CHAPTER 1

INTRODUCTION

1.1 PREAMBLE

Developments in the Information and Communication Technology have made profound changes in each and every field termed as computer revolution, information revolution, communication revolution, Internet revolution, multimedia revolution, binary age, information age, information society, information superhighway and digital age. The changes are evident all over the world and its effects being felt in every walk of life and in every field of knowledge.

Information and Communication Technology has changed the modern day libraries as compared to traditional libraries. The conventional / traditional libraries that houses printed books, manuscripts and libraries store information within a constrained physical space have given way to digital information store houses. These digital information integrated data resources around the globe through the effective use of Information and Communication Technology, without much straining the financial resources. The emergence of Internet and wide availability of affordable computing equipment have created feasibility on digital / electronic library and facilitates tremendous growth and interest in the digital library concept.

In the changing environment, every library grows in terms of reading material, equipment, space, staff, readers, etc. The library and information scenario is changing at a dynamic pace, there is a paradigm shift from print media to web media, from ownership of documents to access to information, intermediary to end user model of services and from location of specific libraries to digital / virtual / hybrid libraries. Similarly, there is a change in the needs and interests of the readers. Hence, the role of library and information professionals has also changed
dramatically. To meet the current requirements, library professionals must be able to perform various tasks coping up with the changes in technological environment.

Academic libraries for centuries have played important role in supporting research in all subjects and disciplines within their host universities and colleges. But the last decade has brought a sea change in relationships between researchers and libraries. Information and Communication Technology enabled products and services and the availability of online information resources have changed the way the services academic institutions and libraries now provide to their researchers. Information and Communication Technology is the integration of computer and communication technology used to process, store and disseminate information. It has changed the traditional practices of library and information centres in delivery of services to the end users. Now researchers can have access to a variety of information and scholarly journals online. It also helps the researchers to access, manage, integrate, evaluate, create and communicate information more easily than ever. Significant developments in Information and Communication Technology have forever changed the way information is gathered, processed and disseminated. While processing, storage and retrieval facilities are provided by computers, telecommunications provide the facilities for the transfer or communication of data or information.

1.2 UNIVERSITY

University present a major contribution in the growth of human resources, it is the centre of learning for higher education which imparts, instruction at graduate, post graduate levels and provides facilities and infrastructure for research and specialisation.

The university has been described by Karl, Jasper as “A community of scholars and students, engaged in the task of seeking truth.”
According to Wilson and Tauber⁴ “The university functions as the conservation of the knowledge and ideas teaching, research publication extension service and interpretation”.

1.2.1 Objectives of University

The university makes the substantial contribution to the advancement of knowledge i.e research at various levels, it serves as the training ground for those who came on investigation in government, industry, the service and other fields. If the university is concerned with search for truth, extension of knowledge, enrichment of minds and training, the demands on the library will reflect the university attitude towards their aims.

The basic objectives of a modern university are as follows:

- Conservation of knowledge and ideas massed from time immemorial.
- Dissemination and communication of this knowledge and idea through teaching publication and extension services.
- Expansion and extension of the boundaries of the existing knowledge by research through teachers and research scholars.
- Production of manpower for various professions by imparting technological and professional education.
- Transforming a student to mature as a person and as a student.
- Interpretation of the result of research and investigation conducted by the university to the society in different ways.

1.2.2 University Library

A university library is the heart of a university. Dr Shankar Dayal Sharma, late President of India, while inaugurating the Eighth World Book Fair on 5 February 1988 in New Delhi, said, “A library is more important than a university because a library can function without a university whereas a university cannot
function without a library". Lenin emphasized the importance of libraries by stating that, "without libraries and without an efficient use of books by readers there can be no cultural revolution". The library is the heart of a university that actively performs the activities related to learning and teaching, research and generation of new knowledge, dissemination of research results and conservation of knowledge and ideas along with the extension of services.

1.2.3 Objectives of University Library

Accumulating and organising books, manuscripts, journals and other materials by university libraries serve as an invaluable in the conservation of knowledge and ideas as an active force in the teaching, research and extension programmes of the university.

