

# Digital Preservation of Cultural Heritage in Uganda: Case of Bugisu Sub Region



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## 1 Introduction

Africa is globally rich in resources of cultural and natural value. The entirety of ‘the people’s cherished arts, customs, festivals, sacred or worship sites, norms, values, ideologies, dress and dress-patterns, traditional monuments and architectures, which are cherished and conserved for their historical, political, educational, recreational and religious significance among others’ is known as cultural heritage [1]. Akullo [2] states that Traditional Knowledge, for example, in Africa has obtained force as a strategic asset for socio-economic development, and consequently, there is a need for efficient management. Digitization is considered as an instrument that can be utilized to give long-term conservation and global approach to Traditional Knowledge. In the 1980s, interest in application of digitization and image processing started to appear amongst cultural institutions [3].

Digitization of cultural heritage has taken a popular turn in Uganda as elsewhere in the world as a means of conservation and preservation of cultural heritage for posterity. Uganda has a very strong cultural heritage. Many of its regions have kingdoms, including Buganda, Toro, Busoga, Bugisu, Teso and Bunyoro, among others. The Ugandan culture encompasses more than 50 African ethnic groups, as well as a small population of Europeans, Asians and Arabs [11]. Uganda’s, digital preservation of cultural heritage is under the Ministry of Tourism, Trade and Industry under the sector of Tourism, Wildlife conservation and Museums. However, while digitization is viewed as a tool that can be used to provide long-term preservation and global access to indigenous knowledge, there have been serious challenges

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associated with digitizing cultural heritage material. Challenges such as limited knowledge on the importance of digitizing cultural heritage, lack of adequate skill in the use of information technologies, limited financial muscle to acquire the appropriate digitization tools and inadequate institutional digital preservation guidelines, policies and strategies have been reported. For example, a study conducted by Alinaitwe [12] on the existing relevant Information technologies available for adoption to safeguard Intangible Cultural Heritage by Cultural Institutions in western Uganda established that while 95% of the respondents recognized the role of information technology as Vital and crucial for preserving cultural heritage, only 29% had exposure to information technologies and about 58% lacked the relevant skills to use information technologies. Around 82% were challenged by limited financial resource envelopes allocated to information technologies. De la Porte and Higgs [13] state that the challenges observed during the digitization of cultural heritage in Western Cape presented that 76% of the respondents admitted there were limited technical skills and absence of training as a provocation. While 70% showed that limitation of knowledge presented an impact on the digitization of activities, 82% of the replies further spotted low numbers of personnel dedicated to digitization activities as a challenge. Lastly, 70% of the respondents showed lack of funding and 58% limited availability of skills. Inconsistent application of standards and the lack of institutional guidelines and policies were identified by 53% of the respondents. These examples give a picture on the challenges to digitization of cultural heritage material experienced in Africa. Magara [14] explains that in Uganda, there is hardly any system of recording, documenting and preserving indigenous information, let alone a mechanism for capturing indigenous knowledge to cope with dynamic world needs. This, therefore, has made it difficult to use ICT to provide long-term preservation and global access to indigenous knowledge in Africa and particularly in Uganda.

## 2 Problem Statement

Digitization of cultural heritage has taken a popular turn in Uganda as elsewhere in the world as a means of conservation and preservation of cultural heritage for posterity. However, whereas digitization of cultural heritage is viewed as a tool that can be used to provide long-term preservation and global access to indigenous knowledge, there have been serious challenges associated with digitizing cultural heritage material. Challenges such as limited knowledge on the importance of digitizing cultural heritage, lack of adequate skill in the use of information technologies, limited financial muscle to acquire the appropriate digitization tools and inadequate institutional digital preservation guidelines, policies and strategies have been reported. This, therefore, has made it difficult to use digital technologies to provide long-term preservation and global access to indigenous knowledge in Uganda.

**Fig. 1** Three-legged stool for digital preservation



### **2.1 Theoretical Model: Three-Legged Stool**

This entire study was guided by the Anne Kenney and Nancy McGovern model [24] for the Digital Preservation Management Workshops in 2003–2006; this stool represents the three aspects of a successful and sustainable digital preservation programme:

1. Organization
2. Resources
3. Technology

What the model demonstrates is that without considering and maintaining each of these components (or “legs”), a digital preservation programme will ultimately collapse. These three components need to be considered together in order to sustain digital preservation activity. This study focused on studying the three legs of the model and how they influence digital preservation (Fig. 1).

## **3 This Chapter**

This chapter, therefore, assesses the underlying challenges of cultural heritage preservation in Uganda and establishes ways for using digital technology to provide long-term preservation and global access to cultural heritage in Uganda.

