2.3	Preparation and Conservation of the	• Repair of the already damaged materials • Removal of staples from archival papers	Bindery section	Ongoing

		• Straightening of folded papers to be digitised		
2.4	Putting materials in boxes for easy transportation to the digitisation room	• Arranging archival materials in boxes according to the order as used in archival boxes • Labelling boxes according to its holdings • Transferring boxes to the digitisation room	Digitisation team	Ongoing
2.5	Scanning	• Sort archival materials according a particular equipment to be used as discussed under section 4.2.4. • Actual scanning/digital conversion	Digitisation team	Ongoing
2.6	Quality control	• Checking that the scanned images are clear • Crosschecking with the original to ensure that there are no missing pages • Combining the scanned pages into a single document	Project coordinator	
2.7	Assigning of metadata and uploading	• Retrieving a specific digital file • Assigning appropriate metadata • Uploading the file into the institutional repository	Digitisation team	
2.8	Verification of the originals and re-shelving	• Comparing the list compiled in step 2 with the physical copies/originals • Putting back the originals into boxes	Digitisation team	Ongoing

		• Carrying back the originals to their respective locations • Re-shelving of the originals		
3	Testing processes and actively scanning material	• Priority 1 material • Testing and fine tuning the processes		Year 2 (9 months)
4	Embedding and enhancing services	• Priority 2 material		Year 3 Ongoing
5	Embedding and enhancing services	• Priority 3 material		Year 4 Ongoing
6	Embedding and enhancing services	• Priority 4 material		Year 5 Ongoing

Notes:

*Conservation time may depend on the number of damaged materials and extent of damage.

**The three activities need to be done consecutively so that in case the quality of the scanned image is poor, it can be rescanned there and then.

Metadata needs to be assigned and item uploaded for immediate access

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5.6　　　　Recommendations for further research

The researcher realised that there is a need for a comprehensive study on policies and procedures that directly relate to digitisation of archival materials. This was based on the fact that only one among the three institutions had policies that were directly related to digitisation of materials. The policy should be wide in scope to cover issues of copyright which limit access to digital content.

There is also a need to conduct a study in future on the value and impact of the digitised Buganda Kingdom collection to establish the return on investment in terms of funds, effort and time

Documentation of the indigenous knowledge held by the existing Buganda chiefs and other notable personalities would also be an area of interest for further research for research and academic purposes. Such a study would result into the creation of new knowledge to the archival collection of Buganda Kingdom.

There are also materials held on unique formats such as the traditional Buganda Kingdom calendars printed on wood. The researcher is of the view that a study on the possibility of digitising materials presented in such formats would be of great interest to scholars and researchers especially when presented online through the institutional repository.

5.7　　　　In summary

A materials based approach was recommended among the reviewed approaches as discussed under section 2.2 of chapter two when planning the digitisation of Buganda Kingdom collection given the nature and the size of the collection.

The physical state of the materials, demand for the material, time covered by the materials, place described by the materials, people/personalities described, and the number of available copies were identified as the criteria appropriate for the selection of the Buganda Kingdom materials for digitisation.

Several steps that could be followed when digitising the Buganda collection were identified that ranged from identification and prioritisation of materials for digitisation to re-shelving of the originals for continued access as indicated under section 5.3.3.

In terms of equipment, the researcher recommended that access is negotiated so that all the scanners as indicated under section 5.3.4 could be used when digitising the various archival materials of the Buganda Kingdom collection. Two file formats were recommended for particular reasons. These include TIFF for archival preservation and PDF for online access.

Writing proposals for funding and the use of permanent members of staff for projects were recommended as strategies to ensure sustainable digitisation in terms of funding and human resource respectively. The digitisation staff need to have specific skills and competencies such as running specific hardware and software, scanning documents, uploading content among other skills and competencies as highlighted under section 5.3.7.

There are policies and standards that guide the digitisation process and as such the researcher recommended that two standards that is the ISO 15489: International Standard on Records Management; the ISO 16175 Principles and functional requirements for records in electronic office environments be adopted by the digitisation team. The formation of a preservation and conservation committee was also recommended purposely to develop a digitisation policy.

The researcher further noted that collaboration is vital in promoting resource sharing especially the scanning equipment and recommended a Memorandum of Understanding between the digitising institutions.

Finally, the researcher developed proposed strategic and implementation plans to facilitate the smooth digitisation of the Buganda Kingdom collection. Areas of interest were identified and recommended for further research.

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Appendix A: Ethical clearance from the University of Pretoria

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2016-08-02

ETHICAL CLEARANCE FOR PATRICK SEKIKOME

Dissertation Title: *Developing a strategy and action plan for sustainably digitising specific special collection: a case of Buganda kingdom collection at the Makerere University Library, Uganda.*

To whom it may concern:

This is to confirm that the Research Committee of the Department of Information Science approved the application by Patrick Sekikome for ethical clearance. Mr Sekikome complied with the standard requirements for ethical clearance as set out by the University of Pretoria's Faculty of Engineering, Built Environment and Information Technology (EBIT), as follows:

- He signed and submitted all the application forms required for ethical clearance;
- He submitted his data collection instruments for vetting by both the Research and Ethics Committees; and
- He implemented all corrections recommended by the above-mentioned committees.