The university library has following objectives:

- It builds up a need based balanced and up-to-date collection of reading materials to serve as a reservoir of information.

- It organizes the collection and creates control system so that it can be made use of quickly and conveniently.

- It circulates reading materials among the readers for use outside the library.

- It provides personal help to the user so that they are able to make optimum use of the resources of the library without any difficulty.

- It provides the users the bibliographic translation and reprographic services and this helps their in the research activities.

- As a part of the university setup, it supports the teaching research and extension programmes of the university through various ways.
1.2.4 University Libraries in Digital Era

Advent of Information and Communication Technology (ICT) and its use in library operations has changed information needs and behavior of the users especially looking to have the information in the multidisciplinary and multi-lingual nature, change in the mindset of the authorities both at national and university levels thereby changed perception and image of the library and that has resulted into the setting up of high power committees and commissions to improve upon the library collection and services, change of work environment such as teamwork, job sharing, telework, outsourcing, staff downsizing and reengineering among others. These developments have necessitated the acquirement and development of new skills in librarianship along with the adequate knowledge of the use of ICT tools.

- Identification, assessment and evaluation of the information needs of the readers.
- Need based collection development and collection building.
- Analyse, evaluate and organise information contents of various types of sources as a content Manager.
- Marketing LIS products and services to promote the underutilised information resources and enhancing the use of library resources and services.
- Consolidation and repackaging of information products and services in a fashion that suits and meets the information hunger of the library readers
- Intranet and Internet potentiality be used extensively by organising training sessions, information literacy programmes.
- Developing the e-learning modules and train the staff and the readers to make use of these for their research and development activities.
Establish or participate in the library consortium for mutual benefits, especially in the area of journals subscription through electronic environment and for this develop the skills of negotiation while signing the contracts with information providers having adequate knowledge about licensing and other legal arrangements for access to digital resources.

1.2.5 Dynamic Tasks of University Librarian in Digital Era

The basic aim of the university library is to support the aims and objectives of the university, for which the university librarian should have a clear cut understanding of the information needs and requirements, both current and prospective. This involves understanding the structure of the university, its functions, its mission and its several departments engaged in teaching and research. In the changing environment, the job of selecting documents is becoming complex because of various reasons such as information explosion, regular exclusion in price of publications, multi-facet nature of information resources, multi-disciplinary approaches of the users, different electronic format of the documents, etc. Since, university libraries are also switching over to electronic information resources, there is a need to consider several factors carefully.

Singh proposed following points to be considered for this purpose:

- **Contents** - print, CD ROM and online version of a product may have different contents, quality, scope, indexing, referencing and illustrations.

- **Cost** - the cost of each format will vary and may not relate to the quality and scope of the document. One should understand that carefully.

- **Bundling** -"it's a package deal", that is, when one title in electronic form is purchased, one may have also to take a variety of other titles or
modules, "bundled" together as a deal product, whether you need them or not.

- **Full text / abstract / citation** – is full-text database required. If the database does not contain full-text, does it have document delivery option? If not, are the given citations complete enough for placing an order?

- **Coverage** – is the subject area covered adequately? Is the scope clearly stated? What is the retrospective coverage of the database? Is the coverage balanced, if not, are the biases clearly stated? Are there links to further sources of information?

- **Different versions** – are there different versions available for the database and is the information the same in each one?

- **Currency** – how current is the information and how frequently and regularly it is updated? What is the time lag in the print version and in the electronic version?

- **Reliability** – is the information compiled from valid sources? What is the authority?

- **Format** – can documents be viewed and downloaded in a variety of formats?

- **Ease of use** – is it user-friendly or requires end-user training?

- **Support and backup** – what level of support and backup is provided by the producer, online help, support documentation and help desk and training? Is local support available?

- **Free trial** – is a free trial offered to allow a complete evaluation of a product by the users?
- **Terms of license** – restrictions placed on access, downloading and distribution?

- **User behavior** – assessment of user behavior has been treated last, but it is absolutely essential, particularly when moving from print publications to e-resources because user’s ability to search, browse and jump across the titles via hyperlinks in an e-environment is the pre-requisite for such sources.