## **4 Research Questions**

1. *What are the underlying challenges of preserving cultural heritage in Uganda?*
2. *What factors are necessary for successful adoption of digital technology to provide long-term preservation to cultural heritage?*

## 5 Methodology

Research Question One: *What are the underlying challenges of preserving cultural heritage in Uganda?*

In order to answer research question one, this study considered the Bugisu region in Eastern Uganda as a case study. This region has one of the richest cultural heritages in Uganda. The Bugisu sub-region is a region in Eastern Uganda consists of the following districts: Bududa District, Bulambuli District, Manafwa District, Mbale District, Namisindwa District and Sironko District. The sub-region is home mainly to the Gisu people, also called Bagisu. The Bagisu speak Lugisu, a dialect of Lumasaba, a Bantu language. Lugisu is very similar to the Bukusu language, spoken by the Bukusu people of Kenya. According to the 2002 national census, the Bugisu sub-region was home to an estimated 1 million people at that time. Random sampling was used to select three districts for the study, namely Manafwa District, Mbale District and Bududa District. Three districts were considered representative. Then purposive sampling was used to identify and select clans that had old cultural artifacts that needed urgent preservation. The clans that were selected include: Baata-BaweeleManyi Clan, BasongolaBasano Clan and Banametsi clan.

### 5.1 Cultural Heritage Under Study: Clan Records

Clan records were selected as the major cultural heritage for study. Clan records were selected because they were readily available and easily accessible compared to other cultural heritage, such as the Bagisu ‘Imbalu’ dance, historical pottery, tools and clothing. Interviews were conducted with the respective clan leaders of the different clans that were identified, and observation was used to observe different cultural heritage and record books. The study used content analysis to determine the presence of certain words, themes, or concepts from the field data.

Research Question Two: *What factors are necessary for successful adoption of digital technology to provide long-term preservation of cultural heritage in Uganda?*

### 5.2 Systematic Review

This study opted to use systematic review to answer question two of this study because of the following reason. Access to digital preservation experts in the region to provide information on ways in which digital preservation of cultural heritage can be made a success was futile. Questionnaires were e-mailed to digital preservation experts outside of the region; however, no feedback was received. Systematic review was, therefore, considered the best method in the absence of digital preservation experts.

Systematic review is a laborious method used to plot out secondary data and lets the evidence emerge automatically [4]. It aims at identifying, evaluating and summarizing the already published findings of all relevant individual studies, thereby making the available evidence more accessible to the researcher. The strength of systematic review method lies in evidence to establish what works and how it works [5]. The systematic review method has been extensively used in medical research and the natural sciences. It is commonly used by international agencies such as the Australian Agency for International Development (AusAID), the UK's Department for International Development (DFID) and many others directly or indirectly by individuals or organizations contracted to do research on their behalf with the sole aim of finding what works and how it worked in generating development out-comes [5].

The purpose of the systematic review carried out in this article was to review the factors necessary for successful adoption of digital technology to provide long-term preservation to cultural heritage presented by different studies. The systematic review method statistically combined data from a series of well-conducted primary studies and therefore provided a better and bigger picture on the factors necessary for successful adoption of digital technology to provide long-term preservation and global access to cultural heritage. The systematic review followed a four-stage systematic review process, namely;

- Framing questions for a review.
- Data collection—an unbiased literature search.
- Data evaluation—assessing the studies for inclusion in the review.
- Data analysis—determining the heterogeneity of data.

### 5.2.1 Framing Questions for a Review

The problems to be addressed by the review should be specified in the form of clear, unambiguous and structured questions before beginning the review work. Research question two particularly guided the systematic review process as stated earlier (*What factors are necessary for successful adoption of digital technology to provide long-term preservation to cultural heritage in Uganda*):

### 5.2.2 Data Collection

An extensive and unbiased literature search was conducted on the *factors necessary for successful adoption of digital technology to provide long-term preservation to cultural heritage*. Keywords were identified from the research questions. The keywords that were identified and searched included success factors digital preservation, cultural heritage, indigenous knowledge and cultural records. The review covered reports, journals, conference proceedings, books and websites. Google Scholar was of much help for this review. The selection of papers was based on how each paper comprehensively addressed the research questions, particularly the

keywords. From the review, About 46 journal/conference/book chapters/articles/thesis on keywords were reviewed. From the review of 46 studies, 22 studies were found to have addressed some aspects of the keywords. A more refined evaluation was made on the 22 studies, and the review found that only eight publications comprehensively covered the keywords and 14 did not extensively address the keywords and they were excluded. Therefore, the eight studies were used in this chapter to derive general factors for successful adoption of digital technology to provide long-term preservation to cultural heritage.

There are a number of arguments concerning the number of studies appropriate for a systematic review. Slavin [6] observes that large sample studies are desirable for external validity, especially if the design features are optimal, though large studies do not necessarily guarantee internal or external validity. Nevertheless, a number of researchers also agree that studies with small sample sizes tend to have much larger, positive effects than larger sample sizes [7]. A number of scholars have set a sample size criterion for a systematic review that provides strong evidence of effectiveness, and moderate evidence of effectiveness. Both require at least two studies with sample sizes of 250 [6]. This, therefore, means that the eight studies reviewed in this paper is adequate in providing a strong evidence of adoption of digital technology to provide long-term preservation to cultural heritage.

### 5.2.3 Data Evaluation

Selected papers for a systematic review must be subjected to a more refined quality assessment procedure. This can be done through general critical appraisal guides and design-based quality checklists. This chapter uses a simple data extraction table to organize the information extracted from each of the eight reviews that provided comprehensive literature on the keywords of the search (e.g. authors, country, publication year, study design/number of participants, the technology used and the outcomes of these study). Data evaluation was then followed by data analysis.

