CREATION OF DIGITAL LIBRARY FOR RAYAT SHIKSHAN SANSTHA

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August 2018

DECLARATION BY THE CANDIDATE

I hereby declare that the thesis entitled **"Creation of Digital Library for Rayat Shikshan Sanstha"** completed and written by me, has not previously formed the basis for the award of any degree or other similar title upon me of this or any other University or examining body.

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CERTIFICATE

This is to certify that the thesis entitled **"Creation of Digital Library for Rayat Shikshan Sanstha"** which is being submitted herewith for the award of the Degree of doctor of philosophy (Ph.D.) in Library and Information Science, Faculty of Moral and Social Science of Tilak Maharashtra University, Pune is the result of original research work completed by **Arjun Baburao Anandkar** under my supervision and guidance. To the best of my knowledge and belief the work incorporated in this thesis has not formed the basis for the award of any Degree or similar title of this or any other University or examining body upon him.

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Date: 31/07/2018 **Research Guide**

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Preface

Executive Summary

As Dr. A.P.J. Abul Kalam rightly concluded the need of the digital library "The role as digital library is where the past meets the presents and creates a future, a digital library provides equitable access to knowledge to all the people, irrespective of place, caste, creed, colour or economic status, digital library unites rather than divide. Therefore there is a need of time to develop digital libraries."

The impact of the information communication technologies have changed the dimensions in the various area such as knowledge industry, socio-economic and political areas, higher education and the globalized environments had a direct impact on the libraries. The Rayat Shikshan Sanstha as an Institute and its colleges also have the impact of ICT, digitization of the modern era. There are internal and external forces pressurized to evolve the digital libraries. The main objective of the libraries is to support the teaching and research activities of the particular organization. To fulfill these objectives the libraries are needed to provide the right information to the right users at the right time and in the right form at the remotest place. In this new digital age, the resources are in digital forms, so the nature of services would have to be different. The staff should be techno savvy and there is a need to use the technology for the superior functioning of the library. To cope up with this situation the staff needs to develop specific skills and training for better management of the library profession. There is also a need to train the user for handling the use of the e-resources and their utilization in the learning process. The digital information is available in a variety of forms such as e-books, e-journals, databases, online resources, digital content, consortia etc. which require specific training and skills for handling the same.

Under the computerization project, the Rayat Shikshan Sanstha has completed the computerization of its head office and its associated institutions, schools and colleges by using the information communication technology. 42 college libraries are using the centrally maintained Libreria software developed by the Maharashtra Knowledge Corporation Limited (MKCl), Pune. Most of the colleges are using the N-list database developed by UGC-INFLIBNET Centre Ahmedabad. On the 4th of October 2015, the Rayat Shikshan Sanstha has developed the digital library popularly known as **Rayat Knowledge Bank** which presently includes the following number of

E-resources E-books-1200, Power Point Presentation (PPT) – 5000, Audio-210, Video-27, Images-430 and Links- 87**.**

The Rayat Knowledge Bank serves as a digital library for the Rayat Shikshan Sanstha. The initiative taken for the development of the digital library is excellent. The use of the digital library is also high but it needs improvement to use the definite technology and software for the implementing the digital library. The basic purpose of this digital library is to create a teaching and learning process more effective and qualitative. The power point presentations and, e-resources are prepared by the teachers of the Rayat Shikshan Sanstha. The other resources are on the Rayat Shikshan Sanstha, Dr. Karmaveer Bhaurao Patil, Sou Lakshami Bhaurao Patil etc. The content are educational, knowledgeable and important. This digital library is open to the society.

The digital library of the Rayat Shikshan Sanstha has the following features:

a) It has included books, images, power point presentation, audio and video recording etc
b) It mainly consists of resources on the history of the Rayat Shikshan Sanstha.
c) It highlights the publication of Dr. Karmaveer Bhaurao Patil and Sow Lakshmibai Bhaurao Patils contribution towards the development of the Rayat Shikshan Sanstha.
d) Digitize books and the journals in the form of PDF.
e) Develop the educational content from the primary class to the post-graduation as a learning object.
f) Provided the educational links to open resources also.

This digital library of the Rayat mainly focuses on the teachers of the Rayat Shikshan Sanstha, Students as a user, educationalists and the learners from the society. The digital library of the Rayat Shikshan Sanstha faces the following challenges which includes:

a) It has used website based technique for developing the digital library instead of using standard digital library software.
b) The information is arranged in folders and subfolders.

c) The search and advance search facility is not present in the digital library as per standard format such as Dublin core, MARC etc.
d) Only the website designer will play an important role for adding and deleting the contents
e) Professional scanning, cleaning and use the OCR techniques needed for improvement.
f) Complete PDF of whole books / periodical is expected while creating the digital library.

The literature review helped to understanding the concept of digital library, its application and need.

Aim / Objective of thesis:

1. To study the present status of ICT Infrastructure required creating digital library for the Rayat Shikshan Sanstha.
2. To study the ICT skills required to create digital library.
3. To undertake the feasibility study for creation of digital library to the Rayat Shikshan Sanstha.
4. To study in detail the conceptual framework of digital library.
5. To prepare a model of digital library for the Rayat Shikshan Sanstha.

Hypothesis

1. The suitable ICT infrastructure required to create digital library is available at the organization.
2. The library staff and users need periodical training to maximize the use of digital library.
3. There is need of central digital library in the organization.

Method for data collection, Analysis and techniques

In this study the descriptive and case study method of research is used. For collection of data, survey techniques is used. The questionnaire tool is designed for the collection of the primary data from the librarians and users of the institutions. The data was analyzed, interpretation and findings are highlighted.

The present study is organized in seven chapters such as **Chapter 1, Introduction** which deals with the introduction of the research problem, need and

importance of the digital library. Statement of the problems, operational definitions of the digital library and related terms, its objectives, hypothesis, assumptions variables, the scope, limitation of the study, the descriptive method of research and case study method is helpful. For collection of data survey techniques is used the questionnaire tool has been used to collecting data from librarian, faculty member and the student. For the selection of sample from librarian census method is used and for collection of sample from user stratified random purposive sampling is adopted. **Chapter 2, Review of Literature** is completely devoted to the review of the related literature. It explains the early digital library research studies. In the study, use of the books, print journals, theses, various online resources such as LISA, EBSCO, N-LIST, Web of Science and open resources such as Shodhganga, Vidhyanidhi etc., for carrying out in depth study systematically. The various aspect of the study are discussed with brief summary. The information is arranged according to the digital library, history of the digital library, World Digital Library projects, Digital Library in India, Types of Digital Libraries, and digital Library Software, Open Source digital Libraries, Digital Library Services, Challenges for building Digital Libraries, Framework of Digital Library and Model of Digital Library. **Chapter 3, Digital Library: An Overview** This chapter deals with the evolution of digital libraries, benefits of digital library, need of the digital library, advantages and disadvantages of the digital library, characteristics of a digital library. Feasibility study, component of digital library. Technical infrastructure of digital library, key components of the digital library, open Archival information system (OAIS), digital library protocols and standards, conceptual model for digital library. **Chapter 4, The Rayat Shikshan Sanstha and its Digital Library** It consists of history of the Rayat Shikshan Sanstha, present status of the Rayat Shikshan Sanstha, Project undertaken by the Rayat. Vision, mission and objective of the Rayat Shikshan Sanatha, The colleges of the institution, the number of courses conducted in the Rayat. Karmaveer Vidya Parbodhini and its activities. Libraries of Rayat, use of ICT, computer education, Library automation, websites, online branch information system, digital library of the Rayat Shikshan Sanstha, reason for building digital library. Strength of digital library, problems associated with the present digital library and need of improvement for future development in digital library. **Chapter 5, Librarian's View about the digital library with special Reference to the Rayat Shikshan Sanstha** deals with data collection, analysis and the interpretation. As the data collected from the librarian. The specific data is

presented in the forms of tables, graphs and pie diagrams as the respondent's response to a particular questionnaire. The views are systematically analyzed and interpreted thoroughly. **Chapter 6, Users View about the digital library with special Reference to the Rayat Shikshan Sanstha** deals with data collection, analysis and the interpretation of the data. As the data is collected from the users such as faculty member and students. The specific data is systematically analyzed and interpreted properly. **Chapter 7, Findings, Suggestions and conclusion** which consist of findings, constructive suggestions are made for building the model digital library for the Rayat Shikshan Sanstha. The study focuses on the management role and the digital library committee for building digital library. The study also highlight the further research area for the investigation and the model of the digital library.

Prominent findings and suggestions of the study

The following are the important suggestions to improve the digital library of the Rayat Shikshan Sanstha.

1. **Need of Central Digital Library:** Extension and decentralization of digital library of an organization is very essential to maximize the use. Subscribe databases centrally at institutional level for achieving greater economy.
2. **Organization Committee for DL:** The organization should develop the digital library committee with the representation of professional librarian and digital library expert.
3. **Human Resource for Digital Library :** Professional Human resource are already existing in an organization make use of same by providing decentralization of power for adding and maintaining individual identity of digital library within organization. The technical personnel should be appointed as per the requirement of digital library.
4. **Budget for development of Digital Library :** Make budget provision regularly for development of digital library at college and an organization level respectively
5. **ICT Infrastructure and framework:** Use the client-server architecture, Open Archives Initiative Protocol for Metadata Harvesting (OAI–PMH) Architecture and cloud computing, along with the technology such as computing, hardware and software networking, information storage and

retrieval, multimedia and user interface design is essential for creation and development of digital library.

6. **Software for Digital Library:** Use the standard open source software for creation of the digital library instead of using website based technology. Use Dspace Open source software for extension and modernization of digital library an organization.
7. **IPR and Digital Right Management:** Follow the IPR and Digital Right Management issue properly, arrange the various training programs sessions for different groups of digital library users and organizer regularly. The digital library should have written policy on copyright development of Information communication technology strategy for the creation, development and maintenance of digital library.
8. **Digital Collection :** Annual Report, Faculty Publication, Workshop, Conference , Seminar Publication, Manuscripts, Rare books and question set of previous year's educational material should be added to the digital library Acquire, convert, use born digital resources and buy subject gateways. Outsourcing to be followed for the digitization activity. The Standard OCR Software such as Adobe Capture, OCR Software, Acrobat PDF Software to be used in Rayat Knowledge Bank.
9. **Organization of Digital Resources:** Follow the Community, Collection and item wise arrangement of information in the digital library. Improvement in real time question answering, on demand help, information literacy and user involvement mechanisms should be follow in the system. The organization of information resources of the Rayat Karmaveer Prabodhini as well as from 42 Colleges should have separate entity in the digital library. Use the Institutional logo to design the interface of digital library, create menu and buttons to highlight the digital library activities. Use the proper font size and colour to make attractive design of the digital library. To know the use of digital library provide the visitor counter, Help menu should be provided for educating the users.
10. **Access infrastructure for digital Library:** Password based Access to registered users should be provided to Rayat knowledge Bank for Security purpose.

11. **Digital library Services:** Search and Advanced digital library services Such as E-Alerts, RSS Feeds, Ask an-expert or eDDs should be provided. Achieve the cost-effectiveness and improve the quality of service for strengthening digital library activity. More attention should be given for digital information services to satisfy the need and expectation of users.

12. **Standards and protocols:** Use the standard format file such as

a) For storage of text file use the PDF, XML, SGML, HTML ASCII and UTF-8.
b) For the storage of still image file use the PDF, JPEG IMG, TIFF, GIF and BMP format. For storage of moving images use the file MPEG, MXF, AVI, MP$, DAT, MOV and WMV format.
c) For the storage of audio file use WAVE, AU, AIFF, MXF, MP3 and MIDI format,
d) For the storage of database files use XML and CSV format.
e) For the storage of web files use WARC format.
f) For the storage of tabular data files use CSV format,
g) For the storage of containers files use ZIP, GZIP and TAR format,
h) For the storage of geospatial file use SHP, GEOTIFF and NetCDF Format,
i) For the storage of statistics file use ASCII, DTA, PGR, SAS and SAV format.

The Meta data format such as Dublin Core (DC), Z39.50. METS (Metadata Encoding and transmission Standards) and ISAD (G) are very useful while creation and development of digital library.

13. **Search Facility in digital library:** Develop the pull technology such as visit to different websites, search and browse interface, library portals, web based user education, integrated search interface and also links the subject specific blogs. The facilities such as navigation, prompt retrieval, browsing and interaction also need improvement.
14. **Training for digital library:** Arrange the training sessions for staff and user's at organization and college level regularly, to maximize the use of

digital library. Develop various skills amongst library staff for handling digital library activity.

15. **Right for adding resources in digital library:** To follow decentralization of adding resources in digital library. Extend the rights to 42 college librarians
16. **Marketing of Digital Library:** Users interface must be given to the Rayat knowledge Bank, create the independent Web Page, Link the created webpage to the college website and also link webpage to the Rayat Shikshan Sanstha's prime website. Extensively Market the digital library for maximize the use.

The study proposed a model of digital library for the Rayat Shikshan Sanstha which recommended to use the Open Archives Initiative Protocol for Metadata Harvesting (OAI–PMH) Architecture. Use the community, collection and item wise arrangement for creating individual college collection as well as to the institution. At the college level establish 30-50 computer terminals laboratory, with 20-30mbps bandwidth of internet connectivity and also provide power backup facility with 10KV (UPS), implementing the use of database, open resources and institutional repository more effectively. To conduct the user's training effectively and periodically.

Direction for future research

1. Evaluation of digital library created by the Rayat Shikshan Sanstha.
2. Use and users study of digital library created by the Rayat Shikshan Sanstha.
3. Marketing of digital library created by the Rayat Shikshan Sanstha.
4. Evaluation of digital library created by different Universities
5. Comparative study of digital library created by various Institute with the Rayat Shikshan Sanstha.
6. Development of Human Resource Skills for digital library.
7. A comparative study of digital library curriculum India with other country.

Conclusion

The thesis presents the concept of the digital library, its importance, scope and application and its emerging needs in libraries for effective and efficient functioning. The survey of the Rayat Shikshan Sanstha's libraries help to understand the current status of the digital libraries in the Institute. The development of the central digital

library / Institutional Repository of the institution is excellent. The information resources selected for the digital library are also as per the need of the subject. The aim of the Rayat Shikshan Sanstha is education to masses means to the society. The digital library will enhance the activities of the institution towards the globalization of educational activities. For improving digital library in its proper direction, it needs to use digital library software which will help to develop the right search strategies, metadata standards and protocols. The model suggests to implement digital library plan at the institutional level first and to extend the cloud server facility to its colleges for developing an inbuilt digital library with the common use of server and to achieve an economy for developing the infrastructure. It will help to build competitive digital library amongst its colleges and to develop a powerful digital library environment cost effectively.

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ABBREVIATIONS AND SYMBOLS

Abbreviation	Meaning
ABBYY	ABBYY Fine Reader
AACR2,	Anglo-American Cataloguing Rules, Second Edition
ACM/IEEE	Machinery and the Institute of Electrical and Electronics
AICTE	All India Council of Technical Education
AIFF	Audio Interchange File Forma
ANSI	American National Standard for Bibliographic Reference
APA	American Psychological Association
ARPA	Advanced Research Projects Agency
ASCII	American Standard Code for Information Interchange,
AVI	Audio Video Interleaved
B. Ed	Bachelor of Education
BLAISE	British Library's Automated Information Service
BMP	The BMP format is a commonly used raster graphic format for saving image files.
BOAI	Budapest Open Access Initiative
BRS/SERCH	is a full-text database and information retrieval system
CADAL	China-America Digital Academic Library
CC	Colon Classification System
CCSDS	Consultative Committee For Space Data Systems
CCTV	Closed Circuit Television
CD	Compact Disk
CD-ROM	Compact Disk Read only Memory
CERN	European Organization for Nuclear Research (Conseil Européen pour la Recherche Nucléaire,)

CGP	Cumulative Grade Point
CIDL	Canadian Initiative on Digital Libraries
CIRNET.	Centre of Industry Relations and Networks
CORBA	Common Object Request Broker Architecture
CRADDL	Cornell Reference Architecture for Distributed Digital Libraries
CSS	Centrally Sponsored Scheme
CSV	comma-separated values
CUSAT	Cochin University of Science and Technology
DAT	A DAT file is a generic data file
DBF	The .dbf file extension represents the dBase database file
DBMS	Database Management System
DC	Dublin Core (DC)
DDC	Dewey decimal classification System
DELNET	Developing Library Network
DIALOG	Dialog is an online information service owned by ProQuest
DL	Digital Library
DLF	Digital Library Federation
DLXS	Digital Library Extension Service
DOAJ	Directory of Open Access Journals
DPLA	Digital Public Library of America
Dr	Doctor
Dspace	Name of Library Open Software
DTA	The *DTA file extension* is primarily associated with data files
DVD	Digital Versatile Disk

DVD-ROM,	Digital Versatile Disk Read Only Memory
e.g.	Exempli Gratia
EAD	Encoded Archival Description.
EBSCO	is the leading provider of research databases
eDD	Electronic Document Distribution
E-mail	Electronic Mail
ENIAC	Electronic Numerical Integrator and Computer.
ERA	e-Learning Revolution for All
E-Resources	Electronic Resources
ERNET	Education and Research Network
etc.	Etcetera
ETD	Electronic Theses and Dissertations
FDBS	Federated Database System
FEDORA	Flexible Extensible Digital Object and Repository Architecture
FMD-ROM	Fluorescent Multi-Layer Disc (FMD-ROM) holds up to 140 GB of data.
FTP	File Transfer Protocol
GEOTIFF	Dereferencing information to be embedded within a TIFF file.
GIF	The Graphics Interchange Format
GIMP	GNU Image Manipulation Program
GIPE	Gokhale Institute of Politics and Economics
GNU	Is an operating system and an extensive collection of computer software
GSDL	Greenstone Digital Library Software

GZIP	Gzip is a file format and a software application used for file compression and decompression.
HP	Hewlett-Packard
HSM	Hierarchical Storage Mechanism
HTML	Hypertext Markup Language
HTTP	Hyper Text Transfer protocol
i.e.	That is
IBM	International Business Machines
ICDL	Integrated Circuit Design Language
ICT	Information Communication Technology
IEE/IEEE	The Institute of Electrical and Electronics Engineers
IFLA	International Federation of Library Associations and Institutions
IIM	Indian Institute of Management
IIS	Internet Information Server
IISER	Indian Institutes of Science Education and Research
IIT	Indian Institute of Technology
ILA	Indian Library Association
ILMS	Integrated library management system
ILS	Integrated library system
IMG	Image filename extension that store raw disk images of floppy disks, hard drives, or optical discs.
INDEST	Indian National Digital Library in Engineering Sciences and Technology (INDEST) Consortium
INFLIBNET	Information Library Network
IP	Internet Protocol
IPR	Intellectual Property Rights

IR	Information Retrieval
IRS	Information Retrieval System
ISAD (G).	General International Standard Archival Description -
ISDN	Integrated Services Digital Network
ISIS	Internet Service Information System
ISO	International Standards Organization
ISROHQ	Indian Space Research Organization Head Quarter
ITIL	Information Technology Infrastructure Library (ITIL)
IUCA	International University Of Central Asia
JAVA	Programming language originally developed by James Gosling at Sun Microsystems in 1995.
JCDL	Joint Conference on Digital Libraries
JISC	Joint Information System Committee
JPEG	Joint Photographic Experts Group
KIIT	Karmaveer Bhaurao Patil Institute of Information Technology
LAN	Local Area Network
LCSH	Library of Congress Subject Headings
LIBMAN	library management system
LINUX	is a family of free and open-source software operating systems
LIS	Library and information Service
LISA	Library and Information Science Abstract
M.Lib.I. Sci	Master of Library and Information Science
M.Phil	Master of Philosophy
MAN	Metropolitan Area Network

MARC	Machine Readable Catalogue
MCI	Medical Council of India
MDDS	Multi-Dimensional Data Sign
MDPL	Maryland Digital Public Library
METS	Metadata Encoding and transmission Standards
MHRD	Ministry of Human Resource Development
MIDI	Musical Instrument Digital Interface
MIS	Management Information Service
MIT	Massachusetts Institute of Technology
MIX	Metadata for Images in XML
MKCL	Maharashtra Knowledge Corporation Limited
MLA	Modern Language Association
MODS	Metadata Object Description Schema.
MOV	is an MPEG 4 video container file format
MP3	MP3 is a standard technology and format for compressing a sound
MP4	MPEG-4 AVC (Advanced Video Coding)
MPEG	Moving Picture Experts Group
MS-SQL	is a relational database management system developed by Microsoft
MXF	Material Exchange Format
MYSQL	is an open-source relational database management system
NAAC	National Assessment and Accreditation council, India
NASA	National Aeronautics and Space Administration
NBA	National Board of Accreditation
NCHER	National Commission for Higher Education & Research

NCSTRL	Networked Computer Science Technical Research Library
NCTE	National Council for Teacher Education
NDLTD	Networked Digital Library of Theses and Dissertation
NEH	National Endowment for the Humanities
NET	National Eligibility Test
NetCDF	Network Common Data Form
NIC	National Informatics Centre
NISO	National Information Standards Organization
NISSAT	National Information System for Science and Technology
NIT	National Institute of Technology
N-LIST	*National* Library and Information services Infrastructure for Scholarly Content
No.	Number
NOSQL	is an alternative to traditional relational databases in which data is placed in tables and data schema is carefully designed before the database is built
NPTEL	National Programme on Technology Enhanced Learning
NSF	National Science Foundation
NUK	National and University Library
OAI	Open Archives Initiative
OAI-PMH	Open Archives Initiative Protocol for Metadata Harvesting
OAIS	Open Archival Information Systems
OCR	Optical Character Reorganization
OPAC	Online Public Access Catalogue
ORBIT	Online Roleplaying Based Internet Training
PC	Personnel Computer

PDF	The Portable Document Format
PERL	Perl Programming Language
Ph.D.	Doctor of Philosophy
PNG	Portable Network Graphics is a raster graphics file format
PPS	Probability Proportional to size
PPT	Power point presentations
PREMIS	Preservation Metadata implementation Strategies
RAP	Repository Access Protocol
RF	Radio Frequency
RQMS	Rayat Quality Management System
RSS	Really Simple Syndication
RUSA	Rashtriya Uchchatar Shiksha Abhiyan
SAS	Statistical Analysis System
SDL	Software Defined Language
SDLIP	Simple Digital Library Interoperability Protocol
SET	State Eligibility Test
SGML	Standard Generalized Markup Language
SHERPA	Systematic Human Error Reduction and Prediction Approach
SHP	The *shapefile format* is a popular geospatial vector data *format* for geographic information system (GIS) software
SOUL	Software for University Library
SRU	Search/Retrieve via URL
SRW	Retrieve Web Service
STN	International is the online scientific and technical information service

SWORD	Simple Web-service Offering Repository Deposit
TAR	The tar command on Linux is often used to create .tar.gz or .tgz archive files
TCP	Transmission Control Protocol
TEI	Text Encoding Initiative
TEL	Technology Enhanced Learning
TIFF	Tagged Image Format File
UCT	Universal Convergence Technologies
UGC	University Grant Commission
UHDL	University of Houston Digital Library
UK	United Kingdom
UMDL	University of Michigan Digital Library Project
UNCW	University of North Carolina Wilmington
UNICODE,	unique, unified, universal encoding
UNIVAC	Universal Automatic Compute
URL	Universal Resource Locator
US	United States
USB	Universal Serial Bus
VRA	Visual Resources Association.
VTLS	Global company that provided library automation software and services
WAN	Wide Area Network
WARC	Web Archive file format
WDL	World Digital Library
WWW	World Wide Web
WEBOPAC	Online Public Access Catalogue through internet

WMP	Windows Media Player
WMV	A file with the WMV file extension is a Windows Media Video file, compressed with one or more of Microsoft's video compression formats.
XML	Extensible Markup language
ZIP	An Archive file format

CHAPTER - 1

INTRODUCTION

1.1 Preamble of Study

Over the past few years, libraries throughout the world have been in a state of transformation as a result of the impact of information technology. No area of the library has remained intact. The impact on collections, services, staff, and facilities has had major ramifications on budgets, planning, and training. Thus, the concept of digital library has come, It focuses on access and service not on buildings and volume. Libraries should hold up users in their searching and acquiring of information and their organization will mirror the services rather than physical location. Technology, law and economics are all becoming more important for libraries who are requiring new know-how in library staff. Perhaps the most important issues for the long term will be the capability of libraries to co-operate in the delivery of the new services.

The library is a hub of teaching and learning activities where students, researchers and teachers can explore the vast resources of information available. The traditional library users have to spend more time for searching a small piece of information and for which they have to exclusively depend on library staff. But in the age of information and communication technology the computers are being used for day to day housekeeping activities of the library which saves the user and the library professional's substantial amount of time. This prevents replication of work and enables smooth and effective conduct of the library.