### 1.3 Changing Dimensions of Libraries

In recent times libraries are shifting their role from the custodian of traditional information resources to the provider of service-oriented digital information resources. The extensive use of computers, increased reliance on computer networks, rapid growth of Internet and explosion in the quality, and quantity of information compelled libraries to adopt new means and methods for the storage, retrieval and dissemination of information.

Library automation, development of digital libraries and application of innovative Information and Communication Technologies (ICT) have exponentially increased because it provides enhanced user satisfaction, cost effectiveness, rapid responses and easier operational procedures. Libraries and Information Centres have been employing ICT and electronic information resources and services to satisfy the diverse information needs of their users. E-journals, CD ROM databases, online databases, e-books, web-based resources and a variety of other electronic means replaced the traditional library resources (Figure 1.1).

All types of libraries are challenged to provide greater information access and improved extensive service, while coping with the pace of technological change and ever-increasing budget pressure. As a result professional librarians must be computer literate and knowledgeable about internet technologies to fully participate in the planning, design and implementation of future library services.
The significant development in the field of Information and Communication Technology (ICT) have created revolutionary changes in all fields of knowledge Libraries, being the reservoirs of knowledge, are not exception to this development. The society and environment around the libraries are changing and getting modified. As a result of information explosion users are getting access to vast and wide amount of information.

In this information explosion era, libraries play a pivotal role in preserving and serving the information requirements of the users. In the present scenario, libraries are the main facilitators in the scholarly communication system. The communicated information has been selected, acquired, processed, stored are retrieved by the library for current use and for prosperity. Therefore, the library is a place where books and other sources of information kept for teaching, learning, research and further extension activities.

Electronic information resources are diminishing the central role of traditional libraries. Libraries need to accept their responsibilities as information
specialists in the new paradigm. Due to information explosion, the traditional library services such as reference service and selective dissemination of information need to be supplemented by selective elimination of information and the evaluation of information to separate quality information from bulk. This change has brought libraries and librarians to the threshold of a new era.

In the changing information environment, the influence of the new Information and Communication Technologies (ICTs) in libraries has converted the concept of library-in-a-desk into a reality. This revolutionary concept, which envisages paperless information system, has brought about drastic changes in library services. The traditional house-keeping operations and services are diminishing day by day, giving rise to modern dynamic library services as libraries without walls, providing access to world information and to the most up-to-date and comprehensive information resources.

1.4 DIGITAL LIBRARY

The advent of digital libraries has changed the role of the library and information Professionals, as well as the required user capabilities. It is therefore important to understand what, in fact a digital library is:

Digital Library, a large global and distributed knowledge repository, which is supported by numerous databases and based on intellectual technology, is a system that provides the users with enormous and organised information and knowledge base that easily search and use. It is mainly a digital system of information source adopted by modern high-tech, which is a large scale knowledge center and convenient for use beyond the time and space limits.10

The digital library has been defined in many ways. A digital library, like any library, is a service that is based on principles of selection, acquisition, access, management and preservation of information resources, meant for a specific client community.11
1.4.1 Genesis of Digital Libraries

The concept of digital libraries is rooted in the age-old dream of creating a virtual library. Among early efforts, one can quote the efforts made by Paul Otlet and his colleagues in 1930s in order to design functions similarly to today's hypertext and hypermedia system\textsuperscript{12}. In 1945 Vannevar Bush\textsuperscript{13} made some efforts to give an idea of connecting the entire human knowledge. He gave a concept of Memex machine, which used a microfilm reading process to retrieve stored information. However, the interest in digital libraries, both scholarly and professional, grew very rapidly only in 1990s. As stated earlier, digital library developments in the USA took place mainly in the course of research led primarily by the computer science community that concentrated on designing and developing technologies for various digital library collection and services. Electronic Library Information Online Retrieval (ELINOR), started in 1992, was the first electronic project in the UK funded by De Mantfort University, the British Library, and IBM, UK\textsuperscript{14}.

Today, there are umpteen numbers of digital libraries worldwide. Some of the important projects at International and National level in India have been highlighted (Appendix E and F).

