

**Economical Affect of Digital Resources And  
Digitization In University Libraries**

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**Nitya Publications**

First Edition 2023

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ISBN: 978-93-5857-231-5

DOI : <https://doi.org/10.65651/NP.9789358572315.2023.1-176>

Price : Rs. 400.00

Published & Printed by:  
Nitya Publications, Bhopal MP India  
Web: [www.nityapublications.com](http://www.nityapublications.com)  
Email: [info@nityapublications.com](mailto:info@nityapublications.com)  
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## Preface

Correct information to the accurate user at the correct time has been the aim of information professionals. Recent developments in information and communication technologies, especially the Internet, information and communication technology and web-based technology, have brought important variations in the ways to create, allocate, and use rights. Everyone has been using printed document sources for a long time, which are made available to us by the efficient efforts of publishers, librarians and information scientists. One of the important applications of information technology is the digitization of knowledge documents. The printed information is converted to digital form. Digitization has changed the whole scenario of information in the world. Digital resources are quick to access, save time and keep up-to-date with the current information in specific fields and related areas. As going digital is the need of the hour to keep the environment healthy and safe. Various organizations are involved in digitization their material because they remain influenced by the enduring value of such resources for learning. Digitization also raises the reputation of the institutions as global users can know the institutional collections and utilize them. Finance is important for the effective functioning of the Library. Efficient library performance is directly related to adequate funds. The financial constraints result in an ineffective library. Proper financial management leads to the preparation of a budget that management of funds in a cost-appropriate manner. In libraries, if funds are managed properly, good-quality reading materials can be acquired and quality services can be offered.

The library happens to be the nucleus of digital resource centers, which support the learning, teaching and research needs of the user and research scholar communities by providing access to scholarly literature through various digital resources. Growth and change have always been predominant characteristics of the libraries. In the present time, adoptions of information technology have compelled the library to be dependent upon digital materials that could be collected through the Internet. Libraries have witnessed a great metamorphosis in recent years for digital resources. The library is the heart of a university. Now the University library is called the Knowledge Resource Center. The present book is found important and needed in identifying and uncovering the information needs, access methods and patterns, financial sources, expenditure on E-Resources and Digitization, extent of use of digital resources and digitized documents among University

libraries in Maharashtra. This book may help the University library management and librarians design an effective, efficient and meaningful information system for their users with minimum cost. It examines the level of effort taken by the Universities libraries among Maharashtra in the Economical affect of digital resources and digitization.

The first chapter includes an introduction to digital resources, digitization, and library finance. The second chapter includes types of digital resources, advantages of digital resources and digitization, the need for digital resources and digitization, the process of digitization, the development of digital resources and digitization, and users of digital resources. The financial sources of University libraries in this chapter include historical background and the current status of University Libraries in Maharashtra. Library budget, sources of funds and financial management of University libraries in Maharashtra. The fourth chapter includes the development of the university library regarding the growth of collections, users, infrastructure, digital resources, and digitization in Maharashtra. Financial development and budget allocation in the University libraries in Maharashtra are also discussed in this chapter. Data collected during the research work is analyzed and interpreted to fulfill the objectives of the research and to prove the hypothesis. Chapter five consists of the principal findings and conclusions drawn from the data collection.

**Dr. Sachin Abaji Borde**

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# 1. INTRODUCTION

## 1.1 Preamble:

Information professionals have made it their mission to provide reliable information to the right user at the right time. The creation, distribution, and usage of rights of entrance and use have undergone significant changes as a result of recent advancements in information and communication technologies, particularly the Internet. Web-based technology helps to minimize issues in accessing information quickly.

We have long used printed document sources that are made available to us by the diligent work of information scientists, publishers, and libraries. However, as information technology has advanced, several steps have been made to reduce work by providing information quickly. Digitizing knowledge documents—converting printed material into a digital format—is one of the key uses of information technology. The universe of information has completely changed as a result of digitization.

The library is the hub of an organization that provides its research scholars with advanced communication tools to spread knowledge. The primary purpose of the library is to satisfy the information needs of its patrons by giving accurate information to the right person or reader at the right time in an appropriate manner. In order to support students and researchers, a university library must obtain and make accessible databases for instruction and research (Devi and Singh, 2004). The nation's industrial, cultural, educational, social, and economic developments are all significantly influenced by the library. The library is a benefit to the organization since it has enough resources and is organized in a way that makes using them simple and pleasant. By making efficient use of its library resources, the education sector may raise the bar both nationally and internationally. Knowledge is the driving force behind human progress, and the future library could be seen as a means of preserving the existing flow of knowledge (Shera, 1987). Libraries have a long history dating back to the dawn of humanity. Libraries were thought of as knowledge repositories where users could not directly access the resources and where books were kept under lock and key. The resources were only available to the users upon request. The organization and operation of libraries have evolved over time from closed to open access, giving patrons direct access and the flexibility to choose the reading material that best suits their information needs. According to Sharma and Vishwanathan (2001), a library is traditionally a place where books, journals, manuscripts, musical scores, and other literary and creative materials are preserved for use rather than for sale. Using the conventional

library system, the library obtains the reading material in print form. Following processing, the material is made available to the public. Every discipline has a rapidly expanding body of literature, but the sciences and technology have particularly rapid growth. It can be challenging for a user to stay up to date on the most recent advancements in the area of interest inside a typical library system. Since 1970, libraries have automated labor-intensive and repetitive procedures like digitization, acquisition, cataloging, and circulation through the use of computers.

Due to the significant increase in information and research activities, automation of library operations becomes crucial at that point. It also facilitates resource sharing among libraries by reducing staff and patron time. The OPAC modified the library catalogue card in 1980. The development of electronic information technology has altered library layouts and working conditions. The field of information science and libraries has seen tremendous advancements in information transmission technology across national boundaries. In order to make the best use of their resources, facilities, and services, libraries have recently developed networks. The traditional library has evolved into an automated, electronic, virtual, and digital library due to the rapid growth of technology. In order to meet their information needs, the user at this location chooses to employ paper and digital information resources. In the field of science, information technology is the most frequently used concept. The processing, storing, retrieval, and dissemination of information have all been significantly impacted by the technological revolution over the past 34 years (Ming, 1996).

### **1.2 Definition of Digital Resource:**

According to Ming, even the most abundant online information is useless to users unless they are aware of the resources at their disposal and know how to retrieve the information they need from the right ones. Electronic resources are easily accessed, time-efficient, and provide the most recent knowledge in their respective domains and associated areas (Kumar and Singh). "Digital information resources are useful for university teaching, learning, and research activities. They are products of information and communication technology" (Olasore and Adekunmisi). According to Shariff, "digital information resources are those that deal with both born electronic and digitized material that can be either accessible from the World Wide Web or from the library's in-house database." Digital resources might be digital resources from birth or digital resources converted from print to digital. Depending on their content, digital resources can take many different forms, such as electronic books, journals, electronic theses databases, electronic zines, online databases, etc. (Dipen Deka 2012). A digital library is connected to the resources of different collections, rather than existing as a standalone

entity. According to Rosenberg (2005), the services offered by the digital library are delivered electronically via the internet and the resources are kept and made available in electronic format. "The first priority is to help clients find resources in a digitally chaotic world" (Lombardi, 2000). Digital information resources are useful for university teaching, learning, and research activities. They are the result of information and communication technology.

### **1.3 Types of Digital Resources:**

There are numerous sorts of digital resources accessible globally. These fall into three main groups, for example. Resources that are Meta, non-text based, and text based. Electronic databases, electronic conference proceedings, electronic journals, electronic reports, electronic dictionaries, electronic directories, electronic newsletters, electronic newspapers, electronic books, and electronic theses are examples of text-based digital resources. Animation, audio files, digital images, book and magazine illustrations, photos, computer graphics, space photos, video files, architectural drawings, maps, paintings, drawings, and sketches, among other materials, are included in the non-text based category. On the other hand, the Meta Resource has archive and database finds, bibliographies, catalogues, indexes, and abstracts (Deka, 2012).

#### **1.3.1 Digital text-based resources:**

Text-based digital resources can include information resources that are developed and kept digitally, such as e-databases, e-conference proceedings, e-journals, e-newspapers, e-books, e-theses & dissertations, e-encyclopedias, e-zine, e-reports, e-dictionaries, e-directories, e-newsletters, etc. According to Deka (2012), digital resources are exclusively available in digital environments and are released in digital format.

**1.3.1.1 E-Database:** An electronic database is an assortment of information systematically arranged to facilitate quick and simple searches. Work done outside of the nation is entirely computerized. Journal or newspaper article descriptions are the most prevalent kind of library database. The core of computerized information retrieval is the process of matching a customer's query against data stored in databases. a digital information file that is updated on a regular basis and contains, among other things, full text texts, abstracts, bibliographic entries, and photographs related to a certain topic in a standard format. A database might be on a CD or DVD, or it can be local or remote.

**1.3.1.2 E-Conference Proceeding:** The collection of scholarly articles published at an academic conference is known as an e-Conference proceeding in the academic world. The contributions made by conference researchers are

included in the proceedings. They serve as a written record of the work that other researchers have rectified.

**1.3.1.3 E-Journals:** A print journal's digital edition that may be accessed online or through other internet-connected devices. IP enabled access to e-journals is standard. These are only accessible on the campus. The journals can be accessed simultaneously by one or more people, depending on the type of subscription. Full text access to some journals is available without a subscription. With the introduction of electronic full text journals, there is now a chance to adopt a new strategy because small and medium-sized libraries, which have limited funding, are likely to bear the brunt of any publisher risk in the new electronic era. Online access to numerous e-journals is now possible. Certain publishers offer free online access to their published journals in exchange for a library print subscription. Users and researchers can easily search and save electronic journals, which can then be viewed on computers, mobile devices, or iPads (Rasheed, Nazia 2015).

**1.3.1.3.1 Feature of e-journals:** A few significant characteristics linked to electronic journals are:

I. The product is now produced and distributed more quickly thanks to electronic formulation and transmission.

II. Quicker journal review process, saving specialists' valuable time.

III. Authors, editors, and referees can create network communication using the e-journal production method.

IV. If necessary, users can quickly view a specific article or the journal's full issue; printouts of the pertinent pages can be obtained.

V Instantaneous, simultaneous searching and retrieval of large collections is possible.

VI. It is also possible to integrate multimedia features into the electronic journals. This gives it an advantage over traditional print journals.

VII. Links between various sections of an article or between a collection of articles in journals and other electronic resources can be made possible by hypertext and hypermedia formats (Dhawan, S.M. 2004).

**1.3.1.3.2 Advantage of electronic journals is:**

A few benefits of using an electronic journal are:

**I. Speed:**

Articles do not need to wait months to appear in a journal issue; they can be posted online as soon as they are ready. All of this indicates that the data is far more current.

## **ii. Simple to search:**

One of the main benefits of a digital format is search ability. There will be a lot more information available to read and stay current with.

## **iii. Interactive:**

Since articles are published so quickly, readers of the journal may read, comment on, and change them far more swiftly than they can with print.

## **IV. Accessible:**

Users have instant access to certain articles or the journals' whole issue. A significant increase in user availability is brought about by tablet computers, especially for individuals who work far from the library. With a little additional work, it is also possible to grant varying levels of access to different individuals. For example, different subscription tiers may grant access to complete multimedia exclusively or only abstracts.

## **v. Accessible:**

The foundation of the hypertext format are links, which you should take advantage of. Papers can be linked not just to other works that they have cited, but also – with a little work – to other works that cite them.

## **vi. Value addition:**

Many commercial publishers simply replicate print journals in exact format; instead, one should take advantage of all the opportunities provided by the web to offer value, such as interactive mathematical charts, virtual reality, and animation.

## **VII. Inexpensive:**

When it comes to pricing, e-journals are much more affordable than print journals.

### **1.3.1.3.3. The advantages of electronic journals:**

Though they seem fancy and will soon be the sole type of journal, electronic journals are not without their detractors. Additional drawbacks exist with electronic resources.

## **I. Reading on a Computer:**

The computer monitor's limitations are one of the drawbacks of digital information. This causes reading difficulties. As with the print form, one cannot read for an extended amount of time.

## **ii. Keeping Archives:**

One problem that occasionally arises with e-journal archiving is determining who is responsible for archiving the collection.

## **iii. Perishable Citation:**

Citations are crucial for advancing research in any field. However, many search engines, including Google, AltaVista, and others, disregard PDF files, which make up the majority of e-journals. This is especially true for files that are exact replicas of print versions of journals (Malik S.K., 20707).

**1.3.1.4 E-books:** Books that are published electronically and can only be viewed on a computer or an e-reader. Many people can access the e-books simultaneously, and there is no need to worry about the contents getting damaged.

The emergence of digital copies of physical books dates back to the 1970s and is a component of the e-publishing movement. The majority of subject areas have a sizable number of e-books that are accessible over the internet for free or for a fee. Libraries view e-books differently than they do physical books: they don't need to be kept on shelves or taken out of the collection when they get damaged. Jane Secker (2001)

### **1.3.1.4.1 Benefits of E- Books:**

Since everyone enjoys reading print books, why should we bother with electronic ones? The following benefits are worth considering:

- i. Portability: a lot of e-books may be conveniently carried together, saving libraries' shelf space.
- ii. Instant acquisition: Online acquisitions are available around-the-clock and are quicker than traditional library acquisitions.
- iii. Accessibility: more accessible to readers of all backgrounds.
- iv. Ability to search: using the entire text will yield better results.
- v. A lot of annotations can be made on an electronic book and then extracted for a final essay at a later time.
- vi. Linking: the ability to click on a word to view its definition in a dictionary.
- vii. Opportunities for multimedia: for all user types.
- viii. Environmental: reduces the cost of printing on paper by using less material.
- ix. Self-publication: direct publication is simpler for writers.

#### **1.3.1.4.2 Problems with e-books:**

Below are some of the issues with e-books:

- i. Pricey readers: devoted readers can be highly costly.
- ii. Reader availability: Dedicated readers are not easily found.
- iii. Technological change: you run the danger of giving the reader information that may soon become outdated.
- iv. Screen resolutions: prolonged screen reading is probably not possible with the standard screen resolutions on mobile devices and PCs.
- v. Limited number of titles available: There are now only a few titles available.
- vi. Cost: Compared to paper books, the more recent e-book titles typically have higher prices.
- vii. Restricted rights: your ability to resell, for example, licenses as opposed to sales.
- viii. Preservation: challenges arise from concerns about preservation (Ramaiah, L.S. 2006).

**1.3.1.5 E-Theses and Dissertations:** University theses and dissertations are a valuable source of information and expertise for researchers. For consumers' convenience, the institutes are digitizing print theses into electronic format.

**1.3.1.6 E-Newspaper:** The online or other internet-accessible digital edition of print newspapers. Multiple people can access these at the same time and in parallel.

**1.3.1.7 E-Newsletter:** An intranet or internet-based electronic newsletter published by the organization. The newsletter is a helpful resource for learning about the accomplishments of the organization and other activities.

**1.3.1.8 E-Standards:** The online or other internet-accessible digital equivalent of print standards.

**1.3.1.9 E-Encyclopedia:** databases of encyclopedias accessible via a media other than paper copies. Encyclopedia Britannica started releasing digital versions of their databases as online services and CD-ROM (compact disc read-only memory) and DVD-ROM (digital video disc read-only memory) products. The electronic encyclopedia evolved from being a print set replica to a stand-alone product that provided a database in the way that was most appropriate for the electronic medium as computer technology advanced around the turn of the twenty-first century.

The most evident benefit of electronic encyclopedias is its multi-media content, which includes sound effects, motion pictures, and animated graphics in addition to the text, images, and line drawings that are carried over from print encyclopedias. The possibility of creating encyclopedias—which let readers retrieve, alter, and organize material in ways that suit them—occurs with the advancement of more complex data-processing tools.

**1.3.1.10 E-Zine:** An electronic magazine sent by email or a website. Certain e-zines are solely nonprofit. Some are quite successful financially. If they could draw in the required audience and sponsors, others would operate on a for-profit basis.

**1.3.1.11 E-Report:** A document that is organized, recurring, periodic, or as needed, and that contains information about the institute in a narrative, graphic, or tabular manner. Reports can be provided or presented electronically and can relate to particular time periods, occasions, events, or topics.

**1.3.1.12 E-Dictionary:** An electronic dictionary is a digitally accessible collection of common words along with their synonyms. There are various types of electronic dictionaries available, such as tablets or specialized mobile devices.

**1.3.1.13 E-Directory:** This directory service program allows you to centrally control resource access across several servers and PCs connected to a network.

### **1.3.2 Non-text based resources:**

Animation, audio files, digital images, drawings from books or periodicals, architectural drawings, maps, paintings, sketches, photos, computer graphics, space photos, video files, multimedia, and so on can all be included in this category. With the aid of suitable hardware and software, the available resources in physical formats (print format) are converted into digital formats, such as institutional repositories, institute publications, e-newsletters, e-theses/dissertations, etc. According to Omaeki, Umeji, and Krubu (2010), "digital information resources" are those that were previously available in print but are now available online and through computers and other related ICT instruments. "Students are motivated by digital information resources because they can transmit, obtain, download, process, and distribute information on a topic of interest" (Ray and Day, 1998). A carefully chosen and arranged collection of digital items (Objects), together with the metadata that characterizes them and at least one interface that provides access to them, can be referred to as digital information resources. These resources could be made for network sharing, institutional use, or local use.

**1.3.3 Meta resources:** these can comprise bibliographies, databases, CDs and DVDs, local and remote databases, abstracts, archival finding aids, catalogues, indexes, and so on (Deka, 2012).

#### **1.3.3.1 Video on CD and DVD:**

These days, CDs and DVD-ROMs are widely used electronic media for information delivery, retrieval, and archiving. It has software that is easy to use and is used to store a lot of data. It can function as a standalone unit with both specific and general coverage, or it can be networked via a CD server. Using CD-ROMs for specialized collections of full-text content is becoming more and more common. (Nazia Rasheed, 2015)

##### **1.3.3.1.1 The advantages of DVD and CD:**

The following crucial elements contributed to CD/DVD-ROM's superiority over more conventional portable storage media like floppy disks and tapes:

I. Cross-platform standard: Common file system specifications are provided by the ISO 9660 format for CD-ROM and the Universal Data Format (UDF) for CD/DVD, allowing these media to be read from a variety of platforms and operating systems (Windows, Mac, UNIX variants, etc.)

II. Capacity: A single CD-ROM may hold up to 700 MB of data, which is the same as 486 floppy disks or 4 GB of storage on a DVD.

III. Durability: Because CD/DVD-ROM media are physically write-once, they are incredibly durable and have a very long shelf life. They are reliable medium that can hold data over extended periods of time and be accessed in the future.

IV. The detachable, lightweight, and inexpensive transportation of CD/DVD-ROM medium makes it incredibly cost-effective for the dissemination of software and data.

V. The most advantageous media for software marketing are economical CDs, which are less expensive, and easily replicable media.

VI. Quick and random access to information is possible using CD/DVD ROM Random Access.

VII. The multimedia capabilities of a CD or DVD-ROM enable the reading and writing of a wide variety of data types, including synchronized playback of text, audio, and video. An encyclopedia CD or DVD-ROM, for instance, can play a sound track and display text and a video clip at the same time. (Satish Kumar, 2002)

### 1.3.4 Other digital resource services:

The three main categories of digital resources are text-based, non-text-based, and meta-based. Additional digital resources are accessible.

**1.3.4.1 Reference material:** Print reference materials that may be accessed online or over an intranet, such as encyclopedias, dictionaries, and handbooks. The main information source is the reference materials. While the majority of reference materials are only accessible to people who have a library subscription, some are freely accessible.

**1.3.4.2 Web resources:** The search engine-accessible information resources that are available on the World Wide Web. The online resources offer full text access to articles as well as links to publisher websites, scholarly publications, and other publications.

**1.3.4.3 Subject-specific portal:** A website created by professionals with in-depth knowledge and expertise in a particular field, such as researchers or subject specialists.

**1.3.4.4 Institutional repository:** The print resources of the institution that have been electronically digitized and made accessible via the intranet.

**1.3.4.5 Institute publications:** The digital edition of books, papers, and other educational content produced by the organization's instructors and students and made accessible via the intranet. Three major categories can be used to classify the current creation and growth of digital libraries:

- (i) A Digital Library produced as an incident
- (ii) Digitizing previously printed materials
- (iii) Fresh information sources made just for the internet.

Users are made easier by the digital information resources, which offer quick and simple access to information. However, there are still a few issues that prevent users from using digital information resources: insufficient knowledge about the resources' existence; lack of interest; and a lack of time and dedication to use the resources (Manda, 2005).

"All electronic information resources arranged for services, as well as computerized and networked online resources accessed through libraries, are included in the digital information services offered by the libraries." According to Coughule (2007), digital information services in libraries are those that are offered to patrons electronically via computers connected to the internet or intranet.

**1.3.4.6 Web OPAC :** is the bibliographic record of books and other reading material accessible on the Web, whereas OPAC: Online Public Access

Catalogue is the bibliographic record of books and other reading material available online to users within the organization. One can find the location and availability of the necessary document or material by using Web OPAC.

**1.3.4.7 Online library tour:** This service gives customers a general overview of the library's location, resources, and services. Gaining firsthand knowledge about the collection, facilities, resources, and services offered by the library is a valuable benefit of this program for new users.

**1.3.4.8 E-Database service:** Digitally organized collection that can be accessed electronically and pertains to a certain subject or a combination of themes. An electronic database may be an indexing, abstracting, or bibliographic database. A user can obtain brief details about published literature related to information needs with the use of the databases.

**1.3.4.9 Digital reference service:** Directing users to the appropriate source so they can utilize digital tools to find the information they need.

**1.3.4.10 Electronic table of contents service:** To give customers electronic access to the most recent journal articles received by the library. The contents of the articles published in the journal are available in the table of contents.

**1.3.4.11 Digital current awareness services:** A service that notifies the user of the most recent publications in his or her area of expertise. Either on demand or ahead of demand, the service is rendered.

**1.3.4.12 Bulletin board services:** An online computer-based messaging system that informs users about upcoming events the library will be hosting. Users can benefit from the service by being informed when new resources are subscribed to or new services are provided by the library.

**1.3.4.13 Forums and discussion groups:** A collection of people with similar interests who get together to exchange ideas and opinions, work through issues, or simply offer commentary. The discussion groups are helpful in getting group members to provide solutions to problems.

**1.3.4.14 Blogs:** A webpage that consistently posts links to other websites or commentary on a certain topic or issue.

**1.3.4.15 Newspaper clippings:** Digital copies of newspaper articles about the institute that were published.

**1.3.4.16 Electronic document delivery:** Sending users the necessary papers electronically via email. Sometimes, people who utilize libraries discover that while necessary documents are available in other libraries, they are not

available in their own. If the document isn't available digitally, it can be arranged upon request by obtaining a scanned copy.

**1.3.4.17 Library portals:** The website of the library that offers comprehensive details about its collection, resources, and services. The user can see what the library has to offer and how to use its resources by using the portals.

**1.3.4.18 Digital publications from the institute:** The institute's annual reports as well as other significant documents are available online or through an intranet, and include e-Newsletters, e-Reports, and e-Journals.

**1.3.4.19 Feedback:** It's critical to understand user opinions regarding the range of services and materials offered by the library. Users can submit their queries online if they have any. Answers to frequently asked questions by new users can be found in the FAQ (Frequently Asked Questions). It assists new users in avoiding asking the same question over and over again.

A digital library information service's main goals are to save users time, facilitate access to a vast amount of information, support multimedia content, have an intuitive user interface, offer unique references for digital objects, and provide links to both internal and external resources (Deka, 2012).

#### **1.4 The value of E- Resources:**

Information is expanding quickly, and literature – particularly in the fields of science and technology – is expanding at an exponential rate. While digital resources offer all the pertinent information from the complete collection in one location, conventional resources need one to go through the entire collection in order to find what they're looking for. Libraries have already incorporated contemporary methods to meet the growing needs of their patrons. The following are the reasons why consumers and libraries are shifting to digital information resources:

**1.4.1 Information explosion:** Due to the rise in multidisciplinary research activities, there is an exponential growth in information available every day, making it challenging for researchers to stay current with the most recent advancements in their area of interest. One can stay up to date on the most recent advancements in the field by using digital resources.

**1.4.2 Extended availability:** Digital resources are available for a longer amount of time. A few e-journal publishers allow users to access resources that are five to ten years old, or occasionally they go back to the first volume's first issue.

**1.4.3 Search becomes simple:** One can obtain precise and targeted information from the complete collection in one location by using digital resources.

**1.4.4 Current information:** While digital resources are updated often to provide users with the most recent information, print resources' content took longer to become updated.

**1.4.5 Needs of the new generation:** While digital resources that the library subscribes to assist in meeting users' information needs, traditional libraries are unable to address the many, cross-disciplinary information needs of its patrons.

### **1.5 Benefits of using digital services and resources:**

Through the network, digital information resources and services are made available. With a network connection and basic search methods, users can freely access the data on the computer. Having access to digital information resources has several benefits, including:

**I. No need to visit the library:** The user can get the necessary information without physically visiting the library by using the internet or intranet to access the resources and services of the digital library from any location on campus.

**II. Multiple Accesses:** The library's digital contents can be accessed without restriction. The same resource can be accessed simultaneously by several users.

**III. Availability 24/7:** While a user of a digital library can access its resources at any time of year via the internet, access to traditional libraries' materials and services is limited to the hours the library is open.

**IV. Organized approach:** Compared to print materials, digital resources are more structured. Using digital resources, the user can go with ease from the catalogue to a certain book and from there to a specific chapter or article, depending on what information is needed.

**V. Improved information retrieval:** Information can be pinpointed precisely and comprehensively by employing digital resources to retrieve it. One can use a single word or phrase to search the full collection using the digital resources. In the digital library, pertinent data can be obtained with just one mouse click.

**VI. Space:** Since libraries subscribe to the majority of digital resources, they aid in resolving the storage issue. Users may access these digital materials on institutional IP or by using the login credentials that the relevant publisher has supplied.

**VII. Preservation and conservation:** The original work's quality is unaffected by the user's ability to take a copy of it at any time.

## **1.6 Digitization:**

The civilization of today is one of digital devices. Digitization, according to Pearce-Moses, is the process of converting an analog document into a binary electronic (digital) form, particularly for computer use and hard drive storage. Materials that were once in human-readable analog formats are now only readable by machines thanks to digitization. Digital knowledge contents can be created using a variety of equipment, including cameras, scanners, editing software, and other devices. The digitization of nearly all significant material kinds is made possible by these technologies, Ph.D. Rare books, manuscripts, voice recordings, images, photos, and theses. Different formats are used to create information, such as digitization, which makes information resources easily accessible. Readers can quickly and easily search for collections in digital documents from any location at any time. Digitization is the process that turns the invisible become visible. The same document can be accessed simultaneously by several people without any issues. Additionally, it eliminates the hassle of distance because users don't need to go to places where the materials are physically stored in hard copy. Although digitization is an expensive and time-consuming endeavor, it is a resourceful solution to the issues of rare books, major journals, manuscripts, and other literature being lacking in knowledge resource centers in the developing world. Many institutions and libraries are pursuing the digitization of their records, newspaper archives, rare books, manuscripts, antiquities, M.Phil. Theses, Ph.D. theses, and other materials. Dissertations as well as additional historical records and pictures. This facilitates broad access to advances that are previously outside their area of expertise and that are feasible at the right time for scientists, administrators, readers, and other information seekers.

"Transformation of analog items into digital format for the purpose of extending beyond access and, where appropriate, to assist with preservation and innovation" is the definition of "digitization." Digitization, to put it simply, is the process of obtaining, scanning, editing, modifying, storing, and maintaining information in an orderly and standard manner with the use of technology. It is connected to every facet of the services offered by the library. Documents are converted into digital formats using specialized scanners and applications, and then saved for later use on hard drives, compact discs, or web-based applications (Pearce Moses, 2005).

## **1.7 What is digitization?**

According to Witten and David (2003), digitization is the process of converting traditional library materials—such as books, papers, and rare volumes—into an electronic, digital format that a computer can use to store and manipulate them. Digitization, according to the US Institute of Museum and Library Services, is the process of converting, producing, and preserving

books, manuscripts, artwork, historical records, images, journals, and other materials into an electronic format so that computers, smart phones, and laptops may see them.

"Digitization is the process of transferring information content from a traditional format into a digitally readable version," according to the librarian's glossary. When scanning a printed book, a scanner or camera is typically utilized; other examples of digital imaging that fall under this category include manuscripts, artworks, doctoral theses, and digital images. As part of the effort to improve preservation procedures, digitization is currently highly favored (Saima Khan, 2015).

According to Ding, Choo Ming (2000), when all of the files are kept in an electronic format with facilities and equipment that are compatible, access to electronic information is less expensive than that of print. Digital texts can be connected together to make them interactive and to improve the retrieval of additional information. In order to make information more internationally accessible, it is only natural to find that more material is being digitalized and uploaded to the Internet or CD-ROM these days (Alhaji, 2005).

### **1.8 The value of digitalization:**

The following are some of the significance of digitization, per Bist (2006).

- i) To provide readers with rare and historical materials.
- ii) To search rapidly and to access them more quickly and effectively. It also expands the possibilities for online learning.
- iii) Digitization also aids in the global marketing and promotion of library materials. Additionally, it draws readers to the library to view the original work, which boosts the institution's income.
- iv) Here, the preservation of the document is facilitated by providing users with a digital copy, which preserves the original.
- v) Information is valuable economically and is also necessary for the growth of science and technology globally, as well as for society, education, and democracy.
- vi) Making the most of the information materials contributes to a happy existence that is full of freedom, health, moral behavior, historical insight, and general well-being.
- vii) Preserving the papers: This means keeping the originals undamaged so that readers of older, uncommon, significant, or unusual papers can continue to read them.

viii) To repurpose the records. It refers to converting papers into other formats, such as using photos in a slideshow and using the material for a different objective.

The term "digitization" refers, in its most basic sense, to the adaptation of resources that were originally generated in alternative setup or electronic form; on the other hand, the definition does not include materials that were initially created digitally, such as handwritten letters, word processing documents, or photographs. According to Sivankalai (2014), the digital image produced by the scanner is saved in numerical form.

### **1.9 Need of Digitization:**

The fundamental principle behind digitization is to fully utilize ICT resources to gain access to global resources while also improving society. As moving digital is becoming increasingly necessary to maintain a safe and healthy workplace. Many companies continue to be impacted by the enduring value of these learning resources, which is why they are digitizing their content. The ability for users worldwide to access institutional collections and use these electronic resources from a distance enhances the standing of the institutions as a result of digitization. Institutions can make information public that was previously only available to a limited readership by digitizing their collection.

When a document in print or other physical media (such as sound recordings) is digitized, it becomes more accessible and usable. A digital document can have a full-text search performed on it by the user. Hyperlinks can be made to point readers to relevant content both inside the text and to other sources. In the end, digitalization serves to improve rather than replace the traditional library collections and services. Depending on the purpose of digitization, the intended user, the availability of funds, etc., a document may be converted to a digital format. Although the goals of digitalization initiatives vary from company to company, increasing access is the main goal. Saving money, preserving, keeping up with technology, and exchanging information are some more goals. The biggest obstacles to organizing and carrying out a digitization project are related to technical restrictions, financial limitations, copyright issues, a lack of policy guidelines, and, finally, the choice of items to digitize. Although digital information can be displayed in novel ways thanks to new and developing technologies, most potential users are unlikely to have access to expensive gear and software. When different institutions utilize incompatible software, it frequently restricts information sharing between them.

One of the primary advantages of digitization is the preservation of rare and delicate items by improving their simultaneous accessibility to a large

number of people. Access to rare and valuable objects is typically restricted to a specific group of people. By going digital, more people could be able to benefit from access. Despite the fact that digitization provides tremendous benefits for access—such as making it possible for anyone to locate, obtain, examine, and work with materials—it is not a suitable replacement for preservation due to the constantly evolving formats, protocols, and software used to create digital artifacts. Depending on their requirements and intended use, libraries can digitize for a variety of reasons, and there are numerous methods for producing the digital images. The user's need for easy access to high-quality information is the main driver behind digitization. Other crucial factors are:

**1.9.1 Quality Preservation:** There is a chance that digital data will be preserved qualitatively. For optimal quality, the preservation-grade photos can be scanned at high resolution and bit depth. Even after being used repeatedly by various users, the quality doesn't change. Nonetheless, care must be taken when selecting digital data as preservation media.

**1.9.2 Multiple referencing:** A number of people can use digital information at once.

**1.9.3 Wide area usage:** Via computer networks and the Internet, people located far away can access digital information.

**1.9.4 Security measure:** For protection, priceless records and documents are digitized and stored digitally.

**1.9.5 Archival storage:** Rare material can be restored by digitization. It is customary to preserve rare books, pictures, and archival material in digital format. (2010) Tariq Ashraf

## **1.10 Benefits of digitalization:**

Digitization combines research data on subjects that are spread across different sites and formats. These online resources could be the most scattered. As a result, digitization makes it simple to gather and compare objects that can be compared only by virtue of representation and to obtain digital reference materials, particularly photos that give researchers a wealth of information. It may be quickly transferred to any location on the internet and combined with alerting services with ease. Ability to produce materials in multiple mediums. Include information in multiple formats. It is simple to duplicate digital resources. 2014's Sivankalai.

## **1.11 Drawbacks of Digitalization:**

1. Tech-savvy librarians are the way of the future.
2. Requires certain knowledge and abilities to operate Librarian.

3. Issues with bandwidth when attempting to access full-text journals and multimedia sites.
4. Scanning all of the collections' original documents.
5. The primary disadvantage is the expense of file preservation and digitalization. This makes the expense of digitizing a rare collection justifiable.

#### **1.12 Digitization and preservation:**

Preservation is the main benefit of digitization. It should prolong the life of the original by minimizing handling of old, uncommon, significant, or delicate material. While the longevity and safety of intelligent content are ensured via preservation, it is not yet known if digital documents will last as long as hard drives. Since preservation involves more than just digitalization, digital conversion by itself does not qualify as preservation because not all documents are typically digitized for a variety of reasons, including financial limitations, a lack of knowledge, information scientists, copyright issues, and ethical dilemmas.

#### **1.13 The university library's mission to digitization:**

The objectives of digitalization align largely with the aim of the university library. Our goal in digitizing is to maximize user happiness. It will undoubtedly provide the foundation for university research, instruction, and learning. They see similarities with the following points when considering the mission of the university library:

1. Keep for use by future generations.
2. To digitally record, edit, save, process, and distribute information.
3. Both additional time and space should be saved.
4. Encourage networking and the sharing of knowledge resources.
5. Make accessible to users who are located remotely.
6. Maximizing user pleasure by offering convenient and multiple access points.
6. The basis for a new library service with value added.
8. We can get over the space issue that every university library is now dealing with in order to accommodate the materials (Singh, 2006).

#### **1.14 University library digitizing resources:**

What should be digitized and what can be saved on other media or knowledge documents must be decided by the university library. Whether all

of the collection needs to be digitized, or only a piece of it. The quantity of money available could influence the choice. These digitization are often found in a standard academic library collection.

1. Written works.
2. Rare books.
3. Annual reports as well as technical reports.
4. Periodicals and newspapers.
5. Dissertations and theses.
6. If any, an institute's special collection.

By creating the digital collection, the university library may move on with developing the digital library, which could eventually include databases with full text articles, electronic books, and electronic journals (Singh, 2006).

We should start active collecting and copyright-free collection after carefully analyzing user needs. The following university collection objects are available for digitalization.

1. Dissertations and theses.
2. Written works.
3. Rare materials.
4. Technical summaries.
5. Reports issued annually.
6. If any, an institute's special collection

Manuscripts ought to come first because they are an important source of research and study materials in the university library collection. Because old rare papers and manuscripts offer important information about society and culture, their digital preservation is crucial. By digitizing them, we should aim to conserve them and make them accessible to everyone via a network. PhD theses as well as M.Phil. Another crucial part of any university knowledge resource center collection is dissertations, which must be digitized as soon as possible. This is because some dissertations may not be accessible to other library users due to their unavailability in print or other media, such as electronic documents. Readers will find them to be valuable to digitize. Institutions publish yearly reports and technical reports, which are considered significant pieces of literature with useful information not accessible through other means. The needs of their customers and the structure of the university may cause them to reassess how important

digitization is. Since none of these involve copyright concerns, digitizing such resources is simple (Singh, 2006).

### **1.15 Digitization-related obstacles:**

The following viewpoints must be used to analyze the barriers to starting a digitization program in a given country:

#### **1.15.1 Technology:**

"Technology has many benefits and drawbacks, and computer technology is no exception." The effectiveness and quality of technologies are also up for dispute. While this is not to suggest that technology is undesirable, recently released items often have a tendency to malfunction for some time (Noerr, 2000). Because database technology is evolving so quickly, individual data items must be moved along with each collection into new data management organizations at the same time. The ultimate objective is to maintain both the context that permits the data to be analyzed and the portions related to the original data (Moore, 2000).

"The same enemies who threaten paper also threaten electronic products." They face new issues like obsolescence in addition to risks from the natural world, like light, heat, and moisture; organic threats, like rodents and insects; and chemical concerns, including acid content, air pollution, and plastic. Because digital materials are kept on brittle magnetic and optical media that deteriorate quickly and can fail unexpectedly due to exposure to heat, humidity, airborne pollutants, or malfunctioning reading and writing equipment, they are particularly vulnerable to loss and destruction. Manuscripts dating back a millennium can still be read, while certain materials older than twenty years are unreadable. Both data degradation and the ease with which a document can be altered—intentionally or accidentally—are causes for concern (Beebe and Meyers, 1999). "It is costly to migrate to new storage systems, and there is always worry about data loss or quality issues during a transfer" (Hodge, 2000).

#### **1.15.2 Facilities:**

Libraries may decide against starting extensive digitization projects because to the substantial amount of human labor needed for editing, reviewing, fixing, and "tagging" (with relevant metadata) digital items (Choudhury, 2000). If crucial information is exclusively available online, "access to hardware and software, access to telephone connections, and knowledge of protocols can limit access to it" (Weisser, 1997). The condition, formats, contents, and volume of the original collections; the selection of scanning technologies; editing; in-house versus contract scanning; the amount of metadata required to grant basic access; and the range of searching processing functions to be supported are all factors that will affect the actual

costs of retroactive conversion. The only reasons why funds are ever increasing, decreasing, or staying the same are to combat inflation and/or price increases. There is relatively little money left over after paying for staff, collections, and other expenses, such as computer systems, peripheral devices like printers and scanners, and software needed for digitization (Chapman and Kenney, 1996).

### **1.15.3 Source:**

Some resources cannot be digitized because they are owned by someone else; their physical size prevents them from being transferred to an electronic format, or both. Our library's vast collection of materials could only be accessed in print format in accordance with current regulations.

### **1.15.4 Rights of Copyright:**

Scholars have occasionally inserted paragraphs, illustrations, and other copyrighted content in their M.Phil. and Ph.D. theses. A dissertation cannot be submitted without permission unless the work has been approved for commercial publication. The user community will put forth demands for the digitization of rare documents, manuscripts, books, and back issues of periodicals that the library is not able to authenticate for copyright. As a result, the radars become disheartened by the digitization process and become less motivated to utilize the modified. Because of how ubiquitous networks and digital information are, even for those sources that have been digitized after obtaining legal rights, enforcement issues may arise (Weisser, 1997).

### **1.15.5 Hard to archive:**

Unlike the source-related issues that are specific to print archiving, digital archiving also needs to address technology-related issues. The lack of widespread access to technology has restricted the amount of digital material that is available. Some people may want to include interactive elements, such as CGI scripting elements that are more ubiquitous on websites, or elements that are difficult to preserve since they might vary with each reading. (Weisser, 1997).

