

# Preservation of Documentary Heritage Collections: A Study of Selected Cultural Institutions in Kerala

*Thesis submitted to the  
University of Calicut in partial fulfillment of the  
requirements for the award of the Degree of*

**DOCTOR OF PHILOSOPHY IN LIBRARY AND INFORMATION SCIENCE**

*by*

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*Under the guidance of*

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**DEPARTMENT OF LIBRARY AND INFORMATION SCIENCE  
UNIVERSITY OF CALICUT  
2023**



## **DECLARATION**

I hereby declare that the thesis entitled **Preservation of Documentary Heritage Collections: A Study of Selected Cultural Institutions in Kerala** is the authentic record of research work carried out by me, for my Doctoral Degree under the supervision and guidance of **Dr. Vasudevan T. M.**, Professor, Department of Library and Information Science, University of Calicut, and it has not previously formed the basis for the award of any degree or diploma or any other similar titles or recognition of any other university.

Calicut University  
30.11.2023

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**CERTIFICATE**

I, Dr. Vasudevan T. M., do hereby certify that the Ph.D. thesis entitled **Preservation of Documentary Heritage Collections: A Study of Selected Cultural Institutions in Kerala** submitted to the University of Calicut, is a record of the bonafide study and research carried out by **Mrs. Dhanya T. K.** under my supervision and guidance. The report has not previously formed the basis for the award of any degree or diploma or any other similar titles or recognition of any other university.

Calicut University  
30.11.2023

**Dr. Vasudevan T. M.**  
(Supervising Teacher)



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## **ABSTRACT**

Documentary heritage collection denotes all kinds of documentary archival materials related to the cultural, historical, and scientific traditions of various civilizations around the world. Libraries and cultural institutions are the centres responsible for the collection, organisation, conservation, preservation, and dissemination of this documentary heritage collection. A significant proportion of the documentary heritage collection housed in libraries and other cultural institutions is in deteriorated condition due to different physical, chemical, and biological factors. Adoption of an effective traditional or digital preservation method is the most important component in ensuring the long-term existence and accessibility of documentary heritage collections.

The libraries and cultural institutions in Kerala possess a wide variety of documentary heritage collections in different forms. Here, documentary heritage collection means old and rare books, bound volumes of old periodicals and magazines, manuscripts on paper, palm leaves, bound volumes of newspapers, government orders and reports, maps and historical records. The review of literature revealed that there was a lack of study on the preservation methods employed by the cultural institutions in Kerala for safeguarding their documentary heritage collections. So there was a need to study the role, efforts, initiatives, and perceptions of cultural institutions in Kerala towards the preservation of documentary heritage collections. Previous studies have identified a lack of expertise among staff as one of the major challenges to proper preservation activities. This study was conducted in an attempt to understand the knowledge and expertise among staff in the cultural institutions of Kerala on preservation practices. The major objectives of this study were to identify the preservation practices followed by the cultural institutions in Kerala for protecting their documentary heritage collections and to assess the opinion and perception of staff working in these cultural institutions on their knowledge and practical abilities in traditional and digital preservation methods.

The present study adopted a multi-method approach to obtain both qualitative and quantitative data. The statistical population of the study comprises all the cultural institutions in Kerala. For the purpose of the study, two types of samples have been selected. The first sample was the 15 cultural institutions in Kerala that possess documentary heritage collections and have initiated preservation activities. The second sample was the staff working in these cultural institutions. The structured schedules were the instrument for data collection. The first schedule was prepared and administered to the heads of the 15 cultural institutions to collect data about the preservation methods employed. To identify the staff expertise, a second schedule was prepared and distributed to the 175 staff of the cultural institutions; 170 schedules were returned with a response rate of 97.14 per cent. The collected data was segregated and consolidated with Microsoft Excel, and further analysis was done by SPSS.

The findings of the study showed that reference service was a major service provided by all the cultural institutions by using their documentary heritage collections. Brittleness and discoloration of the paper were the major deterioration conditions faced by the cultural institutions. For the preservation of documentary heritage collections, the majority of cultural institutions have adopted a hybrid method of preservation (a combination of both traditional and digital preservation methods). The majority of the cultural institutions have started their digitisation project, which is still a continuous and ongoing process. Preservation for the future was the primary need behind their digitisation project. The findings revealed that more than seventy per cent of the cultural institutions have employed a combination of both in-house and out-sourcing methods of digitisation. Sixty per cent of the cultural institutions have indicated that they felt a lack of skilled or trained staff during their preservation project was a serious problem. Findings also depicted that the majority of the staff had only average knowledge and practical abilities to use traditional and digital preservation methods. The study also found that there was no notable variance in the knowledge and practical ability of staff to apply traditional and digital preservation methods for protecting the collection of documentary heritage based on their working experience.

The study recommends that cultural institutions employ advanced methods of traditional preservation along with regular cleaning and dusting. Before adopting digital preservation, a detailed blueprint for the digitisation project has to be prepared. The theoretical and practical methods of traditional and digital preservation have to be included in the curricula of library schools. The proper training and capacity-building programmes for the staff were required to address the challenges of preservation.

**Keywords:** Traditional preservation, Digital preservation, Digitisation, Documentary heritage collection, Staff expertise

## സംഗ്രഹം

ഡോക്യുമെന്ററി പൈതൃക ശേഖരം എന്നത് ലോകമെമ്പാടുമുള്ള വിവിധ നാഗരികതകളുടെ സാംസ്കാരികവും ചരിത്രപരവും ശാസ്ത്രീയവുമായ പാരമ്പര്യങ്ങളുമായി ബന്ധപ്പെട്ട എല്ലാത്തരം ഡോക്യുമെന്ററി ആർക്കൈവൽ സാമഗ്രികളെയും സൂചിപ്പിക്കുന്നു. ഈ ഡോക്യുമെന്ററി പൈതൃക ശേഖരത്തിന്റെ ശേഖരണം, സംരക്ഷണം, പ്രചാരണം എന്നിവയിൽ ലൈബ്രറികളും സാംസ്കാരിക സ്ഥാപനങ്ങളും പ്രധാന പങ്കു വഹിക്കുന്നു. ലൈബ്രറികളിലും മറ്റ് സാംസ്കാരിക സ്ഥാപനങ്ങളിലും സൂക്ഷിച്ചിരിക്കുന്ന ഡോക്യുമെന്ററി പൈതൃക ശേഖരത്തിന്റെ ഗണ്യമായ ഒരു ഭാഗം വിവിധ തരം ഭൗതിക, രാസ, ജൈവ ഘടകങ്ങൾ കാരണം നഷ്ടപ്പെട്ട് പോകുന്ന അവസ്ഥയിലാണ്. ഡോക്യുമെന്ററി പൈതൃക ശേഖരണങ്ങളുടെ ദീർഘകാല നിലനിൽപ്പും ഉപയോഗവും ഉറപ്പാക്കുന്നതിന് ഫലപ്രദമായ പരമ്പരാഗത അല്ലെങ്കിൽ ഡിജിറ്റൽ സംരക്ഷണ രീതികൾ ഉപയോഗിക്കേണ്ടത് ആവശ്യമാണ്.

കേരളത്തിലെ ഗ്രന്ഥശാലകൾക്കും സാംസ്കാരിക സ്ഥാപനങ്ങൾക്കും വ്യത്യസ്ത രൂപത്തിലുള്ള ഡോക്യുമെന്ററി പൈതൃക ശേഖരങ്ങൾ ഉണ്ട്. എന്നാൽ പഴയതും അപൂർവ്വമായ പുസ്തകങ്ങൾ, പഴയ ആനുകാലികങ്ങളുടെയും മാസികകളുടെയും ബൗണ്ട് വാല്യങ്ങൾ, കടലാസിലെ കൈയെഴുത്തുപ്രതികൾ, താളിയോലകൾ, പത്രങ്ങളുടെ ബൗണ്ട് വാല്യങ്ങൾ, സർക്കാർ ഉത്തരവുകൾ റിപ്പോർട്ടുകൾ, ഭൂപടങ്ങൾ, ചരിത്രരേഖകൾ തുടങ്ങിയ ഡോക്യുമെന്ററി പൈതൃക ശേഖരങ്ങൾ ആണ് ഈ പഠനത്തിൽ ഉൾപ്പെടുത്തിയിരിക്കുന്നത്. കേരളത്തിലെ സാംസ്കാരിക സ്ഥാപനങ്ങൾ തങ്ങളുടെ ഡോക്യുമെന്ററി പൈതൃക ശേഖരങ്ങൾ സംരക്ഷിക്കുന്നതിന് അവലംബിക്കുന്ന പ്രിസർവ്വേഷൻ രീതികളെക്കുറിച്ചുള്ള പഠനത്തിന്റെ അഭാവമുണ്ടെന്ന് മുൻ പഠനങ്ങളുടെ വിശകലനത്തിലൂടെ മനസ്സിലാക്കി. അതിനാൽ ഡോക്യുമെന്ററി പൈതൃക ശേഖരങ്ങൾ സംരക്ഷിക്കുന്നതിന് കേരളത്തിലെ സാംസ്കാരിക സ്ഥാപനങ്ങളുടെ പങ്ക്, പ്രയത്നങ്ങൾ, സംരംഭങ്ങൾ, ധാരണകൾ എന്നിവ പഠിക്കേണ്ടതുണ്ട്. കൂടാതെ ജീവനക്കാർക്കിടയിലെ പ്രിസർവ്വേഷൻ രീതികളെക്കുറിച്ചുള്ള വൈദഗ്ധ്യത്തിന്റെ അഭാവം ഡോക്യുമെന്ററി പൈതൃക ശേഖരങ്ങളുടെ സംരക്ഷണ പ്രവർത്തനങ്ങൾക്കുള്ള പ്രധാന വെല്ലുവിളികളിലൊന്നായി മുൻ പഠനങ്ങൾ തിരിച്ചറിഞ്ഞിട്ടുണ്ട്. കേരളത്തിലെ സാംസ്കാരിക സ്ഥാപനങ്ങളിലെ ജീവനക്കാർക്കിടയിലെ പ്രിസർവ്വേഷൻ രീതികളെക്കുറിച്ചുള്ള അറിവും വൈദഗ്ധ്യവും മനസ്സിലാക്കാനുള്ള ശ്രമത്തിലാണ് ഈ പഠനം നടത്തിയത്. കേരളത്തിലെ സാംസ്കാരിക സ്ഥാപനങ്ങൾ അവരുടെ ഡോക്യുമെന്ററി പൈതൃക ശേഖരങ്ങൾ സംരക്ഷിക്കുന്നതിനായി പിന്തുടരുന്ന പ്രിസർവ്വേഷൻ രീതികൾ തിരിച്ചറിയുക, ഈ സാംസ്കാരിക സ്ഥാപനങ്ങളിൽ ജോലി ചെയ്യുന്ന ജീവനക്കാരുടെ പരമ്പരാഗത, ഡിജിറ്റൽ പ്രിസർവ്വേഷൻ രീതികളിലുള്ള അറിവ്, പ്രായോഗിക കഴിവുകൾ എന്നിവയെക്കുറിച്ച് അവരുടെ അഭിപ്രായവും ധാരണയും വിലയിരുത്തുക എന്നിവയായിരുന്നു ഈ പഠനത്തിന്റെ പ്രധാന ലക്ഷ്യങ്ങൾ.

കേരളത്തിലെ സാംസ്കാരിക സ്ഥാപനങ്ങളെ ആണ് ഈ പഠനത്തിൽ ഉൾപ്പെടുത്തിയിരിക്കുന്നത്. പഠനത്തിന് ആവശ്യമായ വിവര ശേഖരണത്തിന് സർവ്വേ , വിവരണാത്മക, നിരീക്ഷണ രീതികൾ അടങ്ങിയ ഒരു മൾട്ടി-മെത്തേഡ് സമീപനം ആണ് സ്വീകരിച്ചിട്ടുള്ളത്. പഠനത്തിനായി, രണ്ട് തരം സാമ്പിളുകൾ തിരഞ്ഞെടുത്തു. ഒന്നാമത്തെ സാമ്പിളായി ഡോക്യുമെന്ററി പൈതൃക ശേഖരങ്ങൾ കൈവശം വച്ചിരിക്കുന്നതും സംരക്ഷണ പ്രവർത്തനങ്ങൾ നടത്തുന്നതുമായ കേരളത്തിലെ 15 സാംസ്കാരിക സ്ഥാപനങ്ങൾ തിരഞ്ഞെടുത്തു. രണ്ടാമത്തെ സാമ്പിൾ ഈ സാംസ്കാരിക സ്ഥാപനങ്ങളിൽ ജോലി ചെയ്യുന്ന ജീവനക്കാരായിരുന്നു. ഷെഡ്യൂളുകളാണ് വിവരശേഖരണത്തിനുള്ള ഉപകരണമായി

ഉപയോഗിച്ചത്. 15 സാംസ്കാരിക സ്ഥാപനങ്ങളുടെ തലവന്മാർക്ക് സംരക്ഷണ മാർഗങ്ങളെക്കുറിച്ചുള്ള വിവരങ്ങൾ ശേഖരിക്കുന്നതിനായി ആദ്യ ഷെഡ്യൂൾ തയ്യാറാക്കി നൽകി. ജീവനക്കാരുടെ വൈദഗ്ധ്യം കണ്ടെത്തുന്നതിന്, സാംസ്കാരിക സ്ഥാപനങ്ങളിലെ 175 ജീവനക്കാർക്ക് രണ്ടാം ഷെഡ്യൂൾ തയ്യാറാക്കി വിതരണം ചെയ്യുകയും 97.14 ശതമാനം പ്രതികരണ നിരക്കോടെ 170 പൂരിപ്പിച്ച ഷെഡ്യൂളുകൾ തിരികെ ലഭിക്കുകയും ചെയ്തു. ശേഖരിച്ച വിവരങ്ങൾ മൈക്രോസോഫ്റ്റ് എക്സൽ ഉപയോഗിച്ച് വേർതിരിച്ച് ഏകീകരിക്കുകയും എസ്റ്റിഎസ്എസ് ഉപയോഗിച്ചു കൂടുതൽ വിശകലനം നടത്തുകയും ചെയ്തു.

പഠനത്തിൽ പങ്കെടുത്ത എല്ലാ സാംസ്കാരിക സ്ഥാപനങ്ങളും അവരുടെ ഡോക്യുമെന്ററി പൈതൃക ശേഖരങ്ങൾ ഉപയോഗിച്ച് നൽകുന്ന ഒരു പ്രധാന സേവനമാണ് റഫറൻസ് സേവനം എന്ന് പഠനം കണ്ടെത്തുന്നു. കാലപ്പഴക്കമനുസരിച്ചു ഡോക്യുമെന്ററി പൈതൃക ശേഖരത്തിലുണ്ടാവുന്ന പൊട്ടലും നിറവ്യത്യാസവുമായിരുന്നു സാംസ്കാരിക സ്ഥാപനങ്ങൾ നേരിടുന്ന പ്രധാന വെല്ലുവിളികൾ. ഡോക്യുമെന്ററി പൈതൃക ശേഖരങ്ങളുടെ സംരക്ഷണത്തിനായി, ഭൂരിഭാഗം സാംസ്കാരിക സ്ഥാപനങ്ങളും പരമ്പരാഗതവും ഡിജിറ്റൽ സംരക്ഷണ രീതികളും സംയോജിപ്പിച്ചുള്ള ഒരു ഹൈബ്രിഡ് സംരക്ഷണ രീതിയാണ് സ്വീകരിച്ചിരിക്കുന്നത്. ഭൂരിഭാഗം സാംസ്കാരിക സ്ഥാപനങ്ങളും അവരുടെ ഡിജിറ്റൈസേഷൻ പദ്ധതി ആരംഭിക്കുകയും, അത് ഇപ്പോഴും തുടർന്നുകൊണ്ടിരിക്കുകയും ചെയ്യുന്നുണ്ട്. ഭാവിയിലേക്കുള്ള സംരക്ഷണമായിരുന്നു അവരുടെ ഡിജിറ്റൈസേഷൻ പദ്ധതിയുടെ പിന്നിലെ പ്രാഥമിക ആവശ്യം. എഴുപത് ശതമാനത്തിലധികം സാംസ്കാരിക സ്ഥാപനങ്ങളും ഡിജിറ്റൈസേഷന്റെ ഇൻ-ഹൗസ്, ഔട്ട്-സോഴ്സിംഗ് രീതികളുടെ സംയോജനമാണ് ഉപയോഗിക്കുന്നതെന്ന് കണ്ടെത്താൻ സാധിച്ചു. അറുപത് ശതമാനം സാംസ്കാരിക സ്ഥാപനങ്ങളും തങ്ങളുടെ സംരക്ഷണ പദ്ധതിയിൽ പ്രിസർവ്വേഷൻ രീതികളിൽ വൈദഗ്ധ്യമുള്ളതോ പരിശീലനം ലഭിച്ചവരോ ആയ ജീവനക്കാരുടെ അഭാവം ഗുരുതരമായ പ്രശ്നമായി തോന്നിയതായി സൂചിപ്പിച്ചു. ഭൂരിഭാഗം ജീവനക്കാർക്കും പരമ്പരാഗതവും ഡിജിറ്റൽ സംരക്ഷണ രീതികളും ഉപയോഗിക്കാനുള്ള ശരാശരി അറിവും പ്രായോഗിക കഴിവുകളും മാത്രമേ ഉള്ളൂ വെന്ന് പഠനം കണ്ടെത്തുന്നു. അവരുടെ പ്രവർത്തന പരിചയത്തെ അടിസ്ഥാനമാക്കി ഡോക്യുമെന്ററി പൈതൃക ശേഖരണം സംരക്ഷിക്കുന്നതിന് പരമ്പരാഗതവും ഡിജിറ്റൽ സംരക്ഷണ രീതികളും പ്രയോഗിക്കാനുള്ള ജീവനക്കാരുടെ അറിവിലും പ്രായോഗിക കഴിവിലും ശ്രദ്ധേയമായ വ്യത്യാസമില്ലെന്നും പഠനം കണ്ടെത്തി.

പതിവ് ശുചീകരണത്തിനൊപ്പം സാംസ്കാരിക സ്ഥാപനങ്ങൾ പരമ്പരാഗത സംരക്ഷണത്തിന്റെ ആധുനിക രീതികൾ കൂടി അവലംബിക്കണമെന്ന് പഠനം ശുപാർശ ചെയ്യുന്നു. ഡിജിറ്റൽ സംരക്ഷണം സ്വീകരിക്കുന്നതിന് മുമ്പ്, ഡിജിറ്റൈസേഷൻ പദ്ധതിയുടെ വിശദമായ രൂപരേഖ തയ്യാറാക്കേണ്ടതുണ്ട്. പരമ്പരാഗത, ഡിജിറ്റൽ സംരക്ഷണത്തിന്റെ സൈദ്ധാന്തികവും പ്രായോഗികവുമായ രീതികൾ ലൈബ്രറി സൂക്ഷകളുടെ പാഠ്യപദ്ധതിയിൽ ഉൾപ്പെടുത്തേണ്ടതുണ്ട്. ഡോക്യുമെന്ററി പൈതൃക ശേഖരങ്ങൾ സംരക്ഷിക്കുന്നതിലുള്ള വെല്ലുവിളികളെ നേരിടാൻ ജീവനക്കാർക്കുള്ള ശരിയായ പരിശീലനവും അവരുടെ പ്രിസർവ്വേഷൻ രീതികളിലെ വൈദഗ്ധ്യം വർദ്ധിപ്പിക്കുന്നതിനുള്ള പരിപാടികളും ആവശ്യമാണ്.

**സൂചകപദങ്ങൾ:** പരമ്പരാഗത സംരക്ഷണം, ഡിജിറ്റൽ സംരക്ഷണം, ഡിജിറ്റൈസേഷൻ, ഡോക്യുമെന്ററി പൈതൃക ശേഖരം, ജീവനക്കാരുടെ വൈദഗ്ധ്യം.

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## **LIST OF ABBREVIATIONS/ACRONYMS**

|          |                                                                     |
|----------|---------------------------------------------------------------------|
| AD       | : Anno Domini                                                       |
| AIL      | : Archives of Indian Labour                                         |
| ANOVA    | : Analysis of Variance                                              |
| APA      | : American Psychological Association                                |
| CAS      | : Current Awareness Service                                         |
| CABI     | : Centre for Agriculture and Biosciences International              |
| CD       | : Compact Disc                                                      |
| CD-ROM   | : Compact Disc- Read Only Memory                                    |
| CeRA     | : Consortium for e-Resources in Agriculture                         |
| COVID-19 | : Coronavirus Disease                                               |
| DHF      | : Department of history, Farook College                             |
| DLI      | : Digital Library of India                                          |
| DPI      | : Dot Per Inch                                                      |
| DVD      | : Digital Versatile Disc                                            |
| EMS      | : Elamkulam Manakkal Sankaran                                       |
| FTP      | : File Transfer Protocol                                            |
| GDRL     | : Guruvayur Devaswom Religious Library & Reading Room`              |
| GIF      | : Graphics Interchange Format                                       |
| HEPA     | : High Efficiency Particulate Air                                   |
| IAC      | : International Advisory Committee                                  |
| ICOMOS   | : International Council on Monuments and Sites                      |
| ICT      | : Information and Communication Technology                          |
| IFLA     | : International Federation of Library Associations and Institutions |
| IGNCA    | : Indira Gandhi National Centre for the Arts                        |

|                |                                                                 |
|----------------|-----------------------------------------------------------------|
| INTACH         | : Indian National Trust for Art and Cultural Heritage           |
| IP             | : Internet Protocol                                             |
| ISO            | : Indian Standard Code                                          |
| IT             | : Information Technology                                        |
| JISC           | : Joint Information Systems Committee                           |
| JPEG           | : Joint Photographic Expert Group                               |
| KAULIS         | : Kerala Agricultural University Library and Information System |
| KCHRL          | : Kerala Council for Historical Research Library                |
| KKL            | : Kerala Kalamandalam Library                                   |
| KLL            | : Kerala Legislature Library                                    |
| KSAL           | : Kerala Sahitya Akademi Library                                |
| KUL            | : Kerala University Library                                     |
| MoW            | : Memory of World Programme                                     |
| MS Excel       | : Microsoft Excel                                               |
| NMM            | : National Mission for Manuscripts                              |
| NVLI           | : National Virtual Library of India                             |
| OPAC           | : Online Public Access Catalogue                                |
| OCR            | : Optical Character Recognition                                 |
| ORI &ML        | : Oriental Research Institute and Manuscripts Library           |
| PAC            | : Preservation and Conservation Programme                       |
| PDF            | : Portable Document Format                                      |
| p <sup>H</sup> | : Potential of Hydrogen                                         |
| Ph.D.          | : Doctor of Philosophy                                          |
| PRESCONS       | : Preservation and Conservation Section                         |
| RIN            | : Research Information Network                                  |
| SCL            | : State Central Library                                         |

|        |                                                                    |
|--------|--------------------------------------------------------------------|
| SDI    | : Selective Dissemination of Information                           |
| SSUSL  | : Sree Sankaracharya University of Sanskrit Library                |
| SRRL   | : State Revenue Reference Library                                  |
| SPSS   | : Statistical Package for the Social Sciences                      |
| SORIL  | : Sukrtindra Oriental Research Institute Library                   |
| TEMUL  | : Thunchath Ezhuthachan Malayalam University Library               |
| TIFF   | : Tagged Image File Format                                         |
| TMR    | : Thunchan Manuscripts Repository                                  |
| UGC    | : University Grants Commission                                     |
| UN     | : United Nations                                                   |
| UNESCO | : United Nations Educational, Scientific and Cultural Organization |
| UPS    | : Uninterruptible Power Supply                                     |
| URL    | : Uniform Resource Locator                                         |
| UV     | : Ultra Violet                                                     |
| UVC    | : Universal Virtual Computer                                       |
| Viz    | : Videlicet                                                        |



## INTRODUCTION

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- 1.1 *Introduction*
  - 1.2 *Cultural Heritage*
  - 1.3 *Documentary Heritage Collection*
  - 1.4 *Memory of the World (MoW) Programme*
  - 1.5 *Preservation of Documentary Heritage Collection*
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  - 1.16 *Title of the Study*
  - 1.17 *Definition of Key Terms*
  - 1.18 *Objectives of the Study*
  - 1.19 *Hypotheses of the Study*
  - 1.20 *Scope and Limitations of the Study*
  - 1.21 *Organisation of the Thesis*
  - 1.22 *Conclusion*
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## **1.1 Introduction**

Memory carries the truth for people, society, and individuals. It is the keystone to a well-balanced personality. The collective memory of the peoples of the world is of key significance in protecting cultural identities, bridging the past and the present, and moulding the future. The documented collective memory of the people or world is called documentary heritage, which constitutes a large percentage of the world's cultural heritage. It guides the evolution of thought and the achievement and discovery of human civilization. It represents the legacy of our ancestors to the descendants of the present and the future. Documentary heritage housed in libraries, archives, and other institutions across the world represents an important part of that memory and reflects the diversity of peoples, cultures, customs, and traditions. A considered proportion of the documentary heritage that resides in libraries and other cultural institutions is now at risk and in fragile condition. Much of the known and unknown documentary heritage that resides in libraries and other cultural institutions has vanished, dispersed, and deteriorated through different causes. Many of the documentary materials are made up of natural materials that are subject to physical destruction and chemical instability. Natural causes such as dust, heat, humidity, age of the material, atmospheric conditions, light, and the attack of biological insects may lead to gradual deterioration, which may be the result of human neglect in providing proper care, handling, protection, and housing. Many of the documents in the documentary heritage have been lost because of natural calamities like floods, fires, cyclones, earthquakes, and storms; man-made disasters like looting and irresponsible handling; man-made technological obsolescence; some historical circumstances; and political barriers like war. The documentary heritage collection has scattered due to the migration and deliberate displacement of holdings in libraries and cultural institutions. Increasing awareness of these threats has created a sense of urgency in the implementation of consistent preservation initiatives to protect this irreplaceable documentary heritage collection. Libraries, archives, and cultural institutions recognised the emergency need to develop a consistent preservation programme for protecting documentary heritage from further deterioration all over the world. Libraries and cultural institutions play

a crucial role in organising, preserving, and providing access to cultural and historical collections. The sheer scale of efforts, knowledge, and staff expertise in traditional and digital preservation methods, state-of-the-art technology, money, and advanced techniques of information and communication technology (ICT) are required for safeguarding the documentary heritage for future generations (Abdelaziz, 1996).

## **1.2 Cultural Heritage**

We often hear about the concept of "cultural heritage", and its value and importance to be preserved. What is the meaning of "cultural heritage"? "Cultural Heritage" (CH) is a way to bring people back to their past memories, or literally, it is a vision of the past memories that can affect present and future generations. Cultural heritage is an identity for a society that recognises human actions concerning historic, aesthetic, and scientific aspects that it inherited from its ancestors and needs to be protected. It is a sign of a legacy of indefinable past activities of society for the future. Cultural heritage is defined as "the legacy of physical artefacts and intangible attributes of a group or society that are inherited from past generations, maintained in the present, and bestowed for the benefit of future generations" (Central European University, n. d.). The term 'cultural heritage' has changed its meaning considerably in recent decades. Cultural heritage does not end at archival sites, buildings, or physical artefacts. It also includes traditions or expressions like oral traditions, rituals, performing arts, and festivals. The concept of "cultural heritage" comprises cultural resources of a place such as tradition, custom, language, and their activities like literature, fine arts, history, knowledge, but also tangible attributes (buildings, monuments, landscapes, books, and works of art) that are inherited from past generations (Franchi, n. d.).

The word cultural heritage is composed of two words: "culture" and "heritage". According to the Cambridge Dictionary, culture is "the way of life, especially the general customs and beliefs, of a particular group of people at a particular time". "Heritage" is property, money, or anything that is considered essential to be passed on to future generations. As regards "cultural heritage",

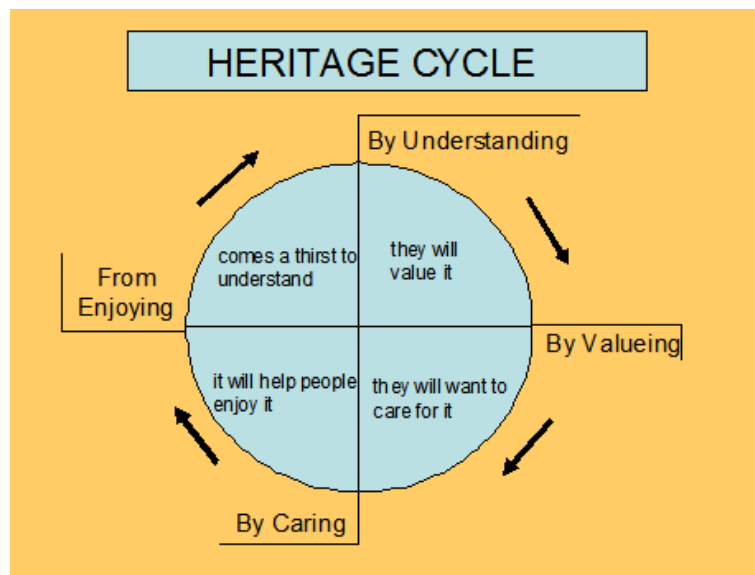
"heritage" doesn't mean property or money but of custom, values, tradition, and culture". "Cultural heritage" is described as,

- It is a shared bond between our belonging and our community.
- It is a representation of our culture and history.
- It is a bond between the past, present, and future.
- It is a human construction planned to inform.
- It is a connection to certain beliefs, social values, and customs.

Thurley (2005) introduces a heritage cycle diagram to provide an idea of the importance of cultural heritage and how we can understand, learn, preserve, and make the past part of our future. The heritage cycle is presented below,

- By understanding (cultural heritage)
  - people value it
- By valuing it
  - people want to care for it
- By caring for it
  - it will help people enjoy it
- From enjoying it
  - comes a thirst to understand
- By understanding it.....etc

(Thurley, 2005)



**Figure 1**  
**Cultural Heritage Cycle**

**Source:**

[http://www.cultureindevelopment.nl/cultural\\_heritage/what\\_is\\_cultural\\_heritage](http://www.cultureindevelopment.nl/cultural_heritage/what_is_cultural_heritage)

(Thurley, 2005)

Preservation of cultural heritage means taking all measures to protect cultural property against destruction, damage, embezzlement, theft, or other loss. The best method to preserve our cultural heritage, whatever it may be, is to share it with others. It is our duty to preserve world history intact for the future generation so that they may have the same opportunities to learn and understand about the past and their own roots as we have.

**1.2.1 Importance of Cultural Heritage**

ICOMOS (2002) describes cultural heritage as “it is an expression of the ways of living developed by a community and passed on from generation to generation, including customs, practices, places, objects, artistic expressions, and values”. It is a broad concept; these are not just luxury goods; these are basic needs. It is the major source of self-expression and self- realisation. “The arts as part of cultural heritage like literature, music, painting and sculpture are essential in a peaceful co-habitation of the human species as it will offer them an alternative point

of view. In presenting a different picture people will be more lenient in accepting differences in real life as well that in turn will stimulate mutual respect. That is why cultural heritage plays such a vital role in the democratization process”.

The importance of cultural heritages are specified as:

1. The importance of cultural heritage has long been undervalued. Inter-linkages between cultural heritage and social development are unknown. Cultural heritage is an imperative agent, a dynamic force, and a transformative force for social development and transformation.
2. Cultural heritage is the key to the cultural memory and cultural diversity of a nation or place, and it also promotes the economic basis of the nation. It is a source of income.
3. Monuments, archival buildings and remains, landscapes, archaeological places, etc. are promoting the cultural tourism of the nation.
4. Books, ancient manuscripts, palm leaves, and historical records are the storehouses of ancient knowledge. It improves research and scholarly education.
5. Cultural heritage provides people with a sense of unity within a group and allows them to better understand their ancestors and the history of where they come from.

### **1.2.2 Types of Cultural Heritage Resources**

The term "cultural heritage" always refers to historical buildings, monuments, archaeological sites, and artefacts like paintings, sculptures, drawings, prints, etc. Now the concept of "cultural heritage" has gradually grown to include new sections, which are wider than the old concept, which included all the evidence of human activity and expression: books and manuscripts, historical documents, photographs, maps, etc. Moreover, "cultural heritage" is not only manifested through material and tangible objects that we can see and touch. It also includes immaterial elements like oral history, traditions, fine arts, social practices, performing arts,

knowledge and skill passed down from generation to generation, rituals, and festivals. According to the UNESCO cultural heritage classification figure:

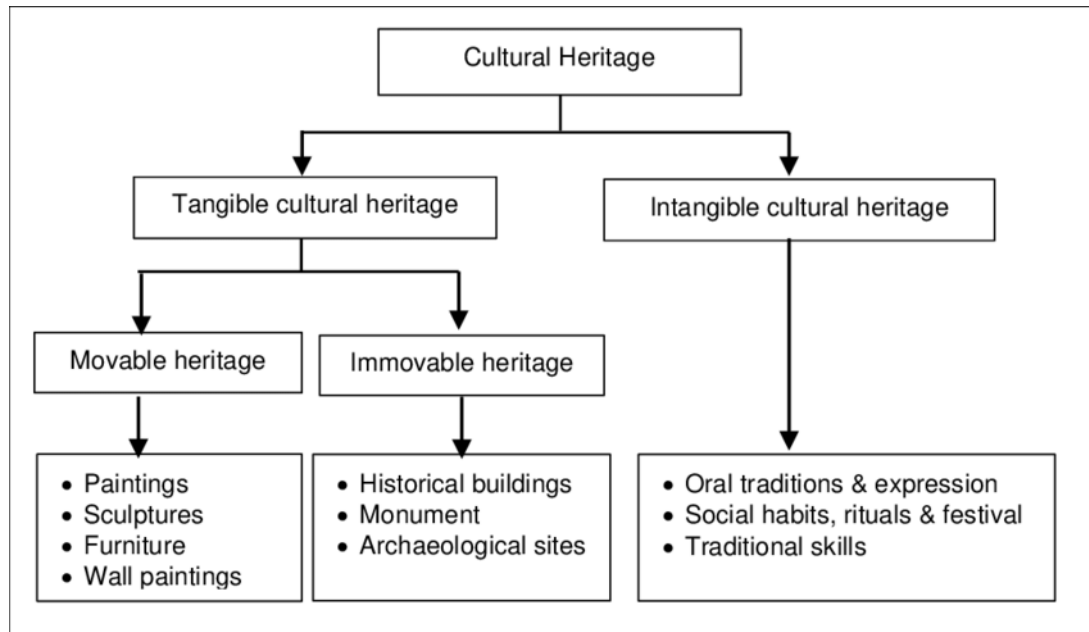


Figure 2

### Types of Cultural Heritage Resources

Source: Cultural Heritage Classification from UNESCO [21] ([https://www.researchgate.net/figure/Cultural-Heritage-Classification-from-UNESCO-21\\_fig1\\_329878297](https://www.researchgate.net/figure/Cultural-Heritage-Classification-from-UNESCO-21_fig1_329878297))

“Cultural heritage” can be classified in different ways and by different means. They are:

#### 1. Built environment, natural environment, and artefacts

According to the existing conditions and environment, cultural heritage can be classified into built, natural, and artefacts. Examples of cultural heritage that consists of the built environment are archaeological monuments, buildings, and townscapes. Cultural heritage, which consists of natural environments, includes agricultural heritage, coasts and shorelines, and rural landscapes. Examples of artefacts are books, manuscripts, documents, etc.

## 2. Tangible, intangible, and natural cultural heritage

This is the general classification. Cultural heritage is often classified into tangible, intangible, and natural cultural heritage. Tangible cultural heritage refers to physical artefacts (books, works of art, sculptures, etc.) produced, maintained, and transferred, as well as those important places that advocate the nation's history and cultural diversity (heritage sites, monuments, and archaeological remains). Intangible cultural heritage refers to those aspects of a nation that do not have a physical presence but hold the traditions or living expressions transferred from our old generation and passed on to our future generation. For example, oral traditions, fine arts, religious traditions, customs, language, indigenous knowledge, history, traditional music, folklore, rituals, beliefs, etc. Natural cultural heritage includes biodiversity and culturally significant landscapes.

## 3. Movable and immovable cultural heritage

Tangible cultural heritage is often expressed as either movable or immovable. Immovable cultural heritage consists of monuments, archaeological buildings, places, etc. Books, sculptures, and paintings fall into the movable category.

## 4. Material and immaterial cultural heritage

Material cultural heritage is any kind of object or material that is created by people and is the bearer of traditions and historical memory and has cultural value. Examples of material cultural heritage are books, buildings, monuments, etc. Immaterial cultural heritage includes oral traditions, fine arts, rituals, etc.

## 5. Documentary and non-documentary cultural heritage

Documentary cultural heritage means a document that is recorded or documented to reflect the cultural heritage, traditions, or history of a society or people. Old and rare books, manuscripts, palm leaves, old journals, historical documents, government reports, etc. are included in this category. Non-documentary

cultural heritage is the reverse of documentary. Which includes buildings, sculptures, etc.

The present study is focused on the preservation of the documentary heritage collection possessed by the selected fifteen cultural institutions in Kerala.

### **1.3 Documentary Heritage Collection**

Documentary heritage is a basic inheritance of our culture and historical and social memory that must be transferred to future generations in the best possible ways. The libraries, archives, and cultural institutions are the centres in charge of dealing with, preserving, conserving, and disseminating this heritage to the world. Documentary heritage includes text, cartography, audio-visuals, digital documents, etc. "A document is that which "documents" or "records" something with deliberate intellectual intent. While the concept of a document is universal, it is acknowledged that some cultures are more "document-oriented" than others. "Consequently, for this and other reasons, not all cultures will be equally represented within the global documentary heritage" (UNESCO, 2002). A document is an object that is deemed to have two elements: analogue and digital information content and the carrier on which it consists. Both the information content and the carrier have great variety and equal importance. It should be movable and preserveable. The content may include text, images, and sounds, which can be copied. The carrier may have technical or cultural qualities. For example:

- Textual items like books, manuscripts, historical records, newspapers, etc. The textual content may be recorded by using ink, paint, or another medium. The carrier may be made of palm leaves, paper, parchment, bark, fabric, papyrus, or other medium.
- Non-textual items like paintings, maps, drawings, cartographic materials, etc.
- Audio-visual items like photographs, films, etc.
- Visual documents like websites.



The Memory of the World (MoW) programme of UNESCO defined the concept of "documentary heritage", which comprises the following items:

- It should usually be movable.
- It should include signs or codes (text), images, and sounds.
- It should be preserveable.
- It should be migratable and reproducible.
- It should be the product of a deliberate documentation process.

(UNESCO, 2015)

According to the MoW programme (2002), documentary heritage can be defined as “those single documents – or groups of documents – of remarkable and enduring value to a culture, a community, a country or to humanity generally, and whose deterioration or disappearance would be a harmful impoverishment. Importance of this heritage may become clear only with the passage of time. The world’s documentary heritage is of global importance and responsibility to all, and should be fully preserved and protected for all, with due respect to and recognition of cultural mores and practicalities. It should be permanently accessible and re-usable by all without impediments. It provides the means for understanding political, social, cultural and collective as well as personal history. It can help to underpin good governance and sustainable development. For each State, its documentary heritage reflects its identity and memory, and thus contributes to determining its place in the global community” (UNESCO, n. d.).

The MoW programme established some criteria for evaluating the cultural value of documentary heritage collections. They are,

1. Influence: Documentary heritage collections should have a strong potential to influence the history of our past generations.

2. Time: Documentary heritage collections should reflect and act as important evidence for understanding the history of our past at a particular important period of time.
3. Place: A documentary heritage collection should hold the important facts about a place (nation, region, or locality) that made a significant contribution to the growth of our past history.
4. People: A documentary heritage collection should have a relationship with the life, creation, and works of a person or people who have made a significant contribution to our history.
5. Subject or theme: A documentary heritage collection should record or document a significant subject or theme of our history.
6. Form and style: A documentary heritage collection should be a significant sample of outstanding form and style.
7. Social and cultural value: documentary heritage collections should have significant social, cultural, aesthetic, historic, or spiritual value.
8. Integrity: A documentary heritage collection should have a high degree of integrity, exhaustiveness, or completeness. The importance of documentary heritage collections may increase if they have a high degree of integrity.
9. Rarity: A documentary heritage collection should be rare and unique. The rarity of the documentary heritage may enhance its significance (Abdelaziz, 1996).

#### **1.4 Memory of the World (MoW) Programme**

Recognising the importance of urgent action for the protection of documentary heritage collections, UNESCO launched the "Memory of the World" (MoW) Programme in 1992 to preserve, protect, safeguard, and promote the documentary heritage. UNESCO's long-standing dedication to the protection of the world's documentary heritage came initially from a growing consciousness of the

dangerous state of preservation of, and bad state of access to, documentary heritage in different parts of the world. UNESCO designed the MoW programme as a new approach to protecting the documentary heritage, democratising access to the documentary heritage, raising awareness of the importance of the documentary heritage, and preserving the documentary heritage.

The first meeting of an International Advisory Committee (IAC) for the MoW Programme, appointed by the Director-General of UNESCO in 1993, was to create an action plan for the implementation of the programme, declare the position of UNESCO as a supervisor for planning and implementing the projects, make suggestions and recommendations regarding fund raising for the programme, grant funds, and allocate MoW labels to the selected projects. The second meeting of the IAC, held in Paris in 1995, decided to extend their recommendations from the first meeting. The idea of documentary heritage was extended to include, besides books, manuscripts, maps, and other old and rare important documents, libraries, cultural institutions, and archives in any medium, as well as computerised recordings, audio-visual documents, and oral traditions having great historic and cultural value. The range of the MoW Programme is broad and involves a variety of members, like students, the general public, scholars, providers and makers of information, and producers of end products.

Accordingly, the MoW Programme should make authorities and the government aware that they must safeguard their documentary heritage collection, support action, aid the preservation projects of international, national, regional, and professional institutions and organisations, and refresh their initiatives. The MoW Programme has the following four main objectives that are complementary to each other and closely interlinked:

1. To facilitate the preservation, by the most appropriate methods of contemporary technology, of the world's documentary heritage.
2. To assist universal access to documentary heritage.

3. To expand awareness worldwide of the presence and importance of documentary heritage.
4. To promote the MoW Programme and its products to the widest possible public.

The first objective of the MoW Programme is to ensure the preservation of documentary heritage that has world, national, and regional significance by using the most appropriate methods or techniques of contemporary technology. And motivate the preservation of documentary heritage through direct practical assistance, the dissemination of guidance and information, support for training, policy development, and execution, connecting sponsors with timely and suitable projects, and other possible methods promoting the preservation of widely available resources in all their forms. The second object is to assist in providing access to documentary heritage collections without any discrimination against people. This is done by encouraging libraries and cultural institutions with documentary heritage collections to make digital copies and catalogues available on the online platform and publish books, CDs, and DVDs from their collection, making it accessible as widely and equitably as possible to the users without any discrimination. The third objective of the programme is to raise awareness of the significance of documentary heritage through the media, exhibitions, promotional and informational publications, educational programmes, awards, and the MoW logo. Preservation and access are related to each other; to raise awareness, demand for access can encourage preservation initiatives. The last objective of the programme is to develop high-quality products from this documentary heritage, make it available for wide distribution through online media, and ensure the maintenance of the originals through the best possible methods of conservation and security.

According to the UNESCO Memory of the World Programme's general guidelines (2017), the vision of the MoW Programme is that "the world's documentary heritage belongs to all, should be fully preserved and protected for all, and, with due recognition of cultural mores and practicalities, should be permanently accessible to all without hindrance". And the mission of the programme is to

"increase awareness and protection of the world's documentary heritage and achieve its universal and permanent accessibility". The second meeting of the International Advisory Committee of the MoW Programme held in Paris in 1995 decided to develop a "Memory of the World Register" to list the documentary heritage of world significance that has been meeting the selection criteria defined by the committee. These criteria, which include time, place, influence, people, form and style, subject, and social value of the collection, The "Memory of the World Register" is a treasury of significant manuscripts, documents, oral traditions, library and archive holdings, and audio-visual materials of cultural and historical value. And also a motivation for nations and regions to identify, list, and protect their documentary heritage. The register will serve as an important tool in raising awareness among authorities, governments, non-governmental organisations, cultural and educational institutions, and the general public about the significance of their documentary heritage, act as an incentive to obtain funds for its preservation, and be integral to their collective memory. (UNESCO, n. d.)

### **1.5 Preservation of Documentary Heritage Collection**

The preservation of documentary heritage is a complex task that entails many diverse problems arising from the social, cultural, and technical aspects of documentary heritage collection, from their holding institutions, and from their users. The research on paper deterioration and new conservation and restoration methods and techniques contributed to spreading awareness about the importance of preservation and disaster management in the cultural heritage sector. The perceptions of preservation and its role in library and information science have been systematically studied and are reflected in the professional development of this field. For a long time, preservation was considered a process that was conducted in laboratories for routine rebinding of books and the restoration of specialised items such as old and valuable books. The concept of preservation began to change. A wider spectrum of activities, such as national and international policies and programmes like the IFLA Preservation and Conservation Programme (PAC), diverse educational possibilities for conservators and librarians, technical

development of methods and their application in the preservation sector, and a comprehensive approach to cooperation and raising awareness about the problem. Digital preservation technology has emerged and is considered the key to long-term preservation. In the case of documentary heritage resources, preservation is not just a technical treatment but a social issue, and we need to take a proactive role in preservation awareness and education and redefine the selection criteria for preservation.

The term "documentary heritage" denotes all kinds of documentary archival materials related to the cultural traditions of various civilizations around the world. Libraries and cultural institutions are responsible not only for collecting, organising, and exhibiting important documentary heritage collections, but also for their long-term preservation, protection, and accessibility. Preservation is the most important component in ensuring the long-term preservation and accessibility of documentary heritage collections. The concept "preservation" is defined as "activities connected with sustaining library materials for future use either in their original physical form or in some other usable form". According to Harvey (1994), preservation includes "all managerial and financial considerations, including storage and accommodation provision, staffing levels, policies, techniques, and methods involved in preserving library and archive materials and the information contained in them". Krtali and Hasenay (2012) defined preservation management as "the systematic and planned organisation of human and financial resources as well as activities necessary to ensure longevity and availability of library material, in conformity with the mission of a specific institution. Managing and organising preservation implies a systematic and comprehensive approach that can be applied regardless of the type of institution or type of material, but one that still provides space for meeting specific preservation needs". The primary objective of preservation is to extend the life span of a documentary heritage collection and to ensure its long-term accessibility. Preservation can also be considered as part of the collection management strategy.

The changes in the social role of libraries and cultural institutions, in the needs of the users, and in the development of technology have made drastic changes

in the basic preservation principles of choice, longevity, integrity, access, and quality. The concept of preservation refers to techniques and methods for maintaining the technical and intellectual survival of records that are prone to being ruined because of decay or loss and is also considered a means to protect these records. Preservation can be divided into three categories. Which includes 1) "preventive preservation", 2) "restorative preservation", and 3) "content preservation". Preventive preservation mainly focuses on the physical protection of the documents. Preventive preservation means a range of direct and indirect activities and processes undertaken on documents for preventing degradation and ensuring the prolonged life span of documents that are at risk of damage and destruction. Preventive preservation can decrease premature deterioration by conducting certain activities such as environmental checks or control, reformatting into alternative media, conservation treatment, security, binding and repair, storage and handling, and preparing and monitoring a disaster preparedness plan. Restorative preservation focused on paper documents for ensuring careful handling and protecting paper documents by developing a Code of Practise for handling records. Content preservation is related to digital documents. The documents are in digital form and are at risk of alteration. To ensure the authenticity and reliability of digital documents, the content of the document needs to be preserved. A variety of computer technologies, hardware, and software are required for content preservation to do routine management like backup and update (Ismail & Affandy, 2018).

### **1.5.1 Preservation and Conservation**

The terms "preservation" and "conservation" are always used synonymously, but conservation is one of the features of preservation activity. Harvey (1994) defines conservation as "those specific policies and practices involved in protecting library and archive materials from deterioration, damage, and decay, including the methods and techniques devised by technical staff". Conservation involves the application of preventive measures and procedures to repair the damaged material and assure its long-lasting existence. Preventive measures can increase the life span of materials and are much more cost-effective than interventive measures used to

cure damage after deterioration has taken place. The concepts of preservation and conservation have different technical implications, but they are related to each other. Preservation and conservation are the procedures of protecting a material from damage, loss, destruction, harm, and decay and keeping it in a good condition for present and future use. Preservation follows regular maintenance, and conservation follows curative treatment.

### **1.5.2 Preservation and Access**

The main two goals of a library or cultural institution that holds a documentary heritage collection are to facilitate access to the collection and the preservation of the collection under their care so that it can be accessible to future generations for education and research purposes. These two goals, "access" and "preservation," are contrary to each other. The preservation of documentary heritage and making it accessible to users are complementary and of equal importance. Access promotes preservation, and preservation makes sure access. Demand for access can encourage preservation activities. There is no value in preservation except to ensure access. The provision of public access is the proof and authentication of public expenditure on preservation. The public's interest in libraries and cultural institutions is sustained by providing access to their documentary heritage collection and the way in which it is preserved.

### **1.6 Deterioration of Documentary Heritage Collection**

Most of the old and rare documents are organic in nature, so they will deteriorate eventually. The degradation of the paper is a crucial problem. In the context of documentary heritage collection, deterioration means the downgrading of physical characteristics such as colour, shape, consistency, and odour. Deterioration can be classified into three categories: physical deterioration, chemical deterioration, and biological deterioration. Physical deterioration of the documentary materials from the impact of factors such as mismanagement, insecure stacking, mutilation, poor storage, excessive photocopying, and careless handling might include tears, folds, creases, scratches, dog-eared corners, etc. Chemical deterioration is due to the impact of factors such as humidity, light, temperature, and pollution within the



storage environment. Biological deterioration caused by biological agents such as insects and fungus in conditions where there is poor lighting, inadequate ventilation, dust, relative humidity, and temperature might include tearing, staining, fading, discoloration, darkening, holes from insect attack, etc. (All India Deprived Community of Records, 2019). Major noticeable deteriorations are:

- Brittleness
- Wear and tear due to excessive photocopying and use
- Wear and tear due to bad shelving
- Paper becoming torn
- Broken spine of the book materials
- Discoloration of the paper
- Fading of data
- Cracking and scratching of materials
- Attack of book worms/silver fish/ termites like biological agents
- Mutilation or vandalism of materials
- Theft of materials

### **1.7 Causes of Deterioration**

The two factors that cause the deterioration of the documentary heritage collection are the inherent chemical stability of the material and the external reasons that affect the material. The external reasons for the deterioration of documentary heritage include poor handling or storage, theft or vandalism, fire, flood, pest, pollution, light, incorrect temperature and relative humidity, etc. Relative humidity speeds up the chemical reaction in paper documents, which leads to their deterioration. In humid conditions, mould and other insects flourish and cause staining, leading to the permanent loss of the paper documents. In high humidity

conditions, paper documents become dry and brittle. In low-humidity conditions, paper documents can warp and grow mould. The light, mainly UV light, speeds up the chemical reaction in the paper and also causes the fading of coloured papers and inks. By the reaction of radiant energy, paper documents become discoloured to brownish or yellowish. Discoloration decreases the legibility of the paper. High temperatures may be the reason for brittle paper documents; they are very hard to repair and further use. The common causes of deterioration of documentary heritage materials are:

- Age of the material
- Acidity level of paper
- Ink
- Type and quality of the material
- High temperature
- Relative humidity
- Excessive light
- Dust and particulate matters
- Air pollution/atmospheric pollution
- Excessive photocopying and use
- Natural calamities like floods, cyclones, fire etc.
- Bad shelving or storage
- Biological agents like termites, book worms etc.

(Library of Congress, n. d.)

### **1.7.1 Age of the Material**

Documentary heritage collections, whatever they are made from, must deteriorate with age, whether they are stored in good condition or not. The deterioration connected with the normal ageing of paper is different from other deterioration. The processes behind the ageing of paper documents are the hydrolysis and oxidation of long cellulose chains in the paper materials. These processes cut down the long cellulose chains into smaller ones, reduce the mechanical properties of the paper, and cause it to become brittle. Fluctuations and extremes in temperature, humidity, light, moisture, and microorganisms are the key factors that cause oxidation and hydrolysis. The chemical constituents in the paper documents are also the reason for ageing.

### **1.7.2 Acidity Level of the Paper**

Excessive acidity in the paper is one of the serious reasons for the degradation of the paper. Measuring the  $P^H$  value is the most reliable method for identifying acidity in the paper.  $P^H$  is the amount of hydrogen ion concentration in any substance.  $P^H$  denotes the direct relationship between acidity and the longevity of the paper. The more acidic papers have a shorter life span. Due to high acidity, paper becomes weaker through the hydrolysis of its cellulose molecules; polymer linkages gradually breakdown, and paper becomes brittle, yellowish, and degraded. Acid migration from adjacent acidic materials such as newspaper clippings and folders also causes deterioration of the paper materials (Deco Orange, n. d.).

### **1.7.3 Ink**

Ink is an important ingredient in paper documents. Ink is made from iron gall and dyes. Ink has varied physical and chemical properties. Some of them are volatile and water-soluble. Ink has two components: a vehicle and a colourant. The degradation and durability of the ink on the paper varied based on the properties of chemicals added during ink production. Under the pressure of temperature variation, moisture, atmospheric pollutants, solvent action, humidity, smudging, and bleeding

are the two key problems noticed in the case of ink. Inks with a carbonyl group have a high life span.

#### **1.7.4 Type and Quality of the Material**

In some cases, the longevity of the paper materials does not depend on their age but on other aspects such as the type and quality of the paper-making materials and the procedure of paper-making. The paper is made from cellulose, which is a repeating chain of glucose molecules extracted from plant wall cells. Paper quality depends on how long the cellulose chains and the paper fibres are. Long-fibered paper is more flexible, stronger, and durable than short-fibered paper. The presence of moisture and acidity from raw materials and the manufacturing process also causes the degradation of the papers. The fibres used in the papermaking process prior to the invention of papermaking machines were cotton and linen clothing rags. These papers are flexible and durable. Now shorter and cheaper fibres replaced the raw materials and paper manufactured by chemical and mechanical pulping processes. So that papers are degraded easily.

#### **1.7.5 High Temperature**

Temperature is the measure of warmth or coldness of an object, body, or substance expressed in terms of any standard scale. Temperature plays an important role in the deterioration of paper documents. Higher temperatures speed up the rate of chemical reactions that cause the degradation of paper documents. The rapid changes in temperature cause the paper to curl or mould. Temperature and relative humidity are interdependent factors. The fluctuations in temperature and humidity can accelerate the damage to paper as a result of the internal stress formed in it as a result of these changes. A cooler temperature is more suitable for increasing the life span of paper documents. Lower temperatures reduce chemical decay and slow down insect activity. The temperature suitable for preserving paper documents is between 18<sup>0</sup> and 22<sup>0</sup> C (Northeast Document Conservation Centre, n. d.).

### **1.7.6 Relative Humidity**

Relative humidity is a ratio, often expressed in percentage that is a measure of the amount of water vapour in a water-air mixture compared to the maximum amount possible. Simply, it refers to the moisture in the air. Fluctuations in relative humidity are the greatest threat to the paper materials. Humidity causes water to accelerate the chemical reactions on paper. The growth of moulds, fungi, and other biological agents increases in humid conditions. Mould causes staining and deterioration of the paper, and fungi create white patches on the document. Inappropriate moisture in the air is dangerous for the preservation of documents. Poor ventilation, a lack of properly sealed walls and windows, a lack of air circulation, a moisture controller, and an air filtering system are the main reasons for humidity problems. The humidity rate needed for the paper documents is between 40 per cent and 55 per cent (Northeast Document Conservation Centre, n. d.).

### **1.7.7 Excessive Light**

Light is a kind of electromagnetic radiation that can be perceived by the human eye and makes objects visible. Light can be considered a prime cause of the deterioration of paper-based documents. Light caused the photochemical deterioration of the documents. Light in the form of waves is absorbed by the molecules in the paper, activates chemical reactions, and leads to the deterioration of paper-based documents. Light changes the colour of the paper to yellow or colourless and also fades the ink or dye. Light accelerates the oxidation process and weakens and brittles the paper. UV light in the sunlight and florescent light cause the oxidation of cellulose. Light has bleaching power to whiten the paper and fade the coloured papers and inks. Light also causes lignin to react with other compounds, making papers brownish and yellowish (Priest, 2022).

### **1.7.8 Dust and Particulate Matters**

Dust and particulate matter are two of the main reasons for the deterioration of print materials. Deposition of dust and particulate matter on the surface of the document can activate document degradation. Particulate matter is the mixture of

liquid droplets and solid particles in the air. When some of the dust particles are placed on books and documents, they absorb moisture and cause deterioration of the document by acid hydrolysis. Keep the library stacks and circulation counter clean; good air circulation facilities help to decrease mould growth. It is important to avoid dust and particulate matter with dangerous compositions through cleaning and preventive measures.

### **1.7.9 Air Pollution/Atmospheric Pollution**

Air pollution, or atmospheric pollution, is the contamination of the air by any physical, chemical, or biological agents such as dust, smoke, and harmful gases that affect human health, animals, and the environment drastically. Various gaseous pollutants from outside sources, such as motor vehicles and industrial discharge, and from indoor sources, such as plastics, paints, cleaning products, photocopiers, and untreated wood, accelerate the chemical reactions that increase the degradation of paper-based materials. The rate of these chemical reactions may double in cases of high humidity (Northeast Document Conservation Centre, n. d.).

### **1.7.10 Excessive Photocopying and Use**

Old and rare documents are too sensitive. It should be ensured that these documents are well handled. While using photocopier machines, the spine or binding of the document may be damaged when it is pulled down into the flat position. The use of an inappropriate photocopier machine and the heat and intense light emitted by some photocopiers by their excessive use contribute to the further deterioration. Improper folding and bending by the staff or users may lead to crumples in the documents. Unwanted marking in the document and excessive use of fragile documents are also causes of deterioration.

### **1.7.11 Natural Calamities like Floods, Cyclones, Fire etc.**

A natural calamity is a sudden and terrible effect of a natural hazard that usually results in serious destruction of the environment and causes environmental, financial, and human losses. Natural calamities include earthquakes, volcanic eruptions, wind, tropical storms, land and mud slides, food, cyclones, monsoons,

forest fires, tsunamis, electrical storms, etc. Natural calamities may cause different types of damage to libraries and cultural institutions, especially material loss of the rare collection, buildings that hold the collection, and social damage. The institutions all over the world that hold documentary heritage collections are concerned about the risks and disasters that challenge the life of their collections due to natural causes. These disasters cause the loss of irreplaceable documentary heritage assets.

### **1.7.12 Bad Shelving or Storage**

Proper storage facilities and shelving can greatly affect the longevity of the documentary heritage collection. To ensure the life and health of these collections, there is a need to consider various factors before deciding where and how an old collection should be stored. They are the environmental conditions in the storage space, the types of furniture to be used for storage, the kind of secondary protection enclosures used to protect the documents, and how the documents should be prepared or processed before storage. Old documents stored bare on the shelves without enclosures such as wrappers, folders, boxes, bindings, and envelopes may have a direct impact on the storage environment from environmental agents like light, heat, dust, and microorganisms. These enclosures contribute to the longevity of the rare collection. There is a need to select storage space with a stable, moderate environmental condition (Northeast Document Conservation Centre, n. d.).

### **1.7.13 Biological Agents like Termites, Book Worms etc.**

Documentary heritage collections suffer serious damage from the attack of biological agents. The major reasons for the growth and proliferation of biological agents are uncontrolled temperature, humidity, and human negligence in housekeeping activities; poor ventilation; the addition of insect-infected documents to the collection; open windows; poorly sealed doors and windows; and ignored roof leaks and cracks in the building. The growth of biological agents such as fungi or moulds and rodents increases, and they attack paper-based materials when temperature and humidity fluctuate. The moulds will digest the organic materials, which may result in staining and damaging materials. The whitish patches in the

documents denote the growth of fungi; later, they become brownish or greenish. Rodents and insects are the major enemies of organic materials that contain cellulose. Proteins and carbohydrates contained in the organic materials attract insects to them. The major noticeable insects that cause the deterioration of paper-based materials are termites, silverfish, bookworms, cockroaches, booklice, carpet beetles, case-bearing cloth moths, powder post beetles, and death watch beetles (Maravilla, n. d.).

### **1.8 Preservation Methods for Documentary Heritage Collection**

Documentary heritage resources are hygroscopic in nature. They can absorb and release moisture, and depending on environmental changes, especially temperature and humidity, these materials are vulnerable to accelerated degradation. The cause and causes of this deterioration are identified, and this can be counteracted by effective preventive measures. It is feasible to prevent and repair damage. There are two major methods for the preservation of documentary heritage materials. The first is preservation in original format by using a number of basic and traditional techniques such as good care and handling, cold storage for special collections, providing a good storage environment, conservation and restoration treatment, fumigation, acidification, etc. The second method of preservation is the complete conversion of material from its original format to another, such as digitisation and microfilming etc. The hybrid approach is the best reformatting option to choose by combining the usefulness of both traditional and digital preservation methods at the same time, if money is not a problem.

### **1.9 Traditional or Basic Preservation Methods**

Documentary heritage materials held in institutions form part of the cultural heritage of mankind, and the preservation of such materials is of key importance. Traditional and basic preservation methods of documentary heritage collection are actions that reduce physical and chemical deterioration and avoid the loss of information content to extend their availability. The basic elements of traditional preservation methods encompass proper housing or storage, disaster planning,



environmental control, conservation treatment, security, replacement or reformatting, proper handling, in-house repair, etc.

- Cleaning and dusting
- Environmental control
- Surface cleaning or stain removal
- Oiling
- Miner repairs and mending
- Binding, trimming, guarding, gathering, stitching
- Ink fixing
- P<sup>H</sup> testing
- Proper shelving
- Lamination
- Photocopying
- De-acidification or alkaline wash
- Fumigation
- Use of insecticides
- Use of natural repellents
- Adequate security measures
- Disaster preparedness and recovery plan
- Installing air conditioners

### **1.9.1 Cleaning and Dusting**

It is the most basic method of preservation. Cleanliness is the basic precautionary measure required to eliminate the infection of biological agents. Maintaining a clean and neat storage space is essential for preserving a documentary heritage collection. Shelves, folders, files, envelopes, containers, boxes, and exteriors should be dusted as and when required to prevent dirt accumulation. There is a need to take great care when dusting documentary heritage collections that are in brittle, damaged, or fragile condition. A wool duster, a dusting brush, a nylon dusting cloth, a microfiber cloth, and vacuum cleaners are the cleaning tools used for dusting. Soft dust brushes can be used for dusting the dirt from records and files. Shelves and the exteriors of folders and boxes can be wiped with a dust cloth. The floor of the building can be cleaned by using water and other cleaning materials like detergents, cleaning liquids, etc. (National Archives, 2016).

### **1.9.2 Environmental Control**

Specialised climate conditions are required for preserving documentary heritage collections by controlling humidity, temperature, pollution, and light. A moderate and stable level of temperature and humidity is needed to prevent the growth of fungi, insects, and bacteria. For the controlled environment, there is a need to ensure some factors: dust-free space, tall ceilings, good air circulation, an air filtration system, smoke detectors, wooden furniture and curtains, sealed windows and doors, moisture detectors, good ventilation, shelves that are deep enough to lie documents flat, and shelves that are deep enough for the storage boxes. A hygrometer can be used for measuring humidity. By using machines like dehumidifiers and chemicals like anhydrous calcium chloride, silica gel, and slaked lime, humidity can be reduced (Ashcroft, n. d.).

### **1.9.3 Surface Cleaning or Stain Removal**

Surface cleaning is a technique that can be used as an independent treatment or as a treatment done prior to further treatment that can be applied for both maintenance and active preservation. Great care must be exercised when deciding

what to remove; in some cases, it is not necessary to remove all dust particles deposited on the paper materials. Surface cleaning is a method based on a non-water or non-solvent concept for decreasing and preventing surface deposits on paper-based documents. Surface cleaning techniques can be considered for removing dirt, dust, soot, mould, accretions, and insect droppings that eventually cause degradation through transfer and acidity. The suitable cleaning materials for historical and archival materials are a soft, clean natural bristled brush, a High Efficiency Particulate Air (HEPA) filtered vacuum, vulcanised surface cleaning rubber sponges, and vinyl erasers. An appropriate cleaner has to be selected by considering the type of documents taken for dirt removal. Paper can be dusted with a soft brush, and dust can be removed from books with a vacuum cleaner that has cheesecloth tied to it. Stains on the paper can be removed by using some stain-removing agents like vinegar (flushing) or by some physical methods (brushing).

#### **1.9.4 Oiling**

Palm leaves are an old tradition of writing. Writing on palm leaves has been practised in India, especially in the southern part of the country. There are two varieties of palm. One is, Talipat, which is thin and broad; the other is Palmyra, which is thick and coarse. Oiling is the traditional method of preservation for palm leaf manuscripts. Due to many reasons, such as high humidity, temperature, insect and rodent activity, loss of oils over time, dehydration of the leaf, and friction between the cord and edge of the binding hole, palm leaves lose their flexibility, become discoloured or brown, and become brittle. These mechanical and chemical damages can be minimised by reapplying the oil to the palm leaves. Lemongrass oil is a natural pesticide and also has anti-fungal properties commonly used for the oiling of palm leaves.

#### **1.9.5 Miner Repairs and Mending**

Minor repairs to the damaged collection are the primary preventive measure to take before further deterioration. The activity of repair involves a thorough preliminary examination of the materials to understand the extent of damage or degradation and to check whether repair is needed or not. The actual work of the

repair starts with the proper cleaning of the material and then patching torn areas with strong, acid-free, near-transparent paper and paste. The Japanese papers are more suitable for patch-up repair work (Kathapalia, 1973).

### **1.9.6 Binding, Trimming, Guarding, Gathering, Stitching**

After completing various repairs, individual sheets of a file can be compiled and stitched into a docket for the protection of loose sheets. If the file is bulky and contains more than 100 pages, ordinary stitching in the docket cover does not provide sufficient protection against handling and use. In such a case, it is worthwhile to bind them. There are many processes combined in the binding process to produce a bound volume, and the recommendations contained in the Indian Standard Code of Practice for Reinforced Binding of Library Books and Periodicals (ISO: 3050-1965) hold good for archival binding. The different stages of binding include trimming, guarding, gathering, stitching, back rounding, fixing the board, covering, etc., and all are carried out normally.

### **1.9.7 Ink Fixing**

In cases where the acidic paper contains water-soluble writing that bleeds with water, it is desirable to do ink fixing. Chemicals used for ink fixing are paraloid B-72, acetone, or tolvin. 5 ml of paraloid B-72 mixed with 100 ml of acetone or tolvin and applied to an area of paper that contains water soluble.

### **1.9.8 P<sup>H</sup> Testing**

P<sup>H</sup> provides a direct correlation between paper acidity and longevity. P<sup>H</sup> can be defined as the concentration of hydrogen ions in the solution or a quantitative measure of the acidity or basicity of a solution. The P<sup>H</sup> of a paper establishes itself as a valid indication of the permanence of a paper.

### **1.9.9 Proper Shelving**

Proper shelving methods have a direct impact on the life span of the old and rare documentary heritage collection. By preventing careless, overcrowded shelving, damage to the old and fragile collection can be avoided. The destruction of materials

can be minimised through proper shelving practices and storing materials in custom protective enclosures when required. The metal shelving with a powder or baked enamel coating is suitable for books and manuscripts. Shelves must be wider than the size of the materials. Bound volumes are shelved based on their size. Maps and paintings should be placed in chemically stable folders and enclosures (Ashcroft, n. d.).

### **1.9.10 Lamination**

Lamination is one of the most widely used methods for paper conservation. Lamination is the process of layering paper documents between sheets of plastic with heat and low-grade adhesives. Nowadays, different kinds of laminations are available: cellulose acetate lamination, machine (commercial) lamination, chiffon lamination, and photolam lamino-encapsulation.

### **1.9.11 Photocopying**

The continued use and handling of damaged materials may cause further damage. To reduce the use of damaged materials, it is necessary to make copies of them. Preservation photocopying is a method of preservation that involves the systematic paper-to-paper copying of damaged materials for preservation purposes by using electrostatic copy machines on archival bond paper.

### **1.9.12 De-acidification or Alkaline Wash**

High acidity levels, or acid-catalysed hydrolysis, are the dominant processes that contribute to the deterioration of paper-based documents. These mechanisms cause the yellowing, brittleness, and instability of the paper and shorten the life span of paper-based materials. Acidic papers and improper storage and lighting cause paper objects to turn yellow over time. An alkaline wash restores the paper to its initial brightness, allowing text and designs to be viewed in their original form. De-acidification is the main chemical stabilisation strategy for paper. It is considered the most important conservation intervention concerning the long-term preservation of paper. De-acidification is the process of adding an alkaline buffering agent to an acidic paper in order to preserve it. De-acidification neutralises harmful acids and

greatly extends the lifespan of books and documents. De-acidification is a chemical treatment for highly acidic paper that neutralises the acids contained in the paper and also decreases the acid hydrolysis and embrittlement of paper-based documents.

De-acidification processes are of two types: aqueous processes, or wet methods, and non-aqueous processes, or dry methods. If the acidic paper contains water-soluble writing or writing in colours, it is desirable to use a non-aqueous method for the neutralisation. Otherwise, the aqueous method can be used. Water is used in the aqueous method, and solvents or gases are used in the non-aqueous method to transport alkaline buffering agents. In the wet method, the document is first immersed in a calcium hydroxide solution for around twenty minutes. After that, it is removed to a tray containing fresh water for a while and then immersed in a solution of calcium bicarbonate for another twenty minutes. After that, the document is taken out and left on the sheets of blotting paper to naturally dry. In the dry method, the acidic paper contains water-soluble writing that bleeds with water. It is desirable to use the dry method. The acidic document is immersed in a solution containing 0.35g of barium hydroxide in 100 ml of methanol for one hour, after which the document is drained and dried.

### **1.9.13 Fumigation**

Fumigation is the method used to eliminate the infestation by fungus, bacteria, and mould. The chemicals thymol or paradicholobenzene are usually used for fumigation purposes. Fumigation with thymol is used for controlling mildew or mould, and fumigation with paradicholobenzene is used for controlling bookworms, silverfish, etc.

### **1.9.14 Use of Insecticides**

The use of insecticides and pest control measures can decrease the growth of insects that cause degradation of old and fragile materials. The use of naphthalene bricks is one of the most useful insect repellent methods. A mixture of paradicholobenzene and creosote and a 10% solution of thymol in methylated spirit can also act as an insect repellent. For the protection of large collections of fragile

documents, it is essential to seek the services of professional pest control agencies for routine treatment.

#### **1.9.15 Use of Natural Repellents**

The use of natural repellents has proven to be an effective means of eliminating insects. Sandle wood powder, neem leaves, sweet flag, cloves, peppercorns, and camphor can be used as effective repellents for the preservation of palm leaves. Lemon grass oil can also be used.

#### **1.9.16 Adequate Security Measures**

It is important to provide adequate security measures like appointing staff for security and installing security cameras to avoid theft and mutilation of the rare collection. Due to violations of fire security rules or some structural problems, fires may occur in libraries or cultural institutions. To prevent damage due to fire, it is important to implement a fire detection or suppression system like smoke detectors, fire detectors, fire extinguishers, wet pipe sprinkler systems, dry pipe sprinkler systems, etc.

#### **1.9.17 Disaster Preparedness and Recovery Plan**

A disaster is an unexpected event that might happen naturally or man-made that puts the documentary heritage collection in danger. No libraries or cultural institutions can be exempt from these situations. Disaster planning is an important part of any preservation programme to be implemented by any type of library or cultural institution for the security of their collection, staff, and building itself. A sound written disaster preparedness and recovery plan will help the institutions respond effectively and quickly to an emergency situation and decrease damage to the building and its precious collections.

#### **1.9.18 Installing Air Conditioners**

The use of air conditioning is the best strategy for preservation. The ideal temperature for the storage of documentary heritage collections varies between

18 and 22°C, and the optimum humidity is between 40 and 55 per cent. These can only be maintained through air conditioning.

### **1.10 Digital Preservation of Documentary Heritage Collection**

Digital preservation is defined as the wide range of activities required to achieve the continued accessibility of digital materials that are 'born digital' or the product of the digitisation process, beyond the limits of media failure or technological change. Digital preservation means the preservation of rare and fragile documents and materials through digitisation by using electronic equipment like scanners, digital cameras, mobile phones, etc. Digital preservation involves the preservation of both "born digital" materials and digitised materials. The most important challenge to digital preservation is the loss of the means of accessing the materials. Digital preservation of documents cannot be said to be effective if the means of access become impossible or are lost. The main purpose of digital preservation is to maintain the continued accessibility of content or messages inherited in digital documents. Libraries and cultural institutions need to adopt the digital method of preservation to increase the life span of their old and rare documents and fulfil the information needs of their users.

- **Digital Microfilming**

It is the method of utilising microfilm technology and digital technology for document rescue.

- **Digitisation**

Digitisation is the process of conversion from analogue to digital through an extensive array of activities employing a scanner, digital camera, and other electronic gadgets.