1.4.2 Types of Digital Libraries

Digital libraries can be grouped in the following ways\textsuperscript{15}

- Digital libraries developed in USA as part of DL11 and DL12 (Digital library initiatives)
- Digital libraries developed in the course of eLib (electronic libraries) Programme in UK
- Digital libraries built by individual institutions
- Digital libraries that are part of National Libraries
• Digital libraries that are part of universities, or by period, or by country of their origin.

1.4.3 Objectives and Functions of Digital Libraries

The primary objectives of Digital Libraries are

• To collect, store, organise and access information in digital form via communication channels.
• To meet the requirements of patrons by providing better services.
• To provide personalised and retrospective services in efficient way.
• To have large digitised databases.
• To save time of library staff by avoiding routine jobs.
• To provide coherent view of all information within a library in any format.
• To serve widely dispersed communities throughout the network.
• To minimise massive storage and space problem of large libraries.
• To reduce cost involved in various library activities.

1.5 DIGITAL RESOURCES

Digital resources may be defined broadly as any electronic journals, magazine, e-zine, webzine, newsletter or type of e-serials publications, which is available over the Internet and can be accessed using different technologies such as www, gopher, FTP, telnet, e-mail or list server etc. E-Journals are the periodicals, regular or irregular moderate unit made available in an e-format either on a static medium or via computer networks. Applying Ranganathan’s Five Laws to the digital resources to this study.
1. Digital resources are for use.
2. Every use his or her digital resources.
3. Every digital resources its user.
4. Save the time of the user.
5. The digital resource is a growing organism.

1.5.1 Types of E-Resources

The e-resources are basically divided in two major types are:

- Online e-resources, which may includes such as e-journal (Full text & bibliographic), e-books, on-line Databases and Web sites
- Other electronic resources may includes such as CD ROM, Diskettes, Other portable computer databases

1.5.2 Types of E-Journals

- Online Journals

   Electronic journals come in many types. Some of them are traditional paper journals simply made available electronically, others are simple selection or just the table of contents of the paper journals and still others have no equivalent paper copies.

- CD ROM Journals

   These are full text journals published and distributed in the form of CD ROM with regular updates, along with search software to access and print. Link online journals, the vast majority of CD ROM based journals are the electronic versions of printed journals e.g.
• Conference proceedings and journals of IEEE
• Conference proceedings and journals of ASME

Kling and Mcklim (1997)\textsuperscript{17} distinguished e-journals into four kinds namely,

• **Pure electronic journals** - Journals whose text originally distributed only in digital form.

• **Electronic Print Journals** - Journals primarily distributed electronically, but may have very limited distributed in paper form.

• **Print Electronic Journals** - Journals primarily distributed in paper form but are also distributed in electronic form.

• **Print + Electronic Journals** - Journals that are initiated with parallel paper and electronic editions that may be widely distributed.

1.5.3 **Electronic Resource Access Types**

The access to e-resources through Internet is prominent because of the inherent advantages of the net over other media such as CD-ROMs and advancement in web technology. The most significant advantage is of wide access and currency of information on the net. However, the types of access are in itself not uniform. The publishers provide the following different types of access mechanism:

a) **Free Access**: On subscribing to the print version of the books, journals, reports, reference proceedings etc., some publishers provide free access to the electronic version of the e-resources.

b) **Fee-based Access**: This is one of the most preferred access mechanisms by both the subscriber and publisher. On the payment of an access fee, which is a certain percentage of the cost of the printed e-resource being subscribed, the publisher provides access to its complete e-holdings. The subscriber will
have to maintain the print level subscription throughout the period of agreement. The access fee percentage in such cases depends on the quantum of print level subscription.

e) **Exclusive subscription:** Institutions can obtain complete access to all the e-journals brought out by the publisher without subscribing to the print counterpart. However, the subscription charges in this case are very high i.e., approximately 90 percent of the print subscription.

d) **Selective Access:** The subscribers choose a maximum number of e-resources from the publisher and pays for them as per agreed terms and conditions. The publishers because of the difficulties in their administration do not favour this type of access.

e) **Institution Vs Consortium Access:** Institutional access of e-journals is expensive and not many institutions and organisations can afford to subscribe to e-journals, particularly in developing countries. In consortia access, a few institutions that have common interest’s ad requirements can form consortia for e-journal access. This would be an economic model for wider accessibility and develop a strong information base.