### **1.15.6 Mentality:**

The ramifications for human resources include the need for additional personnel to handle labor-intensive digital tasks, the requirement for personnel with novel and specialized abilities, the difficulties associated with "up-spilling" and retraining, and the requirement to reevaluate job definitions and skill requirements. There are lots of materials in our libraries that could be digitalized, but the lack of actual projects for library digitization can only be attributable to mentality. Here, the issue of widespread concern is not just

the professionals' lack of interest or their over scheduling of professional time for mundane activities that leaves them with little time for innovation, but also the lack of institutional priority for formulating, endorsing, and carrying out workable ideas.

The establishment of digital libraries and the digitalization of local collections are a natural conclusion of the decades-long investment made by the exposition library community in computer technology. Despite the fact that our libraries are lacking in many materials, such as books and journals, they do have a wealth of official and informal sources that, with the right planning, may be converted into digital format. Over the next ten years, it is expected that picture formats, compression techniques, network transmission, printer and display designs, computing power, and image processing capabilities—particularly for the automated extraction of metadata and visual searching—will all see significant improvements. However, the future will still be shaped by relationships, economy, and behavioral patterns in addition to technology. Our libraries' efforts to digitize are being hampered by a number of issues related to infrastructure, financing, the availability of information scientists, and many other priorities rather than technology (Hodstrom, 1998).

### **1.16 E- library:**

The imagined digital library kept changing as information technology progressed. As computers became more widespread, the idea revolved around the massive bibliographic databases covering every topic under the sun, as well as the widely recognized online retrieval and public access systems found in every modern library. The paradigm changed once more when computers were linked into the vast networks that made up the Internet, and research shifted to building digital libraries of knowledge that were accessible to everybody, anywhere in the world. This wide notion has been described by terms like "virtual library," "electronic library," and, most recently, "digital library" (Gary Cleveland, 1998). In 1990, the idea of a digital library came into being due to the World Wide Web's exponential growth in information and the rise in users visiting websites that allowed for remote access to obtain information. In the contemporary information age, digital libraries are becoming indispensable for preserving digital resources and facilitating access. By giving consumers rapid access to helpful information at a minimal cost, electronic resources improve and support users, research scholars, and education (Vakkari, 2008).

The phrase "digital library" can also refer to a computerized network system in which all data is kept in electronic format and is accessible and transmitted via networks, allowing users to retrieve the information they need. "Digital libraries can offer a level of service that was previously unachievable" (Chen,

2000). Chen placed a strong emphasis on information access and offered a number of strategies, instruments, and tactics to help develop information access in digital libraries. Users can communicate more effectively because to the information dispersed throughout the network (Rava, Chandra, and Sharma, 2000).

"An organized collection of online full-text, abstract, and database digital information focused on one or more specific subject areas" is the definition of a digital library (Monopoli, 2002). Digital libraries are relatively young, with implementation plans and innovations still in their infancy in underdeveloped nations. The digital library is able to restore its services since all of its data is kept on hard drives, which customers may readily access via networks or offline document storage.

The development of digital library services was aided by the convergence of computers, networks, communication, multimedia, smart phones, and the internet. With the advent of new technologies and services in libraries, the significance of individualized services increased. The predominant subject of internet information services nowadays is the multimedia browsing style coupled with distributed search. From the perspective of the researcher, a digital library is simply an electronic collection of resources with richer and more functional content than any database or information retrieval system (Borgman, 1999).

A digital library is an electronic collection of documents that have been arranged and may be accessed through websites of specific institutions, CD-ROM disks, or the Internet. Readers may be able to access e-journals, e-books, e-papers, photos, sound files, and videos, depending on the restricted subject and special library.

### **1.17 Research problem statement:**

"Economic Impact of Digital Resources and Digitization among University Libraries in Maharashtra" is the issue being looked into. Finances are essential to the University Library's efficient operation. Sufficient funding is directly linked to libraries operating efficiently. Because libraries are non-profit, revenue-generating organizations, they are dependent on financial grants from UGC and state and federal governments, which lead to inefficient library systems. There are various categories for digital resources. These can be divided into three notable categories: Meta resources, text-based resources, and non-content-based resources. Content-based advanced resources can include e-databases, e-conference processes, e-journal, e-newspaper, e-book, e-thesis and dissertations, e-encyclopedia, e-zine, e-reports, e-dictionary, e-directory, e-bulletin, and so on. Animation, Audio File, Digital Image, Book Illustrations, Periodical Illustrations, Architectural

Drawings, Maps, Paintings, Drawings, Sketches, Photographs, Computer Graphics, Space Photographs, Video File, Multimedia, and so forth can all be included in the non-content based classification, while abstracts, real discovering assistance, Bibliography, Catalogue, Index, and Database are included in the third class (Deka, 2012).

The process of converting data content from a conventional arrangement into a version that is carefully meaningful is known as digitization. For this purpose, a scanner is typically used when scanning a printed book. This word also secures the digital imaging of manuscripts, rare books, artwork, and prints. Nowadays, there is strong support for digitization as a key component of the effort to improve conservation techniques (Khan, 2015).

The library is the most important resource at a university since it fulfills all of its functions, including teaching and research, ensuring the availability of new material, and passing on to future generations the knowledge and cultures of the past and present. A library plays a vital role in ensuring that research at a higher level is accomplished. The reference service, collection development, circulation, document delivery, access to electronic resources, and user education are among the essential functions performed by university libraries. Mumbai, the capital of Maharashtra, which is west-facing India, is well-known for its rapid pace. Development status is as of May 1, 1960. The six recognized divisions of Maharashtra are Amravati, Aurangabad, Konkan, Nagpur, Nashik, and Pune. 36 regions, 109 sub divisions, and 357 talukas are further divided into the state's six divisions. According to Wikipedia (2015), Maharashtra is the third-largest state in India.

### **1.18 The research's significance:**

The library serves as the hub of digital resource centers, supplying academic literature through a variety of digital resources to meet the demands of user and research scholar communities in terms of learning, teaching, and research. Libraries have always been characterized primarily by their growth and development. The library is currently forced to rely on digital resources that can be gathered online via a www platform due to the proliferation of information technology. Digital resources have undergone a significant metamorphosis in libraries in recent years. There has been a noticeable shift in e-resources during the past few years.

The current study is deemed necessary and significant in determining and exposing the information requirements, patterns and methods of access, and degree of usage of digital resources and digitized documents at university libraries in Maharashtra, India. This study may assist university librarians and library administration in creating a minimally expensive, meaningful, and efficient information system for their patrons. It looks at the amount of

work Maharashtra's university libraries have put into analyzing the financial effects of digitization and digital resources.

#### **1.19 Objectives of the study:**

1. To study the growth performance of University libraries in Maharashtra.
2. To study the various financial sources of University libraries in Maharashtra.
3. To study the various expenses by the University libraries in Maharashtra.
4. To examine the economic impact of digital resources and digitization among University libraries in Maharashtra.
5. To examine the use of electronic and printed document among University libraries in Maharashtra.

#### **1.20 Hypothesis of the present study:**

1. There is independency between selected University libraries income source of UGC grant and University fund.
2. The selected University libraries of Maharashtra are depending on UGC funds.
3. There is no significant difference between averagely total enrolled users of University libraries which used print and Electronic Document.

#### **1.21 Scope and limitations of the study:**

The Present study is confined with related to digital resources, digitization and knowledge documents with economic impact. The UGC recognized state University libraries in Maharashtra are taken for the current study. The period of the study is 2005-06 to 2014-15 is also limitation of the study. The ten state University libraries in Maharashtra are selected for the study.

#### **1.22 Methodology:**

The research is based on survey method. The study is conducted among the University librarian in the universities of Maharashtra. Structured questionnaire is the main tool proposed for data collection in this study. Other tools like observation and interview also support the study. The stages in the methodology includes are data collection, data analysis and interpretation.

#### **1.23 Data collection:**

The study is based on both primary and secondary data. The primary data has been collected with the help of questionnaire and secondary data has

been collected from various selected library records, library web site, annual report and online sources.

#### **1.24 Population sample:**

For the study ten state University libraries working from more than ten years in Maharashtra state has been selected.

The following Universities are selected:

1. Mumbai University, Mumbai (1857).
2. Shreemati Nathibai Damodar Thackersey Women's University, Mumbai (1916)
3. Rashtrasant Tukadoji Maharaj Nagpur University, Nagpur (1925).
4. Savitribai Phule Pune University, Pune (1949).
5. Dr. Babasaheb Ambedkar Marathwada University, Aurangabad (1958).
6. Shivaji University, Kolhapur (1963).
7. Sant Gadge Baba Amravati University, Amravati (1983).
8. North Maharashtra University, Jalgaon (1989).
9. Swami Ramanand Teerth Marathwada University, Nanded (1998).
10. Solapur University, Solapur (2004).

#### **1.25 Design of questionnaire:**

In this study to examine the research problem the structured questionnaires for librarian is prepared. As the study covers a wide range of the Universities situated in the state of Maharashtra, the questionnaire was sent to all the University librarians. The questionnaire consists with library finance, budget and growth of collection, digital resources and digitization.

#### **1.26 Scheme of chapters:**

##### **Chapter I: Introduction.**

This chapter includes the introduction of research work and definition of digital resources and digitization, statement of problem, the objective, hypothesis, methodology, scope and limitation of the study.

##### **Chapter II: Digital resources and digitization.**

This chapter includes types of digital resources, advantages of digital resources and digitization, need of digital resources and digitization and process of digitization, development of digital resources and digitization and users of digital resources in India is presented in this chapter.

### **Chapter III: Financial sources of University libraries.**

This chapter includes historical background and current status of University Libraries in Maharashtra. Library budget, sources of funds and financial management of University libraries in Maharashtra.

### **Chapter IV: Digital resources and digitization in selected University libraries in Maharashtra.**

The development of university library regarding growth of collection , growth of users, growth of infrastructure and growth of digital resources and digitization in Maharashtra. Financial development and budget allocation in the University libraries in Maharashtra is also taken in this chapter. Data collected during the research work is analyzed and interpreted to fulfill the objective of research and to prove the hypothesis.

### **Chapter V: Conclusion & Suggestions.**

Chapter six consists with the principal findings and conclusion drawn on data collection.

#### **1.27 Data analysis:**

After the completion of the data collection, the filled questionnaires were edited properly to make them for coding. After coding, the data were fed into computer and database was created. From the database, the required tables were prepared for further analysis by using "Statistical Package for Social Sciences" (SPSS) software release 17.0 on windows platform. SPSS provides a statistical analysis and data management system in a graphical environment. Using descriptive means and simple dialogue boxes to do most of the work the statistical tools like Growth of Percentage, Percentage of total, Chi-Square test, Mean, Standard deviation and T-Test used.

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## 2. Digital Resources and Digitization

### 2.1 Introduction:

The types and forms of the resources of libraries have been transforming continuously. Developments of Information and Communication Technology (ICT) and Web technology have made a significant impact on electronic publishing. Because of fast development of ICT and its use in various fields, the facilities are extended enormously in storage, so also in access of information; implementation of network technology has made the process more intensive. Due to this change, collection of the Library and Information Centers are now of diverse in nature consisting of both printed and non-printed resources.

The resources of a modern library into four types legacy, transition, new and future. According to him, legacy resources are largely non-digital resources, including manuscripts, prints, slides and maps, audio and video recordings. Majority of existing legacy resources will remain outside the electronic domain for many years to come, despite the huge investment made in digitization process to convert these resources into digital form. Transition resources are those legacy resources which are being or have been digitized for increased access and to reduce reliance on physical libraries. New resources are either expressly created as digital or created in parallel with print form. He goes on describing the future resources as an entity of packaging the data resources and the access or processing method with machine independent code.

In the present study, electronic resource and digital resource are used as synonymous terms and our discussion is focused on transition and new resources only. Digital resources are those resources that are stored and accessible by computer. They are stored in the form of 0 and 1. There is a wide range of resources which can be included in the category of digital resources, like electronic journals, electronic books, bibliographic databases, full text databases, image, maps, audio/video resources, statistical and numeric databases and many more. Digital resources were earlier available in CD-ROM form which was mostly bibliographic and other databases; now they become available in CD-ROM, DVD-ROM and online accessible form is also available over the web. Digital resources have many advantages over the printed form both for the users and the Library & Information Science professionals. "The Library, digital Resources and Scholarly Communication" discussed the benefits of using digital resources both for the users and the libraries. We can have the following advantages of digital resources:

- i. Digital resources are available to anyone anywhere in the world at minimal cost and it does not get exhausted with unlimited use;
- ii. Digital resources have the facilities like instant, multiple and remote access, quick downloading, effective searching, easy retrieval, and sharing by networks;
- iii. Digital resources of large volumes can be stored in less space compared to printed document or resources;
- iv. Remote access and transfer of digital resources is possible with speed and accuracy and read to any place;
- v. Digital resources reference can be used by reference librarians to look for information for users quickly; and thus the quality of information service can be improved and maintained.

The same reasons that have contributed to the growing importance of digitization and digital resources are resources lend themselves to remote access and shared use, i.e. they are accessible from any computer that has network connections; and thus overcome the barriers imposed by space and time. Digital data can be used by more different ways; digital data is manipulation in ways clearly difficulty if not possible, in the print world. Digital data and resources can be interrelated and linked to one another in a seamless fashion. In fact it may be difficult to determine the beginning and end of a digital object; e.g. bibliographic references in a digital paper could have links to full texts of items referred to; these links could also be to items in many different formats and the linked objects may physically reside anywhere. Digital resources offer the users with their facility to build and develop workspace for future use and reference. Digitization offers a cost effective means of preserving the contents of resources that are difficult to preserve in their original form. Hence, with the advancement of technology the libraries are moving towards digital resources which provide more, support searching capabilities (Raghavan, S.K.2003).

## **2.2 Digital resources:**

Following are the digital resources

### **2.2.1 National Digital Library of India:**

The National Digital Library is part of the Ministry of Human Resource Development's department, which is subordinate to its National Mission on Education through Information and Communication Technology. The National Digital Library pilot program aims to enhance the overview of useful sources of learning resources that can be searched using a single

frame. In order to help learners discover the right material quickly and with the least amount of effort, federated and filtered searching is being implemented. The National Digital Library can store content in any language and offers interface support for the two most widely used vernacular languages, Bengali and Hindi, at the moment. Support will be offered for all academic levels, including researchers, users of all stripes, lifelong learners, all popular forms of access devices, and students with disabilities. It is being designed to assist research scholars in conducting interconnected investigation from many sources, to help students prepare for entrance and competitive examinations, and to allow users to learn and get ready for information from best practices from all over the world. The pilot project is creating the necessary structure for eventual content volume and diversity scaling up, eventually developing into the full-fledged National Digital Library of India. IIT Kharagpur is where it is being developed. The whole subject matter of computer science, information and general work, psychology and philosophy, religion, and social science is available in the National Digital Library of India. According to Table 2.1, the maximum collection of digital resources are E-Books, 7606832, E-Articles, 45787774, E-Thesis 875207, E-Question Papers 62338, Audio Lecture 4037, Video lecture 516553.

**Table 2.1: Total Collection of National Digital Library of India**

| Sr.No. | Digital Resources | Quantity |
|--------|-------------------|----------|
| 1      | E-Books           | 7606832  |
| 2      | E-Articles        | 45787774 |
| 3      | E- Thesis         | 875207   |
| 4      | E-Question Papers | 62338    |
| 5      | Audio Lectures    | 4037     |
| 6      | Video Lectures    | 516553   |

(Data Retrieved from- <https://ndl.iitkgp.ac.in/>) Data access on October 20, 2023

**Table 2.2 : Total Collection of Subject wise in NDLI**

| Sr. No. | Subject                                       | Quantity of E-Resources |
|---------|---|-------------------------|
| 1       | Computer Sciencn, Information & General Works | 16674795                |
| 2       | Philosophy & Psychology                       | 647350                  |

|    |                                  |          |
|----|----------------------------------|----------|
| 3  | Religion                         | 253529   |
| 4  | Social Sciences                  | 6543942  |
| 5  | Language                         | 207707   |
| 6  | Natural Science & Mathematics    | 10730051 |
| 7  | Technology                       | 14178113 |
| 8  | The Arts, fine & Decorative Arts | 1991856  |
| 9  | Literature & Rhetoric            | 993097   |
| 10 | History & Geography              | 1242819  |

(Data Retrieved from- <https://ndl.iitkgp.ac.in/>) Data access on October 20, 2023

**Table 2.3: Total Collection Institute Wise in NDLI**

| Sr. No. | Institute Name                | Quantity of E-Resources |
|---------|-------------------------------|-------------------------|
| 1       | Joint Admission Board of IITS | 37                      |
| 2       | GATE                          | 183                     |
| 3       | NPTEL                         | 223503                  |
| 4       | NCERT                         | 5806                    |
| 5       | South Asia Archive            | 29969                   |
| 6       | OECD iLibrary                 | 102017                  |
| 7       | Librivox                      | 206672                  |
| 8       | Krishikosh                    | 138322                  |
| 9       | Shodhganga                    | 390295                  |
| 10      | Shodhgantorti                 | 1930                    |
| 11      | Oxford Scholarship Online     | 771                     |
| 12      | Satyajit Ray Society          | 93                      |
| 13      | World eBook Library           | 7526581                 |
| 14      | British Council               | 656861                  |

(Data Retrieved from- <https://ndl.iitkgp.ac.in/>) Data access on October 20, 2023

### 2.2.2. Krishikosh -An Institutional Repository of India National Agricultural:

An institutional repository created as part of the National Agricultural Research System is called KrishiKosh. This effort involves capturing, preserving, or archiving the intellectual output of Indian NARS in several document types so that users can access the content online. With a collection of theses, rare and valuable books, institutional publications, technical bulletins, project reports, lectures, preprints, reprints, field records, and other documents available in various libraries of Research Institutes and State Agricultural Universities, it is a unique repository of knowledge in agriculture and related sciences. Dispersed around the nation. KrishiKosh serves as a digital platform for managing the institution's usage of its intellectual property through an open access mandate and for preserving it.

The National Agricultural Research System of India A vast collection of rare and valuable books, reports, theses, surveys, statistical data, maps, bulletins, newsletters, journal back volumes, and other documents held by libraries of various Agricultural Research Institutes and State Agricultural Universities spread throughout the nation make up the Indian National Agricultural Research System (NARS), a comprehensive information system for agriculture and related sciences. Under the National Agricultural Innovation Project, an institutional repository called "KrishiKosh" has been established in order to give scientists and researchers worldwide online access to this invaluable resource. According to Table 2.4, the most popular digital resource on the Krishikosh website is E-Thesis, with a maximum collection of 197046; E-Journal, 17714; E-Report, 2247; E-Proceedings, 493, E-Inst. Publication 1888, Articles 17294, Book Chapter 1269, Technical Report 1074, Books 942.

**Table 2.4: Total Digital Resources in Krishikosh**

| Sr. No. | Digital Resources | Quantity |
|---------|-------------------|----------|
| 1       | Thesis            | 197046   |
| 2       | Journal           | 17714    |
| 3       | Report            | 2247     |
| 4       | Proceedings       | 493      |
| 5       | Inst. Publication | 1888     |
| 6       | Article           | 17294    |
| 7       | Book Chapter      | 1269     |

|   |                  |      |
|---|------------------|------|
| 8 | Technical Report | 1074 |
| 9 | Book             | 942  |

(Data retrieve from - <https://krishikosh.egranth.ac.in/home>) Data access on October 20, 2023

### 2.2.3 Inflibnet:

The University Grants Commission of India's Information and Library Network (INFLIBNET) Center is an independent interuniversity center. With its headquarters located in Gujarat State at the Gujarat University Campus in Ahmedabad, it is a significant national program that was started by the University Grants Commission in March 1991. In June 1996, it was established as an autonomous Inter-University Center after beginning as a project within the IUCAA.

In order to maximize the use of information, the information and library network updates university libraries in India and connects them with the nation's information centers via a high-speed national data network. State-of-the-art technologies are employed in this process. The goal of INFLIBNET is to play a significant role in advancing higher education in India as well as academic communication between users and research scientists.

Research scholars can submit their Ph.D. theses and research synopses using the shodhganga below at the Inflibnet center, and the entire academic community can access them as open access PDF files. Subject-wise indexing, department- and university-level storing, distribution, and preservation of electronic theses submitted by research scholars are all capabilities of the repository. Current and historical research data from Ph.D. theses or synopses is easily accessible. 293 universities in all have contributed to the Shodhganga website. According to Table 2.5, the maximum collection for an electronic Ph.D. thesis is 1,38,148, while the total for an e-synopsis is 3,871. On the Shodhganga website, there are 1,42,019 digital content available. The reference is <http://shodhganga.inflibnet.ac.in>.

**Table 2.5: List of Digital Resources in Shodhganga and Shodhgangotri website**

| Sr. No. | Digital Resources          | Quantity |
|---------|----------------------------|----------|
| 1       | E- Thesis                  | 4,98,832 |
| 2       | E- Synopsis                | 12829    |
| 3       | MRPs/PDFs/Fellowships Rep, | 75       |

(Data retrieve from <https://shodhganga.inflibnet.ac.in/>)Data access on October 20, 2023

#### 2.2.4. E-PG Pathshala:

The Ministry of Human Resource Development (MHRD), Government of India, is working on the ambitious National Mission on Education through Information and Communication and Technology (NMEICT) project with the goal of providing original educational and knowledgeable content to all qualified and willing scientists and research scholars in India for a long time. Content and connection are seen as the two main drivers of information communication technology-enabled higher education, acting as accelerators and triggers respectively.

The production of electronic material in eleven main courses and seventy-seven sub-subjects at the postgraduate level has been given to the University Grant Commission by the Ministry of Higher Education and Research production (MHRD) as part of its National Mission on Education through Information and Communication Technology (NME-ICT). The most important aspect of the education department is the material and its caliber.

Numerous digital resources are available on the E-PG Pathshala website. Table 2.6 indicates that a total of 23,523 digital resources are being developed under the E-PG Pathshala initiative, spanning various subjects such as the social sciences, arts, fine arts & humanities, natural & mathematical sciences, linguistics, and languages. Maximum collections for E-Text are 12,800, followed by videos with 10,000 and E-Papers with 723 digital materials on the E-PG Pathshala website. The reference URL is [epgp.inflibnet.ac.in/index.php](http://epgp.inflibnet.ac.in/index.php).

**Table 2.6: List of Digital resources in E-PG Pathshala**

| Sr.No. | Digital Resources | Quantity |
|--------|-------------------|----------|
| 1      | E-Text            | 20000    |
| 2      | Video-Online      | 19000    |
| 3      | E- Paper          | 723      |
| 4      | Quiz              | 30000    |

(Data retrieve from <https://epgp.inflibnet.ac.in/>)Data access on October 20, 2023

#### 2.2.5 DOAJ:

DOAJ is a distinctive and comprehensive index of various open access journals from across the globe, powered by a growing community dedicated

to guaranteeing high-quality material is publicly accessible online without charge to everybody.

OPEN: DOAJ is an essential component of the international open access network.

GLOBAL: DOAJ is a multinational organization with volunteers, ambassadors, and team members situated in 45 nations and speaking 36 languages.

TRUSTED: The DOAJ standards for open access publication are now considered the industry norm worldwide.

DOAJ goal: The goal of DOAJ is to improve quality, peer-reviewed, open access academic research journals' worldwide exposure, accessibility, reputation, use, and influence across all disciplines, languages, and geographies.

DOAJ is dedicated to being 100% autonomous and keeping all of its key services and information available to the public without charge.

DOAJ aim: The goal of DOAJ is to create a varied and egalitarian academic environment where reliable research is freely accessible anywhere in the world.

**Table 2.7: Details of DOAJ**

| <b>Sr. No.</b> | <b>Types</b>          | <b>Quantity</b> |
|----------------|-----------------------|-----------------|
| 1              | Languages             | 80              |
| 2              | Countries Represented | 136             |
| 3              | Journals Without fees | 13566           |
| 4              | Journals              | 20190           |
| 5              | Article Records       | 9614117         |

### **2.2.6. DOAB:**

To make open access books easier to find is the main goal of DOAB. Academic publishers are welcome to submit their open access book metadata to DOAB. Open science is the mission of DOAB, an open infrastructure. The open-source DSpace 6 platform powers it. To maximize effect, exposure, and diffusion, harvestable metadata will be available. Scholars and students may find books easier with the integration of aggregators' records into their commercial services and libraries' directories into their online catalogs. All publishers that publish academic, peer-reviewed books in open access are

welcome to submit their publications to the directory, which should include as many books as possible—as long as they adhere to academic standards and are published in open access.

Who is in charge of DOAB? : The OAPEN Foundation, in collaboration with the Directory of Open Access Journals (DOAJ) & Samper Tool launched the Directory of Open Access Books (DOAB) in 2012.

One of the DOAB Foundation's services is the Directory of Open Access Books. In 2019, Open Edition and OAPEN Foundation founded the DOAB Foundation, a non-profit organization recognized by Dutch law as a "stitching." The DOAB Articles of Association may be downloaded. The National Library in The Hague is home to the Foundation. The OAPEN stakeholder report, which is released annually in collaboration with Open Edition, contains significant updates and advancements pertaining to DOAB.

Executive Board: Pierre Mounier (Community Coordinator for OPERAS and Associate Director of Open Edition)

The OAPEN Foundation's director, Niels Stern

Neil Jacobs is the chair of the supervisory board (UKRN).

The OAPEN Foundation's Antia Wiersma

CNRS's Lionel Maurel

University of Michigan's Charles Watkinson

Aix-Marseille University's Marlène Delhayé

DOAB Scientific Committee

In addition to overseeing PRISM's creation and execution, the DOAB Scientific Committee provides scientific advice on subjects of interest to the DOAB Executive Board and Supervisory Board.

Members of the Scientific Committee (SC) are experts in SSH scholarship and the editing aspects of monograph publication. Members of SC come from a variety of backgrounds and represent a range of publishing fields. Regarding scientific problems, the SC should be consulted since it is an independent body. None of its members may hold other positions within DOAB. Members of the SC are appointed for four years, with the possibility of reappointment for further periods. The Scientific Committee is not open to membership from the Executive Board or the Supervisory Board. When an agreement cannot be established, decisions are taken by majority vote. The SC members have chosen the chairperson. The SC chair serves as the Executive Board's counselor. Over 75500 Academic Peer-reviewed books available on DOAJ website. (<https://www.doabooks.org/>)

### **2.2.7. PDF Drive:**

These days, searching the Internet for a digital copy of a book or the information you need is rather usual. Finding just what you need, however, might be challenging. You could sometimes just locate a few legible passages in the PDF eBook you're searching for, or you might come up empty-handed. Search engines for PDFs may help with this. Although we have previously discussed a few PDF search engines, it is now essential to choose one that can keep up with the demands of today's continuously connected and digitally native consumers due to the rising popularity of online PDF converters, the wealth of information available online, and the frequent engagement with digital documents. One PDF search engine that we discovered – PDF Drive – may not be familiar to you yet.

With the help of PDF Drive, you may download, browse, and search PDF files online. Over 85 million eBooks, periodicals, papers, and other materials are now indexed and discoverable directly on PDF Drive, according to the website. This is understandable given that PDF Drive provides books in a plethora of categories, such as Biography, Environment, Health & Fitness, Art, Business & Career, and Lifestyle. With the variety on offer, you're sure to discover something. There are additional categories like Editor's Pick and Most Popular that might help you locate anything if you're simply browsing around and not searching for anything in particular. (<https://www.investintech.com/resources/blog/archives/10069-pdf-drive-ebook-search.html#:~:text=What%20is%20PDF%20Drive%3F,discoverable%20directly%20on%20PDF%20Drive.>)

### **2.3 Digitization:**

All of the recorded material found in a typical library is analog in nature in today's digital age. Printed materials such as books, journal articles, manuscripts, cards, photos, vinyl disks, video, and audio tapes can all include analog information. Nevertheless, analogue data is converted to digital data when it is entered into a computer, where it is divided into 0 and 1. These fragments of information can be compressed for storage and reassembled for processing. Huge analogue encyclopedias that take up yards of shelf space can be compressed into a tiny amount of space on a computer drive or optical disc, which can then be sent, retrieved, altered, and searched across a network. The fact that digital information is not fixed, unlike words printed on paper, is one of its most significant characteristics. One of the main benefits of digital information is its flexibility. A digital file may produce an infinite number of exact duplicates as it doesn't deteriorate with repeated copies. Moreover, a huge number of users can simultaneously access digital information from remote locations. The process of transforming a printed

knowledge material into a digital format is called digitization. In the majority of library uses, digitization often produces materials that are available online via a library's website. Images are converted into bit maps and digitized using optical scanners and digital cameras.

The process of converting an analog image to a digital image is called digitization. It is crucial to consider selection criteria, especially those that take user demands into account. Thus, while choosing which materials to digitize, the same guidelines that apply to the construction of traditional collections also apply. Nonetheless, in a digitization effort, a number of other factors pertaining to technical, legal, regulatory, and resource management become crucial.

The process of converting information content from a traditional format to a digital format is called digitization. When digitizing rare books, maps, printed journals, etc., a scanner is typically utilized; digital imaging of manuscripts, paintings, prints, etc., is also covered by this phrase. Nowadays, digitization is largely preferred as a component of the effort to reclaim protective methods. (Mohsina Aftab, Shazia Khan, and Saima Khan, 2015)

Analog is the opposite of digital. An example of an analog gadget would be a clock with hands that revolve continually around the face. An analog clock like this one can show any time of the day. A printed book is an analog form of information, as was previously stated. To turn a book into a digital format, its contents must be digitized. The process of transferring content from physical medium to digital ones is known as digitization. The process of converting a piece of information—such as a book, journal article, sound recording, photograph, audio cassette, video recording, etc.—into bits is known as digitization. The basic building blocks of information in a computer system are called bits. Digitization is the process of converting information into these binary digits, and it can be done using a number of current technologies.

### **2.3.1 Choosing the Content to Be Digitized:**

The identification, selection, and priority of documents to be digitized are steps in the digitization material selection process. Strategies for gathering data that is "borne digital" may be implemented if a business produces content. Paper documents can be readily transformed into other formats if they are available digitally. It is crucial to get consent from publishers and data providers for digitization if the material to be digitized is not in the public domain. Early in the selection process, the IPR concerns need to be addressed. Obtaining permissions from individuals and publishers can be challenging, time-consuming, and may include negotiating and paying copyright fees. Additionally, the choice of whether to OCR the digital photos

can be made. It's possible that some of the documents chosen for digitalization are already digitally accessible. If available, purchasing electronic media is always more cost-effective than converting it. Furthermore, choosing which knowledge documents to digitize would involve extremely specialized equipment and highly experienced labor because to the scale of the material, deteriorating collections, bound volumes of journals, manuscripts, etc.

Text, manuscripts, rare books, line art, pictures, color photos, and more could be among the papers that need to be digitalized. A thorough evaluation of the document's selection is necessary, taking into account its cost, quality, security, and usefulness. Documents and photos that are uncommon and in high demand are chosen first, regardless of quality. Before choosing various media for digitization, the following factors may be taken into account:

I. Audio: The subject matter expert and computer sound editor must jointly assess the sound quality and make any necessary modifications.

II. Video: Video clips are often edited on Beta Max cassettes, which can be converted to digital format for transmission. Color tone editing involves checking and correcting resolution.

III. Photos: Choosing the right photos is an extremely important step in the process. For photographic photos and slides to be preserved to jpeg or another format, high resolution is necessary. It is necessary to verify the quality, future needs, and copyright aspects in particular.

IV. Documents: Those that are in high demand, difficult to handle, and hard to find are screened and chosen for the process. When a document's literary value repair requires a significant amount of work, publication is given priority over digitization. Furthermore, value creation and improved access to digital resources are the main goals of any digitalization. The intellectual significance of the contents—in terms of their quality, authority, uniqueness, timeliness, necessity, significance, and demand—should be the primary factor taken into account while digitizing documents. Therefore, important factors to take into account are the amount of present and potential consumers, researchers, and the physical and intellectual substance of the source materials.

### **2.3.2 The Digitization Process Steps:**

The digitization process consists of the following four steps. Software performs all or most of the following tasks and is sometimes referred to as document image processing (DIP), electronic filing systems (EFS), and document management systems (DMS).

### **2.3.2.1 Scanning:**

Using an electronic scanner, an image is "read" or scanned at a preset resolution and dynamic range. An electronic image can be an original photograph, text, manuscript, rare book, report, etc. that is to be imported into a computer. The "bit-map page image" file that is produced is prepared and tagged so that it may be stored and later retrieved by the scanning software. It is also possible to obtain an image using an electronic camera, fax card, or other imaging equipment. Nonetheless, the most crucial and often utilized part of an imaging system for the transfer of standard paper-based documents is an image scanner.

Procedure for Scanning using a Flatbed Scanner

Phase 1. Place an image on the glass of the scanner.

Step 2. Launch the scanning program.

Step 3. Decide which region will be searched.

Section 4. Select the type of image.

Step 5. sharpen and alter the picture

Step # 6. Decide on the image's size.

Step Seven. The scanned image should be saved in a preferred format (GIF or JPEG).

### **2.3.2.2 Indexing**

If the process of imaging entails turning a document into an image or text file as the first stage, then indexing these files is the second. Connecting a scanned image database to a text database is the first step in the indexing process. Similar to a collection of photographs, scanned images must be linked to a text database that describes them and their contents. A two file system is commonly used in imaging systems to store and retrieve scanned images, together with a significant amount of unstructured data. The first file is a conventional one that includes a key to a second file and a written description of the image (keywords or descriptors). The location of the document is in the second file. The user uses a search algorithm to choose a record from the first file. The majority of document imaging software packages enable complex document indexing through their menu drive or command driven interface. Certain document management systems enable the selection of indexing words directly from the image file, while others require human indexing term keying. Moreover, OCR capabilities are provided by numerous DMS programs, which enable the conversion of photos into regular ASCII files. The stored photos can then be fully searched using the OCR text as a database.

### **2.3.2.3 Storage:**

A document image's numerous persistent issues are related to its file size and, consequently, storage. Whether there is ink on the paper or not, every aspect of an electronic image is saved. The size of the region being digitized, the type of graphic file format utilized to save the image, and the scanning resolution all have a direct impact on the file size. As a result, the scanned images must be moved from the scanning workstation's hard drive to an external big capacity storage device, such as a server, an optical disc, a hard drive, a CD ROM, or a DVD ROM. On the other hand, the smaller document imaging system might make use of fixed hard disc drives set aside for picture storage or offline media that needs to be reloaded as needed. Auto-changers, like optical tape library systems, are used by larger document management systems. The scanned image's storage needs vary and are influenced by things like page size, compression ratio, content, and scanning resolution.

### **2.3.2.4 Acquisition:**

A database is required for the selective retrieval of data from one or more fields inside each record in the database once scanned images or documents have been saved as a file. A document imaging system typically stores and retrieves documents from at least two files. The first is a conventional file that includes a key to the second file and a text description of the image. The location of the document is in the second file. The user uses a search algorithm to choose a record from the first file. The application looks up the document using the location index once the user picks a record, and then shows it. The majority of the document management system offers complex search options, such as the usage of wild cards, Boolean and proximity operators, and more. Additionally, users can hone their search tactics.

### **2.3.3 Digitization: Choices for Input and Output:**

Depending on the purpose of digitization, the end user, the availability of funds, etc., the document may be converted to a digital format. To convert from print to digital format, one might use one of four fundamental methods:

#### **2.3.3.1 Scanned Photo or Document:**

The least expensive option is the Image, where every page is a precise duplicate of the original source material. Offering digital access to materials that are now housed in traditional libraries as printed media is the focus of several digital library projects. When it comes to altering an existing paper collection without having access to the original data in computer-processible formats that can be converted into HTML or any other structured or unstructured language, scanned page images are nearly always the only sensible option available to organizations like libraries. When it comes to large-scale conversions for significant digital library initiatives, scanned page

images make sense. The process of turning printed text, images, and figures into computer-accessible formats using a digital camera or scanner is known as document imaging or scanning. Whether a scanned page has text, a line drawing, or a photo on it doesn't matter—the digitally scanned images are saved in a file as bit-mapped page images. A substantial amount of space is needed for data transmission and storage in an image-based approach. Since capturing page image format is relatively simple and affordable, it is an accurate replica of the original while preserving the originality and integrity of the page. Unfortunately, searching via the scanned textual pictures is not possible, and searching is a very error-prone procedure in and of itself, especially when dealing with scientific texts. Print to digital conversion options and technologies are listed separately.

### **2.3.3.2 Preserving OCR and page layout:**

The most recent iterations of Xerox Text Bridge and Caere Omnipage feature technologies that enable the preservation of text and graphics in both word processing and plain ASCII forms, in addition to their original layout. HTML with preserved features like bold, underline, and italic can also be included in the output.

#### **I. Layout Retention Following Optical Character Recognition:**

A scanned document is only an image of a paper document. Its contents cannot be altered or controlled. To put it another way, labels on scanned papers must be used instead of the document's characters. Software tools called optical character recognition programs are used to create word processing files from scanned textual page images. The technique of automatically detecting text in a bit-mapped page image or collection of images and producing a file with that text in ASCII code or a particular word processing format while maintaining the integrity of the image is known as optical character recognition, or OCR.

#### **II. Rekeying:**

This kind of solution's traditional approach would involve entering the data and verifying it. This entails fully keying the text once, then having a different operator fully key it again; the two keying-in operations may occur at the same time. After comparing the two keyed files, any mistakes or discrepancies are fixed. This would provide a minimum of 99.9% accuracy; but, in order to achieve a 99.955% accuracy level, the keyed files would typically need to be completely proofread in addition to table lookups and dictionary spell checks.

#### **III. Preserving Page Arrangement with Acrobat Capture:**

Acrobat Capture 3.0 offers multiple choices for maintaining typefaces and page layout, as well as aligning text to precisely match the original's spacing, so that the result is scanned with accuracy. Unrecognizable text is handled as if it were a picture placed in its place. These graphics are completely readable in the PDF file, but they won't be present in the text file that can be edited and searched. Ordinary OCR programs, on the other hand, consider unfamiliar text in the ASCII output as tilde or some other special character. Page layout is preserved while using Acrobat Capture to scan pages as pictures, images with text, or regular PDFs. In image+text solutions, the OCR'd text appears behind the image and is utilized for searching, but each image has OCR'd text generated for it that is an exact duplicate of the original and left unaltered. Since the OCR'd text is simply intended for searching, it is typically not edited for accuracy. The price is significantly lower than PDF Normal. Nevertheless, because the whole page is bitmapped and neither the typefaces nor the line drawings are vectorized, Image and Text PDFs have far higher file sizes than their respective PDF Normal files, and their pages will not load on the screen as quickly or crisply. Clear view is seen on the screen when using PDF normal. Compared to images and texts, it has a substantially smaller file size and is searchable. But the outcome isn't a perfect duplicate of the scanned page. When exact matching are not possible, alternative typefaces may be utilized while maintaining all formatting and images. When files need to be uploaded to the internet or otherwise distributed online, this is an excellent option. By default, Capture replaces a tiny piece of the original bitmap image if a word cannot be recognized to the chosen confidence level during the Capture and OCR process. In order to preserve the ability to search and index, the "best guess" of the suspect word is captured behind the bitmap. It is not possible to ensure that guesses of these bitmapped words are accurate, though. Furthermore, the bitmap is a little intrusive and takes away from the overall "look" of the page.

#### **2.3.4 India's Digitization Technology:**

Digital images, also known as bit-mapped page images, are electronic photos made up of a collection of bits, or pixels, denoted by the numbers "0" and "1." In terms of typefaces, illustrations, layout, and presentation of scanned documents, a bit-mapped page picture is an accurate depiction of its original. Because of this, unlike text file documents, the contents of a "bit-mapped page image" cannot be searched for or altered. Before using the unit, users are urged to become familiar with the vocabulary, particularly bit, byte, and pixel. Nonetheless, a bit-mapped page image can be converted into a file using optical character recognition (OCR) software, like Xerox's. The terms linked to the technological aspects of digitization are listed in the keywords.