Digital preservation management can be defined as the methods by which digital resources are preserved in digital form for maintaining the durability, usability, and intellectual integrity of the content held therein. There are different strategies that are applied to preserving digital resources. The major strategies are



refreshing, migration, encapsulation, technology preservation, emulation, the Universal Virtual Computer, and digital archaeology.

- Refreshing

It is the periodic copying of digital information from one long-term storage medium to another. Refreshing is an important component of any digital preservation programme for addressing issues like decay and obsolescence of the storage media.

- Migration

Migration is always used interchangeably with refreshing, but it is a broader concept than refreshing. Migration is defined as a set of processes designed to copy, convert, or transfer digital materials from one generation of computer to a subsequent generation or from one hardware or software configuration to another. Preservation of the integrity of digital materials and maintaining the ability to retrieve, display, and use these digital materials in a rapidly changing technological world are the main purposes of migration.

- Encapsulation

It is the technique of grouping together a digital object and its metadata to provide access to that object. In this technique, digital objects are encapsulated with the appropriate metadata, which includes reference, provenance, representation, and context information. Encapsulation is regarded as a major element of emulation. It is a technique for the creation of original applications that are used to create or access digital materials on future computer platforms.

- Technology Preservation

Technology preservation is considered a disaster discovery strategy for digital materials. It is the replication of old-generation hardware or software. Technology preservation means preserving the technical atmosphere that runs the whole system, like the operating system, media drives, and original

application software. It offers the potential to provide access to obsolete media and file formats that have not decayed beyond readability.

- Emulation

Emulation is the process of reproducing all the essential characteristics of the performance of another computer of a different design by combining hardware and software. It is the recreation of the functionality of an obsolete system.

- Universal Virtual Computer (UVC)

The Universal Virtual Computer (UVC) is a type of emulation. It is the development of a computer programme independent of existing hardware and software technology that should prompt the basic architecture of any computer from the beginning. The user can create and save the digital files by using the application programme of their interest. To read that file in the future, we would need only one emulation layer between UVC and the computer of that time.

- Digital Archaeology

Digital archaeology is considered an emergency recovery strategy. It includes specialised methods, procedures, and techniques to recover the content from unreadable, damaged, or obsolete media or obsolete hardware and software environments. (Digital preservation management workshops, n. d.)

### **1.10.1 Digitisation**

Digitisation includes an extensive array of processes for the conversion from analogue counterparts to digital form for easy access and longevity. They are the pre-digitisation planning process, the digital conversion process, and the post-digitisation process. The process of digitisation includes selection, analysis of requirements, setting priorities, planning of prototypes for digitisation, identification

of metadata, creation of metadata, creation of data assortments, exhibition of digital entities to delivery mechanisms, and managing storage of digitised contents. Digitisation involves the following steps:

- Identification of the documentary heritage collection to be digitised
- Checking and solving the legal rights of the collection to be digitised.
- Examining the resources required for the digitisation activities, like software and hardware, human resources, financial considerations, etc.
- Finalise the policies and standards to be followed.
- Evaluation of challenges and forthcoming shortcomings.
- Selection of documentary heritage collections to be digitised.
- Quality check of the collection to be digitised.
- Physical and chemical conservation of documents through various methods such as stain removal, alkaline washing, ink fixing, etc., which are in wrinkled and worn-out condition.
- Unique numbering of individual pages and files for the creation of file names.
- Collection of bibliographical details and structural and descriptive metadata about the collection.
- Scanning of the documents in black-and-white or colour formats in various resolutions by using document scanners or other equipment.
- Ensure image enhancements and quality checking of the images.
- Creation of digital masters.
- Conversion of documents into digital files in various formats like PDF, GIF, etc.

- Metadata creation for the digitised content.
- Digital files are stored on digital storage media.

(Shimray & Ramaiah, 2018)

### **1.11 Challenges of Preservation**

Preservation is a comprehensive task that encompasses many different challenges. Libraries and cultural institutions face many significant challenges when they plan to safeguard their documentary heritage collection. These challenges arise in different forms. documentary heritage, diverse material properties of documentary heritage, changing user needs, legal issues, financial problems, environmental changes, selection criteria, legal formalities, cultural and historical value, national and international policies and contexts, presentation and exhibition possibilities, etc. Krtali and Hasenay (2012) opined that preservation is not only a financial, technical, strategic, and legal issue but also a cultural, educational, and social issue. A good organisation and management with a clear vision of what is and is not preservation can count the issues of preservation and make preservation efficient. Therefore, the following challenges were identified:

- Lack of a unique preservation strategy and policy that would unite and coordinate individual preservation initiatives in libraries and cultural heritage institutions that protect the documentary heritage collection.
- Lack of clearly defined national policy and governance in the preservation of documentary heritage.
- Lack of effective coordination and planning in the preservation of documentary heritage.
- Lack of a written preservation policy.
- Lack of social knowledge about the importance of documentary heritage and its preservation.

- Lack of an authoritative body to plan, coordinate, and monitor preservation practices.
- Lack of knowledge in traditional and basic conservation and restoration techniques.
- Lack of skilled staff and inadequate educational qualifications.
- Lack of adequate buildings and storage spaces.
- Lack of financial resources.
- Lack of effective collaboration and coordination between individual preservation efforts in the different institutions.
- The status of the institution holding documentary heritage, whether it is an independent institution or a section of a larger institution.
- Legal issues like copyright law and intellectual property rights.
- Lack of adequate infrastructure.
- Lack of adequate environmental conditions.
- Technological obsolescence.

### **1.12 Efforts for the Preservation of Documentary Heritage Collection**

Institutions at the local, regional, national, and international levels now actively participate in the preservation project of the documentary heritage collection in order to maintain and secure those collections so that they will be stable and long-lasting, in addition to being accessible, usable, and available over time. Making collections available is important, but ensuring accuracy in resource discovery is vital for future reference. Various institutions from different parts of the world have designed various digitisation and preservation projects for preserving their documentary heritage collections, either on a national or institutional level. The major international, national, and regional efforts for the preservation of documentary heritage collections are as follows:

UNESCO is the international organisation that leads the historical efforts to protect the documentary heritage collection so that future generations can use, enjoy, and understand the legacy of the past. UNESCO established the Memory of the World Programme (MoW) in 1992 with the aim of facilitating the preservation and access of documentary heritage collections worldwide and enhancing public awareness on this subject. In 2013, UNESCO drafted an action plan for strengthening the MoW programme with the objectives of "raising awareness of the importance of preserving the world's documentary heritage, including national documentary heritage, and contributing to its preservation", "developing education and training programmes for digitisation and preservation practices", "promoting networking for more effective implementation of the MoW programme", and "developing a cohesive, conceptual, and practical digital strategy for the management and preservation of recorded information". In 2015, UNESCO adopted "The Recommendation Concerning the Preservation of and Access to Documentary Heritage, including in Digital Form". (UNESCO, 2015).

The Preservation and Conservation Section (PRESCONS) of IFLA promotes the long-term accessibility of documentary heritage collections. NUMERIC project, funded by European commission to develop a European framework for monitoring progress of cultural materials in memory institutions. The major take-up trial projects for the digitisation of cultural resources in Europe such as "Digicult, CHOSA, Dominico, E-Islam, KIST, LabVR, MATAHARI, TREBIS, VIRMUS, CTIC, VALHALLA, Books2u". DiSCmap project, funded by the Joint Information Systems Committee (JISC) and the Research Information Network (RIN) which analyses the users need, demand, priorities for the digitisation of special collection within the context of UK higher education. NUMERIC project for assessing the current state of digitisation in Europe's cultural institutions.

The major Indian initiatives for the preservation of documentary heritage collection are, the Digital Library of India (DLI) is an initiative of the Government of India for the preservation, digitisation, and dissemination of documentary heritage in the form of rare books and manuscripts collected from the different parts of India.

## *Introduction*

The National Mission for Manuscripts (NMM) was established by the Ministry of Tourism and Culture, Government of India, in 2003 for the preservation of the rich manuscript wealth of India. The National Virtual Library of India (NVLI) was set up to digitise the entire Indian cultural heritage and present it in the digital web world. The National Archives of India provides financial assistance for the preservation, conservation, and digitisation of old and rare books, manuscripts, historical documents, etc. Indira Gandhi National Centre for the Arts (IGNCA) is an autonomous institution that has developed a multimedia digital library for cultural heritage resources, "KALASAMPADA," a national database for manuscripts. Indian National Trust for Art and Cultural Heritage (INTACH) is aimed to create awareness of social responsibility towards protecting India's vast cultural heritage. TKDL (Traditional Knowledge Digital Library) project is established in 2001 to provide documented existing traditional knowledge on Ayurveda, Unani, Siddha and Yoga in India. One of the core objective of the National Library of India is to preserve the documented cultural heritage of India, for this purpose, National Library started the digitisation of their old, rare and brittle collection. Archives of Indian Labour (AIL) is established with the objective of digital archiving of documents and records related the labour issues in India and to provide better access to the public.

As per Kerala scenario on the preservation effort for documentary heritage collection. The Archives Department of Kerala was formed to collect, conserve, and preserve the archival wealth of the state. The Kerala State Archives hold the highest collection of manuscript in South India. They started the digitisation of their palm leaves manuscripts and paper manuscripts and stored in a database. E-Likhitham is the search engine software created by the state archives for searching and retrieving the information of digitised manuscripts. The "Community Archives Programme" established by the Kerala State Archives Department aimed to identify and preserve important historical records kept in the custody of individuals and non-government agencies in Kerala. "Digitising Kerala's Past " is an effort taken by the Kerala Council for Historical Research to study, survey, document, and store the historical and cultural resources of the people of Kerala. Kerala Sahitya Akademi also

digitised their rare books and manuscript collection. They are the one of the contributor of Malayalam books to DLI. Oriental Research Institute and Manuscript Library, Thiruvanthapuram, Chinamaya International Foundation, Ernakulam, Amritha Vishwa Vidhyapeetham University, Kollam, D. G. Centre for Heritage Studies, Thripunithura and Thunchan Memorial Trust, Tirur are the institutions in Kerala act as manuscript resource centres of National Mission for Manuscripts in South India.

### **1.13 Staff Development in Preservation of Documentary Heritage**

The preservation activities for documentary heritage collection in cultural institutions are extended far beyond traditional methods to digital technologies. Staff development in both traditional and digital preservation methods is a major preservation challenge to meet the needs of cultural institutions. The role and responsibility of the preservation staff have changed because they have to deal with both traditional and digital collections. The staff performing preservation tasks should have knowledge of both traditional preservation principles and digital preservation principles (Miller & Horan, 2017). The major tasks that need to be performed by the preservation staff suggested by Miler and Horan (2017) are as follows.

- Developing and establishing policies, standards, and best practices for physical and digital resources.
- Planning, assessment, and prioritizing for physical and digital resources.
- Grants and donor relations.
- Education, outreach, and training.
- Conservation knowledge
- Emergency planning, and response.
- Environmental monitoring
- Vendor relations
- Digitisation



For the better preservation of documentary heritage collection stored in cultural institutions. The staff of cultural institutions should have enough knowledge of the concept of documentary heritage collection and its need, importance, and significance to be preserved. For performing traditional methods of preservation, the staff or caretakers of the documentary heritage collection should have enough knowledge and practical abilities in various traditional preservation methods. Then only they have to be able to apply various traditional or basic preventive preservation methods for protecting the fragile documents from physical, chemical, and biological deterioration, misuse, and loss.

For the digital preservation of documentary heritage collection stored in cultural institutions. The staff of cultural institutions should be knowledgeable in scanning, standards, usage of resolution, application of OCR software, proficiency in digital library software, metadata, storage devices, intellectual property rights, etc. For the protection of digitised documentary heritage collections, the preservation staff should have sound knowledge of different security techniques and applications, such as how to safeguard data with encryption and decryption methods, understand data security, secure access by using passwords, and operate back-end control systems for a digital library (Khan & Bhatti, 2017).

The human resources of the institutions can be utilised in their best way to manage the preservation activities by providing training and orientation to them frequently about preservation and conservation techniques and the everyday care and handling of fragile materials. If the cultural institutions have a limited number of staff, then it will be crucial for the cultural institutions to struggle with conservation and preservation activities with everyday routine services. In this situation, the authorities of cultural institutions have to recruit skilled or trained staff for preservation work. In-house training should be given to the existing staff of cultural institutions on preservation practices, allowing them to participate in training or workshops on preservation methods and techniques. Preservation staff should identify the old, rare, and fragile collections of documentary heritage value and

employ basic conservation techniques to protect them before they further deteriorate.

#### **1.14 Need and Significance of the Study**

Documentary heritage is a recorded history in the form of a document or group of documents that reflects the culture, community, diversity of the peoples, languages, and the human collective memory of the past. It should be accessible and reusable for all without interruption or discrimination. It is a significant resource that helps us understand and learn about collective, political, social, and personal history from the past. It can help to create good governance and more equitable, inclusive, and sustainable societies and to solve present problems with information from the past. The importance of the documentary heritage collection will become clear over time. Many people are not aware about the significance of documentary heritage. UNESCO has drawn attention to the critical importance of safeguarding, preserving, raising awareness, and ensuring the universal and permanent accessibility of the world's documentary heritage through their various activities, like the Memory of the World Programme (MoW) and publishing the "Memory of the World Register". The International Federation of Library Associations and Institutions (IFLA) has published "principles of engagement in library-related activities in times of conflict, crisis, or disaster" to promote recognition, preservation, and accessibility of documentary heritage and help libraries fulfil their mandate to protect documentary heritage by establishing standards for professional practise, an appropriate legal framework, concrete plans, and adequate resourcing in terms of funding. According to the Indian Constitution, under Article 51A "it is the fundamental duty of every citizen of India to value and preserve the rich heritage of the country's composite culture". It is our responsibility to pay respect to our ancient documentary heritage, which should be preserved and protected for our future generations. So it is important to study the concept of documentary heritage collection and raise awareness about the significance of its preservation and accessibility.

Memory institutions such as libraries and cultural institutions are playing a crucial role in collecting, organising, managing, safeguarding, and ensuring the

long-term survival of the documentary heritage collection. Documentary heritage collections housed in libraries, archives, and other institutions across the world represent an important part of historical memory and reflect the diversity of peoples, cultures, customs, and traditions. Memory institutions all over the world have always been at the forefront of efforts to ensure the protection, preservation, and access to our precious documentary heritage collection. Memory institutions are the essential partners for any initiatives to safeguard the documentary heritage through their various approaches and excellent competence. Kerala, one of the states of India, is well known for its culture, tradition, and heritage. Kerala has a rich documentary heritage collection in terms of palm leaves, paper manuscripts, rare books, maps, etc. The libraries and other cultural institutions in Kerala are the storehouses of documentary heritage collections. There are many libraries and cultural institutions set apart for the preservation, promotion, and dissemination of documentary heritage resources. In this regard, it is essential to study the documentary heritage collection of libraries and cultural institutions in Kerala. In this study, the investigator made an attempt to study which libraries and cultural institutions contain large collections of documentary heritage, what kinds of documentary collections are available in Kerala, who are the users of these collections, and what services are provided by these institutions by using these collections.

For the purpose of the present study, the investigator has identified fifteen institutions in Kerala that hold documentary heritage collections. Now a days, a major proportion of the documentary heritage collections housed in libraries and cultural institutions are in deteriorated and fragile condition because of various physical, chemical, and biological factors. So it is necessary to focus on the deterioration of the documentary heritage collection. In this study, the investigator tries to identify the major noticeable deterioration and important causes of the deterioration of documentary heritage collections by surveying 15 cultural institutions in Kerala. These pieces of information can alert the caretakers of documentary heritage collections to this critical issue and help them to take the necessary action to protect their collection.

Documentary heritage collections are important resources that help us solve current issues with information on past responses. Proper preservation practices and conservation techniques can guarantee the existence of a documentary heritage collection for continued access, use, and reuse. Innovative strategies are thus required to enhance and support documentary heritage preservation tools, methods, and techniques. Thus, the study is of great importance as it aims to find out the preservation practices followed by the institutions for protecting their documentary heritage collection. Hence, the investigator felt the demand to study the traditional and digital preservation methods adopted by the 15 institutions in Kerala for safeguarding their collections from deterioration.

In the age of modern information and communication technology (ICT), memory institutions are also utilising these emerging trends for managing, preserving, and disseminating their documentary heritage collections. With the progress and applications of ICT, the whole picture of the preservation of documentary heritage collections has changed. There is a shift from traditional preservation methods to digital preservation. These days, memory institutions all over the world have started digitising their physical documentary collections to create their digital counterparts. In Kerala, some of the institutions have also started digital initiatives for the preservation of their collections. So, it is of great significance to know about the current status of digitisation initiatives and how the memory institutions manage these initiatives. Therefore, the investigator proposed to study the digitisation initiatives for documentary heritage collection by the selected institutions in Kerala.

In this study, the investigator has drawn a detailed picture of various aspects, including the need for digitisation, selection criteria used, digitised collections, digitisation methods and strategies used, software and hardware requirements, human resources, budget considerations, and challenges of preservation. For any successful digitisation project, there is a need for concrete planning and a good preservation policy. This study will give a detailed account of the requirements needed for digital preservation, the scope of preservation policy, the need to follow

standards, the importance of collaboration, the challenges of copyright laws, the necessity of training the staff, and the significance of accessibility and security of the digitised collection. The purpose of this study is to create awareness about the importance of documentary heritage collections and their need to be valued and preserved. The findings of the study will encourage institutions and other stakeholders with good documentary heritage collections to conduct sustainable preservation programmes with proper planning. The study also helps the institutions taking part in the preservation of documentary heritage collections update their plans, revise their preservation policies, and tackle their challenges. The study also motivates others to do further research on this topic.

The staffs, whether it is a librarians or others, working in libraries and other cultural institutions play a distinctive and dynamic role in the preservation of documentary heritage collections. Staff are required to manage all preservation activities. On reviewing related studies, it was found that a lack of skilled, trained, or experienced staff is one of the major challenges of preservation. So there is a need to study the overall competencies of staff working in the documentary heritage sector in Kerala. In this study, the investigator tried to find out the competencies of staff, which include knowledge, perception, know-how, attitude, and practical abilities towards traditional and digital preservation methods.

According to the literature review, it was found that there are number of studies has been conducted on cultural heritage collections all over the world. But the number of studies conducted, especially on the preservation of documentary heritage collection, is comparatively low. Kerala is rich in its culture, traditions, and resources. It is a cultural icon of India. Kerala is a heaven of documentary heritage collection. A few studies are conducted in Kerala on the preservation of documentary heritage collection. Investigator recognises a research gap in the knowledge and awareness of documentary heritage collection available in the cultural institutions in Kerala and, the role of these cultural institutions in the preservation of the rich documentary heritage of a Kerala. So there is a need to study the current status of the preservation of documentary heritage collections in

Kerala. It is significant to study Kerala's initiatives, efforts contributions, achievements, and challenges towards the preservation of documentary heritage collection. This study is a small step from Kerala towards the world's research on documentary heritage. Therefore, this study is very significant.

### **1.15 Statement of the Problem**

Documentary heritage collections that resides in libraries and cultural institutions represent our collective memories in tangible form. It is the legacy of our previous generations, communities, and civilizations. These are the scientific, educational, cultural, and aesthetic sources of knowledge, expression, experience, and humanity for people, communities, society, and the government. According to a recent practical example, since the outbreak of the COVID-19 pandemic, the preserved old scientific documents on past pandemic situations provide first-hand information on how governments and people in the past addressed these challenges similar to those faced today. These details helped the present government to impose the lockdown measures and necessary actions to manage the COVID-19 pandemic. From these, it was evident that the knowledge acquired from the documentary heritage collection from the past plays a significant role in our sustainable development. These collections are fragile by nature; failures to provide appropriate preservation and management lead to their loss forever.

Kerala is a treasure trove of culture and heritage. The libraries and cultural institutions in Kerala possess different kinds of documentary heritage collections with historical, cultural, educational, artistic, and scientific value. It is the duty of libraries and cultural institutions to ensure the preservation and protection of documentary heritage collections and ensure continuous and permanent access to these collections. The libraries and cultural institutions in Kerala are not aware of the significance and importance of their documentary heritage collection. They considered this collection just a part of their whole collection and did not provide access to it or maintain it as an archival property not for use. They did not understand the inherent value of their collection and were not ready to provide proper preservation treatment for it. These activities lead to the permanent loss of

these collections. Henceforth, the present study aims to understand the documentary heritage collection available in these institutions, the traditional and digital preservation methods adopted, and the legal and technological restrictions on the preservation and access of documentary heritage collection.

Some of the libraries and cultural institutions in Kerala have made an effort to preserve their documentary heritage collections. The major goal of their preservation programmes is "preservation only" not "providing access". The two words "access" and "preservation" are contrary to each other. Access promotes preservation, and preservation makes sure access. Demand for access can encourage preservation activities. There is no value in preservation whether it is not accessible. The provision of public access is the proof and authentication of public expenditure on preservation. The public's interest in libraries and cultural institutions is sustained by providing access to their documentary heritage collection and the way in which it is preserved. Access to information is a fundamental human right. Hence, it is worthwhile to investigate the policies and strategies adopted by the libraries and cultural institutions in Kerala to ensure preservation and access.

As per the previous studies on the preservation of documentary heritage collection, it was found that lack of experienced or skilled staff is the major challenge to proper preservation management. In Kerala, too, the librarians and staffs working in libraries and cultural institutions have no expertise in traditional or digital preservation methods. So that the major preservation programmes are using outsourcing facilities, which leads to spending more money on preservation projects. The curriculum and syllabus of our library schools give more importance to teaching the concept of collection development, classification, and cataloguing of the collection but give less importance to traditional and digital preservation methods to protect their collection. Collection development and preservation of existing collections have equal importance. The staffs working in libraries and cultural institutions should be skilled in both activities, i.e., collection development and preservation of existing collections for the future. Libraries and cultural institutions did not provide proper refresher courses and training to their staffs on traditional and

digital preservation methods for protecting their documentary heritage collections. So it is important to study the perceptions of staffs working in the selected cultural institutions in Kerala about their knowledge and practical abilities in preservation methods.

### **1.16 Title of the Study**

The title of the present study is entitled as “**Preservation of Documentary Heritage Collections: A Study of Selected Cultural Institutions in Kerala**”

### **1.17 Definition of Key Terms**

It is important to define the key terms used in the title of the study for the purpose of providing the meaning of the concepts discussed and the way in which the investigator used those concepts in his or her research. The important key terms in the present study are defined and presented in the following subheadings:

#### **1.17.1 Preservation**

Macmillan dictionary (n. d.) defined preservation as "the process of working to protect something valuable so that it is not damaged or destroyed". Britannica Dictionary (n. d.) defined preservation as “the act of keeping something in its original state or in good condition”.

In the study, preservation means the actions taken by the cultural institutions for protecting their documentary heritage collection in traditional and digital way.

#### **1.17.2 Documentary Heritage Collection**

UNESCO defined documentary heritage as “those single documents – or groups of documents–of significant and enduring value to a community, a culture, a country or to humanity generally, and whose deterioration or loss would be a harmful impoverishment. The significance of a document may become clear only with the passage of time. The world’s documentary heritage is of global importance and responsibility to all, and should be fully preserved and protected for all, with due respect to and recognition of cultural mores and practicalities. It should be



permanently accessible and re-usable by all without hindrance. It provides the means for understanding social, political, collective as well as personal history. It can help to underpin good governance and sustainable development. For each State, its documentary heritage reflects its memory and identity, and thus contributes to determine its place in the global community” (UNESCO, 2015).

In this study, the documentary heritage collection refers to the old and rare books, bound volumes of old journals and magazines, bound volumes of old newspapers, paper manuscripts, palm leaves, historical records, government orders and maps resides in the cultural institutions in Kerala.

### **1.17.3 Study**

Cambridge dictionary (n. d.) defines Study as “the activity of examining a subject in detail in order to discover new information”.

### **1.17.4 Cultural Institutions**

Cultural institutions defined as “Cultural institutions are institutions with an acknowledged mission to engage in the conservation, interpretation and dissemination of cultural, scientific, and environmental knowledge, and promote activities meant to inform and educate citizens on associated aspects of culture, history, science and the environment. Cultural institutions play a pivotal role in the maintenance, conservation, revitalisation, interpretation, and documentation of heritage, and in facilitating citizens’ interaction and engagement with heritage” (Riches Resources, n. d.).

In the study cultural institutions belongs libraries and other social/cultural/historical/academic/religious institutions possess documentary heritage collection.

### **1.17.5 Kerala**

Britannica (n. d.) defines Kerala as “south western coastal state of India. It is a small state, constituting only about 1 per cent of the total area of the country. Kerala stretches for about 360 miles (580 km) along the Malabar Coast, varying in

width from roughly 20 to 75 miles (30 to 120 km). It is bordered by the states of Karnataka (formerly Mysore) to the north and Tamil Nadu to the east and by the Arabian Sea to the south and west; it also surrounds Mahe, a segment of the state of Puducherry, on the north western coast”.

### **1.18 Objectives of the Study**

The main objectives of the study are to understand the preservation practices followed by the selected cultural institutions in Kerala for the preservation of their documentary heritage collection and to assess the perception and opinion of staffs working in these cultural institutions about their knowledge and practical abilities in traditional and digital preservation methods. In order to accomplish the above objectives, the study has the following specific objectives:

1. To understand the collection of documentary heritage resources of selected libraries and cultural institutions in Kerala and to know the noticeable deterioration, the cause of deterioration of documentary heritage resources, and the preservation methods adopted by these institutions to tackle these challenges.
2. To identify the institutional digitisation projects for documentary heritage resources and to gather data about their need, status, criteria, methods, and strategies that are being used for the digitisation projects.
3. To examine the policies and practices, availability of infrastructure facilities, hardware and software requirements, staff development, standards, budget and financial assistance, and collaborative efforts for the digitisation of documentary heritage resources.
4. To explore the challenges related to the preservation of documentary heritage resources and to propose strategies for addressing them.
5. To analyse the knowledge and practical ability to use traditional preservation methods for protecting documentary heritage collections among staff.

6. To analyse the knowledge and practical ability to use digital preservation methods for protecting documentary heritage collections among staff.

### **1.19 Hypotheses of the Study**

In order to satisfy the above-mentioned objectives, the following hypotheses are formulated according to the existing literature, examined, and tested by applying suitable statistical tools:

1. Majority of the cultural institutions are adopted digital preservation methods for the protection of their documentary heritage collection than traditional methods.
2. Primary purpose of the majority of the digitisation projects for documentary heritage collection is their preservation only.
3. Outsourcing is the most used digitisation method than in-house digitisation.
4. Majority of the cultural institutions are not maintaining any written policy for digitisation of their documentary heritage collection.
5. Majority of the cultural institutions did not follow any national and international standards for their digitisation program.
6. Commercial software is the most used software for digital preservation of documentary heritage collection than open source software.
7. Collaboration efforts among cultural institutions in digitisation projects for documentary heritage collection is at low level.
8. Lack of expertise among staff is the major obstacle to the preservation of documentary heritage collection.
9. There is a notable variance in the knowledge and practical ability of staff to apply traditional preservation methods for protecting the collection of documentary heritage based on their working experience.
10. There is a notable variance in the knowledge and practical ability of staff to apply digital preservation methods for protecting the collection of documentary heritage based on their working experience.

## **1.20 Scope and Limitation of the Study**

This study is focused on the documentary heritage collection possessed by the libraries and cultural institutions in Kerala, the traditional and digital preservation methods adopted by these cultural institutions for safeguarding their valuable collection, and the perceptions of the staffs working in these cultural institutions about their knowledge and practical abilities on preservation methods. The study builds awareness about the significance of the preservation and accessibility of the documentary heritage collection. The present study provides a clear picture of the amount of documentary heritage collection, deterioration factors, traditional preservation methods adopted, status of digital preservation methods, requirements for the digitisation projects (hardware and software, human resources, finance, policies, and standards), the need for collaboration between institutions, and the major challenges of preservation practices. It highlights the role of libraries and cultural institutions in protecting their documentary heritage collections. The findings of the study can help the concerned authorities to identify the limitations of their current preservation management and build new strategies to address them. It also help the policy makers/stake holders to revise their current policies on preservation projects. This study also covers the opinions of the staffs about their knowledge and abilities in preservation methods. The findings of the study will assist the concerned management in understanding their staff's abilities and providing proper training to them.

Kerala is a place that consists of a large number of libraries, archives, museums, and cultural institutions that hold different documentary heritage collections. It was not possible to study all these institutions as a solo research in a limited period of time. So that, the scope of the study is limited to the fifteen cultural institutions in Kerala, namely, State Central Library (SCL), Kerala University Library (KUL), Kerala Legislature Library (KLL), Oriental Research Institute and Manuscripts Library (ORI & ML), Kerala Council for Historical Research Library (KCHRL), Sukrtindra Oriental Research Institute Library (SORIL), Sree Sankaracharya University of Sanskrit Library (SSUSL), Kerala Sahitya Akademi

Library (KSAL), Kerala Agricultural University Library and Information System (KAULIS), Kerala Kalamandalam Library (KKL), Guruvayur Devaswom Religious Library & Reading Room (GDRL), Thunchath Ezhuthachan Malayalam University Library (TEMUL), Tunjan Manuscripts Repository (TMR), Department of History, Farook College (DHF) and State Revenue Reference Library (SRRL). Campus libraries, department libraries, and study centre libraries of Kerala University, Sree Sankaracharya University of Sanskrit, Kerala Agricultural University, and Thunchath Ezhuthachan Malayalam University are not included in the study.

The selection of the sample and the small number of samples may limit the generalizability of the findings. Documentary heritage collections are the source of knowledge having scientific, historical, cultural, and educational value and consist of old and rare books, manuscripts, paintings, historical records, audio-visual records, photographs, maps, palm leaves, cinematographic films, etc. But the present study covers only old and rare books, manuscripts on paper, bound volumes of journals, bound volumes of newspapers, palm leaves, government orders/reports, historical records and maps. Therefore, the findings of the study are limited to these 8 category of documentary heritage collection only. The present study is a mixture of qualitative and quantitative approaches of research, so these concepts also limit the analysis and findings of the study. The preservation projects are ongoing during the data collection period. Investigators collected data about the preservation project during 2019–2021. So that the findings of the study are limited to that period only. The lockdown during the COVID-19 pandemic also influenced the data collection procedure. During the data collection, investigators faced a lot of difficulties acquiring data from the heads of the institutions and from staffs. The time constraints, mental condition, attitude, and family problems of the respondents also affect their responses to the research questions. These factors also limited the scope of the study. Considering all these limitations, the investigator wishes to note that such limitations are not unconventional in an investigation of this kind. Beyond these limitations, the investigator has taken all potential actions to make the study as authentic as possible and fulfil the objectives.

## **1.21 Organisation of the Thesis**

The body of the thesis is organised under seven chapters which comprises of an introduction to the thesis, profile of the cultural institutions surveyed, review of literature, methodology, analysis and interpretations and the findings, suggestions and conclusion. Preliminary pages of the thesis includes declaration, certificate, acknowledgements, abstract, list of tables, list of figures and list of abbreviations used. Bibliography and appendices are presented in the end of the thesis. The major chapters of the thesis, are as follows:

### **Chapter 1: Introduction**

Chapter 1 describes the theoretical concept of the problem. It introduces the subject of research, provides the clear picture of concepts such as need of preservation of documentary heritage collection, traditional and digital preservation methods and challenges of preservation. It also provides detailed account of need and significance of the study, statement of problem, definition of key terms, objectives of the study, hypothesis of the study, scope and limitations of the study and organisation of the thesis.

### **Chapter 2: Profile of the Cultural Institutions Surveyed**

Chapter 2 explores basic details of the fifteen cultural institutions selected for the study in Kerala.

### **Chapter 3: Review of Literature**

Chapter 3 provides the detailed review or related literature of studies conducted in India and abroad. The reviews are arranged under seven sub-headings such as, importance of cultural heritage resources, preservation of documentary heritage collection, digitisation of documentary heritage collection, collaboration in digitisation initiatives, policies and legal implications in digitisation project, challenges of preservation, staff development for preservation activities.

### **Chapter 4: Methodology**

Chapter 4 discusses the methodology used for the study, variables used for the study, sampling design, data collection tools, data collection procedures and various tools and techniques used for data analysis.

## **Chapter 5: Analysis and Interpretations**

This Chapter draws the detailed analysis and interpretation of the data. This chapter contains two parts. First part deals with the analysis of data collected from the head of the cultural institutions and second part deals with the analysis of data collected from staffs working in these cultural institutions.

## **Chapter 6: Findings, Suggestions and Conclusion**

This chapter dedicated to present the summary of findings, tenability of hypotheses, recommendations and suggestions based on the study and conclusions.

## **Chapter 7: Recommendations for Further Research**

This chapter provides recommendations for further research.

The appendices and bibliography are presented at the end.

### **1.22 Conclusion**

Cultural heritage resources have the potential to create an automatic sense of unity within a group and help to understand the history, knowledge, and lives of our previous generations. The documentary heritage collection possessed by libraries, archives, and other cultural institutions is included in a large proportion of the world's cultural heritage. It is important to preserve, protect, and make accessible this documentary heritage collection for the future. The study deals with the preservation of documentary heritage collections in the selected fifteen cultural institutions in Kerala. In this chapter, the investigator describes the concept of cultural heritage and provides a clear picture of the research problem of the study, the objectives of the study, and hypotheses formulated based on the research objectives and the significance and limitations of the study. This chapter also provides a detailed account of concepts such as the meaning and importance of documentary heritage collection, traditional and digital preservation methods for the protection of documentary heritage collection, challenges of preservation, international and national efforts for safeguarding documentary heritage collection, and staff developments in preservation.

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# PROFILE OF THE CULTURAL INSTITUTIONS SURVEYED

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*2.1 Introduction*

*2.2 Profile of the Cultural Institutions*

*2.3 Conclusion*

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## **2.1 Introduction**

This chapter provides a brief introduction to the libraries and cultural institutions selected for the study. There are fifteen cultural institutions in Kerala were selected for the study. They are, State Central Library (SCL), Kerala University Library (KUL), Kerala Legislature Library (KLL), Oriental Research Institute and Manuscripts Library (ORI & ML), Kerala Council for Historical Research Library (KCHRL), Sukrtindra Oriental Research Institute Library (SORIL), Sree Sankaracharya University of Sanskrit Library (SSUSL), Kerala Sahitya Akademi Library (KSAL), Kerala Agricultural University Library and Information System (KAULIS), Kerala Kalamandalam Library (KKL), Guruvayur Devaswom Religious Library & Reading Room (GDRL), Thunchath Ezhuthachan Malayalam University Library (TEMUL), Tunjan Manuscripts Repository (TMR), Department of History, Farook College (DHF) and State Revenue Reference Library (SRRL). The selection of these institutions is based on their documentary heritage collection, their reliability in the cultural heritage sector, and their activities in preserving their documentary heritage collection. The information required for this chapter is collected from the websites of the respective institutions, from the head of the institutions through personal talk, and through direct observation.

## **2.2 Profile of the Cultural Institutions**

The profile details of the fifteen cultural institutions surveyed for the study are presented as follows.

### **2.2.1 State Central Library (SCL)**

The State Central Library, also known as the Trivandrum Public Library, is situated in the centre of Thiruvanthapuram district in Kerala state. The State Central Library is a treasure trove of information and knowledge, and it is considered one of the oldest libraries in India. It was established during the reign of His Highness Swathi Thirunal Maharaja of Trvancore in the year 1829. At present, this library is under the administrative control of the higher education department of the government of Kerala. This library is systematically arranged into 20 sections. The

### *Profile of the Cultural Institutions Surveyed*

library holds a collection of 455274 documents in various languages, such as Malayalam, Tamil, Sanskrit, Hindi, and English, in different disciplines. The major sections of the library include a closed reference section, a gazette section, and a braille section.

- The closed reference section consists of about 35,000 books. The collection in the closed reference section includes old and rare books, some of them dating to the 18<sup>th</sup> century, and back volumes of some popular periodicals from the 1970s. The digital library in the closed reference section holds the digital contents of Kerala state government gazettes, Travancore gazettes, and Fort St. George gazettes from early 1900, as well as about 1200 rare books. This section provides public access to their digitised contents, and a reprographic service is also provided on demand.
- The Gazette section holds the gazettes, which include Thiruvithamkoor, Tirukochi, and Kerala government gazettes from 1903 and consist of over 19 lakh pages. This section also provides the gazette online with a search facility.

The State Central Library started digitising rare book collections in 2005, which has been an ongoing programme. The digitisation project has been conducted in a phased manner. 707 rare documents containing 3,28,268 pages have been digitised during the first phase of the digitisation project. A digital archive for rare books was created in 2006. During the second phase, 480 English books were digitised and included in the digital archive in 2010. The State Central Library also digitised and web-hosted the large collection of Kerala state government gazettes (Travancore-Cochin- Kerala state gazette during the years 1903-2015) and the St. George gazette. (State Central Library, 2023)

#### **2.2.2 Kerala University Library (KUL)**

The Kerala University library is located on the Kerala University Senate Hall campus in the Thiruvananthapuram district of Kerala state. It was established in 1942, and it is the biggest and oldest university library in Kerala. For operational

*Profile of the Cultural Institutions Surveyed*

convenience, the library is arranged into 11 sections. The library has a profound collection of books, maps, journals, theses, dissertations, CDs, microfiche, etc. The collection of the Kerala University Library includes 3.5 lakh books (growing at 5000 titles annually), bound volumes of more than 1000 journal titles, more than 400 Indian periodicals, 43 foreign journals, 35 popular magazines, and 20 newspapers. The library has a rich collection of reference sources and special collections, which include women's studies, Kerala studies, government publications, UN and World Bank publications, general biographies, theses, closed reference (rare books), bound volumes of periodicals, and bound volumes of newspapers. Now, the library is in the process of digitising its rare collection. The major services provided by the library are:

- Bibliographic services
- Current awareness service
- Indexing services
- E- Journal services
- CD-ROM search
- Current Content services
- Lending of Books
- Extension services
- OPAC search
- Inter library loan services
- Reference service
- Internet services
- Reprographic services

- Referral service
- World Bank e-Library service
- User Education programmes

(Kerala University Library, n. d.)

### **2.2.3 Kerala Legislature Library (KLL)**

The legislature library is a special library attached to the Kerala Legislature Secretariat that caters to the information needs of members of the legislature assembly. It is located in Palayam, Thiruvananthapuram district, Kerala state. The library was established in the Dewan's office library of the erstwhile Travancore state, and the library was renamed the Kerala Legislature Library in 1956. The collection of the library includes one lakh and thirteen thousand books, reports of commissions and committees of the government of Kerala and the government of India, government of India and Kerala gazettes, assembly proceedings, Kerala collection, proclamations, biography collection, acts, ordinances, parliamentary studies, census reports, archives of rare books, periodicals, video CDs of assembly proceedings from 2005 onwards, EMS, Gandhiana collection, and back volumes of periodicals. The library contains digitised assembly documents from 1888 to 2016. These digitised contents are available at the archive link of the Kerala Legislative Assembly ([www.klaproceedings.niyamasabha.org](http://www.klaproceedings.niyamasabha.org)). The services provided by the library are:

- Reference service
- Indexing and documentation service
- Press clipping service
- Photocopying service

(Kerala Legislative Assembly, n. d.)



#### **2.2.4 Oriental Research Institute and Manuscripts Library (ORI & ML)**

The Oriental Research Institute and Manuscript Library is an academic department of Kerala University located at the Kariavattom campus of the university in the Thiruvanthapuram district of Kerala state. ORI & ML were shifted to the present building in 1982. It is considered one of the largest manuscript libraries in the country, having about 65,000 manuscripts in different subjects like Ganita, Jyotisa, Vedanta, Vyakarana, Silpa, Natya, Tantra, Mimamsa, Purana, Itihasa, etc. The majority of the manuscripts are in Sanskrit. The major functions of ORI and ML are the collection and preservation of manuscripts, production and sale, and teaching and research. The document library in the ORI & ML holds a collection of books in religion, history, philosophy, English, social science, and old and rare book collections in Sanskrit, Malayalam, and Tamil language and literature, newspapers, government publications, and periodicals. The languages found in this rare collection are Malayalam, Telugu, Tamil, Sankrit, Burmese, Kannada, Oriya, Hindi, Indonesian, etc. The scripts found in this collection are Nadinagari, Vattezhuttu, Grantha, Kolezhuttu, Devanagari, etc. For the preservation of their rare collection, ORI & ML adopted modern techniques like fumigation, microfilming, and digitisation in addition to the indigenous techniques of oiling and dusting. The Oriental Research Institute and Manuscript Library also act as a manuscript resource centre for the National Mission for Manuscripts in south India.

(Oriental research institute and manuscripts library, n. d.)

#### **2.2.5 Kerala Council for Historical Research Library (KCHRL)**

The Kerala Council for Historical Research (KCHR) is an autonomous institution that aims to promote research and academic exchanges in history, archaeology, and other areas of social science and is funded by the ministry of higher education of the government of Kerala. KCHR is located on the premises of the multi-purpose cultural complex Vylopilli Samskrithi Bhavan in the Thiruvanthapuram district of Kerala state. Research, documentation, publication, coordination, and training are the major activities of KCHR. KCHR offers several fellowships, internships, sponsorships, and short-term courses on historical research.

### *Profile of the Cultural Institutions Surveyed*

"Currently, KCHR is involved in high-profile projects such as Digitising Kerala's Past, Charitra-Anweshana Yatrathakal, *Post Excavation Works of the Pattanam Archaeological Research (2007–2015)*, Oral History Project, Panchayath Vijnaneeyams, Archives on Malayali Family Histories and Biographies, Biographical Documentation of Kerala Women, Dalits, History of Malayali Migrations and Migrant Communities, Adivasis, *and Database on Social Reformers*". The state-of-the-art library in the KCHR provides reference services, content alert services, newspaper clipping services, and photocopying facilities.

(Research library and research centre, n. d.)

#### **2.2.6 Sukrtindra Oriental Research Institute Library (SORIL)**

The Sukrtindra Oriental Research Institute is the centre of learning, founded in 1971 by H. H. Shrimad Sudhindra Tirtha Swamiji. It is located in Thammanam, a place in the Ernakulam district of Kerala state. The main objectives of the institution are to promote the study and scientific methods of research in oriental learning with special reference to Sanskrit, literature, culture, history, Indian philosophy, etc., facilitate the preservation and maintenance of India's rich spiritual and cultural heritage; and collect, preserve, transcribe, edit, and publish rare manuscripts. The Mahatma Gandhi University and Kerala University recognised this institution as a research centre for Sanskrit language and literature. The library in the Sukrtindra Oriental Research Institute holds 13000 books that deal with subjects like "Vedas, Vedanta, Puranas, Upanishads, Jyothisha, Vyakarana, Ayurveda, Vedic mathematics, Buddhism, Jainism, Indian history and culture, etc."; 2000 manuscripts cover subjects like "Ithihasa, Purana, Vedas, Mantra, Tantra, Dharmasastra, Darsana, Kavya, Yantra, Champu, Vyakarana, Kama, Strotra Sangita, Niti, etc. The National Mission for Manuscripts (NMM) recognises this institution as an important manuscript repository in Kerala.

(Sukrtindra Oriental Research Institute, n. d.)

### **2.2.7 Sree Sankaracharya University of Sanskrit Library (SSUSL)**

The Sree Sankaracharya University of Sanskrit is one of the pioneering research centres in Sanskrit as well as social science, humanities, and fine arts in Kerala, and it was established in 1993. Sanskrit University is located in Kalady, a place in the Ernakulam district of Kerala state. The major objective of the central library at Sanskrit University is to build a comprehensive collection of library resources that are helpful for students, research scholars, and faculty members in their educational and research activities. The central library holds 77800 books, journals and periodicals, manuscripts, theses and dissertations, and CD-ROMs. In addition to this collection, the library holds rare and historically important manuscripts and palm leaves in different languages. The library offers services like book lending, reference services, IT-related information services, user education, web OPAC, photocopying, newspaper services, and binding services.

(University Library, n. d.)

### **2.2.8 Kerala Sahitya Akademi Library (KSAL)**

The Kerala Sahitya Akademi is the hub of Malayalam language and literature. It was established by the Thiru-Kochi government in 1956. Sahitya Akademi is located in the Thrissur district of Kerala state. The Kerala Sahitya Akademi has been recognised as a research centre for Malayalam language, literature, and cultural studies by all the universities. The library in the Kerala Sahitya Akademi holds one and a half million books, 180 periodicals, and 15000 bound volumes of periodicals in the Appan Thampuram Memorial Periodical Library. In addition to this general collection, Akademi Library consists of special collections such as the Krishnakalyani collection, the Vilasini collection, the Rama Varma Research Institute collection, the Malayalam language reform committee collection, the K. Sukumaran memorial collection, the Prof. V. Aravindakshan collection, microfilm rolls, audio-video cassettes, palm leaves, photo CDs, etc. The library provides reference and reprography services. The Kerala Sahitya Akademi took the initiative to set up a digital conversion lab at the Akademi to scan and preserve rare books, manuscripts, palm leaves, and other documents by using

modern technology to make these valuable documents readily available through the digital library and other local library networks.

(Kerala Sahitya Akademi, n. d.)

### **2.2.9 Kerala Agricultural University Library and Information System (KAULIS)**

The Kerala Agricultural University is located in Vellanikkara, a place in the Thrissur district of Kerala state. It was established in 1971. The functions of Kerala Agricultural University are to produce trained personnel and promote research and extension activities in the agricultural sector. The university central library at the agricultural university was established in 1995. The collection of the central library holds books, periodicals, back volumes of periodicals, theses and dissertations, and e-resources like CeRA, Krishikosh, CAB abstracts, eBooks from CABI, India Agristat, etc. The library provides services like book loan service, reference service, literature search and reprographic service, documentary delivery service, current awareness service, selective dissemination of information, interlibrary loan service, and database and internet-based services.

(Kerala Agricultural University Library & Information System, n. d.)

### **2.2.10 Kerala Kalamandalam Library (KKL)**

The Kerala Kalamandalam is an institution established for the preservation and promotion of the artistic heritage of Kerala, especially Kerala's traditional performing arts, through rigorous training and performance. It was established in 1930 by the famous poet Padmabhooshan Vallathol Narayana Menon and his associate, Manakulam Mukundaraja. It has been working as a deemed university from 2007 onward. It is located in Cheruthuruthi, in the Thrissur district of Kerala state. The library in Kerala Kalamandalam is a treasure trove of books, palm leaves, and rare collections. The collection of the library includes more than 25,000 books, journals, magazines, periodicals, a rare collection contributed by D. Appukkuttan Nair, and more than 175 writings on palm leaves.

(Department of Cultural Affairs, Government of Kerala, n. d.)

### **2.2.11 Guruvayur Devaswom Religious Library & Reading Room (GDRL)**

Guruvayur Devaswom religious library and reading room are located in the "East Nada" of Guruvayur temple in the Thrissur district of Kerala state. It was established in 1945 under the authority of Guruvayur Devaswom. The collection of the library includes books, periodicals, newspapers, manuscripts, etc. The library is equipped with hundreds of rare palm leaves and rare books on religion, art, philosophy, and culture. The library provides services like book lending services, reference services, etc. Guruvayur Devaswom Religious Library started their digitisation project to preserve the old and rare collection for future generations. Digitisation work is going on.

### **2.2.12 Thunchath Ezhuthachan Malayalam University Library (TEMUL)**

Thunchath Ezhuthachan Malayalam University is an institution of excellence aimed at formulating and implementing various programmes and imparting education on various subjects like Malayalam language and linguistics, Malayalam criticism, comparative literature, evolution of South Indian language scripts, antique, tribal language study, study of Kerala renaissance history, regional language study, archaeology, translation in to and from Malayalam, ancient record, epigraphy, etc. It was established in 2012 by the government of Kerala. It was located in Vakkad, in the Malappuram district of Kerala state. Malayalam University built a heritage museum that exhibits pictures, objects, and materials related to the anthropological, social, and cultural antiquity of Kerala. The library at Thunchath Ezhuthachan Malayalam University started working in 2013, and it holds more than 41,000 books and 100 journals and magazines. The major attractions of the library are computerised by using open source library management software "Koha," a rare and old book collection, an in-house digitisation programme, and the development of a digital library in progress by using open source software "Dspace".

(Thunchath Ezhuthachan Malayalam University, n. d.)

### **2.2.13 Tunjan Manuscripts Repository (TMR)**

The Tunjan manuscript repository of the University of Calicut is the second-largest collection of manuscripts in Kerala. It was established in 1971 as part of the Department of Malayalam and Kerala Studies on the campus of the University of Calicut. It is located in Thenchipalam, Malappuram district, Kerala state. The repository is preserving nearly 8,000 manuscripts, including rare palm-leaf bundles, coins, bamboo, copperplates, and paper manuscripts. The digitisation work on these collections is going on. The repository holds rich and rare manuscripts and legendary classical works of prominent authors in various subjects like Vedic literature, Sakta tantra, Puranas, Itihasas, astronomy, Vyakarnam, Kaumudi, medicine, mathematics, etc. The major facilities of the repository are a digitalised catalogue of manuscripts, digital copies of manuscripts (under progress), a reading room, facilities for scholars, the publication of manuscripts, and a manuscript clinic for the public.

(Tunjan manuscript repository, 2023)

### **2.2.14 Department of History, Farook College (DHF)**

Farook College is an autonomous institution affiliated with the University of Calicut. It is an important milestone that marks the renaissance of Muslims in Kerala. It was established in 1948, and it is located in Farook, Kozhikode district, Kerala state. It is now the biggest postgraduate institution in Kerala, offering 22 undergraduate and 16 postgraduate programmes. The Department of History at Farook College was re-designated in 1991. The department has started an initiative called "Malabar Archives" for the preservation and digitisation of old and rare documents related to Malabar. The functioning of the "Malabar Archive" is in progress.

(Farook College, n. d.)

### **2.2.15 State Revenue Reference Library (SRRL)**

The State Revenue Reference Library is the only reference library under the Revenue Department outside the state capital in Kerala and was established in 1998. It is located in Thalassery, in the Kannur district of Kerala state. It is a treasure trove of history. The library holds thousands of important revenue records for the country and the state, especially Malabar. The valuable books and records here shed light on various historical events in North Malabar; some of the most important pertain to the British Raj of the 19<sup>th</sup> century. The library is housed in a building in the office compound of the sub-collector of Thalassery. The Revenue Reference Library holds more than 2800 books and 260 old documents, maps, etc. The collection contains old and rare documents that cover subjects like revenue and civil administration, acts and laws, judicial administration, agriculture, rules and regulations of government, finance, education, community development, health, forest, archaeology, defence, census and population, police, elections, etc.

### **2.3 Conclusion**

This chapter compiled the various profile information regarding the official details, present location, nature of authority, documentary heritage collection, services, activities for the preservation of documentary heritage collection, etc. of the fifteen selected cultural institutions in Kerala for the study.

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# REVIEW OF LITERATURE

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- 3.1 *Introduction*
  - 3.2 *Importance of Cultural Heritage Resources*
  - 3.3 *Preservation of Documentary Heritage Collection*
  - 3.4 *Digitisation of Documentary Heritage Collection*
  - 3.5 *Collaboration in Digitisation Initiatives*
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  - 3.7 *Challenges of Preservation*
  - 3.8 *Staff Development for Preservation Activities*
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### **3.1 Introduction**

A review of literature is the presentation of a comprehensive survey of published and unpublished works in the area of the present topic of the study. It provides a detailed account of the comprehensive study and interpretation of the literature from different sources in the specific discipline of the present study. It is the way to explore the existing information in the field of study, to ascertain informative works on the subject, and to locate important researchers working on this subject. It gives an overview and background theories in the areas of specific interest to the researcher and acts as a stepping stone for the present study. It helps to check the feasibility of the topic of the study and summarises the recent trends and research going on the specific topic of the study. And it helps to prevent the duplication of the study and effort that have already been made. It proposes sources of data, research design, research methods, procedures, statistical techniques, and web tools suitable for the present study. It finds ideas, theories, findings, and conclusions helpful for the interpretation and discussion of the results of the present study. It establishes the similarities, differences, and relationships between the existing studies, which leads to finding out the gaps in the existing studies. It is the documentation of reviews of related studies on a specific subject and provides a summary, description, and critical evaluation of these studies.

This chapter provides a comprehensive account of the studies carried out in the area of the present research topic. The investigator has conducted a detailed survey of related studies published in India and abroad. In order to find out similar studies in the area of the present study, the investigator examined various information sources like online journals, print journals, online databases, books, and other secondary periodicals, etc. The reviews identified were arranged under the following broad subject headings related to the present study:

- Importance of cultural heritage resources
- Preservation of documentary heritage collection
- Digitisation of documentary heritage collection

- Collaboration in digitisation initiatives
- Policies and legal implications in digitisation project
- Challenges of preservation
- Staff development for preservation activities

### **3.2 Importance of Cultural Heritage Resources**

The concept of a cultural heritage resource is generally defined as a product or process acquired from the past generation, created or maintained in the present, and granted for the use of future generations. Cultural heritage resources can be classified as tangible resources (books, monuments, buildings, works of art, etc.), intangible resources (customs, traditions, rituals, performing arts, etc.), and natural resources (biodiversity, landscapes, etc.). Documentary heritage collections are included in the tangible resources.

Cultural heritage provides evidence of the cultural identity of the people in the world. It can be classified as “intangible cultural heritage” and “tangible cultural heritage”. Okumu (2016) documented the role of Intangible Cultural Heritage (ICH) in the conservation of Kenya’s history. Provides an overview of how intangible cultural heritage affects socio-cultural development and environmental conservation in Kenya and what the role of governments, NGOs, and communities is in safeguarding and protecting intangible cultural heritage. The National Policy on Traditional Knowledge, Genetic Resources, and Traditional Cultural Expressions, the National Policy on Culture and Heritage, the Policy on Traditional Medicine and Medicinal Plants, and the Constitution of Kenya (2010) were the evidences that enlightened the attempt made by Kenya to safeguard its intangible cultural heritage.

Intangible cultural heritage includes customs, oral traditions, cultural expressions, folklore, performing arts, songs, dance, memories, stories, literature, etc. UNESCO tried to protect the evidence of intangible cultural heritage through legal methods like copyright and patent protection. Leimgruber (2010) discussed the role of Switzerland and the UNESCO conference in safeguarding the intangible

cultural heritage by raising awareness about its importance, creating policy frameworks, and promoting the practice and transmission of cultural heritage. It was found that these conferences neglected three crucial elements in their discussions to conceptualise the term cultural heritage: (1) “cultural forms that are mobile and transnational”, (2) “medial transmissions of popular culture, and (3) “performative elements of culture”. It also discussed the perceptions of participants in the conference about protecting intangible cultural heritage.

Tangible cultural heritage is a physical artefact made by man that we can touch. “Tangible cultural heritage has a greater life over than intangible counterpart, such that with proper attention it will remain live over centuries”. Tangible cultural heritage includes historic monuments, places, books, paintings, manuscripts, historical records, palm leaves, maps, government records, etc. Bakhshi (2016) explored the heritage collection available in different formats at the Indira Gandhi National Centre for the Arts (IGNCA). It was found that the cultural heritage resources available in IGNCA were manuscript, rare books, photographs, photo-negatives, photographic slides, micro-films, microfiches, motion picture films, LP records and audio spools, etc. the investigator also examined the preservation methods, digitisation and tools & techniques being used in digitisation by the centre. Lack of budget, lack of infrastructure and storage capacity, technological obsolescence and intellectual property rights issues were constraints faced by IGNCA.

By studying the tangible and intangible cultural heritage, we can understand our past, and what traditions have been preserved over the generations. Shafi and Lone (2012) reviewed some journal articles and books dealing with the libraries and institutions that have a collection of oriental manuscripts in India. The reviewed articles were arranged into different sections: estimate amount of manuscript available in India; location of libraries and institutions; contribution of religious groups and kings; manuscripts in research institutions and museums. Study also provided a detailed review of some important libraries. According to the analysis, a large number of documented and non-documented oriental manuscripts were

available in India in different languages like Sanskrit, Arabic, Turkish, Urdu, Persian and so forth. The libraries all over India hold collections of oriental manuscripts whether they were a public library, an academic library, or a research library.

Many types of cultural heritage resources are in danger of vanishing. Manuscripts are considered a valuable source of cultural heritage information. Sahoo (2016) conducted a literature review to reveal information about the antiquities, types, and nature of palm leaf manuscripts, the process of writing over the manuscripts, the factors effecting the deterioration of manuscripts and their conservation and preservation, cataloguing methods, metadata standards, and digitisation methods used in the organisation and dissemination of manuscripts. “Tala” and “Sritala” were the major varieties of palm leaves widely used for writing purposes. It was found that the causes of the deterioration of manuscripts were classified as follows: (1) physical damage because of the loss of natural oil in the leaves, improper use and storage, constant handling, atmospheric factors like light, humidity, temperature change, dust, and climate change, and (2) biological damage because of the attack by insects and microorganisms.

Cultural institutions in any country have a great role in to collecting organising, preserving and disseminating the documentary cultural heritage of the country. Documentary heritage is a part of tangible cultural heritage, which includes rare and old books, manuscripts, palm leaves, maps, historical records, etc. Gaur (2011a) demonstrated the whole picture of the Indira Gandhi National Centre for the Arts (IGNCA) which is charged with providing computerised storage, preservation, and dissemination of resources on arts and cultural heritage. Describes the Kalanidhi division, which is the cultural heritage knowledge resource hub of IGNCA, and the collection of the Kalanidhi reference library, including rare books, personal collections, area collections, manuscripts in microfilm and microfiche, slide collections, and other visual resources. Conservation facilities, cataloguing, database development, and computerisation initiatives of IGNCA have been explained. Steps involved in the development of the digital repository in IGNC have been discussed.

The Royal Tropical Institute or Koninklijk Institute Voor de Tropan (KIT) library holds a cultural historical collection relating to the Dutch colonial past. Levi (2010) provided brief details of cultural heritage collection, map collection and the planning and organisation of a project to digitise maps at the Royal Tropical Institute, or Koninklijk Institute Voor de Tropan (KIT) of the Netherlands. The Investigator described the rich heritage collection of the Royal Tropical Institute or Koninklijk Institute Voor de Tropan (KIT) library, efforts made for the conservation of this rich collection, matters to be considered in planning and organising a digitisation project, and methods to handle the work flow of the digitisation project. The study found that the digitised collection of maps has been used by various researchers as well as by relief workers in the aftermath of the tsunami in Indonesia.

Both intangible cultural heritage and tangible cultural heritage have been threatened by globalisation, industrialisation, environmental deterioration, cultural standardisation, migration and tourism. Nigeria is a heterogeneous society with rich cultural heritage resources that are scattered within the diverse ethnic nationalities. Nwegbu, Eze and Asogwa (2011) have listed out the emerging issues, impacts of globalisation, and challenges of globalisation on Nigerian cultural heritage. It was found that the major positive impacts of globalisation on Nigerian cultural heritage were (1) the integration of Nigerian culture and the ability of the cultural community to see other's cultural heritage through the internet, (2) the speedy online access to Nigerian culture, (3) the digital preservation of cultural artifacts in Nigeria. The negative impact of globalisation was the commercialization of Nigerian culture, which disturbed the religion, family, language and daily lives of Nigerian people. Libraries and library professionals have faced many challenges as part of the globalisation of culture. Librarians needed to improve their ICT literacy to fit in the era of information technology; libraries needed to digitise their collection for preservation and access; digital divide in the rural community for accessing digital collections. The investigator recommended that there is a need to "develop legislative protection for traditional culture, heritage museum, archives, and libraries and to provide training in the use of ICT for documentation, digitisation and preservation of cultural heritage" by the government.

There are special libraries that hold rare collections such as palm leaves, manuscripts, and rare books, which are the sources of cultural and historical knowledge. Parmar and Kamdar (2021) presented the rare collection of 3 special libraries in Ahmedabad (L. D. Institute of Indology, Sheth B. J. Institute of Learning and Research and Shree Mahavir Jain Ardhana Kendra). Study found that, major rare collections of these libraries includes manuscripts, palm leaves, printed books, and diaries, etc. Majority of the rare materials were in fragile condition. The finding of the study is that the majority of the staff of these institutions lack expertise in techniques of preservation and conservation of rare materials.

Wallach (2001) stated that cultural institutions, including libraries, archives, and museums face a lot of struggles to redefine their role as cultural institutions and maintain their foothold in these technological innovations. There was a need to define access to cultural information more clearly for public, which wants it on demand and for free. Investigator tried to define policies regarding access to cultural information and types of access hinged on dichotomies, (1) “specialists vs general public”, (2) “collector vs general public”, (3) “custodianship”. Investigator covered some issues faced by cultural heritage institutions that persisted over years, developing and measuring the effectiveness of preservation and security strategies for our nation’s cultural heritage, dealing with theft, deterioration, damages, the challenges of digitisation and innovations in security and preservation.

The glorious memory of Indian culture is reflected in the antique manuscripts. These are the basic of historical evidence and have great research value. Gaur (2011b) classified the barriers to accessing cultural heritage collections as technological barriers, economical barriers, and language barriers. Study provided details of manuscript digitisation initiatives like those at the Indira Gandhi National Centre for the Arts (IGNCA), National Mission for Manuscripts. Study described the meaning of the term “manuscript” and listed out the manuscripts available in “museums and libraries under the department of culture”, “state archives”, “state libraries and state museums”, “universities”, and “voluntary bodies, trusts, temples and individuals”. Study mentioned some legal issues concerning the digitisation of



cultural heritage. Investigator analysed how the Copyright Act 1957, Information Technology Act 2000 affected the digital preservation of cultural heritage resources in India. Study asserted that both the copyright act 1957 and the IT act of 2000 did not discuss the issues relating to the digitisation of cultural heritage. According to the investigator, “to increase access, improve service, reduce handling and develop collaborative resources” were the reasons for initiating a digitisation project.

Tyagi (2022) endeavoured the preservation and conservation of indigenous manuscripts housed in the Jain Vishva Bharati Institute in Rajasthan. A structured interview schedule was used to collect the data from the 9 staff members in the manuscript section of the central library at the Jain Vishva Bharati Institute. The data related to the physical condition of the manuscripts and the conservation and preservation methods employed has been collected through interview. It was found that the preservation and conservation techniques adopted by the Jain Vishva Bharati Institute for preserving their indigenous manuscript was satisfactory as per the norms and policies of the National Mission for Manuscripts.

Initiatives, which include the activities to strengthen the intangible cultural heritage and tangible cultural heritage for transmission to future generations. Siam Kim Lim (2001) shared his experience exploring the various activities of the National Heritage Board (NHB) in Singapore to change the image of their museums and archives to disseminate and preserve the history and heritage of Singapore and to centralise some of their outreach activities, share resources, ideas and experiences. He also examined the early years of the NHB and its attempts to attract a new audience, collaborating with like-minded partners, fostering community collaboration and providing training for the staff. It was found that, NHB organised activities like travelling exhibitions, folk dancing sessions and street theatre to attract the new audience to their museums and archives, used media to publicise their programmes, used personalities to plug the heritage messages, and conducted exhibitions.

Hutchinson (2007) provided a description of the student poster session in the Sofia 2006 conference conducted for the theme globalisation, digitisation, access

and preservation of cultural heritage held in Bulgaria. In the conference, several students commented on the importance of cultural identity and heritage, the library's role in fostering and preserving its, and also the library's mission to promote cultural literacy. Several students also commented on how libraries can provide better access to unserved populations and issues of digitisation especially intellectual property rights concerns.

Cultural Heritage Resources Management (CHRM) is a legal framework that geared the administration, preservation, dissemination, research, and use of cultural heritage for the benefit of present and future generations. A good cultural heritage legal framework should reflect the "countries historical realities, present need and future aspirations". Kyule (2016) examined the contradictions in the Kenya's cultural heritage policy and legislation. Study provided the remedies that addressed the problems in the present Kenya's CHRM legal framework. Antiquities and Monuments Act (1984), National Museums Act (1984), National Museums and Heritage Act (2006), National Policy on Culture and Heritage (2009), Kenya Constitution (2010), Protection of Traditional Knowledge and Traditional Cultural Expressions Bill (2013), National Culture Bill (2014) were the legal implications made by Kenya for protecting cultural heritage. Investigator stated that, by constitutionalisation of culture and heritage rights, Kenya treated right to cultural heritage as a human right.

Kumar and Nair (2021) conducted a feasibility study on designing a comprehensive cultural heritage information system with the aid of modern conservation techniques and advanced technological support. Study also examined the scope, issues, and problems of conceptualising a cultural heritage information system in the Indian context. Study investigated the availability of various systems and schemes such as knowledge base, ontology frameworks, controlled vocabularies, classification schemes, metadata standards, language compatibility, architectural designs and digital archiving tools. The study found that there was a need for a comprehensive system to effectively collect, document, organise, manage, and update knowledge on cultural heritage in India.

### **3.3 Preservation of Documentary Heritage Collection**

Preservation of documentary heritage resources is defined as all the activities that increase the life span of cultural heritage resources in their original form or any other transformed form by using different methods and techniques. It is an economical, historical and also a cultural process. Krtalic and Hasenay (2012) analysed the legal, economic, and educational frameworks of Croatia in preserving the written heritage in libraries. Investigator tried to contribute to the theoretical and methodological study of preservation to identify the prerequisites that help organise and implement the preservation management model in Croatia. Organisational framework was difficult to analyse, so it was divided into (1) strategic, (2) technical and (3) operational levels. From the results, due to the lack of supervision in the legal regulations, many libraries faced difficulty in preservation. The largest obstacles in preservation were detected at the operational level: the discontinuity of applying preservation measures, limited finances, inadequate educational qualifications of staff, lack of staff, and legal problems.

Objectives of the preservation of cultural heritage would be emotional, economical, and for dissemination. Graham (2003) provided a brief description of activities of Auckland City Libraries' initiatives to guarantee the continued protection of and increased accessibility to the original heritage collections that have national importance. Study explained the heritage materials of Auckland city libraries in New Zealand, and highlighted significant public support, achievements. The Auckland city libraries holds thousands of books, manuscripts, maps, local history publication and indexes, family history collections etc. The major objectives of the preservation of documentary heritage resources in Auckland city libraries was to made accessible to all sectors of the local, national and international research community. Establishment of "Conservation Advisory Council of Department of Internal Affairs", "National Preservation symposium", creation of "National Preservation Office", "preservation of preservation management module" were the development made by Auckland city libraries to educate library professionals and the public about the need for long-term preservation of cultural heritage resources.

The erratic development made by Auckland city libraries heritage preservation has involved not only the heritage team but also the co-operation of policy makers, IT and finance experts, cataloguing section, subject specialists, politicians and users. Investigator provides a message through this paper “without preservation there will be no long-term access to heritage materials”.

Methods for the preservation of cultural heritage are classified into two categories: traditional methods of preservation and digital preservation. Ekwelem, Okafor and Ukwoma (2011) identified the various types of cultural heritage available in Federal Universities in the Southeast Nigeria. Cultural heritage resources available in the Federal Universities were craft, moral, artifacts, songs, folklore, historical sites, works of art etc. Investigator examined the traditional and electronic methods adopted by these institutions in preserving these rare cultural materials and what problems they were confronting. Binding of loose sheets, micro-filming, photocopying, de-acidification and digitisation were the methods adopted for preservation. From these, the majority of the respondents indicated that the binding of loose sheet (63 per cent) seems to be most commonly used preservation method. The cost of digitisation, inadequate infrastructure facilities, a lack of trained manpower, non-existence of software and harsh environmental conditions were the major constraints in preservation.

Conservation and preservation are two words related to each other but have different implications. These are the methods of keeping an object safe from damage, decay, and loss. Sarika (2014) studied the causes and nature of the deterioration of print materials in libraries. Investigator also examined the preservation and conservation techniques of print materials adopted by the libraries and the availability of disaster preparedness and recovery plan in the case of emergency. Questionnaire was used for data collection. It was found that high acidity levels, wear and tear due to excessive photocopying, air pollution, relative humidity, high temperature levels, excessive light, dust and particulate matters, biological agents and bad shelving were the major causes of deterioration. Lamination, microfilming, de-acidification, basic repairs, binding, encapsulation,

cleaning and dusting, photocopying, shelving, installing air conditioners, and using insecticides were the preservation methods adopted by the libraries. Study also revealed that libraries did not have written disaster preparedness and recovery plan to minimise the damage to the library materials in an emergency.

Traditional methods of preservation of cultural heritage mean preserving these resources in their original format and by a number of methods, such as cleaning and dusting, careful handling, airconditioning, de-acidification, fumigation, etc. Njeze (2012) described the traditional preservation and conservation techniques used in the selected private universities in South- West Nigeria and the issues for effective preservation and conservation. Investigator conducted a descriptive survey of 150 librarians and non-librarians at private universities in South-West Nigeria. According to the results, lamination, microfilming, de-acidification, binding, cleaning and dusting, photocopying, shelving, installing air-conditioners, adequate security, and use of insecticides were the traditional preservation methods adopted by the private universities under study. Lack of funding, lack of competent hard work, lack of preservation policy, lack of infrastructure, harsh environmental conditions, and obsolete hardware and software were the major hindrances to effective preservation in the private universities in the South- West Nigeria.

Lone, Wahid and Shakoor (2021) endeavoured to identify the preservation status of rare documents such as rare books, manuscripts, archival documents, reports, journals, magazines, etc. that were held in the private libraries of individuals and religious institutions in Srinagar. It was an attempt to document the preservation methods adopted by these private libraries of individuals and religious institutions for protecting their valuable, rare documents that were unknown to the scholarly world. Interview schedules were used to identify the individuals and families in Srinagar who which possess rare documents. Study found that the private libraries of individuals and religious institutions were still applying traditional methods of preservation.

Digital preservation of cultural heritage means reformatting the material in to another format like digitisation. In 2009, Gaur and Chakraborty investigated the

accessibility and preservation of Indian manuscripts, which serve as the foundation for university libraries' information bases on Indian culture. The concept of manuscripts, their Indian heritage of preservation and access, and both institutional and private initiatives in these areas are all explained in detail in this study. This study also discussed the initiatives taken by IGNCA (The Indira Gandhi National Centre for Arts), NMM (The National Mission Manuscripts) for the preservation of manuscripts.

Preservation of cultural heritage resources in any format, whether it's a book, manuscript, paintings, historical records, maps and audio-visual materials, has become a challenge for libraries, archives, and museums. Monica, Emmanuel and Musah (2017) used a qualitative approach to investigate the authority, standards, and practices used, the competencies of the staff involved, and the challenges to the preservation of audiovisual archives in Ghana with special reference to the J. H. Kwabena Nketia Archives and the Balme Library AV preservation unit. Investigator used an open ended interview schedule for the data collection. Study revealed that, for the preservation, archives in Ghana used specific rooms for keeping audio visual materials, but there were no well-constructed vaults for archiving. It was found that climatic conditions, lack of expertise, obsolete media formats, financial constraints, poor internet connectivity, unavailable obsolete machines, poor storage facilities, and inadequate facilities were the challenges associated with the preservation of audio visual archives in Ghana.

Information and digital technologies can save endangered heritage items like palm leaves, manuscripts and rare books from degradation. Raman Nair (2004) pointed out some international and national efforts like the UNESCO Memory of the World Programme, American Memory the Digital Libraries Initiative (DLI), Indian National Mission for Manuscripts, and Kerala History DL for the digital archiving of manuscripts and cultural heritage resources. In this paper, investigator defined the concept of cultural heritage and the limitations of this documentary cultural heritage, how evolutions in digital technology affected the preservation and access of this cultural heritage, what was the meaning "digital archives" and what was their role in

protecting traditional knowledge; what were the international and national initiatives for archiving these resources: and what were the steps taken by the several institutions in India. Also provided details on digital archiving packages like GenISIS, Greenstone, DSpace, and Nitya and the features and possibilities of these digital archiving solutions.

Segaetsho and Mnjama (2012) assessed the availability of preservation and conservation policies at the University of Botswana and the preservation problems faced by the University of Botswana. Data for this study was collected from 92 staff members working in the library department through a questionnaire and a personal interview. It was found that a full-fledged, elaborate preservation and conservation policy is available at the University of Botswana. Preservation and conservation policy was a plan of action that which “provided a comprehensive statement of intent regarding the care of current and future archives and special collections under the management of the University Library. It outlined the aims and objectives for preservation and the issues to be considered. It also aimed to inform preservation activities for all other University Library collections”. Lack of a well-defined disaster preparedness plan was the challenge faced by the University of Botswana. Investigator recommended that there was a need to formulate a good preservation policy and disaster preparedness and recovery plan to ensure the long term preservation and continued accessibility of library collections.

According to the Indian Constitution, it is our duty to value and preserve the heritage and social history of the country. Nikam et al. (2004) showcased a few examples of preservation initiatives to highlight the importance of preservation and dissemination of the rich heritage of India’s composite culture like books, journals, manuscripts, palm leaves, etc. And the best use of new innovative technologies of ICT and internet to deal with the perceived threat of cultural invasion that is threatening to shake the cultural and social heritage of India. Many of the cultural repositories described in this paper were still reaping the full benefits of digital preservation initiatives, the way ahead for building a virtual cultural knowledge has been established. Investigator described some initiatives to preserve culture and

social history undertaken in India, “INTACH – Indian National Trust for Art and Cultural Heritage”, “Kanchi Kamakoti Mutt at Enathur, Kancheepuram, Tamil Nadu” and “Roja Muthiah Research Library (RMRL), Chennai”. Investigator also described some initiatives to preserve the Tamil culture and languages, “The Theosophical Society in Chennai”, “Vikram University”, “Kalidasa Academy”, “Mysore University Library”.