(Patel & Kumar, **2001**) The Kothari commission on Education mentioned "No University, college, or department, should be set up without taking into account its library needs in terms of staff, books, journals, space, etc. Nothing can be more damaging to a growing department than to neglect its library or to give it a low priority. On the contrary, the library should be an important Centre of attraction in the college or university campus". Education is a lifelong process and libraries are the proper agencies for providing requisite information by using print and non-print resources of information to one and all to attain proper education throughout one's lifetime.

For the academic colleges, there is no specific standard set for the digital library. However, the (NACC) guidelines on quality indicators in library and information

services: affiliated / constituent colleges expect the following e- information / digital library facility:

a) Computerization of library with standard software.

b) Internet facilities to different user groups.

c) E- Information Resources / digital resources availability.

i. CDs /DVDs.

ii. Databases.

iii. Online Journals.

However, the (Rathinasabapathy, 2015) AICTE has prescribed definite standards for digital library such as:

a. Hard Copy International Journals is desirable to procure.
b. Digital library with multimedia facility is essential.
c. Reprographic facility in the library is essential.
d. Document scanning facility in the library is essential.
e. Document printing facility in the library is essential.
f. Library books / non books classification as per standard classification methods is essential.
g. Availability of NPTEL facility at the library is essential.
h. Computerized indexing with bar code / RF tagged book handling is desired.

Th**e Medical Council of India (MCI**), the apex body in India regulating medical education prescribes the following as the mandatory requirements for the library of a medical college vide Amendment Notification dated 8th July 2009 of Medical Council Act,1956 (102 of 1956):

a) Video and Cassette room (desirable) and
b) Air-conditioned Computer room with modem and Internet facility with minimum of 40 nodes.

The norms and standards prescribed by **the National Council for Teacher Education (NCTE)** to the colleges offering a B. Ed. program for the digital library are as follows:

a) It suggested adequate electronic publications (CD-ROMs),
b) The library shall have a photocopying facility and computer with Internet facility for the use of faculty and students.

By bearing in mind the digital library requirement amongst the academic colleges, it became very indispensable to create digital library with the standards prescribed by the different organizations.

1.2 Need of Present Study

The library environment is changing from the traditional library to the digital library. This situation requires a systematic understanding of the digital library concept, software and hardware requirement. The useful resources, managing the library services in digital environment need proficient help, skills and guidance. The anticipation and views of the users are very essential for developing the digital library services.

An understanding of the user experiences and expectations, views from library professionals and management authorities would facilitate to shape the digital library more effectively. Hence, the research aims at examining the issues related to creation and testing and evaluation of the digital library of the institution.

The following are the important aspect which discusses the need of the central digital library for the organization.

1. The users of new generation are techno savvy.
2. Digital library provide user friendly interface.
3. Digital library save the space problem.
4. Digital library retrieve Multi-media information very easily and systematically.
5. Seamless access to information is possible because of digital library.
6. Preservation and conversion of information is possible due to digital library.
7. Digital library is available around the clock 24*7.
8. It will save money, time & efforts of individual colleges to maintain the infrastructure and technology for the creation of the digital library.

By considering the importance of the digital library the researcher has engaged the subject for the study.

1.3 Statement of Problem

The researcher has been working under the Rayat Shikshan Sanstha College as a librarian for the last 17 years. The Researcher has submitted his M.Phil. Thesis to the Yashwantrao Chavan Maharashtra Open University, Nashik titled as **"Rayat Shikshan Sansthechya Varishtha Mahavidyalayin Grathalayacha: Ek Chikistak Abhyas".** The researcher has also completed the computerization of his library by using Libreria Software developed by MKCL, Pune. The Researcher is one of the active members for evolving activity to the Libreria Software.

The Researcher also has puts in order OPAC service to his readers within the library or outside side the library by using mobile / internet WEBOPAC facility. The Researcher also has systematized N-List awareness program in consultancy with INFLIBNET Centre Ahmedabad (Gujarat). The researcher has also participated in the workshop for development of the digital library with the help of DSpace this is the reason the researcher wants to create the digital library for his own college library as well as for the whole institution fraternity.

The organization of digital services in every field is a part of E-Governance. The College library too offered its services to the current need of the users' community. Owing to this, the researcher has engaged the subject for this research work**, "Creation of Digital Library for Rayat Shikshan Sanstha".**

1.4 Importance of the study

The qualitative research implies;

1. The present study will benefit the Rayat Shikshan Santha's Management to bring about necessary changes in information sources and services rendered in the era of digitization.
2. This study will help to create a central digital library for the institution with use of proper digital library software.
3. This study will also propagate the use of N-List database, OPAC, WEBOPAC and open resources etc.
4. The college library will know updates and their imperfections, for improvement.
5. This study will enhance the digital library environment in the traditional Arts, Commerce and Sciences colleges.

1.5 Objectives of the Study

1. To study the present status of ICT Infrastructure required creating digital library for the Rayat Shikshan Sanstha.
2. To study the ICT skills required to create digital library.
3. To undertake the feasibility study for creation of digital library to the Rayat Shikshan Sanstha.
4. To study in detail the conceptual framework of digital library.
5. To prepare a model of digital library for the Rayat Shikshan Sanstha.

1.6 Definition of Terms

To carry out the study, the researcher has devised some operational definitions, which are listed below;

a) **Research:** According to **Clifford Woody** "Research is a careful inquiry or examination in seeking facts or principles, a diligent investigation to ascertain something".

b) **Library:** Library is a collection of books, information sources, resources and services which are organized for use and maintained by an institution.

c) **Digital Library:** Digital library is a collection of information stored in digital / electronic form, available on the internet or on CD-ROM, with provision of seamless access, efficient and effective search and advance search without any physical restriction.

d) **Digitization:** This is the process of converting hard information into the binary coded files for computer storage and processing.

e) **Library Automation:** It is the use of automatic and semi-automatic data processing machines to perform such traditional in-house library activities as acquisition, cataloguing and circulation.

f) **Open Access:** The Research Library **American Research Libraries Association (ARLA)** Task force define Open access "a cost effective way to disseminate and use information. It is an alternative to the traditional subscription-based publishing model made possible by new digital technologies and networked communication."

g) **Aided Colleges:** are those colleges which are run by management and get the financial assistances as per the state government.

h) **Private Colleges:** A college established through a state / central Act by a sponsoring body viz. a society registered under the Societies Registration Act 1860

or any other corresponding law for the time being in force in a state or a Public Trust or a company registered under section 25 of the Companies Act, 1956.

i) **Autonomous College:** (Ankur, 2017) Autonomous college / university typically refers to institute which exercises independent control over its day-to-day operations and curriculum. It implies that the sponsoring state does not have control over academic matters of the school.

1.7 Hypothesis of the study

Hypothesis is an important intellectual instrument of research. Hypothesis is a tentative solution of the problem.

(**Young P. V., 1973**) Defines 'A provisional central idea which becomes the base for fruitful investigation is known as hypotheses'

The definition of hypothesis (**Creighton, 2000**) 'A Hypothesis is a tentative supposition of provisional guess which seems to explain the situation under observation'.

The realization of hypothesis is one of the good steps for an ideal research. Hypothesis is a sense of assumption. Hypothesis is considered as the principal instrument in research. The elementary function of hypothesis is to propose new experimentations and observations. Hypothesis is proficient of being objectively verified and tested.

The study is based on the following hypothesis:

1. The suitable ICT infrastructure required to create digital library is available at the organization.
2. The library staff and users need periodical training to maximize the use of digital library.
3. There is need of central digital library in the organization.

1.8 Variables Related to the Study

The variables related to the study are

1) Independent variables
   - Creation of the digital library for the Rayat Shikshan Sanstha.
2) Dependent variables
   - Need of Central digital library.
   - Human Resource Skill for Digital Library.
   - Budget for development of Digital Library.
   - Infrastructure of Digital Library.

- Digital Library Architecture / Framework.
- Software for Digital Library.
- IPR and Digital Right Management.
- Digital Collection / Resources.
- Digital Knowledge Organization.
- Access Infrastructure.
- Digital Library Services.
- Digital Library Standards and protocols.
- Digital Library Challenges.
- Model of Digital Library.

1.9 Scope and Limitation of the Study

The scope means the limitations of the study. Limitation means the state beyond the control of the researcher. There are restrictions on the assumption of the study and their applications to other circumstances.

The following are scope and limitations of the study:

a) The study is divided into two part such as
   1. Creation of central digital library for the organization.
   2. Testing / evaluating the digital library after the creation

b) The Present study is confined to the Rayat Shikshan Sanstha's 42 senior college libraries only, which are affiliated to :
   1. The Savitribai Phule Pune University, Pune,
   2. The Shivaji University, Kolhapur,
   3. The Mumbai University, Mumbai and
   4. The Solapur University, Solapur.

c) The study also review's the present status of college libraries involvement in the creation of digital library at its own level as well at organization level.

d) A model of the digital library is designed for the Rayat Shikshan Sanstha and its senior college libraries only.

e) The present study is restricted to the period from Academic year 2012-13 to 2016-17 only.

f) The financial aspect are not covered in this study.

g) For creation, building and development of digital library require support from the organization.

1.10 Review of Literature

The Review of literature was carried out on the digital library and its related topics by using various sources such as books, thesis, research reports etc. The secondary sources are also used for finding the literature such as

- LISA (Library and Information Science Abstract)
- Shodhganga (Indian Electronic Theses and Dissertations)
- Vidhyanidhi (Indian digital library of Electronic Thesis)
- NLIST database of INFLIBNET
- EBSCO database
- Web of Science database
- Digital libraries of various institutions
- Websites of the Rayat Shikshan Sanstha, UGC, NAAC, MKCL, Institutional Repository of Gokhale Institute of Politics and Economics, etc. have been studied.

1.11 Implications of the Present Research

The study definitely help to build digital library for institution. It will be facilitate for organizing the information in helpful order which will improve the search facility. The users will be benefited by the digital library and the information resources. The resources are made available at the global level. It concludes that, due to this study the whole society will be benefited with the existence of the digital library of the institution.

1.12 Research Methodology and Techniques

Research Methodology is the path towards planning a research in systematic ways, without Research Methodology research will not be completed. It is very essential for the investigator to clear on the methodology, tool and techniques which would be used applied in the research work. The researcher has followed a descriptive method of research. Survey technique was adopted for collecting data for the study. Further survey method is also divided into different techniques such as observation, questionnaire and interview. For the present study questionnaire was used as main research instrument.

1.12.1 Descriptive Method of Research

The investigator has selected the descriptive method of research, because it is a precise method for carrying research especially in social sciences. The descriptive study is a fact finding investigation with adequate interpretation, it is the simplest type of research. It focus on particular aspects of the problem studied. The major purpose of the descriptive research is that, the researcher has no regulator over the variables, he has to only report what has happened or what is happening. He has to report the state of affairs which exists at present. The descriptive research method should be used for qualitative and quantitative research. Since the topic pertains to qualitative research, due to that descriptive method of research was chosen for the study (Kothari , Research Methodology : Methods and Techniques, 2014)

1.12.2 Case Study Method

The researcher has used case study method especially to study the digital library of an institution.

According to P.V. Young "Case study is a method of exploring and analyzing the life of a social unit, be it that a person, a family, an institution, cultural group or even entire community".

A case study means comprehensive study of a social unit. Be that unit a person, a group, a social institution a district or a community is called a case study. The case study is an intensive story through which one can know precisely the factors and causes of a particular phenomenon. It is a kind of qualitative analysis. It is very good method of collecting information about an individual, a family or group of persons.

1.12.3 Survey Method of Research

According to **(Bulmer, 1984**) when a very large area is intended to be covered for research, the survey method is the most appropriate method. (Kemdarne, 2012) Survey method is one of the most common method used to conduct research in social science. The researcher has to gather the data from the population through personal contact, interviews or other techniques that are commonly called as social survey.

The researcher has used the survey method of research to collect data from library professionals and the users of the library. For collecting data from librarian especially census survey method was adopted. To collect data from users Non-probability stratified random purposive sampling was used.

In brief the investigator has followed the research methodology in the study for achieving the objectives are as follows:

1) The descriptive method of research was used because of qualitative research.
2) The case study method is followed for the intensive study of digital library of an institution.
3) The survey research method and technique adopted for the collection of data on digital library from librarian and users of an institution.
4) The census survey method was especially used to collect the data from the librarian.
5) For the collection of data from user Stratified Random sampling along with Non- probability purposive sampling technique is followed for collection of data from the users of library.
6) Narrative method was used along with description of systems annotation and interpretation for writing thesis.

1.13 Data Collection

The Rayat shikshan Sanstha, Satara (Maharashtra) runs 42 Senior colleges out of that 37 Arts, Commerce and science colleges, 2 B. Ed, 1 Engineering College and 1 Management Institute and 1 Law college. These colleges are mostly located in the 14 districts of Maharashtra. All the colleges run by institution's are Government aided colleges, expect KBP College of Engineering, Satara. Mostly these colleges are situated in the rural area of the Maharashtra. The number of colleges are within the limit for collection of data, because of that all the college are considered for study purpose. List of colleges under study are shown in **Appendix No. III.**

1.13.1 Pilot Study

A pilot study is a 'small scale replica' of the main study. It is a trail performance of the main study. It consists the entire process of research like preparation of a broad plan of the study, construction of tools, collection of data, processing and analysis of data and report writing. It is clear that pilot studies can guide the researcher and they considerably improve the quality of the research. After the completion of pilot study, the conclusion can be drawn that whether the study need any changes either in objectives of the study or in the scope of the study.

For the present research the pilot study was undertaken. In this pilot study only NAAC Re-accredited (Second cycle) 'A Grade College with more than 3.16 CGP had been chosen. After received the constructive response the present study has carried out on selected population. In all there are 16 Colleges of the Rayat Shikshan Sanstha's who is having A Grade. Because of that CGP Criteria is applied for the pilot study.

Table No. 1.1 List of Rayat Shikshan Sanstha's Colleges (More than 3.16 CGP Grade)

SR No.	Name of the Rayat Shikshan Sanstha's A Grade College	CGP
1.	Karmaveer Bhaurao Patil Mahavidyalaya, Pandharpur	3.43
2.	Yashwantrao Chavan Institute of Science, Satara	3.37
3.	Karmaveer Bhaurao Patil College, Washi	3.28
4.	R.B. N. B. College, Shrirampur	3.22
5.	C.D.Jain College of Commerce, Shrirampur	3.16

1.13.2 The Population

The concept of a population is fundamental to any survey research. Therefore, after receiving general information about the digital library and its users, it was necessary to decide the target group or the population for the response and they are:

- Librarians
- User e.g. Faculty member and the students.

1.13.3 Development of Tools

For the present study, the data gathering instrument was the 'questionnaire'. Two comprehensive and structured questionnaires were developed by the researcher in consultation with the supervisor for the purpose of this study. The first questionnaire is for librarian and the second questionnaire is for end user (e.g. faculty and student)

A. Questionnaire for Librarians

For collecting data from the librarian, the survey method is used in the present study. The population size is not vast hence, 42 questionnaires are sent to the college librarian of the institution. For achieving 100 percentage accuracy of the data, the information was sought on the following basis:

- General information.
- Need and purpose of the digital library
- The digital library committee for policy making
- Library staff
- Budget / Funds
- Infrastructure
- Technology
- Hardware and software
- Digital collection of the library
- The structure of digital library (College Library Hybrid)
- Provision of staff training
- Users; training for use of the digital library
- Marketing of the digital library
- Problems faced by the digital library
- The Rayat Knowledge Bank
- Suggestion for the improvement of the digital library

B. Questionnaire for User

For collecting data from the users of a particular college library Non-probability sampling e.g. Purposive or Judgment Sampling has been used in the present study. The faculty and student is the member of the user of the library. Three and Six questionnaire is sent to every group for a particular college respectively.

Table No1.2 Method of Survey and Use of Sample Size

SR. No.	Category	Number of Colleges	No. of Questionnaires for Group	Total Numbers	Method of Survey / Sampling
1.	Librarian	42	01	042	Probability Sampling, survey Method
2.	Faculty	42	03	126	Stratified Random sampling along with Non-probability purposive sampling
3.	Student	42	06	252	
	Total	**42**	**10**	**420**	

1.13.4 Distribution of Questionnaire

The questionnaire for the librarian was mailed by post and the responses were requested. Follow up for the responses was done through telephone and e-mail. Along with the hard copy, a soft copy was also sent through e-mail to 42 college librarians wherever the e-mail address was available. Follow up was done individually through e-mail, by post, or directly visiting to a particular college librarian and through the librarian to individual users.

1.14 Data Analysis

For collection of data the 42 questionnaires sent to the librarians and 42 (100 %) respondents responded to the same. Whereas for the second questionnaire, 378 questionnaires send to faculty user and out of that 294 (78 %) respondent respond to the questionnaire. The filled questionnaires were received from the librarians and users of Rayat Shikshan Sanstha's colleges and the collected data is analysed, interpreted and presented through table, graphs, pie-diagrams / percentage circles. The findings are also considered as important guidelines to draw the conclusions. The hypotheses was tested.

1.15 Structure of Research Study

The present study is organized in seven chapters:

Chapter 1: Introduction

This chapter deals with the introduction of the research problem, Need and importance of the digital library. Statement of the problems, Operational definitions of digital Library related terms, its objectives, hypothesis, assumptions variables, the scope and limitation of the study. The descriptive method of research and case study method is used in the study. For collection of data survey techniques is used. The questionnaire tool has been used to collect data from librarian, faculty member and the student. For the selection of sample from librarian census method is used and for collection of sample from user stratified random purposive sampling is adopted.

Chapter 2: Review of Literature

The review of the related literature explains the early digital library research studies. In this study of books, print journals, thesis, various online resources such as LISA, EBSCO, N-LIST, Web of Science and open resources such as Shodhganga, Vidhyanidhi etc. is carried out in depth study systematically. The various aspect of the study are discussed with brief summary. The information is arranged according to digital library, history of digital library, world digital library projects, digital library in India, Types of digital libraries, digital library software, Open source digital libraries, Digital library services, Challenges for building digital libraries, Framework of digital library and Model of digital library.

Chapter 3: Digital Library: An Overview

This chapter deals with the evolution of digital libraries, benefits of digital library, need of the digital library, advantages & disadvantages of the digital library, characteristics of a digital library, Feasibility study, component of digital library. Technical infrastructure of digital library, key component of digital library, open Archival information system (OAIS), digital library protocols and standards, conceptual model for digital library.

Chapter 4: Rayat Shikshan Sanstha and its Digital Library

It consists of history of the Rayat Shikshan Sanstha and present status of the institution, Project taken by the Rayat. Vision, mission and objective of Rayat Shikshan Sanstha, Colleges affiliated to the Rayat. Number of courses conducted in Rayat. Karmaveer Vidya Prabodhini and its activities. Libraries of Rayat, Use of ICT, computer education, Library automation, websites, online branch information system, digital library of the organization, reason for building digital library. Strength of digital library, problems associated with present digital library and need of improvement along with future development of digital library.

Chapter 5: Librarian's View about Digital Library with Special Reference to Rayat Shikshan Sanstha

This chapter deals with data collection, analysis and interpretation. The specific data collected from librarians. The specific data is presented in the forms of tables, graphs and pie diagrams as the respondent's response in particular questionnaire. The view are systematically analyzed and interpreted thoroughly.

Chapter 6: User's View about Digital Library with Special Reference to Rayat Shikshan Sanstha

This chapter deals with data collection, analysis and the interpretation of the data. As the data collected from the users such as faculty member and student. The specific data is systematically analyzed and interpreted properly.

Chapter 7: Finding, Conclusion and Suggestion

It consists of summary and findings of the present study, constructive suggestions are made for building model digital library for the Rayat Shikshan Sanstha. The study focus on the management role and the digital library committee for building the digital library. This chapter also highlights the further research area for the investigation. The bibliography and appendix and List of Rayat Shikshan Sanstha's Colleges are enclosed at the end of the theses.

1.16 Conclusion

This chapter highlights the significance of the study, objective of the study, the need of the study, scope and limitations of the study, hypothesis of the study, and organization of study systematically. The descriptive method of research was used in the

research. The case study method is followed for the intensive study of digital library of an institution. The survey research method and technique was adopted for the collection of data on digital library from librarian and users of an institution. The census survey method was especially used to collect the data from the librarian. For the collection of data from user stratified random sampling along with non- probability purposive sampling technique was followed. Narrative method was used for writing thesis. The next chapter is Review of literature which will help to understand the concept of digital library thoroughly

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CHAPTER – 2

REVIEW OF LITERATURE

2.1 Introduction

Literature search is an important entity to carry out research. Review of the Literature will help to avoid duplication of research work which will also help to generate new ideas and concepts. The present research on the digital library is a topic of the recent origin.

The attempts have been to review the literature related to the topic published or unpublished in different sources for information which includes books, thesis, research reports etc. The secondary sources are also reviewed along with the sources which are available on the internet or on the websites, such as:

LISA (Library and Information Science Abstract), Shodhganga (Indian Electronic Theses and Dissertations), Vidyanidhi (Indian digital library of Electronic Thesis), NLIST database of INFLIBNET, EBSCO database, Digital llibraries of various institutions such as Rayat Shikshan Sanstha, UGC, NAAC different institutional repository of various organizations etc. Open Access Journals search directories like Directory of Open Access Journals (DOAJ) <http//www.doaj.org>. Used Google Scholar for reference to the digital library. Article Documents available in different universities and higher educational and research institutional libraries including Savitribai Phule Pune University Pune, Dr. Babasaheb Ambedkar Marathawada University, Aurangabad and Tilak Maharashtra Vidyapeeth, Pune were searched.

Attempt has been made to present the literature review in the form of a summary or description of every consulted work with critical analysis of the researcher. APA citation style is used to present the review of literature. The literature review is arranged according to various concepts and the review is arranged according to the date of publication.

2.2 The Higher Education and Digital Library

(Pavani 2007) This paper discusses a digital library which can perform function that are impossible with traditional llibraries accessibility, availability, interaction, customization and reuse are strong reasons to use the digital libraries for higher education even though there are challenges in the digital and networked

environment. This article helps to know the importance of the digital library as compared to the traditional library.

(Law 2009) This paper explores the nature of the changes and challenges facing higher education libraries and suggests key areas of strength and core activities which should be exploited to secure libraries future. This paper helps to know the challenges faced by the traditional libraries and why they have to change themselves.

(Kumar 2009) This paper discusses about the movement and institutional repository is a very powerful idea that can serve as an engine to institutions of higher education and more broadly for scholarly enterprises that support research activities. The article helps to get an idea about the institutional repository and its use in the learning of the higher education.

(Gupta and Gupta 2012) This paper presents the development and presents scenario of higher education in India. The establishment of NCHER, independent regulatory authority for accreditation and national database of academic qualification, increase in number of universities including IITs, IIMs, NITs and SPAs during 11th five year plan and increase in the number of seats in the existing institutions, and passing of the Right of Children to Free and Compulsory Education. The development in the higher education is known from the paper.

(Matthews, 2014) This book explains and clarifies the practice of assessment in academic institutions, enabling library managers to better understand and explain the impact of the library on student learning outcomes, teaching effectiveness, and research productivity. The concept of assessment in institutions and the impact of information technology on the library are known from the books.

(A. Gupta 2014) The development of a nation to a large extent depends on its education system. Education equips people with appropriate expertise, knowledge and skills to be gainfully employed that leads to the overall development of any economy. The paper is an attempt to analyze the various factors which are important for a country to provide world-class education and absence of which act as a hurdle to match the education standards with international norms. It takes stock of the initiatives taken by the government to improve the standard of higher education.

(Rathinasabapathy 2015) AICTE expected following digital requirement from library, subscription to E-Journals is essential. The digital library facility with multimedia facility is essential. Reprographic facility is necessary. Document scanning and printing facility in the library is essential. The NPTEL facility at the library is essential. From this article the researcher has known the expectations of the AICTE from the library.

S**ummary**

From the literature review, it is observed that, the Indian higher education should be as per the international standards and norms. The establishment of NCHER, independent regulatory authority for accreditation and national database of academic qualification, passing of the Right of Children Act to free and compulsory education are the new developments in Indian higher education. The digital library can perform a function that is impossible for traditional libraries. Accessibility, availability, interaction, customization and reuse are strong reasons to use the digital libraries for higher education even though there are challenges in the digital and networked environment. The Institutional repository is a very powerful idea that can serve as an engine for institution of higher education. AICTE expected digital requirement from library such as subscription to E-Journals, digital library facility, reprographic, document scanning, printing and use of NPTEL facility are essential.

2.3 Digital library concept

(Fox and Ohm 2003) The author had compared the traditional libraries function such as collection, organization, access and to preserve the object. The change in the digital technology will help to handle new kinds of object efficiently. The digital library collections include things without direct physical analogy.