### 1.5.4 Benefits and Impact of Digital Resources

The tremendous growth of knowledge and information explosion has posed challenge in procuring, organising and disseminating information for librarians and actual users. With the help of modern information technology and communication technology, libraries and information centers can render their services and also respond to the needs of the readers. Several factors like training of library professional, funds, information policies, modern information technologies also have been taken care of. The following are the expected benefits:

1. Immediate accesses to high demand and frequently used items.
2. Easier access to individual components within items (e.g. articles of journals)
3. Access at multiple points in time (24 hours a day, 7 days a week) and to multiple simultaneous users.

4. The ability to reinstate out of print materials.

5. The potential to display materials that are on in-accessible formats, for instance large volumes or maps.

6. Virtual reunification allowing dispersed together.

7. Ability to enhance digital image in terms of size, sharpness, color, contrast, etc.

8. The potential for integration into teaching materials.

9. Enhanced search ability, abstract and full text.

10. Integration of different media (sound, video etc).

11. Reducing the burden or cost of delivery.

1.5.5 Library Networks and Consortia

The ICT has facilitated the libraries all over the world to establish networks for resource sharing. Further, the emergence of e-journals has forced libraries to opt journals subscription in the electronic format due to variety of reasons. One of the reasons for opting subscription of e-journals through library consortium is the best possible bargaining of the prices and saving attractive segment of money in comparison to the subscription in the print format. Government of India consented University Grants Commission (UGC) to allow its organ, INFLIBNET, to establish a library consortium namely ‘UGC-INFONET’ Digital Library Consortium. This consortium is providing access facilities to e-journals and databases to majority of the university libraries in India. INFONET has helped libraries meet their user’s diverse information needs (Appendix D).
The Consortia in India could be categorised under the following:\textsuperscript{18}:

- **Open Consortia**: This type of consortia is very flexible and it is the wish of members of consortia to join and leave at any time when they please. e.g. INDEST Consortium

- **Closed Group Consortia**: It is within defined group either by affiliation and collaboration, among them like CSIR, DAE, IIM Consortium and the formation and operation of the consortia guidelines and its administration are fairly simple and easy.

- **Centrally Funded Consortia**: In this model, consortium will solely depend on the parent body, usually a Government Agency. e.g. INFONET by UGC, ICMR,CSIR.

- **Shared-Budget Model**: In this model, the participating libraries take the lead and form the consortium. e.g. IIM and FORSA

- **Publisher Initiatives**: The Consortium for Emerald Full text Library (published by the Emerald Publishing Group) is recent example. Here, consortium members will get deep discount price to the participating libraries. Few of the INDEST members have joined the Open Consortium offered by Wiley to get cross access to resources.

- **National Consortium**: The significance of this model is national level licensing of products, as in INDEST and UGC INFONET

### 1.5.6 Digital Library Initiatives in University Library

Creating a digital library is the latest phenomenon being observed and advocated by the group of librarians, especially the librarians working in the academic environment. Digital technology has become the answer to the problems of preservation add new life to rare, brittle and fragile documents in addition to its potentialities of providing access to information speedily, accurately and efficiently. The philosophy of library cooperation and resource sharing is executed in best possible manner through the digital technology as it enables creation of networked libraries.
The big university libraries like University of Delhi, Jawaharlal Nehru University, Jamia Milia Islami, IGNOU and many more in India have already started positive efforts in creating a digital library of their own and having the mission to put their resources in the Web enabled environment to provide access to their resources from anywhere in the world in 24x7 environment. Greenstone Digital Library, E-prints Archives and DSpace are the popular software used by these libraries.