### 5.2.4 Data Analysis/A Meta-Analysis

An exploration for heterogeneity was conducted to determine whether there were major differences between studies in terms of *factors necessary for successful adoption of digital technology to provide long-term preservation to indigenous knowledge*. This was achieved by summarizing the different factors using tables and a graph; however, the findings were also summarized narratively.

## 6 Presentation and Discussion of Results

In this section, the presentation of findings and the discussions are done concurrently.

**Table 1** Clans

Districts	Name of clan	No. of respondents
Manafwa	Baata-BaweeleManyi	2
Mbale	BasongolaBasano	1
Bududa	Banametsi	1

### 6.1 Clans Studied (Table 1)

*Baata-BaweeleManyi* is a Bamasaba-speaking clan that originally came from Manafwa district, which was formally South Mbale. It spread to different locations, including Bulambuli district, Tororo and outside Uganda, that is Kimiliyi in Kenya. The Baata-Baweele are estimated to be an approximate number of 2500. And this number is the total of those in Bulambuli, Tororo, Kenya and Manafwa. This clan belongs to Babuya because they originate from the South.

*Basongola Basano* is a clan neighbouring Mount Wanale to the East of Mbale district. They belong to Wanale because they are in the centre of Bugisu land. They currently live in Busano Sub County, located in Mbale district, with an approximate number of 4200 people, with the biggest population involved in agriculture.

*Banametsi* neighbour the Baata-Baweele Manyi and are, therefore, referred to as the Babuya. They are presently located in Bududa district, mostly covering the hilly areas of the district. This clan is approximated to have five thousand clan members scattered in the different parts of Bududa district.

During the study, a number of historical clan records were presented by the different clan leaders, some dating back to 1975. These included records that contained land conflict meetings, land division meetings, marriage meetings and many others (Fig. 2).

## 7 Importance of Clan Records

One of the questions that was asked during the interview session with the clan leaders was: *What is the relevance of clan records to the society?*

### 7.1 Distinctive Parts of Identity

The clan records have special features that make them easily recognizable and different from other clans. This is true in that, a number of them are written purely in Lumasaba which makes them very different from other clans. Banametsi clansman said, 'these records are of importance because they uniquely distinguish us from

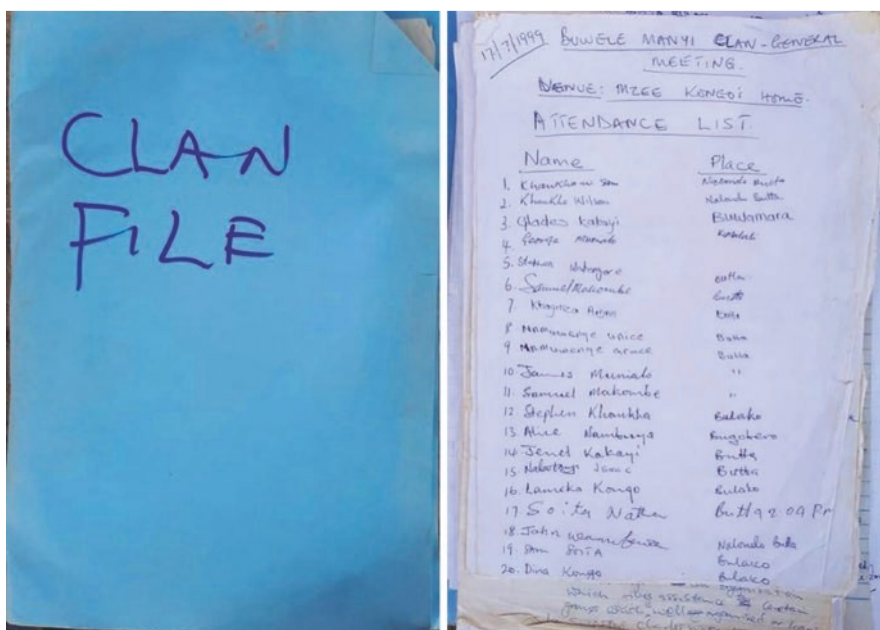


Fig. 2 Some of the clan files

other clans and in the whole world, there are no other cultures with writings and pronunciations like in Lumasaba worldwide’.

Giesecke [8] observes that the difference in clan records defines the end of the system creating identity through shared language and the language itself providing an opportunity to create a particular identity in the system which clearly denies borders.

## 7.2 Learning Purposes

These clan records are kept for the future generations to help aid them learn what transpired during the initial stages of their great-grandparents and parents. This helps learners to be prepared for the future and reach their fullest potential as life-long learners. One of the clan leaders during the interview stated, ‘Am very sure at a certain point in time, there will be a moment when these clan records are a necessity in schools for the students to know what happened those long times ago’.

According to OECD [9], enhancing learning is recognized widely as an important and key route to improving the outcomes of a student and therefore contributing to the country’s economic competitiveness.