Pandya and Gohil (2022) presented the preservation practices followed by the university libraries in India for the preservation of their vernacular literature. Study described the various techniques and strategies adopted for implementing preservation and conservation practices and the different factors contributing to the deterioration of these vernacular materials. Study adopted a descriptive research method for literature analysis, and questionnaire was used for collecting primary data from the 50 university libraries scattered in the different regions of India. The findings of the study revealed that the majority of university libraries have adopted digitisation de-acidification, pest control measures, and binding for the restoration of their rare materials.

Cultural heritage exhibitions have immense potential to increase access to and explore digital content among users. Liew (2005) conducted an exploratory study to highlight the content, landscape, architecture, characteristics, features, information retrieval (search and browse facilities), and interactive features of the major 15 online cultural heritage exhibitions available on the web. The major objectives of the study were to: (1) identify the types of cultural heritage exhibitions available on internet, (2) provide an overview of the objectives and purposes of the cultural heritage exhibitions, (3) analyse the content, information retrieval, and interactive features of the cultural heritage exhibitions and (4) highlight the characteristics and features of current major initiatives. It was found that, (1) browsing facilities provided by each exhibition sites were different, (2) “All the surveyed exhibition sites allowed users to browse their exhibition collections and files via themes or topics or titles, or a combination of all these with thumbnail images”, (3) “selected exhibition sites offered simple keyword and phrase searching



and the technique used in the phrase searching is significantly vary from one another”, (4) surveyed exhibitions used truncation and wild card search facilities, (5) “All the surveyed exhibition sites provided only one brief description of their online collection and also provided one single interface to meet the needs of all the different categories of user”.

Balogun (2023) highlighted the preservation efforts of indigenous knowledge systems in South Africa as a case study of South Africa’s national recorded system. Study adopted multiple case studies and face-to -face interview methods for data collection. Study aimed to identify the sources of indigenous knowledge in South Africa, and their types, and how this knowledge was preserved. Study found that digitisation efforts can facilitate the preservation of indigenous knowledge and collaboration within the indigenous community. The study was helpful for the policy makers and researchers who wanted to know more about digitisation initiatives for indigenous knowledge in South Africa.

### **3.4 Digitisation of Documentary Heritage Collection**

Digitisation of the documentary heritage collection is the process of converting analogue originals to electronic versions by means of scanners or digital cameras. Digitisation is considered another advanced method for the preservation of documentary heritage collection and ensuring their future availability. The studies on the digitisation efforts of various institutions all over the world are presented in this section.

In the framework of Kerala University, Raman Nair (2006) conducted a study on the digitisation of indigenous resources. This study primarily focused on the state of Kerala University's libraries and information systems, as well as those of a few nearby institutions. It highlighted the underutilised value of information found in old manuscripts and records that are inaccessible due to fear of destruction and the overemphasis placed on preservation of physical materials. The study was being conducted with the hope that the situation could be improved through the use of digital library technologies. It can offer an affordable way to preserve indigenous knowledge and documents. It can help create new information, benefit society, and

make them available to educators, learners, and researchers both inside and outside of academic institutions. The study's primary goal was to draw attention to the need of protecting these priceless documents and making the most use of them through the use of digital technology and networking of records and other materials kept in collections at Kerala University and other institutions. This study also mentioned few examples of major digitisation efforts occurred in world-wide, national-wide, and regional and also gives us the information about the features of Nithya archive digital library package.

Beena (2012) carried out a case study about the digital content development in the Kerala University Library. The main focus of this study was on the attempts made for the preservation of resources relating to the history, science, art, culture, heritage, language, literature, economy, and politics of Kerala state. The paper highlighted the need for digitisation, the policy and criteria adopted for selecting the documents for digitisation, the digitisation process, and the digital preservation methods carried out by Kerala University Library. This study also attempted an analysis of the digitised documents. The need for coordinating the digitisation efforts of various universities and institutions is also stressed in the paper.

Rajendran (2015) presented a paper on the akademi digital library: a haven of cultural heritage in local languages and scripts. This paper focused on the application of information and communication technology for the modernisation of library and information system at the Kerala sahithya akademi. The main objectives of this paper were to provide information about the development of digital archiving in the Akademi, and the various initiatives of Akademi harnessing digital technology to help the Akademi and other organisations in the region support research in regional history, literature, etc. This study provided us with a present scenario of the digital library in the akademi. At present, akademi has 6000 digital books as well as digital copies of Malayalam journals published in the last quarter of the 19<sup>th</sup> and early 20<sup>th</sup> centuries. Implementation of information and communication technology in Malayalam granthasooji was the first step in the modernisation project of akademi. Akademi digital collections contains a large number of audio files by

numerous Malayalam writers. In short, Kerala sahithya akademi is a haven of cultural heritage and, a knowledge base for regional studies.

Digitisation has emerged as a promising tool for generation, organisation, preservation, and long-term access to documentary heritage. Sahoo and Mohanty (2015) assessed the status of digitisation of manuscripts and the development of a digital library for manuscripts in the programme “National Mission for Manuscripts (NMM)”. Investigator tried to define the meaning of the word “manuscript” and pointed out the major efforts to preserve and catalogue the manuscripts in India prior to Independence. The major objectives of the article were to “explore the diverse nature of Indian manuscripts available in different forms, languages, scripts, and subjects”, to “understand the growth and distribution of manuscript resource centres (MRCs), manuscript conservation centres (MCCs) along with manuscript collections across various zones and states of India” and to “ assess the status of digitisation of manuscripts and the development of a digital manuscript library in India through the activities of NMM”. The data needed for the study has been collected from the annual report of NMM and the web pages of resource centres under NMM. It was found that manuscript heritage in India holds knowledge of Indian culture and tradition. NMM was the first effort of government of the India for the collection, organisation, documentation, preservation, digitisation and dissemination of Indian manuscripts.

In India and Iran, digitisation and digital preservation are essential for maintaining cultural heritage collections and ensuring public and scholarly access to them. Seifi (2011) conducted a comparative study on the digitisation and digital preservation of the heritage collection in a few Iranian and Indian libraries. The main aim of the study was to find out the main reason for digitisation and digital preservation of the heritage collection in a few Iranian and Indian libraries. The researcher has endeavoured to examine (1) the collection of heritage resources available in the selected libraries, (2) availability of infrastructure for digitisation and digital preservation, (3) budgeting areas, (4) storage procedures, (5) ways of accessibility to digital materials, (4) challenges of digitisation and (6) traditional and

modern methods of protection of heritage materials in a few Iranian and Indian libraries. Questionnaire, interview, observation methods were used for the data collection. It was discovered that the difficulties faced by Indian libraries were related to IT assistance and human resources, but the Iranian libraries' issue was insufficient money.

Jayankar library at the University of Pune holds a collection of manuscripts in Hindi, Marathi, and Sanskrit which that cover the subjects like religion, Ayurveda and Jyotisa. Digital preservation can provide better preservation, and reduce the handling of these fragile collections and also reduce the space for physical storage. Londhe et al. (2011) focused on the digitisation process of manuscripts adopted in the Jayakar library of Pune in India and also evaluated the digitisation software used, different steps in digitisation, feasibility study of digitisation and metadata creation. Investigator conducted a feasibility study to understand the technical feasibility, economic feasibility, legal feasibility and schedule feasibility. Investigator also divided the digitisation process into “pre-digitisation process: assessment and selection of materials, digitisation process and post- digitisation process”. The QuickScan software was used in this project for image capture. Dspace was used for the creation and maintenance of the digital library. The lack of technical experts, the migration of hired staff, and the non-availability of OCR for manuscripts were the problems faced by the digitisation project in the Jayakar library. Investigator pointed out some barriers for the digitisation project in Jayankar library: (1) “lack of expert staff”, (2) “fragility of manuscripts”, (3) “non-availability of OCR for manuscripts”, and (4) “more storage space required for digitisation of “yellowish” images”.

Mass digitisation is the process of digitising everything economically and with some speed; it is the opposite of the discrete digital collection that is available in the online archives. Coyle (2006) differentiated the concept of mass digitisation from non-mass digitisation by using the “Google book project” with the intention of digitising all of the books in some major US libraries. Investigator pointed out the steps involved in the mass digitisation project, (1) photographing books page by page, and (2) converting those images to searchable text by using Optical Character

Recognition (OCR) software. Mass digitisation was made up of two assumptions: to digitise everything and to save money by not digitising the same item more than once. Non-mass digitisation included the careful and individual selection of materials that are deteriorating and to make rare physical collections more widely accessible. Investigator reported that the issues in the mass digitisation project of “Google book search” were: (1) problems in digitisation work flow includes creation of metadata, scanning process, quality control, OCR process, creation of technical metadata, and storage, (2) physical structure of books, (3) creation of a user interface to the digitised materials and (4) lack common standard package for digitisation and quality control issues.

The two dimensions of the term “digitisation”. Libraries, archives, and cultural heritage institutions considered digitisation as a tool to enhance the access of their archival, fragile, and deteriorating collections. At the same time it is not accepted widely as a preservation strategy. Capell (2010) shared the story of the University of Southern Mississippi libraries, where digitisation used as a preservation tool to recover and preserve the content of seventy-two deteriorated acetate negatives. It has been observed that people hesitate to adopt digitisation as a long-term preservation strategy because of the risk of maintaining the digitised materials in future. Investigator also pointed out the issues faced by the archivists who wish to adopt the digitisation as long-term preservation strategy: (1) “technological obsolescence of hardware and software”, (2) “deterioration/ or malfunction of the storage system, and (3) “insufficient financial and technological commitment from organisations”. But in the case of the University of Southern Mississippi digitisation was the best option for preserving and recovering endangered materials.

Music department of the Bavarian State Library has made commendable efforts to digitise their holdings to preserve unique and fragile materials and enhance their visibility. Diet (2014) presented the state of digitisation of music documents in the Bavarian State Library. The library digitises the copyright-free monographs on musicology, musicological journals, sheet music, music manuscripts etc. Bavarian

State Library was a leading music library in the world that provided digital and internet based services through the mass digitisation of their historical collection, which includes “approximately 388,000 scores, 40,000 music manuscripts, 92,000 music sound carriers, 330 archives of musicians, and 164,000 music books”. Investigator reported the digitisation work flow followed by the Bavarian State Library: (a) digitisation of the Bavarian State Library was done by “Munich Digitisation Centre (MDZ)”, (b) “about 1,024,000 objects have been digitised by the MDZ and presented in the web page”, (c) “3D representations and other apps were used for the presentation of digitised materials”, (d) “MDZ used scan robots to so-called boutique digitisation”, (e) “the work flow of MDZ was managed by scalable self-made workflow tool based on MySQL database”, (f) “digital objects in MDZ preserved in large tape storage systems”.

Digitisation accelerates the conversion of books and serials from paper to digital form, enhancing improved search and retrieval of the digital content and advances in the delivery of content through the Internet. Conway (2010) described the concepts ‘digital preservation’, ‘digitisation for preservation’, and ‘preserving digital information’ in the age of Google. According to Conway, digitisation for preservation and digital preservation were related to each other, but the underlying standards, processes, technologies, costs, and organisational challenges were quite distinct. Investigator classified the dilemmas for the preservation of cultural heritage as environmental dilemmas, quality dilemmas, non-book dilemmas and expertise dilemmas. Investigator observed that most of the cultural heritage organisations considered digitisation as a form of copying for easier and broader access while recognising digitisation as a preservation strategy was still unclear. Investigator recommended that cultural heritage organisations must create clear distinctions between efforts to create new digital content by digitising substantial parts of their collections and efforts to preserve digital data for the future use.

The challenges of digitisation of documentary heritage collections have been a major research interest for more than a decade. Shevchenko and Solianik (2022) have made a content analysis of the available documentary heritage collections in

scientific libraries in Ukraine. The major objectives of the study were to identify the current status of digitisation of documentary heritage collection of scientific libraries and explore the various digitisation projects conducted by the leading scientific libraries in Ukraine. Questionnaire was used to collect data related to the nation's documentary heritage from the 14 selected national and state libraries in Ukraine. The findings revealed that most of the scientific libraries in Ukraine developed their own digital repositories for documentary heritage collection. Each scientific library developed and followed its own individual strategy for digitising documents and organising, presenting, and promoting digital repositories.

Micle, Tirziman and Reoanovici (2023) conducted a content analysis and scientometric research on the digitisation initiatives for the preservation of documentary heritage collections in Romanian libraries for the period 2007-2022. Study highlighted the participation of libraries in national and European projects and presented the examples of good practice in the digitisation of documentary heritage collections. It was found that there have been numerous digitisation initiatives that emerged in Romania during the period of 2007-2022, but their performance and results have not always met expectations.

Paul and Singh (2014) have conducted a factor analysis to identify the objectives, criteria for the selection of materials, and priorities of materials to be digitised in the special libraries in India. Investigator used a semi-structured questionnaire to collect data from nine special libraries in the national capital region of India. Study used SPSS (version 15.0). Study shed some light on the problems faced by the organisations in India for their digitisation project: implementation of access rights, difficulty in selecting storage media, lack of appropriate bandwidth and copyright rules, lack of professionally trained staff, and inadequate safety mechanisms. It was found that “to provide increased accessibility” was the preferred objective of the selected 9 libraries for the digitisation. “Content value” and “archival value” of the materials were the most preferred selection criteria for digitisation. It has been observed that the majority of the institutions marked their priority in selecting materials for digitisation as “institutional publication”.

Primary step of an institution for successful digitisation project was to build a comprehensive plan. Riley-Reid (2015) argued that a comprehensive plan is the key to successful digitisation project which consider certain things, (1) determine specific goals for digitising and maintain a preservation policy which care about the physical control of the repository and access the data for future,(2) assess the collection based on the users need and the type of collection, (3) improve the communication and collaboration with digitisation department with other departments to analyse the work flow and take good decisions, (4) identify financial resources, (5) maintain quality control to improve the usability and viability of the digital content, (6) educate/train staff/users, (7) create/maintain metadata, and (8) identify legal and copyright issues. The objective of this study was to elucidate the steps involved in formulating a digitisation project. According to the investigator biggest issue related to the digitisation project was copyright and ownership problems.

By digitising the library materials, the public libraries in Croatia accelerate the cultural, historical, and sociological research on the Croatian national heritage. Vrana (2011) tried to discover the current development in the organisation of digitisation in 152 public libraries in Croatia. Investigator used a web based survey to identify the organisational aspects of digitisation in the Croatian public libraries which is dispersed geographically. According to the findings, only 18.03 per cent of public libraries had an ongoing digitisation project at time of the study conducted. Majority of the public libraries in Croatia did not have a written plan for digitisation, preservation and access were the main reasons to start digitisation, majority of the public libraries did not have sufficient expert staff and adequate infrastructure. Lack of sufficient financial sources, lack of expert staff, inadequate infrastructure and lack of education about digitisation were the major challenges faced by the Croatian public libraries during digitisation. Instead of mass digitisation, public libraries in Croatia choose systematic digitisation of selected library collections. To improve the quality of digitisation of library materials, public libraries need better financial support, additional training of library staff and better infrastructure.



Now a day's digitisation has emerged as a trend. Many large and small-scale organisations like libraries, archives, art galleries, and museums, have been converting their collections in to digital. Holley (2004) gave an overview of how to develop a framework for digitisation and what elements of digitisation framework where. This paper was helpful for all types of organisations to begin developing their own framework for digitisation. According to Holley, the major elements of digitisation framework were: (1) identify the ongoing digitisation projects, (2) enhance the knowledge and expertise of staff in digitisation activities through training, (3) raise the awareness about the importance of digitisation, (4) build collaboration, networks, and relationships for digitisation activities, (5) arrange adequate funding to support digitisation, (6) "instigating digitisation projects", (7) development of strategic planning and policy , (8) "enhancing the IT infrastructure" etc. Holley also suggested some tips to make successful digitisation projects: (1) "create a digitisation steering group", (2) maintain a digitisation policy and conduct an audit on IT infrastructure and staff skills and (3) conduct a pilot project before digitisation.

"As stewards of cultural materials, museums have always managed access to and use of their collections, but the digital revolution is radically changing cultural consumption and production patterns, obliging museums to rethink how they relate to their audiences as users of cultural content". Bertacchini and Morando (2013) attempted to identify how technological innovations affected the museums ability to produce and distribute cultural content and what the challenges and opportunities were to access and use digital collection. This article discussed the two inter-related issues faced by the museums: (1) "increased access to digital images can potentially enhance economic and social value through serendipitous dissemination and reuse", (2) "control over their digital collections would enable museums to generate new revenues in information markets and to retain their position as gatekeepers of authoritative and cultural content". Investigator arranged this article into different sections. In the first section, economic characteristics of digital images and the impact of digital technologies on access and use of cultural collections have been discussed, the second section dealt with the emerging models regarding access,

dissemination, and use of digital images in museum collections and the concluding section explained the challenges and opportunities for museums in managing their digital collections. Typology of four emerging models for accessing to and using of digital images of artwork were online display, proprietary licensing, open licensing and user generated art images has been discussed.

Common motivating factors driven by organisations to digitise their collections were: increasing access, user demand, preservation, intrinsic worth of the collection, advancement of the organisation, commercially exploiting the collection, etc. Dorner, Liew, and Yeo (2007) employed a user survey and in-person interviews to determine the information needs of end users of digital cultural heritage resources in New Zealand. The goal was to assist the national library of New Zealand, libraries, and other cultural heritage institutions in better designing their digitisation projects to better meet the needs of their end users. The investigator tried to identify “who are the major users of New Zealand cultural resources?, what are their specific needs?, and how they use these resources?”. The investigator tried to identify “who are the major users of New Zealand cultural resources?, what are their specific needs?, and how they use these resources?”. It was discovered that the primary motivations for using cultural heritage materials in New Zealand were academic research, professional goals, and instructional objectives. The users encountered the following obstacles when attempting to use digital cultural heritage resources: inability to obtain necessary hardware, software, or internet access; lack of needed usability features; and inability to integrate disparate information sources.

Libraries forced to change their acquisition policy to accommodate digital resources and started digitisation projects to fulfil the increasing demand for digital content by the users. In order to ascertain the existence and evolution of digital collections in Croatian public libraries, Vrana (2010) conducted an online survey. The survey involved about 165 public libraries that were asked to take part. There were 26 questions in the web-based survey, and the response rate ranged from 96.34 per cent to 100 per cent. It was discovered that public libraries in Croatia have made progress in adding more digital content to their current collection, but they still

require more training regarding the creation of digital collections and the acquisition of library materials. According to the results, at the time of the study, only 18.29 per cent of Croatian libraries had at least one digital collection. No renowned software programmes were used by public libraries who took part in this survey to manage their digital holdings. Approximately 86.66 per cent of libraries requested guidance, and 33.33 per cent requested actual assistance from other libraries in the process of digitisation. A total of 81.81 per cent of libraries use standards, recommendations and examples of good practice from other libraries while digitising their own library materials”.

Manaf (2007) conducted a scholarly investigation of Malaysia’s 60 cultural institutions comprising libraries, archives, museums, and art galleries, to explore and understand the state of digitisation projects among cultural heritage institutions and to identify the collaborative efforts among the local cultural institutions in Malaysia. Study revealed that the development of digitisation of cultural heritage information in Malaysia is still at the beginning stage. Study suggested that cultural institutions in Malaysia share some common views, goals, interests and concerns pertaining to the various aspects of establishing a national digital cultural repository centre for Malaysia.

Lopatin (2006) reviewed some literature published from 2000-2005 on issues and how libraries are addressing them in non-commercial digitisation projects conducted by libraries in the US. Study reviewed the article covers the topics like: (1) project management in digitisation, which is a highly complex task to manage staff, workflow, budget and technical problems for successful digitisation, (2) selection of materials for digitisation according to the reviewed articles legal issues, concerns of stake holders, and expense of digitisation may affected the selection, (3) funding, (4) creation of different types of metadata and different metadata schemes, (5) issues of interoperability, (6) “handling legal issues such as copyright”, (7) issues of digital preservation like “the high cost of digital preservation, technological obsolescence, lack of institutional commitment, and legal issues”, etc. It was found that, to providing wider access to resources and providing long term

preservation of these resources were the major reasons for undertaking digitisation projects.

Wielkopolska Digital Library (WDL) is an equipment- organisational platform developed by the Poznan Foundation of Scientific Libraries and the Consortium of Scientific Libraries in Poznan aimed at making available digital resources for educational and research purposes in Poland. Nikisch and Gorny (2005) discussed the organisational assumptions, technology, functionality and resources of the Wielkopolska Digital Library (WDL) in Poland. And also reviewed the activities of Polish libraries in the field of digitising library collections and the problems of librarians in developing digital libraries in Poland. The collection of WDL consists of “educational collections, national heritage collections, publications referring to the town of Poznan and the Wielkopolska region, and musical scores”. WDL consists of full-image publications in PDF and DjVu formats. Full-text publications in HTML and XML formats. WDL is run on the dLibra software, which consists of the metadata module, users module, search module, contents module, events module, and service management module.

Iranian cultural heritage, embodied in the ancient manuscripts that are spread out in the different libraries of Iran “was in danger of being lost forever because of political strife, natural disasters, looting, and biological decay”. Digitisation is the only way to enhance this tradition. Madden and Seifi (2011) explored some manuscript digitisation projects involving Islamic, Iranian, and Persian cultural heritage, like “Haram online manuscript service of the National Library” and “Archives of Iran (NLAI)”. Also explored collaborative bodies such as the National Initiative for Networked Cultural Heritage (NINCH) and libraries, archives, museums and research institutions in the field of cultural heritage. The purpose of this study was to explore the historical context and interdisciplinary research aspects of digital surrogates of Persian manuscripts that hold the rich Persian poetry, art, philosophy, and science.

Information technology and digital technologies open up new opportunities for the cultural heritage sector for promoting research and development and for

preserving and providing digital access to their valuable resources. Segbert (2004) has provided an overview of Trials Support Measure (TRIS) and take-up trial projects for the digitisation of cultural resources in Europe. This study covered the major trial-up projects in Europe like “Digicult, CHOSA, Dominico, E-Islam, KIST, LabVR, MATAHARI, TREBIS, VIRMUS, CTIC, VALHALLA, Books2u”, etc. Aim of this study was raise awareness of these trial-up projects to the wider audience. Investigator presented these trial-up projects under five sub themes according to their objectives: (1) “museum system and scientific heritage”, (2) “information management, exploitation and interfaces”, (3) “digital libraries and digital documents”, (4) “heritage and territory”, (5) “education and publishing”. Segbert also introduced some trial-up projects in the field of libraries and archives: (1) “Books2u!”- It was a new version of inter library loan through digitisation of monographs, (2) “EULER”- it was an initiative to create a digital library in the field of mathematics, (3) “Seax-DAMAS”- It was aimed to make transparent and easy access to the local content and traditions, (4) “Sandalya”- preservation of rare and precious documents, (5) “Archiview”- it was aimed to manage the documentary content in the archives of historical cities.

Funding agencies like the New Opportunities Fund (NOF) put up some initiatives to create online resources by collaborating with partner institutions like libraries, archives, museums to enrich life-long learning. Nicholson and Macgregor (2003) shared the details of the New Opportunities Fund (NOF) and its programme NOF-digitise. Article described few projects under NOF-Digitise, ‘British Pathe’, ‘Ápplause Southwest’, ‘I Dig Sheffield’, ‘The union make us strong: TUC History Online’, ‘Gathering the Jewels’, ‘Act of Union’ to improve the online access of cultural resources from the UK’s libraries, archives, and museums. And it also provided insight into the problems and issues related to the digitisation initiatives. From the investigator descriptions, the “BritishPathe.com” website contains 3,500 hours of video footage and 12 million JPEG stills. In “I Dig Sheffield” website, more than 400 objects have been preserved, photographed, and mounted. TUC History Online opens the door to the collections in the Trades Union Congress Library. “Ápplause Southwest” offers access to the images, histories, and 3D virtual

reconstruction of theatre arts in the south west of the UK. Underestimate the time, expertise, effort and expenditure needed for content creation and metadata creation and being unaware, of the importance metadata standards were the issues to be considered when starting a digitisation project.

A sustainable user-driven digitisation prioritisation framework is needed to encourage consultation and collective engagement between library professionals and users. Birrell et al. (2011) presented the objectives, methods, and implementation, outcomes, and results of the DiSCmap project, funded by the Joint Information Systems Committee (JISC) and the Research Information Network (RIN). This project analysed the users needs, demands, and priorities for the digitisation of special collections within the context of UK higher education. The main objectives of the DiSCmap project were to survey end users and intermediaries (library professionals) to know the priority collections for digitisation, identify user's needs and demands for special collections, formulate a synthesis by analysing previous and current studies on user needs that dealt with the usability and format of digitised resources. DiSCmap project surveyed 1000 end users and intermediaries using web based questionnaire. It was found that, "improve access, enhance impact on research, facilitate resource discovery, enhance impact on teaching, and meet evidence of user demand" were the top-level user-driven criteria for prioritising digitisation of special collections.

To identify the digitisation issues in European countries and the current status of digitisation in Europe's cultural institutions, NUMERIC project has been established. Poll (2010) introduced a project called NUMERIC funded by the European commission. The study described the methods, steps, survey, and features of the NUMERIC project for assessing the current state of digitisation in Europe's cultural institutions. According to the findings of the investigator, (1) NUMERIC project was conducted in 2 years, (2) questionnaire was used to get responses from the sample selected, (3) only 48 per cent of the respondents indicated that they have a digitisation budget, (4) 67.4 per cent of the respondents have an online catalogue for their digitised collection, (5) about 50 per cent of the responding institutions

allowed free and unrestricted access to their digital collections. The study concluded with the opinion that the NUMERIC project has raised awareness of the importance of digitisation of data in Europe's cultural heritage institutions.

The University Historic Photograph Collection (UHPC) holds the institutional memory of Colorado State University (CSU). Hunter, Legg and Oehlerts (2010) told the success story of digitisation of the University Historic Photograph Collection (UHPC) documents the history of Colorado State University (CSU) and the surrounding community of Fort Collins, Colorado. Equipment problems, communication problems, and staff shortages were the problems that emerged during this project. The factors behind the success of this project were: the institutional support, the effective avenues of communication established between the project participants, and the use of project-tracking documentation. The study also showed that, how the collaboration between the project archivist, the digital projects librarian, and the metadata librarian led to the success of this project by combining their specialisation and expertise. This study revealed how collaboration between librarians, archivists, and other experts from different professional methodologies works and leads to the successful digitisation of antique resources.

Documents and images in the Trades Union Congress (TUC) library “are a valuable resource for analysing historical developments, as well as informing economic and social policy and practice in the twenty-first century. Coates (2009) has portrayed the history, collection, and digitisation process of the Trades Union Congress (TUC) library in Britain. The major objectives of this digitisation project were (1) “to create an online library of resources for the study of labour movement history”, (2) “democratise access to precious rare or unique archives and to conserve these fragile archives for the future”, (3) “provide distance access to precious and fragile archives”, (4) “create surrogate copies that would aid conservation by reducing the need for handling original documents”. Investigator used a case study approach to explain the rich collection, digitisation process, and challenges involved in the Trades Union Congress (TUC) library digitisation project.

There is a need to evaluate the performance, collection, usage of collection, training, design, infrastructure, and development of digitisation projects. Anderson (2007) evaluated the user impact, their attitude and actions towards the Glasgow Story (TGS) digitisation project, funded by the UK's National Lottery's New Opportunities Fund Digitization (NoF-Digi) programme. In this project, a questionnaire, participant observation, focus group discussions, and feedback forum were used as evaluation instruments for collecting responses. The study suggested that there was a need for large scale impact evaluation for sustainable digitisation projects in the field of cultural heritage resources.

Breitbach (2002) described the one to one steps for the selection, acquisition, accessioning, maintenance, digitisation, metadata development, and website launch of the Garst photographic collection in Colorado State University (CSU) libraries. The major objectives of the Garst project were (1) "to create publically accessible digital heritage database that documents crucial information for the residents of Colorado", (2) "to build a collaborative structure among the state's libraries, museums, high schools, and other organisations to coordinate and guide the implementation of the digital library museum", (3) "to set criteria and standards to guide the selection of materials for inclusion in the digital library", (4) "to support libraries, archives, historical societies, and museums in the digitising of materials and managing digital objects". According to the authors, the Garst project was a unique because it was managed fully by undergraduate students, from the collection donation to the launch of the final website containing 1000 digital images.

"The advent of digital records and their inevitable proliferation as original source material signifies profound medium to long-term changes for historians, researchers and cultural heritage institutions as they face the challenges presented by preservation needs". Kallman (2014) conducted a pilot study on the digital preservation of cultural heritage information in Sweden. The main purpose of the study was to examine the current way of working on digital long-term preservation issues at the state cultural heritage agency's current needs and state of art at the national and international levels. The interview method was used for the study. In



the framework of the pre-study, different levels of digital preservation were defined: short-term, medium-term and long-term preservation. The main findings of this study were that high costs were needed for both storage and preservation, all the interviewed institutions have digital collections, none of these interviewees were currently using cloud solutions for storage and long term preservation of digital cultural heritage.

The concept of digital preservation can be defined in two aspects: one is the preservation of resources that are already in digital form, and the second is digitisation of printed resources that are in the stage of deterioration. Bhat (2017) conducted an online survey of the Digital library of India (DLI) to know the total number of digital content contributed to DLI and to examine the language and centre-wise contribution to DLI up to December 30, 2016. As per the findings, (1) CDAC-Noida was the number one contributor to DLI, (2) Gujrat Vidyapith Library and the U.S. Department of Education were the least contributors to DLI, (3) “majority of digital books contributed to DLI were in English”, and (4) least number of books contributed to DLI in Nagamese , Kokborma, Nagari and Bhojpuri languages. Study pointed out the role of the Digital Library of India in providing access to digitised books and manuscripts and also described the importance of digital collection.

“The use of metadata has been widely recognized as a crucial component in digital libraries and for discovering and sharing information resources in a networked information environment”. Shreeves, Kaczmarek and Cole (2003) told the story of Illinois OAI-PMH project which aimed to test the efficiency of the OAI-PMH (Open Archives Initiative Protocol for Metadata Harvesting) model for the search and discovery of information resources in the domain of cultural heritage at Urbana-Champaign and was funded by the Andrew W. Mellon foundation. Study examined the subset of metadata contained in the University of Illinois cultural heritage repository, and detailed results have been presented. Investigator provided an overview of the technical challenges faced by the Illinois OAI-PMH in building OAI-based metadata harvesting services and a web portal. Dublin Core (DC)

elements for all 23 repositories have been analysed in this study. It was found that (1) date, identifier, and title were the commonly used elements by the repositories, (2) date of creation/publication/copyright, date of digitisation, date of collection, date of metadata creation, range of years to which the resource belongs, geographic area which resource belongs, subject of the resource and type of resource were the coverage and date elements used by the repositories, (3) normalisation of metadata and use of a text-oriented data mining tool (Theme Weaver) were the solutions implemented to enhance the discoverability of metadata records in a cross-collection repository. Investigator also suggested that the division of metadata into sets might help the service providers too easily harvest the metadata and effectively group the metadata into useful indexes.

Ensuring long-term preservation of digitised collections is the major topic addressed by the institutions that have digital collections and institutional repositories. Liu and Oehlerts (2013) pointed out the models, theories, technologies, and collaboration for digital preservation practices at Colorado state university libraries. According to the experience of the authors, planning for digital preservation should be a component of initial digitisation project planning. It was determined that the best archival formats should be chosen before the digitisation. Accessibility, interoperability, and sustainability were the criteria for choosing archival file formats. Colorado state university libraries operates two digital asset management systems, CONTENTdm by OCLC and DigiTool by Ex Libris. Migration of digital content from CONTENTdm to DigiTool began in 2010 in order to reduce maintenance costs. It also identified the need for close collaboration between librarians and IT professionals. Development of a long-term digital preservation policy was an ongoing process, evolving over time as needs changed, thus, libraries needed to remain aware and flexible. It was found that “digital content of CSU digital libraries were came from in-house and outsource digitisation”.

Intellectual property agreements, money, and library collaborations are required for conducting a massive digitisation of cultural heritage collections. Marcum (2003) thought about the three characteristics that a future digital library

should have. Digital library should have a comprehensive collection of resources that are accessible to all types of users without discrimination and that will be managed by professionals who are the stewards of the intellectual and cultural heritage of the world. According to the investigator, three characteristics of the digital library were: (1) “a comprehensive collection of resources important for scholarship, teaching, and learning”, (2) “readily accessible to all types of users, novices as well as the experienced”, (3) “managed and maintained by professionals who see their role as stewards of the intellectual and cultural heritages of the world”. Investigator explained various concepts like “what was mass digitisation?”, “what were the key characteristics of mass digitisation?”, “examples of mass digitisation projects”, and “pros and cons of mass digitisation”. Copy right issues, money, and duplication of effort were the major obstacles noticed in the mass digitisation project.

Now a days digital library activities are gaining a momentum. Ficarek (2002) examined the work flow process of the Louisiana Purchase digital library project of Louisiana State University (LSU) includes the digitisation of letters, documents, manuscripts, books, and case files. This project was funded by the Institute of Museum and Library Services (IMLS). The investigator explained the different steps involved in the Louisiana Purchase digital library project, (1) preparations before digitisation, (2) creation of navigation order, (3) selection of digital file name scheme, (4) scanning, (5) selection of image resolution and storage of image, (6) creation of thumbnails, (7) usage of image viewer and organising images, (8) implementation of page turner and metadata creation. LSU digital library system runs on the Lotus Domino platform. From the experience, the investigator revealed that, advance planning before starting a digitisation project and tackling the issues of the quality of the digitised collection are essential.

For a sustainable digital library system, there is a need for plans and policies in the fields of standards, metadata creation, infrastructure, interoperability, training, copyright, and preservation methods in India. Varatharajan and Chandrashekara (2007) provided the details of various digital library initiatives in India, like the

Digital Library of India, National Mission for Manuscripts, Traditional Knowledge Digital Library (TKDL), Digital Library Initiative at the National Library of India, Centre for Development of Advanced Computing (C-DAC), Digital Library of Art Masterpieces, Indira Gandhi National Centre for the Arts (IGNCA)—Kalasampada, Khuda Baksh Oriental Public Library, Vidyanidhi Projects, etc. Investigator revealed that the institutions in India, that were conducting digitisation initiatives needed support from the central and state governments to tackle the problems of funding, governance, and technical issues.

Cultural heritage institutions have a digitised collection of resources using web statistics to measure the use of their website and digitised collection. Voorbij (2010) conducted a content analysis to identify the use of web statistics by the cultural heritage institutions in the Netherlands. Study employed a survey, follow-up interviews, and content analysis of annual reports. It was found that the use of web statistics was quite common in the Netherland, and Google analytics was the most popular software package for measuring web statistics.

Presently, cultural institutions are building innovative network services by digitising their rich cultural collection with the help of Information and Communication Technology (ICT). Manaf (2008) collected opinions from information experts about the creation of a National Digital Cultural Heritage Repository Centre (NDCHR) in Malaysia using a modified Delphi technique. The primary goal of the NDCHR was to improve resource discovery, preservation, promotion, and accessibility of the nation's cultural heritage resources. The study discussed the opinions of experts on the importance of creating the NDCHR in Malaysia and the needs and functions of the NDCHR. According to the literature reviewed in this study, the human factor, the content management factor, the governance factor, and the technology factor were the challenges that needed to be addressed by cultural institutions for digitising their collections. The finding of this study was that there was a necessity to establish a central database in Malaysia collecting information on digital cultural heritage. And it also affirmed that

cooperation and collaboration in digitisation project among the cultural heritage institutions were the most important factors in the success of the NDCHR.

Purday (2009) highlighted the genesis, development, launch, and future of the cross-domain cultural heritage portal called Europeana. eu, Europ's digital library funded by the European commission. A total of 405 million items across the range of image, video, text and sound formats have been integrated, and user interest has proved higher than anticipated. Study explained various concepts related to the development of Europeana, (1) "political endorsement", (2) "project antecedents", (3) "user requirements", (4) "public previews of the portal", (5) "content collection and ingestion", (6) "object surrogacy", (7) "system usage", (8) "launching Europeana", (9) "Europeana's future", and (10) "Europeana group: core projects."

It is very important to preserve the digital content as same as its analogue counterparts. The management of digital heritage preservation in Eastern Africa was evaluated by Mutula (2014). The goals of this study were to identify the criteria used to prioritise content for digital preservation, to identify the difficulties in preserving digital history, and to suggest a framework for overcoming these difficulties. It was discovered that: (1) Eastern Africa was becoming more aware of the management of digital preservation. A number of seminars and workshops were held with the goal of understanding the challenges associated with managing heritage preservation and strengthening capacity for safeguarding intangible cultural heritage. (2) Economically advantageous data, web-based literature, content generated by social media, and content on organisational intranets were the materials prioritised for digital preservation in Eastern Africa. (3) The major challenges faced in digital heritage preservation in Eastern Africa include a weak policy and legislative framework, a lack of coordination in digitisation activities, a lack of common standards, issues pertaining to intellectual property rights, low internet connectivity, technological obsolescence, a scarcity of skills, a lack of human, financial, and technological resources, and the fragility of storage media. The investigator also suggested some approaches to improve preservation management, which include (1) "enhancing the capacity of institutions with statutory responsibility for heritage

preservation management to effectively carry out their mandates”, (2) “enactment of enabling digital heritage preservation policies and strategies”, (3) “embracing both social and technical approaches in digital heritage preservation”, and (4) “deploying cloud and grid computing technologies to address processing and storage needs associated with digitisation”.

“Information retrieval is at the core of digital libraries and focuses mainly on developing related technical methods for the effective indexing and retrieval of relevant information for users”. Tsai (2007) reviewed some literature to identify the retrieval methods based on the perspective of image retrieval that were supported by the current digital cultural heritage libraries. General concepts of content-based image retrieval methods, semantic gap problems, and user’s needs were also discussed. And also compared the related works in terms of their supported retrieval methods. This study was helpful for future cultural heritage applications to provide improved retrieval functionality. It was found that “query by example”, “query by specification”, “browsing”, “relevance feedback”, and “keyword-based queries” were the retrieval strategies followed by the respondents. The low-level content based retrieval approach did not provide retrieval results effectively.

A comprehensive coordinated and global approach to digital preservation is needed to identify the risks associated with the preservation of digital content and formulate strategies to mitigate these risks. Knight (2010) provided key concepts, legislative and strategic context, and the technical environment of the National Digital Heritage Archive (NDHA) project of the National Library of New Zealand. The study found that the major key factors to be considered in developing a digital preservation programme. Investigator gave a brief description of, (1) “defining digital preservation in the context of legislative and strategic considerations, effects of digital preservation in business, integration of digital preservation systems into an organisation’s infrastructure, how to migrate the current digital content into the preservation environment, and how to measure the performance of a digital preservation system”, (2) requirements needed for starting a digital preservation system. Investigator developed a four-tiered approach to digital preservation. Also

provided details of some digital preservation models and projects to access advice on best practices in digital preservation.

### **3.5 Collaboration in Digitisation Initiatives**

The first step to starting a collaboration project is to conduct an environmental scan of the technology and knowledge of the participating institutions. Bailey-Hainer and Urban (2004) told the success story of ‘Heritage Colorado’ and ‘Western Trails’, two grants projects of the Colorado Digitisation Program (CDP). Heritage Colorado was a project that aimed to develop a model library-museum collaboration for creating digital resources. Western Trail was for multi-state, museum- library collaboration. Also showcased the pros and cons of collaboration. Investigator found that major problems of collaboration occurred during Colorado project were (1) collaboration between different cultural heritage institutions was time consuming, and (2) confusion due to the usage of different subject terminologies by the different institutions. Collaboration extends the capabilities of local cultural heritage organisations through shared experiences, infrastructures and resources.

Han (2010) discussed a collaboration project called “preserving and creating access to Afghanistan literature” with the aim of cataloging, digitising, creating metadata and building a preservation infrastructure for a unique collection of documents related to Afghanistan history and culture. The objectives, project team, work flow, challenges, and solutions for the project were discussed in detail.

Cooperation is essential for creating a good digital library. Gemmill and O’Neal (2005) outlined the project history and approaches used by the staff to develop the Ohio Memory online scrapbook, which was a database that provided access to documents, photographs, history specimens, and artifacts drawn from all over the countries of Ohio. Ohio Memory was a content driven site that provided access to digital images and their historical importance. Investigator analysed the three-pronged approach used in the Ohio memory online scrapbook project. The components of three-pronged approaches were (1) creating content which includes, (a) selecting the content by using criteria, historical significance, complementary

value, scanning potential, time period, copyright, (b) digitisation, (c) metadata creation (2) second component was “development of tools”, (3) third component was outreach. This Ohio project tried to encourage co-operation between libraries, archives, museums, historical societies, and other cultural organisations to allow the global community to discover and explore Ohio’s rich past.

A common vision, collaborative institutional infrastructure, and adequate funding were the three factors essential to creating sustainable digital information. Yeates (2006) described the creation of a large geographically based cultural heritage consortium, SoPSE (The sense of Place South East), in the south east of England funded by NOF. SoPSE clarifies the role of local authorities, suppliers, content holder communities, and commercial technical expertise for disseminating local cultural heritage via the web. Investigator used a case study approach to describe the SoPSE consortium by using themes of the European Union’s Digitisation Policies Benchmarking Model, (1) “management (objectives, work plan)”, (2) “human resources (available skills)”, (3) “funding (including sustainability)”, (4) “productivity (including the proportion of content that has been digitised)”, (5) “impact (added value)”, (6) “priorities (selection criteria for digitised materials)”, and (7) “technical aspects (appropriate technologies)”. Insufficient funds, intellectual property rights issues were the problems encountered in the SoPSE project.

Bond (2006) outlined the details of the scanning methods adopted, collection searching options, collection access cost to maintain the collection, and reference service of early the Washington Maps project. This was a collaborative project between Washington State University (WSU) and University of Washington (UW). This project made a virtual collection of maps that were physically housed at different institutions around the Washington state.

“Libraries are also drawn to collaborative projects because of increased external funding opportunities, enhanced collection synergies and credibility, and a sense of community obligation”. Gwynn (2016) illustrated some capsule case studies of successful collaborative digitisation projects to show the strategies,



benefit, and challenges of community collaboration in digitisation projects. The challenges of digitisation have been categorised into two types, strategic and operational. Collaboration collection development goals and financial incentives. Investigator provided “general conversations about cooperative collection development and other collaborative projects”.

Making collaborations between professionals from different backgrounds on digitisation project is a complex task. Melrose (2004) provided the details of the experience, funding, collaboration with partners, and problems of the “North Yorkshire Unnetie Digitisation Project” funded by the “New Opportunities Fund (NOF). It was a small co-operative undertaking to digitise the little-known archive of a local photographer, Bertram Unne, and to provide digital educational material relating to the history and culture of the UK. Investigator gave some experience as collaboration is complex task. It takes more time and effort to understand the strengths of the people involved in the collaboration and work on it.

Gorman (2007) explained the importance of libraries in providing access to and preserving of cultural heritage in concert with other cultural institutions. The cooperative bi-lateral and multi-lateral structures and agreements, such as shared standards and procedures, between libraries and the cultural institutions harness the energy and expertise to achieve the organisation, preservation, and transmission of cultural heritage.

“Collaborative challenges that librarians and museum professional’s face, including the lack of a shared vocabulary and differences in cultures and funding structures. By respecting these differences and ensuring that all participants benefit, digitisation programmes can develop collections that are more diverse, increase the efficiency of the digitisation process, and create additional funding options”. Middleton (2005) provided solutions to address the technical, financial, and social challenges faced by collaborative digitisation programs. These programmes were different in terms of structure, participating institutions, software and hardware used. To tackle the challenges of collaborative digitisation programmes, programmes should implement the sound business planning practices, empower digitisation

professionals with training and tools, build strong collaborative networks, empower content providers with appropriate tools, training, and support, and engage end-users with powerful, interactive tools and database of digital objects.

Zhang (2011) reported the proceedings of the China North America Library Conference took place in the capital city of China. Conference discussed the resource sharing policies, digital infrastructure, repository technology, sharing digital preservation methods, research data sharing, shared digital access, retrieval, and use. Conference showcased the importance of many shared projects, like the national cultural information resource sharing project, multi-cultural Canada project, data conservancy, national library digital exchange services and museum platform.

Ryan (2010) explored the collaborative efforts of Aluka and its partners to establish digital labs in Africa to digitise archival documents, manuscripts, and reference works to share online. Intermittent and unreliable power supply, and lack of access to high end equipment were the challenges that limit the operational efficiency of their digitisation project.

Trifunovic (2013) concentrated on the public library- private sector partnership employed in the digitisation of old archives of audio-video content that were kept in several TV and radio stations in Cacak, Serbia. The study discussed the importance of historical and cultural heritage information stored on the audio-video tapes and their digital preservation, legal obstacles, and complicated copyright issues.

Tait (2013) conducted a case study of the community of the Outer Hebrides of Scotland to investigate the technical and social processes involved in the construction and use of community based digital heritage initiatives. Findings of the study shed light on the impact of these initiatives on the local community user group, the potential tension between the values of heritage gatekeepers, the role of social media for collaborative community heritage, and the challenges faced by community digital heritage initiatives.

### **3.6 Policies and Legal Implications in Digitisation Project**

“The legislation can drive the digital preservation initiatives at the national level, and the institutional policies can drive the digital preservation activities at the organisational level”. Katre (2012) compared the Indian and international digitisation initiatives, especially the US initiative, to identify the differences and help the Indian government strengthen its activities on digitisation programme. Study mentioned the need for legislation on digital preservation and the requirement of an institutional policy framework to drive digital preservation in institutions. Study described the digital preservation policies of Parliamentary Archives, UK, Library and Archives of Canada (LAC), H-Net Electronic Mailing List, National Library of Australia. It was found that (1) “the Indian government needs to formulate legislation on the preservation of electronic records and digital information with high priority”, (2) “The institutional digital preservation policy is a result of the mandate, objectives, and legal obligations of the organisation”, and (3) “ The Indian archival institutions and record producers need to formulate their digital preservation policies to fulfil the primary need specified in the ISO for audit and certification of trustworthy digital repositories”.

“Good policies articulate the guidelines on access, the conditions of the materials, preservation issues, the audience for the materials, ownership of and project support”. Mapulanga (2013) explored the policy guidelines on access, preservation issues, type of materials, ownership of rights, and the audience of materials of digital repositories in the University of Malawi libraries (UNIMA) and also analysed the software and hardware requirements, staff development and training, and challenges for building digital repositories. Online questionnaires were used for data collection. It was found that, UNIMA libraries have faced a lack of policy guidelines, technical support, and funding. UNIMA libraries had not drawn any specific policies for institutional repositories and digitisation at the time of study. And also “indicated that a proposal was put to the UNIMA postgraduate committee to consider revisiting the research and publications rules and regulations,

especially on content and collection policies, submission process, copyright and licence issues, metadata, privacy, and service policies”.

“Policy covers areas like authority, responsibility, access, selection, acquisition, implementation, reformatting, etc. Preservation policy ensures the security of access to digitised books and materials. The policies, which are also customised as preservation tools for safe and fair use of resources, monitoring, reviewing, et al. At the present time, the policies for ensuring long-time storage, maintenance, migration, and across digital materials in a secured way”. Das (2017) pointed out some legal aspects such as copyright, intellectual property rights and licencing for digital preservation in academic libraries. The study listed some key legal issues that might occur in cases of accessibility of resources, filtration of resources, applying privacy work flow, freedom of information, resource removal, licencing of the resources, information liability, digitisation of books and other contents, software lending in libraries, etc.

Copyright issues emerged when digitising the collection and make it available through internet. James (2005) shed some light on the serious issue faced by most of the digitisation projects: copy right law. Without the permission of the actual owners of the work, digitisation of the document and exploitation of the digitised documents through lending and uploading digitised documents to the website are violations of copyright law. Study suggested that before starting a digitisation project, the library has to ensure that it was not infringing on any copyright. Study also found that copyright owners can use technological measures like encryption, copy control flags, watermarking, and macrovision to protect their work in a digital environment.

### **3.7 Challenges of Preservation**

Information technology applications in libraries have widened the opportunity to access digital content in addition to preserving it. Libraries, especially academic research and special types, are investing huge amounts in procuring e-resources such as e-journals, e-databases, e-books and so on, and have started digitizings it’s own collection such as theses and dissertations, faculty publications,

reports, and so on. Archival institutions and museums also play a major role in preserving digital information by establishing policies and strategies. Ganesan et al. (2014) studied the issues and strategies for the preservation of digital content in Indian libraries. This study highlighted digital preservation issues faced and strategies to be followed for preserving digital information. This study also provided a bird's eye view of some of the Indian libraries and information centres involved in digitising their collections and issues faced by them, and as well as the remedies to be taken while preserving the digital content. This study also pointed out the major digital library initiatives in Indian libraries and information centres, such as CSIR, Ministry of Science and Technology, Department of AYUSH, Ministry of Health and Family Welfare, Shodhganga project, etc.

There are a number of problems emerging with effective digitisation projects. Iwhiwhu and Eyekpegaha (2009) have emphasized the importance of digitisation in Nigerian universities. The main objectives of the study were to (1) understand the availability of a policy on library digitisation, (2) check the ICT infrastructure in place to enhance digitisation, (3) analyse the level of training of library staff in ICTs and user education/digital literacy programmes and effective information delivery in the Nigerian university library, and (4) ascertain the funding sources for the digitisation project. Investigator employed survey research to collect data from the professional and para-professional staff of the universities. Unskilled staff on ICT applications, high cost of purchasing equipment, lack of policy and implementation, lack of maintenance culture, funding, network fluctuations, space inadequacy, lack of Internet connectivity, environmental disaster and epileptic power supply were the crucial challenges militating against the effective library digitisation project in the Nigerian university library. It was found that “computers, servers, telephones and internet facilities were available, but there was no alternative electric power supply in case of a power outage”, 57.5 per cent of the respondents indicated that no special fund/budget was allocated to the digitisation project. 27.5 per cent of the respondents said, “the government/university management team should support the library by enacting and implementing effective policies on digitisation and providing of adequate funds for digitisation projects, respectively”.

“Audio-visual preservation projects are creating large digital collections, which then share with all other digital collections the problem of sustainability: maintenance and regeneration of the collections”. Wright (2004) presented the findings of the Presto project funded by the European Commission for understanding the issues and problems of digitising audio visual cultural heritage and finding solutions. Investigator explained the problems of audio-visual media, the concepts of the presto project and solutions for how to organise audio-video and film preservation.

“Digitisation has brought many benefits to archive services, particularly in terms of outreach and promotion but also, indirectly, by improving other services such as reprographics and creating new opportunities for cataloguing and preservation. It is important that digitisation occur not just because funding is available but also because it would be of direct benefit both to the collections and to users”. Brown (2006) tried to examine the reasons behind and issues involved in the digitisation project at the archival repositories of the University of Dundee. He found that digitisation activities of the University of Dundee archive have positive output because of competition for resources and the requirements of funding agencies for archives, which were becoming increasingly involved in attempting to determine the needs of the users and in measuring customer satisfaction.

“Preservation is an umbrella term under which most librarians and archivists cluster all the policies and options for action, including conservation treatments of different formats of information materials”. Kalusopa and Zulu (2009) presented some of the findings of the study on the current status of digital heritage preservation in Botswana and suggested some recommendations. Objectives of the study were to understand the strategies and policy issues for the long-term preservation of digital materials. The study used the survey method, consisting of various methods such as field work, document research, observations, etc. The study revealed that most of the public heritage organisations were doing digitisation in-house, whereas private organisations were using commercial service providers to undertake digitisation work on their behalf in Botswana. Lack of a national policy

framework, relevant legislation on ICTs, standards in digital heritage material preservation, and the absence of coordinated national initiatives are the major challenges of digital heritage material preservation in Botswana.

Digitisation offers a partial solutions to the preservation and access of fragile resources. Kumar Das et al. (2009) participated in a study about the digitisation, strategies & challenges of digital preservation. This study investigated a digitisation initiative to conserve the rare documents and rich collections in the Visva-Bharathi library. The researcher made an effort to draw attention to the importance of digital preservation, related tactics and problems, and the work that the Visva-Bharathi library is doing in this area. This paper provided a thorough explanation of the digitisation process as well as the variables and problems that affect how our intellectual and cultural legacy is preserved.

There is a proliferation of digital resources in Africa like online newspapers, online book reviews, digital government orders, and archives. Limb (2005) identified the three basic issues pertaining to digitisation in Africa: providing improved access, maintaining the sustainability of collection, and legal issues related to censorship. Study provided detailed information about the digitisation initiatives in Africa. Investigator provided examples of successful cooperation in building digital libraries with African content, like the “Political Communications Web Archive Project”, “eGranary Digital Library”, “African Online Digital Library”, “The history and culture of Futa Toro”, “Senegal and Mauritania”, etc. Investigator found the major issues related to digitisation projects in Africa: (a) maintaining access to digital scholarly resources without discrimination based on class and other inequalities, (b) maintaining sustainability, (c) the risk of long-term ICT investment due to the structural weakness in African economies and other fragile social infrastructure, (d) and other legal, ethical, and commercial issues like threats of censorship, restrictions on accessing information because of monopoly-ownership patterns, and yawning inequalities of the "digital divide”. Investigator suggested that wide pan-African and international collaboration, combining of the technical, socioeconomic, cultural, and organisational conditions of Africa, and the

combination of open-access with not-for-profit models to improve access to scholars globally and ensure sustainability.

Perry (2014) took part in a study about digitisation and digital preservation. The main purposes of the study were to identify the meaning of digitisation and digital preservation, and what the challenges of digital preservation are. The findings of this study revealed that obsolescence of technology, copyright issues, untrained staff, etc. were the major challenges of digital preservation.

“Over the years, the library has accepted the challenge of preserving the cultural heritage of the people it serves”. Ezeani and Ezema (2011) explained some managerial problems associated with the digitisation project of the University of Nigeria, Nsukka and the strategies adopted by them for improvement. The objectives of the study were to ascertain the adequacy of skills possessed by the personnel involved in the digitisation project, check the reliability of the hardware and software used for the digitisation, examine the managerial problems associated with the digitisation project, and find out the strategies to address these problems. The major problems were the personnel involved in the digitisation not have sufficient digitisation skills, a lack of funds, an inadequate power supply, etc. Study suggested that, for the improvement of digitisation process, advance training should be provided and the digitisation integrated skills in to the curriculum of library schools.

Digital preservation programmes established by libraries, archives, and other cultural heritage institutions addressed the issues of the preservation of technology and digital content. Arora (2009) stated that digital resources have several advantages over their analogue form, but it is a fact that the chance of losing data in digital form is much higher than any other form. Dynamic nature of digital contents, fragility of the media, machine dependency, shorter life span of digital media, technological obsolescence, copyright and intellectual property rights (IPR) issues and format and style were the challenges for preserving digital materials. Depending on the life span of the digital object, digital preservation strategy can be classified into three categories: long-term, medium-term and short-term.



“Information emanating from governments, institutions, organisations, scholars, and private individuals was increasingly appearing online and being demanded electronically, thereby creating a new environment and challenging the library and archival profession”. Asogwa (2011) reviewed some literature on current issues in archiving, preservation, and digitisation to understand the basic approaches, information technology applications, reasons, and challenges to the digitisation of archival collections in Africa. The major purposes of the study were to, (1) examine the implementation of information technology in the digitisation project in Africa and the basic approaches that Africa should know about in the digitalisation of their archival collections, (2) identify the reasons why cultural institutions should preserve their collections in digital format, and (3) understand the “challenges facing African archivists in their efforts to digitise their cultural heritage collection”. Constantly changing hardware and software, inadequate funding, inadequate technical expertise, inadequate technological infrastructure, technological obsolescence, a lack of legislation/policy, and the deterioration of digital media were the major impediments faced by African archivists.

The “rapid development of information technology can result in challenges for the preservation of digital information. Now, the fragility of data, just as its convenience, has gradually been recognised and there are a number of initiatives underway in different parts of the world to address problems of preservation”. Daoling (2007) has conducted a comprehensive survey to identify the main challenges to preserving digital resources in libraries, archives and information centres in China. Investigator used online questionnaire to gather data about types of digital resources in the institutions, their current preservation status, and disaster recovery measures followed by these institutions. According to this study, complexity of digital collection, weak data backup management, lack of relevant knowledge on preserving digital resources, poor maintenance, and selection of storage media were the major challenges to preserving digital resources in China. Investigator thought that uncontrolled production of data, “neglecting maintenance for long-term access to data”, and being unaware of the “relevant knowledge on preserving digital information resources”. Study suggested that a relevant

international conference or workshop should be held in China for training on the management and operations of digital preservation.

Bad paper quality, poor inking, bad printing, obsolete characters, and historical language problems may lead to the unsatisfactory performance of OCR technologies to transform digital images of historical documents into electronic text. Balk and Ploeger (2009) introduced a project proposal of 7 libraries in Europe, “Improving Access to Text” (IMPACT), to ways of enhancing the quality of mass digitisation of historical documents.

According to Wisser (2005) metadata is fundamental for the administration, dissemination, and preservation of cultural heritage materials in the online environment. This article focused on the approaches of North Carolina Exploring Cultural Heritage Online (NC ECHO) to overcome the challenges of effective metadata coordination for the development of an online portal for cultural heritage collection. To meet these challenges, four interrelated approaches have been identified: working groups, metadata first, training and outreach, and accessibility to expertise through metadata consultations.

Renshaw and Liew (2021) examined the attitude and experience of information professionals working across 10 cultural institutions in New Zealand with the descriptive standards and collection management system used for managing their documentary heritage collections. Study employed a qualitative approach to understand the attitude and experience of information professionals. A semi-structured interview method was used to collect data from the 13 information professionals. The findings revealed that the variances among metadata in libraries, archives and records management institutions in New Zealand can lead to challenges around the discovery and access of documentary heritage collections. Study also recommended that there was a need to conduct serious research on the collection management system used by the cultural heritage sector.

“Copyfraud” is a term that stands for “false claims of copyright”. Dryden (2011) focused on the technical measures taken by Canadian archival repositories to prevent the further use of their archival holdings available on the internet.

Investigator used multiple methods to get data from the respondents: (1) analysed the website content of the 154 Canadian repositories, (2) a questionnaire consisting of 46 questions, (3) conducted interviews with the staff members of the repositories. Study revealed that “few copy right complications” was the preferred criteria of the Canadian repositories for selecting materials. As per the respondents “increased access” was the reason chosen by the repositories for making their holdings available online. It was found that loss of revenue, threats to the authenticity of the documents, the reputation of the repository, and fear of legal liability were the reasons behind the actions taken by Canadian repositories. Canadian repositories used technical and non-technical measures to limit the online use of their holdings. The technical measures taken to control the use were to prevent copying, inform users about copyright, and reduce the quality of the copy using watermarks and reduce the quality of the copy using low resolution. In the non- technical measures, the including use of “term-of-use” (TOU) statements, 47 per cent of the total repositories included term-of-use statements on their websites.

Arranging finance for digitisation activities is a challenge. “IMLS has emphasised the development of quality standards and the dissemination of best practices for digitisation, interoperability, information discovery, and preservation to ensure that digital content will have maximum value and long-lasting impact”. Ray (2004) provided information about the Institute of Museum and Library Services (IMLS) which was the federal funding agency with a statutory body to fund digitisation. IMLS mainly focused on the creation, management, use and preservation of digital resources. IMLS funded more than 100 projects through the national leadership grant programme to enhance library and museum services.

### **3.8 Staff Development for Preservation Activities**

As per the current digital environment, professional development is the area that needs more attention and funding. Perry (2005) explained the importance of providing continuous education to the new generation of creators and managers of digital assets in digitisation techniques. Study examined the existing educational mechanisms and initiatives, including intensive workshops, online, hybrid, and

short-term instruction, in North America and Europe. It was found that, (1) “there was a need to improve access to hands-on learning, mentoring, and continuing education, as well as formal education of a new generation of creators and managers of digital assets”, (2) “examination of existing courses, workshops, and other instructional approaches can be extremely useful in prompting innovations within one’s own pedagogical repertoire or preparation for evolving responsibilities in digital librarianship”, (3) “the development of consensus on core competencies and model curricula, based on input from researchers, educators, and practitioners, will continue to influence the broad array of professional development opportunities in this important area”.

“Education of information professionals, who are responsible for the introduction of various kinds of information sources and preserving historical and cultural values, as far as possible, for the benefit of society, should be continuous”. Yılmaz (2013) evaluated a distance education programme in the area of digitisation offered in Turkey to determine how such programmes assist the staff members of libraries, archivists, and museums in gaining knowledge of digitisation. And the degree to which distant education has altered their conceptual and applied understanding of digitisation. The information needed for the assessment was gathered using a web-based questionnaire with thirty multiple-choice and Likert-scale questions. Predictive Analytics Software (PASW) was used for data analysis. “The results of this study were limited to the outputs of digitisation and digital content management training within the framework of Access IT, a project of the European Union and findings obtained from the questionnaire administered to 544 participants”.

As a result of a research conducted through the Institute of Museum and Library Services (IMLS), common constraints to the digitisation plans were a lack of funding, and a lack of experts. Maroso (2005) explored the grant-funded digitisation training project of Illinois, “Basics and Beyond”, emerged to provide different digitisation training programme to cultural institutions in Illinois and to develop a new set of experts who will create successful and long-lasting digitisation

projects. It was found that “the quiz responses show that participants in the workshops learned much from the presentations and were able to assess their own digitisation goals and needs and start planning a project for the future.

### **3.9 Conclusion**

It is important to pay attention to increasing awareness of the significance of documentary heritage, especially the need to preserve the endangered documentary heritage collection and provide access to it. In this chapter, the investigator reviewed 112 studies published in various sources and arranged them under 7 subject headings. The majority of the studies reviewed in this chapter were published in foreign countries. It was found that the number of articles dealing with the concepts of importance and preservation of documentary heritage published in India is lower as compared to abroad. In Kerala, a few journal articles have been published on documentary heritage. Specifically, the articles on the preservation of documentary heritage collections are less. The studies reviewed in this chapter helped the investigator to understand the whole picture of related studies published globally on the topic of the present study, the methods and strategies adopted by the other investigators, and the scope, need, and limitations of the present study.

In the first section of the chapter, the investigator reviewed the articles, which focused on the meaning, importance, types, and various aspects of cultural heritage collection. In the second section, the investigator reviewed the articles focused on the preservation of documentary heritage collections and identified various traditional and digital preservation methods. In the third section, the investigator provides a detailed account of the previous studies conducted on the significance, methods, and challenges of digitisation. And also, the investigator pointed out the various studies that give a clear picture of various digitisation projects all over the world. In the fourth section, the investigator reviewed the studies on collaboration in digitisation initiatives. The fifth section has provided the studies on policies and legal implications in digital preservation. Lack of policy, ICT infrastructure facilities, and expert staff were found to be the major challenges to

preservation in the previous studies reviewed in the sixth section. And the last section discussed the staff expertise in preservation activities.

It was found that the majority of the studies reviewed in this chapter followed a case study approach. The findings of the studies were limited to a specific institution or a specific library. A questionnaire, survey schedule, or interview schedule were used for data collection. Some of the studies were the result of personal observation and the experience of authors with digital preservation projects in their libraries or institutions. Statistical methods were used in a few studies. The number of studies that deal with the various dimensions of the preservation of documentary heritage collections from a Kerala perspective is comparatively low. So there is a research gap to acquire knowledge on the preservation methods adopted by the cultural institutions in Kerala for the preservation of their documentary heritage collection and the opinion of the staff of these cultural institutions on their expertise in preservation methods.

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# METHODOLOGY

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- 4.1 *Introduction*
  - 4.2 *Research Design*
  - 4.3 *Variables Used for the Study*
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#### **4.1 Introduction**

The drastic changes in the economic, social, academic, and technological sectors can have an impact on the preservation of documentary heritage collections held in libraries and cultural institutions. The research studies on the preservation of documentary heritage collections should take an interdisciplinary approach by combining cultural science, information science, and the humanities. The major proportion of the previous research studies adopted a case study method and literature review to know what the documentary heritage collection resides in the libraries and cultural institutions, how the different stakeholders preserve their documentary collection, what the new trends, developments, methods, and strategies used for preservation are, how the changes in technologies affect the preservation practices, and the challenges of the preservation of documentary heritage. The investigator applies the features of the case study, survey, descriptive, and observation methods of research in the study to fulfil the objectives.

Research methodology is a way of explaining how an investigator systematically conducts research to ensure reliable and valid results that address the research's aims and objectives. Research methodology details the techniques or procedures used to collect, analyse, and interpret information about a research topic. It's the systematic or logical approach of an investigator to resolve a research problem. The type of research problem and the data required for resolving these problems are the key characteristics of the method of study.

The present study adopted a multi-method plan to obtain both qualitative and quantitative data. Qualitative data was collected to deliver comprehensive knowledge on the research topic, and quantitative data was collected to deliver the various dimensions of the research topic. The benefit of employing a multi-method design is that it provides a better perception of the research problem than either single method alone could. The study also adopted a realism-philosophical pattern in interpreting the findings. The primary objectives of this study were to understand the preservation practices adopted for the protection of documentary heritage collections and the knowledge and practical ability of the staff involved in the preservation

practices. The qualitative data was collected to satisfy the first objective, and the quantitative data was collected to satisfy the second objective. This chapter provides a detailed account of the methodology adopted by the investigator to conduct this study.

## **4.2 Research Design**

Research design is a blueprint or structural framework of research methods and strategies adopted by the investigator to conduct his or her study. It gives a clear picture of the overall strategies and techniques utilised by the investigator in the study. It is important to ensure the validity and reliability of the study. The methodology employed in the present study is explained under the following headings:

- Variables used for the study
- Sampling design
- Tools used for data collection
- Data collection procedure
- Tools and techniques for data analysis

## **4.3 Variables Used for the Study**

The variables used for the study are mainly divided into two categories: independent variables and dependent variables.

### **4.3.1 Independent Variables**

An independent variable is a variable whose value does not change for another variable but can have an effect on a dependent variable. The independent variables used for the study are:

- Cultural institutions
- Working experience of the staff

#### **4.3.1.1 Cultural Institutions**

Cultural institutions are institutions that possess highly valued documentary heritage collections and have a mission to work for the preservation, conservation, promotion, interpretation, and dissemination of cultural, social, environmental, and scientific knowledge. It may include libraries, archives, museums, religious institutions, academic institutions, cultural organisations, heritage families, art galleries, etc. In the study, the investigator selected 15 cultural institutions in Kerala.

#### **4.3.1.2 Working Experience of the Staff**

Working experience, or expertise, is the skill or knowledge acquired by a person through doing a job or activity. In this study, the investigator tried to identify how the working experience or expertise of the staffs affected their knowledge and practical abilities in the preservation of documentary heritage collections.

#### **4.3.2 Dependent Variables**

A dependent variable is a variable whose value changes according to another variable and is being measured or tested in the research study. Following are the dependent variables used for the study:

- Availability of documentary heritage Collection
- Application of traditional preservation methods
- Application of digital preservation methods
- Availability of basic requirements for digital preservation
- Knowledge and practical abilities of staffs in traditional preservation methods
- Knowledge and practical abilities of staffs in digital preservation methods

#### **4.3.2.1 Availability of Documentary Heritage Collection**

Documentary heritage resources are recorded documents with a deliberate intellectual purpose, which include old and rare books, manuscripts, palm leaves, maps, historical records, etc. The current status of collection, conservation, preservation, and dissemination of documentary heritage resources varies with the policies and practices of concerned cultural institutions. Here, the investigator attempts to check the availability of documentary heritage collections in the cultural institutions in Kerala, who are the users of these collections, what are the services provided, and what are the causes of the deterioration of these collections.

#### **4.3.2.2 Application of Traditional Preservation Methods**

Preservation of documentary heritage collections is needed. Traditional or basic preservation methods include cleaning, dusting, fumigation, de-acidification, the use of natural repellents, lamination, etc. The application of traditional preservation methods depends upon the availability of skilled or experienced staff in the institutions, their budget allocation for these processes, and their policies and practices. Here, the investigator tried to identify the perception and attitude of the cultural institutions towards the application of traditional methods of preservation for the protection of documentary heritage collections.

#### **4.3.2.3 Application of Digital Preservation Methods**

The preservation of documentary heritage collections through digital means. The application of long-term sustainability models and effective digital preservation actions are required for the preservation and accessibility of these collections. The methods, strategies, and techniques used for digital preservation activities vary with the terms and conditions of the respective cultural institutions. Here, the investigator endeavours to understand the methods, needs, policies, techniques, and standards adopted by the cultural institutions in Kerala.

#### **4.3.2.4 Availability of Basic Requirements for Digital Preservation**

The basic requirements needed for implementing effective digital preservation actions are adequate hardware and software technologies, manpower, infrastructure facilities, finance, an effective legal and regulatory framework, a good preservation policy, leadership, collaboration between institutions, etc. All these factors required for digital preservation activity are based on the priorities, leadership, and economic conditions of the concerned cultural institutions. Here, the investigator sought to know how the cultural institutions in Kerala meet these requirements for the digital preservation of their documentary heritage collection.

#### **4.3.2.5 Knowledge and Practical Abilities of Staffs in Traditional Preservation**

##### **Methods**

The staff working in the cultural institutions play a vital role in collecting, managing, organising, preserving, and disseminating documentary heritage collections. The staff in charge of these cultural institutions that hold these vulnerable collections should have adequate knowledge of traditional preservation methods to safeguard them. Lack of skilled manpower is one of the major challenges to preservation. Here, the investigator aims to find out how the working experience of staff affects their knowledge and practical abilities in traditional preservation methods.

#### **4.3.2.6 Knowledge and Practical Abilities of Staffs in Digital Preservation**

##### **Methods**

The knowledge and practical abilities of staff in digital preservation methods include overall competencies, skills, attitudes, and perceptions in the creation, organisation, interpretation, and dissemination of digitised contents of documentary heritage collections. Here, the investigator made an attempt to study how the working experience of staff affects their knowledge and practical abilities in digital preservation methods.

#### **4.4 Sampling Design**

The ultimate research objectives of the study are to understand the preservation methods adopted by the cultural institutions in Kerala for the protection of their documentary heritage collection and the knowledge and practical ability of the staff who are working in these cultural institutions in preservation practices. For the purpose of the study, the investigator has decided to select two sets of samples. The cultural institutions in Kerala were selected to identify the preservation practices followed by these institutions. The staff working in these institutions are selected to assess their perceptions on their knowledge and practical abilities in preservation methods.

##### **4.4.1 Cultural Institutions**

All the cultural institutions in Kerala that possess documentary heritage collections are considered the population of the study. The cultural institutions include libraries, archives, academic institutions, religious institutions, cultural organisations, etc. Kerala is a state that is rich in terms of documentary heritage collections that reside in cultural institutions. Cultural institutions with a large collection of documentary heritage are dispersed in the 14 districts of Kerala. During the pilot study, the Kerala State Archives Department refused to provide data for the study because of their internal problems, so the investigator was forced to exclude the Directorate of State Archives, Thiruvananthapuram, Regional Archives, Ernakulam, and Regional Archives, Kozhikode, from the study. The Cultural Department of Kerala has listed around 30 cultural institutions on its official website. The different types of libraries with documentary heritage collection are scattered across all parts of Kerala.

The investigator identified and prepared a preliminary draft list of cultural institutions by analysing the websites of the institutions, previous research articles, newspaper clippings, formal conversations with the subject expert, and through personal experience and observation. The investigator has stuck to the difficulty of selecting the cultural institutions from the draft list for the study. It was not practical to study the whole population of cultural institutions as solo research in a limited



period of time. It was very complicated to study the entire population to reach a generalisation. So the investigator decided to select 15 cultural institutions by considering the geographical locations where they are situated. The investigator has selected five cultural institutions each from the southern, centre, and northern parts of Kerala, respectively. The investigator chose a total of 15 cultural institutions from the government, autonomous, and private sectors. The criteria used for the selection of cultural institutions include their large collection of documentary heritage, their renowned position in the documentary heritage sector, the mission and vision of their parent organisation, and their activities and initiatives for the preservation of documentary heritage. The list of the selected 15 cultural institutions is given in Table 1.