#### **2.3.4.1 Bit depth or dynamic range:**

The bit depth is determined by the number of bits utilized to define each pixel. The amount of grayscale or color tones that can be expressed increases with bit depth. The entire series of total fluctuations, as determined by a densitometer between documents's lightest and darkest points, is referred to as the document's dynamic range. Depending on the following factors: i) the type of source material or document to be scanned; ii) the intended audience or users; and iii) the capabilities of the display and print subsystem to be utilized, digital images can be captured at different densities or bits per pixel. In libraries, black-and-white or binary scanning is typically used to scan pages with text or illustrations. One bit per pixel is represented by binary scanning. Shades of grey are reliably reproduced via gray scale scanning, which uses continuous or intermediate tones found in black and white photos. In this method, different amounts of bits, ranging from 2 to 8, are assigned to represent different shades of grey.

#### **2.3.4.2 Document Scanning Resolution:**

The quantity of pixels in a specific region is how an image's resolution is determined. When referring to picture files, it is measured in dots per inch; when referring to display resolution on a monitor, it is measured as the ratio of the number of pixels on a horizontal line to the number of pixels on vertical lines. The higher the DPI setting on the scanner, the higher the image quality and resolution, and the larger the image files size. Grayscale imaging can enhance image quality at any resolution by recording the image in this format. Compared to binary scanning alone, the additional gray-scale data can be automatically managed to sharpen edges, file-in characters, remove unnecessary dirt, and eliminate undesirable page strains or discoloration, resulting in a far higher quality image. The fact that gray scale captures a lot of data is a significant drawback. It should be emphasized that, eventually, there won't be any discernible improvements in image quality from continuous resolution increases – the only side effect being an increase in file size.

#### **2.3.4.3 Limit:**

When using bitonality scanning, the threshold setting determines where on a scale – typically between 0 and 255 – grey values will be perceived as either black or white pixels. Text and line drawings, which have great contrast, are the ideal types of documents for bitonal scanning. For knowledge documents with low contrast or nonstop tones, like images, grayscale or color scanning is necessary. When scanning in grayscale or color, bit depth and resolution work together to produce superior images. Each pixel will be either white or black. The Line Art Threshold setting establishes the critical brightness point

that determines whether the sampled value is a white dot or a black dot. The threshold should be kept lower for text written on newsprint or other related colored, low-quality paper. Lowering the threshold from 128 to roughly 85 would significantly enhance the scan quality. OCR software performance would also be enhanced by these changes.

#### **2.3.4.4 Enhancement of Images:**

While picture quality and validity are sacrificed in the process of image enhancement, scanned photos can be made better. However, picture enhancement is a labor-intensive procedure that calls for specialized knowledge and always raises conversion costs. To optimize the halftone quality, common image enhancement tools that are available while scanning or editing a page could be treated using various filters. Software features include transparent backgrounds, touch, image sharpening, curves and color management, filters, and tonal reproduction. Grayscale scans of pages allow for the decomposition of text, line art, and half-tone sections, as well as the individual filtering of each section to optimize quality.

#### **3.3.4.5 Digitalization Compression Technique:**

It is clear that textual ASCII files are smaller than scanning image files. Therefore, in order to achieve cost-effective storage, processing, and network transmission, image files must be compressed. A text file with the same information weighs around 3–4 kb, whereas a black and white image of a page of text scanned at 300 dpi is approximately 1 MB in size. Image compression is the act of condensing repetitious information, such one or more rows of white bits, into a single code in order to reduce the size of an image. Two categories can be used to classify the compression algorithms:

##### **I. Compression without loss:**

Repeated data is transformed through the conversion process into a mathematical algorithm that can be decompressed into the original image with perfect fidelity without sacrificing any details. No data is "lost" or "sacrificed" during the compression process. Bitonal images are where lossless compression is most commonly applied.

##### **ii. Lossy Compression:**

The Lossy compression technique eliminates or reduces elements that are not very important or that might not have a noticeable impact on the image quality. Lossy compression techniques produce an exact reproduction of the original image when the compressed image is decompressed, which is why this type of compression is named lossy. When scanning in color or grayscale, lossy compression is applied. In digital photography, compression is a must, but producing an uncompressed, authentic image reproduction is even more

crucial. This is particularly crucial when moving images between platforms or when software running on separate operating systems handles them. Thus, it is recommended that scanned photos be preserved as lossless compressed images at the very least, or as uncompressed images. Ensuring the migration of images across platforms and hardware media is of great importance.

### **III .Protocols for Compression:**

Commonly used protocols for bitonal, grayscale, or color compression are as follows:

#### **a) TIFF-G4:**

For bitonal black and white images, the International Telecommunication Union compression technique is regarded as standard. TIFFs, or TIFFG4s, are images prepared as TIFFs and compressed using the ITU-G4 compression technology. They are regarded as the de facto standard for storing bitonal images. A lossless compression method is TIFF G-4. Another common compression method for bitonal images is Joint Bi-level Image Group (JBIG) (ISO-11544).

#### **b) JPEG:**

The Joint Photographic Expert Group, or JPEG, is an ISO-10918-I compression technique that identifies regions of an image that have the same tone, shade, color, or other attributes and assigns a code to those regions. Compression results in data loss.

#### **c)LZW:**

The compression method known as Lemple Ziv Welch (LZW) uses an algorithm for table-based lookups. The Graphics Interchange Format (GIF) and Tag Image File Format (TIFF) are two frequently used file formats that employ LZW compression. Each input binary digit sequence of a given length is fed into a specific LZW compression algorithm, which outputs an entry in a table for that bit pattern comprising the pattern plus a shorter code.

#### **d) OCR:**

Software tools called OCR (Optical Character Recognition) are used to convert scanned textual page images into word processing files. The method of automatically identifying text in a bit-mapped page image or collection of images and creating a file holding that text in ASCII code or in a predetermined word dispensation format while maintaining the integrity of the image is known as optical character recognition, or OCR. Without needing to manually enter every word into the computer, optical character recognition (OCR) is used to make every word in a scanned document

readable and fully searchable. After a bit-mapped page image has undergone OCR, its contents—that is, the words present in the text—can be used to edit and manage the document. OCR preserves the image while producing a separate file with the text instead than truly converting an image to text. There are currently four different kinds of OCR technology available.

### **2.3.5 Digitization Media Types and File Formats:**

A title name or other identifier that can clearly identify the kind and format of an object is required in digital libraries. By giving the digital objects file allowances, this is accomplished. In a digital library, file extensions typically indicate formats, protocols, and rights management appropriate for the kind of content. In addition to basic formats, various media kinds like as text, graphics, photos, images, video programs, databases, and models, as well as any combination of these, are stored under the name "file format." All that a file format is is a configuration for distinct data sets that enables data interpretation by software and a computer. These days, many journals' full-text articles are accessible online in electronic form. Complex tables or mathematical formulas cannot be displayed using basic text, even if it is compact, inexpensive to capture and keep, searchable, interoperable, and compatible with other text-based services. Additionally, ASCII cannot display diagrams, pictures, images, or special characters. Moreover, text formatting data such as bold, font type, font size, italics, and paragraph justification is not stored in ASCII format. For these reasons, many journal articles cannot be adequately represented by a plain text or ASCII (Gillesse, R. 2008).

#### **2.3.5.1 Format for Structured Text:**

By marking up the text in a structured text format, documents can be reduced to their essential elements and their original form can be reproduced, or alternative forms such as ASCII can be produced. It is possible to include pictures, photos, and other multimedia types in structured text formats. Standardized Markup Language is a widely used and significant structured text format. Office Document Architecture is another rival standard in a similar vein. A number of related standards are constructed around the international standard known as SGML. The de facto standard for markup language on the World Wide Web, SGML is a flexible language that gave rise to Hyper-Text Markup Language. It regulates document display formats and even the look of the user interface for interacting with the content. Structured text is manipulable and searchable, just like ASCII or basic text. It is quite adaptable and appropriate for both paper and electronic production. Structured text creation is always too costly to produce if it is rekeyed. Nonetheless, the process of creating organized text is typically combined with the development of printed materials. Actually, SGML is a format that is

produced as a byproduct of electronically generated printed artifacts. Other formats, like as SGML and HTML, are also utilized in the development of digital libraries. TeX. TeX is used to format extremely mathematical material and gives the user more control over how the document is shown, including the ability to check for formatting mistakes (Gillesse, R. 2008).

### **2.3.5.2 PDL:**

Although the prepared pages that are shown to the user are text-based rather than image-based, Page Description Languages (PDLs)—like Adobe's PostScript and PDF—are comparable to images. During typesetting, PostScript and PDF formats are easily captured. To read or print documents saved in PDF format, the user must have Adobe Reader installed on their computer. Since most systems create PostScript automatically, it is particularly straightforward to capture. PostScript files can be converted into PDF files using an application called Acrobat Distiller (Gillesse, R. 2008).

### **3.3.5.3 PDF:**

In the field of graphics, the Portable Document Format (PDF) Description language of Acrobat has become the industry standard for describing web pages. PDF is a page-description format; PostScript is a computer language. There are two types of PDFs: (i) Text-based PDFs that describe a page's format using Adobe PostScript PDL (Page Description Language) outline font technology; (ii) PDFs that are raster-scanned picture files without the text output from OCR (Optical Character Recognition). In essence, a PDF image is comparable to TIFF or CCITT G4 formats or a photograph in which computer manipulation of text characters is not possible. Furthermore, once an image-based PDF has undergone OCR, it can be transformed into a text-based PDF (Gillesse, R. 2008).

### **2.3.5.4 Format for Page Images:**

Whether a scanned page has a text, line drawing, or photo on it, the digitally scanned images are saved in a file as a bit-mapped page image. Depending on the scanner and its software, a variety of formats can be produced for the bit-mapped page image. To guarantee that data is interchangeable between platforms, there are a number of national and international standards for image formats and compression techniques. A computer system can display, analyze, and print a picture in a predetermined manner by using an image file, which holds discrete sets of data and information (Gillesse, R. 2008).

### **2.3.5.1TIFF:**

Tagged Image File Format is the most commonly used page image file format and is considered to be the de facto standard for any images. Some image formats are proprietary developed by commercial vendors and

require specific software or hardware for display and printing. They can be uncompressed or compressed using several different compression algorithms (Gillesse, R. 2008).

**Table 2.8: List of File Extension and File Formats**

| <b>Abbreviation</b> | <b>Format</b>                             | <b>File Extension</b> |
|---------------------|---|-----------------------|
| JPEG                | Joint Photographic Expert Group           | .jpg                  |
| IMG                 | Ventura Publisher                         | .img                  |
| JFIF                | JPEG File Format                          | .jfif                 |
| BMP                 | Bit Map Page (Windows)                    | .bmp                  |
| PCD                 | Photo CD (Kotak)                          | .pcd                  |
| PCP                 | PC Paint (Black & White)                  | .pcp                  |
| PCX                 | PC paint Brush (Colour and Black & White) | .pcx                  |
| PDF                 | Portable Document Format                  | .pdf                  |
| PNG                 | Portable Network Graphic                  | .png                  |
| PSD                 | Photoshop                                 | .psd                  |
| SPIFF               | Still Picture Interchange File Format     | .spf                  |
| TGA                 | True Vision Targa                         | .tga                  |
| TIFF                | Tagged Image File Format                  | .tif                  |
| MIDI                | Musical Instrument Digital Interface      | .midi                 |
| MOV                 | Quicktime for Windows Movie               | .mov                  |
| MPEG                | Motion Picture Expert Group               | .mpg                  |
| MP2                 | MPEG Audio Layer 2                        | .mp2                  |
|                     |   |                       |
| MP3                 | MPEG Audio Layer 3                        | .mp3                  |
| RAF                 | Real Audio Format (Progressive Networks)  | .ra                   |

|            |   |        |
|------------|---|--------|
| SND        | Sound   | .snd   |
| PDF        | Portable Document Format (Adobe)                      | .pdf   |
| HTML       | Hypertext markup Language                             |        |
| ASCII      | File format for unstructured text ASCII               | .txt   |
| PostScript | PostScript (Adobe)                                    | .ps    |
| SGML       | Standard Generalized Markup Language                  | .sgml. |
| TEX        | Texture Format  | .txt   |
| XML        | Extended Markup Language                              | .xml   |
| WAVE       | Waveform Audio (Microsoft)                            | .wav   |
| TIFF-G4    | Tagged Image File Format with Group4 File Compression | .tif   |
| AIFF       | Audio Interchange File Format                         | .aif   |
| AU         | Audio (Sun Microsystems)                              | .au    |
| AVI        | Audio Visual Interleave                               | .avi   |
| FLA        | Macromedia Flash Movie                                | .fla   |
| FLC        | AutoDesk Flic Animation                               | .flc   |

(Source- Gillesse, R (2008))

### 2.3.5 Scanning Software for digitization:

Scanning software is used in the digitization process to scan the image and capture it on the computer. Typically, purchasers receive this software from the product's maker. The majority of the applications listed below are in use.

#### 2.3.6.1 Audio and Video Document Digitization:

By connecting an audio player to a system and using an audio capture card to record the sound, analog sound tracks that we often hear on radios or tape recorders can be converted to digital format. The audio files are kept in mp3 format. Compared to previous formats, the MP3 format has superior sound quality and is much more compact. Software for noise reduction can be used

to further process these audio files. A video capture card with input from a video cassette player is necessary for video capture, just like audio.

#### **2.3.6.2 Software for Editing Images:**

The image editing programs can be used for additional alteration after the scanning process is complete and the image is saved to the computer. Features including image editing, cropping, color modifications, converting formats, resizing, sharpening, filtering, and more are available in the majority of image editing software. The majority of software programs for image editing can also be used to take pictures.

#### **2.3.6.3 Digital Pictures Arranged:**

Digitization requires that scanned photos be arranged in a way that makes them useful. Otherwise, a disc containing digitized photographs that is not arranged, browsed, or searched has no purpose other than providing the creator's information. In addition, to make browsing and finding easier, the photographs must be connected to the relevant metadata. The method of organizing the digital images can be broken down into the following three steps: Arrange the scanned image files into a disk hierarchy that makes sense in relation to the document's physical organization. For instance, in a journal scanning project, make a folder for every journal, which might then have a folder for every scanned volume. For each issue, a subfolder may exist within each volume. Each issue's folder might also include a content page with links to articles within the issue and scanned copies of the articles that were published in that issue. Make sure to name the scanned image files in a way that makes sense and adheres to stringent guidelines. As an illustration, the volume and issue numbers should come after the first author's surname in the article's title. The scanned images should be described both internally using the image header and externally using linked descriptive metadata files that include both the scanned content and the images.

#### **2.3.6.4 Software for Digital Libraries:**

Currently accessible digital library softwares include Fedora, Greenstone, Dspace, Digital Library (GSDL), Eprints, and others that may be downloaded for free via the Internet. While there are some commercial digital library software programs available, none of them have seen as much use as the ones that were previously described. Digital library software was widely utilized in Indian libraries. Below is a quick summary of some of the popular digital library software that is in the public domain, along with a description of its standout characteristics.

### **2.3.6.5 The Greenstone:**

The New Zealand Digital Library Project at the University of Waikato created the Greenstone Digital Library software, which is made available under the terms of the GNU General Public License. The software is distributed in collaboration with UNESCO and the Humanities Library Project. It may create new collections and offer digital library collections. It offers a fresh approach to publishing material on CD-ROM or the Internet. Many example collections made with the Greenstone program may be found in the New Zealand Digital Library and are open for public viewing.

### **2.3.6.6 E-Prints:**

The Intelligent Agents, Multimedia Group at the University of Southampton's Department of Electronics and Computer Science developed the E-Prints Digital Library program. E-print's basic configuration, which originated in the scholarly communication movement, is focused on research papers, but it may be modified to accommodate different types of material and uses. The GNU General Public License may be used to distribute GNU E-prints freely. A free program called GNU Eprints 2.x generates online archives at <http://software.eprints.org>. An archive of research papers is created by default settings. Launch version 2.3 is the most recent.

### **2.3.6.7 Dspace:**

The influence of Dspace digital library software is growing as more and more Knowledge Resource Centers install, assess, and use the package worldwide. Hewlett Packard (HP) and Massachusetts Institute of Technology (MIT) collaborated to develop Dspace. The software for the institutional repository is still being developed and is now in use. The Dspace website offers a download for the most recent version, 1.2. The majority of the core development is now done by the original developers, but a growing community of technical users is coming up with ideas for new releases and wanting to produce some add-on modules. Furthermore, this program is being developed using a more community-wide open-source development paradigm, thanks to guidance from the Dspace Federation. Dspace is a digital platform that records, stores, indexes, maintains, and disseminates university research faculty members' intellectual production. All digital content types, including text, photos, audio files, and video, are accepted by Dspace. Papers and preprints, conference papers, technical reports, working papers, e-theses, datasets in the form of statistics and geographic data, photographs, audio and video files, learning objects, and reformatted digital library collections are examples of possible content. This program can be downloaded from [www.dspace.org](http://www.dspace.org).

### **2.3.7 Digitization Management and Planning:**

Building a digital library begins with the extremely specialized and expensive process of digitization. It requires input from different knowledge domains, indicating that the goals, requirements, and purpose of digitization are well defined. The aims, scope, advantages, expenses, time frame, implementation challenges, deliverables, and target users should all be clearly stated in the digitization proposal. It might make sense to maintain traditional collections while also acquiring digital media collections, depending on the circumstances. Instead of starting a digitization initiative, other options include developing subject or library gateways and purchasing access to electronic resources. This plan would reduce ongoing administrative expenses as well as the cost and labor associated with digitization. After the decision to digitize is made, elements like interoperability, reusability, maintenance, verification, and documentation for both developers and users should be carefully considered and prioritized. The following lists some requirements for meticulously organizing the digitalization process in phases:

#### **2.3.7.1 Analysis of viability:**

A feasibility study should take into consideration a variety of factors, including the quantity or number of documents that need to be digitized, the target audience, the needs of the users, and the availability of tools and expertise. The investigation should determine whether the library can handle an internal project or whether it needs to be outsourced.

#### **2.3.7.2 Project Organization:**

The project's design must take managerial planning into account, which includes how different jobs are sequenced, how to manage their time, and how to monitor the project. Managerial planning is necessary for tasks like hiring staff, carrying out feasibility studies, digitizing, whether internal or external equipment acquisition, managing intellectual property rights, integrating content into society, identifying markets, launching, and advertising services. Furthermore.

#### **2.3.7.3 Setting Up the Library's Hardware and Software:**

Whether digitization is done internally or through an outsourcing arrangement, the technological requirements can be worked out before the digitization process begins. Subsequently, the requirements concerning hardware, software, and many other things for the servers and network modules may be determined, along with the financial effects and network elements. Additionally, plans may be made for the capacity and connectivity required to host the digital collection document. The types, formats, editing, standards, and practices that are currently in use should be examined before

proceeding with this. After that, sample data must be used to test the draft specifications. The provisions outlined for the production of metadata for digital items and the digital collection may need to be modified in light of the results of this testing.

#### **2.3.7.4 Administration of Human Resources:**

Human resource management would vary depending on whether the information center chooses to digitize internally or through outsourcing. The following areas require human resources: hiring new employees with the necessary abilities, training current employees, and staff time spent as information scientists. It should be mentioned that even in cases when the digitalization process is outsourced, project planning remains a crucial concern. In order to enable clear communication between the groups and the personnel, the project management may be further divided into several groups with distinct tasks. Lastly, a reporting structure may be established.

#### **2.3.7.5 Financial agreement:**

The financial agreement is crucial and covers a range of expenses, including those related to switching standards and computers, hosting the services, maintaining them, and other related charges.

#### **2.3.7.6 Organizing the purchase of software and hardware:**

The selection of devices, tools, equipment, and technology can be based on a number of factors, including network tools that have been recovered, software for access and search, storage, and backup devices, and other relevant objects. Software may be developed internally or purchased. Installing hardware and software, as well as setting up the network needed to host the digital collection, might be considered for this purpose after obtaining the mandatory materials as previously described. Take into account that the amount of bandwidth required depends on the media that the digital library offers.

#### **2.3.7.7 Library Staff Placement and Training:**

Since creating and maintaining a digital library requires a high level of expertise, there shouldn't be any skipping any steps in the hiring or gathering of personnel. It should be highlighted that even though library employees are highly qualified individuals, they typically require training to improve and hone their skills for this role. This suggests that providing the required training should be a crucial part of the project's implementation.

#### **2.3.7.8 Production of Content:**

Content development involves a number of phases, such as converting digital datasets (e.g., MS Word files to PDFs or images), digitizing areas that are

currently printed, and identifying vendors in case the digitization work needs to be outsourced.

### **2.3.7.9 Project Implementation:**

The project's execution is started once the software, hardware, and other organizational services are set up and the knowledge documents' digitalization priorities are established. The library might make use of Dspace, Greenstone, E-Prints, Digital Library, and other digital library software.

## **2.4 India's Digitization:**

The digitization in India is listed below.

### **2.4.1 Digitization of every document:**

Digitization of all current citizen, government department, and educational section records is necessary. Digitization facilitates preservation, better sorting and searching, and easier access to all historical records.

1.State-level record keeping: All state government records, including those of every agency, must be kept up to date on servers. District-level data organization allows for the contact information of all state employees and office bearers, as well as the location of key government offices such as those for food and civil supplies, electricity boards, water supply boards, primary health care facilities, waste disposal facilities, post offices, and banks. All state government services can be easily downloaded or applied online thanks to the digitized data.

2.Citizenship records: Biometrics and data from birth and death certificates, PAN cards, passport numbers, driving licenses, vehicle registrations, and LPG members can all be combined into a single database. This may be marketed as an India Card or a citizenship card.

3.The information should be available online, on a website, and via a simple helpline number.

4.Biometric Identity System: voter cards, citizenship cards, and Aadhar cards

### **2.4.2 Digitization of land and real estate documents**

1.Every state government portal allows for the district-by-district online storage of all land parcels, site measurements, land type (agricultural, residential, commercial, forest, government, lakes), and other information related to every and every parcel of land.

2.Current and former landowners may be added. This also applies to apartments and homes, etc.

3.It can be suggested that all payments for the purchase and sale of land, homes, villas, and apartments be made via electronic money transfers, with TDS and other service taxes being deducted from the bank accounts involved.

4.Land registration, land records, land surveys, and easy downloads in electronic format are all available.

#### **2.4.3 Finance:**

Providing "a bank in every pocket" through the use of mobile apps, internet banking, digitizing all financial records, and giving users access to a single demat or savings account, among other banking-related digitization initiatives, could make it easier and mandate the collection of data for a variety of transactions, replace bank-specific debit cards with a single money card, and require the seeding of PAN data.

1.The Bank in Every Pocket initiative encourages banks to offer mobile, online, and app-based banking. E-services should be used to access all banking amenities. PAN numbers ought to be seeded into each and every bank account.

2.The user's current, savings, or demat account for loans, corporate insurance, money shares, bonds, fix deposits, and savings. One portable demat account that has all of the financial records for the individual. Demat accounts should not be bank-specific when using an e-wallet. All users should have access to depository services, regardless of the bank.

3.A bank credit and debit card combined into one money card with all the features. This is supposed to be a bank-independent, secure card. In the future, this money card can be used for all cashless transactions, including the purchase of household appliances, stationery, and college tuition.

#### **2.4.4 Transportation:**

1.Booking and selling of bus, train, and airline tickets.

2.any kind of registration for a vehicle.

3.Obtain and renew a driver's license for a two-, four-, or heavy-duty vehicle.

4.Issue and renew commercial motor vehicle route permits.

5.Roadworthiness certification for vehicles and the receipt of levies, penalties, and charges.

#### **2.4.5 Services for Consumers:**

Customer services include tax payments, bill payments, complaints, departmental proposals, and RTI.

1.Simple bill payment via a single platform and bank direct debit

2.All departments should have easy-to-access online complaint and suggestion forms. The customer and superiors to monitor the grievance and deliver prompt, hassle-free resolutions.

3.Include a member of parliament and a member of the legislative assembly under consumer services. Mobile apps and e-platforms should be used to make all information, grievances, and suggestions that individuals may choose to share with members of the legislative assembly and parliament accessible.

4.All government services have helpline lines. Complete citizen support in all languages for all requirements.

5.The Indian government's and the states' services must to be accessible via the internet and mobile devices.

6.Users who have registered their mobile number can receive information about planned and unscheduled power outages, water availability, and power outages by SMS. Updates on the internet and through apps can also be used to disseminate this information.

7.Online processes are used for bill payments, gas, electricity, water delivery, phone line connection and maintenance, and more.

#### **2.4.6 Learning:**

1.Make all back books and Ph.D. digital. Thesis and make them available to every student for quicker download.

2.Easy e-learning programs can be used to access lectures given by reputable college instructors or academics at IIT.

3.tools for e-learning and instructional resources for teachers and students.

4.Every credential and test result have to be digitalized and stored in one HRD depository.

5.Results of public exams sent via email and SMS.

6.Teachers are required to periodically complete online modules for teacher training.

7.Online public exams, data on outcomes and education, and the availability of board exam results online

8.Faculty information relevant to registration is available, as are printable forms pertaining to education.

9.Online registration for students and online payment of fees

10.Information about online learning institutions

11. digitization of manuscripts, sound recordings, books, journals, laboratory records, and literary archives in public libraries and literary archives.

12. Books on religion, culture, and archaeology can all someday be made available as e-books.

#### **2.4.7 Knowledge of computers:**

1. learning computers in elementary school.

2. specialized instruction for anyone managing all internet records.

3. Users will receive records in a language of their choosing.

#### **2.4.8 Services for health:**

Through more focused medical interventions and instant access to vital information, healthcare professionals will be able to exchange information with their community and hospital network, allowing the government to enhance population health overall. This may be applied to electronic health records, electronic medical records, and other health information interchange in an electronic setting.

A health card that contains a person's medical record information. "One Indian, One health record" facilitates the sharing of patient health records throughout the country's healthcare system.

1. The National Electronic Health Record (NEHR) system offers a single point of access to medical data.

2. Physicians and health departments can use electronic health records to build a large repository. One practical way to improve healthcare delivery would be to combine patient and physician datasets.

3. Every medication catalog, from any pharmaceutical corporation to any retail pharmacy, should be made available in a simple, digital format that can be easily traced.

4. online retail drug purchases made with electronically signed prescriptions from practitioners.

5. Use of non-closable identification to stop the sale of fake medications. Basic essential medications, such as those for diabetes, high blood pressure, fever, and colds, should be reasonably priced and accessible at government-run pharmacies.

#### **2.4.9 Farming:**

1. Daily Market Price for all agricultural products on the internet.

2. Agriculture-related historical data for study and analysis.

3.Information on soil type, fertilizer use, micro irrigation, monsoon statistics, and green agriculture can be shared on Farmer TV and Radio.

4.An agricultural research institute dedicated to efficient management of soil and water resources.

5.The information provided on the soil includes its texture, land type, landform, drainage, slope, surface water recession, crop suitability, land zoning, nutrient status, and recommended fertilizer.

6.The purpose of the agriculture call center is to give farmers with phone service in all languages, real-time pricing data, and access to all agricultural information. The same holds true for fisheries and livestock.

#### **2.4.10 Travel and Tourism:**

1.creation of an interactive tourism website featuring a map, phone number, and information on must-see locations.

2.Database of hotels and resorts; operators and authorized travel agencies (Ref: <https://www.mygov.in/sites/>).

#### **2.5 National Digital Library of India (NDLI):**

The digital library of rare books gathered from Indian libraries and made available for public use. The goal of the DLI project, which got its start in early 2000, was to digitally conserve and make all of humanity's great literary, artistic, and scientific creations freely accessible to everyone online for the sake of education, research, appreciation, and future generations. First, a searchable collection of one million books, mostly in Indian languages, will be made available for free via the creation of the Digital Library. The Department of Electronics and Information Technology, Ministry of Communications and Information Technology, Government of India, took over the Project after it was started by the Office of the Principal Scientific Advisor. Additionally, the goal was to provide a testing ground for researchers to enhance optical character recognition, intelligent indexing, scanning methods, and Indian language technology in general. Investigate currently available in Portable Document Format, the Digital Library of India has 550,585 volumes with 191,657,791 pages (191.632 million approximately). The Department of Electronics and Information Technology, Ministry of Communication and Information Technology, Government of India, is providing funding for this initiative. Enabling full text indexing and searching based on existing OCR (optical character recognition) technology is one of the objectives of the Digital Library of India. Online search makes it possible for users to find relevant material fast and consistently, which improves user and research scholar success in their projects. The Indian Copyright Act of 1957 is The copyright guidelines. All books accessible on the

Digital Library of India website are protected by copyright. The Digital Library of India and its material may only be used by registered users for the noncommercial academic and educational purposes specified above. All Digitized Knowledge Documents are for Noncommercial Uses Only. If no one consents to not alter, conceal, amend, or remove any attribution or copyright notice that is contained in the Digital Library, or to provide permission to anyone to do so, The DLI team may be reached at the Indian Institute of Science's Supercomputer Education and Research Centre in Bangalore, India. For the benefit of the Indian government and twenty-one major participation centers, the Digital Library of India operates out of the Indian Institute of Science, Bangalore, in collaboration with MCIT, ERNET, NSF, and CMU. Table 2.9 reveals that the Digital Library of India has 5, 50,589 pages in total that are digitized, with 19, 16, and 81,695 pages altogether. The greatest collection of digitized books at C-DAC, Noida Institute, Uttar Pradesh, is 1, 01,512. The largest number of digitized pages at Banasthali University in Niwai, Rajasthan, is 3, 76, 84, and 591. Table 2.10 lists the amount of pages in each language's digital book. Maximum number of pages in English-language books is 2,89,361, and the number of pages is 11,59,32,078 (<http://www.dli.ernet.in/>).

**Table 2.9: Institute wise list of Digitized document with number of pages**

| <b>Center wise Digitization Report as on 01/01/2017</b> |   |                        |                        |
|---|---|------------------------|------------------------|
| <b>Sr. no.</b>  | <b>Scanning Center</b>                      | <b>Number of Books</b> | <b>Number of Pages</b> |
| 1   | AKCE, Universal Digital Library             | 7063                   | 1026507                |
| 2   | Allama Iqbal Library, University of Kashmir | 17076                  | 6102651                |
| 3   | Anna University                             | 231                    | 106380                 |
| 4   | ASR, Melkote                                | 1293                   | 393852                 |
| 5   | Banasthali University, Rajasthan            | 94022                  | 37684591               |
| 6   | Bharatiya Gyanpeeth, Delhi                  | 18                     | 7612                   |
| 7   | Bharatiya Jnanpith, Delhi                   | 292                    | 92357                  |
| 8   | C-DAC, Noida                                | 101512                 | 31529575               |
| 9   | C-DAK, Kolkata                              | 70692                  | 28929111               |
| 10  | Central Library, University of Delhi        | 52                     | 16537                  |

|    |   |       |          |
|----|---|-------|----------|
| 11 | City Central Library, Hyderabad               | 17257 | 3759927  |
| 12 | Digital Library, Mulund                       | 492   | 160184   |
| 13 | Dr. Zakir Husain Library Jamia Millia Islamia | 5     | 633      |
| 14 | Durga Shah Municipal Library, Nainital        | 465   | 159370   |
| 15 | Goa University                                | 1611  | 191575   |
| 16 | Government Central Press, Mumbai              | 165   | 60743    |
| 17 | Gujrat Vidyapith Library                      | 1     | 43       |
| 18 | Gurukul Kangri Vishwavidyalaya, Haridwar      | 28    | 5200     |
| 19 | IGNCA, Delhi                                  | 10195 | 4205808  |
| 20 | IIAp, Bangalore                               | 1626  | 586917   |
| 21 | IIIT, Allahabad                               | 63741 | 20546413 |
| 22 | IIIT, Hyderabad                               | 2240  | 714886   |
| 23 | IISc, Bangalore                               | 4422  | 1618253  |
| 24 | Kerala Sahitya Akademi, Kerala                | 999   |          |
| 25 | Maulana Azad Library, A.M.U                   | 6     | 1832     |
| 26 | Namgyal Institute of Tibetology, Gangtok      | 2     | 1802     |
| 27 | NIT, Sikkim                                   | 1015  | 1666183  |
| 28 | North Eastern States Libraries                | 30156 | 9595316  |
| 29 | Osmania University                            | 7511  | 2660451  |
| 30 | Pune University                               | 1681  | 496638   |
| 31 | Rashtrapati Bhavan Library                    | 4831  | 2022258  |
| 32 | RMSC, IIIT-H                                  | 54995 | 18947375 |
| 33 | Salar Jung Museum                             | 6127  | 2338824  |
| 34 | SASTRA University, Thanjavur                  | 1867  | 575329   |

|    |  |               |                  |
|----|--|---------------|------------------|
| 35 | Sringeri Sharada Peetham                       | 900           | 283292           |
| 36 | State Central Library, Hyderabad               | 8802          | 3080062          |
| 37 | S.V. Digital Library, Tirupati                 | 15098         | 3860443          |
| 38 | The Record And Persion Office , War Department | 4             | 280              |
| 39 | University of Hyderabad                        | 75            | 35140            |
| 40 | University of Kashmir                          | 76            | 19725            |
| 41 | University of Pune                             | 4             | 854              |
| 42 | Unknown  | 11782         | 4163481          |
| 43 | UOD, Delhi                                     | 6373          | 2622432          |
| 44 | U.S. Department Of Agriculture                 | 2             | 303              |
| 45 | U.S. Department Of Education                   | 1             | 1074             |
| 46 | Veer Sewa Mandir, Dariya Ganj, Delhi           | 3783          | 1409476          |
|    | <b>Total :</b>                                 | <b>550589</b> | <b>191681695</b> |

(Source-<http://www.dli.ernet.in/>)

**Table 2.10: Language wise digitized books list with Number of pages**

| <b>Language wise Digitization Report as on - 01/01/2017</b> |                 |                        |                        |
|---|-----------------|------------------------|------------------------|
| <b>Sr.No.</b>   | <b>Language</b> | <b>Number of Books</b> | <b>Number of Pages</b> |
| 1   | English         | 289361                 | 115932078              |
| 2   | Hindi           | 51724                  | 15969189               |
| 3   | Kannada         | 3336                   | 720128                 |
| 4   | Arabic          | 7630                   | 2484155                |
| 5   | Persian         | 7624                   | 2685979                |

|    |           |       |          |
|----|-----------|-------|----------|
| 6  | Others    | 208   | 91774    |
| 7  | Urdu      | 32265 | 9913618  |
| 8  | Kashmiri  | 479   | 58146    |
| 9  | Punjabi   | 402   | 93187    |
| 10 | Sanskrit  | 35104 | 13884970 |
| 11 | Gujarati  | 39817 | 6777655  |
| 12 | Farsi     | 4     | 4644     |
| 13 | Awadhi    | 2     | 323      |
| 14 | Bhojpuri  | 1     | 160      |
| 15 | Bengali   | 29668 | 8954446  |
| 16 | Braj      | 5     | 2818     |
| 17 | Danish    | 2     | 1062     |
| 18 | Dutch     | 36    | 15024    |
| 19 | French    | 1261  | 564854   |
| 20 | Garo      | 116   | 13746    |
| 21 | German    | 772   | 349179   |
| 22 | Greek     | 23    | 11502    |
| 23 | Irish     | 2     | 1226     |
| 24 | Italian   | 69    | 39648    |
| 25 | Khasi     | 600   | 62512    |
| 26 | Kokborma  | 1     | 28       |
| 27 | Kokborok  | 14    | 3258     |
| 28 | Malayalam | 582   | 16117    |
| 29 | Manipuri  | 2714  | 373734   |

Table 2.7 Contd.

| <b>Sr.No.</b> | <b>Language</b> | <b>Number of Books</b> | <b>Number of Pages</b> |
|---------------|-----------------|------------------------|------------------------|
| 30            | Marathi         | 3907                   | 1044999                |
| 31            | Mizo            | 280                    | 47528                  |
| 32            | Nagari          | 1                      | 64                     |
| 33            | Nepali          | 28                     | 4952                   |
| 34            | Norwigen        | 3                      | 882                    |
| 35            | Oriya           | 49                     | 18454                  |
| 36            | Pali            | 94                     | 32696                  |
| 37            | Pnar            | 4                      | 404                    |
| 38            | Polish          | 5                      | 3508                   |
| 39            | Portuguese      | 1450                   | 168496                 |
| 40            | Prakrit         | 2                      | 268                    |
| 41            | Rajasthani      | 4                      | 756                    |
| 42            | Roman           | 2                      | 506                    |
| 43            | Russian         | 8                      | 2555                   |
| 44            | Sindhi          | 86                     | 32819                  |
| 45            | Spanish         | 25                     | 12605                  |
| 46            | Swedish         | 13                     | 6161                   |
| 47            | Tamil           | 5376                   | 1287932                |
| 48            | Telugu          | 23313                  | 4480770                |
| 49            | Tibetan         | 1037                   | 1674473                |
| 50            | Turkish         | 133                    | 25004                  |
| 51            | Multilingual    | 1931                   | 495542                 |
| 52            | Unknown         | 6846                   | 2753238                |
| 53            | Assamese        | 2168                   | 537824                 |

|    |              |               |                  |
|----|--------------|---------------|------------------|
| 54 | Mongolian    | 2             | 352              |
| 55 | Nagamese     | 1             | 27               |
|    | <b>Total</b> | <b>550590</b> | <b>191657975</b> |

(Source-<http://www.dli.ernet.in/>)

## 2.6 National Library of India, Ministry of culture, Government of India:

As one of the four designated libraries under the Delivery of Books and Newspapers (Public Libraries) Act, 1954, the National Library of India, the most prestigious library in the nation, is entitled to receive a copy of every book produced anywhere in the nation. The library serves as a permanent repository for all printed and reading materials created in India or by international authors, regardless of where they were published or what language they were written in.

The National Library of India has its roots in the Calcutta Public Library, which was founded in the first part of the 1800s. The establishment of the Calcutta Public Library may be attributed mostly to Mr. J. H. Stoqueler, the Editor of the Englishman. March 21, 1936 marked the public opening of the library, which was located on the ground level of Dr. F.P. Strong's home, a civil surgeon.

Lord Curzon was the one who came up with the first concept of a public library. He saw two libraries that had extensive book collections: the Calcutta Public Library and the Imperial Library, which was established in 1891 by combining many Secretariat libraries. The Imperial Library (Indentures Validation) Act of 1902 was passed, and on January 30, 1903, Lord Curzon formally opened the reconstructed Imperial Library to the public at Metcalfe Hall. The library's goals were to serve as a reference resource, a workspace for students, and a storehouse of materials for future Indian historians. The goal was to house, as much as possible, all written works about India throughout history.

From the outset, the Bengali government granted the library the right to request any book that it had acquired for free, in accordance with the Press and Registration of Books Act of 1867. When the Imperial Library acquired 2,333 books from the Library of Congress in 1907, it took the first step toward expanding its collection via the exchange of publications with international institutions. The Imperial Library had around 3,50,000 books in total as of April 1947.

The "Imperial Library (Change of Name) Act" of 1948 replaced the Imperial Library with the NATIONAL LIBRARY of India after India's independence.

On February 1, 1953, Maulana Abul Kalam Azad, the Union Minister of Education at the time, inaugurated the library to the public. It was given the unique status as an institution of national significance under Article 62 of the 7th Schedule of the Union list of the Constitution of India.

### **Digitization Collection**

| Sr. No. | Document Type        | Quantity |
|---------|----------------------|----------|
| 1       | Images               | 99099    |
| 2       | Report & Proceedings | 6905     |
| 3       | E-Books              | 12243    |
| 4       | Rare Books           | 26007    |
| 5       | Snippets             | 82       |
| 6       | Audio                | 51       |
| 7       | Paintings            | 2        |
| 8       | Manuscripts          | 8748     |
| 9       | Other                | 91       |

Data Retrieve from,  
 (<https://indianculture.gov.in/MoCorganization/national-library>)

Data Access on October 20, 2023

## **2.7 Krishikosh - An Institutional Repository of India National**

### **Agricultural Research System:**

The KrishiKosh is an Institutional Repository developed under the under National Agricultural Research System (NARS). In this project, the intellectual output of Indian NARS in various document forms is captured, preserved, archived to enable researchers to access the content online. It is a unique repository of Knowledge in agriculture and allied sciences, having a collection of theses, rare and valuable books, institutional publications, technical bulletins, project reports, lectures, preprints, reprints, field records and other documents available in different libraries of Research Institutes and State Agricultural Universities spread all over the country. KrishiKosh acts as a digital platform to preserve the institution's intellectual assets and to also manage its use through open access mandate.