(Marcum 2003) The changing expectations and demands of library users that are forcing libraries to reassess their role in the digital age. The author examines how the digital resource users are best served, the elements required for a coherent preservation strategy covering digital and traditional resources, and the kinds of education librarians we will need in the future. The users need and demand are factors which is responsible for the development of the digital library. Nowadays the user is becoming more screens-oriented especially in the higher education.

(Blummer 2005) This article surveys current educational opportunities with regards to the digital libraries**.** Traditional the library skills are no longer adequate for maintaining a competitive edge in the field. The Post-graduate education in digital libraries offers information professionals an opportunity to broaden their knowledge of the new technologies utilized in the libraries as well as the issues generated by their use. This article finds the need of the digital library education to the library professionals.

(Bansode 2008) This paper highlights the digitization activities undertaken by the Shivaji University library to preserve the rare material. This study attempts to calculate the costs incurred in the digitization process. It highlights that digitization is the solution for the preservation of the rare material. This paper provided the complete budget requirement for the digitization activity. The article helps to know the practical aspects of rare books digitization and the calculation of the cost of preservation material.

(Alhaji 2009) This paper discusses the new activities, methods and technology used in the digitization and formation of digital libraries. It sets out some key points involved and the detailed plans required in the process, offers pieces of advice and guidance for the practicing librarians and Information scientists. The digital libraries are being created today for diverse communities and in different field's e.g. education, science, culture, development, health, governance and so on. With the availability of several free digital library software, the digital library software and its use in different library were known from the article.

(Liew 2009) This review aims at provide a snapshot of the digital library research of the past 11 years (1997-2007) that focuses on organizational and people issues including those concerning the social/cultural, legal, ethical, and use of dimensions. The analysis reveals that there are several topics that are dominant in the sample. There are significant research streams into one or more aspects of the digital library use and usability, organizational and economic issues as well as legal issues. In comparison, there is very little research in the sample on ethical and social/ cultural issues. This review finds the gap that while creating digital library ethical and social aspects should be given more attention.

(Vijyakumar and Jeevan 2001) This paper presents some of the major issues involved in such a critical activity with some illustrative examples available like IEE/IEEE Electronic Library, Indian Standards on CD-ROM, Science Direct and Web access of Indian Academy of Sciences journals. The justification for selecting external contents has also been mentioned. A detailed checklist for evaluating contents is presented from various angles, like authenticity of content, user interface, search and display capabilities, documentation and technical support, and Media dependent features.

(Kumar 2014) The importance of digital libraries has been recognized by all the nations of the world. The number of colleges and institutional libraries in the advanced and developing countries has already undertaken digitization projects to establish the digital libraries. This article helps to understand the hardware and software requirement for the digitization project.

(Bera 2016) The aim of this paper is to discuss significance of the digital libraries in the modern information era. It depicts the basic concepts, historical background, attribute, process, software need, and the types of reference services in digital environment.

Summary

The changing expectations and demands of library users that are forcing libraries to reassess their role in the digital age. The change in the digital technology will help to handle new kinds of object efficiently. The digitization is the solution for the preservation of the rare material. The number of colleges and institutional libraries in the advanced and developing countries has already undertaken digitization projects to establish the digital libraries. The digital library can be created by the availability of several free digital libraries software. The Post-graduate education in digital libraries offers information professionals an opportunity to broaden their knowledge of the new technologies. There is a need to provide attention towards ethical and social /cultural issues in the digital library era.

2.4 History of Digital Library

(**Arms, 2000**) In this the book digital libraries on an integrated overview of the field, including a historical perspective, the state of the art, and current research. The

term "Digital Libraries" covers the creation and distribution of all types of information.

(Lesk 2012) This paper aims at present a personal view of the development of the digital libraries, starting with the original vision of 1945 and describing how it came to the dominance of online searching and reading that it has today. The Progress in digital libraries is described in four areas like technical, economic, legal and social issues. Originally technological obstacles were dominant, but they have generally been overcome by progress in computers, networks, and algorithms.

(Giannis, et al. 2013) Evaluation is a vital research area in the digital library domain, demonstrating a growing literature in conference and journal articles. We explore the directions and the evolution of evaluation research for the period 2001–2011 by studying the evaluation initiatives presented at two main conferences of the digital library domain, namely the Association for Computing Machinery and the Institute of Electrical and Electronics Engineers (ACM/IEEE) Joint Conference on digital libraries (JCDL), and the European.

(Isah, et al. 2014) This article traces the historical development of the digital libraries (DLs), examines some DL initiatives in developed and developing countries and uses 5S Theory as a lens for analysing the focused DLs. The analysis shows that the present-day systems, in both developed and developing nations, are essentially content and user centric, with low level digitization projects in developing countries. Also, there is a lack of interoperability among the various types of DL initiatives. The article recommends investment in DL projects, digitization of print collection, as well as the development of standards that will address the problem of interoperability among the various systems.

Summary

From the literature review on history of the digital library, it is known that, the evaluation is a vital research area in the digital library which will help to grow the literature. The progress in digital libraries is described in four areas like technical, economic, legal and social issues. Investment in DL projects, digitization of print collection, as well as the development of standards, interoperability among the various systems is the requirement of digital library.

2.5 World Digital Library

(Fox 1998) This article highlights the barriers of interoperability and multilingual collection processing is overcoming the goal worldwide digital library is expected to slowly become a reality and the global understanding and cooperation is enhancing.

(Chowdhury 1999) This paper provides the brief accounts of some major digital library projects that are currently in progress, or are just completed in different parts of the world. The paper ends with an indication of the research issues that need to be addressed and resolved in the near future in order to bring the digital library from the researcher's laboratory to the real life environment. This paper helps to know the major digital library project around the world.

(Ke and Chang 2000) This paper presents the motivation, current status, experiences, and future directions of the Info Spring Project and introduces the Taiwanese library consortium which it services.

(Fahmi 2002) This paper describes the basic design of the Indonesian Digital Library Network which enables it to handle the typical problems encountered in a developing country's digital library network, such as internet accessibility, bandwidth capacity, and network delays.

(Bonnelly 2003) The Canadian Initiative on Digital Libraries (CIDL) is a bilingual networked organization created in 1997 under the umbrella of Library & Archives Canada. The CIDL mission is to promote, coordinate and facilitate the development of the Canadian digital collections and services in order to optimize national interoperability and long-term access to Canadian digital library resources.

(M. Smith 2003) The first part of this article describes the DSpace system including its functionality and design, and its approach to various problems in digital library and archives design. The second part discusses the implementation of the DSpace at MIT, plans for federating the system, and issues of sustainability.

(Benedetti 2007) This article describes how librarians at the University of North Carolina Wilmington (UNCW) have made an effort to expand an access to the resources in a digital library both in their library catalogue and in the World Cat.

(R. Liu 2007) The book reviewed takes a European look at the efforts of the Google to digitize the world's books. By raising critical questions on the cultural significance of making the printed literature accessible online, the reviewer, as a Chinese researcher, expressed his concerns and main arguments over the role of the government and society in promoting culture.

(Y. Han 2007) This paper describes an Afghanistan digital library initiative of building an integrated library system (ILS) for Afghanistan universities and colleges based on the open-source software. This ILS is the first at a large academic library running on open-source software.

(Dalbello 2009) This article presents the narrative accounts of the beginnings of the digital library programs in five European national libraries: Bibliotecanational de Portugal, Bibliothèquenationale de France, Die Deutsche Bibliothek, the National Library of Scotland, and the British Library. Based on the interviews with the policy makers and the developers of the digital libraries, this qualitative study examines the influence of the culture and local practices during the first wave of development, between 1998 and 2002.

(Chowdhury M. H., 2011) In this article, an attempt has been made to describe the current status of IR and DL in Bangladesh.

(Kavcic-Colic 2011) An overview of the digital preservation in Slovenia from the library science perspective is presented, and the comparison with the archival approach is discussed. According to the Slovenian Deposit Law, the National and University Library (NUK) is the only library responsible for the digital preservation of electronic publications. Due to the lack of staff and financial resources the NUK has started with this practice some years later than the other developed libraries all over the world.

(Seifi , Centre Digitization and Digital Preservation of Manuscripts and Access in Organization of Libraries , Museums and Documents of Astan Quds Razavi Library in IRAN : A Case Study, 2011) The paper discusses about the digital preservation, current and future trends, collection and details about the ongoing digitization of the manuscripts program in Organization of the Libraries, Museums and Documents Centre of Astan Quds Razavi Library of Iran.

(Dillon 2012) The article focuses on the Digital Public Library of America (DPLA). It says that DPLA aims to provide a shared infrastructure to digitize and bring the digital content to archives and libraries in the country. It mentions the National Endowment for the Humanities (NEH) grant worth $1 million to support the formation of infrastructure for the DPLA. It notes the effort of the DPLA to partner with the state-wide digital library projects for the establishment of pilot groups.

(Lorio, Scaerf and Bertazzo 2012) The Sapienza Digital Library (SDL) is a research project undertaken by Sapienza Università di Roma, the largest Europe's campus, and the Italian supercomputer centre Cineca. The SDL project aims to build an infrastructure supporting preservation, management and dissemination of the past, present and future digital resources, that contain the overall intellectual production of the Sapienza University.

(Fijeh, 2014) The paper discusses the current traditional preservation methods practiced among academic libraries and observed that these methods are not adequate. It recommends that the academic libraries in Nigeria should digitize these and adopt the cloud computing preservation model through the operations of institutional repositories. The paper further identified the digital divide and poor technological infrastructure, inadequate funding, data security breaches and issues revolving around copyright as challenges of digitization and cloud computing. This article helps to know the cloud computing preservation model and its application in building the digital library.

(Goodale, et al. 2014) A model is proposed suggesting a converse relationship between behaviour and attitudes to support the individual users displaying search behaviour mapped onto the strengths of their cognitive style, but placing greater value on interface features that support aspects in which they are weaker.

(Huang and Helen 2016) In 2000, a collaboration project called the China-America Digital Academic Library (CADAL) was launched by Chinese and US computer scientists and supported by the US National Science Foundation (NSF) and the Chinese Ministry of Education. The leading parties, Carnegie Mellon University and Zhejiang University, pioneered the construction of massive, digitized resources across the world. In 2002, CADAL merged with the China Academic Library and Information System into the China Academic Digital Library.

(Van 2017) The World Digital Library (WDL) is a project to place the online rare and unique cultural documents from libraries and other cultural institutions around the world. The WDL website, which was developed and is maintained by the Library of Congress, emphasizes multilingualism, curatorial selection and description of the content presented, and a high level of functionality.

Summary

From the literature review it is found that, the Canadian Initiative on the Digital Libraries (CIDL) is bilingual Networked organization created in 1197 under the umbrella of library and Archives Canada. According to the Slovenian Deposit law, the National and University Library (NUK) is the only library responsible for digital preservation of electronic publications. Central library of University Tehran digitize the Manuscript. The Digital Public Library of America (DPLA) aims to provide a shared infrastructure to digitize and bring digital content to archives and libraries in the country. The Sapienza Digital Library (SDL) is a research Project undertaken by Sapienza Università di Roma the largest Europe's campus. The SDL project aims to build an infrastructure supporting preservation, management and dissemination of the past, present and future digital resources of the Sapienza University. The cloud computing preservation model follows by the Nigerian Academic libraries. China-America Digital Academic Library (CADL) was launched by Chinese and US Computer Scientists in 2000. The world Digital Library (WDL) was developed by the library of congress.

2.6 Digital Library in India

(Bhattacharya 2004) The paper focuses on the digital library initiatives in India with examples, the initiatives of the government of India and state governments towards the digital library activities, and the policy of the Government of India towards the digital library development. The current initiatives such as the INDEST Consortia, is described in detail. The challenges facing the digital libraries, the problems being encountered while developing the digital libraries is known from the article.

(Krishnamurthy 2005) Important services like the online resource, online public access catalogue (OPAC), consortium and how these sources are helpful in building digital collection in the Indian Statistical Institute Bangalore library is

discussed. In a short period, considerable progress has been made in consortium project in the Indian Statistical Institute libraries. This article gives an introduction to the digitization of the Indian Statistical Institute Library, Bangalore focuses on the key initiatives of the various databases.

(Mittal 2008) The use of the open source software especially for the creation of institutional repositories is found to be common. However, major digital library initiatives such as the Digital Library of India use the custom-made software. The collection size in most digital libraries and repositories is in a few hundreds. The paper highlights the state of the digital libraries and repositories in India in late 2007. The paper is the first of its kind that attempts to identify and evaluate the digital libraries and repositories in India. It also gives a comprehensive listing of the digital libraries and institutional repositories in India available in the public domain.

(Sheeja 2010) The major purpose of this study is to examine the perceptions of undergraduate students towards the digital library of the Cochin University of Science and Technology (CUSAT), Cochin, India. Specifically, the study made an effort to determine the sources consulted and the general pattern of information gathering by the students. The study adopted a descriptive survey design and data was collected using a questionnaire administered to 225 respondents randomly selected from seven branches of the engineering faculty in the CUSAT. The results obtained show that almost all the students use the digital library for learning. They frequently access the digital library for getting previous exam question papers, syllabi and other materials pertaining to their study. They are satisfied with current digital library features and functionality. Students recommended the addition of more documents related to their courses and useful links to the digital library. This study helps for creating questionnaire to the user's response and to collect the need of the user of the digital library.

(Pawar 2011) In this research article the author describes the advantages, usages of software, growth and development of institutional repositories in India. Due to the open access it facilitates the availability and distribution of the scholarly communication which became free. Basically there were financial, legal, time and space barriers were there. The paper provides an overview about the present state of the Open access initiatives by various institutions of the country. The development of

information communication and web technology has changed the landscape of the information handling activities. These technologies provide a simple, web based mechanism for researchers to deposit and access their research publications via digital repositories.

(Singh 2011) This book covers a wide range of topics related to the digital libraries from historical development to the process of digitization, E-journals, E-books, networks and consortia etc. This volume will help to understand the concepts related to the digitization and help the library professionals to provide better services to the users. The books cover theoretical as well as practical aspects of the digital libraries. A Systematic care has been taken to understand the digital libraries, digitization and development of digital libraries. This book is useful for a person dealing with archiving, digitization and preservations of the library resources. To organize and establishing the digital libraries. The main objective of this book is to provide an opportunity to the library professionals to acquire sufficient knowledge and skills about digitization and modernization of libraries.

(Londhe, Desale, & Patil, 2011) The purpose of this paper is to focus on the technical know-how required for digitization of the manuscripts. It aims to discuss the digitization process of manuscripts adopted in the Jayakar Library, the University of Pune in India and also to evaluate the digitization software used in this project. The paper explains different steps of the digitization process. It also explains the process for creating metadata fields for easy retrieval of manuscripts and evaluates the digitization software.

(Shewale 2012) Dhananjayarao Gadgil Library of Gokhale Institute of Politics and Economics (GIPE) has started building up the digital library collections by scanning its valuable rare books during July 2011. The GIPE's digital library uses open source software DSpace for building its digital repository. Currently, repository holds more than 7500 digital documents. These documents are available to all the scholars across the world. The present paper discusses the methodology adapted for its digital library building. The various processes involved were: Identification of the vendor, identifying the documents to be scanned or digitized, overall work flow, preparation of the metadata in excel, converting the data into Dublin Core XML format and then finally uploading the metadata into DSpace server. This article helps to know the

practical aspect of digital software and decided to use the Dspace while developing the digital library model for the Rayat Shikshan Sanstha.

(Deka 2014) The basic purpose of this study is to find out the methods of Management of digital resources in the universities libraries of India. It is found that the present scenario of university libraries with regards to the proper management of the digital resources is not satisfactory. A Number of recommendations for proper implementation and improvement of the university libraries in India regarding digital resources management are suggested in this research.

(Pradhan 2014) This paper focused on the different aspects related to the digital library issues, challenges and services provided using digital information resources. The need and prerequisite for developing digital library, advantages over traditional are highlighted in brief.

(Paratwagh 2014) This paper aims to give an overview in digital preservations and also about its needs, requirements and benefits of digital preservation. The Digital resources are for future use. Ease access to digital information is very necessary, because physically we can't see the resources. Developing preservation process for digital resources will require the integration of new methods, policies, standards and technologies.

(Kumar & Gupta, 2016) The paper examines development of continuing professional education on digital library in India based on the announcement of postings on LIS-Forum related to seminars, conferences, workshops and short-term training programs on digital libraries held in India during April 2003 to October 2015. The paper finds that 73 continuing professional development programs were held on digital library in India during the period. Due to the increasing amount of information available in digital format, education and training.

Summary

The literature review on the digital library of India it is found that, the initiatives of the government of India and the state governments towards digital library activities, and the policy of the Government of India towards the digital library development. The current initiatives, such as the INDEST Consortia came into existence. Important services like online resource, online public access catalogue (OPAC), consortium is helpful in building digital collection in the Indian Statistical Institute Bangalore. The use of the open source software especially for the creation of institutional repositories is found to be common. An example is the Dhananjayarao Gadgil Library of Gokhale Institute of Politics and Economics (GIPE) that has started building up the digital library collections by using the Dspace software.

2.7 Digital Library Software's

(Witten, Stefan, David, & Rodger, 2000) This paper describes the Greenstone digital library software, a comprehensive, open-source system for the construction and presentation of information collections. Collections built with Greenstone offer effective full-text searching and metadata-based browsing facilities that are attractive and easy to use. Moreover, they are easily maintainable and can be augmented and rebuilt entirely automatically. The system is extensible software "plugins" accommodate different document and metadata types.

(Cervone 2006) The Digital library system software selection differs in some significant ways from traditional software implementations. In particular, security and authentication issues, long-term cost and maintenance considerations, vendor viability, as well as training and documentation are areas where the software selection team needs to devote greater attention if the project is to be successful. This paper fills a gap in the digital project management literature by helping project managers understand how the software selection process for the digital library systems projects differs from the traditional process used in software selection.

(Madalli 2012) This paper presents an analytical study along with observations regarding digital preservation support available in the existing open-source digital library software.

(Muller, 2011) This paper seeks to present the results of an analysis of 20 free and open source ILS platforms offered to the library community. These software platforms were subjected to a three-step analysis, whereby the results aim to assist librarians and decision makers in selecting an open source ILS, based on objective criteria.

(Singh and Gareema 2012) This paper aims at the study the open source integrated library management systems, e.g. Koha and NewGenLib, to inform librarians about what considerations to make when choosing an open source integrated library management system (ILMS) for their library. The paper provides a detailed comparative analysis of both types of software, that is Koha (3.2. 4) and NewGenLib (3.0).

(Surendran, Kumar and Kabir 2013) The purpose of this paper is to describe the design and development of a digital library at Cochin University of Science and Technology (CUSAT), India, using DSpace open source software. The study covers the structure, contents and usage of CUSAT digital library. This paper examines the possibilities of applying open source in libraries. An evaluative approach is carried out to explore the features of the CUSAT digital library.

Summary

The literature review on the digital library software finds that, digital library software selection differs in some significant ways from traditional software implementations. In particular, security and authentication issues, long-term cost and maintenance considerations, vendor viability, as well as training and documentation are areas where the software selection team needs to devote greater attention.

2.8 Open Source Software

(M. Smith 2003) The first part of this article describes the DSpace system including its functionality and design, and its approach to various problems in digital library and archives design. The second part discusses the implementation of DSpace at MIT, plans for federating the system, and issues of sustainability.

(Witten 2005) The purpose of this paper is to introduce Greenstone and explain how librarians use it to create and customize digital library collections. The Greenstone digital library software is a comprehensive system for building and

distributing digital library collections. It provides a way of organizing information based on metadata and publishing it on the Internet or on removable media such as CD-ROM/DVD.

(Hoe-Lian, et al. 2006) Many open source software packages are available for organizations and individuals to create digital libraries (DLs). However, a simple to use instrument to evaluate these DL software packages does not exist. The objectives of the present work are to develop a checklist for DL evaluation and use this checklist on four DL software packages.

(Zhang and Gourley 2006) The Greenstone Digital Library software is an open source system for building and publishing digital collections on the Internet. Since 2002, the Washington Research Library Consortium has created twenty-two digital collections using the Greenstone software. This case study describes why we chose the software, and how we customized it for our organizational requirements and integrated it into our digital library environment.

(Laxminarsaiah 2007) The main purpose of this paper is to describe how the ISRO HQ Institutional Repository (IR) idea emerged and what are the steps taken to implement and build the IR. This paper helps in planning to build an IR. The paper also helps the beginners in getting an idea of how different file formats can be used for different collections in order to maintain uniformity.

(Taylor 2008) This paper explores the development rationale behind the Greenstone digital library technology. We also examine three examples of creative new techniques for accessing and presenting information in the digital libraries and stresses the importance of tailoring information access to support the requirements of the users and application area.

(Biswas 2010) The Dspace and Greenstone Digital Library Software have helped spread the practical impact of digital library technology throughout the world, with particular emphasis on developing countries. As the Dspace and Greenstone enters its second decade, this article takes a retrospective look at its development, the challenges that have been faced, and the lessons that have been learned in developing and deploying a comprehensive open-source system for the construction of digital libraries internationally. The Open source digital library packages are gaining popularity nowadays. To build a digital library under economic conditions open source software is preferable. This paper also tries to compare with the features of this popular OSS digital library software.

(Biradar 2013) The main purpose of this paper is to provide practical guidelines of setting up an institutional repository through DSpace open source software. In this direction present paper discussed step by step procedures in building an institutional repository using DSpace including collections. This paper helps in planning to build an IR. It also helps the beginners in understanding the steps to be followed for uploading different file formats to build digital repository to maintain collection with uniformity.

(Cherukodan 2013) The purpose of this paper is to describe the design and development of a digital library at Cochin University of Science and Technology (CUSAT), India, using DSpace open source software. The study covers the structure, contents and usage of CUSAT digital library. The CUSAT has successfully applied DSpace open source software for building a digital library.

(Palmer 2014) The purpose of this study is to assess the current state of research on the open source software (OSS) in the library context. The authors found significant research attention devoted to the open source repository applications, online public access catalog (OPAC) software, and integrated library systems (ILS).

(Naseehath, 2015) This chapter gives an overview of the Open access initiatives and institutional repositories. It emphasizes the emergence and development of open access initiatives from the various international declarations up to its present stage. Definitions, types, characteristic features and impact of open access on various sectors are discussed. The Open access initiatives in India are briefly included. DOAJ and other global organizations are taken in to discussion with their recent events. This paper focuses on the state-of-the-art in open-source software solutions for the digital preservation and curation field used to assimilate and disseminate information to designated audiences. The eleven open source projects for digital preservation are surveyed in areas such as supported standards and protocols, strategies for preservation, methodologies for reporting, dynamic of development.

Summary

It is found that, the Dspace, Greenstone, NewGenLib are the open digital library software. The Open source digital library packages are gaining popularity nowadays, to build a digital library under economic conditions open source software is most preferable useful. The various file formats are used for different collections. The Cochin University of Science and Technology (CUSAT), Gokhale Institute of Politics

and Economics library also successfully used Dspace software for creation of the digital library.

2.9 Digital Library Services

(Lesk 1999) A digital library must focus on the access and service, not buildings and volumes. Libraries will support users in their searching and acquiring of information and their organization will reflect services rather than physical location. Technology, law and economics are all becoming more important for libraries, requiring new expertise in library staff. Perhaps the most important issues for the long term will be the ability of the libraries to cooperate in the delivery of new services.

(Stemper & Butler, 2001) Developing digital reference services within a large library system requires managing fundamental organizational issues before applying technological strategies. Using the development of library services for distance learners as a catalyst, the University of Minnesota-Twin Cities Libraries have implemented an organizational model for providing digital reference services to all students, faculty and staff who access the library remotely. An organizational model for providing digital reference service find useful.

(McCluse, Lanks, Gross, & Choltco-Devlin, 2002) This manual is the first effort to begin, to identify, describe and develop procedures for assessing the various aspects of digital reference services. Its overall purpose is to improve the quality of the digital reference service and assist librarian to design and implement better digital service. This is the basic reference manual which is very useful for design digital services.

(Su, 2004) The real-time digital reference service is valued by most academic librarians in United States. To make the collaborative real-time digital reference service viable in academic library service, the libraries need to understand the information seeking behaviour of potential users and to train the staff well. The participating libraries also need to coordinate the following issues in advance: quality control, question routing, network standards, cultural and political sensitivities, communication, copyright, and marketing.

(Buczynski 2005) The Digital library search services, however, do not support satisfying users. There is no single, simple, comprehensive search service available to end-users to meet their need to gather information on alternatives from all information

repositories accessible through a digital library. Federated search services bridge the gap between satisfying searchers and today's digital libraries.