**Table 1**

*List of the Selected Cultural Institutions*

| <b>Sl. No.</b> | <b>Name of the Cultural institution</b>                       | <b>Place of the Institution</b> |
|----------------|---------------------------------------------------------------|---------------------------------|
| 1.             | State Central Library                                         | Palayam                         |
| 2.             | Kerala University Library                                     | Palayam                         |
| 3.             | Kerala Legislature Library                                    | Palayam                         |
| 4.             | Oriental Research Institute and Manuscripts Library           | Kariavattom                     |
| 5.             | Kerala Council for Historical Research Library                | Plammoodu                       |
| 6.             | Sukrtindra Oriental Research Institute Library                | Thammanam                       |
| 7.             | Sree Sankaracharya University of Sanskrit Library             | Kalady                          |
| 8.             | Kerala Sahitya Akademi Library                                | Chembukkav                      |
| 9.             | Kerala Agricultural University Library and Information system | Vellanikkara                    |
| 10.            | Kerala Kalamandalam Library                                   | Cheruthuruthy                   |
| 11.            | Guruvayur Devaswom Religious Library & Reading Room           | Guruvayur                       |
| 12.            | Thunchath Ezhuthachan Malayalam University Library            | Tirur                           |
| 13.            | Tunjan Manuscripts Repository                                 | Thenhipalam                     |
| 14.            | Department of History, Farook College                         | Farook                          |
| 15.            | State Revenue Reference Library                               | Thalassery                      |

By observing the general profile of selected 15 cultural institutions, it was found that, investigator selected 5 institutions from the south region of Kerala (State Central Library, Kerala University Library, Kerala Legislature Library, Oriental Research Institute and Manuscripts Library and Kerala Council for Historical Research Library), 5 institutions from the centre region of Kerala (Sukrtindra Oriental Research Institute Library, Sree Sankaracharya University of Sanskrit Library, Kerala Sahitya Akademi Library, Kerala Agricultural University Library and Information system and Kerala Kalamandalam Library) and 5 institutions from north region of Kerala (Guruvayur Devaswom Religious Library & Reading Room, Thunchath Ezhuthachan Malayalam University Library, Tunjan Manuscripts Repository , Department of History, Farook College and State Revenue Reference Library)

#### **4.4.2 Staffs Working in the Cultural Institutions**

The second major objective of the study is to identify the perceptions of staff working in cultural institutions about their knowledge and practical abilities in preservation practices. To satisfy the second objective, the population of the study comprises all the staff working in the selected 15 cultural institutions in Kerala. The number of staff working in these cultural institutions may vary depending on the type, scope, and importance of each institution. The total number of staff working in the selected 15 institutions is very low. So the investigator decided to study the whole population. The investigator selected all the staff working in the selected cultural institutions at the time of data collection for the study. The investigator administered 175 schedules to the staff, and 170 schedules were received back. 170 staff members working in the selected 15 cultural institutions participated in the study. Details of schedule distribution among staff are appended (Appendix A). The general profile of the staff is given in Table 2.

**Table 2****General Profile of the Staff (n=170)**

| <b>Variable</b>     | <b>Category</b>            | <b>Frequency</b> | <b>Per cent</b> |
|---------------------|----------------------------|------------------|-----------------|
| Gender              | Male                       | 67               | 39.40           |
|                     | Female                     | 103              | 60.60           |
| Profession          | Librarian                  | 143              | 84.12           |
|                     | Teacher                    | 5                | 2.94            |
|                     | Research/project assistant | 22               | 12.94           |
| Mode of appointment | Permanent                  | 97               | 57.06           |
|                     | Ad hoc/contract            | 73               | 42.94           |
| Type of institution | Government                 | 68               | 40              |
|                     | Autonomous                 | 101              | 59.41           |
|                     | Private                    | 1                | 0.58            |

By observing the general profile of the staff selected for the study, It was found that female staffs are dominated in number in all the selected cultural institutions compared to male staffs. Out of 170 staff, the number of female staff was 103, and that of male staff was 67. By observing the profession-wise distribution of the staff, it was found that, out of 170 staff, 143 are librarians, 5 are teachers, and 22 are research or project assistants. By analysing the mode of appointment-wise distribution of staff, it was found that the number of staff with permanent jobs is higher than the number of employees with ad hoc or contract-based jobs. Out of 170 staff, 40 per cent are from government owned cultural institutions, 59.41 per cent are from autonomous cultural institutions, and 0.58 per cent are from private institutions.

#### **4.5 Tools Used for Data Collection**

Data collection is the methodical process of gathering significant data related to the topic of research. For every research project, it is important to collect actual data from different sources. So it is essential to follow a logical approach to collecting data to propose solutions to relevant research questions. The adoption of appropriate tools or instruments for the study plays a crucial role in conducting effective research. In the present study, the investigator selected a schedule as the main tool for data collection. A schedule is a commonly used data collection tool that contains statements, questions, and blank spaces to write in.

In the present study, the investigator employed a multi-method approach, which includes survey methods, case studies, and observation methods of research. For surveying data, investigators used fully structured schedules. For the data collection, the investigator prepared two schedules: one for the head of the cultural institutions to collect data about the preservation practices followed by these institutions for the preservation of documentary heritage collections, and another for the staff working in these cultural institutions to assess their opinion about their knowledge and practical ability in the preservation practices. For preparing the first schedule, the investigator uses the questionnaire from the IFLA/UNESCO survey on digitisation and preservation as a model. For drafting the second schedule, the investigators used the questionnaire prepared by Khan and Bhatti (2017) for their study on identifying the digital competencies of university librarians for developing and managing digital library as a model. A raw sample schedules were drafted by consulting with the supervising teacher, statistician, subject experts, and co-researchers. The format and structure of model schedules were obtained from previous studies. The investigator used simple language and logically arranged relevant questions to avoid confusion in the minds of respondents. To evaluate the schedules, the investigator conducted a pilot study. By considering the conclusions drawn from the pilot study and suggestions, opinions, and advice from the experts, the investigator revised the schedules by adding relevant questions and eliminating irrelevant ones. The investigator conducted a detailed spell check, word check, and

grammar check before finalising the application. The investigator employed both closed-ended and open-ended questions based on the research aims and objectives. The investigator used different scales for designing schedules, such as dichotomous, multiple-choice, where respondents had to choose from the list of answers given. Likert-scale, rating, and descriptive, which provide blank spaces to write respondents opinions.

#### **4.5.1 Schedule 1 for the Head of the Cultural Institutions**

The schedule for the head of the cultural institutions (Appendix B) consists of 70 questions presented in a logical order. The covering letter attached with the schedule concisely described the clear instructions to the respondents on how the questions would be answered; it introduced the name and other personal credentials of the investigator to the respondents; it provided the exact motives and objectives of this study; and it also gave the respondents assurance regarding the confidentiality of the information they were provided and that has been used for research purposes only. The first schedule consists of eight sections (A–H) with a combination of multiple-choice, Likert scale, and yes/no questions.

Section A of Schedule 1 is intended to identify the profile details of the selected cultural institutions. This section consists of questions related to the name and address of selected cultural institutions, category of institution, chronological year of establishment, parent institution, type of institution, and the URL of the institution's website.

Section B consists of six questions focused on the total documentary heritage collection available in the selected institutions, the type of users and the geographical distribution of the users, the services provided by using the documentary heritage collection, the noticeable deterioration faced by the documentary heritage collection, and the causes of deterioration.

Section C deals with the current preservation status of documentary heritage collection in the selected cultural heritage institutions, which includes questions regarding the application of various traditional preservation methods, the availability

of digital preservation projects, the constraints to adopting digital preservation projects, and the planning of cultural institutions to start digital preservation projects.

Section D is about the digitisation projects of the cultural institutions. The questions enclosed in this section cover the name and time scale of the digitisation project, the participation of cultural institutions in international, national, and state digitisation programmes, the need for digitisation, the criteria used to select the material for digitisation, and the total number of materials digitised.

Section E focused on several aspects of the digitisation methods and techniques applied. Questions included in this section aim to identify the method of digitisation, the persons involved in the digitisation activities, the strategies used, the physical condition and storage of documentary heritage collections after digitisation, the resolutions used, the digital image format, and the file format used during digitisation.

Section F solicited data on the requirements needed for digital preservation activities. The questions in this section try to identify the availability of basic infrastructure needed for the digitisation activity, hardware and software requirements, formulation of policies, application of standards, human resources required, appointment and training of the staff, budget considerations, and collaboration between the institutions.

Section G is about the access, security, and legal considerations of the digitised content. This section deals with the questions regarding how the cultural institutions provide access to their digitised documentary heritage collection, the availability of the digital library, browsing and searching options, the status of paying for digitised content, the services provided by using digitised content, the storage and availability of digitised content, copyright problems during digital preservation, and network and security measures taken for the preservation of the digitised documentary heritage collection.

The final section H deals with the challenges of the preservation of documentary heritage collections. The questions included in this section study the challenges faced by cultural institutions for the preservation of documentary heritage collection and the strategies needed to tackle these challenges. In this section, the investigator provides a blank space to the respondents to acquire their opinions and suggestions for the better preservation of documentary heritage collection.

#### **4.5.2 Schedule 2 for the Staffs Working in the Cultural Institutions**

The schedule for the staffs working in cultural institutions (Appendix C) consists of 11 questions. The schedule starts with a precise covering letter that provides basic information about the investigator, the topic, and the objectives of the study. Through this covering letter, the investigator ensures the credibility of the study and gives assurance to the respondents about the confidentiality of their responses. The schedule for staffs consists of two sections (A–B) with a combination of multiple-choice and five-point Likert scale questions.

Section A is intended to understand the personal details of the staff. This section contains seven questions regarding the gender, age, profession, mode of appointment, working experience, highest educational qualification, and type of institution working.

Section B deals with the opinion and perception of staffs about their knowledge and practical abilities in traditional and digital preservation methods for protecting documentary heritage collection. In this section, the investigator used a five-point Likert scale-type statement to collect data about the knowledge and practical abilities of the staffs. The scale consists of 33 statements. The responses collected from this section followed a five-point Likert scale ranging from 1 (excellent) to 5 (very poor). This section has been arranged into 8 sub-titles: knowledge of staffs in the meaning and importance of documentary heritage collection, knowledge and practical ability of staffs in managing traditional preservation methods, knowledge and practical ability of staffs in developing digitised content of their documentary heritage collection, knowledge and practical ability of staffs in managing digitised content, knowledge and practical ability of

staffs in organising digitised content, knowledge and practical ability of staffs in protecting digitised content, knowledge and practical ability to distribute and evaluate the digitised content, ability to manage staff for preservation activities. This section provides a chance for the respondents to select or suggest methods to improve these skills and also provides blank spaces for their valuable suggestions and recommendations.

#### **4.6 Data Collection Procedure**

The primary data required for the study is collected from a detailed review of related literature. The investigator prepared two schedules for data collection. The first schedule is for the heads of the institutions to understand the preservation methods adopted by these institutions. The second schedule is for the staff working in these institutions to provide their opinion about their knowledge of preservation methods. After the preparation of these schedules, investigators conducted a pilot study to check the validity of the schedules. The main objectives of conducting this pre-testing procedure are to identify the unforeseen errors in the schedules, eliminate or modify the unwanted questions, and substitute additional questions. While conducting the pilot study, the investigator identified the difficulties and challenges that would arise during the main data collection procedure. The investigator updated the schedules in light of the findings from the pilot study. After the final preparation of schedules, investigators collected permission letter or introduction letter from the supervising teacher. The lockdown due to the COVID-19 pandemic affected the time scale of data collection.

The investigator personally visited the 15 cultural institutions selected for the study and sought permission from the concerned heads of the institutions to administer the schedules to the respondents. After making the necessary copies of the schedules, the investigator met all the respondents individually, distributed the schedules, and described the objectives of the study. The investigator provided the respondents with the necessary instructions to fill out the schedules. The majority of respondents reacted positively by filling out the schedules. The responses were encouraging. After the completion of the data collection procedure, the collected



data was taken for editing, coding, classification, and tabulation. The other data needed for the study was collected through informal interviews with the heads of the institutions, librarians, subject experts, other professionals, and personal observation.

#### **4.7 Tools and Techniques for Data Analysis**

The data gathered from the respondents was evaluated and analysed to arrive at the findings. The collected data was segregated and consolidated with Microsoft Excel. The SPSS software package was used to perform the statistical analysis. MS Excel was used for the initial coding of the collected data and then to import that data from Excel into SPSS. The data analysed were presented with the help of tables and pie diagrams, along with detailed interpretations and discussions of the results of previous studies. The following statistical techniques were applied for the analysis of the collected data to find the results:

- Simple percentage method

It is a simple statistical method to condense the whole data. Simple percentage of a number is calculated by, dividing the number by the whole and multiplied by hundred.

- Arithmetic mean

It is the commonly used statistical technique. It is the ratio of the sum of all observations to the total number of observations.

- Standard deviation

Standard deviation is a statistical measure calculated as the square root of variance by determining each data points deviation relative to the mean.

- Analysis of Variance (ANOVA )

Analysis of Variance (ANOVA) is a statistical formula used to compare variances across the means (average) of different groups. In this study,

ANOVA test was used to test the variation of knowledge and practical ability of the staffs based on their working experience.

#### **4.8 Style Manual Used**

American Psychological Association (APA) 7<sup>th</sup> edition is followed to write, arranging of bibliographical references and formatting of thesis.

#### **4.9 Conclusion**

This chapter provides a clear picture of the methodology employed by the investigator to conduct his or her research. This chapter tried to present the research design, variables used for the study, methods used for data collection, data collection procedures, and tools and techniques used for data analysis in detail.

**References**

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# ANALYSIS AND INTERPRETATIONS

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*Part I*

**Analysis of the Data Collected from the Head of the Cultural Institutions**

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*Part II*

**Analysis of the Data Collected from the Staff of the Cultural Institutions**

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# **PART I**

## **Analysis of the Data Collected from the Head of the Cultural Institutions**

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- *Introduction*
  - *Profile of Cultural Institutions*
  - *Documentary Heritage Collection*
  - *Application of Preservation Methods*
  - *Digitisation of Documentary Heritage Collection*
  - *Methods and Techniques Used in Digitisation*
  - *Requirements for Digital Preservation*
  - *Access and Security of Digitised Collection*
  - *Challenges of Preservation*
  - *Conclusion*
-





## **5.1 Introduction**

The data analysis chapter is a significant part of any research work and it comprises of data collected by the investigator during his/her research and the critical analysis of that data. In the present study, the investigator arranges the analysis chapter in two parts. The first part of this chapter presents the detailed analysis of the responses collected from the head of the selected cultural institutions in Kerala viz, State Central Library (SCL), Kerala University Library (KUL), Kerala Legislature Library (KLL), Oriental Research Institute and Manuscripts Library (ORI & ML), Kerala Council for Historical Research Library (KCHRL), Sukrtindra Oriental Research Institute Library (SORIL), Sree Sankaracharya University of Sanskrit Library (SSUSL), Kerala Sahitya Akademi Library (KSAL), Kerala Agricultural University Library and Information System (KAULIS), Kerala Kalamandalam Library (KKL), Guruvayur Devaswom Religious Library & Reading Room (GDRL), Thunchath Ezhuthachan Malayalam University Library (TEMUL), Tunjan Manuscripts Repository (TMR), Department of History, Farook College (DHF) and State Revenue Reference Library (SRRL).

The investigator prepared a structured schedule, personally visited the cultural institutions, and administered the schedules to the heads of the fifteen selected cultural institutions for the study. The present study aimed to understand the status of the collection of documentary heritage possessed by the selected institutions and the traditional and digital preservation methods adopted by these institutions. After data collection, the data was tabulated with MS Excel and analysed using the SSPS statistical package. The collected data was subjected to statistical tests such as simple percentage analysis.

The sum total of schedules administered to the fifteen cultural institutions is 15, and the responses received back are 15, so the response rate is 100 per cent. The responses received from the heads of the cultural institutions are arranged in 8 sections (A–H sections). Section A represents the institution profile; section B is about the documentary heritage collection of the institutions; section C presents the application of preservation methods; section D is about the digitisation project

conducted in the cultural institutions; section E indicates the digitisation methods and techniques used; section F presents the requirements for digital preservation; section G represents the accessibility and security of the digitised collection; and the final section H is about the challenges of preservation. The names of the cultural institutions selected for the study are very lengthy, so it is difficult to present these names in the tables in the analysis chapter. For this purpose, the investigator used abbreviations instead of the names of the institutions wherever required in the chapters. The list of abbreviations used by the investigator instead of the names of the cultural institutions is presented in Table 3.

**Table 3**

*List of Abbreviations Used*

| <b>Name of the Cultural Institution</b>                       | <b>Abbreviation</b> |
|---------------------------------------------------------------|---------------------|
| State Central Library                                         | SCL                 |
| Kerala University Library                                     | KUL                 |
| Kerala Legislature Library                                    | KLL                 |
| Oriental Research Institute and Manuscripts Library           | ORI & ML            |
| Kerala Council for Historical Research Library                | KCHRL               |
| Sukrtindra Oriental Research Institute Library                | SORIL               |
| Sree Sankaracharya University of Sanskrit Library             | SSUSL               |
| Kerala Sahitya Akademi Library                                | KSAL                |
| Kerala Agricultural University Library and Information System | KAULIS              |
| Kerala Kalamandalam Library                                   | KKL                 |
| Guruvayur Devaswom Religious Library & Reading Room           | GDRL                |
| Thunchath Ezhuthachan Malayalam University Library            | TEMUL               |
| Tunjan Manuscripts Repository                                 | TMR                 |
| Department of History, Farook College                         | DHF                 |
| State Revenue Reference Library                               | SRRL                |

### **Section A: Profile of Cultural Institutions**

The profile of cultural institutions involves the basic details of the cultural institutions selected for the study. The responses related to the name, establishment year, parent institution, type of institution, category of institution, and website of the institutions are presented here.

#### **5.2 Profile Information of Cultural Institutions**

It is important to collect fundamental information regarding the name of the cultural institutions selected for the study, their chronology of the year of establishment, the parent institution under which they work, and the URL of the institution's website for the study. Here, an attempt has been made to collect the basic information of the selected fifteen cultural institutions located in the various parts of Kerala. Table 4 indicates the basic information about the fifteen cultural institutions selected for the study.

**Table 4**

#### *Profile Information of the Cultural Institutions*

| <b>Name of the Cultural Institution</b> | <b>Year of Establishment</b> | <b>Parent Institution</b>              | <b>URL of the Institution Website</b> |
|-----------------------------------------|------------------------------|----------------------------------------|---------------------------------------|
| SCL                                     | 1829 AD                      | Department of Higher Education, Kerala | statelibrary.kerala.gov.in            |
| KUL                                     | 1942                         | University of Kerala                   | universitylibrary.ac.in               |
| KLL                                     | 1956                         | Kerala Legislative Secretariat         | www.niyamasabha.org                   |
| ORI & ML                                | 1908                         | University of Kerala                   | --                                    |
| KCHRL                                   | 2001                         | Department of Higher Education, Kerala | www.kchr.ac.in                        |
| SORIL                                   | 1971                         | Sukrtindra                             | sukrtindraoriental.org                |

|        |      |                                                                 |                                                                                    |
|--------|------|-----------------------------------------------------------------|------------------------------------------------------------------------------------|
|        |      | Oriental Research Institute                                     |                                                                                    |
| SSUSL  | 1993 | Sree Sankaracharya University of Sanskrit                       | <a href="https://library.ssus.ac.in">https://library.ssus.ac.in</a>                |
| KSAL   | 1956 | Kerala Sahitya Akademi                                          | <a href="http://www.keralasahityaakademi.org">www.keralasahityaakademi.org</a>     |
| KAULIS | 1995 | Kerala Agricultural University                                  | <a href="http://kaucentrallibrary.org">kaucentrallibrary.org</a>                   |
| KKL    | 1930 | Kerala Kalamandalam Deemed to be University of Arts and Culture | <a href="http://www.kalamandalam.org">www.kalamandalam.org</a>                     |
| GDRL   | 1945 | Guruvayur Devaswom                                              | --                                                                                 |
| TEMUL  | 2012 | Thunchath Ezhuthachan Malayalam University                      | <a href="http://www.malayalamuniversity.edu.in">www.malayalamuniversity.edu.in</a> |
| TMR    | 1981 | Department of Malayalam, University of Calicut                  | --                                                                                 |
| DHF    | 2015 | Farook college, Malappuram                                      | <a href="http://www.farookcollege.ac.in">www.farookcollege.ac.in</a>               |
| SRRL   | 1998 | Department of Revenue, Kerala                                   | --                                                                                 |

Data from Table 4 indicates that SCL is established in 1829 AD, working under the Department of Higher Education, Kerala. KUL is established in 1942, working under the University of Kerala. KLL is established in 1956 and works under the Kerala Legislative Secretariat. ORI & ML is established in 1908, working under the University of Kerala. KCHRL is established in 2001 and works under the Department of Higher Education, Kerala. SORIL is established in 1971, working under the Sukrtindra Oriental Research Institute. SSUSL is established in 1993, working under the Sree Sankaracharya University of Sanskrit.

And Table 4 further indicates that KSAL is established in 1956, working under the Kerala Sahitya Akademi. KAULIS is established in 1995, working under the Kerala Agricultural University. KKL was established in 1930, working under the Kerala Kalamandalam, which is deemed to be University of Arts and Culture. GDRL is established in 1945, working under the Guruvayur Devaswom. TEMUL is established in 2012, working under the Thunchath Ezhuthachan Malayalam University. TMR is established in 1981, working under the Department of Malayalam at the University of Calicut. DHF is established in 2015, working at Farook College in Malappuram. SRRL is established in 1998 and works under the Department of Revenue, Kerala.

Of the fifteen cultural institutions surveyed in this study, it was found that SCL is the oldest cultural institution selected for the study, and DHF is the youngest cultural institution to take part in the study. The majority of the cultural institutions selected for the study are established after independence. Four cultural institutions (ORI &ML, GDRL, TMR, and SRRL) did not provide information regarding the URL of their institution's website.

### **5.3 Category of Cultural Institutions**

Cultural institutions are the institutions established with a defined aim to manage the activities meant to preserve, conserve, maintain, document, interpret, and disseminate the cultural heritage, scientific, and environmental sources of knowledge, and to support the activities meant to aid the citizens in utilising this knowledge, to promote education, the interaction of citizens with this knowledge, and the transmission of this knowledge across generations. The concept of cultural institutions involves libraries, archives, museums, art galleries, socio-cultural institutions, historical institutions, academic institutions, and religious institutions. Hence, there is a need to identify which types of cultural institutions participated in the study. Here, the respondents were asked to select the category of cultural institutions to which they belonged. The category of cultural institutions is illustrated in Table 5.

**Table 5**

*Category of Cultural Institutions*

| Category of Cultural Institutions                                | Frequency | Per cent      |
|------------------------------------------------------------------|-----------|---------------|
| Library                                                          | 12        | 80.00         |
| Other social/cultural/historical/academic/religious institutions | 3         | 20.00         |
| <b>Total</b>                                                     | <b>15</b> | <b>100.00</b> |

Table 5 articulates that, out of the fifteen cultural institutions selected for the study, 12 (80.00 per cent) of the cultural institutions are libraries and 3(20.00 per cent) of the cultural institutions fall under the category of other social/cultural/historical/academic/religious institutions. So the majority of cultural institutions that participated in the study are libraries.

**5.4 Types of Cultural Institutions**

The types of cultural institution indicates the type of concerned authority of the cultural institutions who is responsible for the day-to-day operations, decisions, administration, finances, staff, policies, vision, mission, and rules of the cultural institutions. Whether it is a purely government-owned institution, an autonomous institution, or a private body. The preservation management of the documentary heritage collection of the cultural institutions depends on the authoritative power, policies, vision, and finances of the cultural institutions. Here, the investigator has made an attempt to identify the type of cultural institutions, i.e., government, autonomous, or private, that participated in the study. Table 6 shows the institution-type-wise distribution of the cultural institutions selected for the study.

**Table 6**

*Type of Cultural Institution*

| Type of Cultural Institution | Frequency | Per cent      |
|------------------------------|-----------|---------------|
| Government                   | 6         | 40.00         |
| Autonomous                   | 8         | 53.33         |
| Private                      | 1         | 6.67          |
| <b>Total</b>                 | <b>15</b> | <b>100.00</b> |

It is seen from Table 6 that out of fifteen cultural institutions, 6 (40.00 per cent) of the cultural institutions that participated in the study are purely government-owned institutions, 8 (53.33 per cent) are autonomous institutions, and only 1 (6.67 per cent) institution is owned by a private body. It is found that the majority of the cultural institutions that participated in the study are autonomous in nature. The least number of cultural institutions that participated in the study are in the private sector.

### **Section B: Documentary Heritage Collection**

Documentary heritage collections are an essential part of any cultural institution. Cultural institutions play a crucial role in safeguarding these collections and enabling the transmission of these collections from one era to the next. In this section, the investigator arranged the responses related to the documentary heritage collection available in the selected cultural institutions for the study. It also provides an overview of the users of these collections, the services provided by using them, the deterioration faced by these collections, and the major causes of the deterioration.

#### **5.5 Documentary Heritage Collection**

Libraries and other cultural heritage institutions are the core partners for any initiatives to ensure the protection and public access to the documentary heritage collection for future generations. Documentary heritage collection in all formats is the key element of our rich cultural heritage. It is a single document or group of documents recorded with conscious intellectual intentions that reflects the cultural memory, history, legacy, diversity, and heritage of past peoples, communities, and societies. It includes old and rare books, manuscripts, drawings, palm leaves, photographs, palm leaves, etc. Documentary heritage can have a serious influence on achieving sustainable development for the future, making decisions based on past events, building social cohesion, and maintaining awareness and knowledge of the cultural diversity of our past. The wide range of documentary heritage collections kept in libraries and cultural institutions all over the world. It is important to know the collection of documentary heritage resources possessed by the cultural institutions selected for the study. In this study, the investigator surveyed the availability of eight categories of documentary heritage collections: old and rare

books, bound volumes of old periodicals/magazines, manuscripts on paper, palm leaves, bound volumes of newspapers, government orders/ reports, historical records, and maps. Here, the respondents were asked to provide the number of documentary heritage collections available in their institutions. Table 7 shows the documentary heritage collection available in the selected cultural institutions.

**Table 7**

***Documentary Heritage Collection***

| Name of the Cultural Institution | Documentary Heritage Collection |                                            |                      |             |                             |                                                                               |                    |      |
|----------------------------------|---------------------------------|--------------------------------------------|----------------------|-------------|-----------------------------|-------------------------------------------------------------------------------|--------------------|------|
|                                  | Old and rare books              | Bound volumes of old periodicals/magazines | Manuscripts on paper | Palm leaves | Bound volumes of newspapers | Government orders/ reports                                                    | Historical records | Maps |
| SCL                              | 35,000                          | Above 6000                                 | --                   | --          | 5000                        | Government gazettes from 1903 onwards, Saint George gazette from 1908 onwards | --                 | 10   |
| KUL                              | 5085                            | 41,462                                     | --                   | --          | 910                         | --                                                                            | --                 | 500  |
| KLL                              | 50                              | 100                                        | --                   | --          | 2000                        | 1500                                                                          | --                 | 50   |
| ORI & ML                         | --                              | --                                         | --                   | 65000       | --                          | --                                                                            | --                 | --   |
| KCHRL                            | 600                             | 250                                        | 81                   | --          | --                          | --                                                                            | --                 | 30   |
| SORIL                            | 5000                            | 67                                         | 100                  | 1402        | --                          | --                                                                            | --                 | --   |
| SSUSL                            | 780                             | 4801                                       | --                   | 303         | --                          | --                                                                            | --                 | --   |
| KSAL                             | 18,000                          | 11,000                                     | 300                  | 150 bundle  | 15                          | 300 bound volume                                                              | 2                  | 5    |
| KAULIS                           | --                              | 7019                                       | --                   | --          | 21900                       | 1000                                                                          | --                 | --   |
| KKL                              | 3000                            | 10                                         | 275                  | 260         | --                          | --                                                                            | --                 | 5    |
| GDRL                             | 150                             | 500                                        | --                   | 209         | 200                         | --                                                                            | 500                | --   |
| TEMUL                            | 2000                            | --                                         | --                   | --          | --                          | --                                                                            | --                 | --   |
| TMR                              | --                              | --                                         | --                   | 12,000      | --                          | --                                                                            | --                 | --   |
| DHF                              | 40                              | --                                         | 3000                 | --          | 400                         | --                                                                            | 100                | --   |
| SRRL                             | 2299                            | --                                         | --                   | 1           | --                          | 145                                                                           | 260                | 35   |



### *Analysis and Interpretations*

It is observed from Table 7 that SCL consists of 35,000 old and rare books, above 6,000 bound volumes of old periodicals/magazines, 5000 bound volumes of newspapers, as well as government gazettes from 1903, the Saint George gazette from 1908, and 10 maps. KUL holds 5085 old and rare books, 41,462 bound volumes of old periodicals/magazines, 910 bound volumes of newspapers, and 500 maps. KLL possesses 50 old and rare books, 100 bound volumes of old periodicals/magazines, 2000 bound volumes of newspapers, 1500 government orders/ reports, and 50 maps. Only 65,000 palm leaves reside in ORI & ML. KCHRL has 600 old and rare books, 250 bound volumes of old periodicals/magazines, 81 manuscripts on paper, and 30 maps. SORIL contains 5000 old and rare books, 67 bound volumes of old periodicals/magazines, 100 manuscripts on paper, and 1402 palm leaves. SSUSL carries 780 old and rare books, 4801 bound volumes of old periodicals/magazines and 303 palm leaves. KSAL holds 18,000 old and rare books, 11,000 bound volumes of old periodicals/magazines, 300 manuscripts on paper, 150 bundles of palm leaves, 15 bound volumes of newspapers, 300 bound volumes of government orders/ reports, 2 historical records, and 5 maps. KAULIS comprises 7019 bound volumes of old periodicals/magazines, 21,900 bound volumes of newspapers, and 1000 government orders/ reports. KKL encompass 3000 old and rare books, 10 bound volumes of old periodicals/magazines, 275 manuscripts on paper, 260 palm leaves, and 5 maps. GDRL consists of 150 old and rare books, 500 bound volumes of old periodicals/magazines, 209 palm leaves, 200 bound volumes of newspapers, and 500 historical records. TEMUL possesses only 2,000 old and rare books. TMR holds only 12,000 palm leaves. DHF is embodied with 40 old and rare books, 3000 manuscripts on paper, 400 bound volumes of newspapers, and 100 historical records. SRRL contains 2299 old and rare books, 1 palm leaf, 145 government orders/ reports, 260 historical records, and 35 maps.

It is found that SCL holds the highest collection of old and rare books, KUL holds the highest collection of bound volumes of old periodicals/magazines, DHF holds the highest collection of manuscripts on paper. ORI & ML holds the highest collection of palm leaves. KAULIS holds the highest collection of bound volumes of newspapers. SCL holds the highest collection of government orders/ reports, GDRL

holds the highest collection of historical records, and KUL holds the highest collection of maps.

It is evident from Table 7 that the cultural institutions selected for the study are rich in a wide range of documentary heritage collections.

### **5.6 Users of Documentary Heritage Collections**

The primary goal of a cultural institution is to acquire, arrange, preserve, and disseminate documentary heritage resources to its users. The preservation of a documentary heritage collection has no value if it is not accessible to its users. Students, research scholars, faculties, academic staff, historians, journalists, people from historical and scientific backgrounds, teachers, etc. are the major users of the documentary heritage collection. It is the duty of the cultural institutions to attract the user group to their collection and maximise the accessibility and usability of their collection. It is important to identify the major beneficiaries/ users of the documentary heritage collection of the selected cultural institutions. Here, the investigator made an attempt to find out the major users of documentary heritage collections. For this, respondents were asked to choose the category of users from the list. The investigator also provides an option for the respondents to enter an additional category of users. The user category of documentary heritage collections is presented in Table 8.

**Table 8**

*Users of Documentary Heritage Collections*

| Name of the Cultural Institution | Category of Users (n=15)   |                              |                            |                            |               |
|----------------------------------|----------------------------|------------------------------|----------------------------|----------------------------|---------------|
|                                  | Students                   | Research Scholars            | Teachers/ Academic Staff   | Historians                 | Others        |
| SCL                              | --                         | ✓                            | --                         | ✓                          | --            |
| KUL                              | --                         | ✓                            | --                         | --                         | --            |
| KLL                              | --                         | ✓                            | --                         | ✓                          | MLA's         |
| ORI & ML                         | --                         | ✓                            | --                         | ✓                          | --            |
| KCHRL                            | ✓                          | ✓                            | ✓                          | ✓                          | --            |
| SORIL                            | ✓                          | ✓                            |                            | ✓                          | Writers       |
| SSUSL                            | --                         | ✓                            | ✓                          | ✓                          | --            |
| KSAL                             | --                         | ✓                            | ✓                          | ✓                          | Media Persons |
| KAULIS                           | ✓                          | ✓                            | ✓                          | ✓                          | --            |
| KKL                              | ✓                          | ✓                            | --                         | --                         | --            |
| GDRL                             | ✓                          | ✓                            | --                         | --                         | --            |
| TEMUL                            | --                         | ✓                            | --                         | --                         | --            |
| TMR                              | --                         | ✓                            | --                         | --                         | --            |
| DHF                              | ✓                          | ✓                            | ✓                          |                            |               |
| SRRL                             | ✓                          | ✓                            | --                         | ✓                          | --            |
| <b>Total</b>                     | <b>7</b><br><b>(46.67)</b> | <b>15</b><br><b>(100.00)</b> | <b>5</b><br><b>(33.33)</b> | <b>9</b><br><b>(60.00)</b> |               |

(The figures given in bracket show the respective percentage)

Table 8 articulates that SCL indicates research scholars and teachers/academic staff are the major users of their documentary heritage collection, and KUL indicates research scholars only. KLL mentioned research scholars, historians, and MLAs. Research scholars and historians are the users of ORI&ML. KCHRL and KAULIS indicate students, research scholars, teachers/academic staff, and historians. SORIL has students, research scholars, historians, and writers. SSUSL mentioned research scholars, teachers/academic staff, and historians. KSAL reported research scholars, teachers/academic staff, historians, and media persons. KKL and GDRL indicate students and research scholars. TEMUL and TMR specify

research scholars only. Whereas DHF mentioned students, research scholars, and teachers/academic staff. SRRL indicates students, research scholars, and historians.

Out of the 15 respondents surveyed, 7 respondents (46.67 per cent) indicate students are major users of documentary heritage collections, 15 respondents (100 per cent) indicate research scholars as major users, 5 respondents (33.33 per cent) chose teachers/academic staff and 60.00 per cent of the respondents also chose historians. It is also shown that 3 respondents (20.00 per cent) selected other user categories and added writers, media persons, and MLAs as the users of the documentary heritage collection.

It is observed that research scholars are the major users of the documentary heritage collections of all the selected cultural institutions.

Supporting the above findings, Mkuwira (2015) reported that students (40 per cent), historians (16 per cent), professional researchers (12 per cent), general public (8 per cent), journalists (7 per cent), politicians (5 per cent) and public administrator (5 per cent) are the users of documentary heritage in Malawi.

### **5.7 Geographical Location of the Users**

In Table 8, the investigator tried to identify the category of users of documentary heritage collections. So, it is important to know the geographical location of the users. Here, the investigator decided to check the geographical location of the user. For this purpose, respondents were asked to choose the geographical location of the users. Table 9 indicates the geographical location of the users.

**Table 9**

***Geographical Location of the Users***

| Name of the Cultural Institution | Geographical Location of the Users (n = 15) |                             |                                     |
|----------------------------------|---------------------------------------------|-----------------------------|-------------------------------------|
|                                  | Regional Users (From Kerala)                | National Users (Non Kerala) | International Users (Foreign users) |
| SCL                              | ✓                                           | --                          | --                                  |
| KUL                              | ✓                                           | ✓                           | ✓                                   |
| KLL                              | ✓                                           | --                          | ✓                                   |
| ORI & ML                         | ✓                                           | ✓                           | ✓                                   |
| KCHRL                            | ✓                                           | ✓                           | ✓                                   |
| SORIL                            | ✓                                           | ✓                           | ✓                                   |
| SSUSL                            | ✓                                           | ✓                           | ✓                                   |
| KSAL                             | ✓                                           | --                          | --                                  |
| KAULIS                           | ✓                                           | ✓                           | --                                  |
| KKL                              | ✓                                           | ✓                           | ✓                                   |
| GDRL                             | ✓                                           | --                          | --                                  |
| TEMUL                            | ✓                                           | --                          | --                                  |
| TMR                              | ✓                                           | ✓                           | ✓                                   |
| DHF                              | ✓                                           | --                          | --                                  |
| SRRL                             | ✓                                           | ✓                           | --                                  |
| <b>Total</b>                     | <b>15(100.00)</b>                           | <b>9(60.00)</b>             | <b>8(53.33)</b>                     |

(The figures given in bracket show the respective percentage)

Table 9 shows the geographical location of the users. It can be found that the documentary heritage collections of SCL, KSAL, GDRL, TEMUL, and DHF are used by regional users only. At the same time, KUL, ORI & ML, KCHRL, SORIL, SSUSL, KKL, and TMR have regional, national, and international users for their

documentary heritage collections. But, KLL has regional and international users. Whereas SRRL has regional and national users.

Out of the 15 respondents surveyed, all the respondents indicate the regional users (from Kerala) as the major users of documentary heritage collections; nine respondents, representing 60.00 per cent choose national users (non-Kerala); and eight respondents (53.33 per cent) are selected as international users (foreign users) as the major beneficiaries of documentary heritage collections.

It can be found that the vast majority of the respondents indicated that regional users are major users of documentary heritage collections. A good number of respondents chose national and international users. The result shows that the demand for documentary heritage collections is greater in every part of the world.

### **5.8 Services Provided by the Cultural Institutions**

Libraries and cultural institutions are usually considered service-provider institutions. These institutions provide various services to their users to satisfy their information needs. The popular services are: reference service, circulation service, information service, abstracting service, indexing service, CAS, SDI, reprographic service, online services, CD-ROM (Computer Disc-Read Only Memory) service, and translation service. The information regarding the services provided to the users by using the documentary heritage collection is the evidence needed to understand the usability of this collection. Respondents were asked to select the services provided by them. The investigator gave the “other service” option to the respondents to add their additional services. The services provided by the cultural institutions are illustrated in Table 10.

**Table 10**

*Services Provided by the Cultural Institutions*

| Name of the Cultural Institution | Services Provided by the Cultural Institutions |                            |                            |                            |                           |                                                   |                     |
|----------------------------------|------------------------------------------------|----------------------------|----------------------------|----------------------------|---------------------------|---------------------------------------------------|---------------------|
|                                  | Reference Service                              | Exhibition Service         | Lending Service            | Reprographic Service       | Micro-Filming/CD Writing  | Publication/Print of Documentary Heritage Records | Other Services      |
| SCL                              | ✓                                              | ✓                          | --                         | ✓                          | ✓                         | ✓                                                 | --                  |
| KUL                              | ✓                                              | ✓                          | ✓                          | --                         | --                        | --                                                | --                  |
| KLL                              | ✓                                              | ✓                          | ✓                          | ✓                          | --                        | --                                                | --                  |
| ORI & ML                         | ✓                                              | --                         | --                         | --                         | --                        | --                                                | --                  |
| KCHRL                            | ✓                                              | ✓                          | --                         | ✓                          | --                        | ✓                                                 | --                  |
| SORIL                            | ✓                                              | --                         | --                         | --                         | --                        | ✓                                                 | Journal Publication |
| SSUSL                            | ✓                                              | --                         | --                         | --                         | --                        | --                                                | --                  |
| KSAL                             | ✓                                              | --                         | --                         | ✓                          | --                        | ✓                                                 | --                  |
| KAULIS                           | ✓                                              | ✓                          | ✓                          | ✓                          | --                        | --                                                | --                  |
| KKL                              | ✓                                              |                            | ✓                          | ✓                          | --                        | ✓                                                 | --                  |
| GDRL                             | ✓                                              | ✓                          | ✓                          | --                         | --                        | --                                                | --                  |
| TEMUL                            | ✓                                              | --                         | --                         | ✓                          | --                        | --                                                | --                  |
| TMR                              | ✓                                              | --                         | --                         | --                         | --                        | --                                                | --                  |
| DHF                              | ✓                                              | --                         | --                         | --                         | --                        | --                                                | --                  |
| SRRL                             | ✓                                              | --                         | --                         | --                         | --                        | --                                                | --                  |
| <b>Total</b>                     | <b>15</b><br><b>(100.00)</b>                   | <b>6</b><br><b>(40.00)</b> | <b>5</b><br><b>(33.33)</b> | <b>7</b><br><b>(46.67)</b> | <b>1</b><br><b>(6.67)</b> | <b>5</b><br><b>(33.33)</b>                        | <b>0</b>            |

(The figures given in bracket show the respective percentage)

Data from Table 10 depicts, that out of the 15 cultural institutions, ORI&ML, SSUSL, TMR, DHF, and SRRL provide only reference services to the users. SCL provides reference services, exhibition services, reprographic services, micro-filming/CD writing, and publication/print of documentary heritage records. KUL and GDRL provide reference services, exhibition services, and lending services. At the same time, KLL and KAULIS indicate reference services, exhibition services, lending services, and reprographic services. KCHRL offers reference services, exhibition services, reprographic services, and the publication/print of documentary heritage records. SORIL indicates that they provide reference services,

the publication/print of documentary heritage records, and have also added journal publication. KSAL mentioned reference services, reprographic services, and the publication/print of documentary heritage records. And reprographic services are offered by TEMUL.

Out of the 15 respondents, all the respondents provide reference services to the users, while 6 (40.00 per cent) of the respondents also provide exhibition services. It can be found that 33.33 per cent of the respondents, representing 5 in number, provide lending services. Reprographic services are provided by 7 respondents (46.67 per cent). Only 1 respondent (6.67 per cent) offers micro-filming/CD writing. Publication/print of documentary heritage records are done by 5 respondents, which represents 33.33 per cent. Only 1 respondent indicated additional service as a journal publication.

The above analysis shows that reference service is the major service provided by cultural institutions by using their documentary heritage collections. The exhibition service and reprographic service are the other two popular services provided to the users.

### **5.9 Deterioration of the Documentary Heritage Collection**

Deterioration is the act or process involved in the deteriorating state or condition of a material that, once in good condition, is now worn out or lost due to several reasons. Documentary heritage collections are always vulnerable and fragile in nature. In the context of documentary heritage collection, deterioration means the downgrading of physical characteristics of the materials, such as colour, shape, consistency, and odour, due to the quality and type of the material, inadequate use, careless handling of the materials, fluctuating environmental conditions, and inappropriate storage. The major noticeable deterioration of documentary heritage collections is wear and tear, brittleness, discoloration, fading of data, attacks by biological agents, mutilation of materials, etc. Deterioration of material is one of the driving forces behind conducting immediate preservation practices in cultural institutions. Good preventive conservation can minimise the deterioration of the materials. It is very significant to understand the major noticeable deterioration



conditions faced by the documentary heritage collection in the selected cultural institutions. Respondents were asked to express the noticeable deterioration condition they faced. The investigator provides the ‘other deterioration’ option to the respondents to add their additional deterioration conditions. But no respondents chose that option, so the investigator decided to omit that option from the table. The major noticeable deterioration faced by the cultural institutions is shown in Table 11.

**Table 11**

*Major Noticeable Deterioration Conditions*

| <b>Noticeable Deterioration Conditions</b>                      | <b>Frequency<br/>(n=15)</b> | <b>Per cent</b> |
|-----------------------------------------------------------------|-----------------------------|-----------------|
| Brittleness                                                     | 8                           | 53.33           |
| Wear and tear due to excessive photocopying and use             | 6                           | 40.00           |
| Wear and tear due to bad shelving                               | 3                           | 20.00           |
| Paper becoming torn                                             | 6                           | 40.00           |
| Broken spine of the book materials                              | 5                           | 33.33           |
| Discoloration of the paper                                      | 7                           | 46.67           |
| Fading of data                                                  | 5                           | 33.33           |
| Attack of book worms/silverfish/termites like biological agents | 8                           | 53.33           |
| Cracking and scratching of materials                            | 5                           | 33.33           |
| Mutilation or vandalism of materials                            | 2                           | 13.33           |
| Theft of materials                                              | 2                           | 13.33           |

Table 11 shows that 8 (53.33 per cent) of the respondents indicate brittleness as a noticeable deterioration, and 7 (46.67 per cent) of the respondents indicate discoloration of the paper. Wear and tear of documents due to excessive photocopying and use and paper becoming torn are faced by 6 (40.00 per cent) of the respondents. Also, 5 (33.33 per cent) respondents point out that the broken spine

of the book materials, fading of data, and cracking and scratching of materials are major respondents. 20.00 per cent represents number 3 respondents, indicating wear and tear due to bad shelving is the major deterioration. 2 respondents (13.33 percent) expressed that mutilation or vandalism of materials and theft of materials are the most noticeable deterioration.

As a whole, the above analysis depicts that brittleness is the major noticeable deterioration condition of documentary heritage collection faced by cultural institutions. Mutilation or vandalism of materials and theft of materials are the least deteriorating conditions faced by cultural institutions. Moreover, cultural institutions faced discoloration of the paper, wear and tear of materials due to excessive photocopying and use, and paper becoming torn at medium level.

Some noticeable deterioration found from the study is similar to the findings of Sarika (2014) in her study, it was found that books becoming torn, broken spine of library books, brittleness, mutilation, and vandalism are the major causes of deterioration of paper-based materials.

### **5.10 Causes of Deterioration of Materials**

The concept of deterioration in documentary heritage collections can be classified as physical deterioration, chemical deterioration, and biological deterioration. The causes behind the deterioration of documentary heritage collections are the inherent chemical stability of the material and the external reasons that affect the material. The major causes of deterioration are the age of the material, the type and quality of the material, the ink, the acidity of the paper, uncontrolled temperature, humidity, light, excessive use, atmospheric pollutants, dust particles, natural calamities, bad shelving and storage, and the attack of biological agents. Here, the investigator made an attempt to identify the causes of the deterioration of the documentary heritage collection of cultural institutions selected for the study. Respondents were asked to indicate the major causes of deterioration. The investigator provides the 'other causes of deterioration' option to the respondents to add their additional causes of deterioration. But no respondents chose that option, so the investigator decided to omit that option from the table. The

major causes of the deterioration of documentary heritage collections are illustrated in Table 12.

**Table 12**

*Causes of Deterioration of Documentary Heritage Collection*

| <b>Causes of Deterioration of Materials</b>                | <b>Frequency<br/>(n=15)</b> | <b>Per cent</b> |
|------------------------------------------------------------|-----------------------------|-----------------|
| Age of materials                                           | 13                          | 86.67           |
| Acidity level of paper                                     | 3                           | 20.00           |
| Ink                                                        | 3                           | 20.00           |
| Type and quality of the material                           | 8                           | 53.33           |
| Excessive light                                            | 6                           | 40.00           |
| Relative humidity                                          | 8                           | 53.33           |
| Bad shelving or storage                                    | 3                           | 20.00           |
| Dust and particulate matters                               | 6                           | 40.00           |
| Attack of biological agents like termites, book worms etc. | 8                           | 53.33           |
| Air pollution/atmospheric pollution                        | 4                           | 26.67           |
| High temperature                                           | 3                           | 20.00           |
| Poor handling by users                                     | 5                           | 33.33           |
| Excessive photocopying                                     | 4                           | 26.67           |
| Natural calamities like floods, cyclones, fire etc.        | 1                           | 6.66            |

Table 12 highlights that the majority of the respondents 13 (86.67 per cent) mentioned that the age of the material is the main cause of deterioration. A good number of respondents 8 (53.33 per cent) mentioned the type and quality of the material, relative humidity, and the attack of biological agents like termites, bookworms, etc. as the causes of deterioration. At the same time, 6 (40.00 per cent) of the respondents indicate excessive light, dust, and particulate matter are major causes of deterioration. 5 (33.33 per cent) of the respondents affirm that the reason for deterioration is poor handling by the users. In addition, 4 (26.67 per cent) of the respondents indicated air pollution/atmospheric pollution, and excessive photocopying. It can also be found that 3 (20.00 per cent) of the respondents noticed the acidity level of paper, ink, bad shelving or storage, and high temperature as the major causes of deterioration. Meanwhile, only 1 (6.66 per cent) of respondents felt

that natural calamities like floods, cyclones, fire, etc. were reasons for the deterioration of documentary heritage collections.

The overall analysis indicates that the age of the material is the major cause of the deterioration of documentary heritage collections in the selected cultural institutions. Type and quality of the material, relative humidity, and the attack of biological agents like termites, bookworms, etc. are the causes of deterioration at a moderate level. Deterioration due to natural calamities like floods, cyclones, fire, etc. is the least common cause of deterioration of documentary heritage collections in the selected cultural institutions.

Sarika (2014) observed that dust particulate matters (77.5 per cent), biological agents (62.5 per cent) and wear & tear due to excessive photocopying (62.5 per cent) are the major causes of deterioration. The present study also found that the attack of biological agents is one of the causes. Mkuwira (2015) also depicts that biological agents, environmental factors, and human activities are major causes of damage to the documentary heritage collection.

### **Section C: Application of Preservation Methods**

Application of a good preservation method is very important to decrease the risk or rate of deterioration of documentary heritage collections in cultural institutions. Which includes traditional preservation methods (regular maintenance, environmental control, security measures, and protection of the collections by using appropriate chemical treatment) and digital preservation methods (creation of digital surrogates of the original documents). In this section, the investigator arranged the responses regarding the preservation methods adopted by the selected cultural institutions.

#### **5.11 Adoption of Preservation Methods**

The preservation method for documentary heritage collection is a chain of preventive conservation activities intended to decrease the physical, chemical, and biological degradation and prolong the useful life of the documentary heritage collection. For every cultural institution to possess a valuable documentary heritage

collection, it is a prerequisite to adopt an effective preservation method to conserve, maintain, protect, repair, and restore these collections. Preservation methods involve traditional, digital, and hybrid practices to prevent internal and external factors of deterioration and to make these collections accessible to beneficiaries in the best possible useful condition. Here, the investigator is curious to know what the preservation methods adopted by the selected cultural institutions are. Respondents were asked to specify the methods of preservation they adopted. The preservation methods adopted by the cultural institution are presented in Table 13.

**Table 13**

*Preservation Methods Adopted*

| Name of the Cultural Institution | Preservation Methods Adopted (n=15) |              |                             |
|----------------------------------|-------------------------------------|--------------|-----------------------------|
|                                  | Traditional/Basic Only              | Digital Only | Both                        |
| SCL                              | --                                  | --           | ✓                           |
| KUL                              | --                                  | --           | ✓                           |
| KLL                              | --                                  | --           | ✓                           |
| ORI & ML                         | --                                  | --           | ✓                           |
| KCHRL                            | --                                  | --           | ✓                           |
| SORIL                            | --                                  | --           | ✓                           |
| SSUSL                            | --                                  | --           | ✓                           |
| KSAL                             | --                                  | --           | ✓                           |
| KAULIS                           | --                                  | --           | ✓                           |
| KKL                              | ✓                                   | --           | --                          |
| GDRL                             | --                                  | --           | ✓                           |
| TEMUL                            | --                                  | --           | ✓                           |
| TMR                              | --                                  | --           | ✓                           |
| DHF                              | --                                  | --           | ✓                           |
| SRRL                             | ✓                                   | --           | --                          |
| <b>Total</b>                     | <b>2</b><br><b>(13.33)</b>          | <b>0</b>     | <b>13</b><br><b>(86.67)</b> |

(The figures given in bracket show the respective percentage)

Table 13 demonstrates the preservation methods adopted by the cultural institutions selected for the study. Out of the 15 cultural institutions surveyed, the

majority of the institutions, such as SCL, KUL, KLL, ORI & ML, KCHRL, SORIL, SSUSL, KSAL, KAULIS, GDRL, TEMUL, TMR, and DHF, used both traditional and digital methods for the preservation of their documentary heritage collections. KKL and SRRL adopted traditional methods of preservation only.

It is seen from the Table 13 that, out of the fifteen cultural institutions, only 2 cultural institutions representing 13.33 per cent adopted traditional/basic preservation methods. No cultural institution has adopted only digital preservation, and 13 (86.67 per cent) of the cultural institutions have adopted a combination of both traditional and digital preservation.

It can be concluded that the large majority of the cultural institutions selected for the study adopted a combination of both traditional and digital preservation for the preservation of their documentary heritage collections.

#### **5.12 Frequency of Use of Traditional/Basic Preservation Methods**

Traditional/basic preservation methods are a set of activities that minimise the deterioration and extend the life span of the documentary heritage collection, such as environmental control, proper shelving and storage, minor repairs, binding, disaster planning, chemical and pest control treatment, and anti-theft equipment. The cultural institutions adopted different systematic traditional preservation techniques for safeguarding their documentary heritage collections. Here, the investigator decided to study the frequency of use of traditional/basic preservation methods in their documentary heritage collection. Respondents were asked to express the frequency of use of traditional/basic preservation methods in their institutions. The frequency of use of traditional/basic preservation methods is shown in Table 14.

**Table 14**

***Frequency of Use of Traditional/Basic Preservation Methods***

| Traditional/Basic Preservation Methods               | Frequency of Use (n=15) |               |               |               |
|------------------------------------------------------|-------------------------|---------------|---------------|---------------|
|                                                      | Very often              | Often         | Occasionally  | Never         |
| Cleaning and dusting                                 | 8<br>(53.33)            | 5<br>(33.33)  | 2<br>(13.33)  | 0             |
| Proper shelving                                      | 8<br>(53.33)            | 7<br>(46.66)  | 0             | 0             |
| Environmental control                                | 0                       | 8<br>(53.33)  | 5<br>(33.33)  | 2<br>(13.33)  |
| Surface cleaning or stain removal                    | 0                       | 5<br>(33.33)  | 8<br>(53.33)  | 2<br>(13.33)  |
| Oiling                                               | 3<br>(20.00)            | 0             | 0             | 12<br>(80.00) |
| Minor repairs and mending                            | 0                       | 10<br>(66.66) | 5<br>(33.33)  | 0             |
| Binding, trimming, guarding, gathering and stitching | 0                       | 5<br>(33.33)  | 10<br>(66.66) | 0             |
| Ink fixing                                           | 0                       | 0             | 3<br>(20.00)  | 12<br>(80.00) |
| P <sup>H</sup> testing                               | 0                       | 0             | 3<br>(20.00)  | 12<br>(80.00) |
| Lamination                                           | 0                       | 5<br>(33.33)  | 10<br>(66.66) | 0             |
| Photocopying                                         | 5<br>(33.33)            | 5<br>(33.33)  | 4<br>(26.67)  | 1<br>(6.67)   |
| Fumigation                                           | 1<br>(6.67)             | 3<br>(20.00)  | 0             | 11<br>(73.33) |
| De-acidification or alkaline wash                    | 1<br>(6.67)             | 0             | 2<br>(13.33)  | 12<br>(80.00) |
| Use of insecticide                                   | 1<br>(6.67)             | 1<br>(6.67)   | 6<br>(40.00)  | 7<br>(46.67)  |
| Pest control measures                                | 1(6.67)                 | 2<br>(13.33)  | 3<br>(20.00)  | 9<br>(60.00)  |
| Use of natural repellents                            | 3<br>(20.00)            | 4<br>(26.67)  | 0             | 8<br>(53.33)  |
| Installing Air-conditioners                          | 7<br>(46.67)            | 1<br>(6.67)   | 1<br>(6.67)   | 6<br>(40.00)  |
| Disaster preparedness and recovery plan              | 0                       | 3(20.00)      | 0             | 12<br>(80.00) |
| Adequate security measures                           | 5<br>(33.33)            | 3<br>(20.00)  | 3<br>(20.00)  | 4<br>(26.67)  |

(The figures given in bracket show the respective percentage)

Table 14 articulates the frequency of use of traditional preservation methods. It can be found that, of the fifteen cultural institutions surveyed, 8 (53.33 per cent) of the cultural institutions used cleaning and dusting as a traditional preservation method 'very often', 5 (33.33 per cent) of the cultural institutions used cleaning and dusting 'often', and 2 (13.33 per cent) of the cultural institutions used cleaning and dusting 'occasionally'. Of the fifteen cultural institutions surveyed, 8 (53.33 per cent) of the cultural institutions applied proper shelving as traditional preservation methods 'very often', 7 (46.66 per cent) of the cultural institutions applied proper shelving 'often'. In the case of environmental control, 8 (53.33 per cent) of the cultural institutions indicate that they used environmental control 'often', 5 cultural institutions representing 33.33 per cent used environmental control 'occasionally', and 2 cultural institutions representing 13.33 per cent never used environmental control in their institution. It is also ascertained that 5 (33.33 per cent) of the cultural institutions applied surface cleaning or stain removal 'often', 8 cultural institutions representing 53.33 per cent applied surface cleaning or stain removal 'occasionally', and 2 (13.33 per cent) of the cultural institutions never used surface cleaning or stain removal.

It can be seen that, in the case of oiling, 3 (20.00 per cent) of the cultural institutions used 'often' and 12 (80 per cent) of the cultural institutions never used oiling. Out of the fifteen cultural institutions surveyed, 10 (66.66 per cent) of the cultural institutions used minor repairs and mending as traditional preservation methods 'often', 5 (33.33 per cent) of the cultural institutions used minor repairs and mending 'occasionally'. In the case of binding, trimming, guarding, gathering and stitching, out of 15 cultural institutions, 5 (33.33 per cent) of the cultural institutions used binding, trimming, guarding, gathering, and stitching 'often', and 10 institutions representing 66.66 per cent used binding, trimming, guarding, gathering, and stitching 'occasionally'. Out of the 15 cultural institutions, 3 (20.00 per cent) of the cultural institutions indicates that they use 'ink fixing' 'occasionally', 12 (80 per cent) of the cultural institutions indicates that they never used 'ink fixing'. Out of the 15 cultural institutions, 3 (20.00 per cent) of the cultural institutions indicates that they use 'P<sup>H</sup> testing' 'occasionally', 12 (80.00 per cent) of the cultural institutions indicates that they never used 'P<sup>H</sup> testing'. Of the 15 cultural institutions, 5 (33.33 per cent) of the cultural institutions indicates that they use 'lamination'



‘often’ and 10 (66.66 percent) of the cultural institutions indicates that they use ‘lamination’ occasionally.

It can be found that, in the case of ‘photocopying’, 5 cultural institutions representing 33.33 per cent indicates they use photocopying ‘very often’ and ‘often’ condition each. Out of the 15 cultural institutions, 1 (6.67 per cent) of the cultural institution indicates they use fumigation ‘very often’ and 3 (20.00 per cent) of the cultural institutions indicates they use fumigation ‘often’, 11 cultural institutions representing 73.33 per cent indicates they never use fumigation. While, in the case of de-acidification or alkaline wash, one of the cultural institution indicates they use de-acidification or alkaline wash ‘very often’, 2 cultural institutions representing 13.33 per cent indicates they use de-acidification or alkaline wash ‘occasionally’, 12 (80.00 per cent) of the cultural institutions indicates that they never use de-acidification or alkaline wash. Out of the fifteen cultural institutions surveyed, 1 cultural institution representing 6.67 per cent indicates they use of insecticide ‘very often’ and ‘often’ condition each, 6 (40.00 per cent) of the cultural institution indicates they use insecticides ‘occasionally’ and 7 (46.67) of the cultural institution indicates that, they never use insecticides.

It is articulates that, of the fifteen cultural institutions surveyed, 1 (6.67 per cent) of the cultural institution indicates that they use pest control measures ‘very often’, 2 cultural institutions representing 13.33 per cent indicates that they use pest control measures ‘often’, 3 (20.00 per cent) of the cultural institutions indicates that they use pest control measures ‘occasionally’ and 9 (60.00 per cent) of the cultural institutions indicates they never used pest control measures. In the case of use of natural repellents, 3 (20.00 per cent) of the cultural institutions indicates they use natural repellents ‘very often’, 4 cultural institutions representing 26.67 per cent indicates that they use natural repellents ‘often’ and 8 (53.33 per cent) of the cultural institutions indicates they never used natural repellents. Out of the fifteen cultural institutions surveyed, 7 (46.67 per cent) of the cultural institutions indicates that they use air conditioners ‘very often’, 1 (6.67 per cent) of the cultural institution indicates that they use air conditioners ‘often’ and ‘occasionally’ each and 6 (40.00 per cent) of the cultural institutions indicates that they never used air conditioners. In the case of disaster preparedness and recovery plan, 3 (20.00 per cent) of the cultural institutions indicates that they use disaster preparedness and recovery plan ‘often’

and 12 (80.00 per cent) of the cultural institutions indicates that they never use disaster preparedness and recovery plan. Of the fifteen cultural institutions surveyed, 5 (33.33 per cent) of the cultural institutions indicates that they use adequate security measures, 3 (20.00 per cent) of the cultural institutions indicates that they use adequate security measures ‘often’ and ‘occasionally’ each and 4 cultural institutions representing 26.67 per cent indicates that they never used adequate security measures.

The overall analysis shows that the majority of the cultural institutions selected for the study used cleaning and dusting, and proper shelving only as the traditional or basic preservation method frequently. A good number of cultural institutions also use environmental control, minor repairs, mending, and installing air conditioners. Oiling, ink fixing, P<sup>H</sup> testing, de-acidification or alkaline wash, fumigation, and formulation of disaster preparedness and recovery plans are never used by the majority of cultural institutions.

The findings of the study are similar to the result revealed by Sarika (2014) in her study: cleaning and dusting of library materials (92.3 per cent) and proper shelving (80.6 per cent) are the most common conservation techniques followed by libraries. Sarika also identified that most of the libraries do not maintain written disaster preparedness and recovery plans. The investigator also identified the same result in the case of disaster preparedness and recovery plans for cultural institutions. The observations of Mkuwira (2015) on the preservation methods adopted in Malawi for documentary heritage collection are somewhat similar to the findings presented by the investigator. Mkuwira observed that basic mending and minor repairs, cleaning and dusting of materials, shelving, binding, photocopying, and the application of insect repellent and insecticides are the preservation techniques applied in Malawi for safeguarding their documentary heritage collection.

### **5.13 Status of the Digitisation Project**

The emergence of new digital technologies also influences the traditional preservation of documentary heritage collections. The digital preservation of materials is not a substitute for traditional preservation methods such as conservation treatment, environmental control, etc. Digital means of preservation are

only another advanced technique that can be used for effective preservation of documentary heritage collections. Libraries and cultural institutions all over the world have adopted digital preservation methods to manage and preserve their collections. The number of cultural institutions in Kerala also started the digitisation project for creating digital surrogates of their documentary heritage collection. Hence, the investigator made an attempt to identify the status of digitisation projects at the selected cultural institutions. Respondents were asked a question to indicate the status of the digitisation project in their institution, whether it was started or not. Data regarding the status of the digitisation project is illustrated in the following Table 15.

**Table 15**

*Status of Digitisation Project*

| Name of the Cultural Institution | Status of Digitisation Project |                            | Total                        |
|----------------------------------|--------------------------------|----------------------------|------------------------------|
|                                  | Started                        | Not Started                |                              |
| SCL                              | ✓                              | --                         |                              |
| KUL                              | ✓                              | --                         |                              |
| KLL                              | ✓                              | --                         |                              |
| ORI & ML                         | ✓                              | --                         |                              |
| KCHRL                            | ✓                              | --                         |                              |
| SORIL                            | ✓                              | --                         |                              |
| SSUSL                            | ✓                              | --                         |                              |
| KSAL                             | ✓                              | --                         |                              |
| KAULIS                           | ✓                              | --                         |                              |
| KKL                              | --                             | ✓                          |                              |
| GDRL                             | ✓                              | --                         |                              |
| TEMUL                            | ✓                              | --                         |                              |
| TMR                              | ✓                              | --                         |                              |
| DHF                              | ✓                              | --                         |                              |
| SRRL                             | --                             | ✓                          |                              |
| <b>Total</b>                     | <b>13</b><br><b>( 86.67)</b>   | <b>2</b><br><b>(13.33)</b> | <b>15</b><br><b>(100.00)</b> |

(The figures given in bracket show the respective percentage)

Table 15 depicts that the cultural institutions (SCL, KUL, KLL, ORI & ML, KCHRL, SORIL, SSUSL, KSAL, KAULIS, GDRL, TEMUL, TMR, and DHF) chose the “started” option, i.e., they started their digitisation project for documentary

heritage collection at the time of the data collection. The cultural institutions (KKL and SRRL) choose the “not started” option so that they have not started digitisation project yet or planned to start the digitisation project.

Table 15 further depicts that 13 (86.67 per cent) of the cultural institutions started the digitisation project for the preservation of their documentary heritage collection. Only 2 cultural institutions, representing 13.33 per cent not taken the effort to start the digitisation project.

It was found that the majority of the cultural institutions selected for the study started the digitisation project for the preservation of their documentary heritage collections.

#### **5.14 Constraints/Difficulties to Adopt the Digitisation Project**

According to the findings revealed in Table 15, two cultural institutions (KKL and SRRL) did not make any effort to start the digitisation project for their documentary heritage collections. So the investigator tries to understand the constraints and difficulties of adopting a digitisation project. The investigator asked the two cultural institutions (KKL and SRRL) to specify the reasons for not starting the digitisation project. Data regarding the constraints and difficulties of adopting a digitisation project is shown in Table 16.

**Table 16**

#### ***Constraints/Difficulties to Adopt Digitisation Project***

| <b>Constraints/Difficulties to Adopt Digitisation Project</b> | <b>Frequency</b> | <b>Per cent (n=2)</b> |
|---------------------------------------------------------------|------------------|-----------------------|
| Lack of money                                                 | 2                | 100.00                |
| Large/complex collection                                      | 0                | 0.00                  |
| Legal issues                                                  | 0                | 0.00                  |
| Lack of expert staff                                          | 1                | 50.00                 |
| Lack of support from authority                                | 1                | 50.00                 |
| Lack of infrastructure facilities                             | 2                | 100.00                |
| Lack of knowledge about digitisation                          | 1                | 50.00                 |
| Digital preservation is not necessary                         | 0                | 0.00                  |

As per the Table 16, out of the two cultural institutions that had not started their digitisation project, both of the cultural institutions specified that lack of money and lack of infrastructure facilities are the major constraints to starting a digitisation project. They also mentioned that lack of expert staff, lack of support from authorities, and lack of knowledge about digitisation are major difficulties in starting a digitisation project. So it is evident that lack of money and lack of infrastructure facilities are the major constraints to starting a digitisation project.

#### **Section D: Digitisation of Documentary Heritage Collection**

This section deals with responses related to the digitisation practices adopted by the selected cultural institutions for the preservation of their documentary heritage collections. This section covers the basic details of digitisation projects, the need for digitisation, participation of cultural institutions in international/national/state efforts for the preservation of documentary heritage, the selection criteria used for selecting documents for digitisation and the present status of digitised collections. The total number of cultural institutions selected for the study is fifteen. Table 16 depicts that, out of the 15 cultural institutions, 13 cultural institutions (SCL, KUL, KLL, ORI & ML, KCHRL, SORIL, SSUSL, KSAL, KAULIS, GDRL, TEMUL, TMR and DHF) have started their digitisation project. The remaining two cultural institutions (KKL & SRRL) did not start digital preservation of their collections. The questions included in Section D-G are related to digitisation activities only. So the responses received from those 13 institutions are presented in Section D-G.

##### **5.15 Name and Time Scale of Digitisation Projects**

Digitisation of documentary heritage collections is the process of creating digital surrogates from the analogue originals with the help of any electronic devices such as scanners, cameras, etc. Digitisation technique itself is not a substitute for traditional preservation methods for protecting documentary heritage collections. Digitisation prevents the careless handling and use of fragile documentary heritage collections and ensures the multiple use of their digital surrogates with due respect for intellectual property rights to the content of those collections. Libraries and

cultural institutions have started to implement an effective digitisation project to safeguard their precious documentary heritage collections. The management of a successful digitisation project involves intellectual property rights management, quality control over the digitised collection, and evaluation. In Kerala, a number of cultural institutions have also made an effort to digitise their documentary heritage collections. Here, the investigator tried to find out the name and time scale of the digitisation project conducted by the selected thirteen cultural institutions. Respondents were asked to indicate the name and time scale of their digitisation project. The details of the name and time scale of digitisation projects are presented in Table 17.

**Table 17**

*Name and Time Scale of Digitisation Projects*

| <b>Name of the Cultural Institution</b> | <b>Name of the Digitisation Project</b>                                 | <b>Time Scale</b> |
|-----------------------------------------|-------------------------------------------------------------------------|-------------------|
| SCL                                     | --                                                                      | 2008- Present     |
| KUL                                     | Digitisation of old and rare documents of Kerala University library     | 2008-Present      |
| KLL                                     | --                                                                      | 2006- Present     |
| ORI & ML                                | --                                                                      | 2018- Present     |
| KCHRL                                   | Digitizing Kerala's past, Conservation of historical heritage of Kerala | 2014- Present     |
| SORIL                                   | --                                                                      | 2011- Present     |
| SSUSL                                   | University project                                                      | 2015- Present     |
| KSAL                                    | Kerala sahitya akademi digital resource centre and digitisation hub     | 2008- Present     |
| KAULIS                                  | --                                                                      | 2016- Present     |
| GDRL                                    | Digitisation of Guruvayur devaswom documents                            | --                |
| TEMUL                                   | --                                                                      | --                |
| TMR                                     | --                                                                      | 2009-2018         |
| DHF                                     | Malabar digital archive                                                 | 2018- Present     |

It can be observed from Table 17, SCL started the digitisation project in 2008 and it is still ongoing. The name of the digitisation project at KUL is "Digitisation of old and rare documents of Kerala University library," which started in 2008 and still continues. In 2006, KLL started a digitisation project. "Digitising Kerala's past and conservation of historical heritage of Kerala" are the names of the digitisation projects of KCHRL, which began in 2014. SORIL initiated the digitisation project in 2011. SSUSL set up a digitisation project in 2015 and named it "University project". KSAL established a digitisation project in 2008 and named it "Kerala sahitya akademi digital resource centre and digitisation hub." KAULIS commenced their digitisation project in 2016. "Digitisation of Guruvayur devaswom documents" is the name selected by the GDRL for their digitisation project. TEMUL did not specify the name and time scale of their digitisation project. TMR started a digitisation project in 2009, but it was stopped in 2018 due to internal problems. "Malabar digital archive" is the project name of DHF and started in 2018.

It can be found that the majority of the cultural institutions surveyed are supervising an ongoing digitisation project for their documentary heritage collection now. TMR is the only institution that has stopped its digitisation project due to internal reasons. SCL, KLL, ORI & ML, KAULIS, TEMUL, and TMR are not provided with any specific names for their digitisation projects. TEMUL did not specify the name and time scale of their digitisation project. The majority of cultural institutions started their digitisation projects in the period 2006–2015. Out of the 13 cultural institutions, KLL is the first to start their digitisation project.

#### **5.16 Participation in the International /National/ State Efforts for the Preservation of Documentary Heritage**

International organisations such as UNESCO, IFLA, etc. devised policies and initiated various collaborative efforts to support the activities of various institutions at the national and international level to identify and preserve the documentary heritage and provide standards and legal frameworks for preservation actions and capacity building. At the national level, the Digital Library of India (DLI) has played an active role in digitising rare books, rare periodicals,

manuscripts, and copyright-free or out-of-print books. The National Archives of India provides financial assistance for the preservation of documentary heritage. The National Mission for Manuscripts was created to preserve the vast manuscript wealth of India. The Community Archives programme of the Kerala State Archives Department was implemented with the objective of identifying and protecting relevant historical records in the custody of individuals and non-government agencies. Here, the investigator made an effort to know the participation of selected cultural institutions in the international /national/ state efforts for the preservation of documentary heritage. Respondents were asked to reveal their participation in international /national/ state efforts. The details of the respondent's participation in international /national/ state preservation efforts are shown in Table 18.

**Table 18**

***Participation in the International /National/ State Efforts for the Preservation of Documentary Heritage***

| Name of the Cultural Institution | Participation in the International/ National/ State Efforts |              | Total (n=13)   |
|----------------------------------|-------------------------------------------------------------|--------------|----------------|
|                                  | Yes                                                         | No           |                |
| SCL                              | --                                                          | ✓            |                |
| KUL                              | --                                                          | ✓            |                |
| KLL                              | --                                                          | ✓            |                |
| ORI & ML                         | ✓                                                           | --           |                |
| KCHRL                            | ✓                                                           | --           |                |
| SORIL                            | --                                                          | ✓            |                |
| SSUSL                            | --                                                          | ✓            |                |
| KSAL                             | ✓                                                           |              |                |
| KAULIS                           | --                                                          | ✓            |                |
| GDRL                             | --                                                          | ✓            |                |
| TEMUL                            | ✓                                                           | --           |                |
| TMR                              | --                                                          | ✓            |                |
| DHF                              | --                                                          | ✓            |                |
| Total                            | 4<br>(30.76)                                                | 9<br>(69.23) | 13<br>(100.00) |

(The figures given in bracket show the respective percentage)



Table 18 articulates that the cultural institutions (ORI & ML, KCHRL, KSAL, and TEMUL) participate in international /national/ state efforts for the preservation of documentary heritage. And other cultural institutions such as SCL, KUL, KLL, SORIL, SSUSL, KAULIS, GDRL, TMR, and DHF have not participated in any type of international/national/ state efforts for the preservation of documentary heritage. It can be observed that, out of the 13 cultural institutions surveyed, 4 (30.76 per cent) of the cultural institutions were involved in the international /national/ state efforts; on the other hand, 9(69.23 per cent) of the cultural institutions did not participate in any kind of international /national/ state efforts for the preservation of documentary heritage.

The overall analysis shows that the majority of the cultural institutions selected for the study have not participated in any kind of international /national/ state efforts for the preservation of documentary heritage.