### **7.3 Preservation of Our Roots/Identity**

Clan records make our roots or origin remain in place. Even when our forefathers pass on, when records are written and are in place, they will show and sketch back where the clan originated from. “*When I pass on, am very sure when it comes tracing back when we came to existence, there will be no hassle as it will have been recorded already*”. Preservation is core to protecting identity in the conservation of the past for the future generations to come [10].

### **7.4 Future Reference**

It’s an important item that can be used in future to refer to something that had happened many years ago. When these records are in place, there will be speaking with authority without guess work. “*you can refer your children to the clan records that we had and they may learn what sort of discipline we used, how long our clan meetings took place, the order of writing minutes and so on and so forth*”. It is known by a variety of societies that lack written records do the preservation of their traditions and cultural heritage in forms of folklore, myths and oral histories handed down from generation to generation in sorts of epics and legends. Therefore, a careful refining of these legends and folklore will provide very important evidence about the people in the past.

## **8 Challenges Faced in Preserving Clan Records**

The different clan leaders were also asked to explain how challenging it is to preserve these clan records.

### **8.1 Storage Challenges**

#### **8.1.1 Books Being Eaten by Rats**

Clan record books are being destroyed by rats that hover around the houses looking for food. These rats find their way inside the house with the motive of finding food items but instead land on very important documents we have kept and hence destroy them through different punches in them and hence disorganizing the whole record process. One of the clan leaders cited, ‘As an assistant chairperson to the BaataBaweeleManyi clan, I have for sure evidenced this habit happen exactly in my house and hence lost very paramount information’.

### **8.1.2 Lack of Storage Space**

A specific place where only records can be placed without interference from any persons. They are kept but exposed to where everyone can access, hence rendering these very important records at risk. Actually, we haven't put this into consideration as a clan. 'As a clan leader of BaataBaweele, many of our clan records are exposed to public with no one attending to them as the administrator'. The biographical data, clan records, unpublished records and other documents that relate to the work of individual projects, institutions, field schools and organizations in private and public sectors are being preserved for materials that document the intellectual history of archaeology. Different scholars involved in research on the history of archaeology have for a long time been aware of the conditions in which these records are found and stored. These records are found in individual and institutional possession being degraded and become scattered because of lack of proper storage facilities that come from the individuals who are not sure of what to do with the records and paper [37].

### **8.1.3 Fire Outbreaks**

Fire outbreak is yet another challenge that has affected the preservation of cultural records. This has been possible through young children who accidentally play around with matchboxes by testing one match stick on the carelessly placed records and hence all being lost, including property worth large amounts of money. 'We once experienced this scenario as a family where the fire caught our very important records we had placed in a corner of the house. They were burnt to ashes'. The fire is becoming a nearly annual occurrence in several regions globally as fires keep on occurring due to high temperatures and shifting precipitation. These fires are caused by careless handling by different stakeholders, and accidentally, documents are destroyed [38].

### **8.1.4 Lack of Community/Ngos/Traditional Support**

Due to lack of proper establishment as clans in the Bugisu sub-region, there has been no hand by the government of Uganda, other Ngos and the community at large. These clans are only known by the clansmen and the members of the clans alone but not known by the government as a governing body of the country. So without this in place, it poses a great challenge to the clan records because their involvement would add great value to the way records would be preserved.

'We as a clan of Baata BaweeleManyi haven't taken any initiative to involve the government/NGOs/community in the preservation of clan records. This has greatly pulled us back because involvement of partners would have moved us to a great step ahead'.

Governments no longer provide the vision and the strategy to incorporate sustainability in public policy, and yet governments and NGOs would need to develop strategies for transitioning to an economy which is based on sustainable principles. Bell [16], in addition, states that the government needs to play a strategic role in advanced innovation of all sectors of the society since the advancement of sustainability will call for changes and hence a strong call for technological and policy innovations.

## **9 Factors for Successful Adoption of Digital Technology to Provide Long-Term Preservation of Cultural Heritage in Uganda**

Using the systematic review method, the factors necessary for successful adoption of digital technology to provide long-term preservation of cultural heritage in Uganda were identified. These factors were identified through a systematic review of different models and frameworks for digital preservation of records. A combination of models and frameworks was reviewed to give grounded coherence to the study and to understand the factors that constitute a framework for the preservation of digital records.

### ***9.1 Model and Frameworks for Digital Preservation of Records***

The digital preservation framework formalizes digital resources and associated information used to effectively manage these kinds of resources and more so digital content that resides uniquely under libraries stewardship. Here the preservation resources may include actions necessary for preservation, ensuring authenticity and mitigating the effects of technology. Leijonhufvud [17] observes that models are partial representations of theories and do cover aspects of theories. In addition, models convey a mental image of a phenomenon or a real world and often lead to formulation of theories [18]. Below are eight theories studied and presented in the various tables.

#### **9.1.1 Study One: Davies [19]**

The PSR troika model was forwarded to assist in the understanding of strategy development for the running of organizations. The model comprises three major aspects, which are Policy, Strategy and Resources (PSR), as illustrated in Table 2

**Table 2** Success factors [19]

Success factors
Policy related
Resource related
Management related

**Table 3** Success factors [20]

Success factors
Management-related activities
Policies
Resources
Technology-related activities
Content Management

below. These three elements of the PSR troika model are reviewed in this study as they are considered as enabling factors for successful implementation of digital preservation of cultural records in the Bugisu sub-region.