(Attis 2011) The library's traditional role as a repository for physical books and periodicals is quickly fading, with important implications for space utilization, resource acquisition, and staffing.

(Jeevan, 2011) The Association of college and Research Libraries (ACRL) and the Indian Library Association (ILA) have provided Guidelines for the digital Library Services to distance learners respectively which are as follows:

- Computer–based bibliographic and informational services.
- Reliable, rapid, secure access to institutional and other networks, including internet.
- Reference Service in person or through telephone/fax/email.
- Manual and computerized bibliographic services to faulty.
- Document delivery services.
- Remote access to OPAC, website and networks like DELNET, INFLIBNET.
- Password enabled access to online journals and electronic databases.

(Singh, Gurdev 2011) in his books 'digital Libraries and digitization' he quotes the following services, which are generally offered by the digital libraries:

- Catalog database.
- Current Awareness Bulletin.
- External Purchase Databases.
- CD-ROM databases.
- Remote information Services.
- Internally published Newsletters, Reports and journals.
- Internet information Sources mirroring and Cataloging.
- E-Mail.
- Bulletin Board Service.
- Netnews System.
- Audio and Video communication.
- Electronic table of contents.

- Electronic Document Delivery Service.
- Electronic Thesis and dissertations.
- Reference Service.
- Electronic Publishing or E- publishing.
- Discussion Groups and forums.
- Central Storage Facilities for hosting digital collections and indexes.
- Tools for loading, storing, searching and displaying digital objects.
- Special collections services.

(Wan , 2011) Current Status of Digital Library Services: A Malaysian Case Study is very useful to know the different types of digital library services.

(Ashraf 2012) Design, Development, and Management of Resources for Digital Library Service**s** offers a global perspective on the development and design of digital library and highlights its benefits over a traditional library. This reference source brings together research and ideas on the different facets of a digital library.

(Bera 2016) The aim of this paper is to discuss significance of digital libraries in the modern information era. It depicts the basic concepts, historical background, attribute, process, software need, and the types of reference services in the digital environment.

(Vasanthkumar 2017) This article stresses the significance of Information and Communication Technology in the current Information era. It mainly explains the various types of ICT in development of digital libraries and reference services being provided in the digital environment such as the web based Information and reference services, search engine service, digital and online co-operative catalogue services and personal ICT services etc. This paper emphasizes present scenario of the digital library services in India. It showcases the initiatives taken by UGC India.

Summary

It is observed from the literature review on the topic digital library services that, the significance of Information and Communication Technology in the current Information era that has made an impact on the development of the digital libraries and reference services. For developing the digital reference services within a large library system requires managing fundamental organizational issues before applying technological strategies. Statistics, Measures and Quality Standards for Assessing the Digital Reference Library Service Guideline and procedures by McCluse, Charles et.al has made manual whose overall purpose is to improve the quality of digital reference service and assist the librarian to design and implement a better digital service. The Association of college and Research Libraries (ACRL) and the Indian Library Association (ILA) have provided Guidelines for the digital Library Services.

For providing services in the digital library software driven web-based interfaces are used. Activities like reference service, cataloguing and indexing are carried out through computer based programs through web-based interface with or without human interventions. Following are the services which are provided through the digital library: E-mail Alerts, Web feeds that is RSS Feed service, Ask-an –Expert, Electronic Document Delivery Services, Web-based user Education, Digital Reference Service, Real time Digital Reference Service and My Settings, My saved Searches and My Saved Articles.

2.10 Digital Library Resources

(Chen H.-H. , 2001) In his paper he states that, with the development of Internet, digital libraries/museums have received worldwide attention and many developed countries are doing extensive researches on digital libraries/museums. In Taiwan, many institutions have digitized their rare collections.

(Torma & Vakkari, 2004) This study elaborated relations between digital library use by university faculty, user's discipline and the availability of key resources in the Finnish National Electronic Library (FinELib), The satisfaction with the services did not vary with the discipline, but with the perceived availability of resources.

(Asefeh & Nosrat , 2007) The purpose of this survey aims to investigate the relationships between the awareness and use of the digital resources among the students in Isfahan University of Medical Sciences. He has used the descriptive method of research, the survey techniques have been implemented and a structured questionnaire was designed for collecting the data. He finds the result, 70 % of the students were aware of the digital resources, but only 69 % of them have used them, 62 % were aware of the offline databases, whereas only about 19 % used them through the Central Library LAN network.

(Kotar, 2007) The course Electronic resources in libraries carried out by the Bibliothque nationale de France and Bibliothčque publique d'information within the scope of the programme Courants du monde in November 2006 is presented in the article. The course programme was composed in such a way as to enable the participants to become familiar with all the aspects of selection, digitization, use and preservation of electronic resources in libraries. The participants were systematically familiarized with electronic resources and were able to compare the circumstances prevailing at their home institutions among themselves. This article finds the need of digital course for electronic resources in libraries.

(Rama Devi , 2011) In his thesis, she states that libraries are required to evolve short, medium and long range planning with focus on procuring required digital resources, enhancing service portfolio, identifying training needs based on a systematic training needs analysis and planning for conducting training programs in house or depute the existing library staff for external training. The user development initiatives also demands enormous attention and libraries need to take all the possible steps to ensure users development because if the users are not aware or motivated to utilize the digital library services then the investments on providing such services would be expenditures without any purpose.

(Allenka, 2011) Digital preservation has been gaining its significance mostly because of the exponential growth of the digital resources.

(Prasad, 2016) This paper deals with the different aspects of electronic journals and their impact on users, authors, indexing services, scholarly communication, accessibility and libraries. The electronic serials may be defined very broadly as any journal, magazine, webzine, newsletter or type of electronic serial publication which is available on the Internet. The use of electronic journals are increasing day by day.

Summary

From the literature review on digital library resources, it has been emphasized that, journal, magazine, webzine, newsletter databases, proceedings which are in electronics forms are digital library resources. With the development of the Internet and digital resources digital libraries are also developing. The digital preservation has been gaining its significance mostly because of the exponential growth of the digital resources. The availability of the digital resources is very important for the satisfaction. Short, Medium and Long range planning with focus on procuring required digital resources and staff and user's training is very essential for the use of digital resources in the library.

2.11 Digital Library Standards

(**Baldonado, Chang,, Gravano, & Paepcke, 1997**) The overall goal of the Stanford Digital Library project is to provide an infrastructure that affords interoperability among heterogeneous, autonomous digital library services. These services include both search services and remotely usable information processing facilities. In this paper, we survey and categorize the metadata required for a diverse set of Stanford Digital Library services that we have built.

(Marshall , 1998) The paper explores issues associated with the application of standards, uncertain collection and metadata boundaries, distribution and responsibility.

(Liu and Zhang , Digital Library Infrastructure: A Case Study on Sharing Information Resources in China 2001) This paper investigates how information resources are shared electronically between libraries at the national level in China. Issues pertaining to information technology include use of UNICODE, metadata, interface standards (Z39·50) and others. Using a combination of system analysis and program evaluation methods, the current practice of developing a national digital library infrastructure is investigated.

(Bainbridge 2001) This paper examines the issues surrounding distributed Digital Library protocols. First, it reviews three prominent digital library protocols: Z39.50, SDLIP, and Dienst, plus Greenstone's own protocol. Then, summaries the implementation in the Greenstone Digital Library of a number of different protocols for distributed digital libraries, and describes sample applications of the same.

(Yu 2003) The purpose of this article is to tackle the problems of the web services architecture, its associated standards, and issues of application.

Park, Jung-ran (Park and Yuji Tosaka 2010) This study explores the current state of metadata-creation practices across the digital repositories and collections by using the data collected from a nationwide survey of mostly cataloguing and metadata professionals. Results show that MARC, AACR2, and LCSH are the most widely used metadata schema, content standard and subject-controlled vocabulary, respectively. Dublin Core (DC) is the second most widely used metadata schema, followed by EAD, MODS, VRA, and TEL.

(Chen and Reilly 2011) This article demonstrates the development of the preservation metadata strategies at the University of Houston Digital Library (UHDL) and the preservation of Metadata Encoding Transmission Standard (METS) records generated from customized "7train" based on Dublin Core (DC) descriptive metadata and NISO Metadata for Images in XML Schema (MIX) technical metadata using two open-source software tools (JHOVE and 7train).

(Muriel & Riley, 2014) This book Metadata for digital resources: implementation, systems design and interoperability is forward-thinking in its approach to using metadata to the drive digital library systems, and will be a valuable resource for those creating and managing digital resources.

(Carlos, Olga, & Patricio, 2017) This paper briefly surveys the standards and protocols relevant for digital data preservation. The area of digital data preservation repositories has several open source solutions, which can form the base to overcome the challenges to reach mature and reliable digital data preservation.

Summary

From the literature review it is recommended that, the standards and protocols are for digital data preservation. The MARC, AACR2, and LCSH are the most widely used metadata schema, content standard, and subject-controlled vocabulary, respectively. Dublin Core (DC) is the second most widely used metadata schema, followed by EAD, MODS, VRA, and TEL. The book Metadata for digital resources: implementation, systems design and interoperability by Muriel, Foulonnneau; Riley, Jenn is forward-thinking in its approach to using metadata to drive digital library systems, and will be a valuable resource for those creating and managing digital resources.

2.12 Digital Library Challenges

(Veltman, 2005) While a precise forecast for the next decades is clearly impossible, some major challenges that need to be addressed in the next 10-20 years can be identified. Technologically there will be a shift from the Information and Communication Technologies (ICT) to the Universal Convergence Technologies (UCT). In the cultural realm, these challenges include problems of repositories, the changing scope of cultural heritage.

(Vasileiou, Rowley, & Hartley, 2012) The E-book management in academic libraries is examined, and a framework of the stages in the e-book management process is generated. The stages in the framework are: collection development policy, budget, discovery, evaluation and selection, license negotiations, cataloguing and delivery, marketing/promotion, user education, monitoring and reviewing, and renewals and cancellation.

(Voogt, Erstad, Dede, & Mishra, 2013) This article elaborates on the competencies, often referred to as 21st century competencies that are needed to be able to live in and contribute to our current society. We begin by describing, analyzing and reflecting on international frameworks describing the 21st century competencies, giving special attention to the digital literacy as one of the core competencies for the 21st century.

(Rinehart, Prud homme, & Huot, 2014) This paper details how Milner Library digital preservation advocates have approached the task by seeking collaborations, speaking to administration, participating in national efforts and starting with small steps. This study is based on a case study method. This paper reviews basic misconceptions about and challenges with the digital preservation. Many smaller or mid-sized institutions are left out of the digital preservation conversation because they cannot begin to meet the national standards with restricted resources.

(Tella 2016) Information Seeking Behaviour and Challenges in Digital Libraries This book addresses the challenges faced by the professionals in information management, librarians, developers, students of library science, and policy makers.

Summary

It has been observed from the review of literature that, the digital library faced challenges which are technologically there and will be a shift from the Information and Communication Technologies (ICT) to the Universal Convergence Technologies (UCT). The collection development policy, budget, discovery, evaluation and selection, license negotiations, cataloguing and delivery, marketing/promotion, user education, monitoring and reviewing, and renewals and cancellation and digital literacy. Many smaller or mid-sized institutions are left out of the digital preservation conversation because they cannot begin to meet national standards with restricted resources.

2.13 Digital Library Framework / Architecture

(Lopez and Larsgaard 1998) In this paper, digital libraries, a new form of networked organization, are examined. Suitable organizational frameworks are necessary to develop and sustain the digital library initiatives and to use them most effectively. This paper assumes that today's information network, in the broadest sense, will form the environment for tomorrow's organization. The core management needs of a digital library are discussed.

(Tebbells 1999) This overview provides a framework for examining the complex infrastructure necessary to successfully implement the digital library. Adding records to the library's database from a variety of sources, electronic data exchange in acquisitions, and options for full text document delivery are but a few of the functions now available through library systems. The elements necessary to support the interactive and dynamic nature of the digital library are discussed, database development, OPACs, networking, hardware and wiring, licensing, authentication, and security.

(Frew 2000) Since 1994, the Alexandria Digital Library Project has developed three prototype digital libraries for georeferenced information. This paper describes the most recent of these efforts, a three-tier client-server architecture that relies heavily on a middleware layer to present a single uniform set of interfaces to multiple heterogeneous servers.

(Bertot 2002) The article provides insights into the Maryland Digital Public Library (MDPL) planning, management, and implementation requirements for such an undertaking that can apply to both individual public library digitization projects as well as regional and state-wide digitization efforts. The article offers a framework for creating a state-wide digital public library, identifies issues, and makes recommendations that public libraries, state library agencies, and others should consider when considering the development of digital public library content and services.

(Gonçalves 2007) In this article, the author elaborates on the meaning of quality in digital libraries (DLs) by proposing a model that is deeply grounded in a formal framework for digital libraries: 5S (Streams, Structures, Spaces, Scenarios, and Societies).

(Abdullah 2008) The paper is of the significance in the field of collaborative digital libraries, since the perspectives and dimensions established from the framework comprehensively capture the user needs and context of use, and help ensure that everything relevant to the digital library enterprise is covered.

(Cervone 2008) The purpose of this paper is to provide an overview of the Information Technology Infrastructure Library (ITIL) framework and its relevance to digital library projects and operations. The use of the ITIL has been pervasive in the corporate environment, particularly in the UK. This paper fills a gap in the digital library management literature by exploring the applicability of the ITIL framework as a means for more effectively developing and delivering services in IT organizations that support digital libraries.

(Morgan 2008) This article describes a digital library framework and toolkit called MyLibrary. At its heart, MyLibrary is designed to create relationships between information resources and people. To this end, MyLibrary is made up of essentially four parts: (1) information resources, (2) patrons, (3) librarians, and (4) a set of locally defined, institution-specific facet/term combinations interconnecting the first three.

(Lampert and Chung 2011) This paper examines the challenges inherent in efficiently managing social media and user-generated content and discusses the various stakeholders involved in managing the increased day-to-day work these

initiatives create. Several strategies are suggested to help develop a flexible and supportive organizational framework that can effectively sustain and deliver on the promise of social computing.

(Cox and Sheila 2013) The purpose of this review is to examine the shaping of librarianship in the academic context through the literature of career specialties, with Abbott's (1988) system of professions providing an analytic framework. The specialties investigated are systems librarian, electronic resource librarian, digital librarian, institutional repository manager, clinical librarian and information's, digital curator/research data manager, teaching librarian/information literacy educator, and information and knowledge manager.

Summary

From the literature review it is observed that, today's information network, in the broadest sense, will form the environment for tomorrow's organization. The database development, OPACs, networking, hardware and wiring, licensing, authentication, and security are the essential entity for digital library framework. The Alexandria Digital Library Project has developed three prototype digital libraries for georeferenced information. In digital library framework 5S means (Streams, Structures, Spaces, Scenarios, and Societies). Information Technology Infrastructure Library (ITIL) framework means for more effectively developing and delivering services in IT organizations that support digital libraries. MyLibrary is made up of essentially four parts: (1) information resources, (2) patrons, (3) librarians, and (4) a set of locally defined, institution-specific facet/term combinations interconnecting the first three.

2.14 Building Digital Library

(N. Smith 2002) The article reviews the operation of the Copyright Amendment (Digital Agenda) Act 2000 in libraries, concentrating in particular on five areas: the 'reasonable portion' test; library document supply provisions (sections 49 and 50); intra-library networking (section 49 (5A)); protection from authorization liability (section 39A); and preservation copying (section 51 A). The article suggests that some further changes could simplify library procedures without adversely affecting the interests of copyright owners.

(Saikia and Eqbal 2003) The article highlights the violation of copyright law that is very easy during the information and communication technology era. But it is not fair because of this the government throughout the world has to review their copyright act to protect the right of creator, Author etc.

(Besek 2003) This paper describes copyright rights and exceptions and highlights issues potentially involved in the creation of a non-profit digital archive.

(Varatharajan and Chandrasekhara, Digital Library and Interoperbility : A General Perspective 2006) This paper discusses about the Digital Library and its importance in interoperability while sharing a piece of information in the networked digital library environment, different kinds of interoperability, their challenges and use, etc.

(Reddy 2012) The paper initially describes cloud computing and analyses the current status of cloud computing in the digital library. Then it proposes the architecture of cloud computing in the digital library and summarizes the application of cloud computing in digital library. Finally the author brings out the future improvement in digital library using cloud computing technology.

(**Waghchoure 2012**) The study is about the College of Education libraries in Maharashtra state. The main finding of the study is to find out the present services used in the library, the impact of information communication technology, the status of library automation, internet accessibility use of E-Resources and initiatives of digital library among the student, faculty and librarian of College of Education in Maharashtra state. The researcher has developed a model library for college of Education for the Maharashtra state. This thesis is very helpful for the understanding of the digital library concept, impact of ICT on the library, Networking of the library and changing the role of traditional library to a digital library.

(Shuva 2012) This paper describes the study of building digital libraries in Bangladesh. The author explains the problem and challenges faced during the digital library system development. He proposes one possible approach to build an effective digital library system in Bangladesh.

(Salanje, 2012) This paper views the digitization in Malawi Libraries which includes the processes of scanning and creation of collections using Open source software such as Greenstone, DSpace, Endnote and Electronic Records and Management System etc.

(Nguyen and Chowdhury 2013) The research reported in this article aims to find the core topics and subtopics of DL research in order to build a knowledge map of the DL domain. A knowledge map covering 21 core topics and 1,015 subtopics of DL research which are highlighted in the topic.

(Chakrabarti, 2016) The present paper presents the symbiotic relationship between the libraries and social media for the creation of digital environment in the LIS domain. It is noted that 21st century librarianship witnesses huge changes in the field of Library and Information science. As a result of which many changes in the LIS domain have altered the forms of information and nature of services but the basic role of the libraries-to cater to the information according to need and demand of the users is the same.

(Werla, 2017) The aim of this paper is to present experiences related to development and maintenance of LoCloud Collections platform (https: //locloudhosting. net), including the identified needs of small cultural institutions and features of the described platform. This platform was developed during EC-funded project and is running as a completely free production-quality service since 2015. It is currently being used by 40 institutions from 11 European countries. This service allows quick and easy creation of your own digital library.

(Tripathi, 2017) India has successfully documented the Traditional Knowledge Digital Library and it has successfully changed patents wrongly granted before patent offices. The present paper finds whether the digital documentation has erased the piracy and patenting of traditional knowledge has been stopped as on date. Further, indigenous knowledge is yet left to be documented and still no serious efforts have been taken so far.

Summary

It is observed from the literature review on the building digital library. The government throughout the world has to review their copyright act to protect the right of creator, Author etc. The information in the networked digital library environment has different kinds of interoperability challenges. It is observed that, in the 21st century, the librarianship witnesses huge changes in the field of Library and Information science. As a result of which many changes in the LIS domain have altered the forms of information and nature of services but the basic role of the libraries to cater to the information according to need and demand of the users-is the same. The model developed for college of Education for the Maharashtra state in the theses by Waghchoure is very helpful for understanding the digital library concept, impact of ICT on the library, networking of the library and changing the role of traditional library to a digital library and use of cloud computing technology.

2.15 Model of Digital Library

(Rowlands and Bawden 1999) This article presents an approach to a conceptual framework for understanding the concept of digital libraries. A typology of digital library research is described, based on Yates' model of information work, and comprising three interlinked domains: informational, technological and social. A conceptual framework for digital libraries, or complex libraries in Walt Crawford's (1999) terminology, is developed on this basis.

(Barton, 2003) This paper presents an overview of the methodology and results of the MIT Libraries business plan development project for DSpace (http://www.dspace.org/), MITs digital institutional repository. The introductory section includes a description of DSpace, the objectives of the business plan project, and the current status of the DSpace project. The methodology section explains the process and tools with which the business plan was developed. The remainder of the paper describes the results of the business plan project, including the DSpace service definition, the cost model, potential funding sources, and future DSpace plans.

(Xiaolin 2004) the author describes the Digital Resource Life Cycle model and the phased strategies of the Chinese Digital Library Standards project, explains the CDLS open metadata approach to accommodate multiple metadata and dynamic

fields, and explores the CDLS extended metadata mechanism within an open standards framework to meet the challenge of an open service environment.

(Jeng 2004) This paper reviews how usability has been defined in the context of the digital library, what methods have been applied and their applicability, and proposes an evaluation model and a suite of instruments for evaluating usability for academic digital libraries. The model examines effectiveness, efficiency, satisfaction, and learnability. It is found that there exists an interlocking relationship among effectiveness, efficiency, and satisfaction.

(Marcos, et al. 2007) In this article, the author elaborates the meaning of quality in digital libraries (DLs) by proposing a model that is deeply grounded in a formal framework for digital libraries: 5S (Streams, Structures, Spaces, Scenarios, and Societies)

(Allinson, Harbord, Leonard , Byrne, & Britcliffe, 2008) The purpose of this document is threefold. Firstly, it is a high-level reference model for the University of York digital library, offering both an overarching service framework and a technical infrastructure. Secondly, it offers a model for the set of functions, processes and information workflows that the digital library must support. Finally, through this it derives a set of specific technical, user and functional requirements for building and delivering a digital library service.

(Noguez-Ortiz 2010) To fully understand the digital library, one must grasp not only the concept and its features, but also relate it to the theoretical modeling and assessment concepts. The study of these two characteristics helps provide an understanding of how modeling theory and assessment models combine to yield the specific evaluation model for digital libraries.

(Shiwei, 2012) This paper sets out the outline of the three main features of the smart library: Interconnection, including comprehensive perception, three-dimensional connection and cooperation; Efficiency, including energy-saving and low-carbon, sensitiveness and integration; and Convenience, including full of wireless network, easy to reach and personalization.

(Singh & Veralakshmi, 2012) The article reviews that, till the 1970s, the Indian libraries were mainly dependent upon their own resources to meet their user's information needs. Then came an era of computerization where libraries started working in a collaborative manner being connected through networks or consortia to utilize the resources of participating libraries also. Now cloud computing is emerging as a new technology which is becoming popular for scholarly communications in different types of organizations, particularly in corporate organizations.

(Fedotoy, Zhizhimoy and Fedotova 2014) The paper describes a technological approach for developing a model of information system to support the scientific and educational activities, organized in the form of a digital library.

(Lai, Chiu, Huang, Chen, & Huang, 2014) The aim of this paper is to improve the service quality of the digital libraries (DLs) through an evaluation model for DLs' user interfaces. This evaluation model can provide a useful reference for existing DLs or relevant research.

S**ummary**

From the review of the literature on, Model of Digital Library, it is found that, to understand the conceptual framework the concept of digital libraries, a typology of digital library research is described, based on the Yates' model of information work, and comprising three interlinked domains: informational, technological and social. MIT Libraries business plan development project for DSpace. Digital Resource Life Cycle model and the phased strategies of the Chinese Digital Library Standards project, explains the CDLS open metadata approach to accommodate multiple metadata and dynamic fields, an evaluation model and a suite of instruments for evaluating usability for academic digital libraries. The model examines effectiveness, efficiency, satisfaction, and learnability. There are three main features of the smart library: Interconnection, including comprehensive perception, three-dimensional connection and cooperation; Efficiency, including energy-saving and low-carbon, sensitiveness and integration; and Convenience, including full of wireless network, easy to reach and personalization. Now cloud computing is emerging as a new technology which is becoming popular for scholarly communications in different types of organizations, particularly in corporate organizations.

2.16 Conclusion

The researcher has presented each and every topic and subtopic systematically. The literature on digital library is so vast and wide because of that selected review which are helpful for the subject are taken in to account. The literature review focus on the most recent development in the digital library fields. Logical arrangement of the topic and subtopics are helpful to know the subject scientifically. The issues concern with the digital library software, hardware, infrastructure, conceptual framework for building digital library, model of digital library and the challenges faced by the digital libraries are known from the review of literature. The next chapter deals with digital library: An overview which deals with theoretical aspect of digital library.

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CHAPTER- 3
DIGITAL LIBRARY: AN OVERVIEW

3.1 Introduction

In the present chapter a detailed study for digital library is carried out with the evolution of digital libraries, component of digital library, technical infrastructure for digital library, application software for functioning of digital library, standards and protocol, conceptual model, Open Archival Information System (OAIS) and reference model.

Traditional methods of collecting, storing, processing and accessing information have undergone a massive transformation due to the growth of virtual libraries, digital libraries, online databases libraries and information networks. Digital technology, internet connectivity and physical content can now be dovetailed, resulting in a digital library **(Varatharajan & Chandra Shekara, 2007).**

In a digital library specific searches have produced more useful results, save user's time and effort in searching and users can access the information quickly. Digital library is a very complex and dynamic entity. It has brought phenomenal change in the information collection, preservation and dissemination scene of the world.

3.2 Evolution of Digital Libraries

The History of digital library is not a single entity. It is combination of development of computer technology, information of retrieval system (IRS), information storage and Information and communication technology and development of World Wide Web (www) technology.