#### **5.17 Need for Digitisation of Documentary Heritage Collection**

Digitisation is a comprehensive process of transforming analogue materials into digital form. It is not an easy task to implement, and it can be time-consuming and expensive. Before planning to start digitisation, the authorities of the concerned cultural institutions have to clarify that the digitisation is necessary for that institution. It is important to define the need, purpose, and scope of the digitisation of documentary heritage collections. The two ultimate goals of digitisation are to protect or preserve the documentary heritage collections for the future and ensure continuous accessibility or usage of these collections. The specific needs of digitisation differ according to the objectives and policies of concerned cultural institutions. Manaf (2007) cited that 91.3 per cent of the cultural institutions in Malaysia indicated the two major purposes of digitisation are preserving cultural heritage information and supporting education and research activities.

The investigator made an attempt to identify the needs of digitisation of selected cultural institutions for the study. Respondents were asked to mention their need for digitisation in their institution. The need for digitisation is presented in Table 19.

**Table 19**

***Need for Digitisation of Documentary Heritage Collection***

| <b>Need of Digitisation</b>                           | <b>Frequency</b> | <b>Per cent<br/>(n=13)</b> |
|-------------------------------------------------------|------------------|----------------------------|
| Increase access                                       | 5                | 38.46                      |
| Preservation for future                               | 13               | 100.00                     |
| Reduce damage for originals                           | 7                | 53.84                      |
| Reduce handling of originals                          | 5                | 38.46                      |
| Save space                                            | 6                | 46.15                      |
| To help research and academic activities              | 9                | 69.23                      |
| Commercial exploitation                               | 0                | 0.00                       |
| To provide better service to users                    | 9                | 69.23                      |
| To promote documentary heritage collection world wide | 5                | 33.33                      |

Table 19 states that all the cultural institutions surveyed in the study chose “preservation for the future” as the foremost need of their digitisation of documentary heritage collections. Out of the 13 cultural institutions surveyed, 9 (69.23 per cent) of the respondents chose “to help research and academic activities” and “to provide better service to users” as the reasons for the need for digitisation. Following that, 7 (53.84 per cent) of the respondents opted to “reduce damage for originals”. Also, 6 respondents, representing 46.15 per cent indicate “save space” as their need. 5 (38.46 per cent) respondents selected “increase access”, “reduce handling of originals,” and “to promote documentary heritage collection world-wide” as their needs for digitisation of their collection. No respondents opted for “commercial exploitation” as a need for their digitisation of documentary heritage collections.

It is found that preservation for the future is the primary need of the digitisation of documentary heritage collections conducted by cultural institutions. A good number of respondents (69.23 per cent) also indicate “to help research and academic activities” and “to provide better service to users”. The result found in the present study is similar to the findings of Manaf (2007) in his study on Malaysian cultural heritage preservation.

### **5.18 Use of Selection Criteria**

Digitisation is a sequential process that involves interconnected phases or stages. Therefore, for the successful execution of this process, it is important to prepare a detailed plan for each stage of digitisation. Identification or selection of materials for digitisation is the primary stage of digitisation. The most relevant factor is to analyse the documentary heritage collection and users of the cultural institutions before selecting the materials for digitisation process. The major criteria used for the selection of materials for digitisation are ‘condition’, 'demand', and ‘content’. Other criteria used by cultural institutions to select their materials for digitisation depend on their specific needs. The investigator made an effort to identify the criteria used by the cultural institutions for selecting their documentary heritage collection for digitisation. Here, respondents were asked to specify the criteria used for the selection of documentary heritage for digitisation. Criteria used for the selection of documentary heritage collections for digitisation shown in Table 20.

**Table 20**

*Use of Selection Criteria*

| <b>Selection Criteria Used</b>       | <b>Frequency<br/>(n=13)</b> | <b>Per cent</b> |
|--------------------------------------|-----------------------------|-----------------|
| Cultural/ historical value           | 12                          | 92.23           |
| Content value                        | 9                           | 69.23           |
| Research/ academic importance        | 8                           | 61.53           |
| Demand from users                    | 5                           | 38.46           |
| Age of the materials                 | 8                           | 61.53           |
| Rate of damage                       | 5                           | 38.46           |
| Uniqueness or rarity of the material | 3                           | 23.07           |
| Copyright free items                 | 3                           | 23.07           |

The data shown in Table 20 indicates that a large majority of the respondents, 12 (92.23 per cent) opted for “cultural/ historical value” as the criteria for the selection of their collection for digitisation. A good number of respondents 9

(69.23 per cent) chose “content value” as a criteria for the selection of material for digitisation. 8 (61.53 per cent) of the respondents indicate “research/ academic importance” and “age of the materials” as selection criteria. At the same time, out of the 13 cultural institutions surveyed, 5 (38.46 per cent) of the respondents preferred “demand from users” and “rate of damage” as criteria for the selection of collections for digitisation. 3 respondents, representing 23.07 per cent indicate “uniqueness or rarity of the material” and "copyright-free items”.

It was observed that the cultural/historical value of the material is the most preferred criteria used by cultural institutions for the selection of materials for digitisation. “Uniqueness or rarity of the material” and "copyright-free items” are the least preferred criteria for the selection of materials for digitisation. The findings revealed in the study of Manaf (2007) agreed with the findings of the investigator on selection criteria used by cultural institutions in Kerala in the digitisation project. Cultural value, intrinsic historical value, and academic or research value of the collection are the key criteria followed by the cultural institutions in Malaysia for the selection of materials for digitisation. Kalusopa and Zulu (2009) also found a similar result: most of the organisations (57.1 per cent) in Botswana used “historical and cultural value of the materials” as a selection criteria for identifying materials for preservation.

### **5.19 Digitised Content of Documentary Heritage Collection**

Here, the investigator made an attempt to identify the amount of documentary heritage collection digitised by the cultural institutions. Respondents were asked to indicate their status of the amount of digitised content created. The amount of digitised content of documentary heritage collection is presented in Table 21.

**Table 21**

*Digitised Content of Documentary Heritage Collection*

| Name of the Cultural Institution | Digitised Documentary Heritage Collection |                                            |                      |             |                             |                                                               |                    |      |
|----------------------------------|-------------------------------------------|--------------------------------------------|----------------------|-------------|-----------------------------|---------------------------------------------------------------|--------------------|------|
|                                  | Old and rare books                        | Bound volumes of old periodicals/magazines | Manuscripts on paper | Palm leaves | Bound volumes of newspapers | Government orders/ reports                                    | Historical records | Maps |
| SCL                              | More than 1500                            | --                                         | --                   | --          | --                          | Government gazettes from 1903, Saint George gazette from 1908 | --                 | --   |
| KUL                              | 991                                       | 1074                                       | --                   | --          | --                          | --                                                            | --                 | --   |
| KLL                              | 50                                        | --                                         | --                   | --          | --                          | --                                                            | --                 | --   |
| ORI & ML                         | --                                        | --                                         | --                   | 25 per cent | --                          | --                                                            | --                 | --   |
| KCHRL                            | 15                                        | --                                         | 81                   | --          | --                          | --                                                            | --                 | --   |
| SORIL                            | 10                                        | --                                         | 5                    | 25          | --                          | --                                                            | --                 | --   |
| SSUSL                            | 6                                         | --                                         | --                   | 4           | --                          | --                                                            | --                 | --   |
| KSAL                             | 10250                                     | 150                                        | 259                  | --          | --                          | --                                                            | --                 | 5    |
| KAULIS                           | --                                        | --                                         | --                   | --          | --                          | 1000                                                          | --                 | --   |
| GDRL                             | 150                                       | 1000                                       | --                   | 209         | 200                         | --                                                            | --                 | --   |
| TEMUL                            | 15                                        | --                                         | --                   | --          | --                          | --                                                            | --                 | --   |
| TMR                              | --                                        | --                                         | --                   | 7000        | --                          | --                                                            | --                 | --   |
| DHF                              | --                                        | --                                         | 3000                 | --          | --                          | --                                                            | --                 | --   |

Table 21 enumerates the total digitised documentary heritage collection of selected cultural institutions for the study. SCL digitised more than 1500 old and rare books and government gazettes from 1903, Saint George gazette from 1908 onwards, respectively. KUL digitised 991 old and rare books and 1074 bound volumes of old periodicals/magazines. KLL has digitised a collection of 50 old and rare books. ORI & ML digitised 25 per cent of their total palm leaf collection (65000). KCHRL holds a digitised collection of 15 old and rare books and 81 manuscripts on paper. SORIL consists of a digitised collection of 10 old and rare books, 5 manuscripts on paper, and 25 palm leaves. SSUSL has digitised a

collection of 6 old and rare books and 4 palm leaves. KSAL possesses a digitised collection of 10,250 old and rare books, 150 bound volumes of old periodicals/magazines, 259 manuscripts on paper and 5 maps. KAULIS contains a digitised collection of 1000 government orders/ reports. GDRL comprises a digitised collection of 150 old and rare books, 1000 bound volumes of old periodicals/magazines, 209 palm leaves, and 200 bound volumes of newspapers. TEMUL digitised 15 old and rare books. TMR holds the digitised collection of 7000 palm leaves, and DHF has digitised 3000 manuscripts on paper.

KSAL digitised highest number of old and rare books. KUL digitised highest number of bound volumes of old periodicals/magazines. DHF digitised highest number of manuscripts on paper. ORI & ML digitised highest number of palm leaves. GDRL digitised highest number of bound volumes of newspapers and SCL digitised highest number of government orders/reports. The Digitisation project at the selected cultural institutions are still a continuous and ongoing process.

### **Section E: Methods and Techniques Used in Digitisation**

In this section, the investigator analyses the responses related to the methods and techniques used in the digitisation process. Which includes the way of digitisation, staff involved in the digitisation activities, techniques used during scanning, use of resolution, digital image format and file format, and storage of catalogue records of digitised material.

#### **5.20 Method of Digitisation**

Digitisation project can be done in-house or by seeking help from an outsourcing agency to complete the work. Before approaching a digitisation project, the cultural institutions have to make a decision about the method of digitisation, whether it is in-house or outsourcing. There are many factors to consider before making the choices, including the size and condition of the collection, complications in digitisation process, the time limit of the project, the availability of infrastructure and equipment, the availability of experienced and expert staff, the human resources of the institution, and the previous experience of the institution in conducting

digitisation projects. Cultural institutions conducting the digitisation of documentary heritage collections use different methods: in-house digitisation or outsourcing, and a combination of both in-house and out-sourcing. Here, the investigator tried to identify the method of approach followed by the cultural institutions for the digitisation. The method of digitisation adopted by cultural institutions is presented in Table 22.

**Table 22**

*Method of Digitisation*

| Name of the Cultural Institution | Method of Digitisation (n=13) |             |                             |
|----------------------------------|-------------------------------|-------------|-----------------------------|
|                                  | In-house                      | Outsourcing | Both                        |
| SCL                              | --                            | --          | ✓                           |
| KUL                              | --                            | --          | ✓                           |
| KLL                              | --                            | --          | ✓                           |
| ORI & ML                         | --                            | --          | ✓                           |
| KCHRL                            | ✓                             | --          | --                          |
| SORIL                            | ✓                             | --          | --                          |
| SSUSL                            | --                            | --          | ✓                           |
| KSAL                             | --                            | --          | ✓                           |
| KAULIS                           | --                            | --          | ✓                           |
| GDRL                             | --                            | --          | ✓                           |
| TEMUL                            | ✓                             | --          | --                          |
| TMR                              | --                            | --          | ✓                           |
| DHF                              | --                            | --          | ✓                           |
| <b>Total</b>                     | <b>3</b><br><b>(23.07)</b>    | <b>0</b>    | <b>10</b><br><b>(76.92)</b> |

(The figures given in bracket show the respective percentage)

Table 22 indicates that the cultural institutions (KCHRL, SORIL and TEMUL) opted for the in-house method of digitisation whereas other cultural institutions (SCL, KUL, KLL, ORI & ML, SSUSL, KSAL, KAULIS, GDRL, TMR and DHF) opted for both in-house and outsourcing facilities. No cultural institutions opted out sourcing method alone. It is evident that the majority of the respondents

10 (76.92 per cent) adopted a combination of both in-house and outsourcing methods. 3 (23.07 per cent) of the respondents indicated an in-house method of digitisation only.

It was found that the majority of cultural institutions adopted a combination of both methods, such as in-house and outsourcing, for the digitisation of documentary heritage collections. According to the findings revealed by Manaf (2007) in his study on the digitisation initiatives by cultural institutions in Malaysia. 61 per cent of the digitisation project had been outsourced, and only 39 per cent had been done through the in-house method in Malaysia.

### **5.21 Staff Participation in Digitisation Activities**

Lack of adequate infrastructure and equipment and a lack of experienced or expert staff are the major driving forces behind adopting the out-sourcing method of digitisation. There is a trend of adopting in-house and outsourcing together for a digitisation project. Cultural institutions conduct digitisation in different phases. Initially, they started digitisation with the help of an out-sourcing agency, and after seeking the experience and expertise, the mode of digitisation changed to in-house. The digitisation process involves different stages: selection, preparation and scanning of material; processing; quality control and organisation of digitised content; and storage and access of digitised materials. The institution staff and the staff of the outsourced agency perform the work at every stage of the digitisation process. Here, the investigator tried to know the participation of institution staff and staff of an outsourced agency in various tasks in the different stages of digitisation process. The details of staff participation in various digitisation activities such as selection of materials, preparation, scanning, processing and organisation, and storage and access are illustrated in Tables 23–27.



**Table 23****Staff Participation in Selection of Materials for Digitisation**

| Name of the Cultural Institution | Staff Participation in Selection of Materials for Digitisation (n=13) |                    |                      |
|----------------------------------|-----------------------------------------------------------------------|--------------------|----------------------|
|                                  | Institution Staff Only                                                | Outside Staff Only | Both                 |
| SCL                              | ✓                                                                     | --                 | --                   |
| KUL                              | ✓                                                                     | --                 | --                   |
| KLL                              | ✓                                                                     | --                 | --                   |
| ORI & ML                         | ✓                                                                     | --                 | --                   |
| KCHRL                            | ✓                                                                     | --                 | --                   |
| SORIL                            | ✓                                                                     | --                 | --                   |
| SSUSL                            | ✓                                                                     | --                 | --                   |
| KSAL                             | --                                                                    | --                 | ✓                    |
| KAULIS                           | ✓                                                                     | --                 | --                   |
| GDRL                             | ✓                                                                     | --                 | --                   |
| TEMUL                            | ✓                                                                     | --                 | --                   |
| TMR                              | ✓                                                                     | --                 | --                   |
| DHF                              | --                                                                    | --                 | ✓                    |
| <b>Total</b>                     | <b>11<br/>(84.62)</b>                                                 | <b>0</b>           | <b>2<br/>(15.38)</b> |

(The figures given in bracket show the respective percentage)

Table 23 presents the participation of institution staff and outsourcing staff in the “selection of materials for digitisation”. It is observed that cultural institutions such as SCL, KUL, KLL, ORI & ML, KCHRL, SORIL, SSUSL, KAULIS, GDRL, and TMR allocate only their institutional staffs for the selection of materials, whereas KASL and DHF use both institutional and outsourcing staff to perform the selection of materials. It is further observed that, out of the 13 cultural institutions, the majority of the cultural institutions 11 (84.62 per cent) choose their institution staff to select the materials for digitisation. Two cultural institutions, representing 15.38 per cent choose both the institutional and outsourcing staff to perform these tasks.

The overall analysis shows that the majority of cultural institutions allocate their own staff to selecting the materials for digitisation.

**Table 24**

***Staff Participation in Preparation of Materials for Digitisation***

| Name of the Cultural Institution | Staff Participation in Preparation of Materials for Digitisation (n=13) |                     |                      |
|----------------------------------|-------------------------------------------------------------------------|---------------------|----------------------|
|                                  | Institution Staff Only                                                  | Outside Staff Only  | Both                 |
| SCL                              | --                                                                      | ✓                   | --                   |
| KUL                              | ✓                                                                       | --                  | --                   |
| KLL                              | ✓                                                                       | --                  | --                   |
| ORI & ML                         | ✓                                                                       | --                  | --                   |
| KCHRL                            | ✓                                                                       | --                  | --                   |
| SORIL                            | ✓                                                                       | --                  | --                   |
| SSUSL                            | ✓                                                                       | --                  | --                   |
| KSAL                             | --                                                                      | --                  | ✓                    |
| KAULIS                           | --                                                                      | --                  | ✓                    |
| GDRL                             | ✓                                                                       | --                  | --                   |
| TEMUL                            | ✓                                                                       | --                  | --                   |
| TMR                              | --                                                                      | --                  | ✓                    |
| DHF                              | --                                                                      | --                  | ✓                    |
| <b>Total</b>                     | <b>8<br/>(61.54)</b>                                                    | <b>1<br/>(7.69)</b> | <b>4<br/>(30.77)</b> |

(The figures given in bracket show the respective percentage)

Table 24 indicates the participation of institution staff and outsourced staff in the task of “preparation of materials for digitisation”. It can be seen that cultural institutions such as KUL, KLL, ORI & ML, KCHRL, SORIL, SSUSL, GDRL, and TEMUL selected their institutional staff to perform the preparation of materials for digitisation. SCL opted for staff from an outside agency to perform the preparation of materials before digitisation. At the same time, cultural institutions such as KSAL, KAULIS, TMR, and DHF utilise both institutional and outsourcing staff to prepare materials. It can be further seen that, out of the 13 cultural institutions surveyed, 8 (61.54 per cent) of the institutions used the institution staff only for the preparation of documents before digitisation process, while 4 (30.77 per cent) of the cultural institutions employed both institution staff and outsourcing staff for

preparation work. Only 1 cultural institution, representing 7.69 per cent uses outsourcing staff to do preparation.

The overall analysis indicates that more than 60.00 per cent of the cultural institutions allocate their institution staff to perform the procedures of material preparation before digitisation.

**Table 25**

*Staff Participation in Scanning of Materials*

| Name of the Cultural Institution | Staff Participation in Scanning of Materials (n=13) |                            |                            |
|----------------------------------|-----------------------------------------------------|----------------------------|----------------------------|
|                                  | Institution Staff Only                              | Outside Staff Only         | Both                       |
| SCL                              | --                                                  | ✓                          | --                         |
| KUL                              | --                                                  | ✓                          | --                         |
| KLL                              | --                                                  | --                         | ✓                          |
| ORI & ML                         | --                                                  | ✓                          | --                         |
| KCHRL                            | ✓                                                   | --                         | --                         |
| SORIL                            | ✓                                                   | --                         | --                         |
| SSUSL                            | ✓                                                   | --                         | --                         |
| KSAL                             | --                                                  | --                         | ✓                          |
| KAULIS                           | --                                                  | --                         | ✓                          |
| GDRL                             | --                                                  | ✓                          | --                         |
| TEMUL                            | ✓                                                   | --                         | --                         |
| TMR                              | --                                                  | --                         | ✓                          |
| DHF                              | --                                                  | ✓                          | --                         |
| <b>Total</b>                     | <b>4</b><br><b>(30.77)</b>                          | <b>5</b><br><b>(38.46)</b> | <b>4</b><br><b>(30.77)</b> |

(The figures given in bracket show the respective percentage)

Table 25 enumerates the staff participation in the scanning work in the digitisation process. It is observed that cultural institutions such as KCHRL, SORIL, SSUSL, and TEMUL use only institution staff for the scanning process; SCL, KUL, ORI & ML, GDRL, and DHF use only outside staff for the scanning of documentary heritage collections. Whereas KLL, KSAL, KAULIS, and TMR allocated the scanning duties to both the institution and outside staff. It is further observed that, of

the 13 respondents surveyed, the majority of the respondents 5 (38.46 per cent) utilise outsourcing staff to perform the scanning work of digitisation. A good number of respondents 4 (30.77 per cent) chose institution staff and a combination of both institution and outsourced staff for scanning work.

The overall analysis found that nearly 40.00 per cent of the cultural institutions use outside staff to perform the scanning work of digitisation. It may be because of the inability of institutional staff to do scanning work.

**Table 26**

*Staff Participation in Processing and Organisation of Digitised Materials*

| Name of the Cultural Institution | Staff Participation in Processing and Organisation of Digitised Materials (n=13) |                      |                      |
|----------------------------------|----------------------------------------------------------------------------------|----------------------|----------------------|
|                                  | Institution Staff Only                                                           | Outside Staff Only   | Both                 |
| SCL                              | --                                                                               | ✓                    | --                   |
| KUL                              | --                                                                               | --                   | ✓                    |
| KLL                              | ✓                                                                                | --                   | --                   |
| ORI & ML                         | --                                                                               | ✓                    | --                   |
| KCHRL                            | ✓                                                                                | --                   | --                   |
| SORIL                            | ✓                                                                                | --                   | --                   |
| SSUSL                            | ✓                                                                                | --                   | --                   |
| KSAL                             | --                                                                               | --                   | ✓                    |
| KAULIS                           | --                                                                               | --                   | ✓                    |
| GDRL                             | --                                                                               | ✓                    | --                   |
| TEMUL                            | ✓                                                                                | --                   | --                   |
| TMR                              | --                                                                               | --                   | ✓                    |
| DHF                              | --                                                                               | --                   | ✓                    |
| <b>Total</b>                     | <b>5<br/>(38.46)</b>                                                             | <b>3<br/>(23.08)</b> | <b>5<br/>(38.46)</b> |

(The figures given in bracket show the respective percentage)

Table 26 showcases staff participation in the processing and organisation of digitised surrogates of documentary heritage collection. It is noticed that KLL, KCHRL, SORIL, SSUSL, and TEMUL allocate only their institution staff to

processing and organisation work. SCL, ORI & ML, and GDRL employ only outside staff for this task, whereas KUL, KSAL, TMR, and DHF use both the institution and outside staff to perform these tasks. It is further noted that, out of the 13 respondents surveyed, the majority of the respondents 5 (38.46 per cent) allocated institution staff and a combination of both institution and outside staff for processing and organising work. Whereas 3 respondents, representing 23.08 per cent use only outside staff for this work.

The overall analysis revealed that almost forty per cent of the cultural institutions granted permission to both institution staff and outside staff to participate in the processing and organisation of digitised content.

**Table 27**

*Staff Participation in Storage and Access of Digitised Material*

| Name of the Cultural Institution | Staff Participation in Storage and Access of Digitised Material (n=13) |                      |                      |
|----------------------------------|------------------------------------------------------------------------|----------------------|----------------------|
|                                  | Institution Staff Only                                                 | Outside Staff Only   | Both                 |
| SCL                              | --                                                                     | --                   | ✓                    |
| KUL                              | ✓                                                                      | --                   | --                   |
| KLL                              | ✓                                                                      | --                   | --                   |
| ORI & ML                         | --                                                                     | ✓                    | --                   |
| KCHRL                            | ✓                                                                      | --                   | --                   |
| SORIL                            | ✓                                                                      | --                   | --                   |
| SSUSL                            | ✓                                                                      | --                   | --                   |
| KSAL                             | ✓                                                                      | --                   | --                   |
| KAULIS                           | --                                                                     | --                   | ✓                    |
| GDRL                             | --                                                                     | ✓                    | --                   |
| TEMUL                            | ✓                                                                      | --                   | --                   |
| TMR                              | --                                                                     | --                   | ✓                    |
| DHF                              | ✓                                                                      | --                   | --                   |
| <b>Total</b>                     | <b>8<br/>(61.54)</b>                                                   | <b>2<br/>(15.38)</b> | <b>3<br/>(23.08)</b> |

(The figures given in bracket show the respective percentage)

Table 27 provides the details of staff participation in the storage and access of digitised documentary heritage collections. It is revealed that cultural institutions such as KUL, KLL, KCHRL, SORIL, SSUSL, KSAL, TEMUL, and DHF allocated the duties of storage and access to digitised content to the institution staff only. ORI & ML and GDRL mentioned that they use outside staff for storage and access. While SCL, KAULIS, and TMR mentioned that, they use both the institution and outside staff for this task. It is further revealed that, out of the 13 respondents, a large majority of the respondents 8 (61.54 per cent) use only their institution staff for storage and access of digitised content. 2 (15.38 per cent) of the respondents use outside staff for storage and access work. At the same time, 3 respondents, representing 23.08 per cent use both the institution and outside staff for the storage and access of digitised content.

The overall analysis shows that the majority of cultural institutions use their institution staff to perform work related to the storage and access of digitised documentary heritage collections.

## **5.22 Techniques Used in the Scanning Process**

Scanning is an important task in the digitisation process to convert the analogue originals into their electronic form. Some cultural institutions use the original materials themselves for scanning purposes. Some of them create reproductions of the old and fragile originals, like photocopies, photographs, microfilm, or microfiches, for scanning to prevent extra damage. Here, the investigator tried to find out from which material scanning is carried out, whether it is the original materials or reproductions. The data regarding the format of materials used for scanning is shown in Table 28.

**Table 28**

***Format of Materials Used for the Scanning Process***

| Name of the Cultural Institution | Format of Materials Used for the Scanning Process (n=13) |                    |                       |
|----------------------------------|----------------------------------------------------------|--------------------|-----------------------|
|                                  | From Originals                                           | From Reproductions | Both                  |
| SCL                              | ✓                                                        | --                 | --                    |
| KUL                              | ✓                                                        | --                 | --                    |
| KLL                              | ✓                                                        | --                 | --                    |
| ORI & ML                         |                                                          | --                 | ✓                     |
| KCHRL                            | ✓                                                        | --                 | --                    |
| SORIL                            | ✓                                                        | --                 | --                    |
| SSUSL                            | ✓                                                        | --                 | --                    |
| KSAL                             | ✓                                                        | --                 | --                    |
| KAULIS                           | --                                                       | --                 | ✓                     |
| GDRL                             | ✓                                                        | --                 | --                    |
| TEMUL                            | ✓                                                        | --                 | --                    |
| TMR                              | ✓                                                        | --                 | --                    |
| DHF                              | --                                                       | --                 | ✓                     |
| <b>Total</b>                     | <b>10<br/>(76.92)</b>                                    | <b>--</b>          | <b>3<br/>(23.08)_</b> |

(The figures given in bracket show the respective percentage)

Table 28 indicates that SCL, KUL, KLL, KCHRL, SORLL, SSUSL, KSAL, GDRL, TEMUL, and TMR use the original documentary heritage material itself for the scanning process, whereas ORI & ML, KAULIS, and DHF create reproductions of their documentary heritage materials and use those reproductions for the scanning process. It also indicates that the majority of the respondents 10 (76.92 per cent) conducted scanning by using original documentary materials directly. 3 (23.08 per cent) of the respondents indicate that they create the reproductions for the scanning process. It is found that the majority of cultural institutions perform direct scanning of the original documentary heritage materials.

### **5.23 Types of Reproductions Used**

According to the findings revealed in Table 28, the three cultural institutions, such as ORI & ML, KAULIS, and DHF, have developed reproductions of their documentary heritage materials for the scanning process. Here, the investigator tried to find out the type of reproductions made for scanning. The data regarding the type of reproductions used is presented in Table 29.

**Table 29**

*Types of Reproductions Used*

| <b>Name of the Cultural Institution</b> | <b>Type of Reproductions Used</b> |                    |                                  |                  |
|-----------------------------------------|-----------------------------------|--------------------|----------------------------------|------------------|
|                                         | <b>Photographs</b>                | <b>Photocopies</b> | <b>Microfilm/<br/>Microfiche</b> | <b>Any Other</b> |
| ORI & ML                                | ✓                                 | --                 | --                               | --               |
| KAULIS                                  | ✓                                 | ✓                  | --                               | --               |
| DHF                                     | ✓                                 | --                 | --                               | --               |

Table 29 indicates that ORI & ML and DHF created photographic reproductions of the documentary heritage materials for scanning work. KAULIS uses photographs and photocopies of heritage materials to perform scanning. No cultural institution uses microfilm/microfiche or other forms of reproduction.

### **5.24 Damage to Originals during the Scanning Process**

The physical condition of the majority of documentary heritage collections should be in a fragile state. The major aim of digitisation is to preserve these collections from damage. But careless handling during scanning, light emitted from the scanning machine, and the selection of an inappropriate scanner may cause further deterioration of the materials. The investigator tried to know the experience of cultural institutions regarding the damage that occurred during the scanning of their documentary heritage collection. The responses related to the damages that occurred during scanning are presented in Table 30.



**Table 30**

***Damage to Originals during the Scanning Process***

| Name of the Cultural Institution | Damage to Originals during the Scanning Process (n=13) |                      |
|----------------------------------|--------------------------------------------------------|----------------------|
|                                  | Yes                                                    | No                   |
| SCL                              | ✓                                                      | --                   |
| KUL                              | ✓                                                      | --                   |
| KLL                              | --                                                     | ✓                    |
| ORI & ML                         | ✓                                                      | --                   |
| KCHRL                            | --                                                     | ✓                    |
| SORIL                            | --                                                     | ✓                    |
| SSUSL                            | --                                                     | ✓                    |
| KSAL                             | --                                                     | ✓                    |
| KAULIS                           | --                                                     | ✓                    |
| GDRL                             | --                                                     | ✓                    |
| TEMUL                            | ✓                                                      | --                   |
| TMR                              | --                                                     | ✓                    |
| DHF                              | ✓                                                      | --                   |
| <b>Total</b>                     | <b>5<br/>(38.46)</b>                                   | <b>8<br/>(61.54)</b> |

(The figures given in bracket show the respective percentage)

Table 30 reveals that cultural institutions such as SCL, KUL, ORI & ML, TEMUL, and DHF have faced damage to documentary heritage materials during the scanning process. At the same time, cultural institutions such as KLL, KCHRL, SORIL, SSUSL, KSAL, KAULIS, GDRL, and TMR mentioned that they did not face any damage to original documentary heritage materials during scanning. It also reveals that, out of the 13 respondents, 8 (61.54 per cent) of the respondents did not face any damage to documentary heritage materials during scanning work, but 5 respondents, representing 38.46 per cent faced damage while scanning. It was found that more than 60.00 per cent of the cultural institutions did not face any damage to their documentary heritage collection during the scanning process.

### 5.25 Storage of Original Materials after Digitisation Process

Preservation of documentary heritage collections through digitisation does not mean that the value and access of originals are minimised. Digitisation only a method to preserve these collections. Access to the originals remains the same if they are in good physical condition after their electronic conversion. The persons involved in the scanning process should ensure less physical damage to the originals and store them in good condition after scanning process. Here, respondents were asked to specify the way in which the originals were stored after the digitisation process. The storage of originals after digitisation is presented in Table 31.

**Table 31**

*Storage of Original Materials after the Digitisation Process*

| Name of the Cultural Institution | Storage of Original Materials after Digitisation Process<br>(n=13) |                                 |
|----------------------------------|--------------------------------------------------------------------|---------------------------------|
|                                  | In special condition                                               | In same way before digitisation |
| SCL                              | --                                                                 | ✓                               |
| KUL                              | ✓                                                                  | --                              |
| KLL                              | --                                                                 | ✓                               |
| ORI & ML                         | --                                                                 | ✓                               |
| KCHRL                            | --                                                                 | ✓                               |
| SORIL                            | --                                                                 | ✓                               |
| SSUSL                            | ✓                                                                  | --                              |
| KSAL                             | --                                                                 | ✓                               |
| KAULIS                           | --                                                                 | ✓                               |
| GDRL                             | --                                                                 | ✓                               |
| TEMUL                            | ✓                                                                  | --                              |
| TMR                              | --                                                                 | ✓                               |
| DHF                              | ✓                                                                  | --                              |
| <b>Total</b>                     | <b>4</b><br><b>(30.77)</b>                                         | <b>9</b><br><b>(69.23)</b>      |

(The figures given in bracket show the respective percentage)

Table 31 depicts that cultural institutions such as KUL, SSUSL, TEMUL, and TMR store the original documentary heritage materials in special condition after digitisation process, but cultural institutions such as SCL, KLL, ORI & ML, KCHRL, SORLL, KSAL, KAULIS, GDRL, and TMR store the original documentary heritage materials in the same way before digitisation. It is evident that the majority of the respondents 9 (69.23 per cent) did not provide any special storage facilities for original documentary heritage materials after digitisation process. 4 respondents, representing 30.77 per cent provide special storage conditions for analogue documentary heritage materials after digitisation. It was found that the majority of cultural institutions did not provide proper and special storage facilities for original documentary heritage materials after their digital conversion.

#### **5.26 Resolutions Used for Scanning**

The resolution of the scans is related to the amount of detail captured in the scans. Depending on the type of materials needed to digitise, various resolutions have been used. The resolutions are mainly expressed in “dots per inch” (DPI). With a higher resolution, the size of the file becomes larger. The choice of resolution affects the costs and long-term preservation of the materials. The investigator made an attempt to identify the resolutions used by the cultural institutions during digitisation process. Data regarding the resolutions used for scanning is presented in Table 32.

**Table 32**

***Resolutions Used for Scanning***

| Name of the Cultural Institution | Resolutions Used for Scanning |                            |                            |
|----------------------------------|-------------------------------|----------------------------|----------------------------|
|                                  | 300 dpi                       | 400 dpi                    | Various dpi                |
| SCL                              | --                            | ✓                          | --                         |
| KUL                              | --                            | --                         | ✓                          |
| KLL                              | --                            | ✓                          | --                         |
| ORI & ML                         | ✓                             | --                         | --                         |
| KCHRL                            | --                            | --                         | ✓                          |
| SORIL                            | --                            | ✓                          | --                         |
| SSUSL                            | ✓                             | --                         | --                         |
| KSAL                             | --                            | --                         | ✓                          |
| KAULIS                           | --                            | --                         | ✓                          |
| GDRL                             | ✓                             | --                         | --                         |
| TEMUL                            | ✓                             | --                         | --                         |
| TMR                              | ✓                             | --                         | --                         |
| DHF                              | --                            | --                         | ✓                          |
| <b>Total</b>                     | <b>5</b><br><b>(38.46)</b>    | <b>3</b><br><b>(23.07)</b> | <b>5</b><br><b>(38.46)</b> |

(The figures given in bracket show the respective percentage)

Table 32 presents the resolutions used by the cultural institutions. It can be seen from the table, ORI & ML, SSUSL, GDRL, TEMUL, and TMR use 300 dpi resolution, whereas SCL, KLL, and SORIL use 400 dpi, and other cultural institutions such as KUL, KCKRL, KSAL, KAULIS, and DHF use various resolutions depending on the materials to digitise. Out of the 13 respondents, 5 (38.46 per cent) of the respondents indicated that they used 300 dpi and various resolutions based on the materials to digitise. 3 respondents, representing 23.07 per cent use 400 dpi. It is found that the majority of cultural institutions use 300 dpi resolution and various resolutions depending on the material.

### 5.27 Digital Image Format Used

Here, the investigator tried to identify the digital image format used by the cultural institutions in the digitisation process. Respondents were asked to specify the digital image format used. The digital image format used by the cultural institutions is presented in Table 33.

**Table 33**

*Digital Image Format Used*

| Name of the Cultural Institution | Digital Image Format Used (n=13) |                            |                            |           |
|----------------------------------|----------------------------------|----------------------------|----------------------------|-----------|
|                                  | Colour                           | Black & White              | Grey Level                 | Any Other |
| SCL                              | --                               | ✓                          | --                         | --        |
| KUL                              | ✓                                | ✓                          | --                         | --        |
| KLL                              | --                               | ✓                          | --                         | --        |
| ORI & ML                         | ✓                                | --                         | --                         | --        |
| KCHRL                            | ✓                                | --                         | ✓                          | --        |
| SORIL                            | --                               | ✓                          | --                         | --        |
| SSUSL                            | ✓                                | --                         | --                         | --        |
| KSAL                             | ✓                                | --                         | ✓                          | --        |
| KAULS                            |                                  | --                         | ✓                          | --        |
| GDRL                             | ✓                                | --                         | --                         | --        |
| TEMUL                            | ✓                                | --                         | --                         | --        |
| TMR                              | ✓                                | --                         | --                         | --        |
| DHF                              | --                               | --                         | ✓                          | --        |
| <b>Total</b>                     | <b>8</b><br><b>(61.53)</b>       | <b>4</b><br><b>(30.76)</b> | <b>4</b><br><b>(30.76)</b> | <b>0</b>  |

(The figures given in bracket show the respective percentage)

Table 33 shows that the colour digital image format is used by KUL, ORI & ML, KCHRL, SSUSL, KSAL, GDRL, TEMUL, and TMR. The Black & white digital colour image format is used by SCL, KUL, KLL, and SORIL. And cultural institutions such as KCHRL, KSAL, KAULIS, and DHF use grey-level digital image formats. The overall analysis indicates that cultural institutions use multiple digital image formats. Out of the 13 cultural institutions surveyed, more than sixty per cent of the cultural institutions (61.53 per cent) used colour digital image format,

4 cultural institutions, representing 30.76 per cent indicated black & white, remaining four respondents (30.76 per cent) used grey level.

### **5.28 File Format Used**

Depending on the materials selected for digitisation, different file formats have been used. The major file formats used for the purpose are Joint Photographic Expert Group (JPEG), Tagged Image File Format (TIFF), Portable Document Format (PDF), etc. The TIFF format is considered the best and standard file format for long-term preservation of archival documentary heritage collections. Kalusopa and Zulu (2009) cited in their study on digital heritage material preservation in Botswana that most of the organisations (42.9 per cent) used GIF, JPEG, PDF, and MPEG file formats for digitised materials. Here, the investigator made an effort to identify the file format used by the cultural institutions. Table 34 indicates the file format used by the cultural institutions.

**Table 34**

*File Format Used*

| Name of the Cultural Institution | File Format Used           |                            |                             |           |
|----------------------------------|----------------------------|----------------------------|-----------------------------|-----------|
|                                  | TIFF                       | JPEG                       | PDF                         | Any Other |
| SCL                              | --                         | --                         | ✓                           | --        |
| KUL                              | ✓                          | --                         | ✓                           | --        |
| KLL                              | --                         | --                         | ✓                           | --        |
| ORI & ML                         | ✓                          | --                         | --                          | --        |
| KCHRL                            | --                         | ✓                          | ✓                           | --        |
| SORIL                            | --                         | ✓                          | ✓                           | Raw file  |
| SSUSL                            | ✓                          | ✓                          | ✓                           | --        |
| KSAL                             | --                         | ✓                          | ✓                           | --        |
| KAULIS                           | ✓                          | ✓                          | ✓                           | --        |
| GDRL                             | --                         | --                         | ✓                           | --        |
| TEMUL                            | --                         | --                         | ✓                           | --        |
| TMR                              | --                         | ✓                          | --                          | --        |
| DHF                              | --                         | ✓                          | ✓                           | --        |
| <b>Total</b>                     | <b>4</b><br><b>(30.77)</b> | <b>7</b><br><b>(53.85)</b> | <b>11</b><br><b>(84.62)</b> | --        |

(The figures given in bracket show the respective percentage)

Table 34 enumerates the types of file formats used by the cultural institutions. It can be observed that SCL, GDRL, and TEMUL use PDF format only. KUL uses TIFF and PDF formats. ORI & ML uses TIFF format only. KCHRL, SORIL, KSAL, and DHF use JPEG and PDF formats. SORIL also uses the RAW file format. SSUSL and KAULIS use TIFF, JPEG, and PDF formats. TMR uses JPEG format only. It is also evident that the majority of the respondents 11 (84.62 per cent) used PDF format. 7 (53.85 per cent) of the respondents used JPEG format, and 4 respondents, representing 30.77 per used TIFF format.

The overall analysis shows that PDF is the file format used by the majority of cultural institutions, whereas TIFF is the file format used by the least number of cultural institutions.

### **5.29 Catalogue Records of the Digitised Collection**

Here, the investigator tried to know how the cultural institutions kept the catalogue records of the digitised content. The methods used for keeping catalogue records of the digitised content are presented in Table 35.

**Table 35**

#### *Catalogue Records of the Digitised Collection*

| Name of the Cultural Institution | Catalogue Records of the Digitised Collection |                             |                            |
|----------------------------------|-----------------------------------------------|-----------------------------|----------------------------|
|                                  | Included in Main Catalogue                    | In Separate Catalogue       | Not Catalogued             |
| SCL                              | --                                            | --                          | ✓                          |
| KUL                              | --                                            | ✓                           | --                         |
| KLL                              | --                                            | --                          | ✓                          |
| ORI & ML                         | --                                            | ✓                           | --                         |
| KCHRL                            | ✓                                             | ✓                           | --                         |
| SORIL                            | --                                            | ✓                           | --                         |
| SSUSL                            | --                                            | ✓                           | --                         |
| KSAL                             | --                                            | ✓                           | --                         |
| KAULIS                           | --                                            | ✓                           | --                         |
| GDRL                             | --                                            | ✓                           | --                         |
| TEMUL                            | --                                            | --                          | ✓                          |
| TMR                              | --                                            | ✓                           | --                         |
| DHF                              | ✓                                             | ✓                           | --                         |
| <b>Total</b>                     | <b>2</b><br><b>(15.38)</b>                    | <b>10</b><br><b>(76.92)</b> | <b>3</b><br><b>(23.08)</b> |

(The figures given in bracket show the respective percentage)

Table 35 affirmed that cultural institutions such as KCHRL and DHF mentioned that they kept the catalogue records of the digitised documentary heritage collection in both the main catalogue of the institution and a separate catalogue of digitised content. Whereas KUL, ORI & ML, SORIL, SSUSL, KSAL, KAULIS, GDRL, TEMUL, and TMR maintain a separate catalogue for digitised heritage content. At the same time, SCL, KLL, and TEMUL did not catalogue the digitised content of the documentary heritage collection. It can also indicate that the majority of the respondents 10 (76.92 per cent) created a separate catalogue for digitised content; 2 respondents, representing 15.38 per cent included catalogue records of digitised content in both the main catalogue and a separate catalogue of digitised content and 3 (23.08 per cent) of the respondents did not catalogue their digitised content.

The overall analysis indicates that the majority of the cultural institutions created a separate catalogue for their digitised documentary heritage collections.

### **Section F: Requirements for Digital Preservation**

Digital preservation is a technical process consisting of a series of managed activities that require supporting infrastructure facilities, hardware and software requirements, financial incentives, skilled or expert human resources, the adoption of appropriate standards, good preservation policies, an effective collaborative approach, and an enabling environment. In this section, the investigator analyses responses related to the availability of infrastructure facilities, hardware and software requirements, financial considerations, availability of manpower, status of collaboration in preservation activities, adoption of standards and policies for digital preservation, and selection of storage systems for long-term preservation.

#### **5.30 Infrastructure Facilities for Digitisation Project**

The process of digitisation inevitably involves various steps such as identification and assessment of materials to be digitised, selection of materials based on the criteria, preparation of the materials through conservation treatment, conversion process (scanning), processing and organisation of digitised content,



storage of digitised content, and access and dissemination of digitised content. Effective physical infrastructure facilities, buildings, and space are essential for performing these individual steps involved in the digitisation work. Here, the investigator intended to identify the availability of adequate infrastructure facilities in cultural institutions for the digitisation of their documentary heritage collection. Respondents were asked to express the availability of infrastructure facilities. Data regarding the availability of proper infrastructure facilities is presented in Table 36.

**Table 36**

*Availability of Adequate Infrastructure facilities for Digitisation Project*

| Name of the Cultural Institution | Availability of Adequate Infrastructure facilities for Digitisation Project |                            |
|----------------------------------|-----------------------------------------------------------------------------|----------------------------|
|                                  | Yes                                                                         | No                         |
| SCL                              | --                                                                          | ✓                          |
| KUL                              | ✓                                                                           | --                         |
| KLL                              | ✓                                                                           | --                         |
| ORI & ML                         | ✓                                                                           | --                         |
| KCHRL                            | --                                                                          | ✓                          |
| SORIL                            | ✓                                                                           | --                         |
| SSUSL                            | ✓                                                                           | --                         |
| KSAL                             | --                                                                          | ✓                          |
| KAULIS                           | ✓                                                                           | --                         |
| GDRL                             | ✓                                                                           | --                         |
| TEMUL                            | --                                                                          | ✓                          |
| TMR                              | ✓                                                                           | --                         |
| DHF                              | ✓                                                                           | --                         |
| <b>Total</b>                     | <b>9</b><br><b>(69.23)</b>                                                  | <b>4</b><br><b>(30.77)</b> |

(The figures given in bracket show the respective percentage)

Table 36 exposes the availability of adequate infrastructure facilities in cultural institutions. It can be observed that cultural institutions KUL, KLL, ORI & ML, SORIL, SSUSL, KAULIS, GDRL, TMR, and DHF indicate that they had adequate infrastructure facilities for the digitisation process, whereas SCL, KCHRL, KSAL, and TEMUL indicate that they had no adequate infrastructure facilities for the digitisation process. It also indicates that, out of the 13 cultural institutions surveyed, the majority of the cultural institutions 9 (69.23 per cent) had adequate infrastructure facilities for digitisation work and 4 (30.77 per cent) of the cultural institutions had inadequate infrastructure facilities for the digitisation process.

### **5.31 Hardware Requirements for Digitisation**

The concept of hardware can be defined as a physical component of a computer and related devices. The essential hardware used in the digitisation process are computers, scanners, digital cameras, servers, equipment for digital storage, UPS power systems, and other equipment, etc. The selection of appropriate hardware for digitisation depends on the financial stability of the cultural institution, the size of the collection, and the type of items to be digitised. In the case of scanners, there are many options available depending upon the type of item to be scanned; they are flat-bed scanners, book scanners, drum scanners, sheet-bed scanners, portable scanners, integrated scanners, slide/film scanners, and microfilm scanners. Based on the size of the digitised content, an adequate storage system can be selected for long-term preservation. It is important to select appropriate hardware to ensure long-term digital preservation. Here, the investigator tried to understand the hardware facilities available in the cultural institutions. Details of the availability of hardware facilities in the cultural institutions are presented in Table 37.

**Table 37**

*Availability of Hardware Facilities in the Cultural Institutions*

| Name of the Cultural Institution | Availability of Hardware Facilities in the Cultural Institutions |         |                |                             |                        |
|----------------------------------|------------------------------------------------------------------|---------|----------------|-----------------------------|------------------------|
|                                  | Computer                                                         | Scanner | Digital Camera | Server                      | UPS and Power Systems  |
| SCL                              | 3                                                                | 1       | --             | 1<br>Common for Institution | Common for Institution |
| KUL                              | 6                                                                | 1       | 1              | 1                           | --                     |
| KLL                              | 4                                                                | 1       | 1              | 1                           | 1                      |
| ORI & ML                         | 6                                                                | 1       | 1              | 2                           | 1                      |
| KCHRL                            | 2                                                                | 3       | 1              | 1                           | 2                      |
| SORIL                            | 1                                                                | 1       | 1              | --                          | 1                      |
| SSUSL                            | 3                                                                | 1       | 2              | Common for University       | Common for University  |
| KSAL                             | 6                                                                | 1       | 1              | 2                           | 2                      |
| KAULIS                           | 4                                                                | 2       | 1              | 2                           | 5                      |
| GDRL                             | 1                                                                | 3       | --             | --                          | 3                      |
| TEMUL                            | 1                                                                | 1       | --             | 1                           | Common for Institution |
| TMR                              | 2                                                                | 1       | 1              | 1                           | 1                      |
| DHF                              | 1                                                                | --      | 1              | 1                           | 1                      |

Table 37 summarises the availability of hardware facilities in cultural institutions. SCL consists of 3 computers and 1 scanner. KUL had 6 computers, 1 scanner, 1 digital camera, and 1 server. KLL had 4 computers, 1 scanner, 1 digital camera, 1 server, and 1 UPS power system. ORI & ML holds 6 computers, 1 scanner. KCHRL contains 2 computers, 3 scanners, 1 digital camera, 1 server, and 2 UPS power systems. SORIL had 1 computer, 1 scanner, 1 digital camera, and 1 UPS power system. Table 37 further reveals that SSUSL holds 3 computers, 1 scanner, and 2 digital cameras. Whereas KSAL had 6 computers, 1 scanner, 1 digital camera, 2 servers, and 2 UPS power systems. KAULIS contains 4 computers, 2 scanners, 1 digital camera, 2 servers, and 5 UPS power systems. GDRL consists of 1 computer, 3 scanners, and 3 UPS power systems. TEMUL carries 1 computer, 1 scanner, and 1 server. TMR holds 2 computers, 1 scanner, 1 digital camera, 1 server, and 1 UPS power system. DHF had 1 computer, 1 digital camera, 1 server, and a UPS power system. Cultural institutions such as SCL, SSUSL, and TEMUL use the common

server and power system of the parent institution. It was found that the majority of the cultural institutions have adequate hardware facilities.

### 5.32 Software Requirements for Digitisation

Software is a term used to denote a set of programs or instructions used to operate computers and related devices. Cultural institutions are using open-source, commercial, and in-house software to perform various tasks in the digitisation process. The software used in the digitisation process is scanning software (most of the scanners come with their own in-built software), software for image processing, OCR software, digital library software, image software, document software, conversion software, image viewing software, FTP, desktop publishing software, PDF software, etc. Here, the investigator checks the use of software for various purposes. Respondents were asked to reveal the details of the type of software used in the digitisation process. Table 38 indicates the type of software used by the cultural institutions.

**Table 38**

#### *Types of Software Used by Cultural Institutions*

| Name of the Cultural Institution | Types of Software Used by Cultural Institutions |                             |                           |                                 |                             |                           |                            |                            |                            |
|----------------------------------|-------------------------------------------------|-----------------------------|---------------------------|---------------------------------|-----------------------------|---------------------------|----------------------------|----------------------------|----------------------------|
|                                  | Scanning                                        |                             |                           | Processing of Digitised Content |                             |                           | Digital Library            |                            |                            |
|                                  | Open Source                                     | Commercial                  | In-house                  | Open Source                     | Commercial                  | In-house                  | Open Source                | Commercial                 | In-house                   |
| SCL                              | --                                              | ✓                           | --                        | --                              | ✓                           | --                        | --                         | --                         | ✓                          |
| KUL                              | --                                              | ✓                           | --                        | --                              | ✓                           | --                        | ✓                          | --                         | --                         |
| KLL                              | --                                              | ✓                           | --                        | --                              | ✓                           | --                        | ✓                          | --                         | --                         |
| ORI & ML                         | --                                              | ✓                           | --                        | --                              | ✓                           | --                        | --                         | --                         | ✓                          |
| KCHRL                            | --                                              | ✓                           | --                        | --                              | ✓                           | --                        | --                         | --                         | ✓                          |
| SORIL                            | --                                              | ✓                           | --                        | --                              | ✓                           | --                        | NR                         |                            |                            |
| SSUSL                            | --                                              | ✓                           | --                        | --                              | ✓                           | --                        | NR                         |                            |                            |
| KSAL                             | --                                              | ✓                           | --                        | --                              | ✓                           | --                        | --                         | ✓                          | --                         |
| KAULIS                           | --                                              | --                          | ✓                         | --                              | --                          | ✓                         | ✓                          | --                         | --                         |
| GDRL                             | --                                              | ✓                           | --                        | --                              | ✓                           | --                        | --                         | ✓                          | --                         |
| TEMUL                            | --                                              | ✓                           | --                        | --                              | ✓                           | --                        | ✓                          | --                         | --                         |
| TMR                              | --                                              | ✓                           | --                        | --                              | ✓                           | --                        | NR                         |                            |                            |
| DHF                              | --                                              | ✓                           | --                        | --                              | ✓                           | --                        | NR                         |                            |                            |
| <b>Total</b>                     | <b>0</b>                                        | <b>12</b><br><b>(92.31)</b> | <b>1</b><br><b>(7.69)</b> | <b>0</b>                        | <b>12</b><br><b>(92.31)</b> | <b>1</b><br><b>(7.69)</b> | <b>4</b><br><b>(30.77)</b> | <b>2</b><br><b>(15.38)</b> | <b>3</b><br><b>(23.08)</b> |

(The figures given in bracket show the respective percentage) NR=No Response

Table 38 depicts the type of software used by the cultural institutions for digitisation. It is visible from the table that the majority of the cultural institutions (SCL, KUL, KLL, ORI & ML, KCHRL, SORIL, SSUSL, KSAL GDRL, TEMUL, TMR, and DHF) were using commercial software for scanning. Only one cultural institution (KAULIS) is using in-house software for scanning. It can be seen that, out of the 13 respondents, 12 (92.31 per cent) of the respondents used commercial software for scanning. And 1 respondent, representing 7.69 per cent used in-house software.

Table 38 also reveals that, out of the 13 cultural institutions surveyed, SCL, KUL, KLL, ORI&ML, KCHRL, SORIL, SSUSL, KSAL GDRL, TEMUL, TMR, and DHF are using commercial software for the processing of digitised content, whereas only one institution, KAULIS, used in-house software for the processing work. Out of the 13 respondents, the majority of the respondents 12 (92.31 per cent) used commercial software for the processing of digitised content. At the same time, only 1 respondent, representing 7.69 per cent uses in-house software.

Table 38 also indicates the use of digital library software. Out of the 13 cultural institutions surveyed, KUL, KLL, KAULIS, and TEMUL used open-source digital library software. KSAL and GDRL used commercial digital library software. SCL, ORI & ML, and KCHRL used in-house digital library software. Whereas SORIL, SSUSL, TMR, and DHF do not indicate their responses. Out of the 13 respondents, 4 (30.77 per cent) of the respondents used open source digital library software, 2 (15.38 per cent) of the respondents used commercial digital library software, and 3 respondents, representing 23.08 per cent used in-house software.

### **5.33 Staff Development for Digitisation Process**

Human resource management is an important aspect of any successful digital preservation project. Lack of expertise and skilled staff in digitisation technologies is the major challenge faced by any institution conducting digitisation work. The traditional institution staff with high qualifications, experience, and abilities in traditional library operations have suffered from 'technophobia'; they lack the ability to use technology and are not ready to perform digitisation work. Due to these

reasons, institutions have to hire extra staff for the technical work of digitisation and also seek help from an outsourcing agency. Kalusopa and Zulu (2009) depict that 57.1 per cent of the organisations in Botswana make use of outside experts to conduct their digitisation programs. Here, the investigator tried to find out whether the cultural institutions hired extra staff for digitisation work or not. Respondents were asked to reveal that they had hired extra staff for their digitisation project. The details regarding the hiring of extra staff for digitisation is presented in Table 39.

**Table 39**

*Status of Hiring Extra Staff for Digitisation Work*

| Name of the Cultural Institution | Status of Hiring Extra Staff for Digitisation Work (n=13) |                      |
|----------------------------------|-----------------------------------------------------------|----------------------|
|                                  | Yes                                                       | No                   |
| SCL                              | ✓                                                         | --                   |
| KUL                              | ✓                                                         | --                   |
| KLL                              | ✓                                                         | --                   |
| ORI & ML                         | ✓                                                         | --                   |
| KCHRL                            | ✓                                                         | --                   |
| SORIL                            | --                                                        | ✓                    |
| SSUSL                            | ✓                                                         | --                   |
| KSAL                             | ✓                                                         | --                   |
| KAULIS                           | ✓                                                         | --                   |
| GDRL                             | --                                                        | ✓                    |
| TEMUL                            | ✓                                                         | --                   |
| TMR                              | ✓                                                         | --                   |
| DHF                              | --                                                        | ✓                    |
| <b>Total</b>                     | <b>10<br/>(76.92)</b>                                     | <b>3<br/>(23.08)</b> |

(The figures given in bracket show the respective percentage)

Table 39 reveals that, out of the 13 cultural institutions surveyed, SCL, KUL, KLL, ORI & ML, KCHRL, SSUSL, KSAL, KAULIS, TEMUL, and TMR hired extra staff for digitisation work. SORIL, GDRL, and DHF did not hire extra staff for digitisation work. Out of the 13 respondents, majority of the respondents 10 (76.92 per cent) indicated that they had hired extra staff to perform digitisation work. At the

same time, 3 respondents, representing 23.08 per cent indicate that they were not hired extra staff.

### **5.34 Reasons to Hire Extra Staff for Digitisation Work**

The unavailability of skilled or expert staff is the major driving force behind hiring extra staff for digitisation work. There are many other specific reasons that might force the institutions to appoint extra staff: the large quantity and complex nature of the collection to digitise, the limited number of staff held by the institution, the time limit of the digitisation project, and the lack of previous experience of the institutions in conducting digitisation projects. According to Table 39, there are 10 cultural institutions that indicate that they were appointed extra staff for digitisation work. Here, the investigator tried to identify the reasons to hire extra staff for digitisation work. Table 40 indicates the reasons to hire extra staff for digitisation work.

**Table 40**

*Reasons to Hire Extra Staff for Digitisation Work*

| Name of the Cultural Institution | Reasons to Hire Extra Staff for Digitisation Work (n=10) |                                     |                                        |                                            |                                 |
|----------------------------------|----------------------------------------------------------|-------------------------------------|----------------------------------------|--------------------------------------------|---------------------------------|
|                                  | Large Quantity of Collection                             | Limited Number of Institution Staff | Lack of Professionally Qualified Staff | Lack of Experience in Digitisation Project | Digitisation Project Time Limit |
| SCL                              | ✓                                                        | ✓                                   | --                                     | ✓                                          | ✓                               |
| KUL                              | ✓                                                        | ✓                                   | --                                     | --                                         | ✓                               |
| KLL                              | ✓                                                        | --                                  | --                                     | --                                         | ✓                               |
| ORI & ML                         | ✓                                                        | --                                  | --                                     | --                                         | --                              |
| KCHRL                            | ✓                                                        | ✓                                   | --                                     | --                                         | ✓                               |
| KSAL                             | ✓                                                        | ✓                                   | --                                     | ✓                                          | --                              |
| KAULIS                           | ✓                                                        | --                                  | --                                     | --                                         | ✓                               |
| SSUSL                            | --                                                       | --                                  | --                                     | --                                         | ✓                               |
| TEMUL                            | --                                                       | ✓                                   | --                                     | --                                         | --                              |
| TMR                              | ✓                                                        | --                                  | --                                     | --                                         | --                              |
| <b>Total</b>                     | <b>8</b><br><b>(80.00)</b>                               | <b>5</b><br><b>(50.00)</b>          | <b>0</b>                               | <b>2</b><br><b>(20.00)</b>                 | <b>6</b><br><b>(60.00)</b>      |

(The figures given in bracket show the respective percentage)

Table 40 showcases the major reasons for appointing extra staff for the digitisation project. It can be observed that "a large quantity of the collection" is indicated by SCL, KUL, KLL, ORI & ML, KCHRL, KSAL, KAULIS, and TMR. "Limited number of institution staff" is mentioned by SCL, KUL, KCHRL, KASAL, and TEMUL. "Lack of previous experience in digitisation projects" is specified by SCL and KSAL. The "limited period of digitisation project" is indicated by SCL, KUL, KLL, KCHRL, KAULIS, and SSUSL.

As per Table 39, 10 cultural institutions hired extra staff for digitisation work. Out of the 10 cultural institutions, the majority of the institutions 8 (80.00 per cent) indicate that "large quantity of the collection" is the reason to hire extra staff. A good number of cultural institutions 6 (60.00 per cent) mentioned "limited period of digitisation project" to finish. 5 cultural institutions, representing 50 per cent indicated "limited number of institution staff" and the least number of cultural institutions, 2 (20.00 per cent) mentioned a "lack of previous experience in digitisation". Kalusopa and Zulu (2009) reported that the unavailability of appropriately trained staff is the major problem faced by organisations in Botswana in seeking help from outside experts for digitisation.

### **5.35 Training Programmes for the Staff of Cultural Institutions**

The conventional staff of cultural institutions have less skill and technical know-how in modern digital technologies. They need proper training and guidance on new technologies. For conducting successful digital preservation work in an institution, there is a need for staff with adequate digital preservation techniques. So that the authorities of the institutions should provide proper training and continuous professional development activities to their staff. Kalusopa and Zulu (2009) reported that 57.1 per cent of the organisations in Botswana conducted training programmes in digital preservation for their staff. Here, the investigator intended to check whether the cultural institutions provide proper training to their staff or not. Table 41 indicates the training provided by the cultural institutions to their staff.



**Table 41**

*Training Programmes for the Staff of Cultural Institutions*

| Name of the Cultural Institution | Training Programmes for the Staff of the Cultural Institutions (n=13) |                      |
|----------------------------------|-----------------------------------------------------------------------|----------------------|
|                                  | Yes                                                                   | No                   |
| SCL                              | ✓                                                                     | --                   |
| KUL                              | ✓                                                                     | --                   |
| KLL                              | ✓                                                                     | --                   |
| ORI & ML                         | --                                                                    | ✓                    |
| KCHRL                            | ✓                                                                     | --                   |
| SORIL                            | --                                                                    | ✓                    |
| SSUSL                            | --                                                                    | ✓                    |
| KSAL                             | ✓                                                                     | --                   |
| KAULIS                           | ✓                                                                     | --                   |
| GDRL                             | --                                                                    | ✓                    |
| TEMUL                            | ✓                                                                     | --                   |
| TMR                              | ✓                                                                     | --                   |
| DHF                              | --                                                                    | ✓                    |
| <b>Total</b>                     | <b>8<br/>(61.54)</b>                                                  | <b>5<br/>(38.46)</b> |

(The figures given in bracket show the respective percentage)

Table 41 analyses the training programmes provided by the cultural institutions to their staff. It was found that SCL, KUL, KLL, KCHRL, KSAL, KAULIS, TEMUL, and TMR provided adequate training to their staff. Whereas, ORI & ML, SORIL, SSUSL, GDRL, and DHF indicate that they are not providing training to their staff. Out of the 13 respondents, the majority of the respondents 8 (61.54 per cent) provided training to their staff on digitisation and 5 respondents, representing 38.46 per cent not provide any type of training to their staff.

**5.36 Types of Training Programmes Provided**

Here, the investigator tried to understand what type of training is provided by the cultural institutions to their staff. It is important to know the way in which the

training programmes are provided: initial training, through conducting workshops, on the job training, training by using outside experts, etc. Table 41 indicates that eight cultural institutions provided training to their staff. Respondents were asked to indicate what type of training was provided to the staff on digitisation work. Table 42 shows the types of training programmes provided by the cultural institutions.

**Table 42**

***Types of Training Programmes Provided***

| Name of the Cultural Institution | Types of Training Programmes Provided (n=8) |                      |                                                      |                                                           |
|----------------------------------|---------------------------------------------|----------------------|------------------------------------------------------|-----------------------------------------------------------|
|                                  | Training in between Digitisation Project    | Conducting Workshops | Initial Training by Using Experts in the Institution | Initial Training by Using Experts Outside the Institution |
| SCL                              |                                             | --                   | --                                                   | ✓                                                         |
| KUL                              | ✓                                           | --                   | --                                                   | --                                                        |
| KLL                              | --                                          | --                   | ✓                                                    | ✓                                                         |
| KCHRL                            | ✓                                           | --                   | ✓                                                    | --                                                        |
| KSAL                             | ✓                                           | --                   | --                                                   | ✓                                                         |
| KAULIS                           | ✓                                           | ✓                    | --                                                   | --                                                        |
| TEMUL                            | --                                          | --                   | --                                                   | ✓                                                         |
| TMR                              | --                                          | ✓                    | --                                                   | ✓                                                         |
| <b>Total</b>                     | <b>4<br/>(50.00)</b>                        | <b>2<br/>(25.00)</b> | <b>2<br/>(25.00)</b>                                 | <b>5<br/>(62.5)</b>                                       |

(The figures given in bracket show the respective percentage)

Table 42 states that KUL, KCHRL, KSAL, and KAULIS provided the training in between the digitisation project. KAULIS and TMR provided training by conducting workshops. KLL and KCHRL opted for initial training by using internal experts. The cultural institutions, SCL, KLL, KSAL, TEMUL, and TMR, were provided training by outside experts. It further reveals that KLL provides initial training to their staff with the help of institutional experts and outside experts. KCHRL provides training between the digitisation project and the initial training by

using institutional experts. TMR provides training through workshops and initial training by using outside experts.

According to Table 41, eight cultural institutions are providing training to their staff. Out of the 8 respondents, the majority of the respondents 5 (62.5 per cent) provided initial training with the help of outside experts. Whereas a good number of respondents 4 (50.00 per cent) provide training in between the digitisation project and 2 (25.00 per cent) of the respondents provide training through conducting workshops and initial training with the help of internal experts.

### **5.37 Budget of the Digitisation Project**

One of the major challenges faced by cultural institutions in conducting digitisation projects is the cost of the digitisation activities. Institutions need to allocate a major portion of their budget for digitisation projects. This financial burden demotivates the institutions to plan the digitisation of their collections. The purchase of high-quality equipment needed for digitisation process, the cost of preliminary conservation activities, the outsourcing of the digitisation work, the hiring of expert staff, and the cost of hardware, software, and storage systems are major factors in increasing the overall budget of the digitisation project. Here, the investigator intended to identify the budget allocation of the cultural institutions in digitisation project. Respondents were asked to specify the individual costs used for performing the various tasks of the digitisation process, including pre-digitisation activities, purchasing hardware, software, and scanning equipment, hiring and training staff, and managing storage and delivery systems. But cultural institutions are not ready to provide the budget allocation for individual activities; they provide the total budget of expenditure for digitisation project. The total cost of expenditure for digitisation project is presented in Table 43.

**Table 43**

***Total Cost of Expenditure for Digitisation Project***

| <b>Name of the Cultural Institution</b> | <b>Cost of Expenditure for Digitisation Project (INR)</b> |
|-----------------------------------------|-----------------------------------------------------------|
| SCL                                     | 40 Lakhs/year                                             |
| KUL                                     | 1 Crore                                                   |
| KLL                                     | NR                                                        |
| ORI & ML                                | 1 Crore/year                                              |
| KCHRL                                   | 50 Lakhs                                                  |
| SORIL                                   | NR                                                        |
| SSUSL                                   | 3 Lakhs/year                                              |
| KSAL                                    | 2,00,00,000                                               |
| KAULIS                                  | 1300000                                                   |
| GDRL                                    | NR                                                        |
| TEMUL                                   | NR                                                        |
| TMR                                     | NR                                                        |
| DHF                                     | 150000                                                    |

(NR = No Response)

Table 43 summarises the details of the cost of expenditures spent by the cultural institutions to conduct their digitisation project. It can be seen that SCL uses 40 lakhs per year. KUL spent 1 crore. ORI & ML used 1 crore per year. KCHRL spent 50 lakhs. And SSUSL, KSAL, KAULIS, and DHF spent 3 lakhs per year, 2 crore, 1300000 and 150000, respectively. Cultural institutions KLL, SORIL, GDRL, TEMUL, and TMR are not ready to reveal their cost of expenditure on the digitisation project.

**5.38 Funding Agency for the Digitisation Project**

Here, the investigator tried to identify the funding agency for the digitisation project conducted by the cultural institutions. Respondents were asked to indicate their funding agency. The details of the concerned funding agency are presented in Table 44.

**Table 44*****Funding Agency for the Digitisation Project***

| Name of the Cultural Institution | Funding Agency for the Digitisation Project (n=13) |                            |                |                           |
|----------------------------------|----------------------------------------------------|----------------------------|----------------|---------------------------|
|                                  | Institution Itself                                 | Govt. of Kerala            | Govt. of India | Other Funding Agency      |
| SCL                              | --                                                 | ✓                          | --             | --                        |
| KUL                              | --                                                 | ✓                          | --             | --                        |
| KLL                              | --                                                 | ✓                          | --             | --                        |
| ORI & ML                         | --                                                 | ✓                          | --             | --                        |
| KCHRL                            | --                                                 | ✓                          | --             | --                        |
| SORIL                            | ✓                                                  | --                         | --             | --                        |
| SSUSL                            | ✓                                                  | --                         | --             | --                        |
| KSAL                             | --                                                 | ✓                          | --             | --                        |
| KAULIS                           | --                                                 | ✓                          | --             | --                        |
| GDRL                             | ✓                                                  | --                         | --             | --                        |
| TEMUL                            | --                                                 | ✓                          | --             | --                        |
| TMR                              | --                                                 | --                         | --             | ✓(UGC)                    |
| DHF                              | ✓                                                  | --                         | --             | --                        |
| <b>Total</b>                     | <b>4</b><br><b>(30.77)</b>                         | <b>8</b><br><b>(61.54)</b> | <b>0</b>       | <b>1</b><br><b>(7.69)</b> |

(The figures given in bracket show the respective percentage)

Table 44 reveals the funding agency of selected cultural institutions to conduct their digitisation project. It can be observed that cultural institutions SORIL, SSUSL, GDRL, and DHF indicate that the institution itself is responsible for the funding of their digitisation project. Whereas SCL, KUL, KLL, ORI & ML, KCHRL, KSAL, KAULIS, and TEMUL indicate, the government of Kerala provided the funding for their digitisation project. TMR indicates UGC as their funding agency. Out of the 13 cultural institutions surveyed, the majority of the respondents 8 (61.54 per cent) indicate the government of Kerala. 4 respondents, representing 30.77 per cent funded by the institution itself. 1 (7.69 per cent) of the respondent indicate UGC as their funding agency.

### **5.39 Financial Assistance from Other Organisations**

There are some national and international organisations and bodies that provide financial assistance for the digital preservation of documentary heritage collections. The National Archives of India provides financial assistance for

preservation activities. Here, the investigator tried to identify the financial assistance received from the various national and international organisations and bodies for the digitisation project other than their funding agency. Table 45 indicates the details of the financial assistance received from the other organisations.

**Table 45**

***Financial Assistance from Other Organisations***

| Name of the Cultural Institution | Financial Assistance from Other Organisations (n=13) |                     |
|----------------------------------|------------------------------------------------------|---------------------|
|                                  | Yes                                                  | No                  |
| SCL                              | --                                                   | ✓                   |
| KUL                              | --                                                   | ✓                   |
| KLL                              | --                                                   | ✓                   |
| ORI & ML                         | --                                                   | ✓                   |
| KCHRL                            | --                                                   | ✓                   |
| SORIL                            | --                                                   | ✓                   |
| SSUSL                            | --                                                   | ✓                   |
| KSAL                             | --                                                   | ✓                   |
| KAULIS                           | --                                                   | ✓                   |
| GDRL                             | --                                                   | ✓                   |
| TEMUL                            | --                                                   | ✓                   |
| TMR                              | --                                                   | ✓                   |
| DHF                              | --                                                   | ✓                   |
| <b>Total</b>                     | <b>0</b>                                             | <b>13<br/>(100)</b> |

(The figures given in bracket show the respective percentage)

Table 45 found that all cultural institutions have not availed of any kind of financial assistance from any national or international agencies for their digitisation projects.

**5.40 Policies for Digitisation Activities**

A good policy is essential to executing a digitisation project. Policies can act as a practical guide or working tool to plan the activities of digitisation. Every institution must formulate and maintain written policies for various activities of digitisation, selection of materials, the purchase of equipment, hardware, and software, the conversion process, quality control, staff development, budget

allocations, storage and access of digitised content, and copyright violations. National and international organisations have created an international framework of policies for digital preservation. Manaf (2007) revealed in his study that 61 per cent of the cultural institutions in Malaysia have their own policies for digitising cultural resources, and the remaining 39 per cent of the institutions do not have any policies.

Here, the investigator tried to check the status of the preservation policy of the cultural institutions in their digitisation project. The investigator also checked whether it was written or not. The data regarding the availability of policies for the selection of materials for digitisation, the digitisation process, the selection and purchase of hardware and software, appointment and capacity building of staff, inviting tenders and quotations for digitisation work, preservation and storage of digitised materials, providing access to digitised materials, and copyright are presented in Tables 46–53.

**Table 46**

*Policies for the Selection of Materials for Digitisation*

| Name of the Cultural Institution | Policies for the Selection of Materials for Digitisation (n=13) |                            | If Yes, Condition of the Policy (n=8) |                            |
|----------------------------------|-----------------------------------------------------------------|----------------------------|---------------------------------------|----------------------------|
|                                  | Formulated                                                      | Not Formulated             | Written                               | Unwritten                  |
| SCL                              | --                                                              | ✓                          | --                                    | --                         |
| KUL                              | ✓                                                               | --                         | ✓                                     | --                         |
| KLL                              | ✓                                                               | --                         | --                                    | ✓                          |
| ORI & ML                         | --                                                              | ✓                          | --                                    | --                         |
| KCHRL                            | ✓                                                               | --                         | --                                    | ✓                          |
| SORIL                            | ✓                                                               | --                         | --                                    | ✓                          |
| SSUSL                            | ✓                                                               | --                         | ✓                                     | --                         |
| KSAL                             | ✓                                                               | --                         | ✓                                     | --                         |
| KAULIS                           | ✓                                                               | --                         | --                                    | ✓                          |
| GDRL                             | --                                                              | ✓                          | --                                    | --                         |
| TEMUL                            | --                                                              | ✓                          | --                                    | --                         |
| TMR                              | --                                                              | ✓                          | --                                    | --                         |
| DHF                              | ✓                                                               | --                         | ✓                                     | --                         |
| <b>Total</b>                     | <b>8</b><br><b>(61.54)</b>                                      | <b>5</b><br><b>(38.46)</b> | <b>4</b><br><b>(50.00)</b>            | <b>4</b><br><b>(50.00)</b> |

(The figures given in bracket show the respective percentage)

Table 46 indicates the availability of policies for the selection of materials for digitisation. It is observed that cultural institutions such as KUL, KLL, KCHRL, SORIL, SSUSL, KSAL, KAULIS, and DHF have formulated policies for the selection of materials for digitisation. Whereas, cultural institutions such as SCL, ORI & ML, GDRL, TEMUL, and TMR did not formulate policies for the selection of materials for digitisation. It was found that, out of the 13 cultural institutions surveyed, the majority 8 (61.54 per cent) of the cultural institutions formulated the policies for the selection of materials for digitisation. At the same time, 5 (38.46 per cent) not formulate policies for the selection of materials.