1.6 PROPOSED RESEARCH / NEED FOR THE STUDY

The digital environmental encompasses a wide range of digital technologies, such as computers, information networks (internet, World Wide Web and intranet), hardware and software application. A digital material has altered the ways in which the academic activities teaching, learning, research and extension activities are carried out at higher education level. It has helped to overcome the barriers of time, space and reduced the time lag between the generation of information and its utilisation by the end user. University library, as a subsystem of higher education should act as a trend setter in adopting digital infrastructure and its activities.

The design and development of digital libraries at university level is in infancy stage. Ofcourse efforts are being made and a few universities are in the process. Full fledged automation is most of the universities in Tamil Nadu are yet to be seen. The UGC and AICTE are providing necessary funds to build infrastructure. Added to this, the UGC Infonet and INDEST-AICTE are offering access to a wide variety of e-resources. Under these circumstances, it is necessary to make a systematic investigation about the current situation on the digital library infrastructure in the university libraries in Tamil Nadu.

On review of literature, only a few studies conducted on the digital library initiatives at local, institutional and state level pertaining to Engineering Educational Institutions. However there is no single study on the university libraries in Tamil Nadu.
Therefore in this study attempt has been made to identify the availability of digital library infrastructure facilities, digital materials, digital library hardware and software, digitisation methods are essential to have a fair amount of information on various processes which are available in the university libraries of Tamil Nadu.

1.7 STATEMENT OF THE RESEARCH TITLE

"Digital Library Infrastructure and Facilities in the University Libraries of Tamil Nadu: An Analytical Study".

1.7.1 Explanation of the Concepts in the Title

The diagrammatic representation of statement of the study shown in Figure 1.2 provides brief methodology of approach

a) Digital Library

A digital library is a library in which collections are stored in digital formats (as opposed to print, microform, or other media) and accessible by computers. The digital content may be stored locally or accessed remotely via computer networks.

b) Digital Infrastructure

The information revolution determined change in academic settings and Digital Infrastructure (DI) became the supporting tools that revolutionise the information. In fact digital infrastructure became a fundamental and developmental tool for shaping the academic system more efficient and accessible. Infrastructure has many means. Infrastructure is physical components (hardware and software), various equipments such as scanners, communication networks, etc. Digital library infrastructure requires specialised skills and expertise to handle and manage these effectively. Strategic investments in computer and communication can significantly benefit enterprises, which will have the immediate effect of making the country more competitive. Today, the influence of digital infrastructure facilities on academic library system is creating digital environment for users to access, avail, read and share resources, experiences and best practice.
DIGITAL LIBRARY INFRASTRUCTURE AND FACILITIES IN THE UNIVERSITY LIBRARIES OF TAMIL NADU

Nature of Management
- State Universities
- Deemed Universities

Domains
- Arts & Science
- Engg & Tech
- Medical
- Multiple
- Others

Figure 1.2 Explanation of the Concept
c) University Library

Universities, the higher education institutions, serve as research centres and contribute significantly to innovation and technical change and provide access to basic information materials in the print and non-print form in specialised fields. The success of these libraries depends upon the resources, facilities and services they had in universities libraries in the digital environment. The establishment and maintenance of a resource rich library with need based facilities and services are the important prerequisites for universities. The libraries have to develop the attitude of competitiveness in providing the information to the users at their affordable way.

d) Universities in Tamil Nadu

At present there are 53 universities in Tamil Nadu. The study covers all the 53 universities libraries in Tamil Nadu. The first and foremost university is University of Madras, was established in 1857, which was the only university for composite Madras state. Madurai Kamaraj University was the second affiliated university established in 1966 in Tamil Nadu. The impact of universal and liberalisation of education brought more number of deemed universities established, especially in engineering, technology, and medicine disciplines. However, all the universities generally fall into the following three categories, based on their organisational structure of University Grants Commission (UGC):

(i) Affiliating universities, having university departments, constituent and affiliated colleges, with single or multiple campuses;

(ii) Unitary universities having university departments and constituent colleges, with single or multiple campuses;

(iii) Deemed universities, mostly of the unitary type and having distributed Campuses. At present, conventional or affiliated universities form a significant segment of the university system in Tamil Nadu.
1.8 OBJECTIVES

The following are the objectives of the study:

1. To survey the state-of-the-art of university libraries in Tamil Nadu.
2. To identify the computer infrastructure facilities of various university libraries in Tamil Nadu.
3. To identify the nature and quantum of digital materials available in the university libraries of Tamil Nadu.
4. To examine the mode of access to digital resources and networking facilities in the libraries under survey.
5. To identify the digitisation methods and processes adopted in the libraries under survey.
6. To identify the problems / challenges in digitisation and creating digital library.