### 9.1.2 Study Two: Corrado and Moulaison [20]

Preservation triad was developed by Corrado and Moulaison [20]. This model looks at a variety of needs by several communities. This model (Triad), therefore, focuses on technology, polices, resource management and content management ways, therefore providing enabling factors for successful implementation of digital preservation of cultural records in the Bugisu sub-region, as illustrated in Table 3 below.

### 9.1.3 Study Three: Carnegie Mellon University [35]

The Digital preservation capability maturity (DPCM) model was developed by Carnegie Mellon University in 1999. This model is based on the functional specifications of ISO 14721, the auditing criteria of TRAC and ISO16363. The objective of the model is to provide a process and performance framework (benchmark) against best practice standards and foundational principles of records management, information governance and archival science. This model identifies seven essential elements, as illustrated in Table 4 below. All these elements listed below were essential for understanding ways of enabling digital preservation of cultural records in the Bugisu region.

**Table 4** Shows success factors [35]

Success factors
Strategies
Governance
Policies
Collaboration
Designated communities
Technical expertise
Digital preservation services

**Table 5** Shows success factors [21]

Success factors
Policies and procedures
Collaboration and partnership
Human resources
Funding
Education and training
Technological infrastructure
Strategies metadata systems
Technical expertise
Copyrights and intellectual property rights
Trustworthy repositories

#### 9.1.4 Study Four: Masenya [21]

Masenya [21], in the study titled ‘A Framework for Preservation of Digital Resources in Academic Libraries in South Africa’ examined the implementation of digital preservation practices in academic libraries in South Africa in the light of the rapidly changing information environment and came up with 10 digital preservation practices that were very useful for enabling digital preservation of cultural records in Bugisu region, as illustration below in Table 5.

#### 9.1.5 Study Five: Boamah [22]

Boamah [22] studies show the effective management and preservation of digital cultural heritage resources Boamah 2014: an exploration of contextual factors in Ghana and came up with eight factors for effective management and preservation of digital cultural heritage resources, as illustrated in Table 6. The elements listed below played an important role in understanding enabling factors for digital preservation of cultural records in Bugisu region.

#### Table 4 Study Six: Eschenfelder et al. [15]

Eschenfelder et al. [15] presented a nine-dimensional framework for digital cultural heritage organizational sustainability, and the framework identified nine important factors for digital preservation practices that were useful for enabling digital preservation of cultural records in the Bugisu region, as shown in Table 7 below.

#### 9.1.7 Study Seven: Council of Canadian Academies [23]

The Council of Canadian Academies [23] came up with enabling factors that help realize digital preservation of cultural heritage in Canada. These factors also provide useful insights and enablers for digital preservation of cultural records in the Bugisu region, as shown in Table 8 below.

Table 6 Shows success factors [22]

Success factors
National cultural heritage resources (physical content)
Stakeholders' attitudes
Policies and strategies
Infrastructure and other resources
Collaboration
Effective management and preservation of the content.
Digital content
National Digital Heritage Repository (memory)

Table 7 Shows success factors [15]

Success factors
Technology
Management
Relationships
Revenue
Cost
Valued product service
Disaster planning
Legal/policy
Metrics/assessment

**Table 8** Shows success factors [23]

Success factors
Participatory
Collaborative opportunities
Business models
Infrastructure
Human resources
Funding

### 9.1.8 Study Eight: Kenney and McGovern [24]

Kenney and McGovern [24] developed what they termed a ‘three-legged stool model’ comprising three elements: organizational leg, technological leg and resources leg; they are interrelated and influence one another. It was used as a guide to understand the various elements contributing to the digital preservation framework in academic libraries. This model was helpful in understanding enablers for digital preservation of cultural records in the Bugisu region, as illustrated in Tables 9 and 10 below.

Table 11 below presents a summary of the success factors and their frequencies and percentage.

The outcomes, as indicated in Table 10 above, show the most frequent factors suggested by all the eight (8) studies marked (100%) as Technology infrastructure and Management Related. The second most frequent factor, as suggested by seven out of eight (87.5%), was Resource Allocation/Funding. The third most frequent factor was Proper Implementation of Strategies and Policies, as suggested by six out of eight (75%) studies. The fourth most frequent factors were business models and stakeholders, suggested by three out of eight (37.5%). The factors that only appeared once were content management; participatory; education and training; copyrights and intellectual property rights; valued product service; metrics/assessment; and collaborations & relationships (Fig. 3).

