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Identifying Challenges and Barriers in Collecting, Documenting and Digitizing Palm Leaf Manuscripts in Eastern Sri Lanka

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Abstract
The palm leaf manuscripts are the sources of the cultural heritage of our ancestors. It is a very crucial part of the librarians or archivists or curators to conserve and preserve them from passing the information and knowledge to successive generations. Palm leaf manuscripts indicate previous documentary heritage and conservation, preservation and made them available shortly is a challenging and demanding task at present. Sri Lanka has a rich history of documentary heritage comprised of valuable palm-leaf collections. In eastern Sri Lanka, the palm leaf manuscripts are spread everywhere as personal holdings.
There are many countries all over the world that put much effort into preserving them for the future. One of the potent methods of preserving those endangered documents like manuscripts is digitization. At this point, there is an urgent need to find the suitability of preserving those palm leaf manuscripts in the facets of digitization techniques.
As the palm leaf manuscripts are shown as endangered through ages while tackling them to collecting and documenting them, several challenges were faced. Therefore identifying the solutions to overcome those challenges and barriers is important to further the documentation and digitization process of palm leaf manuscripts. The study aims to find the challenges and barriers in collecting, documenting and digitizing those palm leaf collections in eastern Sri Lanka.
Keywords: Digitization, Palm leaf manuscripts, Indigenous knowledge, Documentary heritage, Cultural heritage, Preservation, Conservation, Endangered documents

Introduction

Before the invention of paper our ancestors were used several tools such as copper plates, vellum, parchment, skulls, wooden barks, papyrus…etc. To record information. Accordingly, palm leaf manuscripts were played an important role in recording information in ancient times till the 20th century.

Palm leaf manuscripts are the indication of previous documentary heritage and we must conserve and preserve and made available to the future. It is a challenging and demanding task at present. At this point, there is an urgent need to find the suitability of preserving those palm leaf manuscripts in the facets of digitization techniques. As the palm leaf manuscripts are shown as endangered through ages while tackling them to collecting and documenting them, several challenges were faced. Therefore identifying the solutions to overcome those challenges and barriers is important to further the documentation and digitization process of palm leaf manuscripts.

The palm leaf manuscripts represent the cultural and intellectual heritage of ancient scholars that have been transmitted orally by generation over generation and recorded permanently after many years of passing. A large number of such materials lost irrecoverably and valuable contents are also lost forever due to the absence of a proper solution for bulk storage of data thousands of palm leaves perished through time. If there were technology, they would have to save crores of valuable documents or information compared to natural and unavoidable threats to palm leaves, the only remedy for preserving data on palm leaves is to convert them into digital format and digital archiving is the commonly accepted and immediate remedy to preserve the contents in palm leaves. Digital archiving such documents solves that issue and contents can be preserved for future use and passing of time can cause deterioration of manuscript leaves and early action in digitizing the collection may lead to preservation of contents (Sageer, T.K.M., and Francis, T, 2014).

Sri Lanka has a rich history of documentary heritage comprises valuable palm-leaf collections. The University and special libraries in Sri Lanka have started the digitization process to a certain extent. Digitization and building digital libraries are leading in the library field in Sri Lanka. Though there is a trend to create a digital collection, a study shows no national policy for Library material digitization in Sri Lanka. It's a major barrier when digitization projects handling in national wide. Though individual libraries and institutions have their policies, those are differing from one to one. In eastern Sri Lanka, the palm leaf manuscripts are spread in everywhere as personal holdings. The study aims to find challenges and barriers in collecting, documenting and digitizing those palm leaf collections in eastern Sri Lanka.

Research Objectives

- To identify the challenges and barriers in collecting palm leaf manuscripts from individual possessions in eastern Sri Lanka
- To identify challenges & barriers in documenting and digitizing the collected palm leaf manuscripts.
- To find the remedies or solutions to overcome the challenges in the collection, documentation and digitization of palm leaf manuscripts.

Literature Review

Sageer, and Francis (2014) stated that, before the invention of paper, the palm leaves are the primary sources of writing and those were preserved all over the world. Though it could be easily damaged by various factors, digitization is the precaution for the survival of those manuscripts. As the first step of digitization, the palm leaves should undergo for collection analysis. Then only it could be decided what, where and how the processes could be started.

Ahmed, F., (2009) reported that the open access system and preparation of catalog cards revolutionized the library and its services. Now, libraries have experienced technological change in information storage and retrieval to electronic and optical media. More than the traditional preservation method, digital conversion can certainly extend the life and use of original artifact could be restricted. Tools for digitization include hardware like a computer with configuration, scanners, digital camera and software like HTML editor, XML editor, OCR software, image editor, page layout and design software and pdf software.