The investigator also tried to understand how the cultural institutions maintain the formulated policies, whether they are in written or unwritten format. Here, eight cultural institutions have formulated policies for the selection of materials for digitisation. It is further observed that, out of the 8 cultural institutions, KUL, SSUSL, KSAL, and DHF maintain the policies for selection materials for digitisation in written format, while KLL, KCHRL, SORIL, and KAULIS maintain the policies in unwritten format. Out of the 8 cultural institutions, 4 (50.00 per cent) of the cultural institutions maintains the policies for selection materials for digitisation in written format, and the other 4 (50.00 per cent) are in unwritten format.



**Table 47*****Policies for the Digitisation Process***

| Name of the Cultural Institution | Policies for the Digitisation Process (n=13) |                            | If Yes, Condition of the Policy (n=11) |                            |
|----------------------------------|----------------------------------------------|----------------------------|----------------------------------------|----------------------------|
|                                  | Formulated                                   | Not Formulated             | Written                                | Unwritten                  |
| SCL                              | ✓                                            | --                         | ✓                                      | --                         |
| KUL                              | ✓                                            | --                         | ✓                                      | --                         |
| KLL                              | ✓                                            | --                         | --                                     | ✓                          |
| ORI & ML                         | ✓                                            | --                         | --                                     | ✓                          |
| KCHRL                            | ✓                                            | --                         | ✓                                      | --                         |
| SORIL                            | ✓                                            | --                         | --                                     | ✓                          |
| SSUSL                            | ✓                                            | --                         | ✓                                      | --                         |
| KSAL                             | ✓                                            | --                         | ✓                                      | --                         |
| KAULIS                           | ✓                                            | --                         | ✓                                      | --                         |
| GDRL                             | --                                           | ✓                          | --                                     | --                         |
| TEMUL                            | --                                           | ✓                          | --                                     | --                         |
| TMR                              | ✓                                            | --                         | ✓                                      | --                         |
| DHF                              | ✓                                            | --                         | ✓                                      | --                         |
| <b>Total</b>                     | <b>11</b><br><b>(84.62)</b>                  | <b>2</b><br><b>(15.38)</b> | <b>8</b><br><b>(72.73)</b>             | <b>3</b><br><b>(27.27)</b> |

(The figures given in bracket show the respective percentage)

Table 47 depicts the availability of policies for the digitisation process. It is observed that cultural institutions such as SCL, KUL, KLL, ORI & ML, KCHRL, SORIL, SSUSL, KSAL, KAULIS TMR, and DHF formulate policies for the digitisation process. Whereas, cultural institutions such as GDRL and TEMUL did not formulate policies for the digitisation process. It was found that, out of 13 cultural institutions surveyed, the majority 11 (84.62 per cent) of the cultural institutions formulated the policies for digitisation process. At the same time, 2 (15.38 per cent) did not formulate policies for the digitisation process.

The investigator also tried to understand how the cultural institutions maintain the formulated policies, whether they are in written or unwritten format. Here, 11 cultural institutions have formulated policies for the digitisation process. It is further observed that, out of the 11 cultural institutions, SCL, KUL, KCHRL, SSUSL, KSAL, KAULIS, TMR, and DHF maintain the policies for the digitisation

process in written format, while KLL, ORI & ML, and SORIL maintain them in unwritten format. Out of the 11 cultural institutions, the majority 8 (72.73 per cent) of the cultural institutions maintain the policies for the digitisation process in written format, and 3 (27.27 per cent) cultural institutions are in unwritten format.

**Table 48**

***Policies for the Selection and Purchase of Hardware and Software***

| Name of the Cultural Institution | Policies for the Selection and Purchase of Hardware and Software (n=13) |                            | If Yes, Condition of the Policy (n=7) |                            |
|----------------------------------|-------------------------------------------------------------------------|----------------------------|---------------------------------------|----------------------------|
|                                  | Formulated                                                              | Not Formulated             | Written                               | Unwritten                  |
| SCL                              | --                                                                      | ✓                          | --                                    | --                         |
| KUL                              | --                                                                      | ✓                          | --                                    | --                         |
| KLL                              | ✓                                                                       | --                         | --                                    | ✓                          |
| ORI & ML                         | ✓                                                                       | --                         | --                                    | ✓                          |
| KCHRL                            | ✓                                                                       | --                         | --                                    | ✓                          |
| SORIL                            | ✓                                                                       | --                         | --                                    | ✓                          |
| SSUSL                            | ✓                                                                       | --                         | ✓                                     | --                         |
| KSAL                             | ✓                                                                       | --                         | ✓                                     | --                         |
| KAULIS                           | ✓                                                                       | --                         | --                                    | ✓                          |
| GDRL                             | --                                                                      | ✓                          | --                                    | --                         |
| TEMUL                            | --                                                                      | ✓                          | --                                    | --                         |
| TMR                              | --                                                                      | ✓                          | --                                    | --                         |
| DHF                              | --                                                                      | ✓                          | --                                    | --                         |
| <b>Total</b>                     | <b>7</b><br><b>(53.85)</b>                                              | <b>6</b><br><b>(46.15)</b> | <b>2</b><br><b>(28.57)</b>            | <b>5</b><br><b>(71.43)</b> |

(The figures given in bracket show the respective percentage)

Table 48 showcases the availability of policies for the selection and purchase of hardware and software. It is observed that cultural institutions such as KLL, ORI & ML, KCHRL, SORIL, SSUSL, KSAL, and KAULIS formulate policies for the selection and purchase of hardware and software. Whereas, cultural institutions such as SCL, KUL, GDRL, TEMUL, TMR, and DHF did not formulate policies for the selection and purchase of hardware and software. It was found that, out of 13 cultural institutions surveyed, 7 (53.85 per cent) of the cultural institutions formulated the policies for the selection and purchase of hardware and software. At the same time, two cultural institutions, representing 15.38 per cent did not formulate policies for the selection and purchase of hardware and software.

The investigator also tried to understand how the cultural institutions maintain the formulated policies, whether they are in written or unwritten format. Here, seven cultural institutions formulate policies for the selection and purchase of hardware and software. It is further observed that, out of the 7 cultural institutions, SSUSL and KSAL maintain the policies for selection and purchase of hardware and software in written format, while KLL, ORI & ML, KCHRL, SORIL, and KAULIS maintain them in unwritten format. Out of the 7 cultural institutions, the majority 5 (71.43 per cent) of the cultural institutions maintain the policies for selection and purchase of hardware and software in unwritten format, and 2 (28.57 per cent) cultural institutions are in written format.

**Table 49**

*Policies for Appointment and Capacity Building for Staff*

| Name of the Cultural Institution | Policies for Appointment and Capacity Building for Staff (n=13) |                            | If Yes, Condition of the Policy |                            |
|----------------------------------|-----------------------------------------------------------------|----------------------------|---------------------------------|----------------------------|
|                                  | Formulated                                                      | Not Formulated             | Written                         | Unwritten                  |
| SCL                              | --                                                              | ✓                          | --                              | --                         |
| KUL                              | --                                                              | ✓                          | --                              | --                         |
| KLL                              | ✓                                                               | --                         | --                              | ✓                          |
| ORI & ML                         | ✓                                                               | --                         | ✓                               | --                         |
| KCHRL                            | ✓                                                               | --                         | --                              | ✓                          |
| SORIL                            | ✓                                                               | --                         | --                              | ✓                          |
| SSUSL                            | ✓                                                               | --                         | ✓                               | --                         |
| KSAL                             | ✓                                                               | --                         | ✓                               | --                         |
| KAULIS                           | ✓                                                               | --                         | --                              | ✓                          |
| GDRL                             | --                                                              | ✓                          | --                              | --                         |
| TEMUL                            | --                                                              | ✓                          | --                              | --                         |
| TMR                              | --                                                              | ✓                          | --                              | --                         |
| DHF                              | ✓                                                               | --                         | ✓                               | --                         |
| <b>Total</b>                     | <b>8</b><br><b>(61.54)</b>                                      | <b>5</b><br><b>(38.46)</b> | <b>4</b><br><b>(50.00)</b>      | <b>4</b><br><b>(50.00)</b> |

(The figures given in bracket show the respective percentage)

### *Analysis and Interpretations*

Table 49 enumerates the availability of policies for appointments and capacity building for staff. It is observed that cultural institutions such as KLL, ORI & ML, KCHRL, SORIL, SSUSL, KSAL, KAULIS, and DHF have formulated policies for the appointment and capacity building of staff. Whereas, cultural institutions such as SCL, KUL, GDRL, TEMUL, and TMR did not formulate policies for the appointment and capacity building of staff. It was found that, out of 13 cultural institutions surveyed, 8 (61.84 per cent) of the cultural institutions formulated the policies for the appointment and capacity building of staff. At the same time, 5 cultural institutions, representing 38.46 per cent did not formulate policies for the appointment and capacity building of staff.

The investigator also tried to understand how the cultural institutions maintain the formulated policies, whether they are in written or unwritten format. Here, eight cultural institutions have formulated policies for the appointment and capacity-building of staff. It is further observed that, out of the 8 cultural institutions, ORI & ML, SSUSL, KSAL, and DHF maintain policies for appointment and capacity building of staff in written format, while KLL, KCHRL, SORIL, and KAULIS maintain policies in unwritten format. Out of the 8 cultural institutions, 4 (50.00 per cent) of them maintain policies for appointment and capacity building of staff in written format, and the other 4 representing, 50.00 per cent are in unwritten format.

**Table 50*****Policies for Inviting Tenders and Quotations for Digitisation Work***

| Name of the Cultural Institution | Policies for Inviting Tenders and Quotations for Digitisation Work (n=13) |                            | If Yes, Condition of the Policy (n=10) |                            |
|----------------------------------|---------------------------------------------------------------------------|----------------------------|----------------------------------------|----------------------------|
|                                  | Formulated                                                                | Not Formulated             | Written                                | Unwritten                  |
| SCL                              | ✓                                                                         | --                         | ✓                                      | --                         |
| KUL                              | --                                                                        | ✓                          | --                                     | --                         |
| KLL                              | ✓                                                                         | --                         | --                                     | ✓                          |
| ORI & ML                         | ✓                                                                         | --                         | --                                     | ✓                          |
| KCHRL                            | ✓                                                                         | --                         | --                                     | ✓                          |
| SORIL                            | ✓                                                                         | --                         | --                                     | ✓                          |
| SSUSL                            | ✓                                                                         | --                         | ✓                                      | --                         |
| KSAL                             | ✓                                                                         | --                         | ✓                                      | --                         |
| KAULIS                           | ✓                                                                         | --                         | --                                     | ✓                          |
| GDRL                             | --                                                                        | ✓                          | --                                     | --                         |
| TEMUL                            | ✓                                                                         | --                         | ✓                                      | --                         |
| TMR                              | --                                                                        | ✓                          | --                                     | --                         |
| DHF                              | ✓                                                                         | --                         | ✓                                      | --                         |
| <b>Total</b>                     | <b>10</b><br><b>(76.92)</b>                                               | <b>3</b><br><b>(23.08)</b> | <b>5</b><br><b>(50.00)</b>             | <b>5</b><br><b>(50.00)</b> |

(The figures given in bracket show the respective percentage)

Table 50 asserts the availability of policies for inviting tenders and quotations for digitisation work. It is observed that cultural institutions such as SCL, KLL, ORI & ML, KCHRL, SORIL, SSUSL, KSAL, KAULIS, TMR, and DHF have formulated policies for inviting tenders and quotations for digitisation work. Whereas, cultural institutions such as KUL, GDRL, and TMR did not formulate policies for inviting tenders and quotations for digitisation work. It was found that, out of 13 cultural institutions surveyed, 10 (76.92 per cent) of the cultural institutions formulated the policies for inviting tenders and quotations for digitisation work. At the same time, three cultural institutions representing 23.08 per cent did not formulate policies for inviting tenders and quotations for digitisation work.

The investigator also tried to understand how the cultural institutions maintain the formulated policies, whether they are in written or unwritten format. Here, 10 cultural institutions have formulated policies for inviting tenders and quotations for digitisation work. It is further observed that, out of the 10 cultural institutions, SCL, SSUSL, KSAL, TEMUL, and DHF maintain the policies for inviting tenders and quotations for digitisation work in written format, while KLL, ORI & ML, KCHRL, SORIL, and KAULIS maintain the policies in unwritten format. Out of the 10 cultural institutions, 5 (50.00 per cent) of the cultural institutions maintain the policies for inviting tenders and quotations for digitisation work in written format, and the other 5 representing 50.00 per cent of the cultural institutions and are in unwritten format.

**Table 51**

*Policies for the Preservation and Storage of Digitised Materials*

| Name of the Cultural Institution | Policies for the Preservation and Storage of Digitised Materials Work (n=13) |                            | If Yes, Condition of the Policy (n=8) |                            |
|----------------------------------|------------------------------------------------------------------------------|----------------------------|---------------------------------------|----------------------------|
|                                  | Formulated                                                                   | Not Formulated             | Written                               | Unwritten                  |
| SCL                              | --                                                                           | ✓                          | --                                    | --                         |
| KUL                              | --                                                                           | ✓                          | --                                    | --                         |
| KLL                              | ✓                                                                            | --                         | --                                    | ✓                          |
| ORI & ML                         | ✓                                                                            | --                         | --                                    | ✓                          |
| KCHRL                            | ✓                                                                            | --                         | --                                    | ✓                          |
| SORIL                            | ✓                                                                            | --                         | --                                    | ✓                          |
| SSUSL                            | ✓                                                                            | --                         | ✓                                     | --                         |
| KSAL                             | ✓                                                                            | --                         | ✓                                     | --                         |
| KAULIS                           | ✓                                                                            | --                         | --                                    | ✓                          |
| GDRL                             | --                                                                           | ✓                          | --                                    | --                         |
| TEMUL                            | --                                                                           | ✓                          | --                                    | --                         |
| TMR                              | --                                                                           | ✓                          | --                                    | --                         |
| DHF                              | ✓                                                                            |                            | ✓                                     | --                         |
| <b>Total</b>                     | <b>8</b><br><b>(61.54)</b>                                                   | <b>5</b><br><b>(38.46)</b> | <b>3</b><br><b>(37.50)</b>            | <b>5</b><br><b>(62.50)</b> |

(The figures given in bracket show the respective percentage)

### *Analysis and Interpretations*

The analysis of Table 51 shows the availability of policies for the preservation and storage of digitised materials. It is observed that cultural institutions such as KLL, ORI & ML, KCHRL, SORIL, SSUSL, KSAL, KAULIS, and DHF have formulated policies for the preservation and storage of digitised materials. Whereas, cultural institutions such as SCL, KUL, GDRL, TEMUL, and TMR did not formulate policies for the preservation and storage of digitised materials. It was found that, out of 13 cultural institutions surveyed, 8 (61.54 per cent) of the cultural institutions formulated policies for the preservation and storage of digitised materials. At the same time, three cultural institutions representing 38.46 per cent did not formulate policies for the preservation and storage of digitised materials.

The investigator also tried to understand how the cultural institutions maintain the formulated policies, whether they are in written or unwritten format. Here, eight cultural institutions have formulated policies for the preservation and storage of digitised materials. It is further observed that, out of the 8 cultural institutions, SSUSL, KSAL, and DHF maintain policies for the preservation and storage of digitised materials in written format, while KLL, ORI & ML, KCHRL, SORIL, and KAULIS maintain policies in unwritten format. Out of the 8 cultural institutions, the majority 5 (62.50 per cent) of the cultural institutions maintain policies for the preservation and storage of digitised materials in unwritten format, and 3 (37.50 per cent) of cultural institutions are in written format.

**Table 52*****Policies for Providing Access to Digitised Materials***

| Name of the Cultural Institution | Policies for Providing Access to Digitised Materials Work (n=13) |                            | If Yes, Condition of the Policy (n=9) |                            |
|----------------------------------|------------------------------------------------------------------|----------------------------|---------------------------------------|----------------------------|
|                                  | Formulated                                                       | Not Formulated             | Written                               | Unwritten                  |
| SCL                              | --                                                               | ✓                          | --                                    | --                         |
| KUL                              | ✓                                                                | --                         | ✓                                     | --                         |
| KLL                              | ✓                                                                | --                         | --                                    | ✓                          |
| ORI & ML                         | ✓                                                                | --                         | --                                    | ✓                          |
| KCHRL                            | ✓                                                                | --                         | --                                    | ✓                          |
| SORIL                            | ✓                                                                | --                         | --                                    | ✓                          |
| SSUSL                            | ✓                                                                | --                         | ✓                                     | --                         |
| KSAL                             | ✓                                                                | --                         | ✓                                     | --                         |
| KAULIS                           | ✓                                                                | --                         | --                                    | ✓                          |
| GDRL                             | --                                                               | ✓                          | --                                    | --                         |
| TEMUL                            | --                                                               | ✓                          | --                                    | --                         |
| TMR                              | --                                                               | ✓                          | --                                    | --                         |
| DHF                              | ✓                                                                | --                         | ✓                                     | --                         |
| <b>Total</b>                     | <b>9</b><br><b>(69.23)</b>                                       | <b>4</b><br><b>(30.77)</b> | <b>4</b><br><b>(44.44)</b>            | <b>5</b><br><b>(55.56)</b> |

(The figures given in bracket show the respective percentage)

Table 52 reports the availability of policies for providing access to digitised materials. It is observed that cultural institutions such as KUL, KLL, ORI & ML, KCHRL, SORIL, SSUSL, KSAL, KAULIS, and DHF have formulated policies for providing access to digitised materials. Whereas, cultural institutions such as SCL, GDRL, TEMUL, and TMR did not formulate policies for providing access to digitised materials. It was found that, out of the 13 cultural institutions surveyed, the majority 9 (69.23 per cent) of the cultural institutions formulated policies for providing access to digitised materials. At the same time, four cultural institutions, representing 30.77 per cent did not formulate policies for providing access to digitised materials.

Kalusopa and Zulu (2009) identified a contradictory finding in their study that only 14.3 per cent of the organisations in Botswana had an access policy in



place for digitised collection. But a large majority of the remaining organisations had not put in place any access policies.

The investigator also tried to understand how the cultural institutions maintain the formulated policies, whether they are in written or unwritten format. Here, nine cultural institutions formulate policies for providing access to digitised materials. It is further observed that, out of the 9 cultural institutions, KUL, SSUSL, KSAL, and DHF maintain policies for providing access to digitised materials in written format, while KLL, ORI & ML, KCHRL, SORIL, and KAULIS maintain policies for providing access to digitised materials in unwritten format. Out of the 9 cultural institutions, the majority 5 (55.56 per cent) of the cultural institutions maintain policies for providing access to digitised materials in unwritten format, and 4 (44.44 per cent) of them are in written format.

**Table 53**

*Policies for the Copyright of Materials*

| Name of the Cultural Institution | Policies for the Copyright of Materials Work (n=13) |                            | If Yes, Condition of the Policy (n=7) |                            |
|----------------------------------|-----------------------------------------------------|----------------------------|---------------------------------------|----------------------------|
|                                  | Formulated                                          | Not Formulated             | Written                               | Unwritten                  |
| SCL                              | --                                                  | ✓                          | --                                    | --                         |
| KUL                              | --                                                  | ✓                          | --                                    | --                         |
| KLL                              | ✓                                                   | --                         | --                                    | ✓                          |
| ORI & ML                         | --                                                  | ✓                          | --                                    | --                         |
| KCHRL                            | ✓                                                   | --                         | --                                    | ✓                          |
| SORIL                            | ✓                                                   | --                         | --                                    | ✓                          |
| SSUSL                            | ✓                                                   | --                         | ✓                                     | --                         |
| KSAL                             | ✓                                                   | --                         | ✓                                     | --                         |
| KAULIS                           | ✓                                                   | --                         | --                                    | ✓                          |
| GDRL                             | --                                                  | ✓                          | --                                    | --                         |
| TEMUL                            | --                                                  | ✓                          | --                                    | --                         |
| TMR                              | --                                                  | ✓                          | --                                    | --                         |
| DHF                              | ✓                                                   | --                         | ✓                                     | --                         |
| <b>Total</b>                     | <b>7</b><br><b>(53.85)</b>                          | <b>6</b><br><b>(46.15)</b> | <b>3</b><br><b>(42.86)</b>            | <b>4</b><br><b>(57.14)</b> |

(The figures given in bracket show the respective percentage)

Table 53 reveals the availability of policies for copyright of materials. It is observed that cultural institutions such as KLL, KCHRL, SORIL, SSUSL, KSAL, KAULIS, and DHF have formulated policies for the copyright of materials. Whereas, cultural institutions such as SCL, KUL, ORI & ML, GDRL, TEMUL, and TMR did not formulate policies for copyright of materials. It was found that, out of 13 cultural institutions surveyed, the majority of the cultural institutions 7 (53.85 per cent) formulated policies for copyright of materials. At the same time, a good number of cultural institutions, representing 46.15 per cent have not formulated policies for the copyright of materials.

The investigator also tried to understand how the cultural institutions maintain the formulated policies, whether they are in written or unwritten format. Here, seven cultural institutions have formulated policies for the copyright of materials. It is further observed that, out of the 7 cultural institutions, SSUSL, KSAL, and DHF maintain policies for copyright of materials in written format, while KLL, KCHRL, SORIL, and KAULIS maintain policies in unwritten format. Out of the 7 cultural institutions, the majority 4 (57.14 per cent) of the cultural institutions maintain policies for copyright of materials in unwritten format, and 3 (42.86 per cent) cultural institutions are maintain the policies in written format.

The overall analysis of tables 46–53 indicates that GDRL is the only cultural institution that has not formulated policies for digitisation activities. TEMUL formulated policies for inviting tenders and quotations for digitisation work only. TMR formulated policies for the digitisation process only. SCL formulated policies for the digitisation process and for inviting tenders and quotations for digitisation work.

#### **5.41 Policy Makers of the Digitisation Project**

Here, the investigator tried to identify the people involved in making policies for the digitisation project. Respondents were asked to indicate who is responsible for formulating policies in their institution. The result from tables 46 to 54 shows that GDRL has not formulated policies for digitisation activities. Table 54 indicates the persons involved in formulating policies for the digitisation project.

**Table 54*****Persons Involved in the Formulation of Policies for Digitisation Projects***

| Name of the Cultural Institution | Persons Involved in the Formulation of Policies for Digitisation Projects (n=12) |                                |                |           |
|----------------------------------|----------------------------------------------------------------------------------|--------------------------------|----------------|-----------|
|                                  | Head of the Institution                                                          | Digitisation Project Committee | Funding Agency | Any other |
| SCL                              | --                                                                               | ✓                              | --             | --        |
| KUL                              | --                                                                               | ✓                              | --             | --        |
| KLL                              | ✓                                                                                | --                             | --             | --        |
| ORI & ML                         | --                                                                               | ✓                              | --             | --        |
| KCHRL                            | ✓                                                                                | --                             | --             | --        |
| SORIL                            | ✓                                                                                | --                             | --             | --        |
| SSUSL                            | --                                                                               | ✓                              | --             | --        |
| KSAL                             | --                                                                               | ✓                              | --             | --        |
| KAULIS                           | ✓                                                                                | --                             | --             | --        |
| TEMUL                            | --                                                                               | ✓                              | --             | --        |
| TMR                              | --                                                                               | ✓                              | --             | --        |
| DHF                              | --                                                                               | ✓                              | --             | --        |
| <b>Total</b>                     | <b>4<br/>(33.33)</b>                                                             | <b>8<br/>(66.66)</b>           | <b>0</b>       | <b>0</b>  |

(The figures given in bracket show the respective percentage)

It can be seen that cultural institutions KLL, KCHRL, SORIL, and KAULIS mentioned that the head of the institution is responsible for formulating policies for the digitisation project. At the same time, SCL, KUL, ORI & ML, SSUSL, KSAL, TEMUL, TMR, and DHF mentioned that the digitisation project committee is formulating policies for the digitisation project. Out of the 12 cultural institutions (GDRL not formulated policies), the majority 8 (66.66 per cent) of the cultural institutions indicate the digitisation project committee is formulating policies for the digitisation project, whereas 4 cultural institutions, representing 33.33 per cent indicate the head of the institution is responsible for formulating policies.

#### **5.42 Perceptions of Respondents about the Policies for Digitisation Project**

Here, the investigator asked a question to identify the perceptions of respondents about the policies of the digitisation project. Respondents were asked to choose whether the formulation of policy would help the successful execution of the

digitisation project or not. The perceptions of the respondents were indicated in Table 55.

**Table 55**

***Perceptions of Respondents about the Policies for Digitisation Project***

| Name of the Cultural Institution | Perceptions of Respondents about the Policies for Digitisation Project |             |
|----------------------------------|------------------------------------------------------------------------|-------------|
|                                  | Helpful                                                                | Not Helpful |
| SCL                              | ✓                                                                      | --          |
| KUL                              | ✓                                                                      | --          |
| KLL                              | ✓                                                                      | --          |
| ORI & ML                         | ✓                                                                      | --          |
| KCHRL                            | ✓                                                                      | --          |
| SORIL                            | ✓                                                                      | --          |
| SSUSL                            | ✓                                                                      | --          |
| KSAL                             | ✓                                                                      | --          |
| KAULIS                           | ✓                                                                      | --          |
| GDRL                             | ✓                                                                      | --          |
| TEMUL                            | ✓                                                                      | --          |
| TMR                              | ✓                                                                      | --          |
| DHF                              | ✓                                                                      | --          |
| <b>Total</b>                     | <b>13<br/>(100.00)</b>                                                 | <b>0</b>    |

(The figures given in bracket show the respective percentage)

It is clear that all the cultural institutions have a positive perception towards formulating policies for digitisation project. All the cultural institutions had a unique opinion that a good written policy is essential for a successful digitisation project.

**5.43 Need for Formulating Written Policies for the Digitisation Project**

Respondents were asked to point out their reasons and the need to formulate written policies for the digitisation project. The details regarding the need to formulate written policies for the digitisation project are presented in Table 56.

**Table 56*****Need for Formulating Written Policies for the Digitisation Project***

| Name of the Cultural Institution | Need for Formulating Written Policies for the Digitisation Project (n=13) |                                     |                                         |                           |           |
|----------------------------------|---------------------------------------------------------------------------|-------------------------------------|-----------------------------------------|---------------------------|-----------|
|                                  | Easy Going of the Project                                                 | Take Good Decisions at a Tough Time | Completion of Tasks in the Correct Time | Avoid Misunderstanding    | Any Other |
| SCL                              | ✓                                                                         | ✓                                   | ✓                                       | --                        | --        |
| KUL                              | ✓                                                                         | ✓                                   | --                                      | --                        | --        |
| KLL                              | ✓                                                                         | --                                  | --                                      | --                        | --        |
| ORI & ML                         | ✓                                                                         | ✓                                   | --                                      | --                        | --        |
| KCHRL                            | ✓                                                                         | --                                  | ✓                                       | --                        | --        |
| SORIL                            | ✓                                                                         | --                                  | ✓                                       | --                        | --        |
| SSUSL                            | ✓                                                                         | --                                  | ✓                                       | --                        | --        |
| KSAL                             | ✓                                                                         | --                                  | --                                      | --                        | --        |
| KAULIS                           | ✓                                                                         | ✓                                   | --                                      | --                        | --        |
| GDRL                             | --                                                                        | --                                  | ✓                                       | --                        | --        |
| TEMUL                            | --                                                                        | ✓                                   | --                                      | ✓                         | --        |
| TMR                              | ✓                                                                         | --                                  | --                                      | --                        | --        |
| DHF                              | ✓                                                                         | --                                  | ✓                                       | --                        | --        |
| <b>Total</b>                     | <b>11</b><br><b>(84.62)</b>                                               | <b>5</b><br><b>(38.46)</b>          | <b>6</b><br><b>(46.15)</b>              | <b>1</b><br><b>(7.69)</b> | <b>0</b>  |

(The figures given in bracket show the respective percentage)

The analysis of Table 56 shows that, out of the 13 cultural institutions, SCL, KUL, KLL, ORI & ML, KCHRL, SORIL, SSUSL, KSAL, KAULIS, TMR, and DHF mentioned that “easy going of the project” is the major need to formulate written policies for the digitisation project. Also, SCL, KUL, ORI & ML, KAULIS, and TEMUL mentioned “take good decisions at tough times” as a need. “The completion of tasks in the correct time” is mentioned by SCL, KCHRL, SORIL, SSUSL, GDRL, and DHF. TEMUL mentioned “avoid misunderstanding” as the reason. Out of the 13 cultural institutions surveyed, the majority of the institutions 11 (84.62 per cent) selected “easy going of the project” as the need for formulating policies for the digitisation project. Six cultural institutions, representing 46.15 per cent selected “the completion of tasks in the correct time”, followed that 5 (38.46

per cent) selected the option “take good decisions at a tough time”. Least number of cultural institution, 1 (7.69 per cent) indicates “avoid misunderstanding”.

#### **5.44 Use of International/National Standards in the Digitisation Process**

International organisations and some other bodies have established internationally recognised standards for digitisation activities, which involve selection, digital conversion, appropriate resolution, processing of digitised content, quality control, selection of storage mechanisms, and access delivery systems. Here, the investigator intended to check whether the cultural institutions follow any internationally established standards for their digitisation work or not. Respondents were asked if they followed standards or not. Table 57 indicates the use of international/ national standards for digitisation work.

**Table 57**

#### *Use of International/National Standards in the Digitisation Work*

| <b>Name of the Cultural Institution</b> | <b>Use of International/National Standards in the Digitisation Work (n = 13)</b> |                       |
|-----------------------------------------|----------------------------------------------------------------------------------|-----------------------|
|                                         | <b>Used</b>                                                                      | <b>Not used</b>       |
| SCL                                     | --                                                                               | ✓                     |
| KUL                                     | --                                                                               | ✓                     |
| KLL                                     | --                                                                               | ✓                     |
| ORI & ML                                | --                                                                               | ✓                     |
| KCHRL                                   | --                                                                               | ✓                     |
| SORIL                                   | --                                                                               | ✓                     |
| SSUSL                                   | --                                                                               | ✓                     |
| KSAL                                    | --                                                                               | ✓                     |
| KAULIS                                  | ✓                                                                                | --                    |
| GDRL                                    | --                                                                               | ✓                     |
| TEMUL                                   | --                                                                               | ✓                     |
| TMR                                     | --                                                                               | ✓                     |
| DHF                                     | --                                                                               | ✓                     |
| <b>Total</b>                            | <b>1<br/>(7.69)</b>                                                              | <b>12<br/>(92.31)</b> |

(The figures given in bracket show the respective percentage)

Table 57 clearly indicates that, out of the 13 cultural institutions surveyed, a large majority of the cultural institutions, such as SCL, KUL, KLL, ORI & ML, KCHRL, SORIL, SSUSL, KSAL, GDRL, TEMUL, and TMR, are DHF, indicating that they are not following any established national or international standards for digitisation work. Only one cultural institution, KAULIS, followed standards for digitisation work. Out of the 13 respondents, a large majority of the respondents 12 (92.31 per cent) not follow any national or international standards, whereas only 1 cultural institution, KAULIS (7.69 per cent) followed standards for digitisation.

#### **5.45 Types of Standards used**

If the cultural institutions followed any type of standards for digitisation work. Investigator tried to understand the type of standards followed by the cultural institutions, whether it is international or national. As per the result of table 57, KAULIS is the only one cultural institution followed standards. The type standards followed by the KAULIS is presented in Table 58.

**Table 58**

#### *Types of Standards Followed by the KAULIS*

| <b>Activity</b>                                                 | <b>International</b> | <b>National</b> |
|-----------------------------------------------------------------|----------------------|-----------------|
| Selection of hardware and software                              | --                   | ✓               |
| Scanning resolution                                             | --                   | ✓               |
| Digital image format                                            | --                   | ✓               |
| File format used                                                | --                   | ✓               |
| Cataloguing of digitised materials                              | --                   | ✓               |
| Metadata creation                                               | --                   | ✓               |
| Selection of storing/ preservation equipment for digitised item | --                   | ✓               |
| Selection of preservation strategy                              | --                   | ✓               |

It was found that KAULIS followed national standards for selection of hardware and software, scanning resolution, digital image format, file format,

cataloguing of digitised materials, metadata creation, selection of storing/preservation equipment for digitised items, and selection of a preservation strategy.

**5.46 Reasons for not Using International/National Standards for the Digitisation Project**

It was found that 12 cultural institutions were not following any standards for digitisation work. The investigator tried to understand the reasons for not using standards. Table 59 indicates the reasons for not using standards in digitisation work.

**Table 59**

***Reasons for not Using International/National Standards for the Digitisation Project***

| Name of the Cultural Institution | Reasons for not Using International/National Standards for the Digitisation Project (n=12) |                         |                                       |
|----------------------------------|--------------------------------------------------------------------------------------------|-------------------------|---------------------------------------|
|                                  | Lack of Knowledge about the Standards                                                      | Standard are not Needed | Internal/Institutional Standards Used |
| SCL                              | --                                                                                         | --                      | ✓                                     |
| KUL                              | --                                                                                         | --                      | ✓                                     |
| KLL                              | --                                                                                         | --                      | ✓                                     |
| ORI & ML                         | --                                                                                         | --                      | ✓                                     |
| KCHRL                            | --                                                                                         | --                      | ✓                                     |
| SORIL                            | ✓                                                                                          | --                      | --                                    |
| SSUSL                            | --                                                                                         | --                      | ✓                                     |
| KSAL                             | --                                                                                         | --                      | ✓                                     |
| GDRL                             | --                                                                                         | --                      | ✓                                     |
| TEMUL                            | --                                                                                         | ✓                       | --                                    |
| TMR                              | --                                                                                         | --                      | ✓                                     |
| DHF                              | --                                                                                         | --                      | ✓                                     |
| <b>Total</b>                     | <b>1<br/>(8.33)</b>                                                                        | <b>1<br/>(8.33)</b>     | <b>10<br/>(83.33)</b>                 |

(The figures given in bracket show the respective percentage)



It can be observed from Table 59 that out of the 12 cultural institutions not using standards for digitisation projects, SORIL indicates that “lack of knowledge about the standards” is the reason for not using them. As per the opinion of TEMUL, standards are not needed. At the same time, SCL, KUL, KLL, ORI & ML, KCHRL, SSUSL, KSAL, GDRL, TMR, and DHF indicate that they were using their own institutional standards for digitisation work, not national or international standards. Out of the 12 respondents who are not using standards, a large majority 10 (83.33 per cent) of the respondents used institutional standards; 1 respondent (8.33 per cent) indicated that they did not have knowledge of standards; and another respondent (8.33 per cent) indicated that following standards for digitisation work is not necessary.

#### **5.47 Collaborative Efforts of Cultural Institutions in the Digitisation Project**

There is a trend of implementing collaborative efforts within the cultural institutions to plan, implement, operate, and run a successful digitisation project for documentary heritage collection. Collaboration helped to manage the project by setting goals, selecting equipment, purchasing hardware and software, sharing resources, expertise, and services, and it also reduced the duplication of efforts and money spent on individual projects. Manaf (2007) indicated that the majority (57 per cent) of the cultural institutions in Malaysia do not have any collaboration effort with other institutions with regards to their digitisation project for cultural heritage resources. Here, respondents were asked to indicate their status of collaboration with other institutions for the digitisation project. The details provided by the respondents related to their collaborative efforts are presented in Table 60.

**Table 60**

*Status of Collaboration in the Digitisation Project*

| Name of the Cultural Institution | Status of Collaboration in the Digitisation Project (n=13) |                      |
|----------------------------------|------------------------------------------------------------|----------------------|
|                                  | Collaborated                                               | Not Collaborated     |
| SCL                              | --                                                         | ✓                    |
| KUL                              | --                                                         | ✓                    |
| KLL                              | ✓                                                          | --                   |
| ORI & ML                         | --                                                         | ✓                    |
| KCHRL                            | ✓                                                          | --                   |
| SORIL                            | --                                                         | ✓                    |
| SSUSL                            | --                                                         | ✓                    |
| KSAL                             | --                                                         | ✓                    |
| KAULIS                           | ✓                                                          | --                   |
| GDRL                             | --                                                         | ✓                    |
| TEMUL                            | --                                                         | ✓                    |
| TMR                              | --                                                         | ✓                    |
| DHF                              | ✓                                                          | --                   |
| <b>Total</b>                     | <b>4<br/>(30.77)</b>                                       | <b>9<br/>(69.23)</b> |

(The figures given in bracket show the respective percentage)

The analysis of Table 60 indicates that, out of the 13 cultural institutions, the majority of the institutions, such as SCL, KUL, ORI & ML, SORIL, SSUSL, KSAL, GDRL, TEMUL, and TMR, have not made any collaborations with other institutions. Whereas KLL, KCHRL, KAULIS, and DHF indicated that they are collaborating with other institutions for their digitisation project. Out of the 13 cultural institutions surveyed, the majority of the institutions 9 (69.23 per cent) have no collaboration with other institutions, and 4 cultural institutions, representing 30.77 per cent have collaboration with other institutions.

**5.48 Level of Collaboration**

According to the findings revealed in Table 60, only four cultural institutions (KLL, KCHRL, KAULIS, and DHF) take part in the collaborative efforts for the

digitisation project. Here, the investigator attempts to identify the level of collaboration between the institutions. Respondents were asked to specify their level of collaboration with the other institutions. Table 61 presents the data regarding the level of collaboration.

**Table 61**

***Level of Collaboration***

| Name of the Cultural Institution | Level of Collaboration (n=4) |                            |                            |
|----------------------------------|------------------------------|----------------------------|----------------------------|
|                                  | International                | National                   | Regional                   |
| KLL                              | --                           | --                         | ✓                          |
| KCHRL                            | ✓                            | ✓                          | ✓                          |
| KAULIS                           | --                           | ✓                          | --                         |
| DHF                              | --                           | --                         | ✓                          |
| <b>Total</b>                     | <b>1</b><br><b>(25.00)</b>   | <b>2</b><br><b>(50.00)</b> | <b>3</b><br><b>(75.00)</b> |

(The figures given in bracket show the respective percentage)

As can be observed from Table 61, KLL and DHF have only regional-level collaboration. KCHRL indicates that they have international, national, and regional collaboration with other institutions. Whereas, KAULIS has national-level collaboration. Out of the 4 cultural institutions, they have collaborated with other institutions; the majority of the institutions 3 (75.00 per cent) have collaborated with regional-level institutions. Two cultural institutions (50.00 per cent) have national-level collaboration, and only 1 (25.00 per cent) has international-level collaboration.

**5.49 Types of Institution/ Organisations Involved in the Collaboration**

According to Table 60, only four cultural institutions (KLL, KCHRL, KAULIS and DHF) take part in the collaborative efforts for the digitisation project. Table 62 shows the type of institutions or organisations with which cultural institutions collaborated to conduct the digitisation project. Respondents were asked to indicate the type of institution or organisation with which collaboration has been made.

**Table 62*****Types of Institution/ Organisations Involved in the Collaboration***

| Name of the Cultural Institution | Types of Institution/ Organisations Involved in the Collaboration (n=4) |          |                            |                            |           |
|----------------------------------|-------------------------------------------------------------------------|----------|----------------------------|----------------------------|-----------|
|                                  | Libraries                                                               | Archives | Private Institutions       | Government Institutions    | Any other |
| KLL                              | --                                                                      | --       | --                         | ✓                          | --        |
| KCHRL                            | ✓                                                                       | --       | --                         | --                         | --        |
| KAULIS                           | ✓                                                                       | --       | --                         | ✓                          | --        |
| DHF                              | --                                                                      | --       | ✓                          | --                         | --        |
| <b>Total</b>                     | <b>2</b><br><b>(50.00)</b>                                              | <b>0</b> | <b>1</b><br><b>(25.00)</b> | <b>2</b><br><b>(50.00)</b> | <b>0</b>  |

(The figures given in bracket show the respective percentage)

From Table 62, it can be observed that KLL reported that they have collaboration with “government institutions”, KCHRL has collaboration with libraries, and KAULIS has collaboration with both libraries and government institutions. DHF collaborates with private institutions. Out of the 4 cultural institutions that reported collaborative efforts, the majority of the cultural institutions 2 (50.00 per cent) indicate that they have collaborations with libraries and government institutions. Only 1 (25.00 per cent) of the cultural institution collaborate with private institutions.

### **5.50 Extend of Collaboration**

According to the result obtained from Table 60, only four cultural institutions, such as KLL, KCHRL, KAULIS, and DHF, have initiated collaboration with other institutions. Here, respondents were asked to mention the extent of their collaboration. The responses related to the extent of collaboration are shown in Table 63.

**Table 63**

***Extend of Collaboration***

| Name of the Cultural Institution | Extend of Collaboration (n=4) |                              |                                 |                                |           |
|----------------------------------|-------------------------------|------------------------------|---------------------------------|--------------------------------|-----------|
|                                  | Equal Partnership             | Buying Services and Products | Exchanging Products and Experts | Offering Services Commercially | Any Other |
| KLL                              | --                            | --                           | ✓                               | --                             | --        |
| KCHRL                            | --                            | ✓                            | ✓                               | --                             | --        |
| KAULIS                           | --                            | ✓                            | --                              | --                             | --        |
| DHF                              | --                            | --                           | ✓                               | --                             | --        |
| <b>Total</b>                     | <b>0</b>                      | <b>2</b><br><b>(50.00)</b>   | <b>3</b><br><b>(75.00)</b>      | <b>0</b>                       | <b>0</b>  |

(The figures given in bracket show the respective percentage)

Table 63 depicts that, out of the 4 cultural institutions that initiated collaboration efforts, the majority of the cultural institutions, KLL, KCHRL, and DHF, extended their collaboration for exchanging products and experts. KLL indicated “exchanging products and experts” only. KCHRL reported both “buying services and products” and “exchanging products and experts”. Whereas KAULIS mentioned “buying services and products” only. Out of the 4 respondents who have collaborated with other institutions, the majority of the respondents 3 (75.00 per cent) reported that they extend their collaboration for “exchanging products and experts”. At the same time, half of the respondents 2 (50.00 per cent) reported “buying services and products.”.

**5.51 Benefits of Collaboration**

Cultural institutions with collaborative efforts were asked to specify the benefits of collaboration in conducting digitisation projects. The benefits of collaboration reported by the respondents are presented in Table 64.

**Table 64*****Benefits of Collaboration***

| Name of the Cultural Institution | Benefits of Collaboration (n=4) |                            |                             |           |
|----------------------------------|---------------------------------|----------------------------|-----------------------------|-----------|
|                                  | Sharing of Resources            | Sharing of Experts         | Avoid Duplication of Effort | Any Other |
| KLL                              | ✓                               | ✓                          | --                          | --        |
| KCHRL                            | ✓                               | --                         | ✓                           | --        |
| KAULIS                           | --                              | ✓                          | --                          | --        |
| DHF                              | --                              | ✓                          | --                          | --        |
| <b>Total</b>                     | <b>2</b><br><b>(50.00)</b>      | <b>3</b><br><b>(75.00)</b> | <b>1</b><br><b>(25.00)</b>  | <b>0</b>  |

(The figures given in bracket show the respective percentage)

From Table 60, only 4 cultural institutions (KLL, KCHRL, KAULIS, and DHF) started collaboration with other institutions for conducting digitisation projects. Out of the 4 cultural institutions, the majority of the institutions (KLL, KAULIS and DHF) reported that “sharing of experts” is one of the major benefits of collaboration. KLL indicates “sharing of resources and sharing of experts”, whereas KCHRL opined that “sharing of resources” and “avoiding duplication of effort” are the major benefits. KAULIS and DHF mentioned “sharing of experts”. Out of the 4 respondents, the majority of the respondents 3 (75.00 per cent) reported that “sharing of experts” is one of the major benefits of collaboration. 2 respondents, representing 50.00 per cent reported “sharing of resources”. And “avoid duplication of effort,” which was reported by only 1 respondent.

### **5.52 Storage of Digitised Content**

Cultural institutions employ various storage strategies to ensure the long-term preservation of their digitised collections. Respondents were asked to indicate the storage facility applied for storing their digitised content of the documentary heritage collection. The respondents related to the storage system applied are indicated in Table 65.

**Table 65**

*Storage of Digitised Content*

| Name of the Cultural Institution | Storage of Digitised Content |                          |                          |
|----------------------------------|------------------------------|--------------------------|--------------------------|
|                                  | Institution Server           | Local Computer Hard Disk | Any Other Storage System |
| SCL                              | ✓                            | --                       | --                       |
| KUL                              | ✓                            | --                       | --                       |
| KLL                              | ✓                            | --                       | --                       |
| ORI & ML                         | ✓                            | --                       | --                       |
| KCHRL                            | ✓                            | --                       | --                       |
| SORIL                            | ✓                            | --                       | --                       |
| SSUSL                            | ✓                            | --                       | --                       |
| KSAL                             | ✓                            | --                       | --                       |
| KAULIS                           | ✓                            | --                       | --                       |
| GDRL                             | ✓                            | --                       | --                       |
| TEMUL                            | ✓                            | --                       | --                       |
| TMR                              | ✓                            | --                       | --                       |
| DHF                              | ✓                            | --                       | --                       |
| <b>Total</b>                     | <b>13<br/>(100)</b>          | <b>0</b>                 | --                       |

(The figures given in bracket show the respective percentage)

It can be observed from Table 65 that all 13 cultural institutions surveyed; SCL, KUL, KLL, ORI & ML, KCHRL, SORIL, SSUSL, KSAL, KAULIS, GDRL, TEMUL, TMR, and DHF, reported that they stored their digitised content on their institution server. They do not prefer other advanced options for storage. Kalusopa and Zulu (2009) indicate that 14.3 per cent of the organisations in Botswana stored their digitised materials on service providers' servers, and 71.4 per cent stored them in in-house facilities.

**Part G: Access and Security of Digitised Collection**

In this section, the investigator deals with responses related to the access, security, demand, pay, services, and copyright of the physical and digitised content of documentary heritage collections in cultural institutions.

**5.53 Permission to Access Originals after Digitisation**

Respondents were asked to indicate whether they were provided permission to access the original documentary heritage collection after digitisation or not. Responses related to the access of originals after digitisation are presented in Table 66.

**Table 66**

*Permission to Access Originals after Digitisation*

| Name of the Cultural Institution | Permission to Access Originals after Digitisation (n=13) |                      |
|----------------------------------|----------------------------------------------------------|----------------------|
|                                  | Permitted                                                | Not Permitted        |
| SCL                              | ✓                                                        | --                   |
| KUL                              | ✓                                                        | --                   |
| KLL                              | --                                                       | ✓                    |
| ORI & ML                         | ✓                                                        | --                   |
| KCHRL                            | ✓                                                        | --                   |
| SORIL                            | ✓                                                        | --                   |
| SSUSL                            | --                                                       | ✓                    |
| KSAL                             | ✓                                                        | --                   |
| KAULIS                           | ✓                                                        | --                   |
| GDRL                             | ✓                                                        | --                   |
| TEMUL                            | ✓                                                        | --                   |
| TMR                              | ✓                                                        | --                   |
| DHF                              | ✓                                                        | --                   |
| <b>Total</b>                     | <b>11<br/>(84.62)</b>                                    | <b>2<br/>(15.38)</b> |

(The figures given in bracket show the respective percentage)

Table 66 depicts that, out of the 13 cultural institutions, the majority of the cultural institutions such as SCL, KUL, ORI & ML, KCHL, SORIL, KSAL, KAULIS, GDRL, TEMUL, TMR, and DHF, reported that they have provided permission to access the original documentary heritage collection after digitisation. Whereas KLL and SSUSL did not provide permission to access originals after digitisation. Out of the 13 respondents, the majority of the respondents 11 (84.62 per cent) provided permission to use and access the original documentary heritage



collection after digitisation. At the same time, two respondents representing 15.38 per cent did not provide permission to access. Manaf (2007) reports a contradictory finding of the investigator in his study that the majority (56.5 per cent) of the cultural institutions in Malaysia did not provide permission to users to access the original heritage collections once they were digitised.

#### **5.54 Demand for Access to Originals after Digitisation**

It is important to identify the status of demand for original documentary heritage collections after digitisation. Some users are obsessed with the document collection. They prefer to use the original documentary heritage collection over its digital version. Here respondents were asked to mention the demand for original documentary heritage collection after digitisation, whether it increased, decreased, or remained the same. The status of demand for original documentary heritage collections after digitisation is indicated in Table 67.

**Table 67**

#### *Demand for Access to Originals after Digitisation*

| Name of the Cultural Institution | Demand for Access to Originals after Digitisation (n=13) |                      |                         |
|----------------------------------|----------------------------------------------------------|----------------------|-------------------------|
|                                  | Increased                                                | Decreased            | Remained About the Same |
| SCL                              | --                                                       | --                   | ✓                       |
| KUL                              | --                                                       | ✓                    | --                      |
| KLL                              | ✓                                                        | --                   | --                      |
| ORI & ML                         | --                                                       | --                   | ✓                       |
| KCHRL                            | ✓                                                        | --                   | --                      |
| SORIL                            | --                                                       | --                   | ✓                       |
| SSUSL                            | --                                                       | --                   | ✓                       |
| KSAL                             | --                                                       | ✓                    | --                      |
| KAULIS                           | ✓                                                        | --                   | --                      |
| GDRL                             | --                                                       | --                   | ✓                       |
| TEMUL                            | --                                                       | ✓                    | --                      |
| TMR                              | --                                                       | --                   | ✓                       |
| DHF                              | --                                                       | ✓                    | --                      |
| <b>Total</b>                     | <b>3<br/>(23.08)</b>                                     | <b>4<br/>(30.77)</b> | <b>6<br/>(46.15)</b>    |

(The figures given in bracket show the respective percentage)

It can be observed from Table 67 that KLL, KCHRL, and KAULIS reported that demand for original documentary heritage collection from users increased after digitisation. Whereas KUL, KSAL, TEMUL, and DHF reported that the demand for original documentary heritage collection decreased after digitisation. But the majority of the cultural institutions, such as SCL, ORI & ML, SORIL, SSUSL, GDRL, and TMR, reported that the demand for original documentary heritage collection remained the same after digitisation. Out of the 13 respondents, the majority of the respondents 6 (46.15 per cent) indicate the demand for original documentary heritage collection remained the same after digitisation. Four respondents, representing 30.77 per cent indicate the demand for original documentary heritage collections has decreased. At the same time, the least number of respondents 3 (23.08 per cent) indicates that the demand for original documentary heritage collection from the users has increased.

#### **5.55 Availability of a Digital Library for Documentary Heritage Collection**

Establishing a digital library for documentary heritage collection is a challenge for cultural institutions. The investigator made an attempt to understand whether the cultural institutions created a digital library for their documentary heritage collection or not. Respondents were asked to indicate the availability of a digital library for documentary heritage collection. The availability of digital libraries for documentary heritage collection is tabulated in Table 68.

**Table 68**

*Availability of a Digital Library for Documentary Heritage Collection*

| Name of the Cultural Institution | Availability of a Digital Library for Documentary Heritage Collection (n=13) |                      |
|----------------------------------|------------------------------------------------------------------------------|----------------------|
|                                  | Yes                                                                          | No                   |
| SCL                              | --                                                                           | ✓                    |
| KUL                              | ✓                                                                            | --                   |
| KLL                              | --                                                                           | ✓                    |
| ORI & ML                         | --                                                                           | ✓                    |
| KCHRL                            | ✓                                                                            | --                   |
| SORIL                            | --                                                                           | ✓                    |
| SSUSL                            | --                                                                           | ✓                    |
| KSAL                             | ✓                                                                            | --                   |
| KAULIS                           | --                                                                           | ✓                    |
| GDRL                             | --                                                                           | ✓                    |
| TEMUL                            | --                                                                           | ✓                    |
| TMR                              | --                                                                           | ✓                    |
| DHF                              | ✓                                                                            | --                   |
| <b>Total</b>                     | <b>4<br/>(30.77)</b>                                                         | <b>9<br/>(69.23)</b> |

(The figures given in bracket show the respective percentage)

The analysis shows that the majority of cultural institutions, such as SCL, KLL, ORI & ML, SORIL, SSUSL, KAULIS, GDRL, TEMUL, and TMR, have not created digital library for documentary heritage collection. Whereas KUL, KCHRL, KSAL, and DHF indicate that they created digital library for documentary heritage collection. Out of the 13 respondents, the majority of the respondents 9 (69.23 per cent) did not establish a digital library for documentary heritage collection. Four respondents, representing 30.77 per cent have a digital library.

**5.56 Availability of Searching and Browsing Options in the Digital Library**

Based on the results revealed in Table 68, only 4 cultural institutions, such as KUL, KCHRL, KSAL, and DHF, have a digital library for their documentary heritage collections. Here, respondents were asked to indicate the searching and

browsing options provided in the digital library. The availability of searching and browsing options in the digital library is presented in Table 69.

**Table 69**

*Availability of Searching and Browsing Options in the Digital Library*

| Name of the Cultural Institution | Availability of Searching and Browsing Options in the Digital Library (n=4) |                             |                             |                            |       |
|----------------------------------|-----------------------------------------------------------------------------|-----------------------------|-----------------------------|----------------------------|-------|
|                                  | Author                                                                      | Title                       | Subject                     | Keyword                    | Other |
| KUL                              | ✓                                                                           | ✓                           | ✓                           | ✓                          | --    |
| KCHRL                            | ✓                                                                           | ✓                           | ✓                           | ✓                          | --    |
| KSAL                             | ✓                                                                           | ✓                           | ✓                           |                            | --    |
| DHF                              | ✓                                                                           | ✓                           | ✓                           | ✓                          | --    |
| <b>Total</b>                     | <b>4</b><br><b>(100.00)</b>                                                 | <b>4</b><br><b>(100.00)</b> | <b>4</b><br><b>(100.00)</b> | <b>3</b><br><b>(75.00)</b> | --    |

(The figures given in bracket show the respective percentage)

Table 69 found that, out of the 4 cultural institutions that have digital library for their documentary heritage collections, KUL, KCHRL, and DHF provide author, title, subject, and keyword options to search, whereas KSAL provides author, title, and subject options. Out of the 4 respondents, all respondents provided author, title, and subject options to search.

**5.57 Access to the Digitised Documentary Heritage Collection**

It is important to study the methods adopted by cultural institutions to provide access to their documentary heritage collections. The investigator made an attempt to understand the source from which the digitised documentary heritage collection was accessible to users. Respondents were asked to indicate how they were providing access to the users. The details regarding the access to digitised documentary heritage collections are enumerated in Table 70.

**Table 70***Access to the Digitised Documentary Heritage Collection*

| Name of the Cultural Institution | Access to the Digitised Documentary Heritage Collection (n=13) |                                   |                                     |                      |
|----------------------------------|----------------------------------------------------------------|-----------------------------------|-------------------------------------|----------------------|
|                                  | Only in Institution Intranet                                   | Restricted Access through Website | Whole Globe through Digital Library | No Access            |
| SCL                              | ✓                                                              | ✓                                 | --                                  | --                   |
| KUL                              | ✓                                                              | --                                | --                                  | --                   |
| KLL                              | ✓                                                              | ✓                                 | --                                  | --                   |
| ORI & ML                         | ✓                                                              | --                                | --                                  | --                   |
| KCHRL                            | --                                                             | --                                | ✓                                   | --                   |
| SORIL                            | ✓                                                              | --                                | --                                  | --                   |
| SSUSL                            | --                                                             | --                                | --                                  | ✓                    |
| KSAL                             | --                                                             | --                                | ✓                                   | --                   |
| KAULIS                           | --                                                             | ✓                                 | --                                  | --                   |
| GDRL                             | ✓                                                              | --                                | --                                  | --                   |
| TEMUL                            | ✓                                                              | --                                | --                                  | --                   |
| TMR                              | --                                                             | --                                | --                                  | ✓                    |
| DHF                              | ✓                                                              | --                                | --                                  | --                   |
| <b>Total</b>                     | <b>8<br/>(61.54)</b>                                           | <b>3<br/>(23.08)</b>              | <b>2<br/>(15.38)</b>                | <b>2<br/>(15.38)</b> |

(The figures given in bracket show the respective percentage)

Table 70 indicates that the majority of the cultural institutions, such as SCL, KUL, KLL, ORI & ML, SORIL, GDRL, TEMUL, and DHF, reported that they are providing access to digitised documentary heritage collections only in their institution intranet. SCL, KLL, and KAULIS reported that they are providing restricted access through the website. Whereas KCHRL and KSAL reported that they are providing access to the whole globe through a digital library, SSUSL and TMR are not providing access to their digitised documentary heritage collections. Out of the 13 respondents, the majority of the respondents 8 (61.54 per cent) provide access to their digitised documentary heritage collection only on their institution's intranet. 3 (23.08 per cent) of the respondents provide restricted access through the website. 2 respondents, representing 15.38 per cent provide access to the whole globe through the digital library. At the same time, the other two respondents did not provide any access to their digitised documentary heritage collection.

### 5.58 Charge of Pay for Digitised Documentary Heritage Collection

Some of the cultural institutions have established fee-based access to documentary heritage collections. Users have to pay charges for using the digitised documentary heritage collection. Cultural institutions charge fees for taking printouts and downloading the digitised documentary heritage collection. Here, the respondents were asked to mention whether they were charging any fee for using their digitised documentary heritage collection. The details of the charge for the digitised documentary heritage collection are shown in Table 71.

**Table 71**

#### *Charge of Pay for Digitised Documentary Heritage Collection*

| Name of the Cultural Institution | Charge of Pay for Digitised Documentary Heritage Collection (n=13) |                      |                      |
|----------------------------------|--------------------------------------------------------------------|----------------------|----------------------|
|                                  | Charged                                                            | Not Charged          | No Response          |
| SCL                              | ✓                                                                  | --                   | --                   |
| KUL                              | ✓                                                                  | --                   | --                   |
| KLL                              | --                                                                 | ✓                    |                      |
| ORI & ML                         | --                                                                 | --                   | ✓                    |
| KCHRL                            | --                                                                 | ✓                    | --                   |
| SORIL                            | --                                                                 | ✓                    | --                   |
| SSUSL                            | --                                                                 | --                   | ✓                    |
| KSAL                             | ✓                                                                  | --                   | --                   |
| KAULIS                           | --                                                                 | ✓                    | --                   |
| GDRL                             | --                                                                 | ✓                    | --                   |
| TEMUL                            | --                                                                 | ✓                    | --                   |
| TMR                              | --                                                                 | --                   | ✓                    |
| DHF                              | --                                                                 | --                   | ✓                    |
| <b>Total</b>                     | <b>3<br/>(23.08)</b>                                               | <b>6<br/>(46.16)</b> | <b>4<br/>(30.76)</b> |

(The figures given in bracket show the respective percentage)

Table 71 depicts that the majority of the cultural institutions, such as KLL, KCHRL, SORIL, KAULIS, GDRL, and TEMUL, indicate that they do not charge any fee for using digitised documentary heritage collections. At the same time, SCL, KUL, and KSAL indicate that they charge fees for using digitised documentary heritage collections. ORI & ML, SSUSL, TMR, and DHF provide no response to this question. Out of the 13 respondents surveyed, the majority 6 (46.16 per cent) of the respondents did not charge any fee for using digitised documentary heritage

collections. 3 respondents, representing 23.08 per cent charged a fee for using digitised documentary heritage collections. Four respondents indicate no response.

Like the findings of the investigator, Kalusopa and Zulu (2009) also indicate that most (57.1 per cent) of the organisations in Botswana have not charged any access fee for digitised materials, whereas only 14.3 per cent of the organisations charged an access fee.

### **5.59 Services provided by using the Digitised Documentary Heritage Collection**

Respondents were asked to indicate the services provided to the users by using the digitised documentary heritage collection. The details regarding the services provided by the cultural institutions are presented in Table 72.

**Table 72**

#### *Services Provided by using the Digitised Documentary Heritage Collection*

| Name of the Cultural Institution | Services provided by using the Digitised Documentary Heritage Collection (n=13) |                            |                            |                                 |                |
|----------------------------------|---------------------------------------------------------------------------------|----------------------------|----------------------------|---------------------------------|----------------|
|                                  | Reference Services                                                              | Make Printouts             | Downloading Facilities     | Publication of Heritage Records | Other Services |
| SCL                              | ✓                                                                               | ✓                          | --                         | --                              | --             |
| KUL                              | ✓                                                                               | ✓                          | --                         | --                              | --             |
| KLL                              | ✓                                                                               | ✓                          | --                         | --                              | --             |
| ORI & ML                         | ✓                                                                               | --                         | --                         | --                              | --             |
| KCHRL                            | ✓                                                                               | --                         | ✓                          | ✓                               | --             |
| SORIL                            | --                                                                              | --                         | --                         | --                              | No Service     |
| SSUSL                            | --                                                                              | --                         | --                         | --                              | No Service     |
| KSAL                             | ✓                                                                               | --                         | ✓                          | --                              | --             |
| KAULIS                           | ✓                                                                               | ✓                          | --                         | --                              | --             |
| GDRL                             | ✓                                                                               | --                         | --                         | --                              | --             |
| TEMUL                            | ✓                                                                               | ✓                          | ✓                          | --                              | --             |
| TMR                              | --                                                                              | --                         | --                         | --                              | No Service     |
| DHF                              | ✓                                                                               | --                         | --                         | ✓                               | ----           |
| <b>Total</b>                     | <b>10</b><br><b>(76.92)</b>                                                     | <b>5</b><br><b>(38.46)</b> | <b>3</b><br><b>(23.07)</b> | <b>2</b><br><b>(15.38)</b>      |                |

(The figures given in bracket show the respective percentage)

Table 72 reported that the majority of the cultural institutions, such as SCL, KUL, KLL, ORI & ML, KCHRL, KSAL, KAULIS, GDRL, TEMUL, and DHF, reported that they provide reference services. SCL, KUL, KLL, and KAULIS allow for printouts along with reference services. KCHRL indicates reference service, downloading facilities, and publication of heritage records. KSAL and TEMUL offer downloading facilities with reference services. DHF indicates reference services and the publication of records. At the same time, SORIL, SSUSL, and TMR did not provide any services to users by using digitised documentary heritage collections. Out of the 13 respondents, the majority 10 (76.92 per cent) of the respondents provide reference services; 5 respondents, representing 23.46 per cent allowed to print outs; 3 (23.07 per cent) offer downloading facilities; and 2 (15.38 per cent) respondents provide publication of heritage records. The remaining 3 respondents provide no services by using the digitised documentary heritage collection.

#### **5.60 Demand for Digitised Documentary Heritage Collection**

Here, respondents were asked to indicate their opinion regarding the sufficient demand of users for digitised documentary heritage collection. Table 73 presents the demand for digitised documentary heritage collection from the users.



**Table 73*****Demand for Digitised Documentary Heritage Collection***

| Name of the Cultural Institution | Sufficient Demand for Digitised Documentary Heritage Collection (n=13) |                      |
|----------------------------------|------------------------------------------------------------------------|----------------------|
|                                  | Yes                                                                    | No                   |
| SCL                              | ✓                                                                      | --                   |
| KUL                              | ✓                                                                      | --                   |
| KLL                              | ✓                                                                      | --                   |
| ORI & ML                         | ✓                                                                      | --                   |
| KCHRL                            | ✓                                                                      | --                   |
| SORIL                            | --                                                                     | ✓                    |
| SSUSL                            | ✓                                                                      | --                   |
| KSAL                             | ✓                                                                      | --                   |
| KAULIS                           | ✓                                                                      | --                   |
| GDRL                             | ✓                                                                      | --                   |
| TEMUL                            | ✓                                                                      | --                   |
| TMR                              | --                                                                     | ✓                    |
| DHF                              | ✓                                                                      | --                   |
| <b>Total</b>                     | <b>11<br/>(84.61)</b>                                                  | <b>2<br/>(15.38)</b> |

(The figures given in bracket show the respective percentage)

Table 73 indicates the demand for digitised documentary heritage collection from the users. It can be observed that the majority of the cultural institutions, SCL, KUL, KLL, ORI & ML, KCHRL, SSUSL, KSAL, KAULIS, GDRL, TEMUL, and DHF, reported that the digitised documentary heritage collection had sufficient demand from the users, whereas SORIL and TMR reported that users didn't express sufficient demand for the digitised documentary heritage collection. Out of the 13 respondents surveyed, the majority 11 (84.61 per cent) indicated that digitised documentary heritage collections have sufficient demand from users. At the same time, a small number 2 (15.38 per cent) of the respondents indicate that digitised documentary heritage collections have no sufficient demand.

### **5.61 Digitisation of Materials with Copyright Issues**

Copyright violations are one of the challenges that frighten the majority of cultural institutions to digitise a documentary heritage collection that is not their own. Cultural institutions should be aware of the copyright rules, claims, violations, and infringements. Here, respondents were asked to indicate whether their digitised

documentary heritage collection has copyright issues. The data regarding the digitisation of material with copyright issues is shown in Table 74.

**Table 74**

***Digitisation of Materials with Copyright Issues***

| Name of the Cultural Institution | Digitisation of Materials with Copyright Issues<br>(n=13) |                       |
|----------------------------------|-----------------------------------------------------------|-----------------------|
|                                  | Digitised                                                 | Not Digitised         |
| SCL                              | --                                                        | ✓                     |
| KUL                              | --                                                        | ✓                     |
| KLL                              | --                                                        | ✓                     |
| ORI & ML                         | --                                                        | ✓                     |
| KCHRL                            | --                                                        | ✓                     |
| SORIL                            | --                                                        | ✓                     |
| SSUSL                            | --                                                        | ✓                     |
| KSAL                             | ✓                                                         | --                    |
| KAULIS                           | --                                                        | ✓                     |
| GDRL                             | --                                                        | ✓                     |
| TEMUL                            | --                                                        | ✓                     |
| TMR                              | --                                                        | ✓                     |
| DHF                              | --                                                        | ✓                     |
| <b>Total</b>                     | <b>1<br/>(7.69)</b>                                       | <b>12<br/>(92.31)</b> |

(The figures given in bracket show the respective percentage)

Table 74 enumerates that the majority of the cultural institutions, SCL, KUL, KLL, ORI & ML, KCHRL, SORIL, SSUSL, KAULIS, GDRL, TEMUL, TMR, and DHF, indicate that they are not digitising the documentary heritage collection with copyright problems; only 1 cultural institution, KSAL, indicates that they have digitised the documentary heritage collection with copyright issues. Out of the 13 respondents, a majority 12 (92.31 per cent) not digitise their heritage collection with copyright issues. Only 1 (7.69 per cent) cultural institution indicates that they digitised materials with copyright issues.

**5.62 Application of Network and Security Measures**

The investigator made an attempt to check whether the cultural institutions take the necessary security measures for preserving digitised documentary heritage

collections to ensure their long-term preservation, continued accessibility, and survival of digital files. Here, respondents were asked to indicate whether they have taken any network and security measures for the preservation of digitised documentary heritage collections. The responses related to the network and security measures for the preservation of digitised documentary heritage collections are presented in Table 75.

**Table 75**

*Application of Network and Security Measures*

| Name of the Cultural Institution | Application of Network and Security Measures (n=13) |                      |
|----------------------------------|-----------------------------------------------------|----------------------|
|                                  | Applied                                             | Not Applied          |
| SCL                              | ✓                                                   | --                   |
| KUL                              | ✓                                                   | --                   |
| KLL                              | ✓                                                   | --                   |
| ORI & ML                         | ✓                                                   | --                   |
| KCHRL                            | ✓                                                   | --                   |
| SORIL                            | --                                                  | ✓                    |
| SSUSL                            | --                                                  | ✓                    |
| KSAL                             | --                                                  | ✓                    |
| KAULIS                           | ✓                                                   | --                   |
| GDRL                             | --                                                  | ✓                    |
| TEMUL                            | ✓                                                   | --                   |
| TMR                              | --                                                  | ✓                    |
| DHF                              | ✓                                                   | --                   |
| <b>Total</b>                     | <b>8<br/>(61.54)</b>                                | <b>5<br/>(38.46)</b> |

(The figures given in bracket show the respective percentage)

Table 75 revealed that the majority of the cultural institutions, such as SCL, KUL, KLL, ORI & ML, KCHRL, KAULIS, TEMUL, and DHF, applied network and security measures for the preservation of digitised documentary heritage collections. Whereas, SORIL, SSSUSL, KSAL, GDRL, and TMR indicate they have not applied any network and security measures for the preservation of digitised documentary heritage collections. Out of the 13 respondents surveyed, the majority 8 (61.54 per cent) of the respondents applied network and security measures for the

preservation of digitised documentary heritage collections, and 5 respondents, representing 38.46 per cent did not apply network and security measures.

### **5.63 Types of Network and Security Measures Applied**

Table 75 indicates that 8 cultural institutions (SCL, KUL, KLL, ORI & ML, KCHRL, KAULIS, TEMUL, and DHF) applied network and security measures for the preservation of digitised documentary heritage collections. Here, the respondents were asked to indicate what network and security measures are taken by the cultural institutions for the preservation of digitised documentary heritage collections. Table 76 showcases the network and security measures taken by the cultural institutions.

**Table 76**

#### *Types of Network and Security Measures Applied*

| Types of Network and Security Measures Applied                                               | Name of the Cultural Institution |     |     |          |       |        |       |     | Total (n=8) |
|----------------------------------------------------------------------------------------------|----------------------------------|-----|-----|----------|-------|--------|-------|-----|-------------|
|                                                                                              | SCL                              | KUL | KLL | ORI & ML | KCHRL | KAULIS | TEMUL | DHF |             |
| Security software firewalls, filtering routers, encryption & decryption measures on the data | --                               | --  | ✓   | --       | --    | ✓      | ✓     | --  | 3<br>(37.5) |
| Data security through keeping backup of digital contents in case of any disaster             | ✓                                | ✓   | --  | ✓        | ✓     | ✓      | ✓     | ✓   | 7<br>(87.5) |
| Access to digital content by providing password or IP based access                           | --                               | ✓   | --  | --       | ✓     | --     | --    | ✓   | 3<br>(37.5) |
| Design administrative back-end control system for digital library                            | --                               | --  | ✓   | --       | ✓     | --     | --    | ✓   | 3<br>(37.5) |
| Design an appropriate digital library usage policy and usage guidelines for the online users | --                               | --  | --  | --       | --    | --     | --    | --  | 0           |

(The figures given in bracket show the respective percentage)

As can be observed from Table 76, the majority of the cultural institutions, such as SCL, KUL, ORI & ML, KCHRL, KAULIS, TEMUL, and DHF, applied “data security through keeping backup of digital contents in case of any disaster”. KLL, KAULIS, and TEMUL used “security software firewalls, filtering routers, and encryption & decryption measures on the data”. And KUL, KCHRL, and DHF applied “access to digital content by providing password or IP based access”. “Administrative back-end control system for digital library” is designed by KLL, KCHRL, and DHF. At the same time, KCHRL and DHF applied three types of network and security measures. Out of the 8 cultural institutions that applied network and security measures for the preservation of their digitised documentary heritage collections, the majority 7 (87.5 per cent) of the cultural institutions applied “data security through keeping backup of digital contents in case of any disaster”.

### **Part H: Challenges of Preservation**

In this section, the investigator presents the responses related to the challenges faced by cultural institutions for the preservation of their documentary heritage collections. And the perception and opinion of cultural institutions on strategies to tackle these preservation challenges.

#### **5.64 Challenges of the Preservation of Documentary Heritage Collection**

It is necessary to analyse the major challenges faced by cultural institutions in the preservation of documentary heritage collections. Sarika (2014) reported that the unavailability of a written preservation policy, trained manpower, and funding are major constraints to preservation activities in libraries. At the same time, Mkuwira (2015) addressed the fact that lack of purposefully built infrastructure, limited funding, and understaffing are the major challenges of preservation in Malawi. Manaf (2007) admitted that lack of commitment and support from top management, lack of standards and technical limitations, and lack of knowledge and skills are the challenges encountered in the digitisation in Malaysia. Here, the respondents were asked to report the major challenges faced during the preservation of documentary heritage collections. Table 77 presents the challenges of preservation.