## 9.2 *Factors for Successful Implementation of Digital Preservation of Cultural Records in the Bugisu Sub-region*

The assumption here is that cultural records in the Bugisu region like, in any other regions of Uganda, are facing difficulty in preserving on both paper and electronically; therefore, there is a great need to understand the level of preserving such records for assured access for the generations to come. A few organizations are digitizing materials that are in danger of being lost in the future, such as old clan books, old photos, and other pieces of history. To ensure that there is permanent storage of these digitized resources, the study found it vital to investigate the factors that lead to successful implementation of digital preservation of cultural records in the Bugisu

**Table 9** Shows success factors [24]

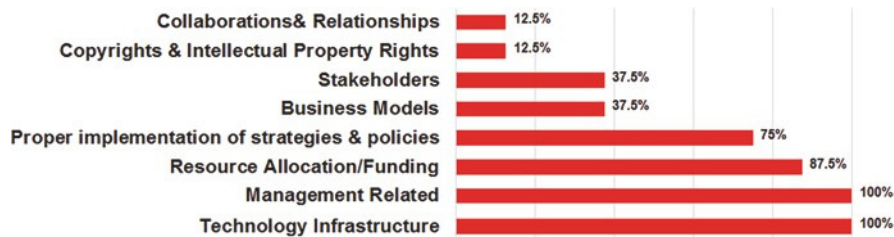
Success factors
Organizational
Technological
Resources

**Table 10** Factors: Frequency of citation across the eight studies

Factors	[19]	[20]	[35]	[21]	[22]	[15]	[23]	[24]
Proper implementation of strategies & policies	X	X	X	X	X	X		
Resource/Funding	X	X		X	X	X	X	X
Management Related	X	X	X	X	X	X	X	X
Technology Infrastructure	X	X	X	X	X	X	X	X
Copyrights & Intellectual Property Rights				X				
Stakeholders			X	X	X			
Business Models						X	X	X
Collaborations & Relationships						X		

**Table 11** Factors: Frequency and percentage table across the eight studies

Factors	Frequency	Percentages
Technology Infrastructure	8	100
Management Related	8	100
Resource Allocation/Funding	7	87.5
Proper implementation of strategies & policies	6	75
Business Models	3	37.5
Stakeholders	3	37.5
Copyrights & Intellectual Property Rights	1	12.5
Collaborations & Relationships	1	12.5



**Fig. 3** Shows the percentage across the eight studies

sub-region. The systematic review here, therefore, presents very paramount factors for successful preservation of clan records in the Bugisu region using technology. These factors include Technology infrastructure, proper implementation of strategies & policies, Resource Allocation/Funding, organizational support, collaborations & relationships and Copyrights & Intellectual Property Rights [20, 21, 24].

### ***9.3 Technology Infrastructure***

According to Table 10 above, technology infrastructure was cited by all the eight authors, and this represented 100%. This means that it is one of the most important factors that is needed for digital preservation of cultural records in Bugisu. There are a number of technologies that were identified during the review which included digital repositories, metadata systems, technological, technical expertise, digital preservation services, technological infrastructure, technical expertise, infrastructure and other resources, digital content, National Digital Heritage Repository (Memory).

For these clan records to be well managed, there is a need for appropriate digital infrastructure. Digital infrastructure includes the ability to run it, define policies and standards for digitization, manage your staff, cost plan, train users and use the acquired skills to do a backup of digital content. Nevertheless, people with competence, appropriate skills and attitudes are not visibly available in various clans of Uganda to do the initiation, implementation and sustainability of digitized records/projects. African archivists do lack the necessary experience and are poorly equipped to train others in the electronic digitization and preservation of clan records [25]. Furthermore, a number of clansmen are totally not comfortable with this technology world in which they are living; they are, therefore, technophobic and struggle a lot to be stewards of digital information and print. For success to be registered in the digital preservation of clan records in the Bugisu region, there is a need to invest in the different kinds of technologies and capacity development.

### ***9.4 Management/Government Support***

Management support is yet another important factor towards digital preservation of cultural records in Bugisu. Table 10 above shows that 8 out of 8 (100%) authors cited management as an important factor. For one to fully sustain digital preservation initiatives, it's very vital to align these initiatives with the organizational goals and mission. There are a number of management-related factors that were identified by different authors during the review, which included adequate leadership, organizational support, procedures and appropriate strategies, good governance, managing content describing the same factor management. Currently, there is very little effort by the clans or Bugisu cultural union or even the government to preserve clan

artifacts for future generations. The clan management must acknowledge the importance and benefits of digital preservation of cultural records. Then clan management and other enthusiasts should convince the Bugisu cultural union and government to support the digitization of cultural artifacts including clan records for future generations. Corrado and Moulaison [20] state that the preservation team needs to convince the management and other decision-makers that digital preservation is important to the overall mission of the organization. There is a need to have a communication plan that clearly describes the various benefits of digital preservation to the management and other stakeholders of Bugisu clans. A number of clans in the Bugisu region haven't made digital preservation a priority and even funded projects may be unsuccessful if digital preservation is not a fundamental concern. Therefore, proper management-related factors need to be put in place to better the digital preservation processes of clan records in the Bugisu sub-region in Uganda, and these factors may include references to organizational support, procedures and appropriate strategies, good governance and managing content, among others.