Sageer and Francis (2014) mentioned that the palm leaves were the main and important writing sources before advent paper. They are available preserving in many places in the world are prone to damage in many ways and hence digitization is only remedied to safeguard its contents for future use. Steps of digitization involve analysis of available collection and, how where and when the digitization process starts. Before the invention of the paper medium for writing, the world's knowledge was transmitted by scholars orally through their followers. After that, they are recorded on palm leaves and preserved for many years. Over the years, palm leaf manuscripts were perished irrecoverably and lost. Anyway, a large number of collections are still preserved without any damages.

Digitization refers to converting an item to printed text, manuscript, image, sound, film or video recording- from one format (usually print or analog) into digital. The process involves taking a physical object and essentially making an "electronic photograph" of it. An image of the physical object is captured, using a scanner or digital camera, and converted to digital form and that can be stored

electronically and accessed via a computer (Vaidya B, 2010)

The manuscript libraries are still not able to meet the basic user needs of cataloging. The digitization of manuscripts and after cataloging of manuscripts they should be available online and they could be preserved for future generation using the latest technology of digitization. Generally, manuscript libraries may be classified into the categories are hereditary/ private collection, patronized collection and collection in research institutions (Ravichandran, P. and Narenthiran, R. 2016)

Challa, N.P. and Mehta, R.V. (2017) reported that in India, there are many organizations or institutions committed to the protection of ancient palm leaf manuscripts to store our precious knowledge writings. As time passes by, the palm leaves are getting spoiled by artificial and natural elements. The author tried to develop an efficient image processing system for retrieving metadata automatically from these manuscripts. Among many image processing techniques, some are image enhancement, segmentation, processing, restoration, compression and acquisition. The author concluded that, there is a need to prepare an efficient database for the automation and digitization of these manuscripts, which can be accessed by all researchers worldwide. Therefore, it is necessary to prepare an efficient manuscript database that can automatically generate metadata from palm leaf manuscripts.

Devika, S.S. and Vijayakumar, K. (2016) revealed that traditional knowledge plays a crucial role in establishing a sustainable relationship between man and nature in a society more dependent on the natural environment for various needs. Thousands of manuscripts were scattered and fragmented in India and foreign countries and no accessible now. Even though, disappearing of manuscripts at an alarming rate, India possesses a rich and enormous cultural heritage of manuscripts since the ancient period. The preservation of manuscripts through digitization is one of the effective and efficient methods but found to be a time-consuming and costly exercise.

Mehta, et al. (2016) stated that, to preserve the precious knowledge ie. Palm leaf manuscripts to humanity which are being damaged by aging or due to several other reasons they have to be digitized for future use. Manuscripts being a precious base of knowledge, should be protected. Image processing over the past decade has undergone various developments. Many image processing techniques have been introduced for efficient data retrievals such as image enhancement, image segmentation and image acquisition. Image processing plays a vital role in enhancing, assessing and improvising manuscripts—there many methods to retrieve information from manuscripts efficiently. The cognitive memory network method using spatial change detection also gave better results extracting information from the Indian manuscript as the Indian language contains a large character set and linguistic features.

Rattan, P. and Singh, R. (2014) mentioned that the manuscripts are such primary sources that reflect socio-cultural, historical, religious, political, economic, scientific, educational, medical and technological information of specific times beyond common tools of information. By way of digitization, the cultural assets and treasures of information can be replicated, reproduced, preserved and transmitted and it will ensure the security and safety of manuscripts from further deterioration and damage and their multiple accesses by users' world over of any period. Also, digitization means acquiring, converting, storing and providing information in a standardized and organized format accessible through a computer.

Gaur, R. C. (2011) reported that the Indian culture lies in ancient manuscripts has glorious past. Even though many digitization manuscript projects undertaken by various institutions in India, digital data are vulnerable, much more so than the originals. And also, end of the digitization project great quantity of precious data were collected but, there is no institution to properly care for these data and look after the post-collection activities. Therefore, any project, a background institution should have to take responsibility for archiving data and preserving it for years is a necessary condition.

Narenthiran R, et al (2012) mentioned that digital processing and various methods and formats of preservation of manuscripts. The author reported the need for digitization as digitization provides a solution to palm leaf manuscripts problems such as conservation, preservation, accessibility and space.

The most vital reason is the stored materials and documents started to deterioration after a certain period at a rapid rate.

Kumar, S., and Shah, L., (2004) stated that every digitization program of manuscripts should be feasible according to budget. The technical requirements need hardware, software, storage and staff. The digital capture, metadata, access should be meet international and national standards. Digitization needs high-quality hardware and software, lighting equipment. Software for data capturing of high quality is also costly.