**Table 77**

***Challenges of the Preservation of Documentary Heritage Collection***

| Challenges of Preservation           | Responses of Cultural Institutions (n=15) |              |              |                   |              |
|--------------------------------------|-------------------------------------------|--------------|--------------|-------------------|--------------|
|                                      | Strongly Agree                            | Agree        | Disagree     | Strongly Disagree | No Response  |
| Lack of funding                      | 2<br>(13.33)                              | 3<br>(20.00) | 5<br>(33.33) | 4<br>(26.66)      | 1<br>(6.66)  |
| Lack of skilled/trained manpower     | 3<br>(20.00)                              | 9<br>(60.00) | 1<br>(6.66)  | 0                 | 2<br>(13.33) |
| Lack of preservation policy          | 0                                         | 5<br>(33.33) | 5<br>(33.33) | 4<br>(26.66)      | 1<br>(6.66)  |
| Inadequate infrastructure facilities | 1<br>(6.66)                               | 5<br>(33.33) | 7<br>(46.66) | 1<br>(6.66)       | 1<br>(6.66)  |
| Technical problems                   | 2<br>(13.33)                              | 4<br>(26.66) | 4<br>(26.66) | 3<br>(20.00)      | 2<br>(13.33) |
| Copyright and other legal issues     | 2<br>(13.33)                              | 7<br>(46.66) | 2<br>(13.33) | 3<br>(20.00)      | 1<br>(6.66)  |
| Technological obsolescence           | 2<br>(13.33)                              | 7<br>(46.66) | 2<br>(13.33) | 3<br>(20.00)      | 1<br>(6.66)  |

(The figures given in bracket show the respective percentage)

Table 77 depicts that, out of the 15 cultural institutions surveyed, only 2 (13.33 per cent) cultural institutions indicate that lack of funding is a major challenge to preservation. At the same time, a large number of cultural institutions (33.33 per cent) did not agree that lack of funding is a challenge. The majority (60.00 per cent) of the cultural institutions reported that they felt a lack of skilled or trained staff during the preservation project was a serious problem. Whereas only one cultural institution indicates a lack of skilled or trained staff, this is not a challenge. 33.33 per cent of the respondents mentioned that a lack of preservation policy is a major challenge to preservation, but an equal number of respondents (33.33 per cent) also indicated “disagree” with this statement, and a good number of respondents 4 (26.66 per cent) strongly disagreed with the lack of preservation policy as a major challenge. The majority of respondents (46.66 per cent) disagree with the statement that inadequate infrastructure is a challenge; at the same time, a good number of respondents (33.33 per cent) agree that inadequate infrastructure is a challenge of effective preservation. 26.66 per cent of the respondents reported that internal technical problems are the major constraint of preservation, but an equal

number of respondents (26.66 per cent) also indicated disagreement with the statement. The majority of the respondents (46.66 per cent) indicate that copyright, other legal issues, and technological obsolescence are the major challenges of preservation.

From the overall analysis, the majority of the cultural institutions reported that lack of skilled/ trained manpower, copyright and other legal issues, and technological obsolescence are the major challenges of preservation.

### **5.65 Strategies to Tackle the Challenges of Preservation**

Here, the respondents were asked to point out strategies to solve the challenges of the preservation of documentary heritage collections. The strategies suggested by the respondents for solving the problems of preservation are tabulated in Table 78.

**Table 78**

#### *Strategies to Tackle the Challenges of Preservation*

| <b>Strategies to Solve the Problems of Preservation (n=15)</b>                                                       | <b>Frequency</b> | <b>Per cent</b> |
|----------------------------------------------------------------------------------------------------------------------|------------------|-----------------|
| Establish a legal framework for preservation of documentary heritage resources                                       | 6                | 40.00           |
| Government should increase financial and technical assistance for the preservation of documentary heritage resources | 10               | 66.66           |
| Copyright laws for documentary heritage resources should be liberal                                                  | 7                | 46.66           |
| Library schools should include the traditional and digital preservation techniques in their curriculum               | 10               | 66.66           |
| Increase the collaboration between institutions holds documentary heritage resources                                 | 8                | 53.33           |
| Build regional/ national digital repository for documentary heritage resources                                       | 3                | 20.00           |
| Provide continuous training to the staffs on traditional and digital preservation techniques                         | 10               | 66.66           |

As can be seen from Table 78, out of the 15 respondents surveyed, a majority 10 (66.66 per cent) of the respondents suggest that the government should increase financial and technical assistance for the preservation of documentary heritage resources, library schools should include traditional and digital preservation techniques in their curricula, institutions should provide proper training to their staff, and staff should receive continuous training on traditional and digital preservation techniques. A good number of 53.33 per cent of the respondents also suggest increasing collaboration between institutions that hold documentary heritage resources.

### **5.66 Conclusion**

The first part of this chapter analyses the data collected from the heads of the selected fifteen cultural institutions in Kerala by using statistical techniques like count and the simple percentage method. The results are explained with the help of tables and diagrams, which help the investigator extract the findings through clear interpretations. The present study is intended to assess the preservation practices followed by cultural institutions to protect their documentary heritage collections. The present study found that the cultural institutions in Kerala possess a large collection of a wide variety of documentary heritage, which includes old and rare books, bound volumes of old periodicals and magazines, manuscripts on paper, palm leaves, bound volumes of newspapers, government orders and reports, historical records, and maps. Cultural institutions employ both traditional and digital methods of preservation for their documentary heritage collections. Lack of skilled or trained staff is the most noticeable challenge faced by cultural institutions during the preservation of documentary heritage collections. The findings of the study are useful for the authorities of cultural institutions to understand the current status of the preservation of documentary heritage collections and improve their activities.



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## **PART II**

# **Analysis of the Data Collected from the Staff of the Cultural Institutions**

- 
- *Introduction*
  - *Profile of the Staff of Cultural Institutions*
  - *Knowledge and Practical abilities of Staff in the Preservation of Documentary Heritage Collection*
  - *Conclusion*
-



### **5.67 Introduction**

The analysis chapter helps the investigator organise, interpret, and evaluate the data collected through his or her research work and present that data as useful information. The second part of the chapter gives a detailed analysis of the responses collected from the staff working in the fifteen selected cultural institutions in Kerala. The investigator prepared a structured schedule, personally visited the cultural institutions, and administered the schedules to the staff working in the fifteen selected cultural institutions for the study. The present study aimed to understand the perception and opinion of the staff about their knowledge and practical ability in traditional and digital preservation methods for the preservation of documentary heritage collections. The study also focused on understanding the impact of the working experience of the staff on their knowledge and expertise in preservation practices. After data collection, the data was tabulated with MS Excel and analysed using the SSPS statistical package. The collected data was subjected to various statistical tests, such as simple percentage analysis, mean, standard deviation, and ANOVA.

The sum total of schedules administered to the staff of the selected fifteen cultural institutions is 175 and the responses received back are 170, so the response rate is 97.14 per cent. The responses received from the staff of the selected fifteen cultural institutions are arranged in two sections (A-B sections). Section A represents the personal details of the staff. Section B is about the opinion and perception of staff about their knowledge and practical abilities in traditional and digital preservation methods for protecting documentary heritage collections. And the methods to improve the preservation skills of the staff of the cultural institutions.

#### **Section A: Profile of the Staff of Cultural Institutions**

In this section, the investigator analyses the personal details of the staff working in the selected fifteen cultural institutions for the study. This section analyses the personal credentials of the staff, such as gender, age, profession, mode of appointment, working experience, highest educational qualification, and type of institution at which they were working.

### **5.68 Gender-wise Distribution of Respondents**

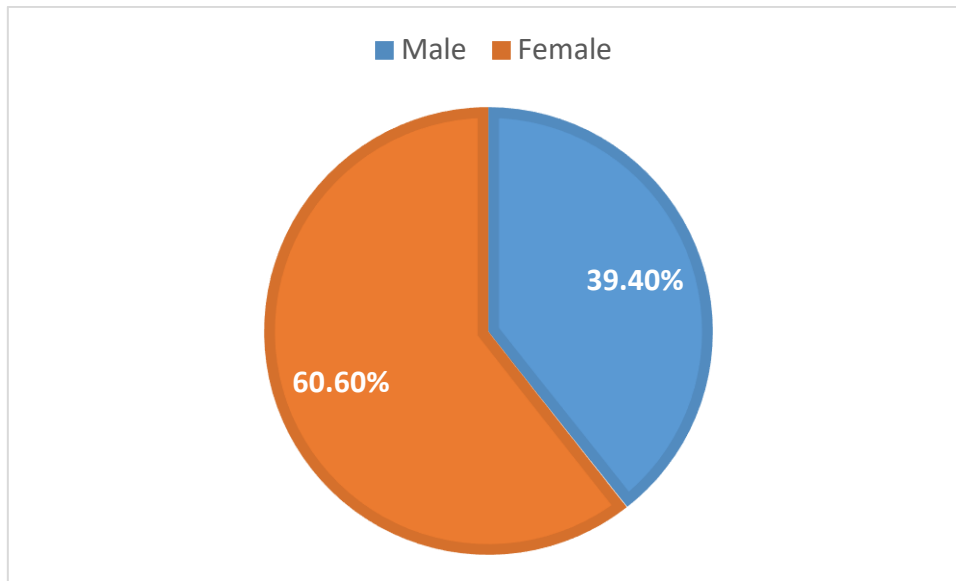
Gender equality has been progressively admitted as being fundamental to managing the activities, policies, and performance of any institution. The staff working in the selected cultural institutions includes both male and female employees. They are equally qualified and experienced. All the staff working in cultural institutions have equal rights, duties, and responsibilities without any gender discrimination. For acquiring a collective opinion regarding their knowledge and practical abilities in preservation, it is significant to collect data from all the staff without any gender discrimination. Table 79 indicates the gender-wise distribution of respondents.

**Table 79**

#### ***Gender-wise Distribution of Respondents***

| <b>Gender</b> | <b>Frequency</b> | <b>Per cent</b> |
|---------------|------------------|-----------------|
| Male          | 67               | 39.40           |
| Female        | 103              | 60.60           |
| Total         | 170              | 100.00          |

Data from Table 79 depicts the gender-wise distribution of respondents. It can be found that, out of the 170 respondents, 67 (39.40 per cent) of the respondents are males and 103 respondents, representing 60.60 per cent are females. The gender-wise distribution of respondents is also presented in Figure 4.



**Figure 3**

**Gender-wise Distribution of Respondents**

From Figure 3, it can be seen that the majority (60.60 per cent) of the respondents are females, and 39.40 per cent of the respondents are males. According to Table 79 and Figure 3, it was found that the majority of the staff participated in the study were female.

**5.69 Age-wise Distribution of Respondents**

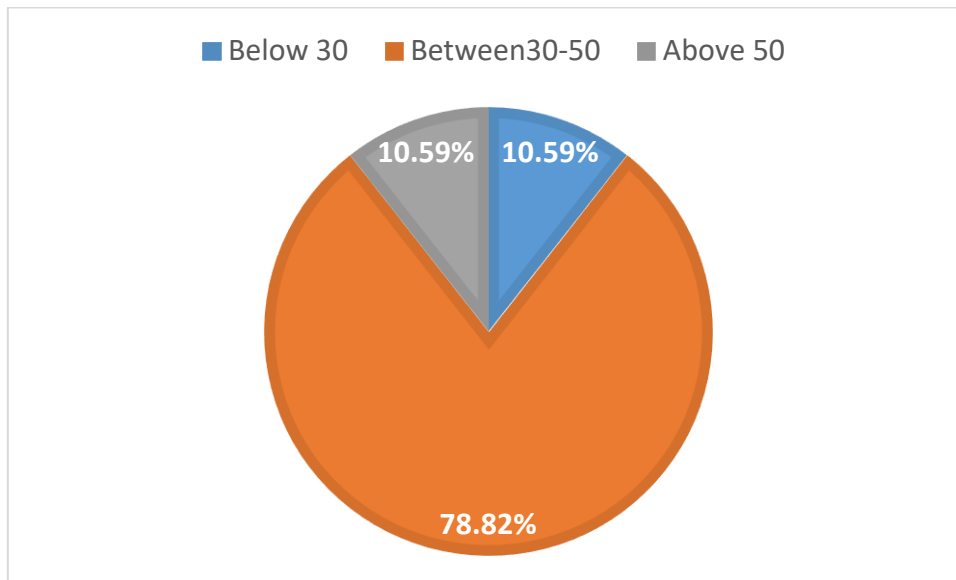
The age-wise distribution of respondents selected for the study is presented in Table 80. The staff working in the selected cultural institutions fall under different age categories.

**Table 80**

***Age-wise Distribution of Respondents***

| <b>Age Category</b> | <b>Frequency</b> | <b>Per cent</b> |
|---------------------|------------------|-----------------|
| Below 30            | 18               | 10.59           |
| Between 30-50       | 134              | 78.82           |
| Above 50            | 18               | 10.59           |
| Total               | 170              | 100.00          |

Table 80 highlights that the majority of respondents, 134 (78.82 per cent) included in the category of age between 30-50. 18 respondents, representing 10.59 per cent each, came under the categories of below 30 and above 50. The detailed picture of the age-wise distribution of respondents is given in Figure 4.



**Figure 4**

#### **Age-wise Distribution of Respondents**

From Figure 4, it can be seen that, out of the 170 respondents, 134 respondents, representing 78.82 per cent fall under the category of being in the 30–50 age group. 10.59 per cent of the respondents each came from the categories of below 30 and above 50. By analysing table 80 and figure 5, it is evident that the majority of the staff who participated in the study are in the 30–50 age group.

#### **5.70 Profession-wise Distribution of Respondents**

The professional role of staff working in cultural institutions comprises teachers, librarians, research assistants, project assistants, etc. Every staff member working in cultural institutions has a crucial role in conducting effective preservation management in their institutions. Table 81 indicates the profession-wise distribution of the respondents.

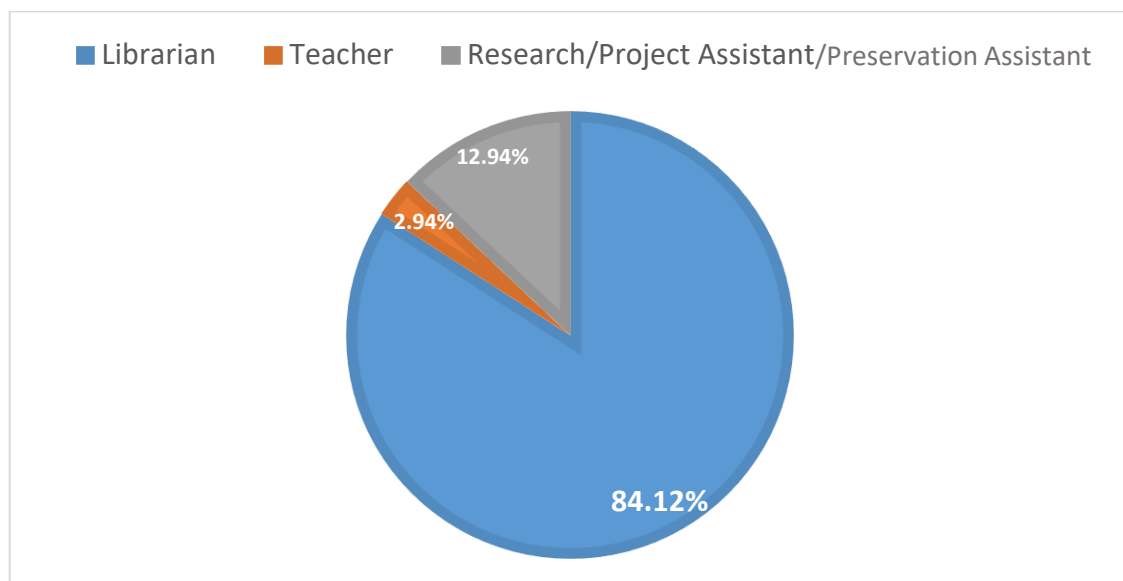


**Table 81**

***Profession-wise Distribution of Respondents***

| <b>Profession</b>                       | <b>Frequency</b> | <b>Per cent</b> |
|-----------------------------------------|------------------|-----------------|
| Librarian                               | 143              | 84.12           |
| Teacher                                 | 5                | 2.94            |
| Research/Project/Preservation Assistant | 22               | 12.94           |
| Total                                   | 170              | 100.00          |

Table 81 articulates that, out of the 170 respondents surveyed, 143 (84.12 per cent) of the respondents are librarians. Five of the respondents, representing 2.94 per cent mentioned they are teachers. At the same time, 22 (12.94 per cent) of respondents are research/project/preservation assistants. The profession-wise distribution of the respondents is also shown in Figure 5.



**Figure 5**

**Profession-wise Distribution of Respondents**

Figure 5 also articulates that the majority (84.12 per cent) of the staff who participated in the study are librarians.

**5.71 Mode of Appointment of the Staffs**

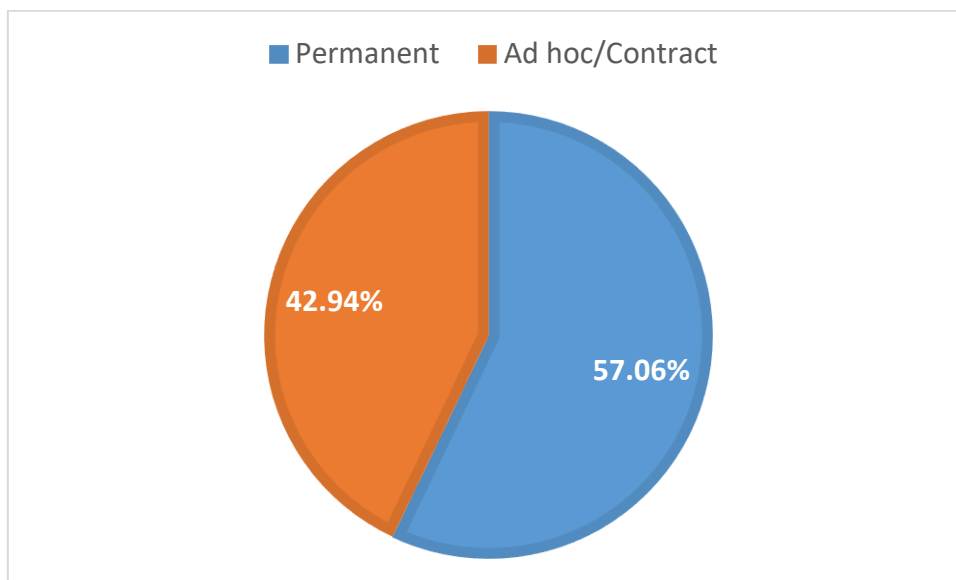
Here, the investigator tried to ascertain the details regarding the mode of appointment of the staff working in the cultural institutions. To check whether they are permanent staff or working on a contract or ad hoc basis. Respondents were asked to specify their mode of appointment. The data regarding the mode of appointment of staff working in the selected cultural institution are presented in Table 82.

**Table 82**

*Mode of Appointment of the Staffs*

| <b>Mode of Appointment</b> | <b>Frequency</b> | <b>Per cent</b> |
|----------------------------|------------------|-----------------|
| Permanent                  | 97               | 57.06           |
| Ad hoc/Contract            | 73               | 42.94           |
| Total                      | 170              | 100.00          |

Table 82 shows that, out of the 170 respondents surveyed, 97 (57.06 per cent) of the respondents are permanent staff. Whereas, 73 respondents, representing 42.94 per cent worked on an ad hoc or contractual basis. A clear picture of the mode of appointment of staff is presented in Figure 6.



**Figure 6**

**Mode of Appointment of the Staffs**

Figure 6 articulates that, out of 170 respondents surveyed, the majority (57.06 per cent) of the respondents are permanent in nature. Also, a good number of respondents (42.94 per cent) are in the ad hoc or contract condition. In the overall analysis of Table 82 and Figure 6, it is found that the majority of the staff who participated in the study are permanent employees.

### **5.72 Working Experience of the Staffs**

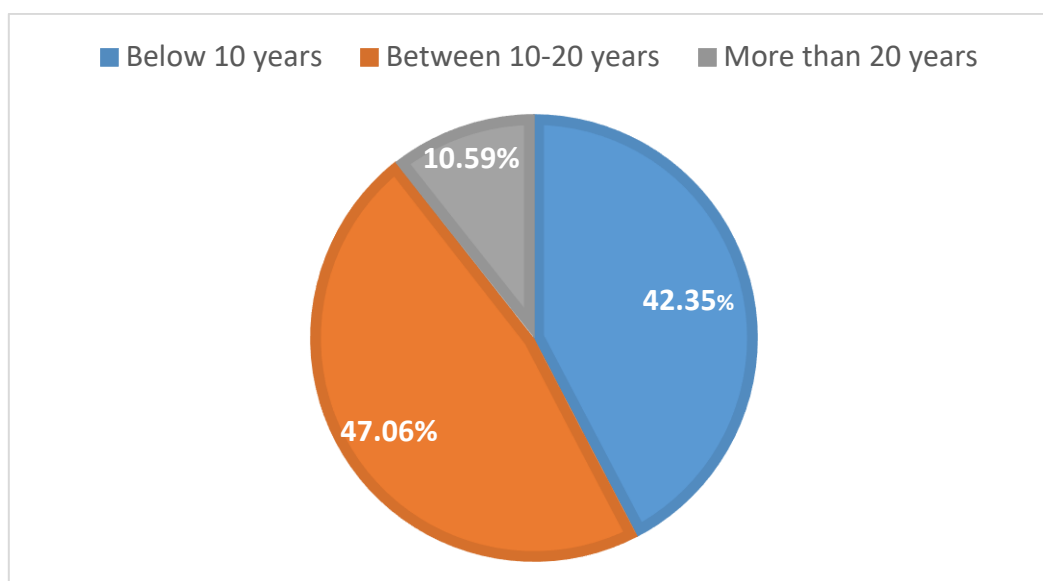
Working experience, or expertise, is the skill or knowledge acquired by a person through doing a job or activity. In this study, the investigator tried to identify how the working experience or expertise of the staff affected their knowledge and practical abilities in the preservation of documentary heritage collections. For this purpose, respondents were asked to indicate their working experience. Data regarding the working experience of the staff is presented in Table 83.

**Table 83**

#### *Working Experience of the Staffs*

| <b>Working Experience (Years)</b> | <b>Frequency</b> | <b>Per cent</b> |
|-----------------------------------|------------------|-----------------|
| Below 10                          | 72               | 42.35           |
| Between 10-20                     | 80               | 47.06           |
| More than 20                      | 18               | 10.59           |
| Total                             | 170              | 100.00          |

Table 83 illustrates the working experience of the respondents. Out of 170 respondents surveyed, 72 (42.35 per cent) of the have below 10 years of working experience. 80 (47.06 per cent) of the respondents have working experience of 10 to 20 (10-20) years. Also, 18 respondents, representing 10.59 per cent, have more than 20 years of working experience. The detailed picture of the working experience of the staff is shown in Figure 7.



**Figure 7**

### **Working Experience of the Staffs**

Figure 7 illustrates that the majority of the respondents (47.06 per cent) have between 10 to 20 years of working experience. Following that, a good number of respondents (42.35 per cent) have below 10 years of working experience. And 10.59 per cent of the respondents have more than 20 years of working experience.

### **5.73 Highest Educational Qualification of Respondents**

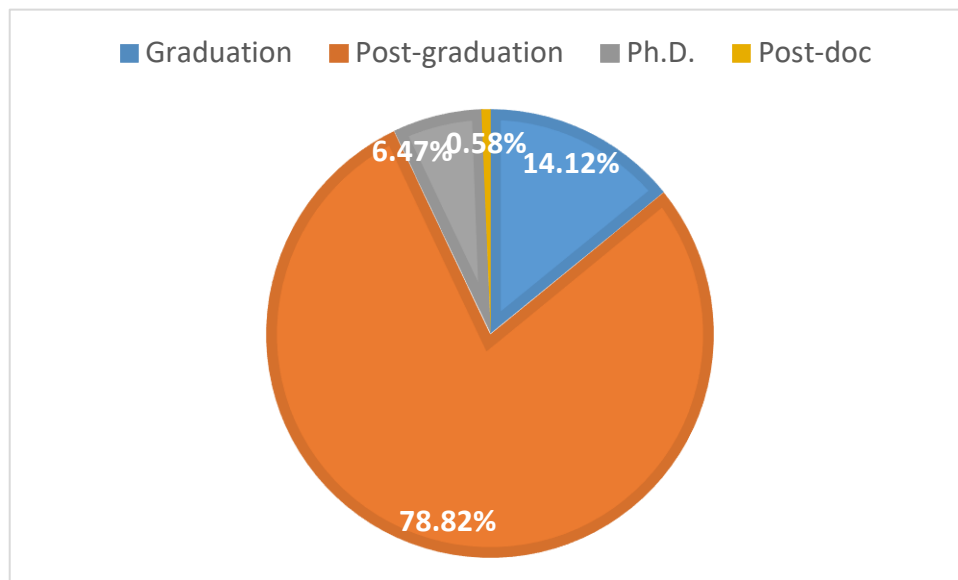
Educational qualification is an academic certification to prove the ability, skill, and knowledge of a person to do a particular job. In the study, the investigator tried to identify how the qualifications of the staff affect their knowledge and practical abilities in the preservation of documentary heritage collections. So, respondents were asked to indicate their highest educational qualification. Data regarding the highest educational qualifications of the staff are presented in Table 84.

**Table 84**

***Highest Educational Qualification of Respondents***

| <b>Highest Educational Qualification</b> | <b>Frequency</b> | <b>Per cent</b> |
|------------------------------------------|------------------|-----------------|
| Graduation                               | 24               | 14.12           |
| Post-graduation                          | 134              | 78.82           |
| Ph.D.                                    | 11               | 6.47            |
| Post-doctoral                            | 1                | 0.58            |
| Total                                    | 170              | 100.00          |

Table 84 articulates the highest educational qualifications of the staff. It is observed that 24 (14.12 per cent) of respondents have graduated. It is also observed that 134 (78.82 per cent) of the respondents have post-graduation qualifications. 11 respondents, representing 6.47 per cent mentioned that they have Ph.D. qualification. Only 1 (0.58 per cent) of the respondent have post-doctoral qualification. The detailed picture of the highest educational qualifications of the staff is presented in Figure 8.



**Figure 8**

**Highest Educational Qualification of Respondents**

Figure 8 shows that, out of the 170 respondents surveyed, a large majority (78.82 per cent) of the respondents possess post-graduation, 14.12 per cent of the respondents have graduated. Also, 6.47 per cent of the respondents completed Ph. D. and only 1 of the respondent representing 0.58 per cent acquired post-doctoral qualification.

In the overall analysis of Table 84 and Figure 8, it was found that the majority of the staff participated in the study are post-graduates.

#### **5.74 Type of Institution of Staff**

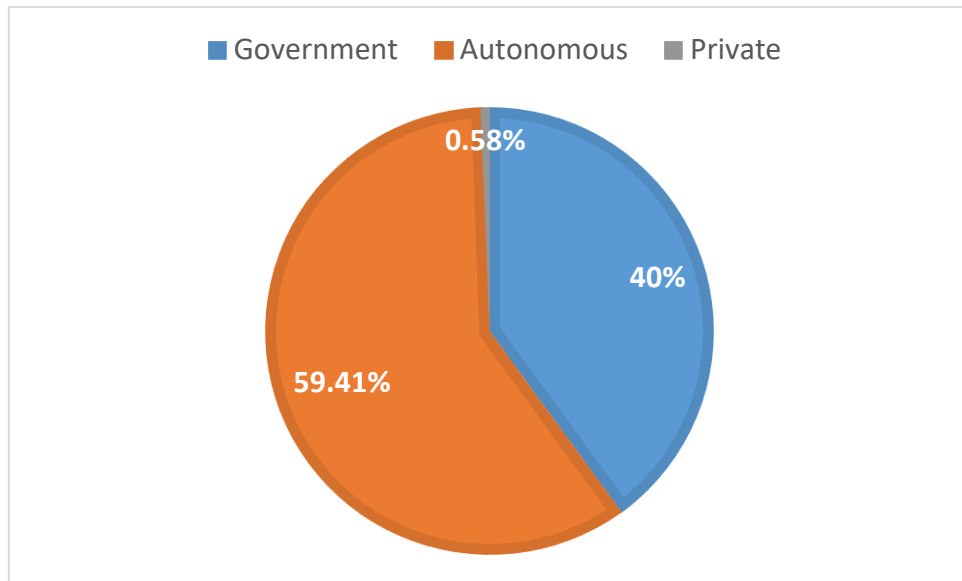
Here, the investigator intended to find out the types of institution of staffs where they were working. Whether it is a government-owned institution, an autonomous institution, or a private institution. Working experience, working environment, and infrastructure enjoyed by the staff may differ according to the type of institution. Here, respondents were asked to indicate the type of institution where they were working. The details of the types of institutions are given in Table 85.

**Table 85**

#### *Type of Institution of Staff*

| <b>Type of Institution</b> | <b>Frequency</b> | <b>Per cent</b> |
|----------------------------|------------------|-----------------|
| Government                 | 68               | 40.00           |
| Autonomous                 | 101              | 59.41           |
| Private                    | 1                | 0.58            |
| Total                      | 170              | 100.00          |

Table 85 articulates that, out of the 170 institutions surveyed. The majority of the respondents 101 (59.41 per cent) working under the autonomous institutions. Also, 68 (40 per cent) of the respondents working in purely government-owned institutions. Only 1 (0.58 per cent) of the respondent is from the private sector. The detailed picture of the types of institutions of staff is presented in Figure 9.



**Figure 9**  
**Type of Institution of Staff**

Figure 9 illustrates the types of institutions where staff were working. 59.41 per cent of the staff are working in autonomous institutions; 40.00 per cent of the respondents are working in government institutions; and 0.58 per cent of the respondent working for a private body.

As can be seen from Table 85 and Figure 9, the majority of the staff who participated in the study are working in autonomous institutions.

### **Section B: Knowledge and Practical abilities of Staff in the Preservation of Documentary Heritage Collection**

In this section, the investigator arranges the responses of the staff working in the fifteen cultural institutions selected for the study. Here, the investigator analyses the perception and self-evaluation of the staff on their knowledge and practical abilities in the preservation methods for protecting documentary heritage collections. This section provides a detailed survey of the skills, expertise, and technical know-how of the staff in traditional and digital preservation methods.

**5.75 Knowledge of Staff in the Meaning and Importance of Documentary Heritage Collection**

For the effective preservation of documentary heritage collection in the cultural institutions, it is important for the staff of cultural institutions should have an adequate knowledge in the concept of documentary heritage collection and it's need, importance and significance to be preserved. Here investigator made an attempt to assess the perception of staff in their knowledge in the meaning and importance of documentary heritage collection. Respondents were asked to indicate their perception on their knowledge. The knowledge of staff in the meaning and importance of documentary heritage collection is presented in Table 86.

**Table 86**

***Knowledge of Staff in the Meaning and Importance of Documentary Heritage Collection***

| Statements                                                            | Perception of Staff in their Knowledge in the Meaning and Importance of Documentary Heritage Collection (n=170) |                             |               |               |           |
|-----------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------|-----------------------------|---------------|---------------|-----------|
|                                                                       | Excellent                                                                                                       | Above Average               | Average       | Below Average | Very Poor |
| Knowledge of meaning and importance of documentary heritage resources | 20<br>(11.76)                                                                                                   | <b>76</b><br><b>(44.71)</b> | 70<br>(41.18) | 4<br>(2.35)   | 0         |

(The figures given in bracket show the respective percentage)

According to Table 86, it is seen that a higher number of respondents, 76 (44.71 per cent) admitted that they have above-average knowledge of the meaning and importance of documentary heritage collection. 70 (41.18 per cent) of the respondents also indicated that they have average knowledge. Only 20 (11.76 per cent) of the respondents indicated that they have excellent knowledge of the concept of documentary heritage collection.

The opinion of the staff on their knowledge of the meaning and importance of the concept of documentary heritage collection is again analysed by using



ANOVA (Analysis of Variance) to understand whether there is any notable variance in the knowledge of staff based on their working experience. The result of the analysis is tabulated in Table 87.

**Table 87**

***Variance Analysis of Staff Knowledge in the Meaning and Importance of Documentary Heritage Collection (Experience-wise)***

| <b>Working Experience</b> | <b>Frequency</b> | <b>Mean</b>   | <b>Std. Deviation</b> | <b>F value</b> | <b>P value</b> |
|---------------------------|------------------|---------------|-----------------------|----------------|----------------|
| Below 10                  | 72               | 2.3194        | .72823                | .069           | .933           |
| Between 10-20             | 80               | <b>2.3625</b> | .73336                |                |                |
| More than 20              | 18               | 2.3333        | .59409                |                |                |
| Total                     | 170              | 2.3412        | .71423                |                |                |

\*Notable variance (at the 0.05 level)

Table 87 reveals the notable variance in staff knowledge of the concept of documentary heritage collection based on their working experience. The mean analysis indicated that working experience between 10-20 years has a high mean value. The overall analysis indicated that the staff have working experience ranging from 10 to 20 years and have high knowledge of the concept of documentary heritage collection. At the same time, it is found that the p value (0.933) is higher than 0.05, so there is no notable variance in the knowledge of staff about the concept of documentary heritage collection based on their working experience.

**5.76 Knowledge and Practical Ability of Staff in Managing Traditional/Basic Preservation Methods**

The staff or the caretakers of the documentary heritage collection should have enough knowledge and practical abilities in various traditional preservation methods. Then only they have to be able to apply various traditional or basic preventive preservation methods for protecting fragile documents from physical, chemical, and biological deterioration, misuse, and loss. Here, respondents were

asked to indicate their opinion regarding their knowledge and practical abilities in traditional or basic preservation methods. The data related to the knowledge of staff in managing traditional/basic preservation is presented in Table 88.

**Table 88**

***Knowledge and Practical Abilities of Staff in Managing Traditional/Basic Preservation Methods***

| Statements                                                                                                                                  | Perception of Staff in their Knowledge and Practical Abilities in Managing Traditional/Basic Preservation Methods<br>(n=170) |               |                             |                             |               |
|---------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------|---------------|-----------------------------|-----------------------------|---------------|
|                                                                                                                                             | Excellent                                                                                                                    | Above Average | Average                     | Below Average               | Very Poor     |
| Knowledge of traditional or basic preventive methods for the preservation of documentary heritage resources                                 | 10<br>(5.88)                                                                                                                 | 44<br>(25.88) | <b>99</b><br><b>(58.24)</b> | 17<br>(10.00)               | 0             |
| Knowledge and practical ability to apply fumigation, insecticides, natural repellents, de-acidification, environmental control, oiling etc. | 8<br>(4.71)                                                                                                                  | 40<br>(23.53) | <b>65</b><br><b>(38.24)</b> | 46<br>(27.06)               | 11<br>(6.47)  |
| Practical ability to do the work of binding, minor repairs etc.                                                                             | 8<br>(4.71)                                                                                                                  | 24<br>(14.12) | 54<br>(31.76)               | <b>57</b><br><b>(33.53)</b> | 27<br>(15.88) |

(The figures given in bracket show the respective percentage)

It is revealed from Table 88 that more number 99 (58.24 per cent) of staff admitted that they have average knowledge and practical abilities in traditional or basic preventive methods for the preservation of documentary heritage resources. Also, 65 (38.24 per cent) of the staff have average knowledge of and practical ability to apply fumigation, insecticides, natural repellents, de-acidification, environmental control, oiling, etc. At the same time, more number 57 (33.53 per cent) of staff have below-average practical ability to do the work of binding, minor repairs, etc.

The knowledge and practical abilities of the staff in managing traditional or basic preservation methods are again analysed by using ANOVA to check whether there is a notable variance in the knowledge of staff in managing traditional or basic preservation methods on the basis of their working experience. The working experience-wise knowledge of staff in managing traditional and basic preservation is illustrated in Table 89.

**Table 89**

***Variance Analysis of Knowledge and Practical Abilities of Staff in Managing Traditional/Basic Preservation Methods (Experience-wise)***

| <b>Working Experience</b> | <b>Frequency</b> | <b>Mean</b>   | <b>Std. Deviation</b> | <b>F value</b> | <b>P value</b> |
|---------------------------|------------------|---------------|-----------------------|----------------|----------------|
| Below 10                  | 72               | 3.1296        | .84208                | 1.376          | .255           |
| Between 10-20             | 80               | 2.9708        | .79590                |                |                |
| More than 20              | 18               | <b>3.2778</b> | .76909                |                |                |
| Total                     | 170              | 3.0706        | .81504                |                |                |

\*Notable variance (at the 0.05 level)

Table 89 depicts that the staff with more than 20 years' working experience got a high mean score (3.2778), so the staff with more than 20 years' working experience have high knowledge and practical abilities in managing traditional or basic preservation methods for the preservation of documentary heritage collections. At the same time, it is also seen that the p value (0.255) is higher than 0.05. So there is no notable variance in the knowledge of staff about managing traditional or basic preservation methods based on their working experience.

**5.77 Knowledge and Practical Ability of Staff in Developing Digitised Content of their Documentary Heritage Collection**

Cultural institutions adopted digital preservation techniques for the preservation of their documentary cultural institutions. Staff working in those cultural institutions where digital preservation projects are in progress should have sound knowledge and practical abilities in various digital preservation techniques,

methods, and strategies. Here, the respondents were asked to indicate their perceptions of their knowledge and practical abilities in developing digitised content of their documentary heritage collection. The analysis is indicated in Table 90.

**Table 90**

***Knowledge and Practical Ability of Staff in Developing Digitised Content of their Documentary Heritage Collection***

| Statements                                                                                                                                                         | Perception of Staff in their Knowledge and Practical Abilities in Developing Digitised Content of their Documentary Heritage Collection<br>(n=170) |               |                             |               |              |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------|---------------|-----------------------------|---------------|--------------|
|                                                                                                                                                                    | Excellent                                                                                                                                          | Above Average | Average                     | Below Average | Very Poor    |
| Knowledge of digitisation of documentary heritage resources                                                                                                        | 12<br>(7.06)                                                                                                                                       | 60<br>(35.29) | <b>81</b><br><b>(47.65)</b> | 15<br>(8.82)  | 2<br>(1.18)  |
| Ability to define criteria for selecting documentary heritage resources for digitization                                                                           | 10<br>(5.88)                                                                                                                                       | 55<br>(32.35) | <b>81</b><br><b>(47.65)</b> | 14<br>(9.41)  | 8<br>(4.71)  |
| Ability to select and use scanners and related software of specific standards to develop digital content from documentary heritage resources with high resolution. | 14<br>(8.24)                                                                                                                                       | 44<br>(25.88) | <b>75</b><br><b>(44.12)</b> | 27<br>(15.88) | 10<br>(5.88) |
| Ability to identify and solve intellectual property, copyright and licensing issues of digital content                                                             | 6<br>(3.53)                                                                                                                                        | 48<br>(28.24) | <b>73</b><br><b>(42.94)</b> | 31<br>(18.24) | 12<br>(7.06) |

(The figures given in bracket show the respective percentage)

Table 90 shows that a greater number of respondents 81 (46.65 per cent) have average knowledge and practical abilities in the digitisation of documentary heritage resources, define criteria for selecting documentary heritage resources for digitisation and select and use scanners and related software of specific standards to develop digital content from documentary heritage resources with high resolution. More number of respondents 75 (44.12 per cent) have average knowledge and practical abilities to select and use scanners and related software of specific standards to develop digital content from documentary heritage resources with high

resolution. And also a higher number of respondents, 73 (42.94 per cent) have average knowledge and practical abilities to identify and solve intellectual property, copyright, and licensing issues of digital content.

The knowledge and practical abilities of the staff in developing digitised content of their documentary heritage collection are again analysed by using ANOVA to check whether there is a notable variance in the knowledge of staff in developing digitised content of their documentary heritage collection on the basis of their working experience. The experience-wise knowledge of staff is presented in Table 91.

**Table 91**

***Variance Analysis of Knowledge and Practical Ability of Staff in Developing Digitised Content of their Documentary Heritage Collection (Experience-wise)***

| <b>Working Experience</b> | <b>Frequency</b> | <b>Mean</b>   | <b>Std. Deviation</b> | <b>F value</b> | <b>P value</b> |
|---------------------------|------------------|---------------|-----------------------|----------------|----------------|
| Below 10                  | 72               | 2.7500        | .72554                | .343           | .710           |
| Between 10-20             | 80               | 2.8156        | .77821                |                |                |
| More than 20              | 18               | <b>2.9028</b> | .74330                |                |                |
| Total                     | 170              | 2.7971        | .74975                |                |                |

\*Notable variance (at the 0.05 level)

It can be observed from Table 91 that staff with more than 20 years' working experience got a high mean score (2.9028), so the staff with 20 years' working experience have high knowledge and practical abilities in developing digitised content of their documentary heritage collection. It is also seen that the p value (0.710) is higher than 0.05. So there is no notable variance in the knowledge and practical abilities of staff in developing digitised content of their documentary heritage collection based on their working experience.

**5.78 Knowledge and Practical Ability of Staff in Managing Digitised Content**

For managing the digitised content of the documentary heritage collection, the staff should possess high knowledge and practical abilities in defining policies for digitisation, adopting international and national standards, selecting image editing and image processing software, applying OCR, assigning metadata, and selecting an appropriate storage device and file format. The investigator tried to make a self-evaluation of the respondents based on their knowledge and practical abilities in managing digitised content. The analysis of the responses of the staff is presented in Table 92.

**Table 92**

***Knowledge and Practical Ability of Staff in Managing Digitised Content***

| Statements                                                                                                                         | Perception of Staff in their Knowledge and Practical Abilities in Managing Digitised Content<br>(n=170) |               |                             |               |              |
|------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------|---------------|-----------------------------|---------------|--------------|
|                                                                                                                                    | Excellent                                                                                               | Above Average | Average                     | Below Average | Very Poor    |
| Ability to define policies for the digitisation and accessing digital content.                                                     | 10<br>(5.88)                                                                                            | 40<br>(23.53) | <b>88</b><br><b>(51.76)</b> | 22<br>(12.94) | 10<br>(5.88) |
| Knowledge on various international, national standards using in digitisation                                                       | 11<br>(6.47)                                                                                            | 26<br>(15.29) | <b>90</b><br><b>(52.94)</b> | 28<br>(16.47) | 15<br>(8.82) |
| Ability to use various image editing and image processing software                                                                 | 5<br>(2.94)                                                                                             | 42<br>(24.71) | <b>66</b><br><b>(38.82)</b> | 45<br>(26.47) | 12<br>(7.06) |
| Ability to apply OCR software to digital content                                                                                   | 8<br>(4.71)                                                                                             | 34<br>(20.22) | <b>67</b><br><b>(39.41)</b> | 46<br>(27.06) | 15<br>(8.82) |
| Practical ability to assign metadata and standards to made a searchable digital content                                            | 7<br>(4.12)                                                                                             | 43<br>(25.29) | <b>57</b><br><b>(33.53)</b> | 49<br>(28.82) | 14<br>(8.24) |
| Practical ability to select and use appropriate storage devices for preserving digital contents like DVD'S, CD-ROM, hard disk etc. | 16<br>(9.41)                                                                                            | 55<br>(32.35) | <b>62</b><br><b>(36.47)</b> | 27<br>(15.88) | 10<br>(5.88) |
| Knowledge of different file formats like tiff, pdf, xml, gif used for digital content                                              | 13<br>(7.65)                                                                                            | 46<br>(27.06) | <b>57</b><br><b>(33.53)</b> | 44<br>(25.88) | 10<br>(5.88) |
| Knowledge and use of indexing language vocabulary                                                                                  | 4<br>(2.35)                                                                                             | 52<br>(30.59) | <b>75</b><br><b>(44.12)</b> | 26<br>(15.29) | 13<br>(7.65) |

(The figures given in bracket show the respective percentage)

*Analysis and Interpretations*

It can be seen from Table 92 that the more number of staff have only average knowledge and practical abilities in following activities related to manage the digitised content, to define policies for digitisation and accessing digital content (51.76 per cent), on various international, national standards using in digitisation (52.94 per cent), to use various image editing and image processing software (38.82 per cent), to apply OCR software to digital content (39.41 per cent), to assign metadata and standards to made a searchable digital content (33.53 per cent), to select and use appropriate storage devices for preserving digital contents like DVD'S, CD-ROM, hard disk, etc. (36.47 per cent), knowledge of different file formats like tiff, pdf, xml, gif used for digital content (33.53 per cent) and knowledge and use of indexing language vocabulary (44.12 per cent).

The knowledge and practical abilities of the staff in managing the digitised content of their documentary heritage collection are again analysed by using ANOVA to check whether there is a notable variance in the knowledge of staff in managing the digitised content of their documentary heritage collection on the basis of their working experience. The experience-wise knowledge of staff in managing digitised content is enumerated in Table 93.

**Table 93**

***Variance Analysis of Knowledge and Practical Ability of Staff in Managing Digitised Content (Experience-wise)***

| <b>Working Experience</b> | <b>Frequency</b> | <b>Mean</b>   | <b>Std. Deviation</b> | <b>F value</b> | <b>P value</b> |
|---------------------------|------------------|---------------|-----------------------|----------------|----------------|
| Below 10                  | 72               | 2.9028        | .79202                | 1.015          | .365           |
| Between 10-20             | 80               | 3.0500        | .84231                |                |                |
| More than 20              | 18               | <b>3.1597</b> | .75343                |                |                |
| Total                     | 170              | 2.9993        | .81254                |                |                |

\*Notable variance (at the 0.05 level)

The analysis of Table 93 shows that staff with more than 20 years' working experience got a high mean score (3.1597), so the staff with 20 years' working experience have high knowledge and practical abilities in managing the digitised

content of their documentary heritage collection. At the same time, it is also seen that the p value (0.365) is higher than 0.05. So there is no notable variance in the knowledge and practical abilities of staff in managing the digitised content of their documentary heritage collection based on their working experience.

**5.79 Knowledge and Practical Ability of Staff in Organising Digital Preservation**

It is highly essential to organise the digital preservation of the documentary heritage collection possessed by cultural institutions. Some cultural institutions fail to organise digital preservation effectively because of their staff’s inadequate knowledge of digital preservation. The staff of the cultural institutions should have good knowledge to plan the budget for the digitisation project, manage technical issues, develop strategies to ensure the quality of the digitised content, and solve all the problems related to the digitisation project. Here, respondents were asked to mention their knowledge of organising digitisation projects for documentary heritage collection, which is presented in Table 94.

**Table 94**

***Knowledge and Practical Ability of Staff in Organising Digital Preservation***

| <b>Statements</b>                                                                           | <b>Perception of Staff in their Knowledge and Practical Abilities in Organising Digital Preservation (n=170)</b> |                      |                             |                      |                  |
|---------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------|----------------------|-----------------------------|----------------------|------------------|
|                                                                                             | <b>Excellent</b>                                                                                                 | <b>Above Average</b> | <b>Average</b>              | <b>Below Average</b> | <b>Very Poor</b> |
| Ability to plan budget and funding for digitisation project                                 | 5<br>(2.94)                                                                                                      | 53<br>(31.18)        | <b>63</b><br><b>(37.06)</b> | 38<br>(22.35)        | 11<br>(6.47)     |
| Ability to manage technical issues during digitisation and digital preservation             | 5<br>(2.94)                                                                                                      | 39<br>(22.94)        | <b>70</b><br><b>(41.18)</b> | 45<br>(26.47)        | 11<br>(6.47)     |
| Ability to design strategies to ensure the quality of digitised content                     | 4<br>(2.35)                                                                                                      | 45<br>(26.47)        | <b>76</b><br><b>(44.71)</b> | 33<br>(19.41)        | 12<br>(7.06)     |
| Ability to cope all type of challenges related to the digitisation and digital preservation | 6<br>(3.53)                                                                                                      | 45<br>(26.47)        | <b>76</b><br><b>(46.47)</b> | 26<br>(15.29)        | 14<br>(8.24)     |

(The figures given in bracket show the respective percentage)



As can be observed from Table 94, a higher number of respondents admitted that they have only average knowledge and practical abilities in, planning budget and funding for digitisation projects (37.06 per cent), managing technical issues during digitisation and digital preservation (41.18 per cent), designing strategies to ensure the quality of digitised content (44.71 per cent) and coping with all types of challenges related to digitisation and digital preservation (46.47 per cent).

The knowledge and practical abilities of the staff in organising digital preservation for their documentary heritage collection are again analysed by using ANOVA to check whether there is a notable variance in the knowledge of staff in organising digital preservation for their documentary heritage collection on the basis of their working experience. The experience wise knowledge of staff in organising digitisation project is enumerated in Table 95.

**Table 95**

***Variance Analysis of Knowledge and Practical Ability of Staff in Organising Digital Preservation (Experience-wise)***

| <b>Working Experience</b> | <b>Frequency</b> | <b>Mean</b>   | <b>Std. Deviation</b> | <b>F value</b> | <b>P value</b> |
|---------------------------|------------------|---------------|-----------------------|----------------|----------------|
| Below 10                  | 72               | 2.9722        | .83028                | .458           | .634           |
| Between 10-20             | 80               | 3.0344        | .83887                |                |                |
| More than 20              | 18               | <b>3.1806</b> | .86520                |                |                |
| Total                     | 170              | 3.0235        | .83527                |                |                |

\*Notable variance (at the 0.05 level)

The analysis of Table 95 reveals that staff with more than 20 years' working experience got a high mean score (3.1806), so the staff with 20 years' working experience have high knowledge and practical abilities in organising digital preservation for their documentary heritage collection. At the same time, it is also seen that the p value (0.634) is higher than 0.05. So there is no notable variance in the knowledge and practical abilities of staff in organising digital preservation for their documentary heritage collection based on their working experience.

**5.80 Knowledge and Practical Ability of Staff in Protecting the Digitised Content**

It is important to protect the digitised content of a documentary heritage collection once it has been developed. The staff should be able to apply different network and security techniques and measures, such as system security, firewall applications, encryption and decryption methods, and restricting access by providing passwords for users. Here, respondents were asked to indicate their knowledge and practical abilities in protecting the digitised content, which is tabulated in Table 96.

**Table 96**  
*Knowledge and Practical Ability of Staff in Protecting the Digitised Content*

| Statements                                                                                    | Perception of Staff in their Knowledge and Practical Abilities in Protecting the Digitised Content (n=170) |               |                             |               |              |
|-----------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------|---------------|-----------------------------|---------------|--------------|
|                                                                                               | Excellent                                                                                                  | Above Average | Average                     | Below Average | Very Poor    |
| Knowledge of network & system security and security software for protecting digital content   | 4<br>(2.35)                                                                                                | 46<br>(27.06) | <b>61</b><br><b>(35.88)</b> | 50<br>(29.41) | 9<br>(5.29)  |
| Knowledge of data security through keeping backup of digital contents in case of any disaster | 7<br>(4.12)                                                                                                | 42<br>(24.71) | <b>62</b><br><b>(36.47)</b> | 48<br>(28.24) | 11<br>(6.47) |
| Knowledge to protect access to digital content by providing password or IP based access       | 6<br>(3.53)                                                                                                | 42<br>(24.71) | <b>66</b><br><b>(38.82)</b> | 45<br>(26.47) | 11<br>(6.47) |
| Knowledge to design administrative back-end control system for digital library                | 4<br>(2.35)                                                                                                | 40<br>(23.53) | <b>67</b><br><b>(39.41)</b> | 43<br>(25.29) | 16<br>(9.41) |

(The figures given in bracket show the respective percentage)

Table 96 enumerates the knowledge and practical abilities of staff in protecting the digitised content for the future. It can be seen that a higher number of respondents admitted that they only have average knowledge in, network & system

security and security software for protecting digital content (35.88 per cent), data security through keeping backups of digital contents in case of any disaster (36.47 per cent), protecting access to digital content by providing password or IP-based access (38.82 per cent) and designing an administrative back-end control system for digital libraries (39.41 per cent).

The knowledge and practical abilities of the staff in protecting the digitised content of their documentary heritage collection are again analysed by using ANOVA to check whether there is a notable variance in the knowledge of staff in protecting the digitised content of their documentary heritage collection on the basis of their working experience. The experience-wise knowledge of staff in protecting the digitised content is tabulated in Table 97.

**Table 97**

*Variance Analysis of Knowledge and Practical Ability of Staff in Protecting the Digitised Content (Experience-wise)*

| <b>Working Experience</b> | <b>Frequency</b> | <b>Mean</b>   | <b>Std. Deviation</b> | <b>F value</b> | <b>P value</b> |
|---------------------------|------------------|---------------|-----------------------|----------------|----------------|
| Below 10                  | 72               | 2.9722        | .83028                | .458           | .634           |
| Between 10-20             | 80               | 3.0344        | .83887                |                |                |
| More than 20              | 18               | <b>3.1806</b> | .86520                |                |                |
| Total                     | 170              | 3.0235        | .83527                |                |                |

\*Notable variance (at the 0.05 level)

The analysis of Table 97 reveals that staff with more than 20 years' working experience got a high mean score (3.1806), so the staff with 20 years' working experience have high knowledge and practical abilities in organising digitisation projects for their documentary heritage collection. At the same time, it is also found that the p value (0.634) is higher than 0.05. So there is no notable variance in the knowledge and practical abilities of staff in protecting the digital content of their documentary heritage collection based on their working experience.

**5.81 Knowledge and Practical Ability of Staff in Disseminating and Evaluating Digitised Content**

The staff of the cultural institutions should have adequate knowledge and expertise in using various digital library software to publish, evaluate, and monitor the digital library for documentary heritage collection and also manage an effective information retrieval system. Here, respondents were asked to do a self-evaluation of their knowledge and practical abilities in disseminating and evaluating the digitised content of their documentary heritage collection, which is presented in Table 98.

**Table 98**

***Knowledge and Practical Ability of Staff in Disseminating and Evaluating Digitised Content***

| Statements                                                                                                 | Perception of Staff in their Knowledge and Practical Abilities in Disseminating and Evaluating Digitised Content (n=170) |               |                             |               |              |
|------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------|---------------|-----------------------------|---------------|--------------|
|                                                                                                            | Excellent                                                                                                                | Above Average | Average                     | Below Average | Very Poor    |
| Knowledge and practical ability to use various digital library software                                    | 11<br>(6.47)                                                                                                             | 55<br>(32.35) | <b>74</b><br><b>(43.53)</b> | 21<br>(12.35) | 9<br>(5.29)  |
| Ability to publish a digital library for cultural heritage resources                                       | 9<br>(5.29)                                                                                                              | 37<br>(21.76) | <b>73</b><br><b>(42.94)</b> | 37<br>(21.76) | 14<br>(8.24) |
| Ability to manage all digital library services and digital library equipment                               | 10<br>(5.88)                                                                                                             | 52<br>(30.59) | <b>71</b><br><b>(41.76)</b> | 24<br>(14.12) | 13<br>(7.65) |
| Ability to develop effective information retrieval mechanism for digital libraries                         | 10<br>(5.88)                                                                                                             | 50<br>(29.41) | <b>64</b><br><b>(37.65)</b> | 30<br>(17.65) | 16<br>(9.41) |
| Ability to monitor overall digital library services and infrastructure                                     | 4<br>(2.35)                                                                                                              | 48<br>(28.24) | <b>83</b><br><b>(48.82)</b> | 24<br>(14.12) | 11<br>(6.47) |
| Ability to conduct the evaluation of the performance of digital library                                    | 7<br>(4.12)                                                                                                              | 44<br>(25.88) | <b>72</b><br><b>(42.35)</b> | 39<br>(22.94) | 8<br>(4.71)  |
| Skill to develop a system for understanding digitised content usage statistics and feedback from the users | 3<br>(1.76)                                                                                                              | 45<br>(26.47) | <b>68</b><br><b>(40.00)</b> | 44<br>(25.88) | 10<br>(5.88) |

(The figures given in bracket show the respective percentage)

*Analysis and Interpretations*

From Table 98, it can be seen that, more number of respondents admitted that they have only an average knowledge and practical abilities in, to use various digital library software (43.3 per cent), to publish a digital library for cultural heritage resources (42.94 per cent), to manage all digital library services and digital library equipment(41.76 per cent), to develop effective information retrieval mechanism for digital libraries (37.65 per cent), to monitor overall digital library services and infrastructure (48.82), to conduct the evaluation of the performance of digital library (42.35 per cent) and to develop a system for understanding digitised content usage statistics and feedback from the users (40.00 per cent).

The knowledge and practical abilities of the staff in disseminating and evaluating the digitised content of their documentary heritage collection are again analysed by using ANOVA to check whether there is a notable variance in the knowledge of staff in disseminating and evaluating the digitised content of their documentary heritage collection on the basis of their working experience. The experience-wise knowledge of staff in disseminating and evaluating the digitised content is tabulated in Table 99.

**Table 99**

***Variance Analysis of Knowledge and Practical Ability of Staff in Disseminating and Evaluating Digitised Content (Experience-wise)***

| <b>Working Experience</b> | <b>Frequency</b> | <b>Mean</b>   | <b>Std. Deviation</b> | <b>F value</b> | <b>P value</b> |
|---------------------------|------------------|---------------|-----------------------|----------------|----------------|
| Below 10                  | 72               | 2.8929        | .83014                | .599           | .551           |
| Between 10-20             | 80               | 2.9643        | .81813                |                |                |
| More than 20              | 18               | <b>3.1270</b> | .83427                |                |                |
| Total                     | 170              | 2.9513        | .82294                |                |                |

\*Notable variance (at the 0.05 level)

The analysis of Table 99 shows that staff with more than 20 years' working experience got a high mean score (3.1270), so the staff with 20 years' working

experience have high knowledge and practical abilities in disseminating and evaluating digitisation projects for their documentary heritage collection. At the same time, it is also found that the p value (0.551) is higher than 0.05. So there is no notable variance in the knowledge and practical abilities of staff in disseminating and evaluating the digital content of their documentary heritage collection based on their working experience.

**5.82 Practical Ability of Staff in Managing Human Resource for Preservation Project**

Here, respondents were asked to indicate their perceptions of their skills in managing human resources for the preservation project for documentary heritage collection, which is presented in Table 100.

**Table 100**

*Practical Ability of Staff in Managing Human Resource for Preservation Project*

| Statements                                                                     | Perception of Staff in their Knowledge and Practical Abilities in Managing Human Resource for Preservation Project (n=170) |               |                             |               |              |
|--------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------|---------------|-----------------------------|---------------|--------------|
|                                                                                | Excellent                                                                                                                  | Above Average | Average                     | Below Average | Very Poor    |
| Ability to manage staff for preservation activities                            | 11<br>(6.47)                                                                                                               | 49<br>(28.82) | <b>74</b><br><b>(43.53)</b> | 24<br>(14.12) | 12<br>(7.06) |
| Ability to train staff and users for the creation and usage of digital content | 8<br>(4.71)                                                                                                                | 49<br>(28.82) | <b>60</b><br><b>(35.29)</b> | 37<br>(21.76) | 16<br>(9.41) |

(The figures given in bracket show the respective percentage)

It can be observed that more number of respondents admitted that they have only an average level of practical abilities in managing staff for preservation activities (43.53 per cent) and training staff and users for the creation and usage of digital content (35.29 per cent).

The knowledge and practical abilities of the staff in managing the human resources for the preservation project for documentary heritage collection are again analysed by using ANOVA to check whether there is a notable variance in the

knowledge of staff in managing the human resources for the preservation project for documentary heritage collection on the basis of their working experience. The experience-wise knowledge of staff in managing the human resources for the preservation project for documentary heritage collection is tabulated in Table 101.

**Table 101**

***Variance Analysis of Practical Ability of Staff in Managing Human Resource for Preservation Project (Experience-wise)***

| <b>Working Experience</b> | <b>Frequency</b> | <b>Mean</b>   | <b>Std. Deviation</b> | <b>F value</b> | <b>P value</b> |
|---------------------------|------------------|---------------|-----------------------|----------------|----------------|
| Below 10                  | 72               | 2.9097        | .95433                | .420           | .658           |
| Between 10-20             | 80               | 2.9312        | .95713                |                |                |
| More than 20              | 18               | <b>3.1389</b> | 1.04044               |                |                |
| Total                     | 170              | 2.9441        | .96144                |                |                |

\*Notable variance (at the 0.05 level)

The analysis of Table 101 shows that staff with more than 20 years’ working experience got a high mean score (3.1389), so the staff with 20 years’ working experience have high knowledge and practical abilities in managing the human resources for the preservation project for documentary heritage collection. At the same time, it is also found that the p value (0.658) is higher than 0.05. So there is no notable variance in the knowledge and practical abilities of staff in managing the human resources for the preservation project for documentary heritage collection based on their working experience.

**5.83 Methods to Improve the Traditional and Digital Preservation Skills of Staff**

Respondents were asked to choose the methods to improve their traditional and digital preservation skills for protecting the documentary heritage collection, which is presented in Table 102.

**Table 102*****Methods to Improve the Traditional and Digital Preservation Skills of Staff***

| <b>Methods to Improve the Traditional and Digital Preservation Skills of Staff</b>                          | <b>Frequency</b> | <b>Per cent (n=170)</b> |
|-------------------------------------------------------------------------------------------------------------|------------------|-------------------------|
| Online training programs and tutorials                                                                      | 104              | 61.17                   |
| In-house training programs in between job                                                                   | 99               | 58.23                   |
| Library schools should offer short courses on traditional and digital preservation                          | 75               | 44.11                   |
| Library schools should include practical methods of traditional and digital preservation in their curricula | 88               | 51.76                   |
| Professional associations should arrange workshops/training courses                                         | 72               | 42.35                   |

It is observed that more than sixty per cent (61.17 per cent) indicated that online training programmes and tutorials can improve the preservation skills of staff. 58.23 per cent of the staff chose in-house training programmes in between the job. A good number (51.76 per cent) of the respondents opined that library schools should include practical methods of traditional and digital preservation in their curricula. And 75 respondents, representing 44.11 per cent indicated that library schools should offer short courses on traditional and digital preservation. At the same time, at least number 42.35 per cent of the respondents mentioned that professional associations should arrange workshops/training/refreshing courses.

**5.84 Conclusion**

The second part of the chapter analyses the data collected from the staff working in the selected fifteen cultural institutions in Kerala by using various statistical techniques like ANOVA, mean, standard deviation, and the simple percentage method. The results are explained with the help of tables and diagrams, which help the investigator extract the findings through clear interpretations. The



### *Analysis and Interpretations*

present study is intended to assess the perception or opinion of the staff working in the selected cultural institutions on their knowledge and practical abilities in traditional and digital preservation methods. The findings of the study show that the majority of the staff of cultural institutions have only average knowledge and practical abilities in traditional and digital preservation practices. The findings of the study have practical implications for the staff and authorities of the cultural institutions. The results are helpful for the staff to understand the knowledge and practical abilities that are needed for the preservation of documentary heritage collections. So they can improve their knowledge in the identified areas. And also, the authorities of the cultural institutions can provide adequate training programmes in those areas where staff are less competent and need training.



# FINDINGS, SUGGESTIONS AND CONCLUSION

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*6.1 Introduction*

*6.2 Major Findings of the Study*

*6.3 Tenability of Hypotheses*

*6.4 Suggestions*

*6.5 Conclusion*

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## **6.1 Introduction**

The present study is designed to understand the preservation methods adopted by cultural institutions for the preservation of their documentary heritage collections. The study is also intended to seek the perception or opinion of the staff working in these respective cultural institutions on their knowledge and practical abilities in traditional and digital preservation methods. Specifically, the present study is aimed at assessing the availability of documentary heritage collections, the current status of traditional and digital preservation methods adopted, the methods and strategies used for digitisation, the requirements and needs for digitisation, the storage and accessibility of the digitised collection, the challenges of preservation, and the impact of the experience of the staff in their knowledge and expertise in preservation practices. Moreover, the inherent objective of this study is to raise awareness and knowledge about the significance of the preservation of documentary heritage collections.

A detailed analysis of the data collected from the heads of cultural institutions and staff working in these institutions was presented in the previous chapter. This chapter deals with the key findings in a summarised form, along with detailed suggestions and recommendations for improving the significance of awareness and preservation of documentary heritage collections. The tenability of the formulated hypotheses is tested, and the conclusion of the study is given at the end.

## **6.2 Major Findings of the Study**

The major findings of the study are arranged under the different headings as follows:

### **6.2.1 Profile of Cultural Institutions**

1. SCL was established in 1829 AD, and it is the oldest cultural institution selected for the study.

2. DHF was established in 2015, and it is the youngest cultural institution to take part in the study.
3. Majority of the cultural institutions that participated in the study were established after the independence of India.
4. Only 4 cultural institutions, such as SCL (1829 AD), ORI & ML (1908), KKL (1930) and GDRL (1945) were established before independence.
5. Majority of cultural institutions have their own institution website. Four cultural institutions (ORI & ML, GDRL, TMR, and SRRL) did not provide information regarding the URL of their institution's website.
6. Majority (80.00 per cent) of the cultural institutions surveyed in the study are libraries; the remaining 20.00 per cent of the cultural institutions fall under the category of other social/cultural/historical/academic/religious institutions.
7. Out of the fifteen cultural institutions surveyed, the majority (53.33 per cent) of the cultural institutions are autonomous institutions. A good number (40.00 per cent) of the cultural institutions are purely government-owned institutions, and only one cultural institution is owned by a private body.

#### **6.2.2 Documentary Heritage Collection**

8. It was found that all the cultural institutions that participated in the study possess a large collection of a wide variety of documentary heritage, which includes old and rare books, bound volumes of old periodicals/magazines, manuscripts on paper, palm leaves, bound volumes of newspapers, government orders/ reports, historical records, and maps.
9. SCL holds the highest collection of old and rare books.
10. KUL has the highest collection of bound volumes of old periodicals/magazines.
11. DHF consists of the highest collection of manuscripts on paper.

*Findings, Suggestions and Conclusion*

12. ORI &ML possess the highest collection of palm leaves.
13. KAULIS comprises the highest collection of bound volumes of newspaper.
14. SCL consists of the highest collection of government orders/ reports (government gazettes from 1903 onwards, Saint George gazettes from 1908 onwards).
15. GDRL has the highest collection of historical records.
16. The highest collection of maps is held in KUL.
17. Research scholars are the major users of the documentary heritage collection of all the selected cultural institutions. A good number of respondents (60 per cent) indicated that historians also use the documentary heritage collection.
18. The documentary heritage collection of KCHRL and KAULIS is utilised by the maximum category of users: students, research scholars, teachers/academic staff, and historians.
19. The regional users from Kerala are the major users of the documentary heritage collection in the selected cultural institutions. A good number of national and international users also utilise the documentary heritage collection.
20. It was found that the documentary heritage collections of SCL, KSAL, GDRL, TEMUL, and DHF are used by regional users only. At the same time, KUL, ORI&ML, KCHRL, SORIL, SSUSL, KKL, and TMR have regional, national, and international users for their documentary heritage collections. Whereas, KLL has regional and international users, and SRRL has regional and national users.
21. Reference service is the major service provided by all cultural institutions by using their documentary heritage collections for their users. Followed by the

reference service, exhibition service and reprographic service are the other two popular services provided to the users.

22. SCL is the only institution that provides the maximum number of services to its users by using its documentary heritage collection.
23. More than fifty per cent of the respondents reported that “brittleness” is the major noticeable deterioration condition of documentary heritage collection (53.33 per cent). Nearly fifty per cent of the respondents also reported discoloration of the paper, wear and tear due to excessive photocopying and use and paper becoming torn.
24. The age of the material is the major cause of the deterioration of documentary heritage collections in the selected cultural institutions (86.67 per cent).
25. A good number of respondents indicated that the type and quality of the material, relative humidity, and the attack of biological agents like termites, bookworms, etc. are the causes of deterioration at a moderate level.
26. Deterioration due to natural calamities like floods, cyclones, fire, etc. is the least common cause of deterioration of documentary heritage collections in the selected cultural institutions.

### **6.2.3 Application of Preservation Methods**

27. Majority (86.67 per cent) of cultural institutions adopted a combination of both traditional and digital preservation methods for the preservation of their documentary heritage collections.
28. The two cultural institutions, such as KKL and SRRL, employed traditional preservation methods only for the protection of their documentary heritage collections. No cultural institutions applied digital preservation practices only.



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29. Cleaning, dusting, and proper shelving are the only traditional or basic preservation methods frequently used by more than fifty per cent of the cultural institutions (53.33 per cent).
30. A good number of cultural institutions also applied environmental control, minor repairs and mending, and installed air conditioners.
31. Oiling, ink fixing, P<sup>H</sup> testing, de-acidification or alkaline wash, fumigation, and the formulation of disaster preparedness and recovery plans are the traditional or basic preservation techniques never used by the majority of cultural institutions.
32. Majority (86.67 per cent) of the cultural institutions have started the digitisation project for the preservation of their documentary heritage collections.
33. Only two cultural institutions, such as KKL and SRRL, have not taken any effort to start the digitisation project for their documentary heritage collections.
34. KKL and SRRL have reported that lack of money and lack of infrastructure facilities are the major constraints to starting a digitisation project in their institutions. They have also indicated reasons such as a lack of expert staff, a lack of support from authorities, and a lack of knowledge about digitisation.

#### **6.2.4 Digitisation of Documentary Heritage Collection**

35. Majority of the cultural institutions indicated that their digitisation project for documentary heritage collection is still ongoing. Only one cultural institution, TMR, reported that their digitisation project has been stopped due to some internal reasons.
36. Majority of cultural institutions started their digitization projects in the period 2006–2015. KLL was the first cultural institution to start its digitisation project.

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37. SCL, KLL, ORI & ML, KAULIS, TEMUL, and TMR are not provided with any specific names for their digitisation projects. TEMUL did not specify the name and time scale of their digitisation project.
38. Majority (69.23 per cent) of the cultural institutions have not participated in any kind of international /national/ state efforts for the preservation of documentary heritage collections.
39. Cultural institutions ORI & ML, KCHRL, KSAL, and TEMUL are participated in the international /national/ state efforts for the preservation of documentary heritage collections.
40. All the cultural institutions surveyed in the study have indicated that “preservation for the future” is the primary need for the digitisation of their documentary heritage collections. A good number of respondents also indicate “to help research and academic activities” and “to provide better service to users”.
41. A large majority (92.23 per cent) of the cultural institutions mentioned that cultural/ historical value of the material is the most preferred selection criteria used by the cultural institutions for identifying materials for digitisation.
42. KSAL has digitised the highest number of old and rare books. KUL has digitised the highest number of bound volumes of old periodicals/magazines.
43. DHF digitised the highest number of manuscripts on paper. ORI & ML digitised highest number of palm leaves.
44. GDRL has digitised highest number of bound volumes of newspapers and SCL digitised highest number of Government orders/ reports.
45. The digitisation of documentary heritage collections in most cultural institutions is an ongoing process, so institutions cannot quantify the exact amount of documentary heritage materials that have been digitised.

### **6.2.5 Methods and Techniques Used in Digitisation**

46. Majority (76.92 per cent) of the respondents have employed both in-house and out-sourcing methods together for the digitisation of documentary heritage collections.
47. The three cultural institutions, such as KCHRL, SORIL, and TEMUL, adopted an in-house method of digitisation only. No cultural institution has fully outsourced their digitisation project.
48. It is observed that the majority (84.62 per cent) of cultural institutions allocate their own institution staff rather than outsourcing staff for selecting documentary heritage materials for digitisation.
49. Only two cultural institutions, KSAL and DHF, allocate both institution staff and outsourcing staff for selecting documentary heritage materials for digitisation.
50. It was found that more than sixty per cent of cultural institutions allocate their own staff rather than outsourcing staff to perform the procedures of material preparation before digitisation (61.54 per cent).
51. KSAL, KAULIS, TMR, and DHF utilise both institutional staff and outsourcing staff for preparing documentary heritage materials before digitization. SCL is the only cultural institution to allocate outside staff for the preparation of materials.
52. Nearly forty per cent of the respondents allocate outside staff rather than their institution staff for the scanning of documentary heritage materials (38.46 per cent).
53. More than thirty per cent of the cultural institutions use their own institution staff rather than outside staff for the scanning of documentary heritage materials (30.77 per cent). And an equal number of cultural institutions have used both institution staff and outside staff for scanning work.

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54. Almost forty per cent of the cultural institutions have allocated their own institution staff rather than outsourcing staff for the processing and organisation of digitised materials.
55. Over forty per cent of the cultural institutions allocate both institution staff and outside staff for the processing and organisation of digitised materials.
56. SCL, ORI & ML, and GDRL have employed outside staff only for the processing and organisation of digitised materials.
57. For the purpose of storing and granting access to digitised documentary heritage collections, over sixty per cent of cultural institutions allocate their own institution staff rather than outside staff (61.54 per cent).
58. SCL, KAULIS, and TMR allocate both institution staff and outside staff for the storage and access of digitised documentary heritage collections.
59. ORI & ML and GDRL employed outside staff rather than institutional staff for the storage and access of digitised documentary heritage collections.
60. It is found that the majority (76.92 per cent) of the cultural institutions perform direct scanning of the original documentary heritage materials during their digitisation.
61. ORI & ML, KAULIS, and DHF create reproductions of their documentary heritage materials and use those reproductions for the scanning process.
62. At the time of digitisation, ORI & ML and DHF created photographic reproductions of the documentary heritage materials for scanning work. KAULIS uses photographs and photocopies of heritage materials to perform scanning.
63. In excess of sixty per cent of cultural institutions have admitted that they did not face any damage to their documentary heritage collection during the scanning process (61.54 per cent).

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64. Nearly forty per cent of the cultural institutions have admitted that they faced damage to documentary heritage materials during the scanning process (38.46 per cent).
65. Majority (69.23 per cent) of the cultural institutions have not provided any special storage facilities for original documentary heritage materials after digitisation process.
66. KUL, SSUSL, TEMUL, and TMR store the original documentary heritage materials in special condition after digitisation.
67. Almost forty per cent of the cultural institutions use 300 dpi resolution for scanning (38.46 per cent).
68. An equal number of cultural institutions also use various resolutions depending on the type of materials (36.46 per cent).
69. SCL, KLL, and SORIL use 400 dpi resolution for scanning.
70. More than sixty per cent of the cultural institutions uses colour digital image format (61.53 per cent).
71. Black-and-white digital image formats are used by 30.76 per cent of the cultural institutions. An equal number of cultural institutions also use the grey-level image format.
72. Majority (84.62 per cent) of cultural institutions use the PDF file format.
73. More than fifty per cent of the cultural institutions use the JPEG format (53.85 per cent).
74. Nearly thirty per cent of the cultural institutions use the TIFF format. It is the format used by the least number of cultural institutions. SORIL also uses the RAW file format.
75. Majority (76.92 per cent) of the cultural institutions have maintained a separate catalogue for digitised documentary heritage content.