The Research Committee of the Department of Information Science therefore requests permission for Mr Sekikome to collect the data he needs in order to complete and submit his mini-dissertation for examination. The Committee further appreciates any effort by appropriate authorities to expedite this process, and expresses its gratitude in anticipation.

Yours sincerely

Dr Marlene Holmner

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Appendix B: Interview schedule

Introductory remarks

I am Patrick Sekikome a Masters student of the University of Pretoria, South Africa; currently in my final year undertaking a study on "Developing a strategy and action plan for sustainably digitising specific special collection: a case of Buganda kingdom collection at the Makerere University Library, Uganda".

This interview should be approximately 60 minutes in duration. I appreciate the time you have made available for me to discuss issues related to digitisation in your institution. In this interview, I would like to discuss with you issues related to (1) approaches used when planning digitisation projects, (2) criteria used when selecting materials for digitisation, (3) stages involved in the digitisation process, (4) technology requirements for digitisation of archival collection, (5) resource requirements for sustainable digitisation initiatives, (6) risks and security related to digitisation as well as any (7) other issues related to digitisation that can make our digitisation project planning a success.

I would appreciate it if I could record this interview for purposes of data collection and transcription. I assure you that the information collected will be treated with utmost confidentiality if given the opportunity to record. I therefore, inquire from you whether you are comfortable with recording your responses. A copy of the transcription will be given to you for review.

Approaches used in planning digitisation projects

1. Which approach did you use when planning the digitisation project?

   (The researcher will give a hint on different approaches and explain what each of these is for the interviewee to clearly understand the question (materials based, collections based, discipline based and formatting decisions)

Criteria for selecting specific archival collections for digitisation

2. Which criteria do you use when selecting materials for digitisation?

   (Here, the researcher intends to know how materials to be digitised are selected).

3. Are these criteria usually sufficient or do you make exceptions so that other material could also be digitized?

(At this stage, the interviewee shall be requested to state the exceptional circumstances in case the criteria are not sufficient)

Process and technology requirements for digitising archival collections

i.   Processes/stages involved in the digitisation of archival collections

4. What steps/processes do you follow when digitising materials?

5. Of what value is each step in the digitisation process?

ii.   Technology infrastructure requirements for digitisation projects

6. Which equipment do you currently use while digitising materials?

7. Do you have equipment linked to specific material types or do you use general equipment that accommodates all formats?

8. If specific equipment is used: Which equipment do you use to digitise particular material types?

Resource requirements for sustainable digitisation initiatives

i.   Funding

9. What costs do you incur while undertaking digitisation projects?

10. How are the costs covered/who sponsors the project?

11. How do you ensure sustainability of the digitisation projects in terms of funding at this organisation?

ii.   Human resource/Staffing

12. How do you manage staffing for digitisation projects? (This relates to whether new staff are recruited for specific projects or they make use of the available staff, if this is the case, how are the roles allocated to the available staff in relation to other routine activities of the sections or departments where such staff are attached).

13. What skills and competencies do you expect a staff member to already have before you would employ him/her to digitise materials at your institution?

14. Do all staff involved in the of materials at your institution already have skills and competencies as mentioned above (or do you provide on the job training to them)?

iii.   Policies and procedures

15. Which policies have you put in place to ensure effective digitisation of materials at your institution?

iv.   Giving access to the digitised collection

16. How do you provide access to the digitised materials? (Open to the general public/your staff only/pay for access)?

17. How do you facilitate access to the digitised materials? (web access/ they need to come to your office)

18. Which metadata standards do you use for describing the digitised materials?

(The researcher shall highlight a few metadata standards commonly used such as Dublin Core, Metadata Object Description Schema and Machine Readable Cataloguing to guide the interviewee – if necessary)

19. What influenced your choice of the metadata standards as mentioned above?

20. In which formats are the digitised materials archived and why?

21. How do you provide access to <u>originals</u> after digitisation is done?

Risks and security

22. Which risks do you think are associated with digitisation of archival materials in your institution?

23. How do you ensure security of the digital objects?

Any other issues related to digitisation

24. Are there other issues, that would enable me develop a framework/action plan for sustainable digitisation of the Buganda kingdom collection at Makerere University Library, that you think we should discuss?

Closing Remarks

I am confident that the information you have shared with me will be very useful in developing a strategy and action plan for the sustainable digitisation of the Buganda Kingdom collection and in the end also for other collections not only those at Makerere University but in other institutions of higher learning.

I am grateful that you sacrificed time for this interview. Your contribution will assist to make my research a success. I request that you allow me contact you in future in case of any further questions and clarification.