Chhatwal, A., et al., (2009) stated that traditional libraries were transformed into digital libraries. Thus national cultural heritage is preserved & accessible everywhere in world through digitization. Both national & international users make use of manuscripts for research purposes. Accessibility and success of digital technology depend on librarians, policymakers, educationists, technical personnel & institutions as well. Individual organizations can't make an adequate effort. Organizations work together to prepare constructive & sustainable programs.

Gnanasekaran, R., (2017) mentioned that writing on palm leaves is one of the oldest established mediums in South India. A significant number of antiquated written works in Tamil Languages have been discovered just as palm leaves. The written panorama was found very delicate or hard to use for research and reading purposes. Digitization is the only way to read and understand well on writings. This study tries to give a prologue to the utilization of Adobe Photoshop filters with significant references to its applications on Tamil antiquated original palm-leaf manuscripts. The Photoshop is most driving and prominent software programming which was developed by Adobe group helps to make ancient palm leaves a readable one through digitization.

Sageer and Francis (2015) mentioned that the endangered documents are scattered and become part of private collections, Institute collection and also part of official archives and damage rate of them is to solve this the steps should be taken to make a digital library. It was explored the different attributes for organizing a digital library for endangered documents and users attitudes towards the use and usability of the same.

Surinta, O., and Chamchong, R., (2008) reported that the palm leaf manuscripts were one of the earliest forms of written media and were used in Southeast Asia to store early written knowledge about medicine, Buddhist doctrine and astrology. Therefore, historical handwritten palm leaf manuscripts are important for people who like to learn about historical documents.

Mehta, et al. (2016) stated that manuscripts being a precious base of knowledge which have to be preserved and to be digitized for future use. It could be protected through image processing techniques and many image processing techniques are available for efficient data retrievals such as image enhancement, image segmentation and image acquisition. Image processing plays a vital role in enhancing, accessing and improving manuscripts. Even though many methodologies available, they are failed to receive efficient data retrieval for Indian languages as it contains large characters and linguistic features. Therefore, the cognitive memory network method using spatial change detection also gave a better result in extracting the information from an Indian Manuscript.

Kurnia, and Sudarma, (2017) stated that the Balenese lontar manuscript as a documentation medium is highly vulnerable to rodent insects and high humidity levels. Therefore, the development of digital technology provides benefits in the preservation of manuscripts through digitization. Digitalization of manuscripts can preserve information and knowledge in the lontar palm leaf into digital form. The manuscript digitization activities can be beneficial to the community. In the future, the manuscript preservation program can be a program that is more inclusive, synergistic and integrative. And people need to know and understand about the collection of manuscripts it has, to arise a sense of belonging to jointly preserve the cultural heritage as a cultural identity.

Qutab, S., et al (2014) reported that in Pakistan, many institutions and personal libraries hold a good collection of manuscripts. Manuscripts were conserved and cared for since old times but, there were no methods to preserve them or at least save their contents forever. It only becomes possible with invent of technology. Facsimiles, microfilming

and now digitization is in practice for this purpose. Digitization is increasingly used as a technique to allow access to content without risking the original materials. Digitization not only helps of the preservation of manuscripts but also solves the issues related to its cataloging, access, distribution and research. Manuscripts are being digitized worldwide to provide user-friendly interfaces, open and easy access and detailed search.

Ahmed, F. (2009) reported that the digital conversion would extend the life of artifact and the use of original documents could be restricted and therefore, digitization will enhance access to artifacts. And also, he mentioned that there are two types of manuscripts which are paper and palm leaves and in Osmania University Library, paper and palm-leaf manuscripts are digitized. The processes involved were, the deteriorated manuscripts are treated and mechanically cleaned and applied citronella oil to make a clean image, register maintained for digitizing manuscripts and scanning the manuscripts.

Gyi, H.H. (2016) reported that a librarian is responsible for creating, storing and digitizing palm leaf manuscripts for the users and palm-leaf manuscripts are cultural heritage and wisdom records of rare collections. The study focused on digital preservation and creating a database of palm leaf manuscripts. The author concluded that palm leaf manuscripts are the cultural heritage of Myanmar and have to preserve manuscripts to cover diverse subjects such as astronomy, mathematics, medicine, literature, history, astrology and scriptures. By digital preservation of palm-leaf manuscripts which are to be easily accessed and searched by researchers and scholars through author, title, subject and general keywords. The document analysis comprises spatial change detection, text line segmentation and character segmentation.