76. SCL, KLL, and TEMUL did not catalogue the digitised content of the documentary heritage collection.
77. KCHRL and DHF have mentioned that they keep the catalogue records of the digitised documentary heritage in both the main catalogue of the institution and a separate catalogue of digitised content.

### **6.2.6 Requirements for Digital Preservation**

78. Majority (69.23 per cent) of the cultural institutions indicated that they have adequate infrastructure facilities for the digitisation project.
79. SCL, KCHRL, KSAL, and TEMUL indicate that they have no adequate infrastructure facilities for the digitisation project.
80. All the cultural institutions have their own computers, scanners, digital cameras, servers, UPS, and power systems for the digital preservation of documentary heritage collections.
81. It is observed that a large majority (92.31 per cent) of cultural institutions use commercial software for scanning their documentary heritage collections. KAULIS is the only institution that uses in-house software for scanning.
82. The vast majority (92.13 per cent) of cultural institutions use commercial software for the processing of their digitised documentary heritage collections. KAULIS is the only institution that uses in-house software for processing its digitised heritage content.
83. KUL, KLL, KAULIS, and TEMUL use open-source digital library software. KSAL and GDRL use commercial digital library software. SCL, ORI & ML, and KCHRL use in-house digital library software. And SORIL, SSUSL, TMR, and DHF did not respond to the question related to the type of software used for digital libraries.
84. The majority (76.92 per cent) of the cultural institutions admitted that they are hiring extra staff for digitisation work.

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85. SORIL, GDRL, and DHF did not hire extra staff for digitisation work.
86. Large quantity of their documentary heritage collection is the primary reason selected by the majority (80.00 per cent) of the cultural institutions to hire extra staff for their digitization project.
87. A good number of respondents also selected a limited period of digitisation project (60.00 per cent) and a limited number of institution staff (50 per cent).
88. More than sixty per cent of the respondents have provided training to their staff on digitization techniques (61.54 per cent).
89. Nearly forty per cent of the cultural institutions have not provided any type of training to their staff (38.46 per cent).
90. Above sixty per cent of cultural institutions have provided initial training to their staff with the help of outside experts (62.5 per cent).
91. Fifty per cent of the cultural institutions have provided training to their staff in between the digitisation project.
92. Least number of cultural institutions have provided training through workshops and initial training with the help of institution experts (25.00 per cent).
93. It can be seen that SCL uses 40 lakhs per year. KUL spent 1 crore. ORI & ML used 1 crore per year. KCHRL spent 50 lakhs. And SSUSL, KSAL, KAULIS, and DHF spent 3 lakhs per year, 2 crore, 1300000, and 150000, respectively for their digitisation project. Cultural institutions such as KLL, SORIL, GDRL, TEMUL, and TMR are not ready to reveal their cost of expenditure on digitisation project.
94. A little over sixty per cent of the cultural institutions have indicated that the government of Kerala provided the funding for their digitisation project (61.54 per cent).

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95. SORIL, SSUSL, GDRL, and DHF indicated that the institution itself is responsible for the funding of their digitisation project. And UGC is the funding agency for TMR's digitisation project.
96. All the cultural institutions have not availed of any kind of financial assistance from any external national and international organisations other than funding agencies for their digitisation project.
97. More than sixty per cent of the cultural institutions have formulated policies for the selection of materials for digitisation (61.54 per cent). And almost forty per cent of the cultural institutions did not formulate policies for the selection of materials for digitisation (38.46 per cent).
98. Fifty per cent of the cultural institutions have maintained policies for selecting materials for digitisation in written format. And an equal number of the cultural institutions have maintained the policies for selecting materials for digitisation in unwritten format.
99. Large majority (84.62 per cent) of the cultural institutions have formulated policies for digitisation process. Only two cultural institutions, such as GDRL and TEMUL, did not formulate policies for digitisation process.
100. More than seventy per cent of the cultural institutions have maintained policies for digitisation process in written format (72.23 per cent). Least number of cultural institutions have maintained policies for digitisation process in unwritten format (27.27 per cent).
101. In excess of fifty per cent of the cultural institutions have formulated policies for the selection and purchase of hardware and software (53.85 per cent). And more than forty per cent of the cultural institutions did not formulate policies for the selection and purchase of hardware and software (46.15 per cent).
102. Majority (71.43 per cent) of cultural institutions have maintained policies for the selection and purchase of hardware and software in unwritten format.



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And the least number of cultural institutions have maintained policies for the selection and purchase of hardware and software in written format (28.57 per cent).

103. More than sixty per cent of the cultural institutions have formulated policies for the appointment and capacity building of staff (61.54 per cent). And nearly forty per cent of the cultural institutions did not formulate policies for the appointment and capacity building of staff (38.46 per cent).
104. Fifty per cent of the cultural institutions have maintained policies for the appointment and capacity-building of staff in written format. And an equal number of the cultural institutions have maintained the policies for the appointment and capacity building of staff in an unwritten format.
105. Majority (76.92 per cent) of the cultural institutions have formulated policies for inviting tenders and quotations for digitisation work. And the least number (23.08 per cent) of cultural institutions did not formulate policies for inviting tenders and quotations for digitisation work.
106. Fifty per cent of the cultural institutions have maintained policies for inviting tenders and quotations for digitisation work in written format. And an equal number of the cultural institutions have maintained the policies for inviting tenders and quotations for digitisation work in unwritten format.
107. A little over sixty per cent of the cultural institutions have formulated policies for the preservation and storage of digitised materials (61.54 per cent). And nearly forty per cent of the cultural institutions did not formulate policies for the preservation and storage of digitised materials (38.46 per cent).
108. More than sixty per cent of the cultural institutions have maintained policies for the preservation and storage of digitised materials in unwritten format (62.50 per cent). Least number (37.50 per cent) of cultural institutions have maintained policies for the preservation and storage of digitised materials in written format.

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109. Almost seventy per cent of the cultural institutions have formulated policies for providing access to digitised materials (69.23 per cent). And least number (30.77 per cent) of cultural institutions did not formulate policies for providing access to digitised materials.
110. More than fifty per cent of the cultural institutions have maintained policies for providing access to digitised materials in unwritten format (55.56 per cent). More than forty per cent of the cultural institutions have maintained policies for providing access to digitised materials in written format (44.44 per cent)
111. Above fifty per cent of the cultural institutions have formulated policies for the copyright of materials (53.85 per cent). But more than forty per cent of the cultural institutions did not formulate policies for the copyright of materials (46.15 per cent).
112. Over fifty per cent of the cultural institutions have maintained policies for the copyright of materials in unwritten format (57.14 per cent). More than forty per cent of the cultural institutions have maintained policies for the copyright of materials in written format (42.86 per cent).
113. More than sixty per cent of the cultural institutions have reported that the digitisation project committee is formulating policies for digitisation project (66.66 per cent). Whereas 33.33 per cent of the cultural institutions have reported that the head of the institution is responsible for formulating policies.
114. All the cultural institutions have a positive perception towards formulating policies for digitisation project. They admitted that a good written policy is essential for a successful digitisation project.
115. A large majority (84.62 per cent) of the cultural institutions reported that a good written policy will enhance the ease of the digitisation project. At the same time, a moderate number of cultural institutions have indicated that a

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good written policy is needed for completing the task in the correct time (46.15 per cent) and taking good decisions in tough times (38.46 per cent).

116. The vast majority (92.31 per cent) of the cultural institutions have not followed any national or international standards for digitisation work.
117. KAULIS is the only cultural institution that follows standards for digitisation. KAULIS followed national standards for selection of hardware and software, scanning resolution, digital image format, file format, cataloguing of digitised materials, metadata creation, selection of storage/preservation equipment for digitised items, and selection of a preservation strategy.
118. Large majority (83.33 per cent) of the respondents reported that the reasons for not using national or international standards for digitisation project were because they used institutional or internal standards for digitisation project.
119. SORIL has admitted that they don't have enough knowledge of standards, so they are not using them for digitisation. At the same time, TEMUL has mentioned that standards are not needed.
120. Majority (69.23 per cent) of the cultural institutions have no collaboration with the other institutions for the digitisation project. Only four cultural institutions, such as KLL, KCHRL, KAULIS, and DHF, have made collaborative efforts with other institutions.
121. Out of these 4 cultural institutions (KLL, KCHRL, KAULIS, and DHF) that collaborated, the majority of the cultural institutions have collaborated with regional-level institutions.
122. Out of these four cultural institutions (KLL, KCHRL, KAULIS, and DHF), fifty per cent of the cultural institutions have collaborated with other libraries and government institutions.
123. Out of these 4 cultural institutions (KLL, KCHRL, KAULIS, and DHF) that collaborated, the majority of the respondents reported that they extended

their collaboration with other institutions for exchanging products and experts.

124. Out of these 4 cultural institutions (KLL, KCHRL, KAULIS, and DHF) that made collaborations, the majority of the respondents reported that “sharing of experts” was one of the major benefits of collaboration.
125. All the cultural institutions have reported that they stored their digitised content on their institution's server.

### **6.2.7 Access and Security of Digitised Collection**

126. Vast majority (84.62 per cent) of cultural institutions have provided permission to use and access original documentary heritage collections to their users after digitisation. KLL and SSUSL did not provide permission to access the originals once they were digitised.
127. More than forty per cent of the cultural institutions have indicated that demand for original documentary heritage collections remained the same after digitisation (46.15 per cent). At the same time, more than thirty per cent of the cultural institutions indicated that the demand for original documentary heritage collection decreased (30.77 per cent). The least number (23.08 per cent) of cultural institutions indicated that the demand for original documentary heritage collection from users has increased.
128. Majority (69.23 per cent) of the cultural institutions admitted that they did not establish digital library for documentary heritage collection. At the same time, KUL, KCHRL, KSAL, and DHF have indicated that they have created a digital library for documentary heritage collection.
129. KUL, KCHRL, and DHF have provided author, title, subject, and keyword options to search, whereas KSAL has provided author, title, and subject options in their digital library for documentary heritage collection.

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130. More than sixty per cent of cultural institutions have provided access to their digitised documentary heritage collections only through their institution intranet (61.54 per cent).
131. SCL, KLL, and KAULIS reported that they are providing restricted access through the website. Whereas KCHRL and KSAL have reported that they are providing access to the whole globe through a digital library. But SSUSL and TMR did not provide any access to their digitised documentary heritage collections.
132. It was found that more than forty per cent of the cultural institutions did not charge any fee for using their digitised documentary heritage collection (46.16 per cent). But SCL, KUL, and KSAL have indicated that they charge fees for using digitised documentary heritage collections. ORI & ML, SSUSL, TMR, and DHF did not provide any responses to this question.
133. Majority (76.92 per cent) of the cultural institutions provide reference services by using digitised documentary heritage collections. But SORIL, SSUSL, and TMR have not provided any services to the users by using digitised documentary heritage collections.
134. Vast majority (84.61 per cent) of cultural institutions have reported that digitised documentary heritage collections have sufficient demand from users. At the same time, SORIL and TMR have reported that users didn't express sufficient demand for digitised documentary heritage collections.
135. Huge majority (92.31 per cent) of the cultural institutions admitted that they did not digitise heritage collections with copyright issues. KSAL is the only cultural institution that has digitised a copyrighted collection.
136. Above sixty per cent of the cultural institutions have reported that they have applied network and security measures for the preservation of digitised documentary heritage collections (61.54 per cent). Whereas nearly forty per cent of the cultural institutions have reported that they did not applied any

network and security measures for the preservation of digitised documentary heritage collections (38.46 per cent).

137. Large majority (87.5 per cent) of the cultural institutions have applied data security by keeping backups of digital contents in case of any disaster.

#### **6.2.8 Challenges of Preservation**

138. Sixty per cent of the cultural institutions have indicated that they felt a lack of skilled or trained staff during their preservation project was a serious problem. At the same time, 46.66 per cent of the cultural institutions indicate that copyright, other legal issues, and technological obsolescence are the major challenges to preservation.

139. For solving the preservation challenges, a considerable number of cultural institutions (66.66 per cent) suggest that the government should increase financial and technical assistance for the preservation of documentary heritage resources, library schools should include traditional and digital preservation techniques in their curriculum, and institutions should provide proper training to their staff, and staff should receive continuous training on traditional and digital preservation techniques.

#### **6.2.9 Profile of the Staff of Cultural Institutions**

140. Majority of the staff who participated in the study are female.
141. Majority of the staff who participated in the study were in the 30–50 age group.
142. Majority of the staff who participated in the study are librarians.
143. It is observed that 57.06 per cent of the staff who participated in the study are permanent employees, whereas 42.94 per cent of the staff who participated in the study are working on an ad hoc or contractual basis.
144. It was found that 47.06 per cent of the staff who participated in the study had 10–20 years of working experience. A good number (42.35 per cent) of the

staff have below 10 years' experience, and only 10.59 per cent of the staff have more than 20 years' working experience.

145. Majority of the staff have secured post-graduation
146. Almost sixty per cent of the staff are working in autonomous institutions (59.41 per cent). Forty per cent of staff are from government institutions, and only 0.58 per cent are from private institutions.

#### **6.2.10 Knowledge and Practical abilities of Staff in the Preservation of Documentary Heritage Collection**

147. It was found that more number of the respondents have above-average knowledge of the concept of documentary heritage resources (44.71 per cent). 41.18 per cent staff have average knowledge. Only 11.76 per cent of the staff have excellent knowledge of the importance of documentary heritage resources.
148. It was also found that only less than fifty per cent of the staff surveyed had average or above-average knowledge of the importance of preserving documentary heritage resources.
149. According to the mean analysis, staff with working experience between 10-20 years have a high mean value for knowledge in the concept of documentary heritage collection. So that the staff have working experience between 10-20 years have high knowledge of the concept of documentary heritage collection.
150. ANOVA test indicated that there is no notable variance in the knowledge of staff about the concept of documentary heritage collection based on their working experience.
151. It is observed that more number of the respondents have only average knowledge of traditional or basic preventive methods for the preservation of documentary heritage resources (58.24 per cent). Only 5.88 per cent of the staff have excellent knowledge.

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152. It can be seen that more number (38.24 per cent) of the respondents have only average knowledge and practical abilities to apply fumigation, insecticides, natural repellents, de-acidification, environmental control, oiling, etc. 27.06 per cent have below average knowledge.
153. Only 4.71 per cent of the staff have excellent knowledge of how to apply fumigation, insecticides, natural repellents, de-acidification, environmental control, oiling, etc.
154. It is observed that more number (33.53 per cent) of the respondents have only below average knowledge and practical abilities to do the work of binding, minor repairs, etc.
155. It was found that the majority of the staff of the cultural institutions admitted that they have only average or below average knowledge and practical abilities in managing traditional or basic preservation methods.
156. According to the mean analysis, staff with more than 20 years of working experience have a high mean value for knowledge and practical abilities in managing traditional or basic preservation methods. So that the staff have more than 20 years of working experience have high knowledge and practical abilities in managing traditional or basic preservation methods for their documentary heritage collection.
157. ANOVA test indicated that there is no notable variance in the knowledge and practical abilities of staff in managing traditional or basic preservation methods for their documentary heritage collection based on their working experience.
158. It is observed that more number (47.65 per cent) of the respondents have only average knowledge of the digitisation of documentary heritage resources. 35.29 per cent have above average knowledge. Only 7.06 per cent staff have excellent knowledge.



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159. It is observed that more number (47.65 per cent) of the respondents have only average knowledge and practical abilities to define criteria for selecting documentary heritage resources for digitisation. 32.35 per cent have above average knowledge. Only 5.88 per cent of the staff have excellent knowledge.
160. More number (44.12 per cent) of the respondents have only average knowledge and practical abilities to select and use scanners and related software of specific standards to develop digital content from documentary heritage resources with high resolution. Only 8.24 per cent of the staff have excellent knowledge.
161. It is observed that more number (42.94 per cent) of the respondents have only average knowledge and practical abilities to identify and solve intellectual property, copyright, and licencing issues with digital content. Only 3.53 per cent of the staff have excellent knowledge.
162. It was found that the majority of the staff of the cultural institutions admitted that they have only average knowledge and practical abilities in developing digitised content of their documentary heritage collection.
163. According to the mean analysis, staff with more than 20 years of working experience have a high mean value for knowledge and practical abilities in developing digitised content of their documentary heritage collection. So that the staff have more than 20 years of working experience and have high knowledge and practical abilities in developing digitised content of their documentary heritage collection.
164. ANOVA test indicated that there is no notable variance in the knowledge and practical abilities of staff in developing digitised content of their documentary heritage collection based on their working experience.
165. It can be observed that more number (51.76 per cent) of the respondents have only average knowledge and practical abilities to define policies for the

digitisation and accessing digital content. Only 5.88 per cent of the staff have excellent knowledge.

166. It can be observed that more number (52.94 per cent) of the respondents have only average knowledge of various international and national standards using digitisation. Only 6.47 per cent of the staff have excellent knowledge.
167. It can be observed that more number (38.82 per cent) of the respondents have only average knowledge and practical abilities to use various image editing and image processing software. Only 2.94 per cent of the staff have excellent knowledge.
168. It can be observed that more number (39.41 per cent) of the respondents have only average knowledge and practical abilities to apply OCR software to digital content. Only 4.71 per cent of the staff have excellent knowledge.
169. It can be observed that more number (33.53 per cent) of the respondents have only average knowledge and practical abilities to assign metadata and standards to make searchable digital content. Only 4.12 per cent of the staff have excellent knowledge.
170. It can be seen that more number (36.47 per cent) of the respondents have only average knowledge and practical abilities to select and use appropriate storage devices for preserving digital contents, like DVDs, CD-ROMs, hard discs, etc. 32.35 per cent of the staff have above average knowledge.
171. It can be observed that more number (33.53 per cent) of the respondents have only average knowledge of different file formats like tiff, pdf, xml, and gif used for digital content. Only 7.65 per cent of the staff have excellent knowledge.
172. It is observed that more number (44.12 per cent) of the respondents have only average knowledge and practical abilities to select and use indexing language vocabulary. Only 2.35 per cent of the staff have excellent knowledge.

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173. It was found that the majority of the staff of the cultural institutions admitted that they have only average knowledge and practical abilities in managing the digitised content of their documentary heritage collection.
174. According to the mean analysis, staff with more than 20 years of working experience have a high mean value for knowledge and practical abilities in managing the digitised content of their documentary heritage collection. So that the staff have more than 20 years of working experience have high knowledge and practical abilities in managing the digitised content of their documentary heritage collection.
175. ANOVA test indicated that there is no notable variance in the knowledge and practical abilities of staff in managing the digitised content of their documentary heritage collection based on their working experience.
176. It is revealed that more number (37.06 per cent) of the respondents have only average knowledge and practical abilities to plan budgets and funding for digitisation project. 31.18 per cent have above average knowledge. Only 2.94 per cent of the staff have excellent knowledge.
177. It is revealed that more number (41.18 per cent) of the respondents have only average knowledge and practical abilities to manage technical issues during digitisation and digital preservation. Only 2.94 per cent of the staff have excellent knowledge.
178. It is revealed that more number (44.71 per cent) of the respondents have only average knowledge and practical abilities to design strategies to ensure the quality of digitised content. Only 2.35 per cent of the staff have excellent knowledge.
179. It is revealed that more number (46.47 per cent) of the respondents have only average knowledge and practical abilities to cope with all types of challenges related to the digitisation and digital preservation. Only 3.53 per cent of the staff have excellent knowledge.

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180. It was found that the majority of the staff of the cultural institutions admitted that they have only average knowledge and practical abilities in organising digital preservation for their documentary heritage collection.
181. According to the mean analysis, staff with more than 20 years of working experience have a high mean value for knowledge and practical abilities in organising digital preservation for their documentary heritage collection. So that the staff have more than 20 years of working experience have high knowledge and practical abilities in organising digital preservation for their documentary heritage collection.
182. ANOVA test indicated that there is no notable variance in the knowledge and practical abilities of staff in organising digital preservation for their documentary heritage collection based on their working experience.
183. More number (35.88 per cent) of the respondents have only average knowledge of network and system security software for protecting digital content. Only 2.53 per cent of the staff have excellent knowledge.
184. A greater number (36.47 per cent) of the respondents have only average knowledge of data security through keeping backups of digital contents in case of any disaster. Only 4.12 per cent of the staff have excellent knowledge.
185. A large percentage (38.82 per cent) of the respondents have only average knowledge to protect access to digital content by providing a password or IP-based access. Only 3.53 per cent of the staff have excellent knowledge.
186. A greater portion (39.41 per cent) of the respondents have only average knowledge of how to design administrative back-end control systems for digital library. Only 2.35 per cent of the staff have excellent knowledge.
187. It was found that the majority of the staff of the cultural institutions admitted that they have only average knowledge and practical abilities for protecting the digitised content of their documentary heritage collection.

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188. According to the mean analysis, staff with more than 20 years of working experience have a high mean value for knowledge and practical abilities in protecting the digitised content of their documentary heritage collection. So that the staff have more than 20 years of working experience have high knowledge and practical abilities in protecting the digitised content of their documentary heritage collection.
189. ANOVA test indicated that there is no notable variance in the knowledge and practical abilities of staff in protecting the digitised content of their documentary heritage collection based on their working experience.
190. It was found that more number (43.53 per cent) of the respondents have only average knowledge and practical abilities to use various digital library software. Only 6.47 per cent of the staff have excellent knowledge.
191. A greater percentage (42.94 per cent) of the respondents have only average knowledge and practical abilities to publish a digital library for cultural heritage resources. Only 5.29 per cent of the staff have excellent knowledge.
192. A greater proportion (41.76 per cent) of the respondents have only average knowledge and practical abilities to manage all digital library services and digital library equipment. Only 5.88 per cent of the staff have excellent knowledge.
193. It was found that more number (37.65 per cent) of the respondents have only average knowledge and practical abilities to develop effective information retrieval mechanisms for digital libraries. Only 5.88 per cent of the staff have excellent knowledge.
194. It was found that a larger number (48.82 per cent) of the respondents have only average knowledge and practical abilities to monitor overall digital library services and infrastructure. Only 2.35 per cent of the staff have excellent knowledge.

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195. A greater share (42.35 per cent) of the respondents have only average knowledge and practical abilities to conduct an evaluation of the performance of digital library. Only 4.12 per cent of the staff have excellent knowledge.
196. It was found that a larger portion (40.00 per cent) of the respondents have only average knowledge and practical abilities to develop a system for understanding digitised content usage statistics and feedback from the users. Only 1.76 per cent of the staff have excellent knowledge.
197. It was found that the majority of the staff of the cultural institutions admitted that they have only average knowledge and practical abilities in disseminating and evaluating the digitised content of their documentary heritage collection.
198. According to the mean analysis, staff with more than 20 years of working experience have a high mean value for knowledge and practical abilities in disseminating and evaluating the digitised content of their documentary heritage collection. So that the staff have more than 20 years of working experience have high knowledge and practical abilities in disseminating and evaluating the digitised content of their documentary heritage collection.
199. ANOVA test indicated that there is no notable variance in the knowledge and practical abilities of staff in disseminating and evaluating the digitised content of their documentary heritage collection based on their working experience.
200. It can be observed that more number (43.53 per cent) of the respondents have only average knowledge and practical abilities to manage staff for preservation activities. Only 6.47 per cent of the staff have excellent knowledge.
201. It can be observed that more number (35.29 per cent) of the respondents have only average knowledge and practical abilities to train staff and users for the

creation and usage of digital content. Only 4.71 per cent of the staff have excellent knowledge.

202. It was found that the majority of the staff of the cultural institutions admitted that they have only average knowledge and practical abilities in managing human resources for the preservation project for documentary heritage collection.
203. According to the mean analysis, staff with more than 20 years of working experience have a high mean value for knowledge and practical abilities in managing human resources for the preservation project for documentary heritage collection. So that the staff have more than 20 years of working experience have high knowledge and practical abilities in managing human resources for the preservation project for documentary heritage collection.
204. ANOVA test indicated that there is no notable variance in the knowledge and practical abilities of staff in managing the human resources for the preservation project for documentary heritage collection based on their working experience.
205. Above sixty per cent of the respondents have mentioned that online training programmes and tutorials can improve the preservation skills of staff at cultural institutions (61.17 per cent). A good number (58.23 per cent) of the respondents have opined that library schools should include practical methods of traditional and digital preservation in their curricula. And 44.11 per cent of the staff have indicated that library schools should offer short courses on traditional and digital preservation. At the same time, least number (42.35 per cent) of the respondents have mentioned that professional associations should arrange workshops/training courses.

### **6.3 Tenability of Hypotheses**

The tenability of the hypotheses formulated according to the objectives of the study and the observations obtained from the previous related studies were examined on the basis of the findings drawn from the study.

### **Hypothesis – 1**

The first hypothesis states that “majority of the cultural institutions are adopted digital preservation methods for the protection of their documentary heritage collection than traditional methods”.

Findings numbers, 27, 28, 29, 30, and 32 indicate that the majority of the cultural institutions have adopted a combination of both traditional and digital preservation methods for the preservation of their documentary heritage collections. Table 13 clearly indicates that no cultural institution has adopted digital preservation practices alone for the preservation of their documentary heritage collection. At the same time, two cultural institutions, KKL and SRRL, have employed traditional preservation methods only for the protection of their documentary cultural heritage collections. Tables 14 and 15 further reveal that cultural institutions have employed both traditional or basic and digital preservation methods for safeguarding their documentary heritage collections. Cultural institutions have chosen a hybrid approach (a combination of both traditional and digital preservation methods) for the protection of their documentary heritage collections.

Therefore, on the basis of the above stated findings this hypothesis is rejected.

### **Hypothesis-2**

The second hypothesis states that “primary purpose of the majority of the digitisation projects for documentary heritage collection is their preservation only”.

Finding number 40 and table number 19 confirm that all the cultural institutions surveyed in the study have chosen preservation of their documentary heritage collection for the future as the primary need or purpose of initiating digitisation projects for their documentary heritage collection.

Hence, on the basis of above mentioned finding this hypothesis is accepted.



### **Hypothesis -3**

The third hypothesis states that “outsourcing is the most used digitisation method than in-house digitisation”.

As per findings numbers 46 and 47, the majority of the cultural institutions have employed both in-house and out-sourcing methods together for the digitisation of documentary heritage collections. There is no cultural institution that has fully outsourced its digitisation project. Moreover, three cultural institutions, such as KCHRL, SORIL, and TEMUL, have adopted an in-house method of digitisation only. Finding numbers 48, 50, 53, 54, 55, and 57, and Table numbers 22, 23, 24, 25, 26, and 27 also reported that the majority of the cultural institutions have allocated their own institutional staff rather than outside staff for performing various digitisation activities such as selection of material for digitisation, preparation of materials before digitisation, processing, quality control and organisation, storage, and access of digitised materials. Findings 49, 51, 55, and 58 indicate that a good number of cultural institutions have allocated both institutional and outside staff as teams to perform work involved in the digitisation project. As per finding number 52, scanning of the materials is the only digitisation work outsourced by a considerable number of cultural institutions.

As per the above findings, this hypothesis is rejected.

### **Hypothesis – 4**

The fourth hypothesis states that “majority of the cultural institutions are not maintaining any written policy for digitisation of their documentary heritage collection”.

According to the findings numbers 97, 99, 101, 103, 105, 107, 109, and 111, and table numbers 46, 47, 48, 49, 50, 51, and 52, the majority of the cultural institutions have formulated policies for various activities included in the digitisation project, such as selection of materials for digitisation, digitisation process, selection and purchase of hardware and software, appointment and capacity building of staff, inviting tenders and quotations for digitisation work, preservation and storage of

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digitised materials, providing access to digitised materials, and copyright of the materials. But finding numbers 98, 104, and 106 reported that fifty percent of the cultural institutions have maintained the formulated policies for selection of materials for digitisation, appointment and capacity building of staff, and inviting tenders and quotations for digitisation work in both written and unwritten format. Whereas finding number 100 clearly states that the majority of the cultural institutions have maintained the formulated policies for digitisation process in written format. At the same time, finding numbers 102, 108, 110, and 112 mentioned that the majority of the cultural institutions have maintained the formulated policies for selection and purchase of hardware and software, preservation and storage of digitised materials, providing access to digitised materials, and copyright of the materials in the unwritten format. From all these findings, it is clear that some of the cultural institutions have maintained written policies for their digitisation projects and some others have not.

In the light of all above findings, this hypothesis is partially accepted.

#### **Hypothesis – 5**

The fifth hypothesis states that “majority of the cultural institutions did not follow any national and international standards for their digitisation program”.

It is evident from findings numbers 116, 117, 118, and 119 that the vast majority of the cultural institutions have not followed any national or international standards for digitising their documentary heritage collections. Table numbers 57, 58, and 59 further reveal that KAULIS is the only cultural institution that follows national standards for digitisation programs. The use of their own institutional standards is the main reason cultural institutions opt not to use national or international standards.

So, on the basis of above stated findings, this hypothesis is accepted.

### **Hypothesis – 6**

The sixth hypothesis states that “commercial software is the most used software for digital preservation of documentary heritage collection than open source software”.

According to findings numbers 81, 82, and 83 and table number 38, a large majority of the cultural institutions use commercial software for the scanning of the documentary heritage collection and processing of the digitised content of the collection. At the same time, more number of cultural institutions use open-source digital library software.

As per the above findings, this hypothesis is partially accepted.

### **Hypothesis- 7**

The seventh hypothesis states that “collaboration efforts among cultural institutions in digitisation projects for documentary heritage collection is at low level”

Findings numbers 120, 121, 122, and 123 and table numbers 60, 61, 62, and 63 clearly point out that the majority of the cultural institutions have no collaboration with the other institutions for the digitisation project. But some cultural institutions, such as KLL, KCHRL, KAULIS, and DHF, have made collaborative efforts with other regional libraries and government institutions to exchange products and experts.

Therefore, in the light of above mentioned findings, this hypothesis is accepted.

### **Hypothesis - 8**

The eighth hypothesis states that “lack of expertise among staff is the major obstacle to the preservation of documentary heritage collection”

According to finding number 138, a good number of cultural institutions have felt a lack of expertise among staff during the preservation project for their

documentary heritage collection. The findings number 155 and table number 89 clearly indicate that the majority of the staff of the cultural institutions have admitted that they have only average or below average knowledge and practical abilities in managing traditional or basic preservation methods. And also, findings numbers 162, 173, 180, 187, and 197 and table numbers 91, 93, 95, 97, and 99 reported that the majority of the staff of the cultural institutions have only average knowledge and practical abilities in developing, managing, protecting, and disseminating digitised content of documentary heritage collections.

Hence on the basis of above findings, this hypothesis is accepted.

### **Hypothesis – 9**

The ninth hypothesis states that “there is a notable variance in the knowledge and practical ability of staff to apply traditional preservation methods for protecting the collection of documentary heritage based on their working experience”.

The findings number 156 and the result of the ANOVA test enumerated in Table 90 clearly indicated that there is no notable variance in the knowledge and practical ability of staff to apply traditional preservation methods for protecting the collection of documentary heritage based on their working experience, since the p-value is greater than 0.05.

So, on the basis of above indicated findings, the hypothesis is rejected.

### **Hypothesis – 10**

The tenth hypotheses states that “there is a notable variance in the knowledge and practical ability of staff to apply digital preservation methods for protecting the collection of documentary heritage based on their working experience”.

The findings number 163, 174, 181, 188 and 198 and the result of ANOVA test indicated in the table number 92, 94, 96, 98 and 100 confirms that there is no notable variance in the knowledge and practical ability of staff in developing, managing, protecting and disseminating digitised content of their documentary

heritage collection based on their working experience, since the p-value is greater than 0.05.

In the light of above mentioned findings, this hypothesis is rejected.

#### **6.4 Suggestions**

Based on the findings encountered in the study and the respondent's suggestions on the various factors of the preservation of documentary heritage collections, the following suggestions are formed with the aim of improving the preservation of documentary heritage collections residing in the cultural institutions of Kerala and the knowledge and practical abilities of the staff working in these cultural institutions on traditional and digital preservation practices.

1. The authorities of the cultural institutions should understand the importance and inherent value of their documentary heritage collection and may give special consideration to this collection.
2. The documentary heritage collection is vulnerable by nature, so cultural institutions may ensure the proper care, use, handling, and preservation of these collections.
3. The cultural institutions should provide proper guidance and awareness programmes to the staff and users on the significance of documentary heritage collection and its proper handling.
4. Cultural institutions should apply basic preventive measures such as proper ventilation, environmental control, cleaning and dusting, proper shelving, and storage adequately to keep the documentary heritage collection safe from degradation. Also, may conduct periodical monitoring of the preservation activities.
5. The different types of advanced traditional preservation methods have to be adopted based on the type of collection and nature of the cause of deterioration, along with the regular cleaning and dusting. Cultural institutions may develop laboratories for conservation or chemical treatment,

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physical infrastructure, and space for restoration, repair works, fumigation, etc.

6. Cultural institutions should maintain a disaster preparedness and recovery plan and adequate security measures for safeguarding documentary heritage collections.
7. The study strongly recommends that cultural institutions should formulate and maintain a written preservation policy for their documentary heritage collections.
8. Digitisation is considered as an advanced method for the preservation of documentary heritage collections. Before adopting digital preservation, the study recommends that cultural institutions should conduct a detailed pilot study of previous digitisation projects of other institutions to understand their strengths and weaknesses.
9. The study firmly recommends that cultural institutions should prepare an action plan before starting a digitisation project, it should clearly indicate what they already have: resources, collection, physical and technical infrastructure facilities, manpower, finance, etc.; what requirements remain to be fulfilled; and what needs to be covered.
10. Cultural institutions should keep a comprehensive blueprint for digitisation projects that clearly defines the need and objective of the digitisation project, strategies, criteria, methods, techniques adopted, scope, limitations, implementation, and future of the project.
11. The study found that the primary purpose of the majority of the digitisation of documentary heritage collections is their preservation only. Preservation and access are related to each other; they are the two sides of the same coin. The preservation of documents has no value if they are not accessible to users. Demand for access increases preservation activities. So the study recommends that cultural institutions should formulate written access

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policies for both original documentary heritage collections and their digitised content.

12. Cultural institutions should adopt innovative access mechanisms to ensure the continuous accessibility and dissemination of digitised documentary heritage collections.
13. Cultural institutions may provide proper training to their staff on traditional and digital preservation practices and also allow them to participate in other training and workshops conducted by other professional bodies and institutions.
14. Cultural institutions may establish collaborative efforts with other similar institutions for the preservation of documentary heritage collections that help to share skills, expertise, and collections and avoid duplication of work.
15. Authorities should offer capacity-building programmes to the staff on preservation methods.
16. Cultural institutions should give equal importance to the preservation of documents as they do to other routine activities such as collection development, classification, and cataloguing of documents.
17. Cultural institutions should utilise the advanced method of storage for storing digitised documentary heritage collections. They must maintain a good storage policy for both original and digitised documentary heritage collections.
18. Cultural institutions may follow national and international standards for the digital preservation of documentary heritage collections.
19. Cultural institutions should make efforts to participate in national and international initiatives for safeguarding documentary heritage collections around the world, such as the Memory of the World programme by UNESCO, the National Mission on Manuscripts, the Digital Library of India, etc.

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20. Cultural institutions should make an effort to raise funds from national and international organisations that promote and provide financial assistance for preservation projects of documentary heritage collections.
21. It is recommended that cultural institutions that possess large collections of old and fragile documentary heritage have to recruit staff with archival qualifications to do the archival preservation of the collection. Otherwise, the institution may provide periodic training on archival preservation to the existing staff.
22. The cultural institutions may arrange a public awareness campaign to improve the usage levels of documentary heritage collections.
23. The cultural institutions may establish and publish a digital library for their digitised documentary heritage collection.
24. Cultural institutions should be conscious of intellectual property rights (IPR), such as copyright issues, while digitising. Adequate legal measures should be taken to avoid copyright violations.
25. The cultural institutions should offer innovative services to their users by using both physical and digital documentary heritage collections.
26. Cultural institutions should coordinate with IT institutions to acquire technical assistance for the digital preservation of documentary heritage collections and to meet the challenges of technological obsolescence.
27. The cultural institutions should apply adequate network and security measures such as security software firewalls, filtering routers, encryption & decryption measures, keeping backups of digital contents, providing password- or IP-based access, and an administrative back-end control system for the preservation of digitised documentary heritage collections.
28. The findings of the study revealed that the majority of the staff working in cultural institutions have only average knowledge and practical abilities in traditional and digital preservation methods. So the staff themselves should



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take the initiative to participate in the training opportunities and workshops to improve their preservation skills.

29. The government authorities may provide technical and financial assistance for the preservation of documentary heritage collections.
30. The cultural department of the government may conduct a study to identify the valuable documentary heritage collections that reside in different cultural institutions. And build a database and a consortium for valuable documentary heritage collections.
31. Government authorities should set up policies and guidelines for the digital preservation of documentary cultural collections that should lead to uniformity in the preservation activities of cultural institutions.
32. Government authorities should establish a legal framework for the digital preservation of documentary heritage collections. Intellectual property rights, such as copyright, are the major constraint on digitising documentary heritage collections. Digital preservation of cultural heritage is not clearly defined in the Indian Copyright Act of 1957 and the IT Act of 2000.
33. Library schools should include theoretical and practical methods of traditional and digital preservation in their curricula or syllabus. And library schools should offer short-term, refreshing courses on traditional and digital preservation.
34. Professional associations should arrange workshops and training courses for the preservation of documentary heritage collections.
35. There is a need for a network of cultural institutions that possess the same type of documentary heritage collection to create a standard for digital preservation activities and present the digitised content on a single platform.
36. The cultural institutions should act as a centre of excellence for the research and development of the documentary heritage collection.

## **6.5 Conclusion**

The documentary heritage collection is a basic inheritance of our historical memory and includes text, cartographic, audio-visual, and digital documents. Libraries, archives, museums, and other cultural institutions play a significant role in the organisation, conservation, preservation, and dissemination of documentary heritage collections. A significant proportion of the documentary heritage collection that resides in libraries and other cultural institutions is at risk of being lost due to physical, chemical, and biological causes. The application of preventive measures and restoration techniques is the remedy that can guarantee the survival of a documentary heritage collection. The cultural institutions initiated commendable efforts for the preservation of their valuable documentary heritage collection through traditional and digital preservation methods. The present study made an attempt to assess the preservation practices followed by the selected fifteen cultural institutions in Kerala for the protection of their documentary heritage collections.

The cultural institutions that participated in the study possess a large collection of a wide variety of documentary heritage, which includes old and rare books, bound volumes of old periodicals and magazines, manuscripts on paper, palm leaves, bound volumes of newspapers, government orders and reports, historical records, and maps. The cultural institutions indicated that the research scholars and historians from the regional part of Kerala are the major users and beneficiaries of the documentary heritage collection possessed by these institutions. Reference services, exhibition services, and reprographic services are the major services provided by cultural institutions. Brittleness, discoloration of the paper, and wear and tear due to excessive photocopying and use are the major noticeable deteriorations faced by the documentary heritage collection. It is found that the age of the materials, type and quality of the materials, relative humidity, and attack by biological agents are the major causes of deterioration.

The overall analysis indicated that the majority of cultural institutions adopted a combination of both traditional and digital preservation methods for the preservation of their documentary heritage collections. Cleaning, dusting, and proper

shelving are the most frequently used traditional or basic preservation methods. A good number of cultural institutions also applied environmental control, made minor repairs and mending, and installed air conditioners. The digitisation of documentary heritage collections in most cultural institutions is an ongoing and continuous process. Preservation for the future is the primary need for digitisation, as indicated by the majority of cultural institutions. The cultural or historical value of the material is the most preferred selection criteria used by cultural institutions for identifying materials for digitisation. The majority of cultural institutions do not participate in any kind of international, national, or state effort for the preservation of documentary heritage.

The findings also indicated that the majority of the cultural institutions employed both in-house and outsourced methods for the digitisation of their documentary heritage collections. The majority of cultural institutions allocate their own institution staff rather than outsourcing staff for performing the digitisation activities, such as selecting documentary heritage materials for digitisation, preparation of materials before digitisation, processing and organising of digitised materials, storage, and providing access to the digitised documentary heritage collection, except scanning of materials. Cultural institutions use various resolutions for scanning, depending on the materials. And they also used colour, black and white, and grey-level digital image formats. PDF is the most popular file format. It was also found that the majority of cultural institutions maintain a separate catalogue for digitised documentary heritage content.

Findings also depict that cultural heritage institutions have adequate physical infrastructure and technical facilities for digitisation projects. And they have their own computers, scanners, digital cameras, servers, UPS, and power system for the digital preservation of the documentary heritage collection. Commercial software is used for scanning and processing digitised collections. Because of the large quantity of the documentary heritage collection and the limited time period of the digitisation project, cultural institutions hired extra staff for the digitisation project. A good number of cultural institutions provide initial training and on-the-job training to their

staff on digitisation techniques. The government of Kerala provides funding for the digitisation projects of more than sixty percent of the cultural institutions. Cultural institutions have not availed themselves of any kind of financial assistance from any external national and international organisations other than funding agencies for their digitisation projects.

The findings also reveal that the majority of the cultural institutions formulated policies for various activities included in the digitization project, such as selection of materials for digitisation, digitisation process, selection and purchase of hardware and software, appointment and capacity building of staff, inviting tenders and quotations for digitisation work, preservation and storage of digitised materials, providing access to digitised materials, and copyright of the materials. But fifty percent of the cultural institutions maintain the formulated policies for selection of materials for digitisation, appointment and capacity building of staff, and inviting tenders and quotations for digitisation work in both written and unwritten formats. Whereas the majority of cultural institutions maintain the formulated policies for the digitisation process in written format. At the same time, the majority of cultural institutions maintain the formulated policies for selection and purchase of hardware and software, preservation and storage of digitised materials, access to digitised materials, and copyright of the materials in the unwritten format.

The findings clearly reveal that the vast majority of cultural institutions have not followed any national or international standards for digitisation work. The majority of the cultural institutions have not maintained any collaboration efforts with the other institutions for the digitisation project. All the cultural institutions surveyed reported that they stored their digitised content on their institution's server. Cultural institutions provide permission to use and access original documentary heritage collections to users after the digitisation process. The majority of the cultural institutions admitted that they did not establish a digital library for documentary heritage collections. More than sixty per cent of the cultural institutions reported that they applied network and security measures for the preservation of digitised documentary heritage collections. Lack of skilled or trained

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staff is the major challenge faced by the cultural institution for the preservation project. A considerable number of cultural institutions suggest that the government should increase financial and technical assistance for the preservation of documentary heritage resources, library schools should include traditional and digital preservation techniques in their curricula, and staff should receive continuous training on traditional and digital preservation techniques to tackle the challenges of preservation.

It has been found that a lack of expertise among staff in preservation practices is the major challenge to effective preservation projects. The investigator again intended to acquire the perception or opinion of the staff working in the selected fifteen cultural institutions on their knowledge and practical abilities in preservation practices. It was found that the majority of the staff of the cultural institutions have only average knowledge of traditional and digital preservation methods for safeguarding documentary heritage collections. The ANOVA test indicated that there is no notable variance in the knowledge and practical abilities of the staff in traditional and digital preservation methods based on their working experience.

The findings of the present study have practical implications for cultural institutions, their staffs, professional bodies, library schools, and government authorities. The findings are useful for the authorities of cultural institutions to understand the present status of their preservation of documentary heritage collections. Identify their problems and challenges and improve their efforts for the preservation of documentary heritage collections. It is also useful for identifying the capabilities of their staff and providing adequate training and capacity-building programmes to them. The findings help the staff understand the knowledge and skills needed for performing better preservation practices. So they can develop their abilities in preservation practices through training and workshops. Library schools can include the theoretical and practical concepts of preservation practices in their curricula and syllabuses. And the professional bodies can arrange training for the staff in areas where they are less competent and have limited knowledge.



# RECOMMENDATIONS FOR FURTHER RESEARCH

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*7.1. Introduction*

*7.2. Recommendations for Further Research*

*7.3. Conclusion*

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### **7.1. Introduction**

The present study has helped to understand the preservation practices followed by the selected fifteen cultural institutions in Kerala for the preservation of their documentary heritage collections. The investigator hopes to suggest the following areas of research for further research to nourish the existing knowledge on this subject.

### **7.2. Recommendations for Further Research**

1. The present study is investigating preservation practices followed by the selected fifteen cultural institutions in Kerala for the preservation of their documentary heritage collections. Further research can extend the findings of the study by measuring preservation practices followed by all other cultural institutions in Kerala.
2. Further research can broaden the findings of the study by analysing the preservation practices followed by archives and museums to safeguard their documentary heritage collections.
3. A detailed case study method can be employed to understand the preservation practices followed by individual cultural institutions.
4. The present study analyses the preservation of a selected type of documentary heritage collection only. Further research could measure the preservation of other types' tangible cultural heritage collections.
5. This study may be extended to all the cultural institutions under the cultural department of the government to understand their initiatives on the preservation of documentary heritage collections.
6. A detailed literature review may be conducted to understand the recent trends and developments in the preservation of documentary heritage collections.

### *Recommendations for Further Research*

7. A user analysis can be conducted to measure the usage of documentary heritage collection in cultural institutions.
8. The present study focuses on institutional preservation. Further research is needed to assess the individual preservation of documentary heritage collections possessed by individuals, ancient homes, private bodies, etc.
9. More studies are required to investigate the challenges of digital preservation of documentary heritage collections.
10. Further research can be done to analyse the performance of national and international efforts for the preservation of documentary heritage collections.

### **7.3. Conclusion**

This chapter provided detailed account of suggestions and recommendations for further research on the topic of the present study.

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# **APPENDICES**

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## APPENDIX A

## DISTRIBUTION OF SCHEDULES TO THE STAFF

| Name of the Cultural Institution | No. of Schedules |                              | Total Responses in Percent (n=170) |
|----------------------------------|------------------|------------------------------|------------------------------------|
|                                  | Distributed      | Received                     |                                    |
| SCL                              | 45               | 42<br>(93.33)                | 24.70                              |
| KUL                              | 31               | 31<br>(100.00)               | 18.23                              |
| KLL                              | 18               | 18<br>(100.00)               | 10.58                              |
| ORI & ML                         | 8                | 8<br>(100.00)                | 4.70                               |
| KCHRL                            | 7                | 7<br>(100.00)                | 2.35                               |
| SORIL                            | 1                | 1<br>(100.00)                | 0.588                              |
| SSUSL                            | 18               | 18<br>(100)                  | 10.58                              |
| KSAL                             | 13               | 13<br>(100.00)               | 7.64                               |
| KAULIS                           | 11               | 11<br>(100.00)               | 6.47                               |
| KKL                              | 2                | 2<br>(100.00)                | 1.17                               |
| GDRL                             | 7                | 7<br>(100.00)                | 2.35                               |
| TEMUL                            | 5                | 5<br>(100.00)                | 2.94                               |
| TMR                              | 2                | 2<br>(100.00)                | 1.17                               |
| DHF                              | 4                | 4<br>(100.00)                | 2.35                               |
| SRRL                             | 1                | 1<br>(100.00)                | 0.588                              |
| <b>Total</b>                     | <b>175</b>       | <b>170</b><br><b>(97.14)</b> | <b>100.00</b>                      |

(The figures given in bracket show the respective percentage)



## APPENDIX B

### SCHEDULE

(For the head of the cultural institutions)

#### Preservation of Documentary Heritage Collections: A Study of Selected Cultural Institutions in Kerala

Dear Sir,

I am a research scholar in the Department of Library and Information Science at the University of Calicut. As part of my doctoral programme, I have to conduct a study on “**Preservation of Documentary Heritage Collection: A Study of Selected Cultural Institutions in Kerala**”. I am so grateful that you have been selected to participate in the study. I assure you that the information provided by you will treat with the highest level of confidentiality and will be used only for the academic purpose.

DHANYA T K, Research Scholar  
DLISc, University of Calicut

(Kindly answer the questions. Most of the questions require only tick [✓] marking. Kindly tick [✓] multiple answers whenever necessary. Please write the answer also where spaces have been provided.)

#### PART A – PROFILE OF CULTURAL INSTITUTIONS

1. Name & address of the cultural institution (Contact number also):  
.....
2. Category of institution:  
Library   
Other social/cultural/historical/academic/religious institutions
3. Year of establishment:  
.....
4. Parent institution:  
.....
5. Type of institution:  
Government  Autonomous  Private
6. URL of your institution website & Email Id:  
.....

**PART B - DOCUMENTARY HERITAGE COLLECTION**

7. What is the total number of documentary heritage collection in your institution?

| Sl. No. | Documentary Heritage Resources             | Total Number |
|---------|--------------------------------------------|--------------|
| 1.      | Old and rare books                         |              |
| 2.      | Bound volumes of old periodicals/magazines |              |
| 3.      | Manuscripts on paper                       |              |
| 4.      | Palm leaves                                |              |
| 5.      | Bound volumes of newspapers                |              |
| 6.      | Government orders/ reports                 |              |
| 7.      | Historical records                         |              |
| 8.      | Maps                                       |              |

8. Who are the major users of your documentary heritage collection?

Students  Research scholars   
 Teachers/Academic staff  Historians   
 Others.....

9. Users are from?

Regional users (from Kerala)  National users (Non Kerala)   
 International users (Foreign users)

10. What are the services provided to your user community in your institution by using documentary heritage collection?

Reference services  Exhibition services  Lending services   
 Reprographic services  Micro- Filming/CD writing   
 Publication/print of Heritage Records   
 Any other.....

11. What is the noticeable deterioration of the documentary heritage collection of your institution?

Brittleness  Wear and tear due to excessive photocopying and use   
 Wear and tear due to bad shelving  Paper becoming torn   
 Broken spine of the book materials  Discoloration of the paper   
 Fading of data  Attack of book worms/silverfish/termites like biological agents   
 Cracking and scratching of materials  Mutilation or vandalism of materials   
 Theft of materials  Any other.....

12. What are the causes of deterioration of documentary heritage collection?  
 Age of materials  Acidity level of paper  Ink   
 Type and quality of the material  Excessive light  Relative humidity   
 Bad shelving or storage  Dust and particulate matters   
 Attack of biological agents like termites, book worms etc.   
 Air pollution/atmospheric pollution  High temperature   
 Poor handling by users  Excessive photocopying   
 Natural calamities like floods, cyclones, fire etc.   
 Any other.....

**PART C - APPLICATION OF PRESERVATION METHODS**

13. What are the preservation methods adopted by your institution for the preservation of documentary heritage collection?  
 Traditional/basic only  Digital only  Both
14. What are the major traditional preservation methods adopted in your institution and their frequency of use?

| Sl. No.                         | Preservation techniques                              | Very often | Often | Occasionally | Never |
|---------------------------------|------------------------------------------------------|------------|-------|--------------|-------|
| 1.                              | Cleaning and dusting                                 |            |       |              |       |
| 2.                              | Proper shelving                                      |            |       |              |       |
| 3.                              | Environmental control                                |            |       |              |       |
| 4.                              | Surface cleaning or stain removal                    |            |       |              |       |
| 5.                              | Oiling                                               |            |       |              |       |
| 6.                              | Minor repairs and mending                            |            |       |              |       |
| 7.                              | Binding, trimming, guarding, gathering and stitching |            |       |              |       |
| 8.                              | Ink fixing                                           |            |       |              |       |
| 9.                              | P <sup>H</sup> testing                               |            |       |              |       |
| 10.                             | Lamination                                           |            |       |              |       |
| 11.                             | Photocopying                                         |            |       |              |       |
| 12.                             | Fumigation                                           |            |       |              |       |
| 13.                             | De-acidification or alkaline wash                    |            |       |              |       |
| 14.                             | Use of insecticide                                   |            |       |              |       |
| 15.                             | Pest control measures                                |            |       |              |       |
| 16.                             | Use of natural repellents                            |            |       |              |       |
| 17.                             | Installing Air-conditioners                          |            |       |              |       |
| 18.                             | Disaster preparedness and recovery plan              |            |       |              |       |
| 19.                             | Adequate security measures                           |            |       |              |       |
| Any other (Please specify)..... |                                                      |            |       |              |       |

15. Do you have a project for digitising your collections? Yes  No   
If “no” please answer question 16.
16. What are the major constraints/difficulties to adopt digitisation?  
Lack of money  Large/complex collection  Legal issues   
Lack of expert staff  Lack of support from authority   
Lack of infrastructure facilities  Lack of knowledge about digitisation   
Digital preservation is not necessary   
Any other.....

**PART D - DIGITISATION OF DOCUMENTARY HERITAGE  
COLLECTION**

17. What is the name of the digitisation project in your institution?  
.....
18. What is the time scale of the program? -  
From.....to.....
19. Is your institution included in any kind of preservation efforts conducted by  
International/ national/ state organization? Yes  No
20. What is the need of digitisation of your documentary heritage resources?  
 Increase access  
 Preservation for future  
 Reduce damage of originals  
 Reduce handling of originals  
 Save space  
 To help research and academic activities  
 Commercial exploitation  
 To provide better service to users  
 To promote cultural heritage collection world wide  
 Any other.....
21. What are the criteria's used for the selection of documentary heritage  
collection for digitisation?  
 Cultural/ historical value  Content value  
 Research/ academic importance  Demand from users  
 Age of the materials  Damage  
 Uniqueness or rarity of the material  Copyright free items  
Any other.....



22. How many items of your documentary heritage collection are digitized so far?

| Sl. No. | Cultural Heritage Resources                | Total Number of Items Digitised |
|---------|--------------------------------------------|---------------------------------|
| 1.      | Old and rare books                         |                                 |
| 2.      | Bound volumes of old periodicals/magazines |                                 |
| 3.      | Manuscripts on paper                       |                                 |
| 4.      | Palm leaves                                |                                 |
| 5.      | Bound volumes of newspapers                |                                 |
| 6.      | Government orders/ reports                 |                                 |
| 9.      | Historical records                         |                                 |
| 10.     | Maps                                       |                                 |

**PART E - METHODS AND TECHNIQUES USED IN DIGITISATION**

23. Which type of digitisation is carried out in your institution?  
 In-house  Outsourcing  Both

24. Please mention who carries out the digitisation activities

| Sl. No. | Activities                                         | Institution Staff Only | Outside Staff Only | Both |
|---------|----------------------------------------------------|------------------------|--------------------|------|
| 1.      | Selection of materials for digitisation            |                        |                    |      |
| 2.      | Preparation of materials for digitisation          |                        |                    |      |
| 3.      | Scanning of materials                              |                        |                    |      |
| 4.      | Processing and organization of digitised materials |                        |                    |      |
| 5.      | Storage and access of digitized material           |                        |                    |      |

25. From what the digitisation carried out?  
 Originals  Reproductions  Both

26. If reproductions are used what type of reproductions are made?  
 Photographic  Photocopies  Microfilm/Microfiche   
 Any other.....

27. During scanning and processing is there any damage occurred to the original materials  
 Yes  No
28. How are the originals stored after digitisation?  
 In special condition  In the same way before digitisation
29. Which resolutions are used for digitisation?  
 300 dpi  400 dpi  Various   
 Any other.....
30. Which digital image formats are used?  
 Colour  Black & white  Grey level   
 Any other.....
31. Which file format is used?  
 TIFF  JPEG  PDF   
 Any other.....
32. How you keep the catalogue records of digitised material?  
 Included in main catalogues  In separate catalogue   
 Not catalogued

**PART F - REQUIREMENTS FOR DIGITAL PRESERVATION**

33. Do you have adequate infrastructure which would guarantee success of digitisation project? Yes  No
34. Hardware used in the digitisation process

| Sl. No.   | Hardware              | Number | Specification |
|-----------|-----------------------|--------|---------------|
| 1.        | Computer              |        |               |
| 2.        | Scanner               |        |               |
| 3.        | Digital camera        |        |               |
| 4.        | Server                |        |               |
| 5.        | UPS and power systems |        |               |
| Any other |                       |        |               |

35. Please indicate the software used in the digitisation activities.

| Sl. No.   | Activity                  | Open source | Commercial | In-house |
|-----------|---------------------------|-------------|------------|----------|
| 1.        | Scanning software         |             |            |          |
| 2.        | Image processing software |             |            |          |
| 3.        | Digital library software  |             |            |          |
| Any other |                           |             |            |          |

36. Do you hire extra staff for digitisation work? Yes  No

37. If Yes, What is the reason?

Large quantity of materials to digitise

Number of institution staff are very low

Institution staff are not professionally qualified

Institutional staff have no experience in digitisation

To complete the digitisation work at the period of time

Any other.....

38. Do you provide any training programme to the staff? Yes  No

39. If Yes, what type of training is given?

Training in between digitisation project

Conducting workshops

Initial training from the experts in the institution

Initial training from the experts outside the institution

Any other.....

40. What is the estimate cost of your digitisation project?

| Cultural Institution | Cost of Expenditure for Digitisation Project<br>(INR) |
|----------------------|-------------------------------------------------------|
| SCL                  |                                                       |
| KUL                  |                                                       |
| KLL                  |                                                       |
| ORI & ML             |                                                       |
| KCHRL                |                                                       |
| SORIL                |                                                       |
| SSUSL                |                                                       |
| KSAL                 |                                                       |
| KAULIS               |                                                       |
| GDRL                 |                                                       |
| TEMUL                |                                                       |
| TMR                  |                                                       |
| DHF                  |                                                       |

41. Who is the funding agency of your project?

Institution itself  Govt. of Kerala

Govt. of India

Other funding agency/ organization.....

42. Do you get any finance assistance from organizations like UNESCO/IFLA etc.?

Yes  No

If Yes, which is that organization.....

43. Does your institution has a separate policies for digitisation activities?

| Sl. No.   | Activity                                              | Yes | No | Written | Unwritten |
|-----------|-------------------------------------------------------|-----|----|---------|-----------|
| 1.        | Selection of materials for digitisation               |     |    |         |           |
| 2.        | Digitisation process                                  |     |    |         |           |
| 3.        | Selection and purchase of hardware and software       |     |    |         |           |
| 4.        | Appointment and Capacity Building of Staff            |     |    |         |           |
| 5.        | Inviting Tenders and Quotations for Digitisation Work |     |    |         |           |
| 6.        | Preservation and storage of digitised materials       |     |    |         |           |
| 7.        | Providing access of digitised materials               |     |    |         |           |
| 8.        | Copyright of documents                                |     |    |         |           |
| Any other |                                                       |     |    |         |           |

44. Who is responsible for the policy making for the digitisation project?

Head of the institution

Digitisation project committee

Funding agency

Any other.....

45. Do you think good written policies will help the digitisation project?

Yes  No

46. If Yes, please mention to what extend?

Easy going of the project

Take good decision at tough time

Completion of tasks in the correct time

Avoid misunderstanding

Any other.....

47. If No, Please mention the problems.

Policies are not essential for the project

Policies are rigid

Policies will complicate the decision making

Lagging of project

Policies will not corporate with the digitisation activities

Any other.....

48. Do you follow any established standards for your digitisation project?

Yes  No

49. If yes, please indicate

| Sl. No.   | Activity                                                        | International | National |
|-----------|-----------------------------------------------------------------|---------------|----------|
| 1.        | Selection of hardware and software                              |               |          |
| 2.        | Scanning resolution                                             |               |          |
| 3.        | Digital image format                                            |               |          |
| 4.        | File format used                                                |               |          |
| 5.        | Cataloguing of digitised materials                              |               |          |
| 6.        | Metadata creation                                               |               |          |
| 7.        | Selection of storing/ preservation equipment for digitised item |               |          |
| 8.        | Selection of preservation strategy                              |               |          |
| Any other |                                                                 |               |          |

50. If No, What is the reason?

Lack of knowledge about the standards

Standard are not needed

Internal/institutional standards used

Any other.....

51. Is there any collaboration with other organisations to develop the digitisation project?

Yes  No

52. At what level does collaboration take place?

International  National  Regional

53. With which organisations does this collaboration take place?

Academic/ public/special libraries  Other archives

Private institutions  Government institutions

Any other.....

54. How does the collaboration work?

Equal partnership  Buying services and products

Exchanging product and experts  Offering services commercially

Any other.....

55. What are the benefits of collaboration?  
 Sharing of resources   
 Sharing of experts   
 Avoid duplication of effort   
 Any other.....
56. How did you store the digitised material  
 Institution server   
 On local computer hard disk   
 Any other.....

**PART G - ACCESS AND SECURITY OF DIGITISED COLLECTION**

57. If a document is digitised, is access still allowed to the original?  
 Yes  No
58. After digitisation, what is the demand for access to original materials?  
 Increased  Decreased  Remained about the same
59. Do you have a digital library for cultural heritage collection?  
 Yes  No
60. If yes, which type of browsing and searching options are used?  
 Author  Title  Subject  Keyword   
 Other.....
61. Where are the digitised materials of your institution available?  
 Only in institution intranet  Restricted access through website   
 Whole globe through digital library  No access   
 Any other.....
62. Do users have to pay to use digitised material?  
 Yes  No
63. What are the options that the users are allowed to do with the digitised material?  
 Reference service  Make printouts   
 Downloading facilities   
 Publication of heritage records  Other services
64. Is there sufficient demand for a digitised product from the users?  
 Yes  No
65. Is any copyright material digitised?  
 Yes  No
66. Do you apply network & system security measures for the safety of your digitised materials?  
 Yes  No

67. If yes, what are the safety measures applied?
- Security software firewalls, filtering routers, (encryption & decryption measures on the data
  - Data security through keeping backup of digital contents in case of any disaster
  - Access to digital content by providing password or IP based access
  - Design administrative back-end control system for digital library
  - Design an appropriate digital library usage policy and usage guidelines for the online users

**PART H - Challenges of Preservation**

68. What are the major challenges of preservation of documentary heritage collection in your institution?

| Sl. No.   | Challenges                           | Strongly Agree | Agree | Disagree | Strongly Disagree | No response |
|-----------|--------------------------------------|----------------|-------|----------|-------------------|-------------|
| 1.        | Lack of funding                      |                |       |          |                   |             |
| 2.        | Lack of skilled/trained manpower     |                |       |          |                   |             |
| 3.        | Lack of preservation policy          |                |       |          |                   |             |
| 4.        | Inadequate infrastructure facilities |                |       |          |                   |             |
| 5.        | Technical problems                   |                |       |          |                   |             |
| 6.        | Copy right and other legal issues    |                |       |          |                   |             |
| 7.        | Technological obsolescence           |                |       |          |                   |             |
| Any other |                                      |                |       |          |                   |             |

69. How would you address the problems of digitisation of cultural heritage resources?
- Establish a legal framework for preservation of documentary heritage resources.
  - Government should increase financial and technical assistance for the preservation of documentary heritage resources
  - Copyright laws for documentary heritage resources should be liberal.
  - Library schools should include the traditional and digital preservation techniques in their curriculum
  - Increase the collaboration between institutions holds documentary heritage resources

Build regional/ national digital repository for documentary heritage resources.

Provide continuous training to the professionals on traditional and digital preservation techniques.

Any other.....

70. Please mention your valuable suggestions

.....  
.....

**THANK YOU**



**APPENDIX C**  
**SCHEDULE**

(For the staffs working in cultural institutions)

**Preservation of Documentary Heritage Collections: A Study of Selected Cultural Institutions in Kerala**

Dear Sir,

I am a research scholar in the Department of Library and Information Science at the University of Calicut. As part of my doctoral programme, I have to conduct a study on “**Preservation of Documentary Heritage Collection: A Study of Selected Cultural Institutions in Kerala**”. I am so grateful that you have been selected to participate in the study. I assure you that the information provided by you will treat with the highest level of confidentiality and will be used only for the academic purpose.

DHANYA T K, Research Scholar  
DLISc, University of Calicut

(Kindly answer the questions. Most of the questions require only tick [✓] marking. Kindly tick [✓] multiple answers whenever necessary. Please write the answer also where spaces have been provided.)

**PART A – PROFILE OF THE STAFF OF CULTURAL INSTITUTIONS**

1. Personal details

|    |                                                   |                                        |                                             |                                                                              |                                      |
|----|---------------------------------------------------|----------------------------------------|---------------------------------------------|------------------------------------------------------------------------------|--------------------------------------|
| 1. | Gender <input type="checkbox"/>                   | Male <input type="checkbox"/>          | Female <input type="checkbox"/>             |                                                                              |                                      |
| 2. | Age <input type="checkbox"/>                      | Below 30 <input type="checkbox"/>      | 30-50 <input type="checkbox"/>              | Above 50 <input type="checkbox"/>                                            |                                      |
| 3. | Profession <input type="checkbox"/>               | Librarian <input type="checkbox"/>     | Teacher <input type="checkbox"/>            | Research / <input type="checkbox"/><br>Project/<br>Preservation<br>assistant |                                      |
| 4. | Mode of<br>appointment <input type="checkbox"/>   | Permanent <input type="checkbox"/>     | Adhoc/Contract<br><input type="checkbox"/>  |                                                                              |                                      |
| 5. | Experience <input type="checkbox"/>               | Below 10 <input type="checkbox"/>      | 10-20 <input type="checkbox"/>              | More than 20 <input type="checkbox"/>                                        |                                      |
| 6. | Highest<br>qualification <input type="checkbox"/> | Graduation <input type="checkbox"/>    | Post-graduation<br><input type="checkbox"/> | PhD <input type="checkbox"/>                                                 | Post-doc<br><input type="checkbox"/> |
| 7. | Type of<br>Institution <input type="checkbox"/>   | Government<br><input type="checkbox"/> | Autonomous <input type="checkbox"/>         |                                                                              |                                      |

**PART B: KNOWLEDGE AND PRACTICAL ABILITIES OF STAFF IN THE PRESERVATION OF DOCUMENTARY HERITAGE COLLECTION**

2. What is your knowledge in the meaning and importance of documentary heritage collection

| Statements                                                            | Perception of Staff in their Knowledge in the Meaning and Importance of Documentary Heritage Collection |               |         |               |           |
|-----------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------|---------------|---------|---------------|-----------|
|                                                                       | Excellent                                                                                               | Above Average | Average | Below Average | Very Poor |
| Knowledge of meaning and importance of documentary heritage resources |                                                                                                         |               |         |               |           |

3. What is your knowledge and practical ability in managing traditional/basic preservation methods?

| Statements                                                                                                                                  | Perception of Staff in their Knowledge and Practical Abilities in Managing Traditional/Basic Preservation Methods |               |         |               |           |
|---------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------|---------------|---------|---------------|-----------|
|                                                                                                                                             | Excellent                                                                                                         | Above Average | Average | Below Average | Very Poor |
| Knowledge of traditional or basic preventive methods for the preservation of documentary heritage resources                                 |                                                                                                                   |               |         |               |           |
| Knowledge and practical ability to apply fumigation, insecticides, natural repellents, de-acidification, environmental control, oiling etc. |                                                                                                                   |               |         |               |           |
| Practical ability to do the work of binding, minor repairs etc                                                                              |                                                                                                                   |               |         |               |           |

4. What is your knowledge and practical ability in developing digitised content of their documentary heritage collection?

| Statements                                                                                                                                                         | Perception of Staff in their Knowledge and Practical Abilities in Developing Digitised Content of their Documentary Heritage Collection |               |         |               |           |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------|---------------|---------|---------------|-----------|
|                                                                                                                                                                    | Excellent                                                                                                                               | Above Average | Average | Below Average | Very Poor |
| Knowledge of digitisation of documentary heritage resources                                                                                                        |                                                                                                                                         |               |         |               |           |
| Ability to define criteria for selecting documentary heritage resources for digitization                                                                           |                                                                                                                                         |               |         |               |           |
| Ability to select and use scanners and related software of specific standards to develop digital content from documentary heritage resources with high resolution. |                                                                                                                                         |               |         |               |           |
| Ability to identify and solve intellectual property, copyright and licensing issues of digital content                                                             |                                                                                                                                         |               |         |               |           |

5. What is your knowledge and practical ability in managing digitised content

| Statements                                                                     | Perception of Staff in their Knowledge and Practical Abilities in Managing Digitised Content |               |         |               |           |
|--------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------|---------------|---------|---------------|-----------|
|                                                                                | Excellent                                                                                    | Above Average | Average | Below Average | Very Poor |
| Ability to define policies for the digitisation and accessing digital content. |                                                                                              |               |         |               |           |
| Knowledge on various international, national standards using in digitisation   |                                                                                              |               |         |               |           |
| Ability to use various image editing and image processing software             |                                                                                              |               |         |               |           |

|                                                                                                                                    |  |  |  |  |  |
|------------------------------------------------------------------------------------------------------------------------------------|--|--|--|--|--|
| Ability to apply OCR software to digital content                                                                                   |  |  |  |  |  |
| Practical ability to assign metadata and standards to made a searchable digital content                                            |  |  |  |  |  |
| Practical ability to select and use appropriate storage devices for preserving digital contents like DVD'S, CD-ROM, hard disk etc. |  |  |  |  |  |
| Knowledge of different file formats like tiff, pdf, xml, gif used for digital content                                              |  |  |  |  |  |
| Knowledge and use of indexing language vocabulary                                                                                  |  |  |  |  |  |

6. What is your knowledge and practical ability in organising digital preservation

| Statements                                                                                  | Perception of Staff in their Knowledge and Practical Abilities in Organising Digital Preservation |               |         |               |           |
|---------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------|---------------|---------|---------------|-----------|
|                                                                                             | Excellent                                                                                         | Above Average | Average | Below Average | Very Poor |
| Ability to plan budget and funding for digitisation project                                 |                                                                                                   |               |         |               |           |
| Ability to manage technical issues during digitisation and digital preservation             |                                                                                                   |               |         |               |           |
| Ability to design strategies to ensure the quality of digitised content                     |                                                                                                   |               |         |               |           |
| Ability to cope all type of challenges related to the digitisation and digital preservation |                                                                                                   |               |         |               |           |

7. What is your knowledge and practical ability in protecting the digitised content

| Statements                                                                                    | Perception of Staff in their Knowledge and Practical Abilities in Protecting the Digitised Content |               |         |               |           |
|-----------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------|---------------|---------|---------------|-----------|
|                                                                                               | Excellent                                                                                          | Above Average | Average | Below Average | Very Poor |
| Knowledge of network & system security and security software for protecting digital content   |                                                                                                    |               |         |               |           |
| Knowledge of data security through keeping backup of digital contents in case of any disaster |                                                                                                    |               |         |               |           |
| Knowledge to protect access to digital content by providing password or IP based access       |                                                                                                    |               |         |               |           |
| Knowledge to design administrative back-end control system for digital library                |                                                                                                    |               |         |               |           |

8. What is your knowledge and practical ability in disseminating and evaluating digitised content

| Statements                                                                         | Perception of Staff in their Knowledge and Practical Abilities in Disseminating and Evaluating Digitised Content |               |         |               |           |
|------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------|---------------|---------|---------------|-----------|
|                                                                                    | Excellent                                                                                                        | Above Average | Average | Below Average | Very Poor |
| Knowledge and practical ability to use various digital library software            |                                                                                                                  |               |         |               |           |
| Ability to publish a digital library for documentary heritage resources            |                                                                                                                  |               |         |               |           |
| Ability to manage all digital library services and digital library equipment       |                                                                                                                  |               |         |               |           |
| Ability to develop effective information retrieval mechanism for digital libraries |                                                                                                                  |               |         |               |           |

9. What is your practical ability in managing human resource for preservation project?

| Statements                                                                     | Perception of Staff in their Knowledge and Practical Abilities in Managing Human Resource for Preservation Project |               |         |               |           |
|--------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------|---------------|---------|---------------|-----------|
|                                                                                | Excellent                                                                                                          | Above Average | Average | Below Average | Very Poor |
| Ability to manage staff for preservation activities                            |                                                                                                                    |               |         |               |           |
| Ability to train staff and users for the creation and usage of digital content |                                                                                                                    |               |         |               |           |

10. What are useful methods to develop the traditional and digital preservation skills?

- a)  Online training programs and tutorials
- b)  In-house training programs in between job
- c)  Library schools should offer short courses on traditional and digital preservation
- d)  Library schools should include practical methods of traditional and digital preservation in their curricula
- e)  Professional associations should arrange workshops/training courses
- f) Any other.....

11. Please mention your valuable suggestions

.....

.....

.....

Thank you

## LIST OF PUBLICATIONS

### Journal Papers

- Dhanya, T. K. & Vasudevan, T. M. (2018). User's attitude towards digitised collection of Kerala Sahitya Akademi Library. *International Research: Journal of Library & Information Science*, 8(1), 135-143. <https://irjlis.com/users-attitude-towards-digitised-collection-of-kerala-sahitya-akademi-library/>
- Dhanya, T. K. & Vasudevan, T. M. (2018). A study on preservation practices followed by the selected libraries in the Kannur district of Kerala. *Journal of Library and Information Technology*, 14(2), 15-23.

### Conference Papers/Chapters in Books

- Dhanya, T. K. & Vasudevan, T. M. (2019). Digitization of cultural heritage collection: a special reference to Kerala sahitya akademi digital library and information system. In K. Mohammed Haneefa & T. M. Vasudevan ( Ed.), *Innovations and transformations in libraries (pp.167-184)*. Department of Library and Information Science, University of Calicut.
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