### ***9.5 Resource Allocation/Funding***

Funding is very primary in the sustainability of digital preservation. As seen in Table 10 above, seven out of eight authors (87.5%) pointed out resources as a significant factor in digital preservation of clan records in the Bugisu region. Digital preservation projects and activities require considerable resources to implement and maintain over a long period of time [26]. To be successful, there needs to be commitment by various institutions to financially support the project [20]. Financial support is one of the key factors for any commitment to any project; it ensures sustainable preservation of digital resources. However, Masenya [21] observes that clans do not have the necessary funds readily available to develop and sustain their digital preservation programmes, making it a challenge to fund such initiatives. There is a need to secure adequate funding from the government or stakeholders for the successful preservation of clan records in Bugisu.

### ***9.6 Proper Implementation of Strategies & Policies***

For long-term access to digital preservation of clan records for future generations to benefit, there has to be heavy dependence on digital preservation strategies being in place which are labeled by relevant policies and procedures [27]. As Table 10 shows, 75% of the authors pointed out strategies and policies as a vital factor in digital preservation of records. During the study, it was discovered that there were no policies put in place to ensure long-term preservation of digital services, clan leadership cannot be said to be undertaking digital preservation. A number of clans in the Bugisu region do not have policies to control the execution of such activities. So a

clear and realistic preservation policy will help to achieve long-term access to digital content and reap future benefits of digital preservation.

There is a need for policies that can provide a framework and practical guidelines for the development of an institutional digital preservation procedure. This may include a digital preservation policy model with two phases, that is a policy level and implementation level and a Joint Information System Committee Digital Preservation Policies Study that designs a model for helping institutions develop appropriate digital preservation policies [28].

Therefore, digital preservation policies need to be designed to guide in the digital preservation processes of clan records in the Bugisu sub-region in Uganda and such policies should include references to copyright and metadata policies, digital resources, storage, security and collection disaster plans, among others.

### **9.7 Business Models**

Table 10 above shows that three out of eight (37.5%) authors cited Business Models as an important factor. A well-designed business model is extremely important for generating alternative revenue for sustaining digital preservation of clan records projects in the Bugisu region. The success of preservation of digital records requires maintenance, proactive stewardship and continuity of service [23]. Heritage institutions like clans may provide informal support to do a preservation of digital assets and have digitization outputs, commitment to the progressing maintenance of the resources is always not exactly spelt out or even guaranteed, and therefore, alternative funding model is of paramount value. Different scholars argue that lack of ongoing endowment and the investment of capital in digital preservation is a reflection of a tradition of digital heritage projects that rely on commercial revenues models and project-based philanthropic funding.

### **9.8 Stakeholders**

Freeman [29] defines stakeholders as managers and employees as internal stakeholders, and suppliers, society, government or clients as external stakeholders. While McCabe et al. [30] define a stakeholder as an individual or a group having legitimate interest in an organization or its activities. Table 10 above shows that three out of eight (37.5%) authors cited Stakeholders as an important factor. Stakeholder collaboration becomes an important aspect in digitizing clan records. McCabe et al. [30] distinguish between collaboration for planning and development processes and collaboration for marketing purposes. Raju [33] observes that stakeholders contribute to the achievement of the clan's objectives. Stakeholders are needed to manage and maximize a vision shared, representation, achievement of objectives good working relationship and communication. Stakeholders

conclusively contribute a lot towards the digital preservation of cultural records and therefore without them, there wouldn't be records that many scholars have researched about.

## ***9.9 Collaborations & Relationships***

There is a need for a well-maintained collaboration with many stakeholders with the mandate to preserve electronic records [31]. Table 10 above shows that 1 out of 8 (12.5%) authors cited Collaborations & Relationships as one of the most important factors for successful digital preservation of records. Ryan [32] observes that Uganda encounters several challenges when it comes to the collaboration of digital preservation projects and includes the complicated customs process, limited control over the environment and lack of accessing high-end equipment. This DPWG did propose a five-point plan for creating digital preservation partnerships: cultivate a foundation of knowledge and identify a shared vision; assess the current digital preservation landscape at each institution; advocate for the value of digital preservation activities; implement shared digital preservation services; and sustain group activities and establish structures for ongoing support [34]. In a nutshell, great collaborations and relationships are vital for a successful digital preservation of clan records initiative in the Bugisu region in Uganda.

## ***9.10 Copyrights & Intellectual Property Rights***

As Table 10 shows, only 12% of the authors pointed out Copyrights & Intellectual Property Rights as a vital factor in digital preservation of records. Well-stipulated copyrights and intellectual property rights will steer the process of digitizing cultural records and put it at a greater height, hence putting the preservation of clan records in the Bugisu sub-region in Uganda at a stance. Various institutions may fail to preserve these collective works because the identification of copyright owners, obtaining license agreements, locating them and keeping records of each agreement are unquestionably a resource-intensive process [23].

## ***9.11 The Three-Legged Stool Model for Digital Preservation of Cultural***

### **9.11.1 Heritage in Uganda**

Having established the successful factors for implementing digital preservation of cultural records in Bugisu. This study used the three-legged stool model forwarded by Kenney and McGovern [24] to provide a taxonomy for classifying the different

factors for successful adoption of digital technology to provide long-term preservation to cultural heritage.