Indian National Agricultural Research System The Indian National Agricultural Research System (NARS) is a comprehensive information

system for agriculture and allied sciences consisting of vast collection of rare and valuable books, reports, theses, surveys, statistical data, maps, bulletins, newsletters, journal back volumes and other documents held by libraries of different Agricultural Research Institutes and State Agricultural Universities spread all over the country. In order to provide online access to this valuable resource to researchers and scientists all over the world, an Institutional Repository named 'KrishiKosh' has been created under the National Agricultural Innovation Project (NAIP).

**Digitization:** The work of digitization of the research documents was taken up by four different centers, namely - Acharya N G Ranga Agricultural University, Hyderabad; Indian Agricultural Research Institute, New Delhi; Indian Veterinary Research Institute, Izatnagar; and University of Agricultural Sciences, Bengaluru. Using Open Source software, the material in the repository was organized into Institution wise collection of documents such as books, journals, theses, reports, articles etc. The process of digitization including scanning, cleaning, cropping, editing conversion to text (OCR), conversion to PDF or JPG format, is currently being done at four different Centres'. So far, table 2.11 shows that more than 8.6 million pages from 19,495 documents have been digitized along with the necessary Metadata.

**Digitization Centers:** Initially the repository has been developed at the following four libraries:

- i. Indian Agricultural Research Institute, New Delhi
- ii. University of Agricultural Sciences, Bangalore
- iii. Indian Veterinary Research Institute, Izatnagar
- iv. Acharya N G Ranga Agricultural University, Hyderabad

**Table no. 2.11 Digitized document in Krishikosh**

| Sr. No. | Digitized Document          | Quantity |
|---------|-----------------------------|----------|
| 1       | 8.6 million Pages digitized | 19,495   |

(Source- <http://lib.hku.hk/etd2013/> presentation)

## 2.8 Selection of Material for Digitization and 'Born Digital' in India:

The identification, selection, and prioritization of the documents to be digitized is the first and most important step in the project's execution process. When papers are accessible digitally, they may be viewed anywhere and quickly changed to various forms. In every other scenario, procedures for capturing newly created digital data must be established when the company is

producing its own content. IPR concerns must be addressed if the chosen content originates from outside sources. If the content to be digitized is not in the public domain, consent from the publishers or data providers is required before digitization may begin. Additionally, the choice of whether to OCR the digital photos may be made. It's possible that some of the documents chosen for digitalization are already digitally accessible. If accessible, it is always more cost-effective to purchase electronic material rather than convert it. Additionally, bound volumes of journals, manuscripts, decaying collections, enormous material, etc., would need for very specialized labor and equipment.

**Conclusion:** technical limits, financial restrictions, copyright issues, a lack of policy guidelines, and, finally, the acquisition of digitization materials provide the biggest obstacles to the design and implementation of digitization projects. The selection process, material preparation, publishing industry collaboration, digitization specifications, research into optical character recognition, research into various file designs to lower storage costs, automatic quality control mechanisms, new language-based search and retrieval techniques, digital preservation of the files, and the technical infrastructure to support all these aspects are additional significant issues and problems. The focus of digitization efforts changed with the turn of the century. Libraries are now digitizing whole collections instead than just selected highlights. Project organization became more crucial as digitization advances grew in scope. Methods and growth were stabilizing, and the issue of long-term digital content protection was becoming more widely recognized. The libraries began digitizing text resources, audio and video collections, and other assets rather than visually appealing ones. It was found that there were new uses for the digitized collections, notably ones aimed at certain target audiences like students and scientists. A library may initially need to purchase its own scanners and employ personnel, but it has come to light that scanning is not the library's primary business. Therefore, outsourcing digitalization may be necessary. It may not be able to satisfy the high criteria established by the libraries in accordance with their requirements because of these high standards. Nowadays, digitization from microfilm or microfiche is preferred over digitizing from originals since it is less expensive but often produces pictures of inferior quality. The idea of using a single format for both protection and access is being studied for the same reason. In order for a library to be able to contract out its scanning needs, it must establish criteria of quality that private businesses can meet. The library may nevertheless retain expertise in imaging methods even if all scanning tasks are outsourced.

The widespread availability of digital materials in university libraries is one of the main drivers of their successful use. However, there is debate over their appropriate and optimal use. Over the last several decades, significant

advancements in computer applications have brought about profound changes in the ways that information is acquired, stored, managed, accessed, retrieved, and consumed. Information processing using computers has given rise to a number of new goods and services. The Web and the internet are continually influencing the creation of new forms of academic communication; they have enormous promise for delivery since they are able to effectively get over the geographic constraints that print media has. Moreover, there has been a significant decrease in the duration between the publishing of the product and its delivery. Information demands may be met and retrievals made quickly with the use of the internet. Given that the majority of university libraries need an increasing amount of research, this is crucial. This crucial information is persuading a lot of information resource centers to switch to digital resources, which are more readily available and less costly. This is particularly useful for remote learners who don't have much time to visit libraries outside. They may use dialup connection to access widely accessible electronic resources, such as CD-ROMs, OPACs, and the Internet, which are mostly replacing print media.

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## 3. Financial Sources of University Libraries

### 3.1 Introduction:

The purpose of education is to make any community better. The most important institution in society that serves as a basis for knowledge generation, preservation, and dissemination is the university. Universities are now intricate institutions. It is likely that colleges should generate individuals committed to the development of the nation and its services given the rapidly expanding size of India. The University Library's goods directly impact the kind, purpose, improvement, and functional structure of the library. So, to set the scene for the study, a synopsis of the evolution, financial standing, and enhancement of university libraries in Maharashtra State in general, as well as the ten university libraries in particular—Dr. Babasaheb Ambedkar Marathwada University in Aurangabad, Rashtsant Tukadoji Maharaj Nagpur University in Nagpur, Shivaji University in Kolhapur, Mumbai University in Mumbai, North Maharashtra University in Jalgaon, Santa Gadgebaba Amravati University in Amravati, Solapur University in Solapur, Savitribai Phule Pune University in Pune, and Swami Ramanand Teerth Marathwada University in Nanded—are all included in this overview.

Over the past few years, information technology has completely changed how university libraries handle information. To develop such an integrated university library and information system, automating individual university libraries is not so much a prerequisite as a first step. The optimal use of information resources will be facilitated by the promising trend in the enhancement of information services with these libraries' effective networking (Sistla, 2006).

The renowned Indian philosopher Kautilya also said, "Treasury should receive the majority of attention because all undertakings depend on finance." Any organization's finances are its foundation and vitality. Therefore, sound financial management is essential for every firm, but especially for universities, which serve as the hub of higher learning. Academic finances have experienced a significant shift in terms of volume and trends. The flow of funds into universities has expanded along with their requirements and expectations (Kaur, Trishanjit 2014).

Finance is one of the most essential requirements for any firm to survive and prosper. As service organizations, libraries and information centers have a national responsibility, particularly to individuals affiliated with public service and educational institutions. Therefore, it is crucial that sufficient funding be available to handle the organization's diverse tasks. A few

concepts are needed to manage money, as it needs frequent oversight and assessment much like other management tasks.

These consist of the financing sources for different types of libraries, the main expenses incurred by libraries, and the standards and procedures for financial estimation in libraries. We'll look at the aforementioned factors in relation to academic, public, and special libraries. The majority of the money that libraries spend goes into user services, staff wages, digital resources, books, magazines, construction materials, furnishings, maintenance, and computer equipment (Arora, Renu 2014).

### **3.2 University Library:**

The university still exists for humanism, reason, and truth. When everything is said and done, it makes plans ahead of the general public through advancements in learning. The components of a university are the generation of new knowledge through research and its translation with already-existing information; the provision of information to users in all areas of the knowledge universe and the provision of expert and professional preparation; the dispersal of knowledge and the reduction of social and cultural gaps; and the promotion of sincere beliefs and mentalities in the public eye through various outreach initiatives. It does a good job of portraying the university as an open space where researchers and educators are the brain, users are the body, and libraries are the heart. Examiners, administrators, and educators have all frequently emphasized the importance of libraries in higher education.

"The library is the heart of University's work, straightforwardly along these lines, as respects its research work, and by implication as respects its instructive work which gets its life from research work," reads the explanation provided by the Radhakrishnan Commission on University Education (1948-1949). "Humanistic research needs a library as well as a knowledge resource center, while preparation in higher branches of education and research is fundamentally an issue of instruction how to utilize the apparatuses."

In addition, the Kothari Commission emphasized in its Report on Education and National Improvement (1964-1966) that "No university, institution, or office should be established without taking into account its knowledge resource center demands in terms of people, books, diaries, and space. Therefore, the University library structure is designed to get the University closer to realizing its goals and ideas. Since the University Knowledge Resource Center functions as a vital component of the University, its growth and development are solely dependent upon the growth and development of the University's research and instructional software engineers. In this way,

allow us to briefly review the objectives of higher education in India. Despite the fact that the Indian university system is rooted in archaic and medieval educational institutions such as parishads and viswavidyalayas, which were centers of ancient Brahmin, Buddhist, and Muslim societies, the Western model of university structure was initiated in 1857 with the establishment of three universities in Calcutta, Bombay, and Madras. Before independence, there were just eighteen institutions; now, there are approximately 300, including those that are regarded as universities. Advanced universities have a knowledge resource center, as evidenced by their large personnel, enormous understudy enrollment, and abundant resources (Adishesaiah, 1992).

### **3.3 The University Library's Goal:**

A library is a crucial component in ensuring that research at a higher level gets completed. College libraries engage in a wide range of activities, such as Collection Improvement, User Education, Document Delivery, Transmission, Reference Service, Digitization of Uncommon Archives, Access to Electronic Resources, and so on. The college knowledge resource center's primary objective is to serve as a dynamic tool for elucidating the expanding frontiers of knowledge. The knowledge resource center serves as the hub for educational and perceptive interest at colleges by catering to the needs and desires of its patrons, from the senior instructional staff engaged in driving research to the astute contestant who animates and moves users to develop long-lasting habits for good reading, study, and investigation.

The goals of the parent association are mirrored in the college library's destinations, which were established to support parent body satisfaction. The goals of the college knowledge resource center are as follows going forward:

- i) Provide scholarly administrative initiative to people from diverse backgrounds and instill a sense of social reason in the general populace;
- ii) Seeking and acquiring new knowledge, drawing heavily on the pursuit of truth, and striving for fresh revelations;
- iii) Make an effort to promote social justice and uniformity while reducing social disparities via education; moreover, direct researchers in all fields of knowledge and disperse scientific findings for the benefit of mankind.
- iv) Establish rules, processes, and policies for protecting and gaining access to information that aids in education;
- v) Look into funding options and community projects with various groups; Provide services that fulfill college students' information demands and to limit information and ideas for kids; Preserve knowledge accumulated over eons;

- vi) Create print and online social events that use expertise from beyond the information resource center to encourage user research and further;
- vii) Expanding the boundaries of knowledge via research projects conducted by educators and other researchers, and disseminating what they have learned through instruction and output (Ghanch, D.A. 1992).

### **3.4 The University Library's Function:**

In order to meet the goals of higher education, university libraries should design their operations so that they become indispensable partners in the preservation of knowledge through teaching, research, translation, and application of findings for the benefit of society, as well as program expansion and services. The information resource center supports university initiatives and aids in education. As a result, a knowledge resource center at a university serves as an educational tool in addition to acting "as a dynamic instrument of education, to bolster the keenness of clients, empower scientists of the staff and welcome all who go into its home to share completely of its scholarly and social substance," in the words of Gelfand.

The University's information resource center structure was highly praised by the Kothari Commission on Education (1964-1966), which recommended that the center should do the following:

- i) Assist university staff in remaining updated on changes to their orders;
- ii) Provide materials essential for study in subjects of relevance to the university library;
- iii) Make an offer to library administrations for the completion of all formal education;
- iv) Open doors to the vast world of books that exist outside the boundaries of one's own field of expertise wherever possible. Assemble scholars, students, and books in settings that encourage reading for pleasure, self-disclosure, and self-awareness.

According to Malcolm S. Adisheshaiah, "If instruction is the basis for all learning, then the library is the springwater of all education and cannot be replaced. If the goal of advanced education at the post-graduate, graduation, ace of rationality, specialist of theory, and post-doctoral levels is to develop new sources of information and new current information, then there should be no alternative to the knowledge resource center."

Paul Buck stated that the nature of higher education is incomprehensible without a high-quality knowledge resource center; a high-quality workforce is not potential without one, and an instructional foundation is essential to maintaining free access to ideas. Buck arranged the components of a

university knowledge resource center under the headings of resources, information recovery, coordination, and staff ability, all of which are summed up in the phrase responsiveness to the needs of the university. Nigel Cox investigates the components of a university knowledge resource center under fewer than four headings as follows:

- i) Control: includes ordering, promoting, procuring, stocking, and getting ready;
- ii) Service: record-keeping, reference, mindfulness now, and skillful guidance to individual users;
- iii) Collaboration: establishing a link between the local and national library resource systems;
- iv) Research and change: made use of cutting-edge resources to digitize rare books, OPAC, RFID, smart cards, and unusual volumes. Library processes were also upgraded.

The development and continuation of learning for truth, edification, and standards of magnificence is, therefore, the reason for university libraries. From one viewpoint, there is a learning explosion and substantial inflow of information; on the other hand, there is an overwhelming desire for time-saving, targeted information. Manual processes for the recovery and dissemination exercises of information are becoming noticeably inadequate, and these are being replaced. Information correspondence innovation is gradually being connected to give access to information (Sahai, S. 1990).

### **3.5 University Library Services:**

While continuing to provide various customary information services, bookkeepers are developing new skills and adjusting to new components that are necessary to support innovation-based services like an E-Book, E-resources, and information seek remote access through. The environment and capabilities of university libraries fluctuate starting with one then onto the next, inferable from the way of curricular projects, flow mindfulness, examine exercises, and neighborhood needs of research researchers. Generally, the libraries are putting forth reference, current mindfulness, and loaning services to their users.

Among them are:

- i) A Wi-Fi connection;
- ii) Remote access via OPAC;
- iii) A reference desk;
- iv) SDI and Current Awareness;

- v) Loaning and lending between libraries;
- vi) Synopsis;
- vii) Supply e-books and e-journals.
- ix) Clippings from newspapers;
- ix) Knowledge of users and information literacy
- x) Help with website finding and access to the Internet, and
- xi) Using consortia and networks to access electronic resources.

An e-consortium harbors countless makers sharing a common enthusiasm through an arrangement of interlinked site pages like systems and consortia. The modern computerized condition is "consortia" that is proposed to share the resources but joint effort inside the part libraries. This helps educationalists in procuring Information rapidly at reasonable rates. (Gupta, O.P.1998).

In order to effectively and professionally support the instructive research, the university libraries sponsor all levels of instructive research personnel as well as all exploration staff and research researchers. All of this support is provided through various services that are expressed before the truth is revealed. The accompanying are fundamental prerequisites for the university knowledge resource center (Sistla, 2006).

### **3.6 Education Committees and Commissions:**

The UGC, the single most important statutory, advisory, and executive body, was purposefully established to assist the Government in discharging its constitutional responsibility, and it has played a significant role in the improvement of university libraries in India. The significant commissions and committees appointed by the University Grant Commissions that are related to knowledge resource centers are as follows:

- I The Committee for the Library (1957)
- ii) The Library and Information Science Review Committee (1961)
- iv) The 1964 Education Commission
- iv) The 1983 Mehrotra Committee
- v) The 1988 release of INFLIBNET, the National Network System for Universities Libraries
- vi) Library and Information Science Curriculum Improvement Committee (1990-93)

### 3.7 The University Library's Finances:

The managers of knowledge resource centers, for instance, are typically responsible for a variety of activities related to financial information, such as managing day-to-day operations, maintaining expenditures in accordance with their budgets, choosing the best approaches for providing services, determining prices to charge for services, justifying projects and staff, requesting funds for a capital project, and justifying the existence of the knowledge resource center or information center. These decisions are similar to those faced by librarians and information professionals, so it is important that they too are knowledgeable about various aspects of financial management.

Financial management is defined as the study of principles and practices involved in the financial operations of an organization, which includes libraries as well because financial management also deals with various aspects of acquisition, distribution, and utilization of funds in addition to balancing revenue and expenditures. In addition to the above, the general control and evaluation of financial affairs is also within the purview of knowledge resource centers. As a result, a basic understanding of knowledge resource center finance, library expenses, budget, and account is very significance for any knowledge resource center and information science.

The knowledge resource center to manage of financial issues involving rising of funds, in vesting of funds, preparation and approval of budget and other finance related matters. The role of the knowledge resource center is to estimate its own financial necessities; preparation of budget for its functions, activities, programmers; managing and spent of funds within the stipulated time frame; maintaining accounts and preparation of financial reports and information (Arora renu 2014).A compelling financial management framework empowers: enhances execution of the Information association; accomplishment of short-and long haul objectives; streamlines installments for procured funds; guarantees effective charging strategies available to be purchased of items and services; kills accounting mistakes; limits record-keeping repetition; empowers consistence of accounting directions In this module, we will realize, how designation of funds is helped out in the wake of raising the funds through various channels. Spending designation is a center issues experienced confronted by most libraries normally by open and instructive libraries everywhere throughout the world. The cost of knowledge resource center materials has expanded colossally amid the previous decade while increments to the libraries' accumulations budget have not kept pace. The funds ought to in this way be dispensed in such a way, to the point that they are ideally utilized.

The funds are distributed; the following activity is budgeting of the knowledge resource center budget. This is because of the way that the monetary allowance characterizes the operational potential outcomes for the knowledge resource center amid a given timeframe. It characterizes the soundness of the association and its capacity to give services to a developing, progressively different populace that is requesting a more noteworthy assortment of knowledge resource center materials in different arrangements. With a specific end goal to gather a financial plan, a knowledge resource center or Information proficient needs a decent understanding and information of the knowledge resource center' costs and wellsprings of income and arrangements for future development. Courses of events are for the most part given in which current spending uses and incomes ought to be assessed. Future budgets depend on costing gauges gotten from the present budget. Other than education sorts of budget, techniques for spending arrangement, legitimization and endorsement of budget, we will likewise take in the sorts of money related records required by Information associations. (Arora, Renu 2014).

### **3.8 Financial Management Fundamentals:**

All knowledge resource center professionals and other officials must handle financial resources prudently and cost-effectively in order to fulfill the knowledge resource center's mission of effectively promoting a variety of services and activities. As such, each official must abide by the following principles and responsibilities: simplicity, effectiveness control, economy, regularity, flexibility.

#### **i) Simplicity:**

The numerous financial procedures in the library should be minimal, straightforward, and simple to use since simplicity breeds efficiency in both finances and operations.

#### **ii) Control effectiveness:**

An organization's financial operations function optimally when they are managed effectively. This requires management of the finances to be straightforward, with appropriate economy, little waste, appropriate resource allocation, and widespread achievement of goals with few resources.

#### **iii) Finance:**

In addition to many other operations, economy should be practiced in financial concerns to the greatest extent feasible by adopting preventative measures to minimize unnecessary expense, duplication of labor or activities, and resource waste.

#### iv) Regularity

In order to make sure that transactions are reasonable, accurate, and adequately reported as well as that unnecessary costs are avoided, actual financial results must be compared to the budget on a regular basis. When actual financial results differ significantly from the budget, knowledge resource center officials must ascertain the reason for the variation, assess the activity, and take appropriate corrective action. Adhering to deadlines is also crucial, particularly when it comes to budget preparation, journal subscriptions, and other tasks. Information professionals should also project future needs in addition to the organization's current needs.

#### v) Adaptability:

Financial rules can be made flexible by taking into account the emergent nature or crisis situation of a given activity and making adjustments according to the circumstances. In addition, when funds are excess and time is limited, they can be diverted to carat in the form of useful collection or used for some new equipment (Arora, Renu 2014). Flexibility should be exercised.

### **3.9 Fund Allocation:**

Libraries and information associations also need to manage their financial resources effectively and creatively. However, since information associations are not profit-making organizations, they differ from other associations in terms of budgetary assignments. Libraries have traditionally allocated their funds according to a formula based on utilization insights and material costs; however, in the last few years, this approach has changed due to evolving information innovations. In addition, support assignments should be balanced annually based on the associations' ever-changing needs and the financial constraints that libraries face.

Fund allocation is contingent upon the following:

- i) To determine how much money libraries spend on resources;
- ii) How a sizable portion of the overall budget is allocated to the various services provided by the particular library;
- iii) To arrange the resources allotted to the various services;
- iv) To calculate the expenses for each service unit delivered, assuming yield measurements are provided;
- v) How much money could we reallocate to start a new service or support an existing one?

vi) Both formal and informal designation of monies; and judging what is appropriate and making discernible assumptions when allocating.

vii) Limited resources for purchasing library books;

The most well known ways to deal with knowledge resource center spending allotment are equation based portions. In these techniques, the designation is resolved relatively in light of a few elements, for example, the quantity of practical divisions, client classifications and number of clients in every class, number of full time workers. Despite the fact that in different libraries designation formulae are utilized to apportion reserves while different all the more simply receive an information way to deal with allot stores. Best recorded techniques for reserve assignment has a few focal points over casual or specially appointed methodologies. While allotment equations can be connected to a wide range of knowledge resource center materials, generally couple of associations utilizes recipes when apportioning budgets for memberships or proceeding with funds. Equations are utilized all the more regularly in the assignment of budget identified with book gathering. Funds ought to be distributed in such a way, to the point that they are ideally utilized. With a specific end goal to distribute finances in the most ideal way, the accompanying focuses must be viewed as (Arora, Renu 2014).

### **3.10 University Library Budget:**

The cornerstone of financial services is budgeting. A financial plan can be used to:

i) offer a financial agreement clearly stated;

ii) Determine the expenses associated with achieving specific goals;

iii) Provide justification for the arrangement and the subsequent approval;  
and

iv) Track progress toward goals.

The most essential tool for any administrator to communicate custodian arrangements and objectives in budgetary terms is budgeting, which is essential to the financial management handle. Budgets can be created at any authoritative level, ranging from the budget of a single item or service to the association's overall ace budget. The majority of curators and information specialists typically negotiate at the level of a departmental budget, which consists of the costs for at least one specific service or exercise. A financial plan needs to be realistic, reasonable, and workable.

Successful knowledge resource center associations and services are dependent upon adequate financial arrangements in the knowledge resource center and information association budget. Knowledge resource center

specialists need to understand how, in order to provide a more accurate estimate of knowledge resource center services, they should be willing to spend whatever is necessary to provide these services. Examples of budgetary items in libraries include:

- i) Pay
- ii) Training and moving forward with expert modification
- iv) Capital goods
- iv) Headaches
- v) Premises charges
- vi) Purchasing
- vii) Subscriptions

Every knowledge resource center should establish an annual budget in order to provide a tool for raising the capital needed to achieve its objectives and goals, to assess current financial performance and direct operations related to financial agreements, and to identify significant changes in the conditions or operational states of the association. Each branch of the knowledge resource center should operate within the allocated budget; if consumptions exceed the financial plan, an explanation for such excess must be provided; a formal plan to remove shortfall adjustments should also be generated (Arora, Renu 2014).

### **3.11 Budget Types for University Libraries:**

There are several kinds of budgets that one might exceed or observe from written references. These include:

- i) Budget by Line Item
- ii) The lump sum budget
- iv) Budgets by Formula
- iv) Budget for Performance
- v) Budget for the Program
- vi) Programming Budgeting System (PPBS) and Budgeting
- vii) Budgeting using zeros (ZBB)

#### **I. Budget by Line Item:**

The most popular type of budget is the detail budget, which consists of a series of lines, each of which represents a different use case. The main line may be pay rates, followed by costs for materials, hardware and equipment,

opportunities, and so on. There is no set procedure for resolving these lines, and the items determined in these lines may vary from association to association. The main advantage of this technique is that it is very straightforward and easy to plan, and for subsequent years by potentially increasing the sums, the financial plans can be prepared. However, this technique has some drawbacks, including its inability to inform consumers about how money will be spent, the lack of future projections, and, finally, it

ii. All-In Budget:

Under this method, the experts provide the library's parent body with enough funding, from which the parent body sets aside a certain amount for the knowledge resource center. Typically, this amounts to a certain percentage of the total budget, which the knowledge resource center is responsible for managing. This way, the knowledge resource center's financial plan appears to be a single amount in the parent association's authoritative budget; however, even though the amount appears to be a single amount, the knowledge resource center experts must decide how to distribute funds to various leaders within the knowledge resource center. As a result, spending arrangement in this case is

iii. Budgets in Formulas:

An equation budget represents a situation where funding allocation to various organizations performing complementary or parallel functions is determined by a formula. For example, a state may distribute funds to libraries within the state college or university system based on a particular formula, the contribution of which could be the number of full-time enrolled college students, postgraduate students, employees, the degree of nearby and upkeep required, or any other similar component. Such an equation could determine the precise amount to be assigned to each organization or the relative size of the sum which each organization receives. Clearly, an equation budget determines what the knowledge resource center will receive, not how it will be spent.

iv. Budget for Performance:

In this case, the financial support is presumably being built around the activities of the association and the services it offers or is mandated to provide. For everything, a unit cost could be established. For example, it costs "A" sum to flow a book, "B" sum to handle another book. The knowledge resource center's financial plan would then essentially be based on the volume of exercises anticipated for the year, taking into account the unit fetched for these exercises. An execution spending would then depend on use brought about on exercise execution, and the operational proficiency would be the concern. A drawback of this approach is that it measures quantity

rather than quality, which is rather difficult to quantify given the importance of client satisfaction.

v. Budget for Program:

The proposed costs of the association are delineated and scrutinized based on the capacities it endeavors to fulfill. A program budget primarily presents the library's intended uses as they are associated with each capacity. The advantage of this type of financial plan is that it allows one to understand what the funds being used are doing, as well as what will remain unaffected in the event that the financial allocation is reduced or what funds will be required to develop the extent or degree of particular services or capacities. An instructive and helpful way to illustrate a financial plan is to visually combine the detail budget and the program budget, providing a clear picture of where and why money is being spent.

vi. The System for Programming Budgeting and Budgeting (PPBS):

Program Budgeting and Budgeting System (PPBS), a sophisticated and modified version of program budgeting that combines the best aspects of execution budgeting and program budgeting, was introduced for the US Department of Defense by Robert McNamara in the 1960s without prior precedent. The main feature of this approach is that the destinations to be expert are characterized prior to the funds being allocated to finish the exercises/programs. Following the characterization of the goals, the various options for achieving those goals are examined and costs evaluated.

vii. ZBB, or zero-based budgeting:

The most recent procedure of budgeting, which has been principally utilized as a part of industry and government however now additionally in a wide range of libraries is the Zero-Based Budgeting (ZBB). This procedure begun in United States and has turned out to be very well known in India too particularly in the service division. ZBB is characterized as a strategy for budgeting in which all costs must be legitimized for each new period. Zero-based budgeting begins from a "zero base" and each capacity inside the association is dissected for its needs and expenses. Financial plan is then worked around what anyone can do the coming year, paying little respect to whether the monetary allowance is higher or lower than the past one. Give us a chance to take a gander at this approach regarding libraries and information focuses. If there should arise an occurrence of traditional budgeting frameworks, earlier year's financial plan is utilized as a benchmark and is generally changed in accordance with reflect current circumstances and legitimization is given for increments in different exercises, and so on. If there should arise an occurrence of ZBB, every unit of the monetary allowance must be legitimized and put in a chain of command. Exercises are

broken into bundles and finances are designated in their bundle chain of importance until funds are no longer available till the cut-off point.

Therefore in zero-based budgeting two centrality steps are recognized, that is, distinguishing proof of the choice bundles and positioning of these bundles. In recognizable proof of choice bundles, the bundle distinguished ought to be the most minimal unit for which a financial plan can be readied. It requires a depiction of every movement with that service unit. This procedure of portrayal requires the recognizable proof of objectives and targets, an announcement of options, the purpose behind the movement, outcomes of not presenting the bundle, itemized estimation of execution and the expenses of the action. After a choice unit is distinguished, a progression of choice bundles is recognized, each including objectives and destinations et cetera. The procedure of particularly recognizing choice bundles concentrates on the most ideal method for getting things done, either by sparing expenses of effectiveness of service. Once the choices have been proposed, quantitative measures must be built up to screen yield, which is typically communicated in budgetary terms. With all the choice bundles created, utilizing the destinations as aides, they are positioned in priority arrange and are introduced for endorsement or dismissal, the choice being founded on position in chain of importance and reasonableness.

Therefore, zero-based budgeting is more concerned with what will be needed in the future than with what has already happened. It is also essentially the same as participatory budgeting (PPBS) in that it involves a careful examination of the exercises that are necessary for the knowledge resource center and their legitimacy must be identified. The ZBB procedure also allows for a sign of the actual costs of the various exercises along with a gauge of the base cost level that is crucial to providing each service. Together, these elements make zero-based budgeting the most effective method for budgeting, especially in Indian libraries (Arora, Renu 2014).

### **3.12 Financial Guidelines and Standards:**

The methods for budgetary estimation that we studied in the previous module were: recipe strategy, proportionate strategy, per capita strategy, and strategy for points of interest. The per capita technique involves the least amount of money related to allocation on a per head basis, which is considered essential for providing legal or standard knowledge resource center services. The equation technique means that the transfer of funds to a learning asset fixates is based on a predetermined recipe. The proportionate strategy relies on the assumption that professionals provide adequate funds to the parent organization of the knowledge resource center, from which the parent organization settles a specific settled sum for the knowledge resource center. Finally, the technique for subtle elements includes eve

You are aware that the essential components of any financial strategy are:

Staff salaries (i)

ii) The price of supplies, such as books and magazines

iv) Equipment, supplies, stationery

IV) Consumption of upkeep

v) Other offenses and possible charges

The aforementioned real objects of consumption have to be considered in order to develop budgetary criteria and gauges for the appropriation of funds to libraries. These standards and measurements differ from knowledge resource center to library.

According to Ranganathan, a university library should budget according to the following guidelines:

Employees: 50%

50% of reading materials, including books

Not specified 10%

Taking into consideration the commendations of UGC, other university and education commissions, similar standards in other countries, and several knowledge resource center experts, the University Grants Commission Knowledge Resource Center Committee has also suggested similar norms for university libraries. The following norms have been established for educational libraries.

|                          |     |
|--------------------------|-----|
| Salaries                 | 50% |
| Books                    | 20% |
| Periodicals              | 13% |
| Binding                  | 07% |
| Maintenance & Stationery | 10% |

Similarly, in the case of public libraries, the norms are as below:

|             |     |
|-------------|-----|
| Salaries    | 50% |
| Periodicals | 20% |
| Binding     | 5%  |

For the special libraries, the following norms can be applied:

|             |     |
|-------------|-----|
| Salaries    | 30% |
| Books       | 20% |
| Periodicals | 30% |
| Binding     | 10% |
| Others      | 10% |

Notwithstanding, with respect to the above standards, it must be recalled that the previously mentioned standards are just connected as rules as every knowledge resource center needs to go as indicated by the guidelines and controls of its parent body and the standards as in the long run chosen by its specialists are to be considered with the end goal of spending making. The main goal of any knowledge resource center is to give services to its clients in the most ideal way. Hence, with the expansion in expenses of perusing materials and increment in compensations, the financial plans ought to likewise keep pace. The knowledge resource center budget ought to likewise be readied keeping in view the requests made on the knowledge resource center (Arora, Renu 2014).

### **3.13 Preparation of University Library Budget:**

Prior to establishing a financial strategy, it is always essential to review past spending, that is, examine the justifications for past expenditures and the annual reports from the preceding three years in order to understand the association's past and identify trends. The custodian or information specialists, who are also tasked with overseeing the distribution of funds within the library's general software engineers and activities, are responsible for setting up the financial support. A piece of the spending preparation handle is shaped by the understanding of the items on the budget and their defenses, but vocation shouldn't be limited to just one template. The process for conducting the audit, discussing services, and defending money should be uniform. Before the financial plan is officially introduced, senior service and financial professionals should share their opinions and approach headings within the budgeting section. Suggestions for upcoming and new programs, exercises, and activities should also be planned and predicted correctly in the budgeting section of the financial plan. The suggested budget must be fully supported by the relevant documentation that ties the suggestions to approved plans and supports the recommendations themselves. The knowledge resource center specialist responsible for establishing the funding should do the homework in a proper manner by allocating enough time and making the necessary efforts to understand the parent association's budgeting process. This is beneficial when the final

financial support is introduced to experts for approval and validates the requests for future financial subsidies (Arora, Renu 2014).

### **3.14 Accounting for Expenditure:**

The budget system necessitates an Enumeration of Use, encompassing both working and capital consumptions. One-time expenses such as building a new information resource center, automating it, or buying a record are examples of capital usage. While they might happen again, capital expenditures are one-time costs. They usually discuss long-term projects. Working consumptions are ongoing costs associated with the information association's daily activities. They are divided into fixed and variable costs. The agreed-upon expenses correspond to annual overhead expenditures, such as building maintenance, leasing, security, and fees for services that are legally obligatory. However, element costs vary depending on how they are used and identified, including consulting fees, using the internet to obtain information, electricity costs, shipping costs, postage, and so on. In Indian libraries, the necessary expenditures are usually covered within a prearranged timeframe created by the parent organization of the information resource center. The areas of interest that should be included in this framework include minor details about: staff members' salaries and remittances; and other items needed for the information resource center. All of the consumption items are to show the initial budgetary assessments for the current year; actual usage that resulted in the previous year; reevaluated measurements for the current year; and distinct financial assessments for the subsequent year. This reflects the idea that budgeting is an effort including the utilization of prior year data, current year consumption, and future estimates. It is not an activity that is carried out in a detached manner. Consequently, the entire process has to be carried out by a skilled person who is familiar with the association's activities (Arora, Renu 2014).

### **3.15 Fundamentals of Budgeting:**

There are two fundamental guidelines for budgeting: first, a financial plan is an organizing and verification tool; second, a thorough method is required in order for the financial allowance to be accurate and effective. The bookkeeper is in charge of creating expenditure plans in consultation with the organization and the information resource center's back divisions. The expenditures for newly hired or prospective employees, as well as the probable purchase of new computers, furniture, and equipment for the knowledge resource center, should also be included in the budgetary evaluations. The following viewpoints, which go along with providing spending assessments, may come first on the priority list:

- i) The budget should be approved and presented well in advance of the beginning of the fiscal year.
- ii) Spending metrics for non-repeating items should include a demand for hiring temporary employees for a set amount of time in order to purchase and process knowledge resource center reports that are needed for specific purposes.
- iii) The expenditure assessments should be established in consultation with the Internet lab, the reference section, and other department heads of the knowledge resource center.
- iv) The knowledge resource center in charge should ask for adequate funding in each category of the financial allowance to support the many initiatives that lead to wise modifications to knowledge resource center activities.
- v) The budget's execution should be logically flexible. The expenditure meetings' sequence should enable the curator to compare the financial records with the dense equalization reports that the knowledge resource center's records division sends. The financial assistance should be used to discuss the goals and objectives of the knowledge resource center, such as providing funding for the purchase of books and periodicals, digital resources, and computers in order to facilitate the organization of soon-to-be-organized new exercises.

The governing guidelines for creating budgets reflect the political and legal processes involved in changing a financial plan, together with the addition of specialized and money-related value measurements. Accordingly, the standards for creating a budget include setting broad goals to direct basic leadership, creating strategies to meet those goals, creating a stable financial plan that includes strategies to meet those goals, providing responsible financial services, clearly defining roles and responsibilities, being flexible in responding to immediate problems while planning for the long term, providing high-quality financial information, demonstrating the faculty's strength in the basic leadership role, and evaluating and making adjustments. Aside from the aforementioned, it should be remembered that a financial plan is not an isolated entity. Instead, it should respond specifically to the association's current working environment. The association's financial deficiencies need to be acknowledged and fixed in the upcoming year. (Rendu Arora, 2014).

### **3.16 State the Request for the Budget:**

The financial plan's modules that "vindicate" the cost of the suggested movement are explained in detail in the expenditure confirmation. The explanations should focus on how each expenditure item is necessary to

achieve the organization's goals and how the assessed costs in the budget were determined. Everything in the financial allowance should be justified at the moment when a neat, detailed budget is presented. The financial plan is sent to the foundations for approval once it is complete. The experts may need to understand the significance of finances before they can provide their unequivocal approval for the financial support, especially if the request for subsidies is more than it was last year. It might be for additional gear, new services, or new recruits. The experts examine the merits of the request in light of existing similar associations and the availability of cash for transfer. It is necessary to provide points of interest and information regarding additional subsidies when promoting the financial plan. In other cases, it seems sense to ask for a little bit more than is actually needed by padding out all the costs associated with the request. This is due to the fact that budgetary specialists usually recommend a less amount than what is actually sought. In these situations, information associations figure out how to function even if the entire amount requested is not approved, as they had initially requested somewhat more than was actually necessary. It is essential that all budgetary needs are met in a straightforward manner under appropriate budgetary headings. If professionals in different conditions do not understand the introduction to the financial plan, they may reject it or ask that the delicate budgetary parts be corrected. It's also essential to have ready any necessary and accessible supporting documentation. (Rendu Arora, 2014).

### **3.17 Accounting:**

Accounting is a must for any knowledge resource center, information center, or library to have a comprehensive and sufficient financial service arrangement. Essentially, it is a plan for estimating and documenting financial events based on accounting conditions in order to provide fundamental leadership. By documenting the same, the accounting, effective salary maintenance, and use of the knowledge resource or information center are completed. Appropriate accounting also prepares budgets for upcoming years and aids in future planning. Accounting is referred to in libraries and information associations as the accounting techniques needed to create a financial record of transactions and to budget statements on the funds, liabilities, and salaries, as well as the operational outcomes of the information association. It also refers to the strategy, analysis, and comprehension of an association's financial matters, bookkeeping, or records. The term "bookkeeper" refers to the professional who provides these services. These days, libraries also need the assistance of trained bookkeepers in order to provide efficient financial services. It differs from inspecting, which is a very important area of accounting. Thus, accounting may be thought of as a system that, via record-keeping and evaluation, provides quantitative information regarding accounts (Arora, Renu 2014).

### **3.18 Approving the Budget:**

The information association's experts only approve the financial plan if they are satisfied with the justifications provided by the curator who presents it. The Knowledge Resource Center Board, which is composed of senior educators and experts, grants the sanction in educational associations and finally approves the budget. The general population knowledge resource center expert has the authority to approve the finance plan in the event that open libraries occur. Finally, the parent organization of the knowledge resource center or the parent body's representing leadership has the authority to approve the budget in the case of unusual libraries. The approved budget is formally shared with the knowledge resource center specialists, and at the beginning of the fiscal year, several budgetary categories are used.

### **3.19 Financial Documents:**

Records pertaining to accounts or money-related concerns are referred to as monetary records. Records pertaining to money are maintained by libraries, information societies, and other institutions. In terms of budgeting, the knowledge resource center's parent association's statute governs the maintenance of the budgetary records. Currently, the administrator does not typically maintain separate budgetary records for the knowledge resource center; instead, the records department of the knowledge resource center's parent body typically maintains them since purchases, payments, and other related matters are handled in between. However, should large libraries emerge, akin to a national knowledge resource center or a sizable collegiate knowledge resource center; a distinct fund division may exist just to manage the knowledge resource center's financial transactions.

The financial records must be preserved annually, that is, from the beginning of the budgeting year to the end of the fiscal year. Records for that particular year must be maintained, and the falling should begin again the next year. Any knowledge resource center's budgeting records should almost always include nuanced details about exceptional requests, invoices that are still awaiting payment and bills that have been successfully paid. Maintaining financial records is mostly done to keep spending under control, or within approved spending limits. A few more uses for the financial data include helping to organize the annual report and providing insights on expenditures related to money, which are useful in allocating funds under various budgetary headings. These provide clear details on the allocated funds (Arora, Renu 2014).