John Mauchly and J. Preseper Ecket built Electronic Numerical integrator and Calculator (ENIAC I) at the University of Pennsylvania. It had over 18,000 vacuum tubes, weighed thirty tons and was housed in two stories of a building. On 23rd December 1947 at bell laboratory the vacuum tube is replaced by transistors, which will help to reduce the size of the computer and at the same time increases the speed and capacity of the computer.

Then came up the Universal Automatic computer (UNIVAC). This was the first computer that used transistor. It was used at the US Bureau of the census from 1951 until 1963 which was designed by J. Presper Eckert and John Mauchly.

The First microprocessor used in a PC was Intel 8080 in 1974. It was a complete 8-bit microprocessor on a single chip. Intel 8088 used in the IBM PC in 1979, was the first microprocessor that made its presence in the market. Know the PC market moved from the 8088, 80386, 80486, Pentium, Pentium-II, III, IV and now to Intel Dual Core and presently we are using Quad Core.

Like microprocessor technology, digital storage technology devices have also witnessed notable reduction in its size and cost with enhancement in storage capacity. They are of two types first one is **removable data storage devices** and another is **Non- Removable Data Storage devices.**

The Magnetic Storage media was the invention of Valdemar Poulsen in 1898. Three billion (or three gigabits) of data per square inch can fit on a single magnetic disk. Hard discs, floppies, tapes, cartridges etc. are examples of Magnetic media.

The first optical storage media called the compact disc was introduced in 1982. Two version of CD-ROM were released in 1988 are CD-R and CD-RW which is having 700 mb storage capacity. Digital video Disc (DVD) was introduced in 1996, DVD-R was released in 1997. DVD+R was released in 2002 the storage capacity was 4.7GB.

Invention of metal-oxide semiconductors- based on storage devices, popularly known as pen drives or UBS drives for flash memory devices were patented in 1999 by IBM. Kingston Technology Company has released 3.0 USB Flash drives in 2013 with 1TB Capacity **(Kingston Technology Company, 2014).** Library influenced by storage systems.

Online database and Information Retrieval System DIALOG 1967, Evolution began in mid-1970 and late 1970s. IBM's Storage and information System (STRIRS), Battelle Automated Search information System (BASIS), INQUIRE, BRS/SEARCH, DOCU/MASTER, ASSASSIN, STATU, CAIRS etc. Micro CDS /ISIS advanced non-numerical information storage and retrieval software, database

Management System (DBMS) such as Ingres, Microsoft Access, MS-SQL Server, MS Fox pro, MYSQL, NOSQL, Oracle, Postgres, SqLite and Mongo DB etc**.**

Digital imaging Technology developed in 1965's and 1970's. The first digital image was produced in 1920. Charge coupled device in 1969 at AT & T Bell Labs by Boyle and George E. Smith., Digital document imaging system, which employ computer hardware and software to scan and store images of documents in digitized formats.

Institutional repositories and service providers to harvest metadata from growing number of IRS. Major Catalytic initiatives are OAI- compliant, open source Software for IRS. Publisher's response to IRS Open Access Movement. 2002 Budapest Open Access initiative (BOAI) launched by the open Society Institute. 2002 Project ROMEO and project SHERPA launched. In 2003 mandating deposition of articles by faculty in open access repositories in the universities of Southampton Department of Electronic and computer Science. Some of the important OAI complaint Open Access Software are Eprint (Southampton University, 2000), SDS ware (CERN, 2002), Dspace (MIT, 2002), FEDORA (University of Virginia and Cornell University, 2003).

During 1991's brought a true revolution in digital library system due to advent of **World Wide Web (www)**, which offered a crucial advantage with the availability of ready to use publicly available, user friendly graphical web browser for all prevalent platforms. Browsers are being upgraded regularly to added functionality such as email, client support for JAVA and Active X and the ability to view important document formats without having to install plugins for them. These browser solved the maintenance problem allowing developers to concentrate fully on the server side and not to other with the client side. Development of web by Berner-Lee at CERN Laboratory.

In 1964 Machine Readable cataloguing (MARC) came. During 1970 formation of union catalogues through library networks. Online Search services like DIALOG, ORBIT, BRS Search and datastar in USA, BLAISE and Pergamon Infoline in UK, DIMDI in Germany. Euronet and Diane in Europe, ESA-IRS in Italy and CAN/OLE in Canada were also made accessible online to the research community.

During 1980 Bibliographic and full-text databases on CDROM has come. Such as DIALOG and STN. During 1990 emergence of internet and World Wide Web (www). Publisher started using the internet as a global way to offer their publications to international community.

The term digital library has received popularity in recent years, they have evolved along the technological ladder for the past thirty years. In the early 1970s, digital libraries were built around mini and main-frame computers providing remote access and online search and retrieval services to online databases using computer and communication technology available at that time.

The creation and remote accessibility of online databases through information retrieval system (IRS) can be considered as an important landmark in digital libraries history. Therefore history of variety of different types of information systems and technologies that have been considered as "digital libraries".

The First joint initiative of the National Science Foundation (NSF), Department of Defense Advanced Research Projects Agency (ARPA) and the National Aeronautics and Space Administration (NASA) in 1994, funded six digital library development projects for a period of four years, among six academic institutions. The second was the signing of the National Digital Library Federation Agreement in May 1995, led by the Library of Congress and 14 other research libraries. Its purpose was to "bring together from across the nation and beyond digitized materials that will be made available to students, scholars and citizens everywhere". (Arora, Digital Library, 2016)

3.3 Definitions of Digital Library

There are many definitions described by different experts, some of them are mentioned below

1) "An informal definition of a digital library is a managed collection of information, with associated services, where the information is stored in digital formats and accessible over a network" **(William Arms).**
2) **Borgman (1992**) emphasized that digital libraries should not be viewed only as a point of access to digital information, but as a combination of -

- Services;
- an architecture;
- a set of information resource, databases of text, numbers, graphics, sound, music or animation, etc.; and
- a set of tools and capabilities to locate, retrieve and utilize the information resources available.

3) **Marchionni and Fox (1999)** identified the following four dimensions of digital libraries:

- **Community**: Reflects social, political, legal and cultural issues.
- **Technology**: Includes technical progress in computing, networking, information storage and retrieval, multimedia, interface design, etc.
- **Services**: Includes present and future services, personalization, digital reference services, real-time question answering, on-demand help, information literacy and user involvement mechanisms.
- **Content**: Represents all possible kinds of forms and genre of information, printed as well as digital.

4) **Kumar & Rao (2014)** in their study defined digital library "as an organized and focused collection of digital objects, including text, images, video and audio, with the methods of access and retrieval and for the selection, creation, organization, maintenance and sharing of collection".

It is critical that digital libraries provide an organized and structured access to information contents in a distributed environment and assist users in searching, evaluating and utilizing resources irrespective of their format.

3.4 Benefits of Digital Library

The following are the Benefits of digital library (Subramaniam & Bharani)**,** because of that, digital libraries becoming popular day by day.

a) Digital Library brings the library to the user.
b) Digital library improved access such as searching and browsing.
c) Information can be shared more easily in digital library.
d) In digital library it is easier to update information quickly.
e) Information is always available 24 x 7.
f) New forms of information become possible.

g) Wider access.
h) Allow collaboration and exchange of ideas.
i) Digital libraries may save money.
j) Digital library improve preservation process.

3.5 Need of Digital Library

According to (Senthil Kumar, 2012) Time is a major factor for each modern user of the library and digitization is the only solution to the problem. Digital libraries are needed to provide quality based service at the users' doorstep. In general digital libraries are needed for the following reason.

a) Graphical information system of digital libraries is easy to understand.
b) Users of new generation becomes only happy when they will be able to read from the screen it means there is change in the environment.
c) Multiple function of same information is possible due to hypertext solution.
d) Digital library can easily handle the problem of information explosion.
e) Digital library can easily retrieved information specifically E.g. Text, image, photo, etc.
f) Distance learning from home, office or other remote places is possible due to digital library.
g) To procure online information and publication is possible due to digital library technology.

3.6 Advantages of Digital Library

A digital library (Singh & Yakkaldevi, 2014) is not confined to a particular location or building. It is virtually distributed all over the world. The user can get required information on his own computer screen by using the internet connection.

a) Digital library need not have any physical boundary it is available throughout the world due to internet connection only.
b) Digital libraries are available round the clock.
c) Digital libraries have multiple access.
d) Digital library has structured approach.
e) Digital library provide very user friendly interfaces**.**
f) Preservation and conservation are the most important aspect of the digital library.

g) Digital library saves the space.
h) Digital library access the information seamlessly because of networking.
i) Digital libraries are cost effective and economical.

3.7 Disadvantages of Digital Library

According to (Singh & Yakkaldevi, 2014) The computer viruses, lack of standardization for digitized information, quick degrading properties of digitized material, different display standard of digital product and its associated problem, health hazard nature of the radiation from monitor etc. makes digital libraries at times handicap.

a) Digitization violates the copy right law easily.
b) Speed of access decreases due to number of connection are increasing.
c) The infrastructure cost of digital library is very high.
d) Digital library need high band for transfer of multimedia resources.
e) Finding the right material is very difficult.
f) Digital libraries cannot reproduce the environment of a traditional library.
g) Because of technological developments digital library can become out of date very rapidly.

3.8 Limitations of Digital Library

According to (Subramaniam & Bharani) Digital Libraries are not without their limitations at least for the time being. The very large volume of print material that already exists and the comfort attached to reading from print material, means that print and digital material are going to co-exist for a very long time to come. Following are some of the limitation that facing digital libraries today.

a) The major risk to digital objects is not physical deterioration, but technological obsolescence in the hardware.
b) In digital library a more serious problem is software obsolescence.
c) Digital preservation will be an ongoing operation, requiring considerable recurring expense.
d) Enforcing copyright in digital environment is a major issue.
e) The key issue in digital library is that of inter-operability working with different digital libraries.
f) Due to information explosion network bandwidth became a major issue.

3.9 Characteristics of Digital Library

As per (Dass & Yadav, 2011) Digitization has benefits beyond improved accessibility. Institutions can protect originals from excessive handling and repeated copying; digitization can be a preservation strategy for the institutes. The different characteristics of a digital library are as follows:

a) Digital library able to handle large collection very quickly.
b) Both digital and non-digital information material will have to coexist due to technology.
c) Digital library consist of work oriented perspective focusing on group of information analysts, work being done and the documents and technologies also support it.
d) Trans bordering of information flow from one country to another is possible due to information communication technology.

3.10 Planning for Digital Library

The digital library planning and implementation has the following steps:

- Selection of content / document to be added to the digital library collection.
- Digitize the content in appropriate digital format.
- Assigning metadata to the digital documents added to the collection.
- Indexing and storage of documents and associated metadata for enabling its efficient / effective search and retrieval
- Assign a unique identifier to each digital object available in a digital library.
- Developing a web-based interface to enable browsing, searching, retrieving and viewing the contents of the digital library.

3.11 Requirement for Digital Library

Before establishing a digital library, it is essential to find out its requirement and purpose. Its need and relevance, targeted community of users and the process involved in building of digital library need to discuss clearly. It must clarify the following question for creation and building digital library.

- What type of resources are required for digital library?
- How will be digital library grow in future?
- Who is going to use digital library?
- How can resources be protected.
- How to access digital library?
- What systems does digital library need to interact with?
- What are special capabilities doe's digital library need?
- What resources will be required to create and maintain digital library?

Answers to these questions clarify the digital library functionality. Required key players and expertise that in necessary to create digital library. The availability of financial and technical know-how would finally determine the successful execution of a digital library project, overall vision and its articulation is the foundation stone for building a digital library.

3.12 Feasibility Study

(Arora, Digital Library, 2016) At the time of planning and before implementation of a digital library, it is necessary to conduct a feasibility study of the digital library project. The feasibility should be established not only in terms of availability of tools and expertise, but also other factors like volume / numbers of documents, target audience, demand for material to be digitized and user's expectations and requirements. The study should also assess whether the library can take up the project in house or should it be out sourced to external vendors.

3.13 Digital Library Implementation

Digital Library implementation phase consist of serval steps that are follows (Smith, 2001)

- Establishing the digitization team.
- Setting up the information technology infrastructure.
- Procuring and installing digital library software packages.
- Finalizing policies and specifications.
- Completing arrangement of workflow for digitization.
- Creating the online digital library collection.
- Obtaining copyright permissions and

- Providing access to the digital library collection.

3.14 Components of Digital Library

Digital library is collection of different system and resources connected by a networks. (Arora, Major componet of digital library) Number of components which are required for creation of digital library can be divided into six categories which are shown in the following figure 3.1

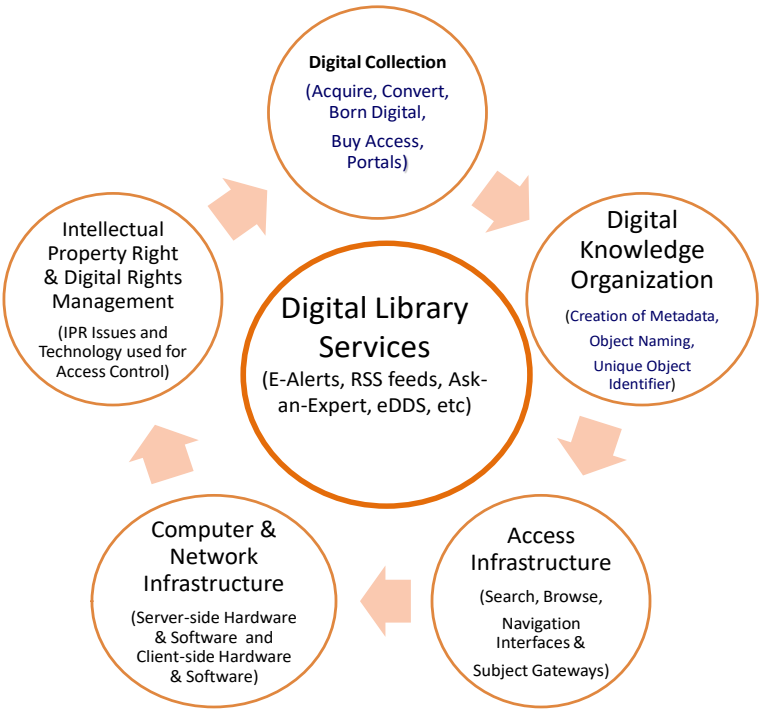


Figure 3.1 Components of Digital Library

a) The collection infrastructure consist of two important component i.e. metadata and digital object which holds a digital library.

b) Digital knowledge organization consists of structured / unstructured text, numeric data, scanned images, graphic, articles in a journals, as chapters in a book and other multimedia objects. The digital libraries are built around the web. The process of organizing digital objects is as follows:

- Development of metadata schema.
- Assigning different kind and level of metadata to each digital object.
- Assigning unique object Identification to each digital object.
- Linking digital objects with associated metadata to facilitate their browsing, searching and navigation.

- Organizing digital object in building browse, search and navigation interfaces.

c) Access Infrastructure for digital libraries consist of :

- Browse, search and navigational interfaces for individual libraries.
- Specialized indices for specialized local collections.
- Portal of subject gateways for web resources.
- An integrated interface for all e-resources accessible to a given library including library OPAC etc.

d) Computer and Network Infrastructure consist of following elements

- A digital library consists of client's server environment.
- Hardware and software components at server and client's side
- Server hosts databases.
- Digital objects browse search and navigation interfaces to facilitate its access.
- Client machines are used for accessing digital library.

e) For digital library intellectual property rights management is mandatory.

f) Digital library services are given as follows :

- E-mail alerts.
- RSS Feed.
- Ask-an- Expert.
- Electronic document delivery services.
- Web based user's education.
- Digital reference services.
- Real time reference service.
- My setting.

3.15 Technical Infrastructure of Digital Library

For establishing a digital library software, hardware and network components are required. Readymade or monolithic systems are not available for digital library. It is combinations of various components. These components are connected through network. The use of open architecture, standard and protocols will help to build digital library.

The some of the components required for establishing a digital library would be internal to the institutions, but several others would be distributed across the internet, owned and controlled by a large number of independent players. The task of

building a digital library, therefore, requires a great deal of integration of various components **(Flecker D., 2000).**

The storage capacity of a digital library is also important factor. A typical digital library in a distributed client-server environment consists of hardware and software components at server side as well as at client's side.

3.15.1 Server-Side Hardware Components

A servers is the heart of a digital library. Server for digital library should be powerful. It should have adequate main memory (RAM) to handle the expected work, have large amount of secure disc storage for the database and digital objects. Another important factor is network bandwidth for communication requirements. A digital library may needed a number of specialized servers for different tasks so as to distribute the workload onto different servers. It would require one or more object server(s) to store digital objects and other multimedia objects, an index server that maintains indices and support searching of data stored in a distributed system. The rights management system to take care of unauthorized usage and intellectual property rights. The following are the hardware component which are required for server

- Server with high capacity hard disk.
- Latest PCs (Touch Screen monitor).
- Capture devices such as scanners (Flatbed Scanner), digital cameras, OCR, data compression devices.
- Storage devices for backup.
- Printers.
- High power UPS.
- Secondary storage devices such as CD-ROM (R and RW), DVD ROM, Blue Ray or opto-magnetic devices (The digital library collections that are too large to store entirely on a disk use hierarchical storage mechanisms HSM).
- High speed LAN and WAN.
- Internet connectivity (devices such as switches, routers, hubs, repeaters, modems).
- Network.

3.15.2 Server-Side Software Components

The software required for a digital library broadly classify into the following two categories such as for content creation and for the operation.

I. For the content creation following are software required such as

- Adobe's Photoshop.
- Open source GIMP (GNU Image Manipulation Program) provides image enhancement features like filters, tonal reproduction, colour management, touch, crop, image sharpening, contrast, and transparent background.
- ABBYY Fine Reader, Acrobat Capture has an OCR built into it. For converting digital material into PDF requires Acrobat Software Suite.
- Optical Character Recognition (OCR) such as Scansoft, Omni Page Professional and ABBYY Fine Reader.
- Scanning Software.
- Adobe Acrobat Reader.

II. The Software Components Required for Operation of Digital Library

The following are the software components which are essential for digital library.

- Server Operating system such as UNIX, Linux.
- Apache's http or Microsoft's Internet Information Server (IIS). The organization of digital objects with associated metadata.
- RDBMS package like Oracle, MySQL, MS SQL, PostgreSQL or NoSQL packages, Cassandra and MongoDB.
- Web server.
- Desk top operating system.
- Optical Character Recognition (OCR) software.
- PDF converter.
- Scanning software.
- Firewall and Protection Software.
- Library software for cataloguing and searching digital resources.
- The database management software provides structured storage and retrieval facilities to the contents of a digital library.

- Search engine connected to a DBMS to support searching of digital objects stored in it.
- Windows-NT Networking software SQL Server Software, Data Base Management Software.
- Web-designing Software such as JAVA, Front page, XML etc.
- Storage software's such as CD-read / write Software.

III. The Digital Library Application Software

The digital library application software's are of two types such as open source software and commercial software which are required for setting up digital library, which are discussed below

1. Open Source Software Dspace

Dspace **(www.dspace.org)** was developed in partnership between Hewlett-Packard (HP) and MIT (Massachusetts Institute of Technology) and being maintained by DuraSpace foundation. Dspace, as institutional repository software, is making its mark with an increasing number of institutions around the globe installing, evaluating and using the package.

2. Greenstone Digital Library (GSDL)

The Greenstone Digital Library Software is produced by the New Zealand Digital Library Project at the University of Waikato and distributed in cooperation with UNESCO and the Humanities Library Project. It is open-source software, available from **http://greenstone.org** under the terms of the GNU General Public License.

It is software for creating, building, managing and distributing digital library collections. It is available for both windows and LINUX operating system. It requires PERL software to build collection.

3. GNU E-PRINTS

E-Print is an open source digital library software package designed primarily to create institutional repositories. It was developed at the Electronics and Computer Science Department of the University of Southampton. GNU E-Prints is freely distributable and subject to the GNU General Public License. The latest version is 3.3.12 and is available for download **(http://files.eprints.org/).** This software works

on LINUX operating system and needs MySQL, Perl modules and Apache web server.

4. CONTENTdm

From OCLC is a multimedia software suit that provides easy loading, management and access to media archives in a library. This software helps to build showcase and to preserve digital collection. The software provides tools to assist with every phase of collection development. One can start small with a few items or CONTENTdm can handle databases with millions of objects (https://www.oclc.org/en/contentdm.html).

5. FEDORA

Fedora (Flexible Extensible Digital Object Repository Architecture) repository system **(http://www.fedora.info)** is an open source, digital object repository system developed jointly by the University of Virginia Library and Cornell University and now being maintained by Dura Space Foundation. The Fedora project is devoted to the goal of providing open-source repository software that can serve as the foundation for many types of information management systems. The software shows that how distributed digital information management can be developed by using web-based technologies along with XML and web services.

6. ARNO

Academic Research in the Netherlands Online, Tilburg University (http://www.uva.nl/arno).

7. CDWare

CERN Document Server Software (CDSWare), CERN, Geneva, Switzerland (http://www.cdsware.cern.ch/)

8. I-Tor

Tools and Technologies for Open Repositories.

9. MyCoRe

Essen University library, University of Duisburg-Essen, Germany (http://www.mycore.de/eng/indes.html/).

10. ROADS

This software is a programme developed in the setting up and day to day running of www based catalogs of online resources. It works on UNIX operating systems with HTTP apache web server and Pearl language.

11. SITESEARCH

This software developed by OCLS which provides solution in managing distributed library and information resources in a www environment. It work on both Windows NT and UNIX operating system.

A) Commercial Digital Library Software's

There are serval commercial digital library software's that are available today. Some of them are

1. ENCompass of Endeaver Information System (http://www.endinfosys.com/).
2. Digi Tool of ExLibris (http://www.exlibris.co.it).
3. Visual MIS(Multimedia and imaging Solutions) of VTLS (http://www.vtls.com).
4. TEMS of Artesia Technologies (http://www.artesia.com/).
5. Muse Search of Muse global, Inc. (http://www.museglobal.com).

3.15.3 Client-Side Hardware and Software Components

Clients are the machines that reside on the user's desks. Most of the digital libraries require an Internet-enabled multimedia PC (or Macintosh) or a tablet equipped with an Internet Browser such as Internet Explorer, Mozilla Firefox or Google Chrome as their clients.

3.16 Digital Libraries and Cloud Computing

The cloud computing means use off-site computer processing power to replace content creation and servers that were traditionally hosted onsite. In layman's terms, this means "using web services for our computing needs" (Kroski, 2009). Cloud computing allows content creation to be made "when data and software applications reside on and are drawn from the network rather than locally on any one workstation". By utilizing online applications, users can create and save their files online, share content, work collaboratively with others or create entire services that can all be accessed online without need of having the programs on their own computer.

3.17 Key Components : Digital Library Architecture and Design

The digital libraries have their own underlying design and architecture. Most digital library architectures provide for the five key components such as User interfaces, Digital Repository, Digital object naming service (Unique Identifiers), Index Services and Search System and Content delivery which is shown in figure 3.2

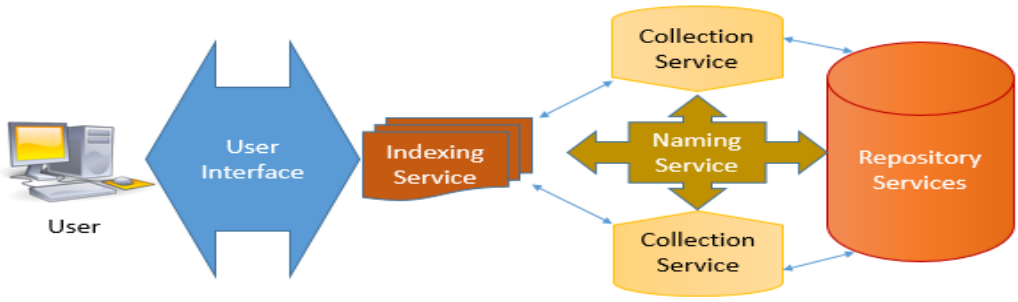


Figure 3.2: Key Components of a Digital Library Architecture

3.17.1 Digital Library Models and Architecture

The following are some of the important digital library architectures which are discussed shortly.

3.17.1.1 Kahn-Wilensky Architecture

Kahn and Wilensky (1995) defined a general-purpose framework for a distributed digital library consisting of a very large number of digital objects comprising of all types of material accessible over the networks. Kahn and Wilensky defined the basic entities stored, accessed, disseminated and managed in distributed digital repositories. Introduction of naming conventions for identifying and locating digital objects in digital repository was one of the most important contributions of this framework.