### ***9.12 The Three-Legged Stool (Extended)***

Created by Kenney and Nancy McGovern for the Digital Preservation Management Workshops in 2003–2006, this stool represents the three aspects of a successful and sustainable digital preservation programme:

1. Organization
2. Resources
3. Technology

What the model demonstrates is that without considering and maintaining each of these components (or ‘legs’), a digital preservation programme will ultimately collapse. These three components need to be considered together in order to sustain digital preservation activity.

## **10 Organization**

The organization or management leg of the stool looks at the elements required to address the organizational needs and practices of a digital preservation programme. This leg not only maps the parameters of a programme but helps drive the organizational change required for a successful digital preservation programme.

Given the eight factors identified through the systematic review process conducted in this chapter, the organizational or management components include:

- Management
- Proper implementation of strategies and policies
- Copyrights and intellectual property rights
- Business model

## **11 Resources**

The resources leg looks at the time, money and people requirements of a digital preservation programme. These are the resources required to create and maintain a sustainable programme. The resources required include:

- Resource/Funding.

## 12 Technology

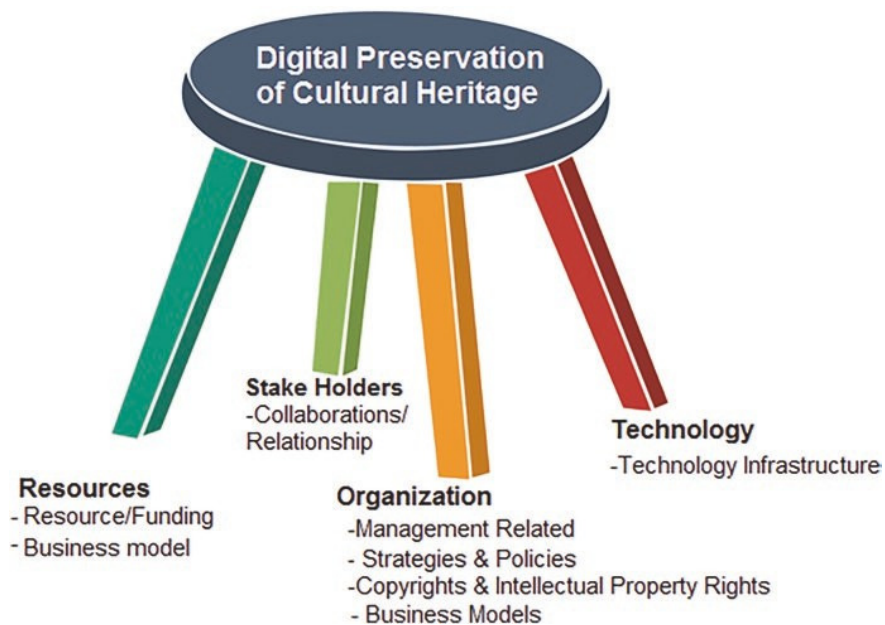
The technology leg represents the necessary hardware, software and secure environments required to sustain a digital preservation programme. The technology leg also acknowledges changing technology and is prepared to respond accordingly. The areas the technology leg covers in digital preservation include:

- Technology Infrastructure

## 13 Stake Holders

McCabe et al. [30] state that a stakeholder is an individual or group that has legitimate interest in the activities of the organization. Here there is a need to maximize a shared vision, the achievement of objectives, representation, good working relationships and communication. The stakeholder's leg is where collaborative partnerships of planning and development are established [30]. The various stakeholders include resource allocators, content creators, external collaborators, internal collaborators and the end users.

- Collaborations & Relationships



## 14 Model Summary

The organization leg ('the what'), the technological leg ('the how'), the resource leg ('the as is') and the stakeholders of digital preservation stool need to be coordinated to develop compliant and feasible digital preservation strategies. A number of clans make efforts to preserve their records by digitizing and implementing them but such efforts are being obstructed by limited human resource, lack of policies and planning, technological and financial resources on the side of the organizational with statutory responsibility of digital preservation. In a nutshell, for the sustainability of digital preservation of cultural records, there must be key factors to the three-legged stool model, which include organizational, technological, resource and stakeholder factors.

## 15 General Conclusion

This study investigated an investigation on digital preservation of cultural records in Uganda, especially in the Bugisu sub-region, with the intention to propose a framework necessary to the clans. There was a revelation of little growth of awareness of digital preservation of cultural records in the Bugisu region whereby the clan leaders had some ideas of making various efforts to make an implementation. There were some efforts to create digital preservation programmes, but challenges such as funding, technical expertise, copyright/ legal issues and management support, among others, hindered the progress of preservation of cultural records digitally [36].

These preservation methods were hindered by several challenges, such as lack of human resources, lack of funding, lack of technological knowledge by the clan leadership who have the responsibility of preservation and alleviation of these challenges.

Lack of knowledge about digitization of clan records was highlighted as a major issue and as this, clans were to put strategies in place such backups and risk management to keep the digital materials. Based on the findings above, Technology Infrastructure, Management/Government Support, Resource Allocation/Funding,

Proper Implementation of Strategies & Policies, Business Models, Stakeholders, Collaborations & Relationships, Copyrights & Intellectual Property Rights are the factors that will enable smooth digital preservation of cultural records in the Bugisu region.

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