### **3.20 Funding Sources for University Libraries:**

The university library receives funding in varying amounts from the following sources: endowments and gifts; grants from the University Grants

Commission; grants from the State and federal governments; grants from the university budget. Usually granted in one academic year, the funding might be provided to the institution as a single amount or item-by-item for things like computers, staff, furniture, equipment, books, and periodicals. Apart from the normal awards, the University Knowledge Resource Center occasionally receives additional funding from different agencies such as the Asia Foundation, Ford Foundation, Rockefeller Foundation, and University Grant Commission.

i) Grants from Federal and State Authorities:

Grant makes it very evident that state universities support the state government while the central government primarily finances central institutions. The Indian Council of Agricultural Research (ICAR) provides financing to agricultural universities.

ii) University Grants Commission Grants:

The Knowledge Resource Center receives special funding from the University funding Commission for a variety of uses, including books, journals, digital resources, digitalization, buildings, furnishings, and equipment. Occasionally, matching grants are also provided by state governments in response to UGC requirements. It falls under the university's funding. A huge, multilingual, and multicultural nation like India poses a great challenge to its planners and administrators when it comes to national progress. Since education is essential to a nation's growth and development, the Indian government has taken a number of steps to adapt the educational system to the demands of the country since gaining independence in 1947. The primary goals were complete literacy and systemic independence for higher education. The Government made a few bold moves toward achieving the aims of the country. Children must attend school; adults must have access to education; facilities must be expanded quantitatively; secondary and higher education must be improved qualitatively; and scientific and technical education in a variety of subjects must be provided.

The post-Independence era saw intense attempts to raise the bar for higher education. Members of the University Education Commission, which was established by the Indian government and chaired by Dr. S. Radhakrishnan, came from the United States and the United Kingdom and had similar bodies. Established in July 1919, the UGC of Great Britain provided guidance and inspiration for the formation of similar organizations in Australia, New Zealand, India, Israel, and Bangladesh, among other nations.

In order to uphold the country's standards for higher education, the UGC was founded in December 1953 and became a statutory entity in November 1956 by an Act of the Parliament. The UGC was established and has operated

as a stand-alone advisory body. Its literal connotation implies that it has far fewer tasks to undertake, such as awarding funding to colleges. The Act gives the UGC the authority to take all necessary steps, after consulting with the universities and other relevant parties, to improve and coordinate higher education as well as to address and maintain the standards of teaching, learning, and research in universities. The UGC can investigate financial needs, assign and distribute grants to the universities, create and maintain shared services and facilities, suggest policies to enhance university education, and offer advice on grant distribution, university establishment, etc. in order to achieve these goals.

iii) Grants given from the university's budget:

Funds from the university budget make up a sizeable portion of the budget for the university information resource center. Normally, allocations are sent straight to the knowledge resource center. Grants come in two varieties: recurrent and non-recurring. Grants for curing are often awarded to cover the cost of books and journals, employee wages, upkeep of normal services, and projected unforeseen expenses. The non-recurring awards are intended for particular uses, such as creating a knowledge resource center, buying computers, furniture, and other items, or occasionally enhancing unique collections in university libraries.

iv) Endowments and gifts:

In India, endowments and donations are commonplace. Indians consider charitable giving to be done primarily for the sake of education and then for religious reasons. Early in the 1960s, dormant grants from the Ford Foundation, PL480 funding, the Rock Faller Foundation, and other donors helped to equip Indian colleges with finances for the construction of libraries (Kaur, Trishanjit 2014).

### **3.21 Recommended Guidelines for University to Library Fund Provision:**

It is extremely difficult for university libraries to survive and grow amid the current financial crisis. It depends on a number of factors, including the state of the nation's economy, the availability of funds overall, the policies and funding availability with the federal and state governments, whether or not the university prioritizes the knowledge resource center highly, and most importantly, the attitude of higher authorities toward the center and the mission of the university librarian.

The University Education Commission (1948–1949) recommended that 6.25% of the total university budget be spent on the university library. Other Education Commissions, Committees, and Agencies have suggested audacious norms of knowledge resource center expenditure to the total

university expenditure, varying from 6.25% to 20%. The UGC Library Committee (1957–1965) suggested that library grants be given out at the current rates of Rs. 15 for students and Rs. 200 for professors and research scholars. According to the Kothari Commission's report from 1964–66, grants for knowledge resource centers should be awarded at a rate of Rs. 25 for research scholars and Rs. 300 for professors. This is the per-capita approach to library funding calculation. Depending on the degree of development, the Education Commission suggested that a university allocate between 6.5% and 10% of its overall budget to the library. The Karnataka State Universities Review Committee (1979–1980), directed by K. N. Raj, suggested allocating 20% of the university budget to a knowledge resource center. These proposals were the most ambitious ones. However, the state of affairs at university libraries has not been ideal, even in spite of these precise instructions. India is not an exception to the global trend of declining library funding. Drake, however, notes that instead of this, universities are calling for "quantitative measures of value, outcomes, and impact; budget justifications; and increasing accountability" (Kaur, Trishanjit 2014).

### **3.21.1 Ranganathan Committee (1957):**

Dr. S.R. Ranganathan's committee report, "Report of the University Grant Commission Knowledge Resource Center Committee," is the most extensive and important publication about universities and their libraries. The University Grants Commission released a report titled "University and University Libraries" in 1959. It was perhaps the first attempt by any Knowledge Resource Center Committee in India to conduct a systematic nationwide survey of educational libraries and the first time the Indian government had the resources to consult with experts in the field of education libraries. The committee gave the University Grant Commission its approval on a number of issues, including salary scales, buildings, knowledge resource center instruction, and standards for libraries. The University Grant Commission and the State Government should assist university libraries and libraries in the educational sector in expanding their collections of books, periodicals, and digital resources, according to some of the committee's pet peeves. The committee suggested allocating cash at the rate of Rs. 15 for each registered student and Rs. 200 for each member of the teaching staff and research scholar. In the event of a newly established university or department inside an already-existing institution, there will also be special initial knowledge resource center awards.

### **3.21.2 Kothari Commission (1956–1966):**

The Education Commission is chaired by Dr. D.S. Kothari. The twelfth university library in India was established in 1966. The Commission was surprised to learn that the Radhakrishnan Commission's approvals had not

been fully implemented, as only four Indian universities had allocated at least 5% of their budget for the purchase of books and periodicals, despite the Commission of 1948 suggesting that 6% of the total budget go toward libraries. The unmistakable evidence that none of India's university libraries was operating properly to meet the demands of any field or topic in higher education.

### **3.21.3 Commission on National Knowledge:**

The government established the National Knowledge Commission. India on May 13, 2005. The National Knowledge Commission was tasked with directing policy and functions as an advanced advisory body to the Indian Prime Minister, with a particular emphasis on important sectors including education, science and technology, agriculture, industry, and e-governance. The Commission's main priorities include improved knowledge services, easy access to knowledge, creation and maintenance of knowledge systems, and knowledge dissemination (Kaur, Trishanjit 2014). Establish a Central Knowledge Resource Center Fund: Libraries must receive a designated portion of the State and Central education budgets. Based on calculations, it is recommended that a Central Knowledge Resource Center Fund be established in order to upgrade current libraries over a four-year period. The government sector may first provide Rs. 1,000 cores, and the private sector may equal this amount through corporate giving (Kaur, Trishanjit 2014).

### **3.22 College Library:**

In India, college libraries play a big part in postsecondary education. Even though all 533 affiliated institutions in India did not have row libraries when the country gained its independence, the libraries in every college now receive little maintenance. The majority of college libraries lack the necessary resources to adequately serve their patrons' requirements. Many of them are single libraries, their budgets are quite small and insufficient, and their collections are out of date. Rather of thinking of the information resource center as a distinct structure, many institutions increase their hall or an appropriate area. A few book shelves might fit in any empty space, which is frequently located out of sight. The absence of a policy for collection enhancement in college libraries and the selection of books is made without taking into account the real demands of the professors and students. Due to the closed stack system, a lack of staff, and a lack of facilities for usage regulations, even this tiny, insufficient collection is not exploited to its full potential in terms of depth and substance.

In Indian universities and colleges, information and communication technologies have advanced significantly. The way the information is kept has been altered. Given that school libraries must first establish the

infrastructure necessary to provide computers, internet access, and trained personnel, this has immediately placed further strain on the already meager resources available to them. More funding is required because university libraries are purchasing access to digital resources, electronic books, journals, and other information bases. The conventional recipe developed by Dr. S.R. Ranganathan, in which he suggested

Employees: 50%

40% of all reading materials are books.

Unspecified items: 10%

Later, the following statement may be used to determine how much should be spent on each head, depending on the approvals of different committees and specialists at the knowledge resource center:

50% of salaries and wages

Books: 20%

Periodicals: 15%

7% Binding

Heating and lighting, 3%

Library resources: 7%

The way universities, colleges, and their libraries are taught has changed, and this has resulted in a number of modifications to the university budget. Pay rates have been changed several times over the years, and employee salaries are significantly depleting the funds allocated to the university's knowledge resource center. Increased currency rates and the depreciation of the rupee have led to a significant decline in journal subscriptions. The quantity of books purchased each year has likewise decreased. Many costs, like as computer insurance and maintenance, have enhanced the drowsiness. The issue of increasing users and research scholar fees is something that Central and State Government Universities and Colleges struggle with on a regular basis, but students are against it (Kaur, Trishanjit 2014).

### **3.23 Auditing:**

Auditing every financial transaction made by government and semi-government entities is known as auditing. It is a financial control mechanism that provides oversight over erratic, careless, and unnecessary expenditure. The audit report is ultimately what persuades and satisfies the Central or State governments, the UGC, the Senate, or whatever the higher authority is that every penny has been spent properly. In Indian university libraries, there are two different kinds of audit systems: pre-audit and post-audit. The

university librarian is responsible for auditing the knowledge resource center's expenditures, and auditing is conducted at the university office. In university libraries with post-audits, in particular, it is customary to teach patrons that the librarian is knowledgeable of the audit dates. Before the audit, a staff member from the knowledge resource center visits the university office and takes down payment dates, voucher numbers, spending declarations, and other pertinent information so that the papers that are actually required for the audit may be provided. As a result, audits are conducted about knowledge resource center expenses. Pre-audit is now a standard component in all Indian university libraries. The issues with the pre-audit approach stemmed from an incorrect claim that voucher collecting and notation did not increase (Kaur, Trishanjit 2014).

### **3.24 Expense for libraries**

Libraries need money to be able to charge for their services. Libraries invest money on user services, equipment, CD-ROMs, consortia, digital resources, books, periodicals, and other reading materials. The primary goal of knowledge resource center expenditures is to ensure that users receive the most potential benefit by allocating as much money as they can. The following are the features of library expenditures: libraries are spending organizations; they are constantly expanding organizations; and library expenditures are recurrent.

#### **3.24.1 Themes for library spending:**

The following are the guidelines for spending at knowledge resource centers: economy, widely aggregate benefit, advance budgeting, and equitable distribution.

##### **3.24.1.1 The need of planning ahead:**

The information resource center spending should be planned ahead of time in accordance with the principle of advance preparation to ensure that there are no issues or incorrect arguments during the real movement. This aids in maintaining a balance between incoming and outgoing monies. It is best to put advance orders for books and periodicals to prevent them from becoming unavailable later.

##### **3.24.1.2 The broadly aggregate profit principle:**

Libraries are service organizations, and their patrons are the only reason they exist. As a result, the librarian should exercise special caution while choosing reading materials, making sure to choose only those that would truly benefit readers greatly. Additionally, the services must be designed such that a large number of people may make use of them.

### 3.24.1.3 The economic principle:

This implies that all expenses should be made with economy in mind. By all means, prevent unnecessary duplication, wastage, and additional expenses. Additionally, spending shouldn't go beyond the allocated funds.

### 3.24.1.4 The Impartial Allocation Principle:

Funds from the knowledge resource center should be divided evenly among all types of reading materials, with attention paid to ensure that all subjects are appropriately covered. Maintaining equilibrium when constructing a collection is crucial for the information resource center to run well. Likewise, more funding has been allocated for new services than for conventional and established ones. Two opposing concepts exist in libraries: maintaining financing for the knowledge resource center system and safeguarding the resources needed by different departments. In addition, it will be necessary to attend to the demands of the professional personnel of the knowledge resource center in the current information and communication technology environment. It is also necessary to consider judgments on the superiorities of the knowledge resource center on an ongoing basis, rather than merely annually.

## 3.25 Expense Classification for Knowledge Resource Centers:

In addition to paying staff members' salaries and wages, the recurrent funding are used to acquire books, journals, and other materials for the knowledge resource center and to run its ongoing activities. Each year, these are made available. Conversely, non-recurring grants are awarded for particular uses such as the construction of new buildings, automation of knowledge resource centers, refurbishment of existing facilities such as e-books, e-journals, and information bases, acquisition of computer systems, furniture, and other equipment, etc. With this in mind, the costs associated with information resource centers may be divided into many categories, which differ depending on the knowledge resource center. Some companies may have detailed expense lists that are limited to recurrent and non-recurring expenses, as follows:

- i. Books
- ii. Diaries
- iii. Pay
- iv. Online Sources
- v. Associations
- vi. Stationery

- vii. Old books and notebooks bound into a volume
- viii. Telecommunication and Internet fees
- ix. Maintenance-related equipment (building upkeep, security, cleaning, water and power)
- x. Pieces of furniture
- xi. Publication and printing
- xii. Unspecified and unexpected
- xiii. Use Pay

The aforementioned items could be categorized as organization bland capital budget components in university libraries. Regarding moving the advertisements, there are no strict guidelines.

### **3.26 Financial Budgeting Techniques:**

Any information organization needs a sufficient and consistent supply of funding. Therefore, it is crucial that the financial evaluations be completed accurately in order to prevent incorrect financing. Libraries must estimate their future costs for resources and operations, much like other types of organizations do. The ideal approach to set up the financial estimation correctly is to thoroughly research the activities that are anticipated for the upcoming year and the resources needed to carry them out. However, by using instructional resources, one may compute the projected expenses and perform a free financial estimation. A scientifically and rationally executed financial budget also supports the financial requests by providing documentation and strong evidence for the required amounts. In addition, the scale of the information organization in terms of personnel and collection, the kind of services offered, the quantity and quality involved, the number of users, and the unique selling points of that specific information organization all affect how much money is available. In the current technological age, one must also take into account the cost of tangible goods and requirements, the yearly rise in prices, and the diversity of information resources available. These materials include books, journals, digital resources, consortia, accessible volumes, and digital resources. The per capita approach, the formula method, the proportionate method, and the method of details are the four primary techniques for financial estimate.

#### **3.26.1 Method of Per Capita:**

It is common knowledge in libraries that all funding for maintaining and enhancing the services provided by information resource centers should be allocated on a per capita basis, rather than through grants that are awarded on an as-needed basis. The average cost of reading materials, the average

income of the community using the KRC services, the staffing levels at the KRC, the average cost of the reading materials, the average cost of the reading materials, and the applicable technologies for providing KRC services are some common factors that aid in determining the per capita financial amount. In this method, KRC users are typically categorized, with an appropriate amount being appropriated for each category. This is the safest way to compute the knowledge resource center financing based on per head of the knowledge resource center readers. Then, computation is done for all of their adders in each category. This approach is essential and has to be publicized with the appropriate government approval; otherwise, it would be challenging to persuade the financial distribution organizations to take funding. A university should give Rs. 15 per user and Rs. 200 each instructor to purchase reading materials for its knowledge resource center, according to a recommendation made by the University Grants Commission Knowledge Resource Center Committee few years ago. In 1964–1966, the Kothari Education Commission also suggested that universities should budget Rs. 25 for each student and Rs. 300 for each instructor as a standard. In a similar vein, Ranganathan has also offered recommendations for financing college libraries and universities based on a per capita basis. The cost of reading materials and the salaries of knowledge resource center employees have increased significantly in the current environment, therefore some national agency must act to conduct research and set standards for public and educational libraries of all sorts. The most effective, secure, and user-friendly approach for estimating finances is the per capita technique.

### **3.26.2 Formula Method:**

This plan presents a scenario where a certain method determines how money is distributed to recognize a resource center. For example, a state government may designate funds to libraries within the state college and school framework based on a particular plan, the contribution of which may include the number of undergraduate students, postgraduate students, researchers, teachers, the extent to which the gathering is officially open, or other similar factors. A recipe like this may determine the precise amount of money to give each association or the proportion of total expenditure that each association receives. It is believed that the recipe strategy and the per capita method for financial budgeting are essentially the same.

### **3.26.3 Proportionate Method:**

The proportional approach is predicated on the idea that experts give cash to the knowledge resource center's parent organization, which then sets aside a certain amount for the center. Typically, a certain percentage of the total budget is allocated to the knowledge resource center, which they are responsible for supervising. Typically, this approach uses the knowledge

resource center's hierarchical expenditure component as a gauge to determine the appropriate rate of spending that goes into the center. Various guidelines have been recommended. According to guidelines set forth by the University Education Commission, a university's information resource center should receive no less than 6% of its overall budget. The Commission also suggested that, given the current situation, the consumption range between 6 and 10 percent. The requirements may include, among other things, setting up new services like e-books, e-diaries, consortia, gathering expertise in a particular field of study, pursuing knowledge resource center automation, or taking some other step. In essence, very suitable criteria may be established for distinct and public libraries, and in this way, financial estimation is finished. For extraordinary libraries, there are no restrictions and the rate can be quite high because they exist just to assist the association's operations. In other cases, important activities are subject to easily accessible information. Ranganathan has suggested allocating either 6% of the state government's education budget or 10% of the college reserve's overall budget in the case of open libraries.

#### **3.26.4 Details Method:**

A strategy for areas of interest is included, and all useful items should be included in order to prepare financial assessments. It's also important to think about the capital uses that are repeated or non-repeating. Everything is thoroughly examined point by point, supported by reliable sources and partner reports. This approach necessitates that all exercises and the money needed to complete each activity be emphasized with the "thrown necessities" for each scenario, hence highlighting budgetary materials. In this way, the professionals who require accounts are set up with the subtle aspects. The best approach for estimating financial matters is this one.

#### **3.27 Financial obligation:**

The question of who should take command of the financial service responsibility. The information specialist has to be in control of the knowledge resource center's financial administration, according to several assessments about the financial services provided by information associations and knowledge resource centers. The measures that follow are recommended for effective budgeting services. The parent organization must approve the assessments before they can be presented, be approved themselves, and be held accountable for the financial year's fund service (Arora renu 2014).

#### **Conclusion:**

Maintaining accurate financial records, managing budgeting declarations, and making all receipts and payments simple are all components of a good financial management system. An extensive budget must be well understood

and managed by library professionals in order to plan for the short-, medium-, and long-term development of knowledge resource centers. One of the most important tasks for custodians or information masters is budgeting for knowledge resource center services. A library expert may believe that, given the current financial situation, it is easy to justify an increase in funding to the KRC's representative body; nevertheless, during lean financial times, KRC services may be seen as unnecessary. The association's departments must be able to operate within their budget. Should consumptions exceed the budget, justification for such excesses needs to be provided. Additionally, a written agreement to remove deficient adjustments must be created. The goal and objectives statement of the information resource center should serve as the foundation for budgetary planning. It is always preferable to arrange long-term financial agreements. Most of the time, spending reports must adhere to a setup chosen by the parent association. There are several distinct types of budgets, including zero-based, execution, program, line item, five-year, and zero-based budgets. An organization may make use of any of these budgeting formats.

Numerous changes in politics, economy, society, and technology have occurred since the beginning of higher education and its institutions, and these changes have had an impact on the higher education system and its institutions either directly or indirectly. Libraries at universities are hardly an exception. After coming full circle, the trip started with Taxila, Nalanda, and now there is New Nalanda University. The number of universities has increased to more than 500. There are well-known, large universities in India as well as smaller, less fancy ones. By 2015, the National Knowledge Commission has suggested the establishment of 1490 institutions, which appears to be doable. Neither is it a solution to turn outdated colleges into universities. Because of this, private companies have entered the market and now own state institutions with top-notch, vital research papers, up-to-date facilities and technology, and comprehensive university libraries. They have monetized higher education by demanding exorbitant fees and utilizing information and communication technologies. Under the guise of offering the newest amenities, private institutions are prospering and drawing students.

Money has always been the foundation of any society or institution, and it always will be. Therefore, the future of university libraries and their services would be dismal if the government and UGC do not join together and create a strategy to address the financial issue. Universities must be able to support themselves financially in order to function successfully and efficiently. In a similar vein, university libraries must strategize their future for sound financial management to prevent any detrimental effects on knowledge resource center services. Knowledge resource center services need to be periodically updated to stay up with the times. More money is required for

this, and the swills must be handled. As previously said, those state governments lack the funding for public institutions, therefore immediate action is required to prevent students in the future from being deprived of access to knowledge resource centers.

Any corporate organization's ability to coordinate and control its resources depends on its financial management. Managers may use this tool to create and evaluate the financial data necessary for company decision-making, regardless of whether they are financial specialists or not. This is because managers' reaction abilities are mostly non-financial. All managers, from top executives to line supervisors, may apply financial management concepts to support the objectives of the company more effectively.

The funding sources for educational, special and public libraries differ from knowledge resource center to knowledge resource center. The techniques used for financial estimation also differ throughout information resource centers. Since libraries are essentially service companies that spend money with limited revenue streams, their expenditure patterns differ from those of other types of businesses.

A well-planned budget that manages finances in a cost-effective way is the result of sound financial management. If money is managed well, libraries may purchase high-quality books and provide high-quality services. All of this makes it possible for the libraries to fulfill their mission and satisfy patron needs.

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## 4. Digital resources and digitization in selected University Libraries in Maharashtra

### 4.1 Introduction:

Since born digital resources are unable to satisfy user demands, digitization is a necessary component of digital resource management. A significant portion of rare and priceless papers may be found in the collections of several university libraries. Because these materials are only available to users inside of libraries and not to people outside of them, their use is extremely restricted. It is also not feasible to access these resources more than once. This specific issue may be fixed by digitizing these materials to create digital versions of them. Libraries have embraced the process of digitizing their papers to varying degrees, given the many benefits of doing so and how many of their priceless materials they utilize. Digital resources are easy to use, time-efficient, and up to date with the most recent data in their respective domains and adjacent subjects. Digital information resources are useful for university teaching, learning, and research activities. They are byproducts of information and communication technology.

### 4.2 Library Members:

The library members are the backbone of libraries. There were five types of library member i.e. PG Student, Research Scholar, Faculty Members, Non-teachers and Special members. Table no 4.1 presents the total number of library members in different categories in Maharashtra state during the period form 2005-06 to 2014-15. It is found that among the total members of the libraries in the Maharashtra state on an average the highest 27169 library members are PG students followed by 2374 faculty members, 2350 Research Scholar, 1601 Non-teachers and 322 special members during the period form 2005-06 to 2014-15. As per annual average growth rate research scholars recorded highest 15.96 percent growth rate after that special members recorded 6.1 percent, Non-teachers 5.72 percent, faculty members 2.09 percent and PG students library members recorded negative (-0.28 percent) annual growth rate during the study period.

**Table 4.1: Total Number of library member's of Selected University Libraries in Maharashtra**

| Year           | PG Student     | % Growth     | Research scholar | % Growth     | Faculty member | % Growth    |
|----------------|----------------|--------------|------------------|--------------|----------------|-------------|
| 2005-06        | 27513          | --           | 1109             | --           | 2207           | --          |
| 2006-07        | 25511          | -7.28        | 1692             | 52.57        | 2088           | -5.39       |
| 2007-08        | 26598          | 4.26         | 1747             | 3.25         | 1936           | -7.28       |
| 2008-09        | 24592          | -7.54        | 1940             | 11.05        | 2449           | 26.50       |
| 2009-10        | 26685          | 8.51         | 1893             | -2.42        | 2673           | 9.15        |
| 2010-11        | 29144          | 9.21         | 2064             | 9.03         | 2265           | -15.26      |
| 2011-12        | 32729          | 12.30        | 3101             | 50.24        | 2552           | 12.67       |
| 2012-13        | 28030          | -14.36       | 2980             | -3.90        | 2610           | 2.27        |
| 2013-14        | 25090          | -10.49       | 3246             | 8.93         | 2459           | -5.79       |
| 2014-15        | 25806          | 2.85         | 3729             | 14.88        | 2506           | 1.91        |
| <b>Average</b> | <b>27169.8</b> | <b>-0.28</b> | <b>2350.10</b>   | <b>15.96</b> | <b>2374.50</b> | <b>2.09</b> |

**Table 4.1: Contd.**

| Year           | Non-teacher    | % Growth    | Special Members | % Growth    |
|----------------|----------------|-------------|-----------------|-------------|
| 2005-06        | 1215           | --          | 218             | --          |
| 2006-07        | 1310           | 7.82        | 268             | 22.94       |
| 2007-08        | 1361           | 3.89        | 304             | 13.43       |
| 2008-09        | 1507           | 10.73       | 343             | 12.83       |
| 2009-10        | 1482           | -1.66       | 322             | -6.12       |
| 2010-11        | 1662           | 12.15       | 332             | 3.11        |
| 2011-12        | 1804           | 8.54        | 354             | 6.63        |
| 2012-13        | 1786           | -1.00       | 356             | 0.56        |
| 2013-14        | 1902           | 6.49        | 369             | 3.65        |
| 2014-15        | 1987           | 4.47        | 361             | -2.17       |
| <b>Average</b> | <b>1601.06</b> | <b>5.72</b> | <b>322.70</b>   | <b>6.10</b> |

### 4.3 University wise Library Members in Maharashtra:

University wise Number of library Members are shown in table 4.2. It is observed that total number of library members in 2014-15 were 34389 in Maharashtra. Shivaji University library has highest 6586 total numbers of library members followed by Shreemati Nathibai Damodar Thackersey Women's University library 5393 members, Mumbai University library 4176 members, North Maharashtra University library 3847 members, Savitribai phule pune University library 3243 members, Dr. Babasaheb Ambedkar Marathwada University library 2946 members, Swami Ramanand Teerth Marathwada University library 2765 members, Sant Gadge Baba Amravati University library 2628 members, Rashtrasant Tukadoji Maharaj Nagpur University library 1668 members and Solapur University library haave 1137 total numbers of library members. According to percentage at Maharashtra level the Shivaji University have highest 19.15 percent members and Solapur University have lowest 3.31 percent members among the selected 10 universities of the Maharashtra state.

**Table 4.2: University wise Number of library members in Maharashtra**

| Univers<br>ity code    | MUM          | SNDTU        | RTMNU       | SPPU        | BAMU        | SUK          | SGBAU       | NMU          | SRTMU       | SUS         |
|------------------------|--------------|--------------|-------------|-------------|-------------|--------------|-------------|--------------|-------------|-------------|
| PG Student             | 2935         | 4627         | 881         | 2168        | 1854        | 5668         | 1594        | 3026         | 2082        | 971         |
| Research scholar       | 504          | 172          | 517         | 408         | 540         | 324          | 498         | 250          | 426         | 90          |
| Faculty member         | 341          | 467          | 177         | 512         | 259         | 336          | 93          | 109          | 178         | 34          |
| Non-teacher            | 319          | 105          | 82          | 124         | 280         | 158          | 401         | 427          | 49          | 42          |
| Special Members        | 77           | 22           | 11          | 31          | 13          | 100          | 42          | 35           | 30          | 0           |
| <b>Total</b>           | <b>4176</b>  | <b>5393</b>  | <b>1668</b> | <b>3243</b> | <b>2946</b> | <b>6586</b>  | <b>2628</b> | <b>3847</b>  | <b>2765</b> | <b>1137</b> |
| <b>% Share of Uni.</b> | <b>12.14</b> | <b>15.68</b> | <b>4.85</b> | <b>9.43</b> | <b>8.57</b> | <b>19.15</b> | <b>7.64</b> | <b>11.19</b> | <b>8.04</b> | <b>3.31</b> |

Source: Survey work, question no: 2

#### 4.4 Total collection of Selected University Libraries in Maharashtra:

Table no 4.3 present the total collection of selected University libraries in Maharashtra. The total collection of books were 24,29,954 in 2005-06 which continuously increased except the years 2008-09 and 2010-11 and researched up to 28,79,806 in the year 2014-15. The collections of books are increased by on an average 10.64 percent per year. Whereas, the collection of periodicals shows an average negative (-2.34 percent) growth rate during the same period due to availability of periodicals in the study period. On an average the collection of Ph.D. thesis in the university libraries of Maharashtra state were 73055 Thesis per year. The total Ph.D. thesis in the university libraries of Maharashtra state were 61,226 in 2005-06 which increased by on average growth rate of 4.81 percent and researched up 93315 in the year 2014-15. The maximum annual growth rate was 10.48 percent in 2014-15 and the lowest growth was 1.83 percent in during 2007-08 during the study period. The digitized document indicates the 6.89 percent average annual growth rate. On an average the digitized documents in the university libraries were 1239 during the study period. The E-documents of university libraries of Maharashtra sows 115.25 percent average annual growth rate during the study period. The E-documents of university libraries are increased form 2008-09. The collection of CD & DVD were 8724 in 2005-06, which increase by on an average annual growth rate of 6.09 percent and went up to 14,827 in the year 2014-15. It also observed that highest collection in the university libraries are books and followed by E-documents and Ph.D. Thesis during the study period. The E-documents recorded highest 37.73 average annual growth rate and collection of books recorded 10.64 percent average annual growth next to E-documents.

**Table 4.3: Total collection of selected libraries in Maharashtra**

| Year    | Books   | % Growth | Periodicals | % Growth | Ph.D. Theses | % Growth |
|---------|---------|----------|-------------|----------|--------------|----------|
| 2005-06 | 2429954 | --       | 2740        | --       | 61286        | --       |
| 2006-07 | 2506379 | 3.15     | 2708        | -1.17    | 63046        | 2.87     |
| 2007-08 | 4754654 | 89.70    | 2658        | -1.85    | 64200        | 1.83     |
| 2008-09 | 2595239 | -45.42   | 2692        | 1.28     | 66788        | 4.03     |
| 2009-10 | 4806776 | 85.22    | 2526        | -6.17    | 69533        | 4.11     |
| 2010-11 | 2676545 | -44.32   | 2554        | 1.11     | 72107        | 3.70     |
| 2011-12 | 2720276 | 1.63     | 2744        | 7.44     | 76691        | 6.36     |

|                |                  |              |                |              |                |             |
|----------------|------------------|--------------|----------------|--------------|----------------|-------------|
| 2012-13        | 2793876          | 2.71         | 2669           | -2.73        | 79125          | 3.17        |
| 2013-14        | 2841343          | 1.70         | 2475           | -7.27        | 84460          | 6.74        |
| 2014-15        | 2879806          | 1.35         | 2186           | -11.68       | 93315          | 10.48       |
| <b>Average</b> | <b>3100484.8</b> | <b>10.64</b> | <b>2595.20</b> | <b>-2.34</b> | <b>73055.1</b> | <b>4.81</b> |

**Table 4.3: Contd.**

| Year           | Digitized document | %Growth     | E-Document     | %Growth      | CD & DVD       | %Growth     |
|----------------|--------------------|-------------|----------------|--------------|----------------|-------------|
| 2005-06        | 00                 | --          | 00             | --           | 8724           |             |
| 2006-07        | 00                 | --          | 00             | --           | 9732           | 11.55       |
| 2007-08        | 00                 | --          | 00             | --           | 10231          | 5.13        |
| 2008-09        | 5021               | --          | 34305          | --           | 11000          | 7.52        |
| 2009-10        | 548                | -89.09      | 47379          | 38.11        | 11664          | 6.04        |
| 2010-11        | 1065               | 94.34       | 95400          | 101.36       | 12254          | 5.06        |
| 2011-12        | 3969               | 272.68      | 71100          | -25.47       | 12834          | 4.73        |
| 2012-13        | 1401               | -64.70      | 98178          | 38.08        | 13542          | 5.52        |
| 2013-14        | 394                | -71.88      | 130712         | 33.14        | 14163          | 4.59        |
| 2014-15        | 00                 | -100.00     | 184474         | 41.14        | 14827          | 4.69        |
| <b>Average</b> | <b>1239.8</b>      | <b>6.89</b> | <b>66154.8</b> | <b>37.73</b> | <b>11897.1</b> | <b>6.09</b> |

#### **4.5 University Library wise Total collection in Maharashtra:**

Table 4.4 presents the university wise total collection of university libraries in Maharashtra during 2005-06 to 2014-15. The total collection of books by university libraries in Maharashtra were 28,79,806 out of this Mumbai university have highest 26.75 percent share in total collection of books followed by Savitribai Phule University 19.08 percent, SNDT University, 13.75 percent and ranked third in the total university. Whereas, Solapur University have only 0.82 percent books collection and ranked at bottom in case books collection. It is found that on an average books collection by university libraries in Maharashtra were 2,87,980 books. Out of total ten universities Mumbai University, SNDT University, RTMN University and Savitribai Phule University have average collection of books and remaining all universities collection of books is below the average of

state level. The collection of Ph.D. thesis 21948 ( 23.52 percent) were highest in case Savitribai Phule University and ranks first, Mumbai University ranks second with 22.96 percent share of books collection while, RTM University ranks third and Solapur University ranks at bottom. On an average 1239 digitized documents in the university libraries during the study period. Out of total digitized documents Savitribai Phule University and Dr. Babasaheb Ambedkar Marathwada University ranks first and second with 44.89 and 33.31 percent share respectively. These two universities have more than 78 percent digitized documents. Mumbai University, RTMN University, Solapur University and SRTM University do not have any digitized documents. Shivaji University is just start the digitization process.

In case of E-documents there were average 18,447 E-documents in university libraries of Maharashtra. SNTD University have 46.68 percent E-documents and ranks first and Sant Gadge baba University have 13.55 percent E-documents and ranks second. While Savitribai Phule pune University and Dr. Babasaheb Ambedkar Marathwada University ranks third having 8.13 percent E-documents and Shivaji University have 6.50 percent E-Documents ranks fourth and Mumbai University have 5.62 percent E-documents and ranks fifth and other all Universities have below four percent E-documents. On an average, there were 1482 CD & DVD collection in University libraries. It found that SNTD University have highest 7275 CD&DVD (49.07 percent) and ranks first followed by Mumbai University 2674 (18.03 percent) ranks second and Shivaji University ranks third having 12.02 percent share of CD & DVD among ten universities of Maharashtra. Whereas, Solapur University ranks at bottom having only 0.92 collection of CD&DVD. In case of collection of rare books 68.21 percent rare books collection made by Mumbai University Mumbai and ranks first and Shivaji University ranks second with 27.28 percent and Dr. Babasaheb Ambedkar Marathwada University ranks third with 3.41 percent share in total collection of rare books among the University Libraries in Maharashtra. Whereas, other all university libraries of Maharashtra have below one percent share in the collection of rare books. The average collection of manuscripts by university libraries in Maharashtra were 4130 manuscripts. In case of collection of manuscripts RTMN University ranks first having 34.65 percent share, Mumbai University ranks second with 23.97 percent share, Shivaji University ranks third with 22.19 percent share and Savitribai Phule University ranks fourth by having 10.90 percent share. Whereas, Dr. Babasaheb Ambedkar Marathwada University had 8.27 percent share and ranks fifth and remaining all other universities do not have collection of manuscripts. On an average, the total periodicals with bound volume were 20,537 in the University libraries in Maharashtra. Mumbai University ranks first with having 36.93 percent share in collection of periodicals with bound volume followed by RTMN University 17.48 percent

and Shivaji University 16.14 percent and ranks second and third respectively. Solapur University have only 0.51 percent share in collection periodicals bound volume and ranks at bottom.

**Table 4.4: University wise total collection of University Libraries**

| Uni. Code    | Books          | % to Total | Ph.D. Thesis  | % to Total   | Digitized document | % to Total | E-Document     | % to Total   |
|--------------|----------------|------------|---------------|--------------|--------------------|------------|----------------|--------------|
| MUM          | 770364         | 26.75      | 21428         | 22.96        | 00                 | 0.00       | 10360          | 5.62         |
| SNDT         | 395909         | 13.75      | 12005         | 12.87        | 320                | 2.58       | 86114          | 46.68        |
| RTMNU        | 379747         | 13.19      | 12807         | 13.72        | 00                 | 0.00       | 5000           | 2.71         |
| SPPU         | 549477         | 19.08      | 21948         | 23.52        | 5565               | 44.89      | 15000          | 8.13         |
| BAMU         | 252107         | 8.75       | 5746          | 6.16         | 3758               | 30.31      | 15000          | 8.13         |
| SUK          | 269572         | 9.36       | 10207         | 10.94        | 00                 | 0.00       | 12000          | 6.50         |
| SGBAU        | 108973         | 3.78       | 2342          | 2.51         | 2499               | 20.16      | 25000          | 13.55        |
| NMU          | 68535          | 2.38       | 3360          | 3.60         | 256                | 2.06       | 6000           | 3.25         |
| SRTMU        | 61376          | 2.13       | 2117          | 2.27         | 00                 | 0.00       | 5000           | 2.71         |
| SUS          | 23746          | 0.82       | 1355          | 1.45         | 00                 | 0.00       | 5000           | 2.71         |
| <b>Total</b> | <b>2879806</b> | <b>10</b>  | <b>9331.5</b> | <b>10.00</b> | <b>1239.8</b>      | <b>10</b>  | <b>18447.4</b> | <b>10.00</b> |

**Table 4.4: Contd.**

| Uni. Code | CD & DVD | % to Total | Rare Books | % to Total | Manuscripts | % to Total | Periodicals (Bound Vol.) | % to Total |
|-----------|----------|------------|------------|------------|-------------|------------|--------------------------|------------|
| MUM       | 2674     | 18.03      | 100000     | 68.21      | 9900        | 23.97      | 75844                    | 36.93      |
| SNDT      | 7275     | 49.07      | 366        | 0.25       | 12          | 0.03       | 5074                     | 2.47       |
| RTMNU     | 412      | 2.78       | 0          | 0          | 14313       | 34.65      | 35909                    | 17.48      |
| SPPU      | 579      | 3.91       | 1000       | 0.68       | 4500        | 10.9       | 2780                     | 1.35       |
| BAMU      | 0        | 0          | 5000       | 3.41       | 3414        | 8.27       | 31891                    | 15.53      |

|              |                          |           |                           |           |               |           |                |           |
|--------------|--------------------------|-----------|---------------------------|-----------|---------------|-----------|----------------|-----------|
| SUK          | 1782                     | 12.02     | 40000                     | 27.28     | 9163          | 22.19     | 33139          | 16.14     |
| SGBAU        | 1066                     | 7.19      | 0                         | 0         | 0             | 0         | 6835           | 3.33      |
| NMU          | 250                      | 1.69      | 0                         | 0         | 0             | 0         | 6266           | 3.05      |
| SRTMU        | 653                      | 4.4       | 266                       | 0.18      | 0             | 0         | 6586           | 3.21      |
| SUS          | 136                      | 0.92      | 0                         | 0         | 0             | 0         | 1054           | 0.51      |
| <b>Total</b> | <b>1482.</b><br><b>7</b> | <b>10</b> | <b>14663.</b><br><b>2</b> | <b>10</b> | <b>4130.2</b> | <b>10</b> | <b>20537.8</b> | <b>10</b> |

Source: Survey work, question no: 4

#### 4.6 Budget Allocation for Digital Resources by University Libraries in Maharashtra:

Digital resources are important to researchers and faculty members as well as to all members of the University Libraries. The budget allocation of digital resources made by university libraries in Maharashtra presents in table 4.5. It is observed from the table 4.5 that the University Libraries of Maharashtra start to allocate budget for digital resources from the academic year 2009-10, before this year only two universities allocated budget for digital resources in 2008-09 and Savitribai Phule University is the only university which allocating budget for digital resources since 2008-09. On an average, Rs, 24.50 lacks allocated for digital resources by Savitribai Phule University and ranks first among selected ten universities of Maharashtra. Followed by SNDT University allocated Rs. 17.70 lacks and ranks second, Mumbai University & Sant Gadge Baba Amrawati University ranks third with allocation of Rs. 10.50 lacks and Dr. Babasaheb Ambedkar Marathwada University allocated Rs. 9 lacks and has rank fourth. While North Maharashtra University allocated only Rs. 5 lacks in the year 2012-13 only and ranks at bottom.