3.17.1.2 Dienst and NCSTRL

The Dienst is one of the first digital libraries architecture based on three basic principles of a distributed digital library system, i.e. open architecture, federation and distribution (Davis & Lagoze, 2000).The Developed by the Digital Library Research Group at Cornell University, the Dienst model was implemented in the “Networked

Computer Science Technical Research Library (NCSTRL; www.ncstrl.org)".The NCSTRL has more than 150 participating institutions and 20,000 digital objects.

3.17.1.3 CRADDL

Developed by the Digital Library Research Group at Cornell University, the Cornell Reference Architecture for Distributed Digital Libraries (CRADDL) is component or service based digital library architecture. The CRADDL offers the five basic services (Lagoze & Fielding , 1998) which includes Repository Service, Naming Service, Indexing Service, Collection Service and User Interface Service. FDBS Architecture and the NSDL.

3.17.1.4 The NDLTD: Federated Digital Library Design

The NDLTD is another example of digital libraries based on loosely coupled Federated Database System (FDBS). The Networked Digital Library of Theses and Dissertation (NDLTD), the digital library of theses and dissertations of masters and doctoral students from various universities in the USA and around the globe has adopted a federated design approach. (Fox, 2001)**.**

3.17.1.5 Common Object Request Broker Architecture (CORBA)

Common Object Request Broker Architecture (CORBA) represents one of the widely known models of distributed object-oriented computing. The CORBA standards have been incorporated in the middleware of several commercially available network system products. The CORBA relies heavily on object-oriented and client-server technologies. It uses an open systems approach where digital library designers can implement the CORBA specifications in a variety of ways depending on their requirements. Applications of CORBA are platform-independent both at hardware and software level. Components of a digital library may be distributed among different servers.

3.17.1.6 Software Agents Architecture and UMDL

The University of Michigan Digital Library Project (UMDL) uses a proprietary architecture to support the federation of loosely coupled digital library collections and services. The core of the architecture is the concept of the software agents that is based on object technology. An agent is highly encapsulated module of software

representing an element of a collection or service with very specific capabilities. These software agents may dynamically team together to combine their capabilities to handle more sophisticated tasks such as the process of performing a complex search request (Ferrer, 1999).

3.17.1.7 Open Archival Information System (OAIS)

The OAIS Reference Model was developed by the Consultative Committee for Space Data Systems (CCSDS) targeted to digital preservation projects. It is a framework for understanding and applying concepts needed for long term digital information preservation. It is also a starting point for a model addressing non digital information. The model establishes terminology and concepts relevant to digital archiving, identifies the key components and processes endemic to most digital archiving activity and proposes an information model for digital objects and their associated metadata. The reference model does not specify an implementation, and is, therefore, neutral on digital object types or technological issues. The model can be applied at a broad level to archives digital image files, "born-digital" objects, or even physical objects (Sayer, 2001).

i) Preservation Description Information

The preservation description information consists of four major types of metadata elements, namely reference information, provenance information, context information and fixity information as mentioned below:

a) Reference Information

Reference information enumerates and describes identifiers assigned to the content information such that it can be referred to unambiguously, both internally and externally to the archive (e.g., ISBN, URN).

b) Provenance Information

Documents the history of the content information (e.g., its origin, chain of custody, preservation actions and effects) and helps to support claims of authenticity and integrity.

c) Context Information

The documents the relationship of the content information to its environment (e.g., why it was created, relationships to other content information).

d) Fixity Information

The documents authentication mechanisms used to ensure that the content information has not been altered in an undocumented manner (e.g. checksum, digital signature).

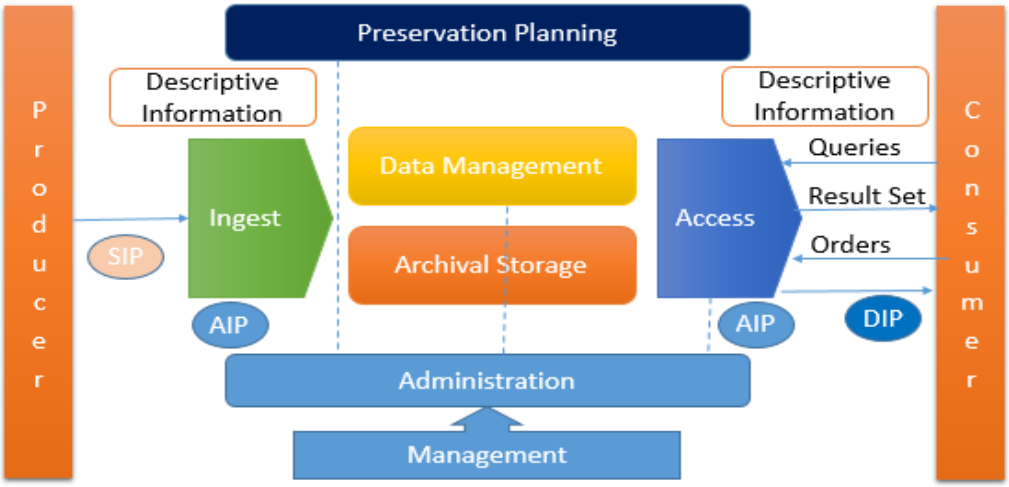


Figure 3.3: Open Archival Information System (OAIS) Model

3.18 Digital Library Protocols and Standards

The standards and protocols have a major role and importance in building a digital library. Communication protocols, bibliographic standards, record structure standards, encoding standards, information retrieval standards and digital preservation standards. Standards and protocols are the backbone of a digital library. Which is the pre-requisite for data transfer, exchange and interoperability amongst digital libraries.

The following are the important institutions and organizations which are actively involved in the development and promotion of standards relevant to digital libraries for example The Digital Library Federation (DLF), (http://www.diglib.org). The DLF operates under the administrative umbrella of the council of library and Information Resources (http://www.clir.org) located in Washington DC. The Library of Congress (http://www.loc.gov), play an important role in maintaining several key standards such as MARC, MARCXML, etc. The International Federation of Library Associations and Institutions (IFLA) maintain a gateway-IFLANET Digital Libraries, which has developed relevant standards **(http:// www.ifla.org).**

3.18.1 Communication Protocols

Control protocol / Internet protocol (TCP / IP), Hypertext Transfer Protocol (http) and file Transfer protocol (FTP) which are used by the internet for establishing communication between clients and servers in a digital library. http is the most important protocol used in the world wide web (www). The file Transfer protocol (FTP) is a protocol which is used for transferring files from one computer to another over LAN, MAN, WAN or internet.

3.18.2 Bibliographic Standards

Bibliographic standards are concerned with the description of contents as well as physical attributes of documents and non-documents in a library, Machine Readable Catalogue (MARC), Dublin core, BIB-1, TEXT Encoding Initiative (TEI), Electronic Archival Description (EAD), Metadata Encoding and transmission Standard (METS) Metadata Object Description Schema (MDDS) are the standards used for bibliographic description.

3.18.3 Record Structure

Record Structure mean the physical and logical structure of the record which holds the data. ISO2709 / Z39.2 are used for record structure.

3.18.4 Encoding Standards

The most digital library software supports ASCII as well as Unicode to support multilingual requirements.

3.18.5 Information Retrieval Standards

Z39.50 or ISO23950 Search / Retrieve Web Service (SRW) and Search / Retrieve via URL (SRU), Open Archives Initiatives. Metadata Harvesting Protocol (OAI-PMH), Open URL for information storage and retrieval. These protocol allow a client machine to search databases on a server machine and retrieve records that are identified as a result of search.

3.18.6 Formats and Media

Text based contents of a digital library can be stored and presented as (i) Simple text or ASCII (American Standard code for Information Interchange, (ii) Unstructured text and (iii) Structured text (SGML or HTML or XML). Page Description Language (PDL) is Adobe's Post Script and PDF page image formats that is TIFF, image PDF, JPEG etc.

3.18.7 Preservation Standards

PREMIS (Preservation Metadata implementation Strategies) and open Archival System (OAIS) are the preservation Standards.

3.19 Conceptual Model of Digital Library

(Arms, 2000) Explain a conceptual model of digital Library, which consists of four components such as Interface design, functional design, data and Metadata, computer system and networks.

Conceptual Model	Interface design
	Functional Design
	Data and Metadata
	Computer System and Networks

Figure 3.4 Conceptual Model of Digital Library

a) Interface design

This consist of appearance of screen, it also consists aspects such as font size, colour, logos, keyboard, control, menu and buttons.

b) Functional design

This specifies the functions that are offered to the user, which includes selecting parts of a digital object, searching a list or sorting results, obtaining help manipulating objects on the screen.

c) Data and Metadata

The data and metadata which are essential for searching an object.

d) Computer system and networks

These are pre-requisite of digital library, without it digital library can't came into existence.

3.20 Conclusion

Digital Library creation is complex process. It is combination of hardware, software and networking server and client and many more. Digital libraries are built around the internet and web technologies. Standards and protocols play vital role in the creation of digital library. Conceptual Model consists of Interface, functional design, data and metadata and computer systems and networks. Open Archival Information System (OAIS) is a Reference model which is the most preferred model for creation of digital library. The next chapter deals with Rayat Shikshan Sanstha and its digital library which deals with introduction to the institution and the development of its digital library

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CHAPTER - 4

RAYAT SHIKSHAN SANSTHA AND ITS DIGITAL LIBRARY

4.1 Introduction

Under the computerization project, the Rayat Shikshan Sansthah has completed the computerization of its head office and its affiliated institutions such as schools and colleges. By using the ICT based technologies. 42 college libraries are using centrally maintained Libreria Software developed by Maharashtra Knowledge Corporation Limited (MKCL), Pune. Most of the colleges are using N-list database developed by UGC-INFLIBNET Centre Ahmedabad. The The Rayat Knowledge Bank serves as a digital library for the Rayat Shikshan Sanstha.

4.2 The Higher Education System of India

India has one of the largest higher education systems in the world, before the independence in 1947 the growth rate of the educational Institutes in India was slow. But now (2014) there are 677 universities, 45 Central Universities, 318 State Universities, 185 State Private universities, 129 Deemed Universities, 51 Institutions of National Importance are established under the Acts of the Parliament under the MHRD (IITs-16, NITs-30 and IISERs-5) and four Institutions are established under the State Legislations. As on 31st March 2013, there are 37,204 Colleges in India. Higher Education is the shared responsibility of the Centre and the States. The coordination and determination of standards in Universities & Colleges is responsibility of the UGC and other statutory regulatory bodies. The Central Government provides grants to the UGC and establishes Central Universities / Institutions of National Importance in the country.

4.3 Higher Education in Maharashtra

(**Wikipedia** , 2017) In Maharashtra there is one central University, 23 state Universities and 21 deemed Universities are present. The University of Mumbai is the oldest university which is established in 1857. (Kakodkar, 2011) As per the 2007 statistics, published by the MHRD Government of India in 2010, Maharashtra has 3258 colleges. The total enrollment is 30.82 lakh students (The Higher and Technical Education , 2017) The Higher and Technical Education System in Maharashtra has grown into a fairly large sized system, offering opportunities for education and

training in a wide variety of trades and disciplines at certificate, diploma, degree, postgraduate degree and doctoral levels in institutions located throughout the state. As a result, Maharashtra is among the top states in the country in terms of number of colleges, student enrollments and admissions in Higher and Technical education in state.

4.4 The Rayat Shikshan Sanstha

The Rayat Shikshan Sanstha is one of the largest and leading educational organization founded by the Late Padma Bhushan Dr. Karmaveer Bhaurao Patil in1919, with the motto “Education through Self- help”. Its aim was to provide education to students who, had not got an opportunity due to caste, religion and economic status, the organization has its headquarters at Satara, in Maharashtra state.

Padma Bhushan, Karmaveer Dr. Bhaurao Patil and his wife Sou. Lakshmibai Bhaurao Patil are the idol of sacrifice, for the cause of education to the people who are poor, needy, down trodden and belong to the rural society. The University of Poona honored him with the Doctor of Literature (D.Lit.) and the Government of India with the Padma Bhushan. However, the people have known him as "Karmaveer" meaning, "hero in action”. The Rayat Shikshan Sanstha Administrative Setup at a glance shown in table 4.1 and Student and Employee in the Institution table 4.2

Table 4.1 The Rayat Shikshan Sanstha's Administrative Setup at a Glance

SR. No.	Sanstha's Number of Institutes	Central Region	South Region	North Region	West Region	Raigad Region	Number
1	Administrative Offices	3	1	1	1	1	07
2	Senior Colleges	20	7	7	4	4	42
3	Secondary Schools	129	84	123	68	34	438
4	Primary Schools,	9	4	10	12	06	41
5	Pre-Primary Schools	7	2	4	9	6	28
6	Training Schools for Teacher's	3	3	1	---	1	08
7	Hostels,	27	13	28	6	4	78
8	Ashramshalas,	---	---	3	---	5	08
9	Industrial Training Institute	---	1	---	---	1	02
10	Ancillary branches.	27	13	12	5	---	57
	Total Branches	**225**	**128**	**189**	**105**	**62**	**709**

(Reference Annual Report Rayat Shikshan Sanstha, Satara, 2014-2015 Page No. 38)

Table 4.2 Student and Employee in the Institution

SR. No.	Particular	Total Numbers
1.	Number of Student Studying in Rayat Shikshan Sanstha	4,59,729
2.	Number of Employee in Rayat Shikshan Sanstha	14,990

(Reference Annual Report Rayat Shikshan Sanstha, Satatra,2014-2015Page No. 101)

4.4.1 Projects Undertaken by the Rayat Shikshan Sanstha

The following are the projects which are undertaken by the Institution.

1. 'Education through self-help' was the principle of Karmaveer Bhaurao's educational philosophy. He introduced the concept of Earn and Learn scheme in his organization since initiation of the organization.
2. For computer education, Karmaveer Bhaurao Patil Institute of Information Technology was established at Satara (KIIT).
3. Karmaveer Vidya Prabodhini was established in 1974 with aim of quality education along with the quantitative growth and to enhance quality of teaching learning process.
4. Rayat Quality Management System (RQMS) was established for internal Evaluation of the system. For the preparation of NAAC and ISO 8000-9001 to acquire definite quality in the education and infrastructure facility etc.
5. Competitive Examination and Carrier Guidance Centre has established for the preparation to various examinations.
6. Panchayat Raj Training Centre was established in September 1962 to train the members of Grampanchayat, Sarpanch, Deputy Sarpanch, Women members, Gramsevaks, Anganwadi Sevikas etc. The institute covers the three districts namely Satara, Sangli and Pune.
7. Rayat Sevak Bank is a co-operative bank for the employees of the Sanstha. The bank has its independent status having 21 branches spread all over Maharashtra.
8. Rayat Seva Co-Operative Store was established in 1942 to provide stationery, sports material, journals and chemicals to supply quality material to its branches.
9. It has recently established incubation center to provide services such as management training or office space for development of a new business or company

4.4.2 Karmaveer Vidya Prabodhini and its Activities

The following are the activities which are run by the Karmaveer Vidya Prabodhini. The details of the activities are listed below, which is shown in table 4.3

Table 4.3 Karmaveer Vidya Prabodhini's Activities

SR. No.	Karmaveer Vidya Prabodhini	Activities in details
1.	Prabodhini Examination	Exam of English, Mathematics, General Knowledge for 5th to 12th standard.
2.	Rayat Talent Search	School Talent Search in Rayat Shikshan Sanstha Schools.
3.	Competitive Examination Guidance	M.P.S.C. and other competitive examinations preparation.
4.	Competitions	Elocution competition, Quiz Competition for High school and College student at state level.
5.	Cultural and Sport Activity	Cultural and Sports Academy
6.	Publications	• Trajectory is published biannually • Rayat Sevak Ank is published yearly. • Annual Reports yearly. • Career Guidance Ank yearly
7.	School for Failure	Established Pragati Vidyalaya
8.	Pre-recruitment Training	Military & Paramilitary
9.	Exhibition	Collection of various information, letter, photo of Karmaveer Anna and Sanstha.
10.	Archives	Audio / Video CD Pragati Vidyalaya Film Shahu Boarding Film Rayat Mauli Geet- Madhav Thorat a Marathi poet has composed-'Karna Lajun Vichari' Rayat Mauli Geet honouring life and work of Laxmibai. Rayat Geet-' Rayate Madhuni Navya Yugacha Manus Ata Ghadato Ahe'- composed by a great Marathi poet Vitthal Wagh remains the source of inspiration to the student of the Sansha. Ek Mahan Karmayogi
11.	Gurukul Project	For secondary schools, residential and non-residential
12.	NEET / JEE Guidance	for 11th and 12th Students
13.	Training Academy : Jagruti	Training institute for all Teaching and Non-teaching staff
14.	The Rayat Knowledge Bank	Institutional Repositary

4.4.3 Libraries of the Rayat Shikshan Sanstha

The library is a soul of every college. The books in the library enriches the depth of the knowledge of the students. With this view every library in the Sansthas is looked after, because of this, it has a variety of books. Keeping in a view the demand and need of the books recorded by the students, the books are made available to the libraries of the Sanstha. These include fiction, text books, reference books and periodicals. At present, 20, 38, 349 books are available in the 42 colleges run by the Sanstha.

4.4.4 Use of ICT in the Rayat Shikshan Sanstha

The Institution is making tremendous changes in its activities, due to globalization and liberalization. It emphasizes to use the new method and technology for imparting quality education, because of this the institution has actively started the process of adjusting with the new trends. The following activities have been adopted towards the path of digital era.

4.4.4.1 Computer Education

The Sanstha has introduced computer education in MS-CIT centers in almost all of the colleges. The Sanstha has set up the Karmaveer Bhaurao Patil Institute of Information Technology (KIIT) at Satara for computer education.

4.4.4.2 Office Administration

In the office administration the institution has been using the biometric attendance system for the employees. The account sections are using the tally software for accounting purpose. Linux operating system is used for office purpose. Use of CCTV for general security purpose. Most of the colleges of the institution are subscribing online database such as N-LIST database, delnet database etc.

4.4.4.3 Websites

The Rayat Shikshan Sanstha and its colleges are having their own websites which is self-explanatory, with inclusion of the library information.

4.4.4.4 Online Branch Information System

The Institution has developed a Management information system (MIS) software for collecting the online information from its various branches which are primary Schools, Secondary Schools, Junior Colleges, Senior Colleges, Engineering, MBA and others, which is shown in screen shot Figure 4.1



Figure 4.1 Online System of MIS in the Rayat Shikshan Sanstha

(Reference: http://rayatshikshan.edu/Content.aspx?ID=905&PID=3)

4.4.4.5 Mobile Apps developed by the Sanstha

The Rayat Shikshan Sanstha has developed the mobile apps / Android application, which are Rayat Shikshan Sanstha, ERayat2, Messenger, Rayat Live etc.

4.4.4.6 Online Admission System

Each and every college of the Institution is using the online admission system.

4.4.4.7 Library Automation

The Rayat Shikshan Sanstha's Management Authorities provided Libreria Software to each and every colleges libraries of the Sanstha's through MKCL Pune. 40 colleges of the Rayat Shikshan Sanstha are using the Libreria software. At present central server for the Libreria is at MKCL, Pune. Except the C.D. Jain College of Commerce, Shrirampur and S.S.G.M. College, Kopargaon are using different softwares such as SOUL and LIBMAN before the initiation of the Libreria Software.

The Libreria Software is an integrated library management system which is made up of modules such as the Masters, Book management, Accessioning, Circulation, OPAC, Cataloguing Reports, Assign Role. The MKCL Pune and the Rayat Shikshan Sanstha is always providing necessary training to all the college librarians for updating the Libreria software periodically. The computerization of bibliographic data is successfully available through the OPAC. The union catalogue of its college libraries is available through WEBOPAC.

4.5 Digital Library of the Institution

The digital library of the institution is popularly known as **Rayat Knowledge Bank,** with the efforts of Organization Management Authorities, Karmaveer Vidya Parbodhani, Dr. Anil Patil as a Chairman of the Sanstha. The Principal, teachers, librarians of the various schools and college work together for the creation of the digital library by creating educational material, selecting the resources.

4.5.1 Need of Central Digital Library for the Rayat Shikshan Sanstha

The Rayat Shikshan Sanstha is educational organization. Its aim is to educate the students as well as the society. To preserve and retrieve the traditional as well as modern information assets of the institution, the digital library came into existence. This digital library focuses mainly on the teacher, student as a user, Educationist and Learner from the society.

4.5.2 Reason For Building Digital Library

The digital library is built for the following reasons.

1. To create and develop digitized collection and resources.
2. There is a demand from the user community.
3. The digital library technology helps to manage large amount of digital contents very effectively.
4. The digital library is needed to procure the online publication and to provide link to important sources of information.
5. The digital library will help to save the space problem.

6. Creation and maintenance of digital library technology is available now a days.
7. To save the traditional libraries old and rare document.
8. For promoting economic and efficient delivery of the information to all sections of the society.

By considering the above reason the institution has developed the digital library for its user's community.

4.5.3 Organization of Digital Library for Rayat Shikshan Sanstha

Under the Rayat Shikshan Sanstha's Karmaveer Vidya Parbhodhini the present digital library came into existence on 4th October 2015. Which is known as The Rayat Knowledge Bank Presently it does not have digital library organization committee and librarian's proper representation for proper development of digital library.

4.5.4 Human Resource for Digital Library

The two personnel from software engineer field working for the Rayat Knowledge Bank. They organize the digital content in the server by using website technology. The digital contents created by teachers of the institution, for Secondary, Higher Secondary and Senior Colleges, which include more than 15,000 PPT's collection, Rayat Shikshan Patrika, Research Journal, Videos, images, and many more contents of Karmaveer Vidya Prabodhini, Satara. They also manage the digital collection of Hon. Arvind Gupta's more than 1000 E-books contribution to the Rayat Knowledge Bank

4.5.5 Budget for Development of Digital Library

Lump Sum budget is provided for the development of infrastructure such as hardware and software for the digital library and personnel appointed for the development of digital library.

4.5.6 Infrastructure for Digital Library

The Rayat Shikshan Sanstha at its head quarter Satara, Maharashtra has developed digital library at the Karmaveer Vidya Prabodhini office. The computer and network facility for the digital library, which include two servers such as

windows server and backup Server which work as 4TBWD Cloud Server. The specification for windows server and backup server is shown in the following table 4.4

Table 4.4 Infrastructure for Digital Library

Sr. No.	Type	Specification
1.	Server Type	Windows Server, server with < 2000 SEs 2 Processors, 2 GHz minimum Processors speed, 3 GHz recommended Memory 8 GB
2.	Hardware	CPU: x86-64 processor
3.	Memory	8 GB RAM
4.	Domain Disk space	1 TB for product installation
5.	Operating System	The operating system of only 64-bit version & supported by a) Microsoft Windows Server 2012 b) Microsoft Windows Server 2012R2 c) Microsoft Windows Server 2016 d) Microsoft SQL Server 2014 & e) Microsoft SQL Server 2016

4.5.7 Digital Library Architecture

For building digital library website technique have been used. Server and client architecture is followed. The static webpage is created for showing the brief information about the digital library and linked same to the institutional official website with URL http://www.erayat.org/kvp/Rayat_Knowledge_Bank.html. On the static webpage link is also provided to the Rayat Knowledge Bank for more detail information. The information is provided through Server IP address (ftp/115.124.114.63/10). The webpage is created in HTML (Hypertext Markup Language) etc. Visitor counter link is also provided on the static webpage.

4.5.8 Software for Digital Library

For building digital library of an organization, website based technology is used. Server and client architecture was followed by using software like Window

operating system, Scanning Software, Adobe Software etc. The standard digital library software was not used for the building digital library.

4.5.9 IPR and Digital Right Management

The digital library of an organization follows the intellectual property rights and digital right management**.**

4.5.10 Digital Collection of The Rayat Knowledge Bank

For building digital collection to the Rayat Knowledge Bank born digital and printed resources are used. The power point presentation is created by the teachers of the institution. The institution has organized vast training program for the teachers to prepare the PPTs for their subject and respective classes. Through the involvement of teachers and the librarians all the PPTs are created and collected. The education material is forwarded to the Karmaveer Vidya Prabodhini.