Ranasinghe, P. and Dilruk (2013) mentioned that manuscripts in 40 temples and 05 private collections were examined and mo0re than 100,000 pages were digitized. The Project is entirely funded by the Faculty of Social sciences, Kelaniya. A website was developed and a digitized database of manuscripts will be online in due course. D Space software with doubling core metadata standards was done.

Ranasinghe, P. (2015) stated that, in Sri Lanka, the collection and preservation of palm leaf manuscripts are still in a poor stage. No efforts have been taken by the government or private sector except some in libraries. It was found that the University of Kelaniya and the University of peradeniya are engaged in the collection and preservation of palm leaf manuscripts, particularly in Sinhala, Sanskrit and Pali Language for digitization.

Methodology

In this research, the qualitative approach was used. By the observation and content analysis, the challenges and barriers in collecting, documenting and digitizing the palm leaf manuscripts in the eastern part of the island were identified. The remedies to overcome those problems were also found out.

Challenges and Barriers in Collecting, Documenting and Digitizing Palm Leaf Manuscripts

The eastern region of Sri Lanka has prominent collections of palm leaf manuscripts as private possessions as well as in temples and organizations as well. Comparably, the palm leaf manuscripts are enormous in private hands.

The challenges and barriers are found in the following areas:

- Collecting palm leaf manuscripts from people
- Handling the damaged palm leaf manuscripts
- Identifying the language
- Find the human resources to read the manuscripts
- Selection of manuscripts for digitization
- Process of digitization

Collecting Palm Leaf Manuscripts

Most of the palm-leaf manuscript collections are personal possessions in the area of eastern Sri Lanka. Therefore, much effort was made to find out the people who have the collections through advertisements, searches and other means. It is very difficult to collect from the people as they are keeping those manuscripts as their heritor assets. Most of the people who are doing herbal or Siddha medicines handling those manuscripts unwilling to provide their manuscripts.

Handling the Damaged Palm Leaf Manuscripts

The palm leaf manuscripts are easily fragile and susceptible to damage and therefore, those are easily perishable through time. As the collections are very old, it is very difficult to handle by hands. The manuscripts are in variable sizes, such as some are in 23-25 cm long and 3 cm wide and others are 13-15 cm long and 3 cm wide. Therefore the long leaves are easily torn. And also, small leaves are tied with pins and ropes which causes damage to the leaves. The manuscripts are in different ages that are some are very old and it is not very clear. Some people only provide their manuscripts for digitization purposes only and after the process, those should be returned without any variations if some issues of handling damages cause serious problems in returning them.

Identifying the Language in the Manuscripts

Mostly the collected palm leaf manuscripts don't have full stops and continuously written. And also struggles to find out the continuity of the leaves. The letters in the oldest manuscripts are not clear; therefore, proper treatment of the manuscripts should be taken before documentation and digitization. Some have fungal, insect and water damages. They also must be treated.

Human Resources to Read the Manuscripts

The palm leaf manuscripts can't be read by everyone. The past generation people only read the manuscripts. If they wish, only they read the manuscripts. Very few people are only present at the moment to read these manuscripts. If those older people expected to treat them well with good hospitality only they would come forward to help in reading the manuscripts. And also, most of the manuscripts comprise lyrics that are unable to understand by other people. The people who read the manuscripts should be paid well. Some people only read some kind of manuscripts only.

Author of Manuscripts

Similar manuscripts were found out with various authors makes confusion and it's difficult to find out the right author in time (e.g., Ammanai Manuscripts). Therefore, additional efforts to be made to find out the right author.

Text Variation

If the manuscripts were already published a book, there are variations in the original manuscripts and the texts in the books. Hence, it should identify the correct verses of the text. (eg: Vaikuntha mammanai, Arichandran Nadaham)

Process of Digitization

For digitization purposes, the manuscripts should be selected after the processes of cleaning. And also, the capital cost for digitization is comparably high. High-definition scanners, digital cameras, computer hardware and software, space and human resources are needed for the process of digitization.

Suggestions to Overcome the Challenges

The proper awareness programs to the whole community are needed. By this they will be able to know the importance, benefits of documenting and digitizing the palm leaf manuscripts for the present and future generations as well. Through the exhibition, seminars and workshops regarding the documentary heritage of palm leaf manuscripts will result in a good move of supporting the documentation and digitization process. The staff should be trained well national and international level will enhance their skills in this field.

Discussion

Collecting, documenting and digitizing the palm leaf manuscripts is essential in the present era to conserve and preserve our documentary heritage. Because the palm leaf manuscripts are the main icon of the documentary heritage of eastern Sri Lanka. Much more efforts to be considered the conservation and preservation of palm leaf manuscripts to protect the endangering heritage of our country.

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