**Table 4.5: Budget allocated by selected universities for Digital Resources in Maharashtra**

| <b>Year/ Uni. Code</b> | <b>MUM</b> | <b>SNDTU</b> | <b>RTMNU</b> | <b>SPPU</b> | <b>Dr. BAMU</b> |
|------------------------|------------|--------------|--------------|-------------|-----------------|
| 2005-06                | 00         | 00           | 00           | 00          | 00              |
| 2006-07                | 00         | 00           | 00           | 00          | 00              |
| 2007-08                | 00         | 00           | 00           | 00          | 00              |
| 2008-09                | 00         | 00           | 00           | 2000000     | 00              |
| 2009-10                | 1000000    | 00           | 00           | 5500000     | 00              |

|                |                |                   |               |                |               |
|----------------|----------------|-------------------|---------------|----------------|---------------|
| 2010-11        | 1000000        | 800000            | 200000        | 3000000        | 1000000       |
| 2011-12        | 1000000        | 1200000           | 2500000       | 3000000        | 2000000       |
| 2012-13        | 1500000        | 1700000           | 300000        | 2000000        | 3000000       |
| 2013-14        | 2000000        | 7000000           | 300000        | 3000000        | 1500000       |
| 2014-15        | 4000000        | 7000000           | 300000        | 6000000        | 1500000       |
| <b>Average</b> | <b>1050000</b> | <b>1770000.00</b> | <b>360000</b> | <b>2450000</b> | <b>900000</b> |

**Table 4.5: Contd.**

| <b>Year/<br/>Uni.<br/>Code</b> | <b>SUK</b>    | <b>SGBAU</b>      | <b>NMU</b>   | <b>SRTMU</b>  | <b>SUS</b>    |
|--------------------------------|---------------|-------------------|--------------|---------------|---------------|
| 2005-06                        | 00            | 00                | 00           | 00            | 00            |
| 2006-07                        | 00            | 00                | 00           | 00            | 00            |
| 2007-08                        | 00            | 00                | 00           | 00            | 00            |
| 2008-09                        | 00            | 00                | 00           | 00            | 00            |
| 2009-10                        | 00            | 1000000           | 00           | 00            | 3000000       |
| 2010-11                        | 00            | 1000000           | 00           | 00            | 1200000       |
| 2011-12                        | 00            | 1000000           | 00           | 00            | 2000000       |
| 2012-13                        | 00            | 1500000           | 500000       | 800000        | 1000000       |
| 2013-14                        | 1500000       | 2000000           | 00           | 500000        | 1000000       |
| 2014-15                        | 1000000       | 4000000           | 00           | 00            | 00            |
| <b>Average</b>                 | <b>250000</b> | <b>1050000.00</b> | <b>50000</b> | <b>130000</b> | <b>820000</b> |

#### **4.7 UGC Grants Received to University Libraries:**

The financial position of University Libraries is depending on University Grants Commissions grants. University Grant Commission allocates grants for library building, purchase of books and for digital resources. Table 4.6 indicates the UGC grants received to University Libraries of Maharashtra. During the period form 2005-06 to 2014-15 on an average Savitribai Phule University has highest Rs.240 lacks grants from UGC followed by SNDT University has Rs.43.46 lacks, Sant Gadge Baba Amrawati University has Rs.38.03 lacks and ranks second and third respectively. Whereas, Solapur University has only 10 lacks grants form UGC during the whole period of the

study. While Dr. Babasaheb Ambedkar Marathwada University and Swami Ramanand Teerth Marathwada University has on an average Rs. 12 lacks and Rs. 12.46 lacks grants form UGC respectively during the study period. Mumbai University do not have any grant form University Grants Commission during the study period. During the study period total grant Rs. 5.27 crore received to all ten Universities of Maharashtra. Out of all grants received from UGC Savitribai Phule University alone has 66.34 percent share and ranks first, followed by SNDT University shared 15.16 percent, Shivaji University 5.33 percent and ranks second and third respectively. While the share of Mumbai and Solapur University is negligible during the study period.

**Table 4.6: UGC Grant Received to University Libraries in Maharashtra**

| Year/Uni. Code | MUM      | SNDTU             | RTMNU            | SPPU            | Dr. BAMU       |
|----------------|----------|-------------------|------------------|-----------------|----------------|
| 2005-06        | 00       | 2064500           | 1050435          | 10000000        | 1000000        |
| 2006-07        | 00       | 1539501           | 680749           | 25000000        | 1000000        |
| 2007-08        | 00       | 1231000           | 00               | 30000000        | 1000000        |
| 2008-09        | 00       | 2503164           | 1300000          | 10000000        | 1500000        |
| 2009-10        | 00       | 1196220           | 4632636          | 25000000        | 1500000        |
| 2010-11        | 00       | 2277704           | 946317           | 30000000        | 1500000        |
| 2011-12        | 00       | 6249875           | 1297711          | 25000000        | 1500000        |
| 2012-13        | 00       | 3100000           | 6159570          | 25000000        | 1000000        |
| 2013-14        | 00       | 15000000          | 2500000          | 25000000        | 1000000        |
| 2014-15        | 00       | 8000000           | 322390           | 35000000        | 1000000        |
| <b>Average</b> | <b>0</b> | <b>4316196.40</b> | <b>1888980.8</b> | <b>24000000</b> | <b>1200000</b> |

**Table4.6: Contd.**

| Year/Uni. Code | SUK     | SGBAU   | NMU    | SRTMU   | SUS |
|----------------|---------|---------|--------|---------|-----|
| 2005-06        | 1087500 | 1500000 | 00     | 1907986 | 00  |
| 2006-07        | 1644524 | 7500000 | 00     | 583316  | 00  |
| 2007-08        | 1810719 | 3137000 | 400000 | 1001715 | 00  |
| 2008-09        | 1958526 | 5000000 | 700000 | 00      | 00  |

|                |                  |                   |                |                  |               |
|----------------|------------------|-------------------|----------------|------------------|---------------|
| 2009-10        | 1420674          | 4219000           | 700000         | 2423145          | 00            |
| 2010-11        | 1938191          | 4219000           | 700000         | 1876583          | 00            |
| 2011-12        | 2392000          | 2374574           | 700000         | 898777           | 00            |
| 2012-13        | 2500000          | 5300000           | 2500000        | 1324191          | 00            |
| 2013-14        | 2500000          | 2282700           | 2500000        | 1325196          | 1000000       |
| 2014-15        | 2811393          | 2500000           | 2000000        | 1121535          | 00            |
| <b>Average</b> | <b>2006352.7</b> | <b>3803227.40</b> | <b>1020000</b> | <b>1246244.4</b> | <b>100000</b> |

Source: Survey work, question no: 6

#### 4.8 University Library Funds:

For the development of library each university has created various types of funds. The economic situation of library depends upon their own funds. Table 4.7 consists with university library funds in Maharashtra. It is clear from the table 4.7 that the funds of Mumbai University was Rs.140 lacks in 2005-06 which increased and goes up to Rs.640 lacks the increase is more than 4.5 times. On an average, the funds of Mumbai University Library were 399.42 lacks during the study period. The funds of Mumbai University Library were increased by on an average growth rate of 22.67 percent. The funds of SNDT University Library was increased by on an average growth rate 27.20 percent per year and gone up from 10.47 lacks to 60.55 lacks in 2014-15 with compare to the year 2005-06. The RTMN University Library showed negative (-6.48 percent) growth rate of funds during the study period. The funds of this university were Rs.30.50 lacks in 2005-06 which goes down up to Rs. 5.25 lacks during 2014-15. The funds of Savitribai Phule University Library were increased by annual average growth rate of 6.11 percent per year during the study period. The average funds of Savitribai Phule University Library was Rs. 83 lacks per year during the study period.

The funds of Dr. Babasaheb Ambedkar Marthwada University Library were Rs. 20 lacks in 2005-06 which increased by on an average growth rate of 40.93 percent and stood at Rs.30 lacks in 2014-15. The increase in the funds of Dr. Babasaheb Ambedkar Marthwada University Library was 1.5 times during the study period. While the funds of Shivaji University, Kolhapur Library were increased by average annual growth rate of 15.56 percent during the study period. On an average, the funds of Shivaji University Library were Rs.25.77 lacks during the study period. The funds of Sant Gadge Baba Amrawati University Library were Rs. 28 lacks in 2005-06 which increased and stood at Rs. 60 lacks in 2014-15. The funds of Sant Gadge Baba Amrawati University Library recorded average annual growth rate of 14.76 percent during the

study period. While, the funds of North Maharashtra University Library recorded average annual growth rate of 9.26 percent during the study period. The funds of North Maharashtra University Library were Rs. 50 lacks in 2005-06 which increase by two times and stood at Rs.100 lacks in 2014-15. The average funds of North Maharashtra University Library was Rs. 77.5 lacks per year during the study period. The Swami Ramanand Teerth University Library shows average annual growth rate of 149.13 percent in the funds during the study period. On an average, the funds of Swami Ramanand Teerth University Library were 11 lacks per year. Whereas, the funds of Solapur University Library were Rs. 22 lacks in 2005-06 which gone up to Rs. 37.65 lacks in 2014-15, with average annual growth rate of 6.52 percent during the study period.

It is found from the table 4.7 that the highest average funds of Mumbai University Library were Rs. 399 lacks, followed by Rs. 83 lacks Savitribai Phule University Library and Rs. 77.50 lacks North Maharashtra University Library and ranks second and third respectively during the study period. The Swami Ramanand Teerth Marathwada University Library recorded lowest Rs.11 lacks funds per year during the study period. But, according to average annual growth rate Swami Ramanand Teerth Marathwada University Library recorded highest 149.13 percent average annual growth rate. The lowest average annual growth rate (-6.48 percent) in funds was recorded by RTMN University during the study period.

**Table 4.7: University funds for libraries in Maharashtra**

| Year/<br>Uni.<br>Code | MUM             | %<br>Growth  | SNDTU          | %<br>Growth  | RTMNU          | %<br>Growth  | SPPU           | Growth      |
|-----------------------|-----------------|--------------|----------------|--------------|----------------|--------------|----------------|-------------|
| 2005-06               | 14000000        | --           | 1047000        | --           | 3050000        | --           | 5000000        | --          |
| 2006-07               | 29500000        | 110.71       | 863600         | -17.52       | 2850000        | -6.56        | 5000000        | 0.00        |
| 2007-08               | 25620000        | -13.15       | 1060500        | 22.80        | 3886000        | 36.35        | 10000000       | 100.00      |
| 2008-09               | 31900000        | 24.51        | 1103500        | 4.05         | 3886000        | 0.00         | 8000000        | -20.00      |
| 2009-10               | 46500000        | 45.77        | 1103000        | -0.05        | 4457000        | 14.69        | 10000000       | 25.00       |
| 2010-11               | 45150000        | -2.90        | 1696500        | 53.81        | 4903000        | 10.01        | 10000000       | 0.00        |
| 2011-12               | 45250854        | 0.22         | 2776000        | 63.63        | 4016000        | -18.09       | 10000000       | 0.00        |
| 2012-13               | 48500000        | 7.18         | 6000045        | 116.14       | 4175000        | 3.96         | 10000000       | 0.00        |
| 2013-14               | 49000000        | 1.03         | 5448000        | -9.20        | 604215         | -85.53       | 10000000       | 0.00        |
| 2014-15               | 64000000        | 30.61        | 6055000        | 11.14        | 525000         | -13.11       | 5000000        | -50.00      |
| <b>Average</b>        | <b>39942085</b> | <b>22.67</b> | <b>2715314</b> | <b>27.20</b> | <b>3235221</b> | <b>-6.48</b> | <b>8300000</b> | <b>6.11</b> |

Source: Survey work, question no: 6

**Table 4.7: Contd.**

| <b>Year/<br/>Uni.</b> | <b>Dr.<br/>BAMU</b> | <b>%<br/>Growth</b> | <b>SUK</b>     | <b>% Growth</b> | <b>SGBAU</b>      | <b>%<br/>Growth</b> |
|-----------------------|---------------------|---------------------|----------------|-----------------|-------------------|---------------------|
| 2005-06               | 2000000             | --                  | 3000000        | --              | 2800000           | --                  |
| 2006-07               | 2500000             | 25.00               | 4250000        | 41.67           | 2800000           | 0.00                |
| 2007-08               | 3000000             | 20.00               | 2000000        | -52.94          | 2800000           | 0.00                |
| 2008-09               | 3000000             | 0.00                | 3500000        | 75.00           | 2800000           | 0.00                |
| 2009-10               | 2500000             | -16.67              | 1000000        | -71.43          | 1510000           | -46.07              |
| 2010-11               | 500000              | -80.00              | 1500000        | 50.00           | 1510000           | 0.00                |
| 2011-12               | 500000              | 0.00                | 2737000        | 82.47           | 2000000           | 32.45               |
| 2012-13               | 2500000             | 400.00              | 2000000        | -26.93          | 3500000           | 75.00               |
| 2013-14               | 2500000             | 0.00                | 3787000        | 89.35           | 3500000           | 0.00                |
| 2014-15               | 3000000             | 20.00               | 2000000        | -47.19          | 6000000           | 71.43               |
| <b>Average</b>        | <b>2200000</b>      | <b>40.93</b>        | <b>2577400</b> | <b>15.56</b>    | <b>2922000.00</b> | <b>14.76</b>        |

**Table 4.7: Contd.**

| <b>Year/<br/>Uni.</b> | <b>NMU</b>     | <b>%<br/>Growth</b> | <b>SRTMU</b>     | <b>%<br/>Growth</b> | <b>SUS</b>     | <b>%<br/>Growth</b> |
|-----------------------|----------------|---------------------|------------------|---------------------|----------------|---------------------|
| 2005-06               | 5000000        | --                  | 200662           | --                  | 2200000        | --                  |
| 2006-07               | 5000000        | 0.00                | 639424           | 218.66              | 2520000        | 14.55               |
| 2007-08               | 5000000        | 0.00                | 1369407          | 114.16              | 3000000        | 19.05               |
| 2008-09               | 7500000        | 50.00               | 3023619          | 120.80              | 3025000        | 0.83                |
| 2009-10               | 7500000        | 0.00                | 461791           | -84.73              | 3120000        | 3.14                |
| 2010-11               | 7500000        | 0.00                | 1309991          | 183.68              | 3775000        | 20.99               |
| 2011-12               | 10000000       | 33.33               | 724803           | -44.67              | 3940000        | 4.37                |
| 2012-13               | 10000000       | 0.00                | 3047214          | 320.42              | 4040000        | 2.54                |
| 2013-14               | 10000000       | 0.00                | 27487            | -99.10              | 4065000        | 0.62                |
| 2014-15               | 10000000       | 0.00                | 195961           | 612.92              | 3765000        | -7.38               |
| <b>Average</b>        | <b>7750000</b> | <b>9.26</b>         | <b>1100035.9</b> | <b>149.13</b>       | <b>3345000</b> | <b>6.52</b>         |

#### **4.9 University library Expenditure on Books:**

Table 4.8 shows the total expenditure made by University Libraries in Maharashtra on books during the period from 2005-06 to 2014-15. The Mumbai University Library made on average Rs.73.49 lacks on books during the study period. The average annual growth rate of amount spent on books by Mumbai University Library was 7.45 percent and varied between -11.10 percent in 2014-15 to 33.21 percent in 2006-07. The average annual growth rate of expenditure on books by SNTD University Library was 45.66 percent and was -50.94 percent minimum in 2009-10 and it was maximum 194.79 percent in 2010-11. The average expenditure on books was Rs. 33.58 lacks per year spent by SNTD University during the study period. While, Rashtra Sant Tukdoji Maharaj Nagpur University has spent Rs. 36.14 lacks per year on Books. The average annual growth rate of expenditure on books by this University was 14.52 percent during the study period. The Savitribai Phule University spent Rs. 53.39 lacks per year with annual average growth rate of 270.74 percent. The Dr. Babasaheb Ambedkar Marathwada University recorded annual average growth of 51.34 percent in case of expenditure on books. Dr. Babasaheb Ambedkar Marathwada University shows mixed trends in expenditure on books the maximum growth was 495.05 percent in 2011-12 and was minimum -86.95 percent in 2010-11. The average expenditure on books was Rs. 34.59 lacks spent by Dr. Babasaheb Ambedkar Marathwada University Library during the study period. The growth in expenditure on book of Shivaji University shows mixed trend with positive annual average growth rate of 127.42 percent. On an average, the expenditure on books of Shivaji University was Rs. 13.72 lacks.

Sant Gadge Baba Amrawati University also shows mixed trends in the growth of expenditure on books. The annual average growth rate of expenditure on books of this University 66.16 percent which varies between -63.18 percent to 409.29 percent during 2005-06 to 2014-15. North Maharashtra University Library expenditure on books was Rs.30.98 lacks in 2005-06 which increased by annual growth rate of 10.47 percent and stood at Rs. 41.93 lacks in 2014-15. North Maharashtra University Library expenditure on books was Rs. 57.79 lacks during the study period. Swami Ramanand Teerth Marathwada University Library expenditure on books was Rs. 10.90 lacks in 2005-06 which slightly decreased and goes down to Rs. 10.84 lacks in 2014-15 with negative average annual growth rate of -14.52 percent . The average expenditure on books of this University was Rs.14.76 lacks during the study period. Whereas, the Solapur University Library expenditure on books was Rs.1.20 lacks in 2005-06 which goes up to Rs. 2.76 lacks in 2014-15. The average annual growth rate of expenditure on books of this bank was 60.28 percent and varied between -73 percent to 279.81 percent during the study period.

It is observed that on an average the highest expenditure on books was Rs.73.49 lacks recorded by Mumbai University followed by North Maharashtra University Rs.57.79 lacks and Rs. 53.39 lacks by Savitribai Phule University and ranks second and third respectively. The lowest expenditure on books was Rs. 4.75 lacks per year made by Solapur University during the study period. It is also observed that the expenditure on books of all Universities of Maharashtra was increased in 2014-15 with compare to initial year 2005-06 except Dr. Babasaheb Ambedkar Marathwada University, sant Gadge Baba Amarawati University and Swami Ramanand Teerth Marathwada Univeristy.

**Table 4.8: University Library Expenditure on books in Maharashtra**

**(Amount in Rupees)**

| Year/<br>Uni.  | MUM            | %<br>Growth | SNDTU          | %<br>Growth  | RTMNU          | %<br>Growth  | SPPU           | %<br>Growth   |
|----------------|----------------|-------------|----------------|--------------|----------------|--------------|----------------|---------------|
| 2005-06        | 4522105        | --          | 1240967        | --           | 1351369        | --           | 3000000        | --            |
| 2006-07        | 6023813        | 33.21       | 1076168        | -13.28       | 1649755        | 22.08        | 200000         | -93.33        |
| 2007-08        | 7083002        | 17.58       | 1055199        | -1.95        | 1728262        | 4.76         | 3000000        | 1400.00       |
| 2008-09        | 9106392        | 28.57       | 2359567        | 123.61       | 2607006        | 50.85        | 500000         | -83.33        |
| 2009-10        | 8945242        | -1.77       | 1157653        | -50.94       | 6197144        | 137.71       | 6000000        | 1100.00       |
| 2010-11        | 8914971        | -0.34       | 3412677        | 194.79       | 3590707        | -42.06       | 8000000        | 33.33         |
| 2011-12        | 8954708        | 0.45        | 3412677        | 0.00         | 2768296        | -22.90       | 10000000       | 25.00         |
| 2012-13        | 8945839        | -0.10       | 5510550        | 61.47        | 4006585        | 44.73        | 12500000       | 25.00         |
| 2013-14        | 8998933        | 0.59        | 8354601        | 51.61        | 2245881        | -43.95       | 10000000       | -20.00        |
| 2014-15        | 7999941        | -11.10      | 6528506        | -21.86       | 1784355        | -20.55       | 15000000       | 50.00         |
| <b>Average</b> | <b>7349500</b> | <b>7.45</b> | <b>3358005</b> | <b>45.66</b> | <b>3614500</b> | <b>14.52</b> | <b>5339596</b> | <b>270.74</b> |

Source: Survey work, question no: 7

**Table 4.8: Contd.**

| Year/<br>Uni. | Dr.<br>BAMU | %<br>Growth | SUK    | %<br>Growth | SGBAU   | %<br>Growth |
|---------------|-------------|-------------|--------|-------------|---------|-------------|
| 2005-06       | 4072450     | --          | 431933 | --          | 1487058 | --          |
| 2006-07       | 5402994     | 32.67       | 922935 | 113.68      | 7573500 | 409.29      |

|                |                |              |                |               |                   |              |
|----------------|----------------|--------------|----------------|---------------|-------------------|--------------|
| 2007-08        | 4589122        | -15.06       | 577756         | -37.40        | 3078304           | -59.35       |
| 2008-09        | 3779424        | -17.64       | 3255485        | 463.47        | 4525345           | 47.01        |
| 2009-10        | 5151667        | 36.31        | 651407         | -79.99        | 3489464           | -22.89       |
| 2010-11        | 672408         | -86.95       | 624627         | -4.11         | 1506824           | -56.82       |
| 2011-12        | 4001169        | 495.05       | 271084         | -56.60        | 1349076           | -10.47       |
| 2012-13        | 2245704        | -43.87       | 1997564        | 636.88        | 6795642           | 403.73       |
| 2013-14        | 919000         | -59.08       | 1482871        | -25.77        | 3271498           | -51.86       |
| 2014-15        | 2027444        | 120.61       | 3509218        | 136.65        | 1204507           | -63.18       |
| <b>Average</b> | <b>3459893</b> | <b>51.34</b> | <b>1372488</b> | <b>127.42</b> | <b>3428121.80</b> | <b>66.16</b> |

**Table 4.8: Contd.**

| <b>Year/<br/>Uni.</b> | <b>NMU</b>     | <b>%<br/>Growth</b> | <b>SRTMU</b>   | <b>%<br/>Growth</b> | <b>SUS</b>    | <b>%<br/>Growth</b> |
|-----------------------|----------------|---------------------|----------------|---------------------|---------------|---------------------|
| 2005-06               | 3098942        | --                  | 1090806        | --                  | 120000        | --                  |
| 2006-07               | 2444874        | -21.11              | 639424         | -41.38              | 455772        | 279.81              |
| 2007-08               | 3737737        | 52.88               | 00             | -100.00             | 1022000       | 124.23              |
| 2008-09               | 4021647        | 7.60                | 1558773        | 0.00                | 510500        | 0.00                |
| 2009-10               | 5169790        | 28.55               | 2884936        | 85.08               | 809956        | 58.66               |
| 2010-11               | 6446804        | 24.70               | 3186575        | 10.46               | 644959        | -20.37              |
| 2011-12               | 9131364        | 41.64               | 1623580        | -49.05              | 174165        | -73.00              |
| 2012-13               | 8584721        | -5.99               | 1324191        | -18.44              | 528209        | 203.28              |
| 2013-14               | 10967799       | 27.76               | 1373358        | 3.71                | 213522        | -59.58              |
| 2014-15               | 4193363        | -61.77              | 1084585        | -21.03              | 276398        | 29.45               |
| <b>Average</b>        | <b>5779704</b> | <b>10.47</b>        | <b>1476622</b> | <b>-14.52</b>       | <b>475548</b> | <b>60.28</b>        |

#### **4.10 University Library Expenditure on Periodicals:**

University Library expenditure on periodicals in Maharashtra is presented in table no. 4.9. It is found that the expenditure on periodicals spent by Mumbai University was Rs. 90.03 lacks in 2005-06 which continuously increased and went up to Rs. 597.04 lacks in 2014-15. The average annual growth rate of Mumbai University library on periodical was found 21.83 percent. The

expenditure on periodical of Mumbai University library increased by 663.16 times in absolute terms with compare to initial year. The growth of expenditure on periodicals of Mumbai University has varied between 0.14 percent in 2011-12 to 49.27 percent in 2014-15. SNTD University expenditure on periodicals was on an average 38.06 lacks showing 9.64 times increase with compare to initial year. The expenditure on periodicals of SNTD University was Rs. 9.04 lacks in 2005-06 which went up to Rs.87.17 lacks in 2014-15 with annual average growth rate of 60.64 percent during the study period. Rashtra Sant Tukdoji Maharaj Nagpur University library expenditure on periodicals was Rs.11.75 lacks in 2005-06 which gone up to Rs. 17.22 lacks in 2014-15, indicating 1.46 times increase. The annual average growth rate of expenditure on periodicals of Rashtra Sant Tukdoji Maharaj Nagpur University library is found 24 percent during the study period.

While, the expenditure on periodicals of Savitribai Phule University library was Rs. 50 lacks in 2005-06 which, goes up to Rs. 200 lacks in 2005-06 showing four times increase with compare to initial year 2005-06. The annual average growth of expenditure on periodicals of Savitribai Phule University is found 43.70 percent during the study period. The average expenditure on periodicals of Savitribai Phule University library was Rs. 133 lacks per year. Whereas, the expenditure on periodicals of Dr. Babasaheb Ambedkar Marathwada University was 24.54 lacks in 2005-06 which slightly increased in researched up Rs.27.47 lacks in 2014-15. On an average, the expenditure on periodicals of Dr. Babasaheb Ambedkar Marathwada University was Rs. 27.96 lacks during the study period. The annual growth rate of expenditure on periodicals of Dr. Babasaheb Ambedkar Marathwada University is found negative (-0.42 percent) during the study period. While, Shivaji University library expenditure on periodicals was Rs. 5.57 lacks in 2005-06 which went up to Rs. 27 lacks in 200-14-15 with an average annual growth rate of 83.6 percent during the study period. The average expenditure on periodical of Shivaji University Library was Rs. 18.61 lacks. Sant Gadge Baba Amrawati University expenditure on periodical was Rs. 13.44 lacks in 2005-06 which goes down and researched up to Rs. 2.98 lacks in 2014-15 indicating -5.44 percent annual average growth rate during the study period. The average expenditure on periodicals of SGBA University was Rs.7.54 lacks.

It is observed that the annual average growth rate of expenditure on periodicals was highest 83.6 percent in case of Shivaji University Kolhapur and ranks first in Maharashtra. Followed by SNTD University recorded 60.64 percent average annual growth rate in expenditure on periodical and ranks second while in case of growth in expenditure on periodicals RSTMN

Univrsity ranks third ( 24 percent) and Solapur University Solapur ranks fourth having 23 percent growth rate. Whereas, Dr. BAM University library, Gadge Baba Amrawati University library and Swami Ramanand Teerth Marathwada University library recorded negative annual average growth rate in expenditure on periodicals during the study period.

**Table 4.9: University Library Expenditure on Periodicals in Maharashtra**

| Year/<br>Uni.  | MUM             | %<br>Growth  | SNDTU          | %<br>Growth  | RTMNU          | %<br>Growth  | SPPU            | %<br>Growth  |
|----------------|-----------------|--------------|----------------|--------------|----------------|--------------|-----------------|--------------|
| 2005-06        | 9003512         |              | 904227         |              | 1175000        |              | 5000000         |              |
| 2006-07        | 12829654        | 42.50        | 774222         | -14.38       | 1275662        | 8.57         | 3000000         | -40.00       |
| 2007-08        | 18018489        | 40.44        | 1011663        | 30.67        | 1772088        | 38.92        | 10000000        | 233.33       |
| 2008-09        | 22501168        | 0.00         | 1122862        | 0.00         | 2001699        | 0.00         | 5000000         | 0.00         |
| 2009-10        | 26981742        | 19.91        | 1135373        | 1.11         | 5129403        | 156.25       | 10000000        | 100.00       |
| 2010-11        | 35915496        | 33.11        | 5584271        | 391.84       | 1811580        | -64.68       | 20000000        | 100.00       |
| 2011-12        | 35966038        | 0.14         | 5584271        | 0.00         | 2472882        | 36.50        | 20000000        | 0.00         |
| 2012-13        | 39369927        | 9.46         | 3424855        | -38.67       | 2452426        | -0.83        | 20000000        | 0.00         |
| 2013-14        | 39997060        | 1.59         | 9805227        | 186.30       | 830812         | -66.12       | 20000000        | 0.00         |
| 2014-15        | 59704811        | 49.27        | 8717189        | -11.10       | 1722988        | 107.39       | 20000000        | 0.00         |
| <b>Average</b> | <b>30028789</b> | <b>21.83</b> | <b>3806416</b> | <b>60.64</b> | <b>2064454</b> | <b>24.00</b> | <b>13300000</b> | <b>43.70</b> |

**Table 4.9: Contd.**

| Year/<br>Uni. | Dr.<br>BAMU | %<br>Growth | SUK     | %<br>Growth | SGBAU   | %<br>Growth |
|---------------|-------------|-------------|---------|-------------|---------|-------------|
| 2005-06       | 2454109     | --          | 557532  | --          | 1344547 | --          |
| 2006-07       | 1919763     | -21.77      | 4729335 | 748.26      | 1822156 | 35.52       |
| 2007-08       | 2745874     | 43.03       | 1555836 | -67.10      | 102312  | -94.39      |
| 2008-09       | 3716198     | 0.00        | 1703041 | 0.00        | 1128699 | 0.00        |
| 2009-10       | 2713153     | -26.99      | 1232682 | -27.62      | 1234233 | 9.35        |
| 2010-11       | 2991017     | 10.24       | 1582337 | 28.37       | 488403  | -60.43      |
| 2011-12       | 2988514     | -0.08       | 1450000 | -8.36       | 468211  | -4.13       |
| 2012-13       | 2937561     | -1.70       | 1500000 | 3.45        | 526815  | 12.52       |

|                |                |              |                |              |               |              |
|----------------|----------------|--------------|----------------|--------------|---------------|--------------|
| 2013-14        | 2747205        | -6.48        | 1600000        | 6.67         | 131062        | -75.12       |
| 2014-15        | 2747205        | 0.00         | 2700000        | 68.75        | 298441        | 127.71       |
| <b>Average</b> | <b>2796059</b> | <b>-0.42</b> | <b>1861076</b> | <b>83.60</b> | <b>754487</b> | <b>-5.44</b> |

**Table 4.9: Contd.**

| Year/ Uni.     | NMU           | % Growth     | SRTMU          | % Growth     | SUS           | % Growth     |
|----------------|---------------|--------------|----------------|--------------|---------------|--------------|
| 2005-06        | 64000         | --           | 817180         | --           | 150000        | --           |
| 2006-07        | 111000        | 73.44        | 1001624        | 22.57        | 120000        | -20.00       |
| 2007-08        | 139000        | 25.23        | 1167027        | 16.51        | 150700        | 25.58        |
| 2008-09        |               | 0.00         | 1464846        | 0.00         | 250000        | 0.00         |
| 2009-10        | 436000        | 0.00         | 1531147        | 0.00         | 2035151       | 0.00         |
| 2010-11        | 297000        | -31.88       | 1597852        | 4.36         | 397393        | -80.47       |
| 2011-12        | 212000        | -28.62       | 1919678        | 20.14        | 1710275       | 330.37       |
| 2012-13        | 869000        | 309.91       | 1999920        | 4.18         | 1376919       | -19.49       |
| 2013-14        | 87000         | -89.99       | 2020153        | 1.01         | 2354604       | 71.01        |
| 2014-15        | 00            | -100.00      | 36950          | -98.17       | 00            | -100.00      |
| <b>Average</b> | <b>246111</b> | <b>17.56</b> | <b>1355637</b> | <b>-3.27</b> | <b>854504</b> | <b>23.00</b> |

#### **4.11 Expenditure on Digital Resources by the University Libraries in Maharashtra:**

Expenditure on Digital Resources in the University Libraries in Maharashtra are presented in table 4.10. It is found that the university libraries started to use digital resources from the year 2009-10 only Savitribai Phule University pune using the digital resources since 2008-09. On an average highest Rs.30.24 lacks digital resources has by SNDT university and ranks first followed by Savitribai Phule University Rs.27.85 lacks, Dr. Babasaheb Ambedkar Marathwada University, Aurangabad Rs.16.16 lacks, Sant Gadge Baba Amrawati University Rs. 8.99 lacks, Solapur University Rs. 6.23 lacks, RTMN university Rs. 5.30 lacks, Shivaji University Kolhapur Rs. 4.49 lacks, Mumbai university Rs. 3 lacks and North Maharashtra University has Rs. 0.40 lacks digital resources and ranks at bottom in case of digital resources during the study period.

**Table 4.10: Expenditure on Digital Resources by University Libraries**

| Year/ Uni.     | MUM            | SNDTU           | RTMNU          | SPPU            | BAMU           |
|----------------|----------------|-----------------|----------------|-----------------|----------------|
| 2005-06        | 00             | 00              | 00             | 00              | 00             |
| 2006-07        | 00             | 00              | 00             | 00              | 00             |
| 2007-08        | 00             | 00              | 00             | 00              | 00             |
| 2008-09        | 00             | 00              | 00             | 1500000         | 00             |
| 2009-10        | 00             | 00              | 00             | 5000000         | 00             |
| 2010-11        | 00             | 529422          | 150000         | 2500000         | 950000         |
| 2011-12        | 00             | 1022510         | 2094987        | 2500000         | 1800000        |
| 2012-13        | 00             | 1511000         | 160000         | 500000          | 2500000        |
| 2013-14        | 00             | 6045211         | 150000         | 2500000         | 1450000        |
| 2014-15        | 3000000        | 6014598         | 100000         | 5000000         | 1380000        |
| <b>Total</b>   | <b>3000000</b> | <b>15122741</b> | <b>2654987</b> | <b>19500000</b> | <b>8080000</b> |
| <b>Average</b> | <b>300000</b>  | <b>3024548</b>  | <b>530997</b>  | <b>2785714</b>  | <b>1616000</b> |
| <b>Min.</b>    | <b>--</b>      | <b>529422</b>   | <b>100000</b>  | <b>500000</b>   | <b>950000</b>  |
| <b>Max.</b>    | <b>--</b>      | <b>6045211</b>  | <b>2094987</b> | <b>5000000</b>  | <b>2500000</b> |

Source: Survey work, question no: 7

**Table 4.10: Contd.**

| Year/ Uni. | SUK     | SGBAU   | NMU    | SRTMU  | SUS     |
|------------|---------|---------|--------|--------|---------|
| 2005-06    | 00      | 00      | 00     | 00     | 00      |
| 2006-07    | 00      | 00      | 00     | 00     | 00      |
| 2007-08    | 00      | 00      | 00     | 00     | 00      |
| 2008-09    | 00      | 00      | 00     | 00     | 00      |
| 2009-10    | 00      | 812727  | 00     | 00     | 2845107 |
| 2010-11    | 00      | 878628  | 00     | 00     | 1042352 |
| 2011-12    | 00      | 879253  | 405000 | 00     | 1884440 |
| 2012-13    | 1247469 | 1223847 | 00     | 796947 | 16500   |
| 2013-14    | 811393  | 1636914 | 00     | 112360 | 442993  |
| 2014-15    | 2440000 | 3560063 | 00     | 00     | 00      |

|                |                 |                 |               |                |                 |
|----------------|-----------------|-----------------|---------------|----------------|-----------------|
| <b>Total</b>   | <b>4498862</b>  | <b>8991432</b>  | <b>405000</b> | <b>909307</b>  | <b>6231392</b>  |
| <b>Average</b> | <b>449886.2</b> | <b>899143.2</b> | <b>40500</b>  | <b>90930.7</b> | <b>623139.2</b> |
| <b>Min.</b>    | <b>0</b>        | <b>0</b>        | <b>0</b>      | <b>0</b>       | <b>0</b>        |
| <b>Max.</b>    | <b>2440000</b>  | <b>3560063</b>  | <b>405000</b> | <b>796947</b>  | <b>2845107</b>  |

#### 4.12 Expenditure on Digitization by University Libraries in Maharashtra:

Table 4.11 presents the expenditure on digitization made by university libraries in Maharashtra during 2005-06 to 2014-15. It is found that the Mumbai University, Rashtra Sant Tukdoji Maharaj Nagpur University, Swami Ramanand Teerth Marathwada University and Solapur University Solapur do not spent any money on digitization during the entire period of the study. Whereas, on an average as higher as Rs. 25.54 lacks spent by Dr. Babasaheb Ambedkar Marathwada University on digitization and followed by Savitribai Phule University Pune spent Rs. 2.41 lacks, SGBAU and North Maharashtra University has spent Rs. 77.74 thousand and 77.68 thousand respectively and SNDT University spent Rs. 69.58 thousand on digitization and ranks fifth during the study period.

**Table 4.11: Expenditure on Digitization by University Libraries in Maharashtra**

| <b>Year/ Uni.</b> | <b>MUM</b> | <b>SNDTU</b> | <b>RTMNU</b> | <b>SPPU</b> | <b>DR.BAMU</b> |
|-------------------|------------|--------------|--------------|-------------|----------------|
| 2005-06           | 00         | 00           | 00           | 00          | 00             |
| 2006-07           | 00         | 00           | 00           | 00          | 00             |
| 2007-08           | 00         | 00           | 00           | 00          | 00             |
| 2008-09           | 00         | 00           | 00           | 500000      | 2995304        |
| 2009-10           | 00         | 00           | 00           | 25000       | 1845324        |
| 2010-11           | 00         | 00           | 00           | 200000      | 00             |
| 2011-12           | 00         | 00           | 00           | 00          | 2428321        |
| 2012-13           | 00         | 00           | 00           | 00          | 2950000        |
| 2013-14           | 00         | 626300       | 00           | 00          | 00             |
| 2014-15           | 00         | 00           | 00           | 00          | 00             |

|                |    |          |    |          |          |
|----------------|----|----------|----|----------|----------|
| <b>Total</b>   | 00 | 626300   | 00 | 725000   | 10218949 |
| <b>Average</b> | 00 | 69588.89 | 00 | 241666.7 | 2554737  |
| <b>Min.</b>    | 00 | 0        | 00 | 00       | 00       |
| <b>Max.</b>    | 00 | 626300   | 00 | 500000   | 2995304  |

**Table 4.11: Contd.**

| <b>Year/<br/>Uni.</b> | <b>SUK</b> | <b>SGBAU</b>  | <b>NMU</b>     | <b>SRTMU</b> | <b>SUS</b> |
|-----------------------|------------|---------------|----------------|--------------|------------|
| 2005-06               | 00         | 00            | 00             | 00           | 00         |
| 2006-07               | 00         | 00            | 00             | 00           | 00         |
| 2007-08               | 00         | 00            | 00             | 00           | 00         |
| 2008-09               | 00         | 00            | 00             | 00           | 00         |
| 2009-10               | 00         | 00            | 00             | 00           | 00         |
| 2010-11               | 00         | 777400        | 00             | 00           | 00         |
| 2011-12               | 00         | 00            | 00             | 00           | 00         |
| 2012-13               | 00         | 00            | 56371          | 00           | 00         |
| 2013-14               | 00         | 00            | 99000          | 00           | 00         |
| 2014-15               | 00         | 00            |                | 00           | 00         |
| <b>Total</b>          | <b>00</b>  | <b>777400</b> | <b>155371</b>  | <b>00</b>    | <b>00</b>  |
| <b>Average</b>        | <b>00</b>  | <b>77740</b>  | <b>77685.5</b> | <b>00</b>    | <b>00</b>  |
| <b>Min.</b>           | <b>0</b>   | <b>00</b>     | <b>00</b>      | <b>00</b>    | <b>00</b>  |
| <b>Max.</b>           | <b>00</b>  | <b>777400</b> | <b>99000</b>   | <b>00</b>    | <b>00</b>  |

Source: Survey work, question no: 7

#### **4.13 Funds for Library Digitization by University Libraries in Maharashtra:**

Table 4.12 denotes the funds created by university libraries for library digitization in Maharashtra during the period from 2005-06 to 2014-15. Among the selected ten universities of Maharashtra State four universities created funds for digitization of library during the study period. Mumbai University, Rastrasant Tukdoji Maharaj Nagpur University, Swami Ramanand Teerth Marathwada University and Solapur University Solapur do not created funds for library digitization. In case of funds for digitization

Dr. Babasaheb Ambedkar Marathwada University has created highest on average Rs. 11.66 lacks funds per year for digitization of library during the study period. Whereas, Savitribai Phule Pune University created on average Rs. 1.22 lacks funds for library digitization and ranks second after Dr. Babasaheb Ambedkar Marathwada University. Followed by Sant Gadge Baba Amrawati University created on average Rs. 0.80 lacks, Shivaji University Kolhapur on average Rs. 2.00 lacks, SNDT University on average Rs. 0.70 lacks and North Maharashtra University crated on average Rs. 0.22 lacks per year for digitization library during the study period. It is found that Dr. Babasaheb Ambedkar Marathwada University has made more digitization than all other universities of Maharashtra State during the study period.