The Sanstha has selected the printed / digital resources from the various colleges through librarians, the resources are written books on Karmaveer Bhaurao Patil, Lakshmibai Bhaurao Patil, the publication of the Sanstha, books, periodical of the Sanstha. These printed resources are scanned in the Karmaveer Vidya Prabodhini at Satara (Maharashtra), under the supervision of the software engineer. The scan images are converted into PDF form. Some of the literature e.g. EK Mahan Karmayogi are already available in audio and video form as a born digital collection with the organization. The digital library presently include number of E-resources collection shown in table 4.5

Table 4.5 Particulars of E- Resources

SR. No.	Particulars of E- Resources	Number
1.	PPTs	5000
2.	E-Books	1200
3.	Images	430
4.	Videos	27
5.	Audio	210
6.	Links	87

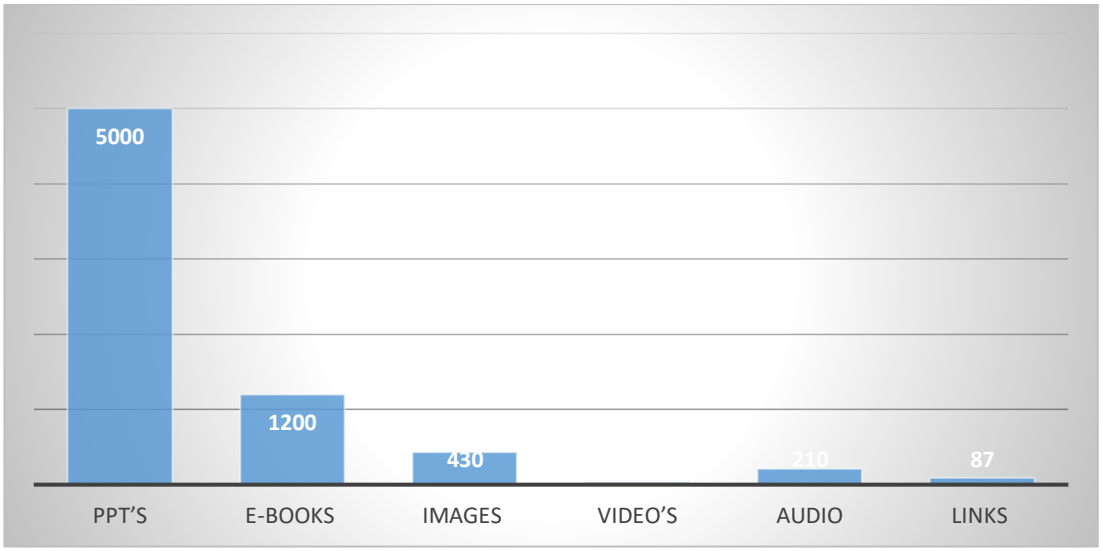


Figure 4.2 Particulars of E- Resources

The basic purpose of this digital library is to create teaching learning more effective and qualitative. This digital library is open to all the society. The URL and the screen shot of the home page is shown as follows.

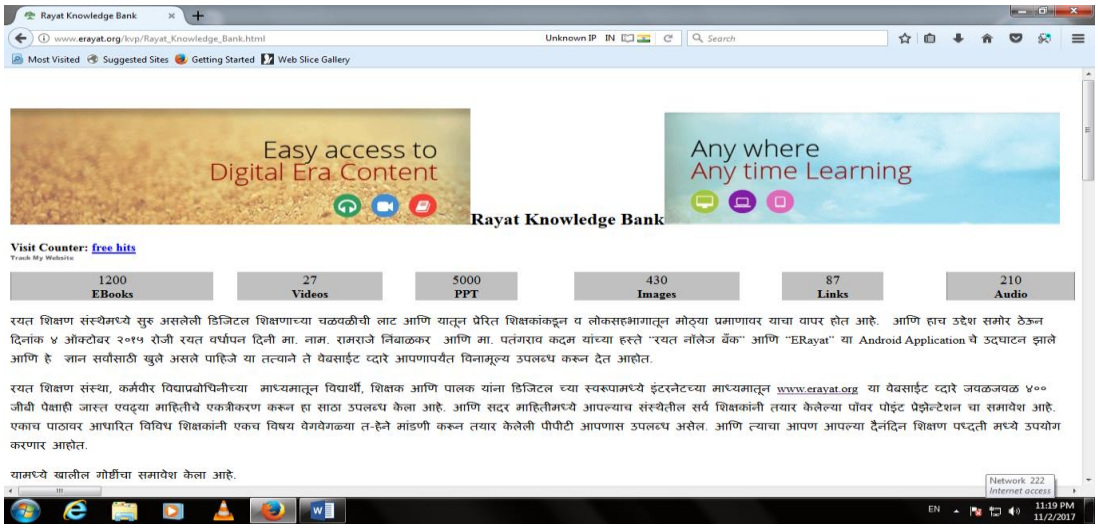


Figure 4.3 Webpage of Rayat Knowledge Bank

(Reference: http://www.erayat.org/kvp/Rayat_Knowledge_Bank.html)

4.5.11 Digital Knowledge Organization

The format of collection is textual, PDF, PPT, Audio, Video, Graphic (Information Resources are in Multimedia format).

The information resources are arranged in the digital library is as follows in the form of folders and sub folder and the files in the form of PDF, PPT's Audio, and Videos. Table No. 4.6

Table 4.6 Arrangement of Information Resources in Rayat Knowledge Bank

SR. No.	Arrangement of Information Resources
1.	Autobiography
2.	The Rayat Knowledge Bank PPT
3.	Educational Films- Science Equipments
4.	Rayat Shikshan Sanstha
5.	Other Video Contents
6.	Ek Mahan Karmayogi- Computer Disc
7.	Arvind Gupta- Science Video
8.	Photo Gallery
9.	Rayat Shikshan Patrika (from Sept-Oct-Nov 1985 to 9th May1995)
10.	Virtual Book
11.	E-Books
12.	Question Bank
13.	IUCA
14.	Karmaveer Anna and Vahini
15.	Guest Lectures and Motivational Videos
16.	Android Applications
17.	Syllabus
18.	Trajectory (1993 to 2013)

It has also provided links to different websites table no. 4.7

Table 4.7 Links to Different Websites in Rayat Knowledge Bank

SR. No.	Link to different websites
1.	Arvind Gupta
2.	Khan Academy
3.	Links to List of Websites for Maharashtra
4.	Standard 5th and 8th Question Banks
5.	Photo Gallery
6.	Science experiment Videos
7.	Digital Locker
8.	You Tube

4.5.12 Access Control of Digital Library

The repository of the organization has open access. One can directly search the information with the institution official website as well as through The Rayat Knowledge Bank in the google search. Browsing and downloading of information is easily accessible in appropriate forms.

4.5.13 Digital Library Services

The following are the services which are offered by digital library.

a) Preservation of rare and valuable resources for the institution.
b) To provide the educational material in the form of PPTs, PDF, Audio and Videos form primary to senior college level.
c) Back issues of Rayat Shikshan Patrika and Research Journal.
d) Audio and videos recordings in multimedia format. Such as Science experiments by Arvind Gupta, Videos and many more.

4.5.14 Standards and Protocols for Digital Library

The digital library of an organization does not follow the standards and protocols such as creation of Metadata, object Naming and Unique Object identification. The standard like MARC, Dublin Core Z39.50 are not followed while creation of digital library.

4.5.15 Strength of Digital Library of an Institution

The following are strength of digital Library

1. The initiative taken for creation of the digital library by the organization is the golden history for the improvement of education environment and the digital library culture. The present digital library fulfils the need of central digital library for an organization.
2. The digital library is having very strong management support from organization.

3. The professional human resources are present in the organization for the development of the digital library.
4. As per budget an organization has sound financial background it can easily overcome the hurdles.
5. The infrastructure facility provided by an organization is sound.
6. The digital library follows server and client architecture.
7. They have used window operating system, Scanning software, Acrobat adobe software which are essential.
8. It follows the IPR and digital right management properly.
9. It has included books, images, power point presentation, audio, video recording.
10. It highlighted the history of the organization properly. The publication on Dr. Karmaveer Bhaurao Patil and Sou. Lakshmibai Bhaurao Patil's contribution in the development of the organization has nicely covered.
11. It also provided the links to other open resources such as Arvind Gupta, Khan Academy, Science experiment Videos, Digital locker, You Tube and many more. The quality of the educational content is very good.
12. The motto of institution is to make learning more effective due to that, more number of PPTs are included in the digital library.
13. Developed the educational content from primary to senior college level as a learning object. The rare material & back issues of periodical are made available in the digital library.
14. The digital library is open to society. No restriction for the use of information.
15. The usability of the digital library is also very high, because of large number of community in the organization.

4.5.16 Digital Library limitations

The following are the problems and limitation associated with the digital library which is highlighted below:

1. It has used website based technique for development of digital library instead of using standard digital library software. Only website designer will play important role for adding and deleting the contents

2. The storage capacity of the present system is only 1TB.
3. Individual pages are scanned and single pages are converted in PDF form for periodicals back issues. Professional scanning, cleaning and use the OCR techniques was not properly followed in the system. .
4. The information is arranged in folders and sub folders which is not expected in the digital library.
5. The standard formats and protocol are not used in the system. Metadata standard such as Dublin core, MARC, ASCII are not followed in the present system.
6. The facilities such as navigation, prompt retrieval, browsing and interaction are absent in the system. Search and advance search facility is not present in the digital library.
7. There is user interface but retrieval of information is very poor.
8. As per services real time question answering, on demand help, information literacy and user involvement mechanisms is absent in the system.
9. Alerting services such as my profile, citation, RSS Feed is not present in the system.

4.6 Conclusion

The development of the central digital library of the institution is excellent. The information resources selected for the digital library are also as per the need of the subject. The aim of the organization is to educate masses and provide a means to the society. The digital library will enhance activities of the institution towards globalization of educational activities. For improving digital library in proper direction, it needs to test / evaluate the present digital library system, because of that user's survey are designed for the further development of the digital library. The next chapter is the Librarian view about the digital library with special Reference to the Rayat Shikshan Sanstha.

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CHAPTER - 5

LIBRARIAN'S VIEW ABOUT THE DIGITAL LIBRARY WITH SPECIAL REFERENCE TO THE RAYAT SHIKSHAN SANSTHA

5.1 Introduction

This Chapter is to appreciate the fundamental need and purpose for launching digital libraries in the colleges of the Rayat Shikshan Sanstha. It is experiential that most of the librarians are absorbed in executing the digital libraries in the college, but it desires management and financial support from the authorities. Most of the college libraries are generating digital library environment in the college campus. It has been pragmatic that many librarians have advanced websites and completed the library computerization projects effectively by subscribing databases like N-List by using the open source databases, e-books, e-journals etc. This is the initial phase towards the creation of digital library. This study highlights the planning, budgeting, use of ICT in the creation of digital library. It's a prerequisite of human resource in the creation of digital library. Hardware and software requirement. Open source software and commercial software's. It also highlights the problem and challenges faced during the creation of digital library etc.

The government of India has created consortium of online Journals and E-books through UGC-INFLIBNET known as N-List, National Digital library of India, World digital library, Shodhaganga, Vidyanidhi are the examples of digital libraries.

5.2 Data Collection

In the present research descriptive method of research and case study method is used. For collection of data survey techniques are used. The questionnaire tool has been used for collecting data from librarian, faculty member and the student.

A survey was conducted on the basis of objectives and hypothesis to assess and extend the use of digital library created by the Rayat Shikshan Sanstha. This study helps to find the effective and efficient functioning and provide right kind of digital library to the organization as well as to the whole society. Two sets of questionnaire were designed as per the objective and hypothesis of the study. One for librarian and other is for users of the college libraries such as faculty member and student of the

college library. The first set is sent to 42 senior college librarian of the Rayat Shikshan Sanstha in the state of Maharashtra.

The Librarian's questionnaire was prepared to find out the present status of digital library in the college as well as centrally created digital library of the Rayat Shikshan Sanstha. The questionnaire which includes questions on financial status of college library, the manpower required for digital library, availability of digital library collection and service. Infrastructure for digital library, file format, use of metadata standards protocols and the satisfaction for use of digital library.

First step, questionnaire send through the post office. Then email sent to the particular colleges. Google form also created and posted to respective email address. Some set of questionnaire also filled with the direct visit to particular colleges by the researcher, as well as through colleagues. Telephonic conversion to individual respondents also help for collecting data. After continuous efforts from researcher to individual librarian and request, 100 percent response received from the librarian of the Institution.

Whereas second set of questionnaire sent to 378 users of college libraries of the Rayat Shikshan Sanstha out of that 294 questionnaire from 42 college libraries user received. The response is 77.77 percent.

5.3 Data Analysis and Interpretation

5.3.1 Year of Establishment of Colleges

(Q.1) An attempt has been made to know the year of establishment of the collegs of the institution. The response are shown in the table 5.1

Table 5.1 Year of Establishment of Colleges

Sr. No.	Period of college establishment	Number of response	Percentage
1.	1940-1950	01	02
2.	1951-1960	04	10
3.	1961-1970	13	31
4.	1971-1980	03	07
5.	1981-1990	14	33
6.	1991-2000	07	17
	Total	**42**	**100**

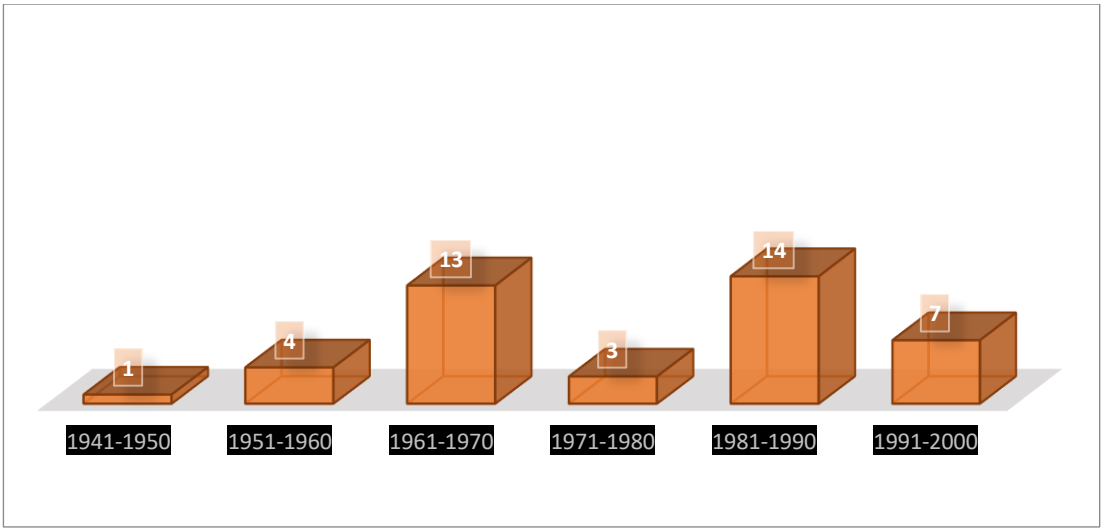


Figure 5.1 Year of Establishment of College

From table no.5.1 and Figure 5.1, it is found that during 1947 the first college was found. During 1951-1960, 4 colleges (10%) have been founded. In the year 1961-1970, 13 colleges (31%) have founded. During 1971-1980, 03 colleges (07%) have founded; during 1981-1990, 14 colleges (33%) have been founded; during 1991-2000, 07colleges (17%) had founded; it is found that during 1961-1970, 13 colleges (31%) and during 1981-1990, 14 colleges (33%) have been founded; it means that most of the colleges are young colleges and they can easily adopt the new technology of digital library.

5.3.2 Financial Status of colleges

(Q.2) To know the financial condition of an Institution / Colleges this question has been asked. The financial condition of an institute play major role in the development of an organization. The following are the findings received from the respondents table 5.2

Table 5.2 Financial Status of Colleges

Sr. No.	Financial status of college	Number of response	Percentage (%)
1.	Government Aided	38	90
2.	Self-financing	03	07
3.	Autonomous	01	03
	Total	**42**	**100**

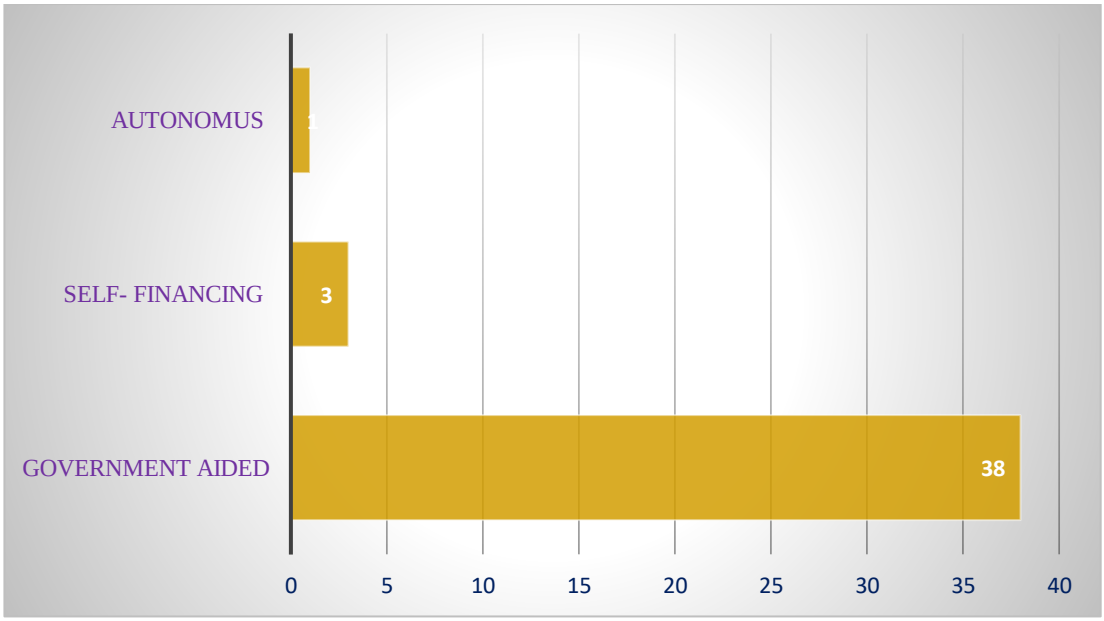


Figure 5.2 Financial Status of Colleges

From table 5.2 and figure 5.2, it is found that 90 percent colleges are Government aided colleges. 7 percent College are self-financing colleges and 3 percent college are autonomous.

It is observed that the financial condition of Colleges and Institution is very sound for implementing digital library.

5.3.3 Professional Qualification of librarian

(Q.3) The qualification of a librarian is very significant for the development of library. Librarian is the key resources for the proper guidance and direction of library. The qualification of librarian's are also important for the development of digital library. For the functioning of the modern library such as automation of library, using barcode techniques in library is essential. Use of the E-resources in library. Subscription of databases and users education in the light of the modern techniques, it needs quality education as well as leadership in the librarianship. By considering the development in a library the study tries to understand the educational qualification of the librarian. The following are the responses shown in the table 5.3

Table 5.3 Professional Qualification of Librarian

Sr. No.	Professional qualification of librarian	Number of response	Percentage (%)
1.	M.Lib.Sci	04	9.52
2.	M.Lib.Sci., NET/SET	30	71.42
3.	M.Lib.Sci.,M.Phil	05	11.90
4.	M. Lib. Sci.,SET/NET, Ph. D	03	7.16
	Total	**42**	**100.00**

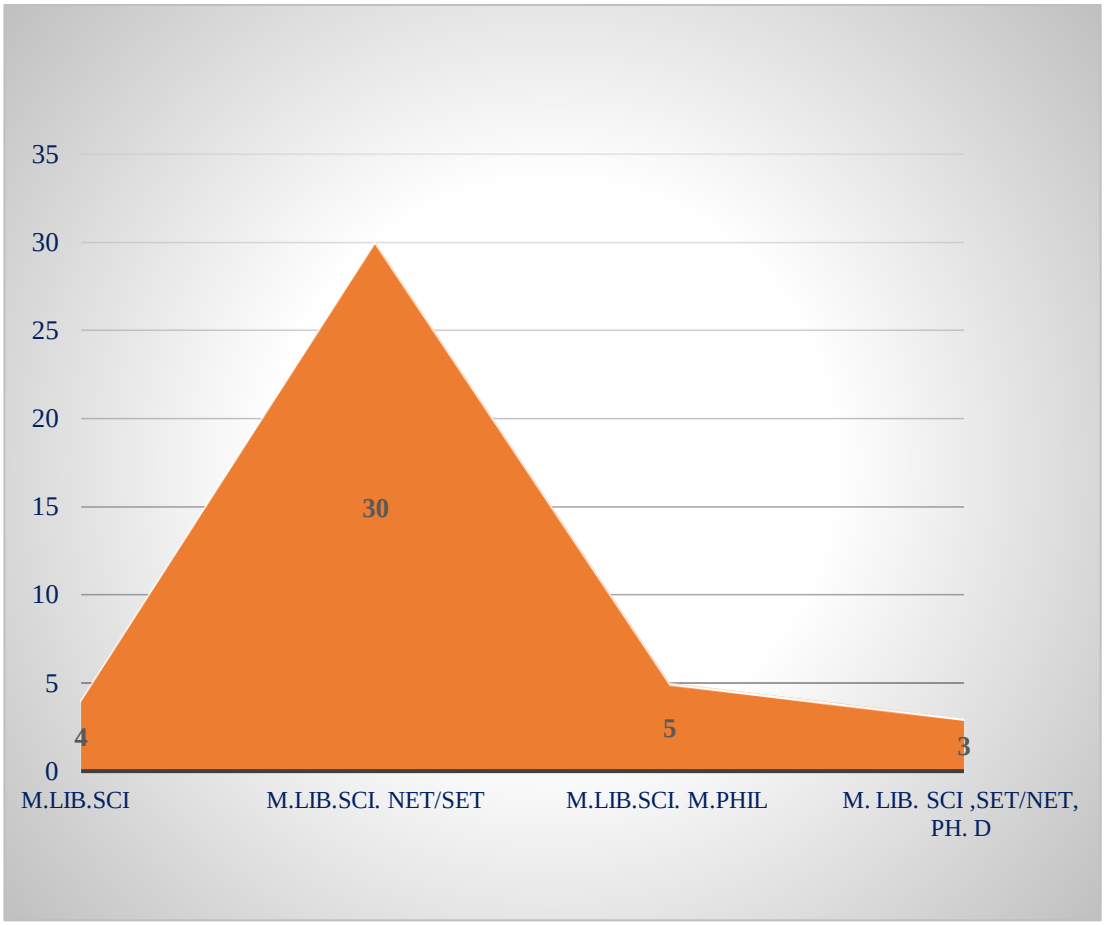


Figure 5.3 Professional Qualification of Librarian

From Table 5.3 and Figure 5.3, this study finds that 71.42 percent respondents have M.L.I.Sc with NET and SET Qualification. 9.52 percent librarian is only having M.L.I.Sc degree. Whereas 11.90 percent librarian's having M. Phil degree and only 7.16 percent librarian having Ph. D degree in Library and Information Science. It shows that majority of librarian is having good academic qualification as per the UGC norms. They can easily lead toward the digital era.

5.3.4 Faculty in Colleges

(Q.4) The present question has been asked to know the faculty in colleges. The response has indicate in the table 5.4

Table 5.4 Faculty in Colleges

Sr. No.	Faculty in colleges	Number of response	Percentage (%)
1.	Arts, Commerce and Science	20	47.61
2.	Arts and Commerce	10	23.80
3.	Arts and Science	01	02.38
4.	Arts	02	04.76
5.	Science	01	02.38
6.	Commerce	02	04.76
7.	B. Ed	02	04.76
8.	Law	01	02.38
9.	Management	01	02.38
10.	Engineering	01	02.38
11.	Polytechnic	01	02.38
	Total	**42**	**100.00**

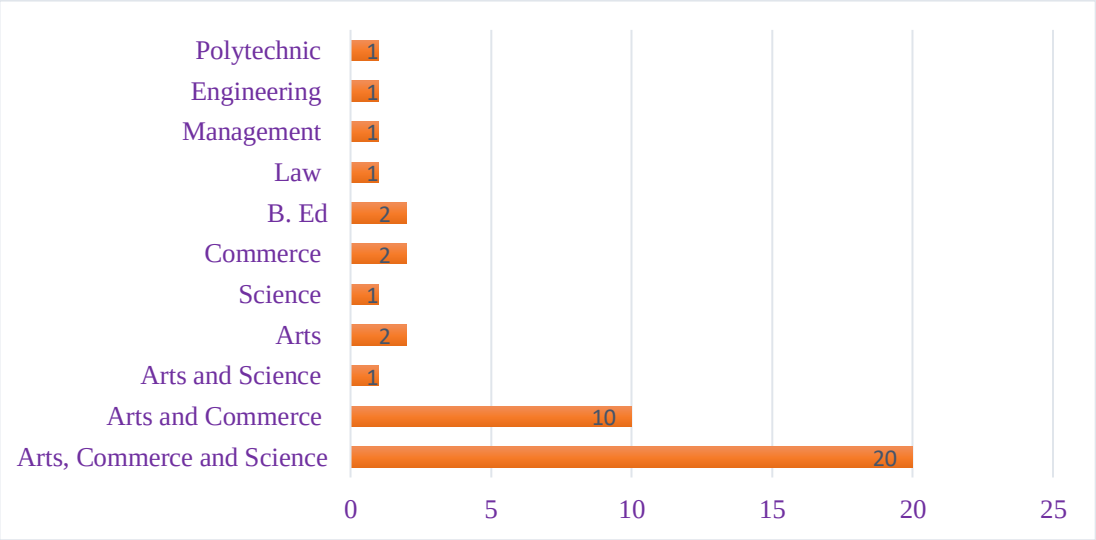


Figure 5.4 Faculty in Colleges

From Table 5.4 and Figure 5.4, it is found that 47.61 percent colleges are having Arts, Commerce and Science faculty. 23.80 percent colleges are having Arts and Commerce faculty. 2.38 percent colleges are having Arts and Science faculty. 4.76 Percent colleges are Single faculty colleges in Arts, Commerce respectively. 2.38 Percent colleges are single faculty professional college such as Law and Management, Engineering and Polytechnic respectively. 2.38 Percent colleges are single faculty Science College.