1.9 HYPOTHESES

The study proposed the following hypotheses:

1. There exists willingness on digitisation among the university libraries.
2. There is a significant difference in the hardware and software facilities among the university libraries.
3. There exist variations in the digital collection among the university libraries in Tamil Nadu.
4. There exists the technological difference among the university libraries on networking and internet connectivity.
5. There exists a facility for data capturing, digital conversion and preservation of digital materials among the university libraries.

6. There exists hurdles / problems / constrains in the development of digital library.

1.10 LIMITATIONS

The following are the limitations to the study:

- This study excludes NIT’s and IIT’s.
- Universities which are functioning as examining bodies are not considered.

1.11 SIGNIFICANCE OF THE STUDY

The study is significance on the following aspects:

- Provides the State-of-the-art of university libraries in Tamil Nadu
- Highlights the availability of online resources, digital library hardware and software used, networking facilities, Internet connectivity, digitisation methods among the different domains of universities.

1.12 METHODOLOGY

Methodology refers to the processes, principles and procedures by which one approaches a problem to seek solutions. The researcher adopts certain techniques and procedures for studying a research problem, which are enumerated in the methodology.
Step 1: Review of Literature

The literature on digital library, digital materials, on-line resources, digital library hardware and software, digital library access/architecture, digitisation materials, method, resources, reasons, challenges has been examined and reviewed, which facilitated the construction of questionnaire.

Step 2: Questionnaire Construction

Based on the review of literature, a structured questionnaire has been designed to collect data form the university libraries. The questionnaire covers information on the following aspects:

Section A : Profile of the University
Section B : About the University Library
Section C : Availability of Information and Communication Technology (ICT) in the Library
Section D : Digital Library
Section E : Types of Scanners and formats
Section F : Digitisation

Step 3: Pilot Study

A pilot study was conducted with a sample of 9 university libraries of Tamil Nadu from different domains of universities. Based on the study and results, the questionnaire was further modified and developed to suite the stated objectives. Accordingly, the revised questionnaires were finally administered among the universities libraries in Tamil Nadu.

Step 4: Administration of the Questionnaire

The revised questionnaire was administered among 53 universities such as Arts and Science Universities, Engineering and Technology Universities, Medical
Universities, Multiple domain Universities and other Universities in Tamil Nadu. A total of 48 university libraries have responded and response rate is 90.57 %.

1.13 DATA ANALYSIS

The data collected from the questionnaire have been analysed and interpreted to test the hypotheses framed and to fulfill the stated objectives. For this purpose Statistical Package for the Social Sciences (SPSS) software has been used. The statistical analysis techniques such as Frequency Distribution, Percentage Analysis, Standard Deviation, Weighted Arithmetic Mean, Cluster Analysis, Chi-square etc., have been employed depending on the nature of the data collected from the respondents.

1.14 CHAPTERISATION

The thesis has been presented in five chapters:

Chapter 1 highlights the need for the study, proposed research, objectives, hypotheses, limitations, significance of the study and methodology adopted in the study.

Chapter 2 deals with a review of related literature.

Chapter 3 covers the brief note on the growth and development of higher education and state-of-the-art of university libraries in Tamil Nadu.

Chapter 4 presents the analysis and interpretation of the data collected through questionnaire about the digital library, digital materials, on-line resources, digital library hardware and software, digital library access / architecture, digitisation materials, methods, resources, reasons and challenges in the study area.

Chapter 5 provides a summary of major findings, observations, suggestions and areas for further research.

The thesis concludes with a list of bibliographic references and appendices.
REFERENCES