**Table 4.12: Funds for Library Digitization by University Libraries in Maharashtra**

| Year/ Uni.     | MUM       | SNDTU         | RTMNU     | SPPU           | Dr.BAMU         |
|----------------|-----------|---------------|-----------|----------------|-----------------|
| 2005-06        | 00        | 00            | 00        | 00             | 00              |
| 2006-07        | 00        | 00            | 00        | 00             | 00              |
| 2007-08        | 00        | 00            | 00        | 00             | 00              |
| 2008-09        | 00        | 00            | 00        | 700000         | 3000000         |
| 2009-10        | 00        | 00            | 00        | 100000         | 2000000         |
| 2010-11        | 00        | 00            | 00        | 300000         | 00              |
| 2011-12        | 00        | 00            | 00        | 00             | 2500000         |
| 2012-13        | 00        | 00            | 00        | 00             | 3000000         |
| 2013-14        | 00        | 700000        | 00        | 00             | 00              |
| 2014-15        | 00        | 00            | 00        | 1500000        | 00              |
| <b>Total</b>   | <b>00</b> | <b>700000</b> | <b>00</b> | <b>1100000</b> | <b>10500000</b> |
| <b>Average</b> | <b>00</b> | <b>70000</b>  | <b>00</b> | <b>122222</b>  | <b>1166667</b>  |
| <b>Min.</b>    | <b>00</b> | <b>0</b>      | <b>00</b> | <b>0</b>       | <b>0</b>        |
| <b>Max.</b>    | <b>00</b> | <b>700000</b> | <b>00</b> | <b>700000</b>  | <b>3000000</b>  |

Source: Survey work, question no: 10

**Table 4.12: Contd.**

| Year/ Uni. | SUK | SGBAU | NMU | SRTMU | SUS |
|------------|-----|-------|-----|-------|-----|
| 2005-06    | 00  | 00    | 00  | 00    | 00  |

|                |                |               |               |           |           |
|----------------|----------------|---------------|---------------|-----------|-----------|
| 2006-07        | 00             | 00            | 00            | 00        | 00        |
| 2007-08        | 00             | 00            | 00            | 00        | 00        |
| 2008-09        | 00             | 00            | 00            | 00        | 00        |
| 2009-10        | 00             | 00            | 00            | 00        | 00        |
| 2010-11        | 00             | 800000        | 00            | 00        | 00        |
| 2011-12        | 00             | 00            | 00            | 00        | 00        |
| 2012-13        | 00             | 00            | 100000        | 00        | 00        |
| 2013-14        | 00             | 00            | 100000        | 00        | 00        |
| 2014-15        | 2000000        | 00            | 00            | 00        | 00        |
| <b>Total</b>   | <b>2000000</b> | <b>800000</b> | <b>200000</b> | <b>00</b> | <b>00</b> |
| <b>Average</b> | <b>200000</b>  | <b>80000</b>  | <b>20000</b>  | <b>00</b> | <b>00</b> |
| <b>Min.</b>    | <b>0</b>       | <b>00</b>     | <b>00</b>     | <b>00</b> | <b>00</b> |
| <b>Max.</b>    | <b>2000000</b> | <b>800000</b> | <b>100000</b> | <b>00</b> | <b>00</b> |

**4.14 Funds for Digital Resources by University Libraries in Maharashtra:** In case of recent readers the digital resources are the most important for their academic career. Table 4.13 presents the funds provided by selected universities of Maharashtra for digital resources during the period from 2005-06 to 2014-15. It is found that the Universities of Maharashtra started to create funds for digital resources during 2010-11. Only Savitriabai Phule University Pune created fund for digital resources during the year 2008-09 and after that Sant Gadge Baba Amravati University and Solapur University Solapur has created funds for digital resources during the academic year 2009-10. During the study period on an average Savitriabai Phule University Pune provided maximum funds to digital resources of Rs. 24.50 lacks per year and ranks first followed by Shreemati Nathibai Damodar Thackersey Women's University Library Rs. 17.70 lacks and ranks second, Sant Gadge Baba Amravati University provided on average Rs. 10.50 lacks and ranks third among the selected ten universities of Maharashtra state. Whereas, Solapur University provided on average Rs. 9.11 lacks and Dr. Babasaheb Ambedkar Marathwada University provided on average Rs. 9.00 lacks and ranks fourth and fifth respectively. While North Maharashtra University Jalgaon provided on average Rs. 50,000/- funds for digital resources and ranks at bottom among the selected ten Universities.

**Table 4.13: Funds for Digital Resources by University Libraries in Maharashtra**

| Year/ Uni.     | MUM            | SNDTU           | RTMNU          | SPPU            | Dr.BAMU        |
|----------------|----------------|-----------------|----------------|-----------------|----------------|
| 2005-06        | 00             | 00              | 00             | 00              | 00             |
| 2006-07        | 00             | 00              | 00             | 00              | 00             |
| 2007-08        | 00             | 00              | 00             | 00              | 00             |
| 2008-09        | 00             | 00              | 00             | 2000000         | 00             |
| 2009-10        | 00             | 00              | 00             | 5500000         | 00             |
| 2010-11        | 00             | 800000          | 200000         | 3000000         | 1000000        |
| 2011-12        | 00             | 1200000         | 2500000        | 3000000         | 2000000        |
| 2012-13        | 00             | 1700000         | 300000         | 2000000         | 3000000        |
| 2013-14        | 00             | 7000000         | 300000         | 3000000         | 1500000        |
| 2014-15        | 3500000        | 7000000         | 300000         | 6000000         | 1500000        |
| <b>Total</b>   | <b>3500000</b> | <b>17700000</b> | <b>2680000</b> | <b>24500000</b> | <b>9000000</b> |
| <b>Average</b> | <b>350000</b>  | <b>1770000</b>  | <b>268000</b>  | <b>2450000</b>  | <b>900000</b>  |
| <b>Min.</b>    | <b>00</b>      | <b>0</b>        | <b>0</b>       | <b>0</b>        | <b>0</b>       |
| <b>Max.</b>    | <b>3500000</b> | <b>7000000</b>  | <b>2100000</b> | <b>6000000</b>  | <b>3000000</b> |

Source: Survey work, question no: 11

**Table 4.13: Contd.**

| Year/ Uni. | SUK     | SGBAU   | NMU    | SRTMU  | SUS     |
|------------|---------|---------|--------|--------|---------|
| 2005-06    | 00      | 00      | 00     | 00     | 00      |
| 2006-07    | 00      | 00      | 00     | 00     | 00      |
| 2007-08    | 00      | 00      | 00     | 00     | 00      |
| 2008-09    | 00      | 00      | 00     | 00     | 00      |
| 2009-10    | 00      | 1000000 | 00     | 00     | 3000000 |
| 2010-11    | 00      | 1000000 | 00     | 00     | 1200000 |
| 2011-12    | 00      | 1000000 | 500000 | 00     | 2000000 |
| 2012-13    | 00      | 1500000 | 00     | 800000 | 1000000 |
| 2013-14    | 1500000 | 2000000 | 00     | 500000 | 1000000 |
| 2014-15    | 1000000 | 4000000 | 00     | 00     | 00      |

|                |                |                 |               |                |                |
|----------------|----------------|-----------------|---------------|----------------|----------------|
| <b>Total</b>   | <b>2500000</b> | <b>10500000</b> | <b>500000</b> | <b>1300000</b> | <b>8200000</b> |
| <b>Average</b> | <b>250000</b>  | <b>1050000</b>  | <b>50000</b>  | <b>130000</b>  | <b>911111</b>  |
| <b>Min.</b>    | <b>0</b>       | <b>0</b>        | <b>0</b>      | <b>0</b>       | <b>0</b>       |
| <b>Max.</b>    | <b>1500000</b> | <b>4000000</b>  | <b>500000</b> | <b>800000</b>  | <b>3000000</b> |

#### **4.15 Availability of Digital Resources in University Libraries in Maharashtra:**

Availability of digital resources in University libraries in Maharashtra during academic year 2014-15 presented in table 4.14. E-books and E-journals are the major digital resources for libraries. Table 4.14 shows that the total E-books were 23,530 are available in the university libraries of Maharashtra State during the academic year 2014-15. On an average total E-books available in the university library of Maharashtra was 2356 per University. It is found that all the universities except Dr. Babasaheb Ambedkar Marathwada University have below the number of average E-books. Dr. Babasaheb Ambedkar Marathwada University alone have 89.12 percent E-books and ranks first followed North Maharashtra University has 7.20 percent E-books and Mumbai University have 1.53 percent E-books and ranks second and third among ten Universities of Maharashtra State. Whereas, Swami Ramanand Teerth University do not have any E-books during the study period. In case of E-journal it is found that total 1,94,614 e-journals were available in the university libraries of Maharashtra. SNDT University subscribed maximum 58,614 (30.12 percent) E-journals followed by Dr. Babasaheb Ambedkar Marathwada University subscribed 30,000 ( 15.42 percent), North Maharashtra University Jalgaon subscribed 25,000 (12.85 percent) and Sant Gadge Baba Amravati University has subscribed 20,000 (10.28 percent) E-journals during the period from 2005-06 to 2014-15.

Total E-database is found to be 41 in the university library of Maharashtra State during the academic year 2014-15. Out of 41 E-database Savitribai Phule University have alone 16 (39.02 percent) E-database. Whereas, North Maharashtra University Jalgaon. Swami Ramanand Teerth University Nanded and Solapur University Solapur do not have any E-database during the study period. It is also found that the no one university of Maharashtra has Consortia and networks. Only Dr. Babasaheb Ambedkar Marathwada University library has interred library lending or resources sharing facility of digital resources with other libraries. The University takes charge of Rs. 6000 from register library.

**Table 4.14: Availability of Digital Resources in University Library of Maharashtra State**

| Type/ Uni.     | E-books       | % to Total | E- Journals    | % to Total | E- Database | % to Total |
|----------------|---------------|------------|----------------|------------|-------------|------------|
| MUM            | 360           | 1.53       | 10000          | 5.14       | 5           | 12.20      |
| SNDT           | 16            | 0.07       | 58614          | 30.12      | 5           | 12.20      |
| RTMNU          | 50            | 0.21       | 7000           | 3.60       | 3           | 7.32       |
| SPU            | 250           | 1.06       | 15000          | 7.71       | 16          | 39.02      |
| BAMU           | 21000         | 89.12      | 30000          | 15.42      | 3           | 7.32       |
| SUK            | 40            | 0.17       | 12000          | 6.17       | 4           | 9.76       |
| SGBAU          | 100           | 0.42       | 20000          | 10.28      | 5           | 12.20      |
| NMU            | 1697          | 7.20       | 25000          | 12.85      | 0           | 0.00       |
| SRTMU          | 0             | 0.00       | 5000           | 2.57       | 0           | 0.00       |
| SUS            | 50            | 0.21       | 12000          | 6.17       | 0           | 0.00       |
| <b>Average</b> | <b>2356.3</b> |            | <b>19461.4</b> |            | <b>4.1</b>  |            |

#### 4.16 Amount paid towards consortium membership by University Libraries in Maharashtra:

| Type/ Uni.     | EBSCO           | % to Total | INDEST       | % to Total | Any Other       | % to Total |
|----------------|-----------------|------------|--------------|------------|-----------------|------------|
| MUM            | 800000          | 9.58       | 0            | 0          | 0               | 0          |
| SNDT           | 800000          | 9.58       | 280000       | 100        | 0               | 0          |
| RTMNU          | 30000           | 0.36       | 0            | 0          | 0               | 0          |
| SPU            | 4700000         | 56.26      | 0            | 0          | 0               | 0          |
| BAMU           | 1137722         | 13.62      | 0            | 0          | 600000          | 21.94      |
| SUK            | 0               | 0.00       | 0            | 0          | 1294030         | 47.31      |
| SGBAU          | 800000          | 9.58       | 0            | 0          | 0               | 0          |
| NMU            | 0               | 0.00       | 0            | 0          | 0               | 0          |
| SRTMU          | 0               | 0.00       | 0            | 0          | 112000          | 4.10       |
| SUS            | 87000           | 1.04       | 0            | 0          | 729000          | 26.65      |
| <b>Average</b> | <b>835472.2</b> |            | <b>28000</b> |            | <b>273503.0</b> |            |

Table 4.15 shows the amount paid for consortium membership and renew University Library in Maharashtra. It observed that total amount paid for consortium membership and renew by all University Libraries in Maharashtra was Rs. 111.17 lacks with average of Rs. 10.00 lacks per university. In case of EBSCO Savitribai Phule University spent maximum Rs. 47.00 lacks (56.26 percent) of total expenditure on EBSCO by all Universities of Maharashtra. Followed by Dr. Babasaheb Ambedkar Marathwada University spent Rs.11.37 lacks (13.62 percent) and ranks second, while Mumbai University, SNTD University and Sant Gadge Baba Amravati University spent equally Rs. 8.00 lacks ( 9.58 percent) on EBSCO out of total amount spent by university libraries in Maharashtra and ranks third. Shivaji University Kolhapur and North Maharashtra University Jalgaon and swami Ramanad Teerth Marathwada university Nanded do not spent any amount on EBSCO during the study period. In case of INDEST only SNTD University spent Rs. 2.8 lacks. While Dr. Babasaheb Ambedkar Marathwada University and Shivaji University Kolhapur and SRTMU Nanded spent on other consortium membership.

**Table 4.15: Amount paid towards consortium membership and renews by University Libraries in Maharashtra:** Source: Survey work, question no: 24

**4.17 Use of library software in University libraries:**

Library software is most important for easy to books issue and return and also preserves the books record. Table 4.16 presents the use of library software in the University libraries in Maharashtra. It is clear from the table 4.16 that the Mumbai University Library, Dr. Babasaheb Ambedkar Marathwada University Library, Sant Gadge Baba Amravati University Library, North Maharashtra University Library, Swami Ramanand Teerth Marathwada University Library are used SOUL Library Software. Rashtrasant Tukadoji Maharaj Nagpur University Library, Savitribai Phule Pune University Library, Shivaji University Library are used LIBSYS Library software. Shreemati Nathibai Damodar Thackersey Women's University Library and Solapur University Library are used SLIM21 Library Software. It is found from the table 4.16 that the 50 percent university libraries of Maharashtra state were using SOUL Library Software followed by LIBSYS Library Software SLIM21 Library Software during the study period.

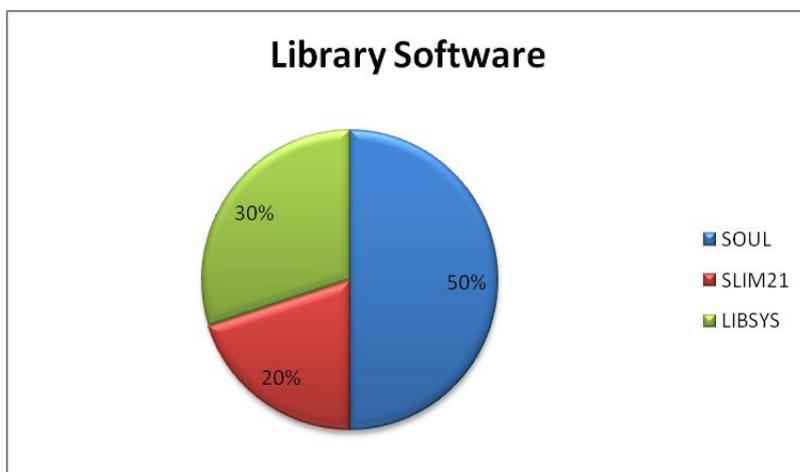
**Table 4.16: Use of library software among University libraries in Maharashtra**

| Software | frequency | percentage |
|----------|-----------|------------|
| SOUL     | 5         | 50         |

|        |   |    |
|--------|---|----|
| SLIM21 | 2 | 20 |
| LIBSYS | 3 | 30 |

Source: Survey work, question no: 9

**Figure 4.1: Use of library software among University libraries in Maharashtra**



**4.18 Digitization of knowledge documents by University Libraries in Maharashtra:**

Digitization allows easy access allowing to build collection and compare items which can be viewed side solely by virtue representation and access to digital reference materials especially images that provide a great deal of information to researchers. Table 4.17 shows the total digitized knowledge document made by University libraries in Maharashtra. Total digitization of knowledge document was 12263 and total expenses was Rs. 1,24,80,520 by selected university libraries in Maharashtra. Total digitizations of Ph.D. thesis were 5694 and expenses on this was Rs. 15, 59,071 by University libraries in Maharashtra. Total digitization of manuscripts were 4500 and expenses on it was Rs. 5,00,000 made by University libraries in Maharashtra. Total digitization of rare books were 2069 and expenses was Rs. 2,00,000 made by University libraries in Maharashtra. It is observed that the highest 5694 digitization of knowledge documents were Ph.D. Thesis followed by

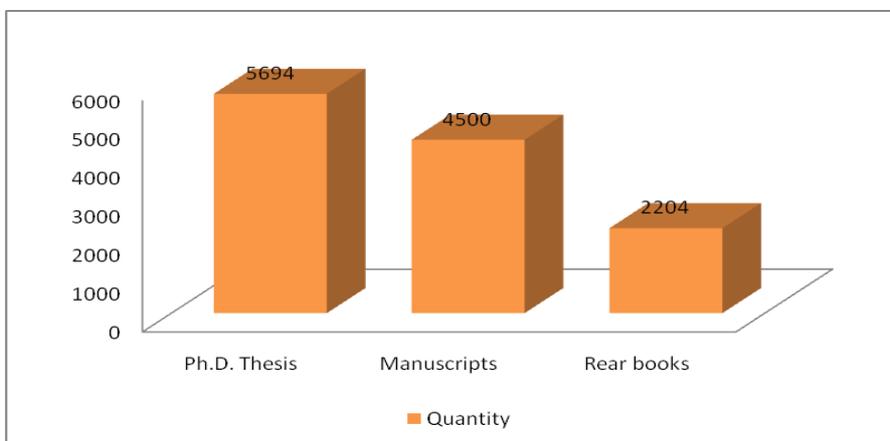
Manuscripts 4500 and Rear books 2204 by the University libraries in Maharashtra.

**Table 4.17: Digitized Knowledge Documents by University libraries in Maharashtra**

| Types of Documents | Quantity     | Total Expenses     |
|--------------------|--------------|--------------------|
| Ph.D. Thesis       | 5694         | 8828020            |
| Manuscripts        | 4500         | 500000             |
| Rear books         | 2204         | 3152500            |
| <b>Total</b>       | <b>12398</b> | <b>1,24,80,520</b> |

Source: Survey work, question no: 13

**Figure 4.2: Digitized knowledge documents by University libraries in Maharashtra**



#### **4.19 Principal reasons for digitization of knowledge document in University libraries:**

The present principal reasons are for digitization of heritage collections among University libraries in Maharashtra. The principal reasons has been selected based on International Federation of Library Association and Institutions for digitization, therefore it has been categorized into: 'enhanced access', 'facilitate new forms of access and use', 'preservation' and 'reduction

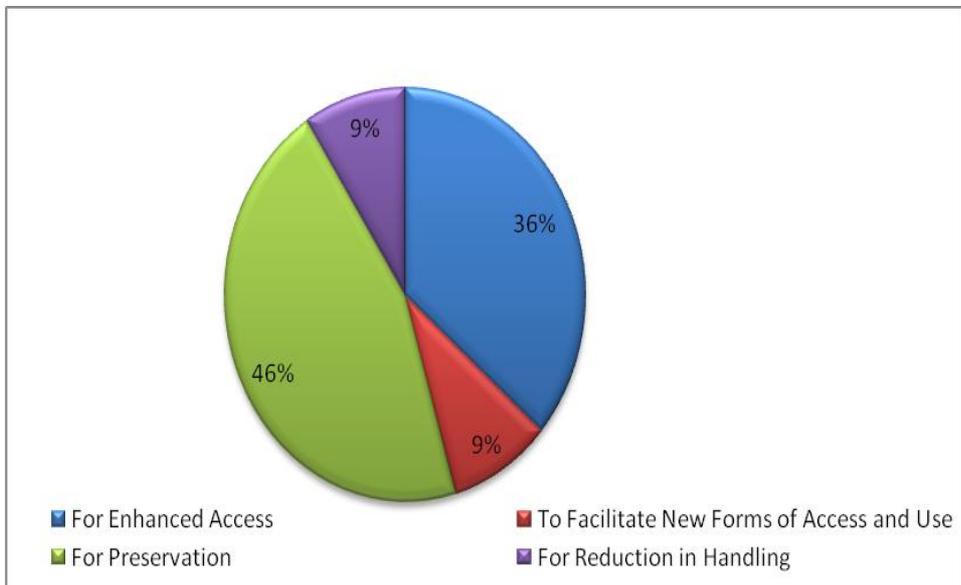
in handling'. Principal reasons for digitization of knowledge document are presented in table 4.18. It is found that the total ten University libraries surveyed in Maharashtra, 'preservation' was 46 percent the main reason in University libraries for digitization of knowledge document, followed by 'enhanced access' was 36 percent and 'facilitate new forms of access and use' and reduction in handling was 9 percent each during the study period.

**Table 4.18: Principal reasons for digitization of knowledge document by University libraries**

| Types of reasons                          | Yes | Percentage |
|---|-----|------------|
| For Enhanced Access                       | 4   | 36         |
| To Facilitate New Forms of Access and Use | 1   | 9          |
| For Preservation                          | 5   | 46         |
| For Reduction in Handling                 | 1   | 9          |

Source: Survey work, question no: 14

**Figure 4.3: Principal reasons for digitization of knowledge document**



**4.20 Total number of Computers in Internet lab by University Library:**

Computer is most important in the library, Library management, Book record; Books issue and return make it easy to gather information through a Computer. Computer system available in the Internet lab for accessing digital resources presented in table 4.19. It is found that the maximum computer available in Dr. Babasaheb Ambedkar Marathwada University library were 151 computers, Followed by North Maharashtra University library has 70 computers, Solapur University library has 55 computers, Savitribai Phule Pune University library and Sant Gadge Baba Amravati University library have same 40 computers, Rashtrasant Tukadoji Maharaj Nagpur University library and Swami Ramanand Teerth Marathwada University library have same 30 computers, Mumbai University library, Shreemati Nathibai Damodar Thackersey Women's University library and Shivaji University library has 20 computers.

**Table 4.19: Total number of Computers in Internet lab by University libraries**

| <b>Name of the University</b>                                    | <b>Quantity</b> |
|--|-----------------|
| Mumbai University, Mumbai  | 20              |
| Shreemati Nathibai Damodar Thackersey Women's University, Mumbai | 20              |
| Rashtrasant Tukadoji Maharaj Nagpur University, Nagpur           | 30              |
| Savitribai Phule Pune University, Pune                           | 40              |
| Dr. Babasaheb Ambedkar Marathwada University, Aurangabad         | 151             |
| Shivaji University, Kolhapur                                     | 20              |
| Sant Gadge Baba Amravati University, Amravati                    | 40              |
| North Maharashtra University, Jalgaon                            | 70              |
| Swami Ramanand Teerth Marathwada University, Nanded              | 30              |
| Solapur University, Solapur                                      | 55              |

Source: Survey work, question no: 19

#### **4.21 Criteria for selection of Digital resources used by University libraries:**

Digital resources are most important of current generation. Criteria for selection of digital resources it has been categorized into: 'Quantity to meet user need', 'Subject relevance', 'Cost effectiveness', 'Authenticity of information' and 'Currency of information'. Criteria for selection of digital resources were presented in table 4.20. It is found that the total ten University

libraries surveyed in Maharashtra, were used criteria for selection of digital resources were Quantity to meet user needs and subject relevance have been used by maximum university libraries in Maharashtra.

**Table 4.20 Criteria for selection of Digital resources used by University libraries:**

| Criteria                    | Yes | No |
|-----------------------------|-----|----|
| Quantity to meet user need  | 8   | 2  |
| Subject relevance           | 9   | 1  |
| Cost effectiveness          | 3   | 7  |
| Authenticity of information | 3   | 7  |
| Currency of information     | 4   | 6  |
| Back issues facility        | 1   | 9  |
| Ease of accessibility       | 3   | 7  |
| Preservation                | 1   | 9  |

**4.22 Software packages used by University libraries for Digital library in Maharashtra:**

For creating and managing an Institutional Repository of the in-house collection of an institution various open Source software's are available. Both commercial and open source software are available that can be used to develop IR in University libraries of Maharashtra. Table 4.21 shows the software packages used for digital library by University libraries in Maharashtra. Savitribai Phule Pune University library, Shivaji University library, Sant Gadge Baba Amravati University library and Swami Ramanand Teerth Marathwada University library used Dspace software.

**Table 4.21: Software packages used by University libraries for Digital library in Maharashtra:**

| Open Source Software | Yes | No |
|----------------------|-----|----|
| Dspace               | 4   | 6  |
| Fedora               | 0   | 10 |
| Eprints              | 0   | 10 |

|      |   |    |
|------|---|----|
| GSDL | 0 | 10 |
|------|---|----|

Source: Survey work, question no: 26

#### 4.23 Security System of University Libraries in Maharashtra:

Protect the digital resources from various threats like loss, computer virus, theft etc. proper security system is necessary. In the survey, query was put on the various security measures adopted by the University libraries. Table 4.22 shows all University libraries were used of Antivirus Software and CCTV system. RFID Security system was used by Mumbai university library, Savitribai Phule Pune University library, Dr. Babasaheb Ambedkar Marathwada University library and North Maharashtra University library. Smart Card was used by Savitribai Phule Pune University library, Dr. Babasaheb Ambedkar Marathwada University library, Sant Gandgebaba Amravati University library and Solapur University library.

**Table 4.22: Security System of University Libraries in Maharashtra:**

| Security System     | MUM | SN DU | RT MUN | SP PU | DR. BA MU | SUK | SG BA U | NMU | SRTMU | SUS |
|---------------------|-----|-------|--------|-------|-----------|-----|---------|-----|-------|-----|
| Anti Virus Software | Yes | Yes   | Yes    | Yes   | Yes       | Yes | Yes     | Yes | Yes   | Yes |
| CCTV                | Yes | Yes   | Yes    | Yes   | Yes       | Yes | Yes     | Yes | Yes   | Yes |
| Infrared Card       | -   | -     | -      | -     | -         | -   | -       | -   | -     | -   |
| RFID (3M Tech)      | Yes | -     | -      | Yes   | Yes       | -   | -       | Yes | -     | -   |
| Smart Card          | -   | -     | -      | Yes   | Yes       | -   | Yes     | -   | -     | Yes |

Source: Survey work, question no: 28

#### 4.24 Users Satisfaction by Use of Digital Resources:

Library growth depends on which types of library services provided to users. Third law of library science is every reader his book. Forth law of

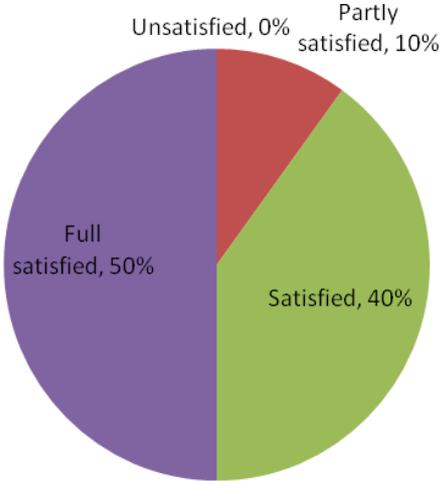
library science is every book its reader, means any information its users hence University libraries provided current information by Digital resources. Users are satisfied with digital resources; therefore it has been categorized into: 'Fully satisfied', 'satisfied', 'Partly satisfied' and 'Unsatisfied'. Users are satisfied with digital resources presented in table 4.23. It is found that the total ten University libraries surveyed in Maharashtra, 'Fully satisfied' users were 50 percent, followed by 'Satisfied' users were 40 percent, 'Partly satisfied' users were 10 percent and there were no one found unsatisfied in case of digital resources.

**Table 4.23: Users Satisfaction by Use of digital resources:**

| Satisfied level  | No. of University |
|------------------|-------------------|
| Fully satisfied  | 5                 |
| Satisfied        | 4                 |
| Partly satisfied | 1                 |
| Unsatisfied      | 0                 |

Source: Survey work, question no: 29

**Figure 4.4: Users Satisfaction by Use of digital resources:**



**4.25 Use of Printed and Electronic Documents in University libraries:**

Library users are used Printed document and Electronic Document. Electronic document means e-books, e-journals and e-database. Printed

document means books, journals, and other reference material. Table 4.24 presents the use of Printed and Electronic Documents by University libraries in Maharashtra during the period from 2005-06 to 2014-15. On an average highest 311883 use of printed documents is found in Shreemati Nathibai Damodar Thackersey Women's University Library followed by Shivaji University Library 116388, Dr. Babasaheb Ambedkar Marathwada University Library 67373, Savitribai Phule Pune University Library, Shivaji University Library 40893, Swami Ramanand Teerth Marathwada University Library 28904, North Maharashtra University Library 21328, Sant Gadge Baba Amravati University Library 15517, Solapur University Library 11516, Mumbai University Library 7013 and Rashtrasant Tukadoji Maharaj Nagpur University Library used lowest 4801 print document among the selected ten University libraries in Maharashtra state. On an average highest 167596 use of Electronic Document in Shivaji University Kolhapur followed by Savitribai Phule Pune University Library 141149, Shreemati Nathibai Damodar Thackersey Women's University Library 136885, Dr. Babasaheb Ambedkar Marathwada University Library 128533, North Maharashtra University Library 71718, Sant Gadge Baba Amravati University Library 32237, Swami Ramanand Teerth Marathwada University Library 18190, Rashtrasant Tukadoji Maharaj Nagpur University Library 16639, Solapur University Library 12709 and Mumbai University library was used minimum 9548 electronic document among the selected ten University libraries in Maharashtra state. On an average highest 311883 printed documents used by Shreemati Nathibai Damodar Thackersey Women's University Library While on an average highest 167596 Electronic Document used by Shivaji University Kolhapur.

**Table 4.24: Use of Print and Electronic Documents by University libraries in Maharashtra**

| Year    | MUM   |            | SNDTU  |            | RTMNU |            | SPPU  |            | BAMU  |            |
|---------|-------|------------|--------|------------|-------|------------|-------|------------|-------|------------|
|         | Print | Electronic | Print  | Electronic | Print | Electronic | Print | Electronic | Print | Electronic |
| 2005-06 | 6263  | -          | 370924 | 41482      | 4922  | -          | 53928 | -          | 62498 | -          |
| 2006-07 | 7880  | -          | 406329 | 62024      | 5611  | -          | 38536 | -          | 35704 | -          |
| 2007-08 | 5915  | -          | 374171 | 71099      | 4739  | -          | 22664 | -          | 21900 | -          |
| 2008-09 | 6512  | -          | 299797 | 81912      | 3200  | -          | 29112 | 47307      | 64356 | 12186      |
| 2009-10 | 6928  | 7547       | 249504 | 150650     | 3439  | 12124      | 40257 | 53759      | 97501 | 82415      |

|                |               |                 |                |                 |               |                 |                |                |                |                 |
|----------------|---------------|-----------------|----------------|-----------------|---------------|-----------------|----------------|----------------|----------------|-----------------|
| 2010-11        | 7105          | 7823            | 332256         | 179338          | 4482          | 14698           | 61808          | 113688         | 86281          | 66140           |
| 2011-12        | 7091          | 8972            | 165858         | 182797          | 4800          | 15394           | 84544          | 138316         | 59528          | 97824           |
| 2012-13        | 7137          | 9401            | 261736         | 131367          | 5127          | 17390           | 26064          | 174817         | 61953          | 122854          |
| 2013-14        | 7259          | 10598           | 327670         | 204239          | 5398          | 19935           | 28322          | 212987         | 85420          | 192584          |
| 2014-15        | 8042          | 12948           | 330585         | 263946          | 6297          | 20297           | 23704          | 247169         | 98596          | 325733          |
| <b>Total</b>   | <b>70132</b>  | <b>57289</b>    | <b>3118830</b> | <b>1368854</b>  | <b>48015</b>  | <b>99838</b>    | <b>408939</b>  | <b>988043</b>  | <b>673737</b>  | <b>899736</b>   |
| <b>Average</b> | <b>7013.2</b> | <b>9548.167</b> | <b>311883</b>  | <b>136885.4</b> | <b>4801.5</b> | <b>16639.67</b> | <b>40893.9</b> | <b>14114.9</b> | <b>67373.7</b> | <b>128533.7</b> |

| Year           | SUK            |                 | SGBAU         |                 | NMU           |                 | SRTMU          |                | SUS            |                |
|----------------|----------------|-----------------|---------------|-----------------|---------------|-----------------|----------------|----------------|----------------|----------------|
|                | Print          | Electronic      | Print         | Electronic      | Print         | Electronic      | Print          | Electronic     | Print          | Electronic     |
| 2005-06        | 90921          | -               | 19234         | -               | 19244         | -               | 28035          | -              | 5020           | -              |
| 2006-07        | 92722          | -               | 21532         | -               | 18915         | -               | 35372          | -              | 6072           | -              |
| 2007-08        | 96686          | -               | 16918         | -               | 20198         | -               | 38296          | -              | 6003           | -              |
| 2008-09        | 90970          | 64005           | 16424         | 9147            | 21120         | -               | 37129          | -              | 7009           | -              |
| 2009-10        | 94586          | 87537           | 17513         | 16763           | 23211         | 53588           | 36654          | 2100           | 8183           | -              |
| 2010-11        | 116680         | 116115          | 15927         | 16872           | 19213         | 45967           | 11908          | 4732           | 9322           | 1437           |
| 2011-12        | 105351         | 185320          | 14098         | 16789           | 20352         | 52662           | 15473          | 3998           | 11082          | 2510           |
| 2012-13        | 116464         | 193044          | 12696         | 13478           | 21751         | 86781           | 22593          | 26342          | 15317          | 3632           |
| 2013-14        | 67500          | 237230          | 12351         | 12907           | 22652         | 92602           | 28475          | 32713          | 22070          | 4719           |
| 2014-15        | 292000         | 289923          | 8477          | 139707          | 26624         | 98712           | 35106          | 39258          | 25089          | 51250          |
| <b>Total</b>   | <b>1163880</b> | <b>1173174</b>  | <b>155170</b> | <b>225663</b>   | <b>213280</b> | <b>430312</b>   | <b>289041</b>  | <b>109143</b>  | <b>115167</b>  | <b>63548</b>   |
| <b>Average</b> | <b>116388</b>  | <b>167596.3</b> | <b>15517</b>  | <b>32237.57</b> | <b>21328</b>  | <b>71718.67</b> | <b>28904.1</b> | <b>18190.5</b> | <b>11516.7</b> | <b>12709.6</b> |

#### 4.26 Staff of University libraries in Maharashtra:

The library staff consists of three levels of employees: Professional librarians, Support staff, and part time assistants. Similarly, the University library has the following staff Librarian, Deputy Librarian, Assistant librarian, Library assistant, Information scientist, Attendant, Supporting staff. Table 4.25 show that the Mumbai University library has highest 84 employees and Solapur University library has lowest 09 employees. Five Universities do not have appointed fulltime librarian. These Universities are Mumbai University, Rashtrasant Tukadoji Maharaj Nagpur University, North Maharashtra University, Swami Ramanand Teerth Marathwada University and Solapur University. Four Universities do not have Information scientist working in the library. These University are Mumbai University library, Savitribai Phule Pune University library, Shivaji University library and Solapur University library.

**Table 4.25: Staff of University libraries in Maharashtra:**

| Staff / Uni. Code     | MUM       | SNDTU     | RTMNU     | SPPU      | BAMU      |
|-----------------------|-----------|-----------|-----------|-----------|-----------|
| Librarian             | -         | 1         | -         | 1         | 1         |
| Deputy librarian      | 1         | 3         | 1         | 1         | -         |
| Asst. librarian       | 3         | 4         | 3         | 3         | 1         |
| Library assistants    | 28        | 7         | 13        | 13        | 4         |
| Information scientist | -         | 1         | 1         | -         | 1         |
| Attendant             | 10        | 6         | 25        | 4         | 4         |
| Supporting staff      | 42        | 18        | 18        | 5         | 14        |
| <b>Total</b>          | <b>84</b> | <b>40</b> | <b>61</b> | <b>27</b> | <b>25</b> |

Source: Survey work, question no: 3

**Table 4.25: Contd.**

| Staff / Uni. Code | SUK | SGBAU | NMU | SRTMU | SUS |
|-------------------|-----|-------|-----|-------|-----|
| Librarian         | 1   | 1     | -   | -     | -   |
| Deputy librarian  | 1   | -     | 1   | -     | -   |
| Asst. librarian   | 1   | 2     | 1   | 2     | 3   |

|                       |           |           |           |           |          |
|-----------------------|-----------|-----------|-----------|-----------|----------|
| Library assistants    | 8         | 6         | 1         | 6         | -        |
| Information scientist | -         | 1         | 1         | 1         | -        |
| Attendant             | 7         | 6         | 14        | 3         | 2        |
| Supporting staff      | 7         | 4         | 5         | 7         | 4        |
| <b>Total</b>          | <b>25</b> | <b>20</b> | <b>23</b> | <b>19</b> | <b>9</b> |

#### 4.27 Budget Methods used by University libraries in Maharashtra:

There are four types of budget methods i.e. line budgeting, program budgeting, performance budgeting, by comparison with past expenditure. Table 4.26 presents the budget methods used by University libraries in Maharashtra. The Line Budgeting method was used by five University libraries in Maharashtra. These are Mumbai University library, Shreemati Nathibai Damodar Thackersey Women's University library, Savitribai Phule Pune University library, Dr. Babasaheb Ambedkar Marathwada University library and North Maharashtra University library. Program budgeting method was used by three University libraries in Maharashtra. These are Rashtrasant Tukadoji Maharaj Nagpur University library, Shivaji University library and Sant Gadge Baba Amravati University library. Performance budgeting method was used in Swami Ramanand Teerth Marathwada University library. By comparison with past expenditure method was used in Solapur University library. It is found that 50 percent libraries used of line budgeting methods with followed by Program budgeting methods used by 30 percent University libraries.

**Table 4.26: Budget Methods used by University libraries in Maharashtra:**

| Types of Budget                     | Frequency | Percentage |
|-------------------------------------|-----------|------------|
| Line Budgeting                      | 5         | 50         |
| Program Budgeting                   | 3         | 30         |
| Performance Budgeting               | 1         | 10         |
| By Comparison with past expenditure | 1         | 10         |

Source: Survey work, question no: 8

#### 4.28 Availability of infrastructure facilities in University libraries in Maharashtra:

The Information Communication Technology infrastructure is as important as the older essential technological infrastructure such as electricity and transportation. Table 4.27 presents the availability of infrastructure facilities among University libraries in Maharashtra. The Dr. Babasaheb Ambedkar Marathwada University library has 185 ICT infrastructure facilities followed by North Maharashtra University library 147, Shreemati Nathibai Damodar Thackersey Women's University library 114, Savitribai Phule Pune University library 84, Rashtrasant Tukadoji Maharaj Nagpur University library and Sant Gadge Baba Amravati University library 81 each, Solapur University library 77, Shivaji University library 76, Mumbai University library 60 and Swami Ramanand Teerth Marathwada University library has 49 available of ICT infrastructure facilities.

**Table 4.27: Availability of infrastructure facilities in University libraries in Maharashtra.**

| Staff / Uni. Code | MUM       | SNDTU      | RTMNU     | SPPU      | BAMU       |
|-------------------|-----------|------------|-----------|-----------|------------|
| Computer systems  | 40        | 45         | 50        | 70        | 162        |
| Servers           | 1         | 1          | 3         | 1         | 4          |
| Scanners          | 1         | 24         | 5         | 3         | 2          |
| Digital camera    | -         | -          | -         | -         | 1          |
| Web camera        | -         | -          | 2         | -         | 2          |
| Bar coding gun    | -         | 7          | 7         | 4         | 5          |
| Printer           | 12        | 34         | 10        | 4         | 5          |
| Projector         | 3         | 2          | 2         | 1         | 1          |
| Xerox machine     | 3         | 1          | 2         | 1         | 3          |
| <b>Total</b>      | <b>60</b> | <b>114</b> | <b>81</b> | <b>84</b> | <b>185</b> |

Source: Survey work, question no: 15

**Table 4.27: Contd.**

| Staff / Uni. Code | SUK | SGBAU | NMU | SRTMU | SUS |
|-------------------|-----|-------|-----|-------|-----|
| Computer systems  | 45  | 50    | 106 | 40    | 62  |
| Servers           | 1   | 4     | 3   | 1     | 2   |
| Scanners          | 1   | 4     | 12  | 1     | 3   |

|                |           |           |            |           |           |
|----------------|-----------|-----------|------------|-----------|-----------|
| Digital camera | 2         | -         | -          | -         | -         |
| Web camera     | 2         | 4         | -          | -         | 1         |
| Bar coding gun | 4         | 6         | 20         | 2         | 2         |
| Printer        | 18        | 11        | 3          | 3         | 6         |
| Projector      | 2         | 2         | 1          | 1         | -         |
| Xerox machine  | 1         | -         | 2          | 1         | 1         |
| <b>Total</b>   | <b>76</b> | <b>81</b> | <b>147</b> | <b>49</b> | <b>77</b> |

#### 4.29 Hypothesis Testing:

**Hypothesis 1:** There is independency between selected University libraries income Source of UGC grant and University fund.

**Table 4.28: UGC Grant and University Funds of University Libraries in Maharashtra:**

| Name of the University   | UGC grants | University fund | Chi-Square Test                  | p-value |
|--|------------|-----------------|----------------------------------|---------|
| Mumbai University, Mumbai  | 0          | 10              | Chi-Sq<br>=<br>15.151,<br>DF = 9 | 0.087   |
| Shreemati Nathibai Damodar Thackersey Women's University, Mumbai | 10         | 10              |                                  |         |
| Rashtrasant Tukadoji Maharaj Nagpur University, Nagpur           | 10         | 10              |                                  |         |
| Savitribai Phule Pune University, Pune                           | 10         | 10              |                                  |         |
| Dr. Babasaheb Ambedkar Marathwada University, Aurangabad         | 10         | 10              |                                  |         |
| Shivaji University, Kolhapur                                     | 10         | 10              |                                  |         |
| Sant Gadge Baba Amravati University, Amravati                    | 10         | 10              |                                  |         |
| North Maharashtra University, Jalgaon                            | 8          | 10              |                                  |         |

|   |   |    |  |  |
|---|---|----|--|--|
| Swami Ramanand Teerth<br>Marathwada University,<br>Nanded | 9 | 10 |  |  |
| Solapur University, Solapur                               | 1 | 10 |  |  |

**Result:**

We observe that

P-Value = 0.087 is greater than the alpha ( $\alpha$ ) level (=5%).

$\therefore$  The first hypothesis is accepted.

**Hypothesis 2:** The selected University libraries of Maharashtra depending on UGC funds.

**Table 4.29: UGC Grant and University Funds for Library Development in Maharashtra:**

| Types of Grant  | N   | Mean    | StDev    | SE Mean | t-test value | p-value |
|-----------------|-----|---------|----------|---------|--------------|---------|
| UGC Grant       | 100 | 3958100 | 7443555  | 744355  | -2.39        | 0.009   |
| University fund | 100 | 7341206 | 12057158 | 1205716 |              |         |

**Result:**

We observe that

P-Value = 0.009 is less than the alpha ( $\alpha$ ) level (=5%).

$\therefore$  The second hypothesis is rejected.

**Hypothesis 3:** There is no significant difference between averagely total enrolled users of University libraries which used Print and Electronic Document.

**Table 4.30: Use of Print and Electronic Document of University Libraries in Maharashtra:**

|            | N  | Mean    | StDev    | t-test | p-value |
|------------|----|---------|----------|--------|---------|
| Print      | 67 | 80407.6 | 110215.6 | -0.03  | 0.980   |
| Electronic | 67 | 80829.9 | 82550.1  |        |         |

**Result:**

We observe that

P-Value = 0.980 is greater than the alpha ( $\alpha$ ) level (=5%).

∴ The third hypothesis is accepted.

**Conclusion:**

Digital resources are quick to access, save time and keep up-to-date with the current information in the specific fields and related area. Digital information resources are products of information and communication technology and relevant for teaching, learning and research activities in a university. Digitization is a part of digital resources management as only the born digital resources cannot meet the needs of the users. Many university libraries have a good number of rare and valuable documents in their collection. The use of these resources is very limited as these are restricted to only the users inside the libraries and not beyond the libraries. Multiple accesses of these resources are also not possible. This particular problem can be resolved by converting these resources into digital form by the process of digitization. Considering the different merits of digitization of their valuable documents and their use numbers of libraries have adopted digitization process of their documents in different levels.

It is found that among the total members of the libraries in the Maharashtra state on an average the highest 27169 library members are PG students followed by 2374 faculty members, 2350 Research Scholar, 1601 Non-teachers and 322 special members during the period from 200-06 to 2014-15. As per annual average growth rate research scholars recorded highest 15.96 percent growth rate after that special members recorded 6.1 percent, Non-teachers 5.72 percent, faculty members 2.09 percent and PG students library members recorded negative (-0.28 percent) annual growth rate during the study period. According to percentage at Maharashtra level the Shivaji University have highest 19.15 percent members and Solapur University have lowest 3.31 percent members among the selected 10 universities of the Maharashtra state. On an average the digitized documents in the university libraries were 1239 during the study period. The E-documents of university libraries of Maharashtra shows 115.25 percent average annual growth rate during the study period. The E-documents of university libraries are increased from 2008-09. The collection of CD & DVD were 8724 in 2005-06, which increase by on an average annual growth rate of 6.09 percent and went up to 14,827 in the year 2014-15. It also observed that highest collection in the university libraries are books.

On an average, Rs, 24.50 lacks allocated for digital resources by Savitribai Phule University and ranks first among selected ten universities of Maharashtra. Followed by SNDT University allocated Rs. 17.70 lacks and ranks second, Mumbai University & Sant Gadge Baba Amravati University ranks third with allocation of Rs. 10.50 lacks and Dr. Babasaheb Ambedkar Marathwada University allocated Rs. 9 lacks and has rank fourth. While North Maharashtra University allocated only Rs. 5 lacks in the year 2012-13 only and ranks at bottom. During the study period total grant Rs. 5.27 crore received to all ten Universities of Maharashtra. Out of all grants received from UGC Savitribai Phule University alone has 66.34 percent share and ranks first, followed by SNDT University shared 15.16 percent, Shivaji University 5.33 percent and ranks second and third respectively. While the share of Mumbai and Solapur University is negligible during the study period.

It is observed that on an average the highest expenditure on books was Rs.73.49 lacks recorded by Mumbai University followed by North Maharashtra University Rs.57.79 lacks and Rs. 53.39 lacks by Savitribai Phule University and ranks second and third respectively. The lowest expenditure on books was Rs. 4.75 lacks per year made by Solapur University during the study period. It is also observed that the expenditure on books of all Universities of Maharashtra was increased in 2014-15 with compare to initial year 2005-06 except Dr. Babasaheb Ambedkar Marathwada University, Sant Gadge Baba Amravati University and Swami Ramanand Teerth Marathwada University. It is observed that the annual average growth rate of expenditure on periodicals was highest 83.6 percent in case of Shivaji University Kolhapur and ranks first in Maharashtra. On an average highest Rs.30.24 lacks digital resources has by SNDT university and ranks first followed by Savitribai Phule University Rs.27.85 lacks.

Dr. Babasaheb Ambedkar Marathwada University alone have 89.12 percent E-books and ranks first followed North Maharashtra University have 7.20 percent E-books and Mumbai University have 1.53 percent E-books and ranks second and third among ten Universities of Maharashtra State. Whereas, Swami Ramanand Teerth University do not have any E-books during the study period. In case of E-journal it is found that total 1,94,614 e-journals were available in the university libraries of Maharashtra. SNDT University subscribed maximum 58,614 (30.12 percent) E-journals followed by Dr. Babasaheb Ambedkar Marathwada University subscribed 30,000 (15.42 percent), North Maharashtra University Jalgaon subscribed 25,000 (12.85 percent) and Sant Gadge Baba Amravati University has subscribed 20,000 (10.28 percent) E-journals during the period from 2005-06 to 2014-15.

It observed that total amount paid for consortium membership and renew by all University Libraries in Maharashtra was Rs. 84.66 lacks with average of Rs. 8.46 lacks per university. In case of EBSCO Savitribai Phule University spent maximum Rs. 47.00 lacks (55.51 percent) of total expenditure on EBSCO by all Universities of Maharashtra. Followed by Dr. Babasaheb Ambedkar Marathwada University spent Rs.11.37 lacks ( 13.44 percent) and ranks second, while Mumbai University, SNDT University and Sant Gadge Baba Amravati University spent equally Rs. 8.00 lacks ( 9.45 percent) on EBSCO out of total amount spent by university libraries in Maharashtra and ranks third.

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## 5. Summary, Findings and Suggestions

### Summary:

Information professionals have made it their mission to provide reliable information to the right user at the right time. The creation, distribution, and usage of rights of entrance and use have undergone significant changes as a result of recent advancements in information and communication technologies, particularly the Internet. Web-based technology helps to minimize issues in accessing information quickly. We have long used printed document sources that are made available to us by the diligent work of information scientists, publishers, and libraries. However, as information technology has advanced, several steps have been made to reduce work by providing information quickly. Digitizing knowledge documents—converting printed material into a digital format—is one of the key uses of information technology. The universe of information has completely changed as a result of digitization.

There are numerous sorts of digital resources accessible globally. These fall into three main groups, for example. Resources that are Meta, non-text based, and text based. Electronic databases, electronic conference proceedings, electronic journals, electronic reports, electronic dictionaries, electronic directories, electronic newsletters, electronic newspapers, electronic books, and electronic theses are examples of text-based digital resources. Animation, audio files, digital images, book and magazine illustrations, photos, computer graphics, space photos, video files, architectural drawings, maps, paintings, drawings, and sketches, among other materials, are included in the non-text based category. On the other hand, the Meta Resource comprises database and archival finding, bibliography, catalogue, index, and abstracts.

Information is expanding quickly, and literature—particularly in the fields of science and technology—is expanding at an exponential rate. While digital resources offer all the pertinent information from the complete collection in one location, conventional resources need one to go through the entire collection in order to find what they're looking for. Libraries have already incorporated contemporary methods to meet the growing needs of their patrons.

The civilization of today is one of digital devices. Digitization, according to Pearce-Moses, is the process of converting an analog document into a binary electronic (digital) form, particularly for computer use and hard drive storage. Materials that were once in human-readable analog formats are now only readable by machines thanks to digitization. Digital knowledge contents

can be created using a variety of equipment, including cameras, scanners, editing software, and other devices. The digitization of nearly all significant material kinds is made possible by these technologies, Ph.D. Rare books, manuscripts, voice recordings, images, photos, and theses. Different formats are used to create information, such as digitization, which makes information resources easily accessible. Readers can quickly and easily search for collections in digital documents from any location at any time. Digitization is the process that turns the invisible become visible. The same document can be accessed simultaneously by several people without any issues. Additionally, it eliminates the hassle of distance because users don't need to go to places where the materials are physically stored in hard copy. Although digitization is an expensive and time-consuming endeavor, it is a resourceful solution to the issues of rare books, major journals, manuscripts, and other literature being lacking in knowledge resource centers in the developing world. Many institutions and libraries are pursuing the digitization of their records, newspaper archives, rare books, manuscripts, antiquities, M.Phil. Theses, Ph.D. theses, and other materials. Dissertations as well as additional historical records and pictures. This facilitates broad access to advances that are previously outside their area of expertise and that are feasible at the right time for scientists, administrators, readers, and other information seekers.

The fundamental principle behind digitization is to fully utilize ICT resources to gain access to global resources while also improving society. As moving digital is becoming increasingly necessary to maintain a safe and healthy workplace. Many companies continue to be impacted by the enduring value of these learning resources, which is why they are digitizing their content. The ability for users worldwide to access institutional collections and use these electronic resources from a distance enhances the standing of the institutions as a result of digitization. Institutions can make information public that was previously only available to a limited readership by digitizing their collection.

In the literature review, the analyst has tried to include and make reference to the relevant chips that are thrown at the various territories. In any case, there is so much literature on the research area and the economic effects of digitization and digital resources in university libraries that it is nearly impossible to include all that is important in one survey. The current study cannot be considered comprehensive as only selected and easily accessible works covering a wide range of topics are included. This section contains an aggregate of 46 papers covering the broad topics of digital resources, digitization, and financial library research. Few research scholars and LIS professionals have investigated the economic or financial aspects of digitization and digital resources, despite the fact that many study these topics. Since the majority of library patrons and research scholars used e-

books and e-journals, many more libraries bought e-databases. The third chapter discusses digital resources and India's digitization. The third chapter covers the many kinds of digital resources, the benefits of digitization and digital resources, the necessity and method of digitization, the evolution of digitization and digital resources, and the use of digital resources in India.

Mechanical limitations, financial restrictions, copyright issues, a lack of policy guidelines, and, finally, the acquisition of digitization resources present the biggest planning and implementation problems in digitization projects. The selection process, material preparation, publishing industry collaboration, digitization specifications, research into optical character recognition, research into various file designs to lower storage costs, automatic quality control mechanisms, new language-based search and retrieval techniques, digital preservation of the files, and the technical infrastructure to support all these aspects are additional significant issues and problems. The focus of digitization efforts changed with the turn of the century. Libraries are now digitizing whole collections instead than just selected highlights. Project organization became increasingly crucial as digitization advances grew in scope. Methods and growth were stabilizing, and the issue of long-term digital content protection was becoming more widely recognized. The libraries began digitizing text materials, audio and video collections, and other assets rather than visually appealing ones. It was found that there were new applications for the digitized collections, notably ones aimed at certain target audiences like students and scientists. A library may initially need to purchase its own scanners and employ personnel, but it has come to light that scanning is not the library's primary business. Therefore, outsourcing digitization may be necessary. It might not be able to satisfy the high criteria set by the libraries in accordance with their requirements because of these high standards. Nowadays, digitization from microfilm or microfiche is preferred over digitizing from originals since it is less expensive but typically produces images of inferior quality. The idea of using a single format for both protection and access is being studied for the same reason. In order for a library to be able to contract out its scanning needs, it must implement criteria of quality that private businesses can meet. The library may nevertheless retain expertise in imaging techniques even if all scanning activities are outsourced.

The widespread availability of digital resources in university libraries is one of the main drivers of their effective utility. However, there is debate regarding their appropriate and optimal usage. Over the past few decades, significant advancements in computer applications have brought about profound changes in the ways that information is gathered, stored, managed, accessed, retrieved, and consumed. Information processing through computers has given rise to a number of new goods and services. The Web

and the internet are continually influencing the creation of new forms of scholarly communication; they have enormous promise for delivery since they are able to effectively get over the geographic constraints that print media has. Moreover, there has been a significant decrease in the duration between the publication of the product and its delivery. Information needs can be met and retrievals made efficient with the use of the internet. Given that the majority of university libraries require an increasing amount of research, this is crucial. This crucial information is persuading a lot of information resource centers to switch to digital resources, which are more readily available and less costly. This is especially useful for remote learners who don't have much time to visit libraries outside. They can use dialup connection to access widely available electronic resources, such as CD-ROMs, OPACs, and the Internet, which are mostly replacing print media.

Maintaining accurate financial records, managing budgeting declarations, and keeping all receipts and payments simple are all components of a good financial management system. An extensive budget must be fully understood and managed by library professionals in order to plan for the short-, medium-, and long-term development of knowledge resource centers. One of the most important tasks for custodians or information masters is budgeting for knowledge resource center services. A library expert may believe that, given the current financial situation, it is easy to justify an increase in funding to the KRC's representative body; nevertheless, during lean financial times, KRC services may be seen as unnecessary. The association's departments must be able to operate within their budget. Should consumptions exceed the budget, justification for such excesses needs to be provided. Additionally, a formal agreement to remove deficient adjustments must be created. The purpose and objectives statement of the information resource center should serve as the foundation for budgetary planning. It is always preferable to prepare long-term financial agreements. Most of the time, spending reports must adhere to a setup chosen by the parent association. There are several distinct types of budgets, including zero-based, execution, program, line item, five-year, and zero-based budgets. An organization may make use of any of these budgeting formats.

Numerous changes in politics, economy, society, and technology have occurred since the beginning of higher education and its institutions, and these changes have had an impact on the higher education system and its institutions either directly or indirectly. Libraries at universities are hardly an exception. After coming full circle, the trip started with Taxila, Nalanda, and now there is New Nalanda University. The number of universities has increased to more than 500. There are well-known, large universities in India as well as smaller, less fancy ones. It appears that the National Knowledge Commission's recommendation to establish 1490 universities by 2015 can be

achieved. Neither is it a solution to turn outdated colleges into universities. Because of this, private companies have entered the market and now own state institutions with top-notch, vital research papers, up-to-date facilities and technology, and comprehensive university libraries. They have monetized higher education by demanding exorbitant fees and utilizing information and communication technology. Under the guise of offering the newest amenities, private universities are prospering and drawing students.

Money has always been the foundation of any society or institution, and it always will be. Therefore, the future of university libraries and their services would be dismal if the government and UGC do not get together and create a plan to address the financial issue. Universities must be able to support themselves financially in order to function successfully and efficiently. In a similar vein, university libraries must strategize their future for sound financial management to prevent any detrimental effects on knowledge resource center services. Knowledge resource center services need to be periodically updated to stay up with the times. More money is required for this, and the swills must be managed. As previously indicated, those state governments lack the funding for public universities, therefore immediate action is required to prevent students in the future from being deprived of access to knowledge resource centers.

Any corporate organization's ability to coordinate and control its resources depends on its financial management. Managers can use this tool to generate and analyze the financial data necessary for company decision-making, regardless of whether they are financial specialists or not. This is because managers' reaction abilities are mostly non-financial. All managers, from top executives to line supervisors, can apply financial management principles to support the objectives of the company more effectively. The funding sources for educational, special and public libraries differ from knowledge resource center to knowledge resource center. The techniques used for financial estimation also differ throughout information resource centers. Since libraries are essentially service companies that spend money with few revenue streams, their expenditure patterns differ from those of other types of businesses. A well-planned budget that manages funds in a cost-effective way is the result of sound financial management. If funds are managed well, libraries may purchase high-quality books and provide high-quality services. All of this makes it possible for the libraries to fulfill their mission and satisfy patron needs.

Digital resources are easy to use, time-efficient, and up to date with the most recent data in their respective domains and adjacent subjects. Digital information resources are useful for university teaching, learning, and research activities. They are byproducts of information and communication

technology. Since born digital resources are unable to satisfy user needs, digitization is a necessary component of digital resource management. A significant portion of rare and priceless papers can be found in the collections of several university libraries. Because these resources are only available to users inside of libraries and not to people outside of them, their use is extremely restricted. It is also not possible to access these resources more than once. This specific issue can be fixed by digitizing these resources to create digital versions of them. Libraries have embraced the process of digitizing their papers to varying degrees, given the various benefits of doing so and how many of their priceless documents they use.

Among the total members of the libraries in the Maharashtra state on an average the highest 27169 library members are PG students followed by 2374 faculty members, 2350 Research Scholar, 1601 Non-teachers and 322 special members during the period from 200-06 to 2014-15. As per annual average growth rate research scholars recorded highest 15.96 percent growth rate after that special members recorded 6.1 percent, Non-teachers 5.72 percent, faculty members 2.09 percent and PG students library members recorded negative (-0.28 percent) annual growth rate during the study period. According to percentage at Maharashtra level the Shivaji University have highest 19.15 percent members and Solapur University have lowest 3.31 percent members among the selected 10 universities of the Maharashtra state. On an average the digitized documents in the university libraries were 1239 during the study period. The E-documents of university libraries of Maharashtra shows 115.25 percent average annual growth rate during the study period. The E-documents of university libraries are increased from 2008-09. The collection of CD & DVD were 8724 in 2005-06, which increase by on an average annual growth rate of 6.09 percent and went up to 14,827 in the year 2014-15.

On an average, Rs, 24.50 lacks allocated for digital resources by Savitribai Phule University and ranks first among selected ten universities of Maharashtra. Followed by SNTD University allocated Rs. 17.70 lacks and ranks second, Mumbai University & Sant Gadge Baba Amrawati University ranks third with allocation of Rs. 10.50 lacks and Dr. Babasaheb Ambedkar Marathwada University allocated Rs. 9 lacks and has rank fourth. While North Maharashtra University allocated only Rs. 5 lacks in the year 2012-13 only and ranks at bottom. During the study period total grant Rs. 5.27 crore received to all ten Universities of Maharashtra. Out of all grants received from UGC Savitribai Phule University alone has 66.34 percent share and ranks first, followed by SNTD University shared 15.16 percent, Shivaji University 5.33 percent and ranks second and third respectively. While the share of Mumbai and Solapur University is negligible during the study period.

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Total amount paid for consortium membership and renew by all University Libraries in Maharashtra was Rs. 84.66 lacks with average of Rs. 8.46 lacks per university. In case of EBSCO Savitribai Phule University spent maximum Rs. 47.00 lacks (55.51 percent) of total expenditure on EBSCO by all Universities of Maharashtra. Followed by Dr. Babasaheb Ambedkar Marathwada University spent Rs.11.37 lacks ( 13.44 percent) and ranks second, while Mumbai University, SNDT University and Sant Gadge Baba Amravati University spent equally Rs. 8.00 lacks ( 9.45 percent) on EBSCO out of total amount spent by university libraries in Maharashtra and ranks third.

### **Findings:**

The main findings of the present study are given below:

1. The most significant challenges in planning and execution of a digitization project relate to mechanical limitations, budgetary constraints, copyright considerations, lack of policy guidelines and lastly, the

collection of materials for digitization. Other important issues and problems relate to the selection process, preparation of the materials, collaboration with the publishing sector, the specifications for the digitization itself, research into development of optical character recognition, research into several file designs to reduce the cost of storage, automatic quality control mechanisms, new language-based methods for search and retrieval, the digital preservation of the files and the technical organization to support all these aspects.

2. Motivations for the effective utility of digital resources are availability in a University library is very common. But their proper and maximum use is a matter for discussion. Advances in computer applications during the past few decades have brought radical changes on the way information is gathered, store, organized, accessed, retrieved and consumed.

3. Library proficient need to completely understand and master mind an exhaustive budget as an arrangement for present, future and long-run knowledge resource center development. Budgeting for knowledge resource center services is one of custodian's or information master's most centrality errands.

4. Ever since the origin of higher education and its organizations, many modification have taken place politically, economically, socially, technologically which have directly or indirectly effected higher education system mind its organizations. Universities and their libraries are no exception.

5. Funds have and will always remain the back bone of any society or organization. So if the government and UGC do not sit together and checkout plan to deal with the financial crisis, the future university libraries and their services will be bleak. There is a need for universities to generate their own funds so that they can run efficiently and effectively. Similarly, university libraries have also to plan their strategy for future for proper financial management, so that knowledge resource center services are not negatively affected.

6. Proper financial management leads to preparation of around budget that management of funds in them cost appropriate manner. In libraries if funds are manage properly, good quality reading materials can be acquired and quality services can be offered. All this thus enables the libraries to carry out their mandate and meet user necessities.

7. Digital resources are quick to access, save time and keep up-to-date with the current information in the specific fields and related area. Digital information resources are products of information and communication technology and relevant for teaching, learning and research activities in a

university. Digitization is a part of digital resources management as only the born digital resources cannot meet the needs of the users.

8. Many university libraries have a good number of rare and valuable documents in their collection. The use of these resources is very limited as these are restricted to only the users inside the libraries and not beyond the libraries. Multiple accesses of these resources are also not possible.

9. The total members of the libraries in the Maharashtra state on an average the highest 27169 library members are PG students followed by 2374 faculty members, 2350 Research Scholar, 1601 Non-teachers and 322 special members during the period from 2005-06 to 2014-15. As per annual average growth rate research scholars recorded highest 15.96 percent growth rate after that special members recorded 6.1 percent, Non-teachers 5.72 percent, faculty members 2.09 percent and PG students library members recorded negative (-0.28 percent) annual growth rate during the study period.

10. Total number of library members in 2014-15 was 34389 in Maharashtra. Shivaji University library has highest 6586 library members followed by Shreemati Nathibai Damodar Thackersey Women's University library 5393 members and Solapur University library have as low as 1137 library members. According to percentage at Maharashtra level the Shivaji University have highest 19.15 percent members and Solapur University have lowest 3.31 percent members among the selected 10 universities of the Maharashtra state.

11. The total collection of books were 24,29,954 in 2005-06 which continuously increased except the years 2008-09 and 2010-11 and researched up to 28,79,806 in the year 2014-15. The collections of books are increased by on an average 10.64 percent per year. The collection of periodicals recorded an average negative (-2.34 percent) growth rate during the same period due to availability of periodicals in the study period.

12. On an average the collection of Ph.D. thesis in the university libraries of Maharashtra state were 73055 Thesis per year. The total Ph.D. thesis in the university libraries of Maharashtra state were 61,226 in 2005-06 which increased by on average growth rate of 4.81 percent and went up to 93315 in the year 2014-15.

13. The digitized document indicates 6.89 percent average annual growth rate. On an average the digitized documents in the university libraries were 1239 during the study period. The E-documents of university libraries of Maharashtra shows 115.25 percent average annual growth rate during the study period.

14. The collection of CD & DVD were 8724 in 2005-06, which increase by on an average annual growth rate of 6.09 percent and went up to 14,827 in the

year 2014-15. The highest collection in the university libraries are books and followed by E-documents and Ph.D. Thesis during the study period. The E-documents recorded highest 37.73 average annual growth rate and collection of books recorded 10.64 percent average annual growth next to E-documents.

15. The total collection of books by university libraries in Maharashtra were 28,79,806 out of this Mumbai university have highest 26.75 percent share in total collection of books followed by Savitribai Phule University 19.08 percent, SNDT University, 13.75 percent and ranked third in the total university. Whereas, Solapur University have only 0.82 percent books collection and ranked at bottom.

16. On an average 1239 digitized documents in the university libraries in Maharashtra during the study period. Out of total digitized documents Savitribai Phule University and Dr. Babasaheb Ambedkar Marathwada University ranks first and second with 44.89 and 33.31 percent share respectively. These two universities have more than 78 percent digitized documents. Mumbai University, RTMN University, Solapur University and SRTM University do not have any digitized documents.

17. In case of E-documents there were average 18,447 E-documents in university libraries of Maharashtra. SNDT University has 46.68 percent E-documents and ranks first and Sant Gadge baba University have 13.55 percent E-documents and ranks second. While Savitribai Phule Pune University and Dr. Babasaheb Ambedkar Marathwada University ranks third having 8.13 percent E-documents and Shivaji University have 6.50 percent E-documents and ranks fourth and Mumbai University have 5.62 percent E-documents and ranks fifth and other all Universities have E-documents below four percent.

18. On an average, there were 1482 CD & DVD collection in University libraries in Maharashtra. SNDT University have highest 7275 CD&DVD (49.07 percent) and ranks first followed by Mumbai University 2674 (18.03 percent) ranks second and Shivaji University ranks third having 12.02 percent share of CD & DVD among ten universities of Maharashtra.

19. The average collection of manuscripts by university libraries in Maharashtra were 4130 manuscripts. In case of collection of manuscripts RTMN University ranks first having 34.65 percent share, Mumbai University ranks second with 23.97 percent share, Shivaji University ranks third with 22.19 percent share and Savitribai Phule University ranks fourth by having 10.90 percent share. Whereas, Dr. Babasaheb Ambedkar Marathwada University had 8.27 percent share and ranks fifth and remaining all other universities do not have collection of manuscripts.

20. On an average, the total periodicals with bound volume were 20,537 in the University libraries in Maharashtra. Mumbai University ranks first with having 36.93 percent share in collection of periodicals with bound volume followed by RTMN University 17.48 percent and Shivaji University 16.14 percent and ranks second and third respectively. Solapur University has only 0.51 percent shares in collection periodicals bound volume and ranks at bottom.

21. The University Libraries of Maharashtra start to allocate budget for digital resources from the academic year 2009-10, before this year only two universities allocated budget for digital resources in 2008-09 and Savitribai Phule University is the only university which allocating budget for digital resources since 2008-09. On an average, Rs, 24.50 lacks allocated for digital resources by Savitribai Phule University and ranks first among selected ten universities of Maharashtra. While North Maharashtra University allocated only Rs. 5 lacks for digitization and ranks at bottom.

22. During the study period total grant Rs. 5.27 crore received to all ten Universities of Maharashtra. Out of all grants received from UGC Savitribai Phule University alone has 66.34 percent share and ranks first, followed by SNDT University shared 15.16 percent, Shivaji University 5.33 percent and ranks second and third respectively. While the share of Mumbai and Solapur University is negligible during the study period.

23. The highest average funds of Mumbai University Library were Rs. 399 lacks, followed by Rs. 83 lacks Savitribai Phule University Libray and Rs. 77.50 lacks North Maharashtra University Library and ranks second and third respectively during the study period. The Swami Ramanand Teerth Marathwada University Library recorded lowest Rs.11 lacks funds per year during the study period. But, according to average annual growth rate Swami Ramanand Teerth Marathwada University Library recorded highest 149.13 percent average annual growth rate. The lowest average annual growth rate (-6.48 percent) in funds was recorded by RTMN University during the study period.

24. On an average the highest expenditure on books was Rs.73.49 lacks recorded by Mumbai University followed by North Maharashtra University Rs.57.79 lacks and Rs. 53.39 lacks by Savtiribai Phule University and ranks second and third respectively. The lowest expenditure on books was Rs. 4.75 lacks per year made by Solapur University during the study period.

25. The annual average growth rate of expenditure on periodicals was highest 83.6 percent in case of Shivaji University Kolhapur and ranks first in Maharashtra. Followed by SNDT University recorded 60.64 percent average annual growth rate in expenditure on periodical and ranks second while in

case of growth in expenditure on periodicals Rahtra Sant Tukdoji Maharaj Nagpur University ranks third ( 24 percent) and Solapur University Solapur ranks fourth having 23 percent growth rate. Whereas, Dr. Babasaheb Ambedkar Marathwada University library, Gadge Baba Amravati University library and Swami Ramanand Teerth Marathwada University library recorded negative annual average growth rate in expenditure on periodicals during the study period.

26. On an average SNTD University library has highest Rs.30.24 lacks digital resources and ranks first followed by Savitribai Phule University Rs.27.85 lacks and Dr. Babasaheb Ambedkar Marathwada University, Aurangabad Rs.16.16 lacks and ranks second and third respectively. North Maharashtra University has only Rs. 0.40 lacks digital resources and ranks at bottom in case of digital resources during the study period.

27. Mumbai University, Rahtra Sant Tukdoji Maharaj Nagpur University, Swami Ramanand Teerth Marathwada University and Solapur University Solapur do not spent any money on digitization during the entire period of the study. Whereas, on an average Rs. 25.54 lacks spent by Dr. Babasaheb Ambedkar Marathwada University on digitization and ranks first and followed by Savitribai Phule University Pune spent Rs. 2.41 lacks, SGBAU and North Maharashtra University has spent Rs. 77.74 thousand and 77.68 thousand respectively and SNTD University spent Rs. 69.58 thousand on digitization and ranks fifth during the study period.

28. Among the selected ten universities of Maharashtra State four universities created funds for digitization of library during the study period. Mumbai University, Rastrasant Tukdoji Maharaj Nagpur University, Swami Ramanand Teerth Marathwada University and Solapur University Solapur do not created funds for library digitization. In case of funds for digitization Dr. Babasaheb Ambedkar Marathwada University has created highest on average Rs. 11.66 lacks funds per year for digitization of library during the study period.

29. On an average Savitriabai Phule University Pune provided maximum funds to digital resources of Rs. 24.50 lacks per year and ranks first followed by Shreemati Nathibai Damodar Thackersey Women's University Library Rs. 17.70 lacks and ranks second, Sant Gadge Baba Amravati University provided on average Rs. 10.50 lacks and ranks third among the selected ten universities of Maharashtra state. Whereas, Solapur University provided on average Rs. 9.11 lacks and Dr. Babasaheb Ambedkar Marathwada University provided on average Rs. 9.00 lacks and ranks fourth and fifth respectively. While North Maharashtra University Jalgaon provided on average Rs. 50,000/- funds for digital resources and ranks at bottom among the selected ten Universities.

30. Total E-database is found to be 41 in the university library of Maharashtra State during the academic year 2014-15. Out of 41 E-database Savitribai Phule University have alone 16 (39.02 percent) E-database. Whereas, North Maharashtra University Jalgaon, Swami Ramanand Teerth University Nanded and Solapur University Solapur do not have any E-database during the study period. It is also found that the no one university of Maharashtra has Consortia and networks. Only Dr. Babasaheb Ambedkar Marathwada University library has interred library lending or resources sharing facility of digital resources with other libraries.

31. Total amount paid for consortium membership and renew by all University Libraries in Maharashtra was Rs. 111.17 lacks with average of Rs. 10.00 lacks per university. In case of EBSCO Savitribai Phule University spent maximum Rs. 47.00 lacks (56.26 percent) of total expenditure on EBSCO by all Universities of Maharashtra. Followed by Dr. Babasaheb Ambedkar Marathwada University spent Rs.11.37 lacks ( 13.62 percent) and ranks second, while Mumbai University, SNDT University and Sant Gadge Baba Amravati University spent equally Rs. 8.00 lacks ( 9.58 percent) on EBSCO out of total amount spent by university libraries in Maharashtra and ranks third.

32. Out of total universities of Maharashtra 50 percent university libraries were using SOUL Library Software followed by LIBSYS Library Software and SLIM21 Library Software during the study period.

33. The highest 5694 digitization of knowledge documents were Ph.D. Thesis followed by Manuscripts 4500 and Rear books 2204 by the University libraries in Maharashtra.

34. RFID Security system was used by Mumbai university library, Savitribai Phule Pune University library, Dr. Babasaheb Ambedkar Marathwada University library and North Maharashtra University library. Smart Card was used by Savitribai Phule Pune University library, Dr. Babasaheb Ambedkar Marathwada University library, Sant Gadge Baba Amravati University library and Solapur University library.

35. Among the total users of University libraries in Maharashtra, 50 percent users were Fully satisfied, 40 percent, users were satisfied and 10 percent users were Partly satisfied.

36. On an average highest 311883 printed documents used by Shreemati Nathibai Damodar Thackersey Women's University Library While on an average highest 167596 Electronic Document used by Shivaji University Kolhapur.

37. The Mumbai University library has highest 84 employees and Solapur University library has lowest 09 employees. Five Universities do not have appointed fulltime librarian. These University are Mumbai University, Rashtrasant Tukadoji Maharaj Nagpur University, North Maharashtra University, Swami Ramanand Teerth Marathwada University and Solapur University. Four Universities do not have Information scientist working in the library. These University are Mumbai University library, Savitribai Phule Pune University library, Shivaji University library and Solapur University library

38. The Line Budgeting method was used by five University libraries in Maharashtra. These are Mumbai University library, Shreemati Nathibai Damodar Thackersey Women's University library, Savitribai Phule Pune University library, Dr. Babasaheb Ambedkar Marathwada University library and North Maharashtra University library. Program budgeting method was used by three University libraries in Maharashtra. These are Rashtrasant Tukadoji Maharaj Nagpur University library, Shivaji University library and Sant Gadge Baba Amravati University library. Performance budgeting method was used in Swami Ramanand Teerth Marathwada University library. By comparison with past expenditure method was used in Solapur University library. It is found that 50 percent libraries used of line budgeting methods with followed by Program budgeting methods used by 30 percent University libraries.

39. The Dr. Babasaheb Ambedkar Marathwada University library has 185 ICT infrastructure facilities followed by North Maharashtra University library 147, Shreemati Nathibai Damodar Thackersey Women's University library 114, Savitribai Phule Pune University library 84, Rashtrasant Tukadoji Maharaj Nagpur University library and Sant Gadge Baba Amravati University library 81 each, Solapur University library 77, Shivaji University library 76, Mumbai University library 60 and Swami Ramanand Teerth Marathwada University library has 49 available of ICT infrastructure facilities.

### **Suggestions:**

The growth performance, financial structure and use of digital resources and digitization of University libraries in Maharashtra is, one the whole, satisfactory. But certain inconsistencies and imbalance have occurred in the growth performance, financial structure and use of digital resources and digitization due to lack of professionalism, inadequate internal controls and excessive regulation from UGC and state government. In the light of findings and conclusions of this study, the following suggestions are worthwhile in correcting the present prevailing situation.

1. The University libraries should develop the collections, services and ICT infrastructure facilities to provide effective services to the users or research scholar.
2. University Library is the instant source to the students and teaching faculties to enrich their knowledge. So the UGC and University should sanction more funds to improve the infrastructure facilities.
3. The Library of Shivaji University, Kolhapur has Archival cell. A historical Currency, Manuscripts and Rare books are available in that, there is need to digitize them.
4. There are 14313 Manuscripts available in the library of Rashtrasant Tukdoji Maharaj Nagpur University. They do not have any Digitization of Manuscripts, so it is necessary to digitize the available Manuscripts.
5. The Rashtrasant Tukdoji Maharaj Nagpur University has 12807 Ph.D. Thesis available but they did not uploaded Ph.D. Thesis on the Shodhganga.com Website. There are many old Ph.D. Thesis available in Rashtrasant Tukdoji Maharaj Nagpur University it is necessary to Digitization these Thesis to increased Digital Resources.
6. The Mumbai University Mumbai has 21428 Ph.D. Thesis available but they did not uploaded Ph.D. Thesis on the Shodhganga.com Website. There are many old Ph.D. Thesis available in Library of Mumbai University, it is necessary to Digitization these Theses to increase Digital Resources.
7. All Surveyed University Libraries spend more amounts on Journals and fewer amounts have spent on Books and Digital Resources. So it is suggested that university library should spent budget on books and digital resources with proportional to journals.
8. The university libraries should urgently realize the need of technology change rather than showing their inability to incorporate changes due to inadequate trained manpower, administrative bottlenecks, existing staff structure, inadequate resources and lack of action plan.
9. The all university Libraries has does not taken insurance policy. For Security purpose it is necessary to assured insurance policy for all universities of Maharashtra.
10. Most of the University libraries are hardly Accessing Digital Resources only through UGC-Infonet consortia which are very few numbers so the users are not getting their required Digital Resources. The all university libraries should subscribe more Digital Resources through national and international consortia.

11. Mumbai University, RTMN University, Solapur University and SRTM University do not have any digitized documents. The authorities of these universities should take efforts to digitize important documents.

12. Dr. Babasaheb Ambedkar Marathwada University library, Gadge Baba Amrawati University library and Swami Ramanand Teerth Marathwada University library recorded negative annual average growth rate in expenditure on periodicals during the study period. So it suggested that these universities should provide more funds to purchase periodicals.

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