5.3.5 Post Graduate Education Facility in the Colleges

(Q.5) The present question has been asked to know the Post Graduate education facility available in colleges. The response are shown in the table 5.5

Table 5.5 Post Graduate Education Facility in the Colleges

Sr. No.	Post Graduate education facility in colleges	Number of response	Percentage (%)
1.	M.A.	14	45
2.	M.com	09	29
3.	M.Sc.	08	26
	Total	**31**	**100**

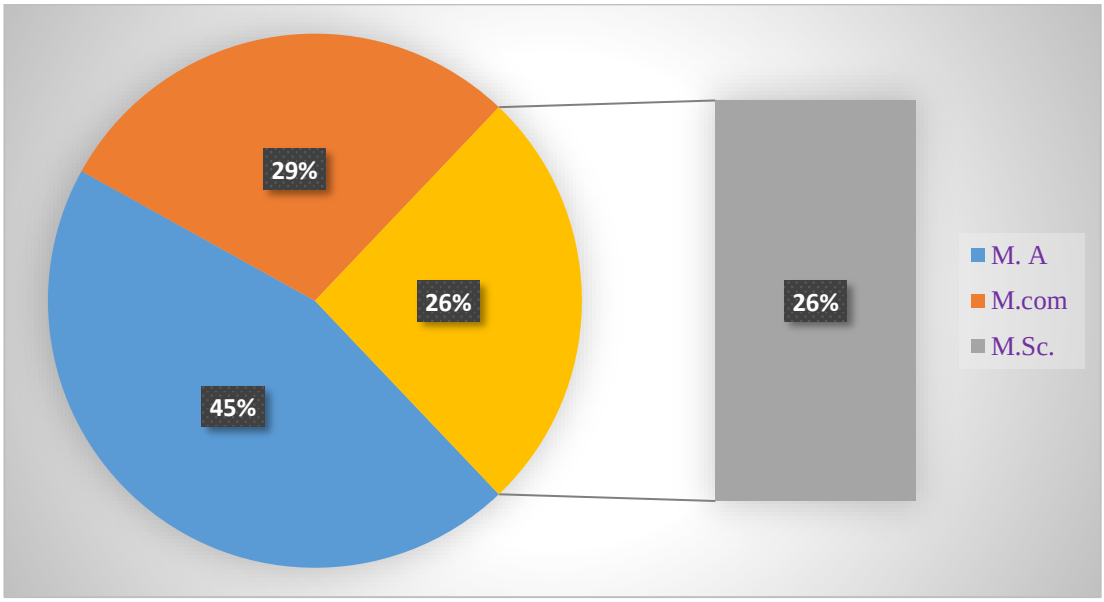


Figure 5.5 Post Graduate Education Facility in the Colleges

From Table 5.5 and Figure 5.5, it is found that 45 percent colleges are having Master of Arts faculty. 29 percent college are having Master of Commerce faculty. Whereas 26 percent college are having Master of Science faculty.

5.3.6 Accreditation Status of the Colleges

(Q.6)The purpose of this question is to know the status of colleges in accordance to National Assessment and Accreditation council, India (NAAC) grade. This is indication of institutional quality benchmark. (Table 5.6)

Table 5.6 Accreditation Status of the Colleges

Sr. No.	NAAC Re Accredited Grade (Second Cycle)	Number of response	Percentage (%)
1.	A	14	33.33
2.	B	24	57.14
3.	B Grade (NBA)	04	09.52
	Total	**42**	**100.00**

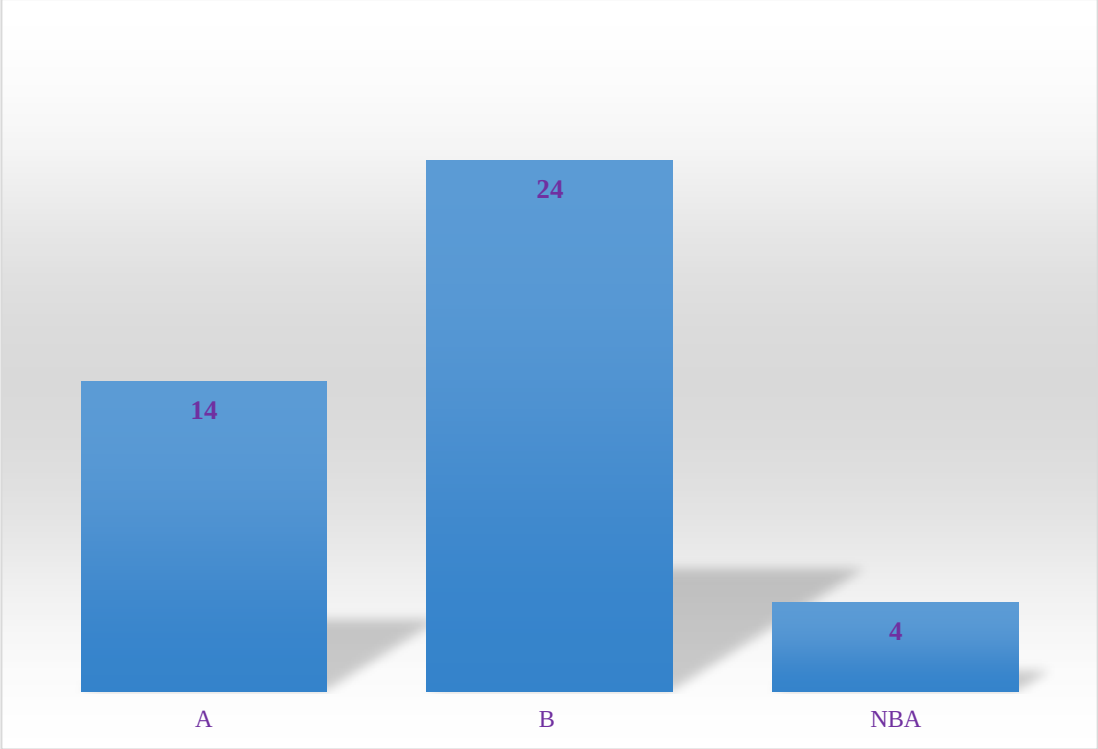


Figure 5.6 Accreditation Status of the Colleges

From table 5.6 and figure 5.6, it is found that 33.33 percent college have reaccredited with ‘A ‘grade. Whereas 57.14 percent colleges have reaccredited with ‘B’ grade. 9.52 percent colleges reaccredited by The National Board of Accreditation (NBA), India which was established by AICTE (All India Council of Technical Education) for periodic evaluations of technical institutions & programs base according to specified norms and standards as recommended by AICTE.

5.3.7 Strength of Library Users

(Q.7) The purpose of this question is to know the strength of library users in colleges see table 5.7

Table 5.7 Strength of Library Users

Sr. No.	Strength of library users	Number of response	Percentage (%)
1.	0000-1000	12	29
2.	1001-2000	13	31
3.	2001-3000	05	12
4.	3001-4000	05	12
5.	4001-5000	04	09
6.	5001 more	03	07
	Total	**42**	**100**

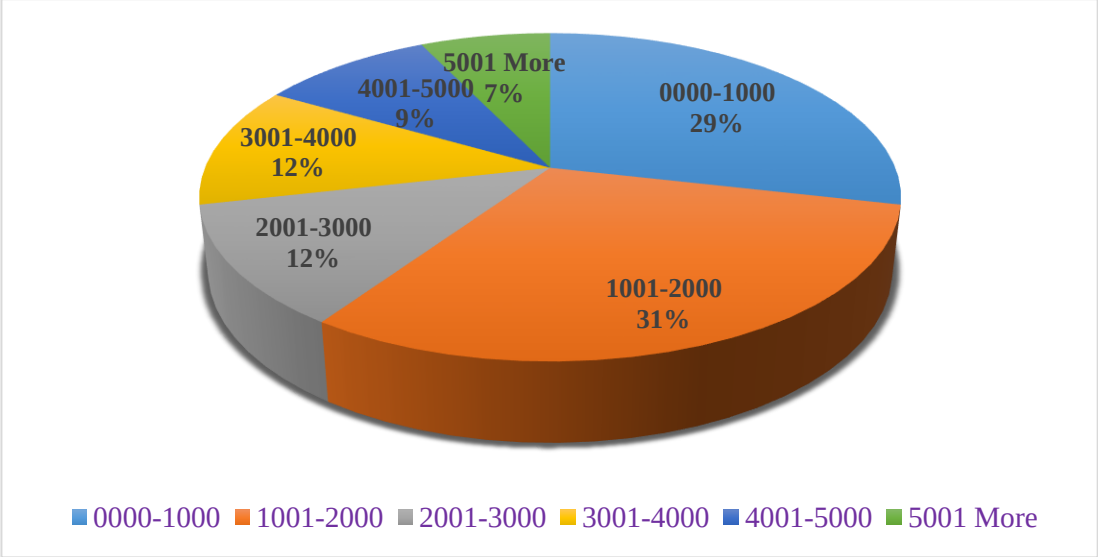


Figure 5.7 Strength of Library Users

From table 5.7and figure 5.7, it is found that 29 percent college libraries are having up to 1000 Strength of library users. 31 percent college libraries are having 1001-2000 strength of library users. 12 percent college libraries are having 2001-3000 and 3001-4000 strength of library users respectively. 9 percent college libraries are having 4001- 5000 strength of library users. Whereas 7 percent college libraries are having more than 5001 strength of library users.

5.3.8 Need of Central Digital Library

(Q.8) The aim of this question is to find out the need of central digital library for the Rayat Shikshan Sanstha. The response for the same has been indicated in the table 5.8

Table 5.8 Need of Central Digital Library

Sr. No.	Central digital library need for the Rayat Shikshan Sanstha	**Number of response**	**Percentage (%)**
1.	Strongly Agree	38	90
2.	Agree	04	10
3.	Disagree	00	00
4.	Strongly disagree	00	00
	Total	**42**	**100**

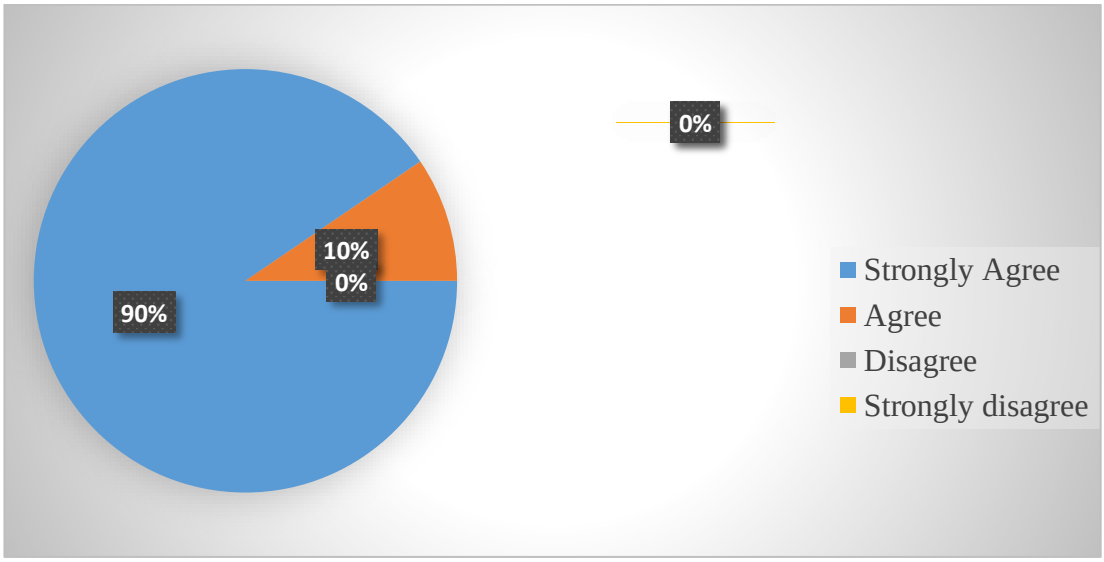


Figure 5.8 Need of Central Digital Library

From table 5.8 and Figure 5.8, it is found that 90 percent college librarian strongly agree to have central digital library for the Rayat Shikshan Sanstha.10 percent college librarian agree to have central digital library for the Rayat Shikshan Sanstha. Whereas no librarian disagree with the need of digital library for an organization

5.3.9 Digital Library Organization Committee

(Q.9) for proper functioning of any library it need library committee. Presently the Rayat Knowledge Bank came into existence it needs many improvement and development. The purpose behind this question is to know, the necessity of digital library committee at Institutional level for development of the Rayat Knowledge Bank. The response are shown in table 5.9

Table 5.9 Digital Library Organization Committee

Sr. No.	Digital library committee	Number of response	Percentage (%)
1.	Yes	40	95
2.	No.	02	05
	Total	42	**100**

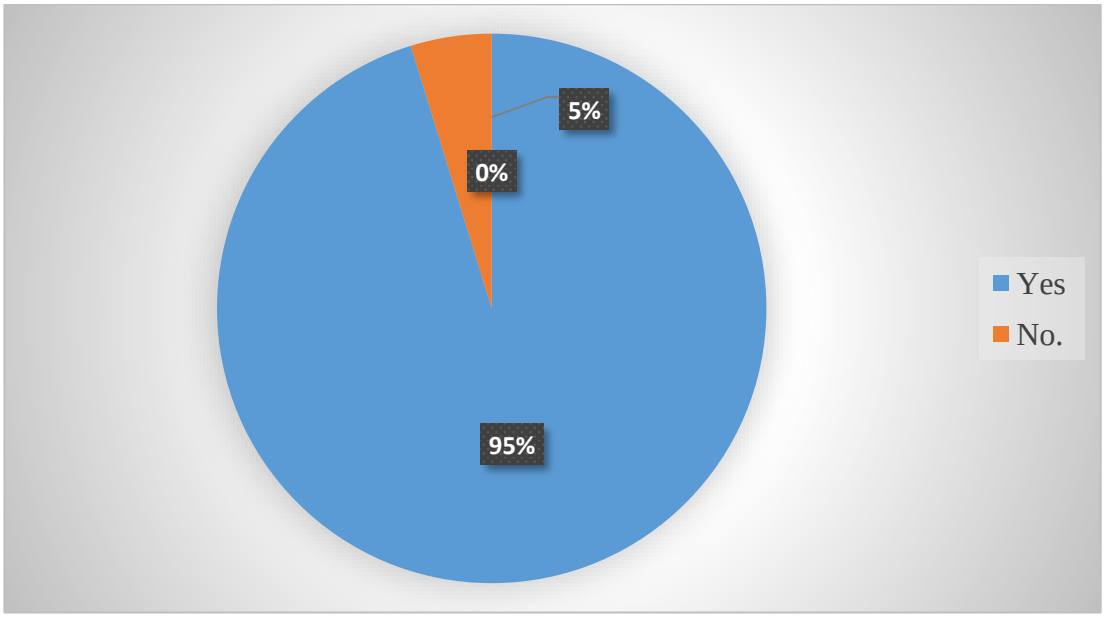


Figure 5.9 Digital Library Organization Committee

From table 5.9 and figure 5.9 it is observed that 95 percent respondents reveals that the need of digital library committee at institutional level for development of the Rayat Knowledge Bank. Whereas 5 percent respondents do not find the need to establish digital library committee at institutional level.

5.3.10 Librarian's Representation in Digital Library Committee

(Q.10) The role of librarian's in library committee is very important. To know the librarian's representation in the Rayat Shikshan Sanstha's digital library the present question has been asked.

Observation

It is found that 100 percent respondents reported that librarian's representation is very essential in digital library committee in the Rayat Knowledge Bank created by the institution**.**

5.3.11 Professional Staff for Digital Library

(Q.11) Presently the Rayat Knowledge Bank is maintained by software engineers. Being a library professional researcher think that proper functioning of digital library professional staff is very essential. To know the opinion of other library professional the question has been asked, the responses are indicated in table 5.10

Table 5.10 Professional Staff for Digital Library

Sr. No.	Professional staff for digital library	Number of response	Percentage (%)
1.	Yes	39	92.85
2.	No.	02	4.76
3.	Neutral	01	2.39
	Total	**42**	**100**

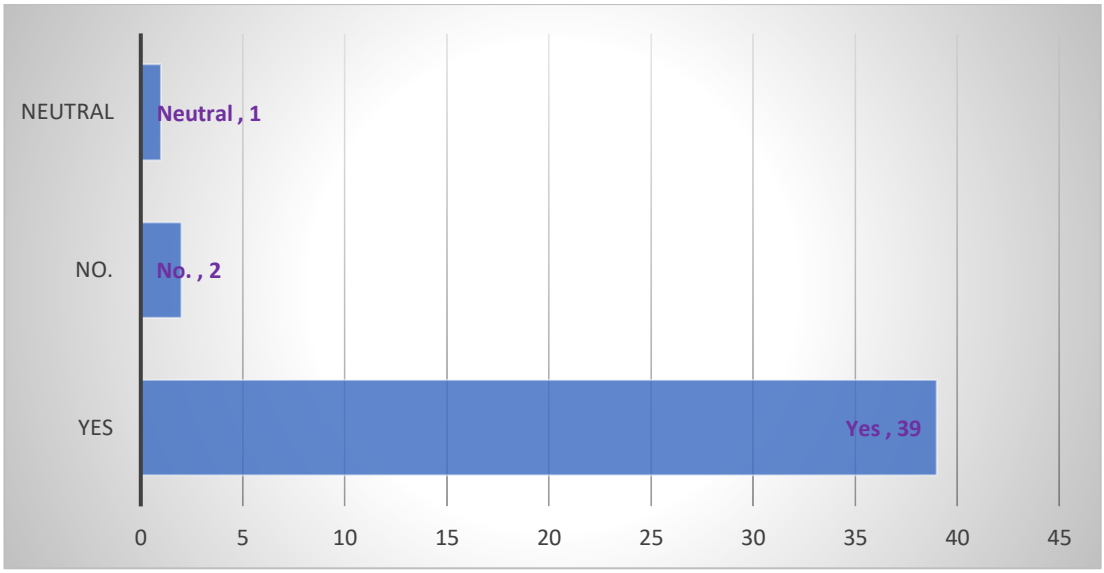


Figure 5.10 Professional Staff for Digital Library

From table 5.10 and figure 5.10 it is observed that 92.85 percent respondents report that for proper functioning of digital library professional staff is essential, whereas 4.76 percent respondents report that for proper functioning of digital library professional staff is essential is not required. 2.39 percent respondents did not responds to a question they remain neutral.

5.3.12 Skills to Handle Digital Library

(Q.12) For functioning of digital library many skill are required such as software, hardware, web designing, networking, scanning, digitization and knowledge and practical handling skill for computer application. Human resources must have equipped with these skills. To know the preference for a particular skill the present question has been asked, the question is multi choice question, the response are collected in the table 5.11

Table 5.11 Skills to Handle Digital Library

Sr. No.	Skills to handle digital library	Number of response	Percentage (%)
1.	Software Skill	12	31.57
2.	Computer Hardware Skill	32	84.21
3.	Web Designing Skill	04	10.52
4.	Network Administrating Skill	10	26.31
5.	Digitization process skill	38	100.00
6.	Computer handling skill	38	100.00

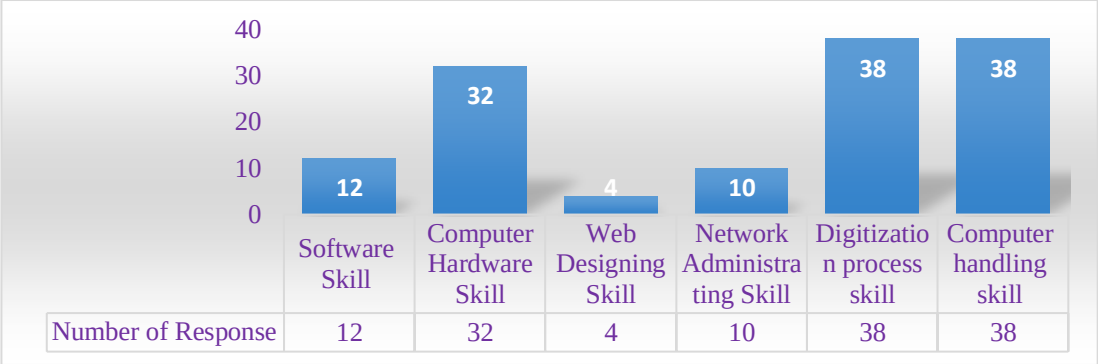


Figure 5.11 Skills to Handle Digital Library

From Table 5.11 and figure 5.11 it is observed that 31.57 percent respondents noted that software skill is must for working on digital library. 84.21 percent respondents reported that Hardware skill is must for working on digital library.10.52 percent respondents report that web designing skill is must for working on digital library. Whereas 100 percent respondents noted that digitization and computer handling skill are essential skill required for working on digital library.

5.3.13 Special Training on Digital Library

(Q.13) for working on digital library special training is very essential. To know the opinion of respondents the question has been asked. The response are indicate in the table 5.12

Table 5.12 Special Training on Digital Library

Sr. No.	Special training on digital library	Number of response	Percentage (%)
1.	Yes	37	88.09
2.	No.	05	11.91
	Total	**42**	**100.00**

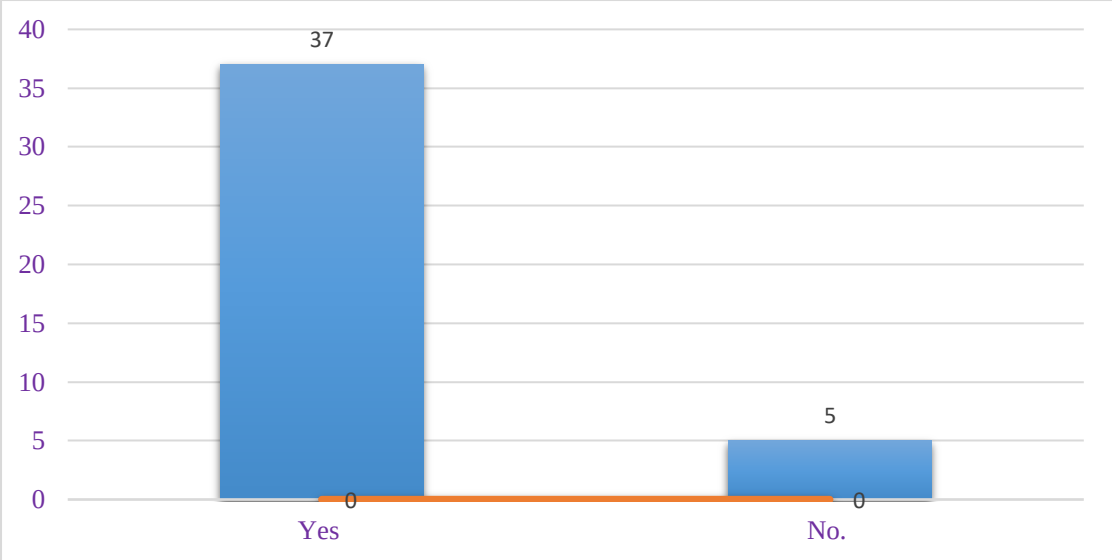


Figure 5.12 Special Training on Digital Library

From table 5.12 and figure 5.12 it is observed that 88.09 percent respondents report that the staff need special training working on digital library. Only 11.91 percent respondents report that their library staff need not required any special training working on digital library.

5.3.14 Organization of Special Trainings by the Institution

(Q.14) The Rayat Knowledge Bank digital library of the institution is centrally maintained Digital Library. For maximum use of digital library their extension is must. To add no of resources by 42 colleges will definitely improve the quantity and qualitative development of library. So there should be decentralization of addition rights to a colleges also. Periodically there should be arrangement of training session is must. To know any specific training organized by the institution for library professionals, the question has been asked. The response are shown in table 5.13

Table 5.13 Specific Trainings Organized by the Institution

Sr. No.	Specific trainings organized by the institution	Number of response	Percentage (%)
1.	Yes	05	11.90
2.	No.	35	83.34
3.	Neutral	02	04.76
	Total	**42**	**100**

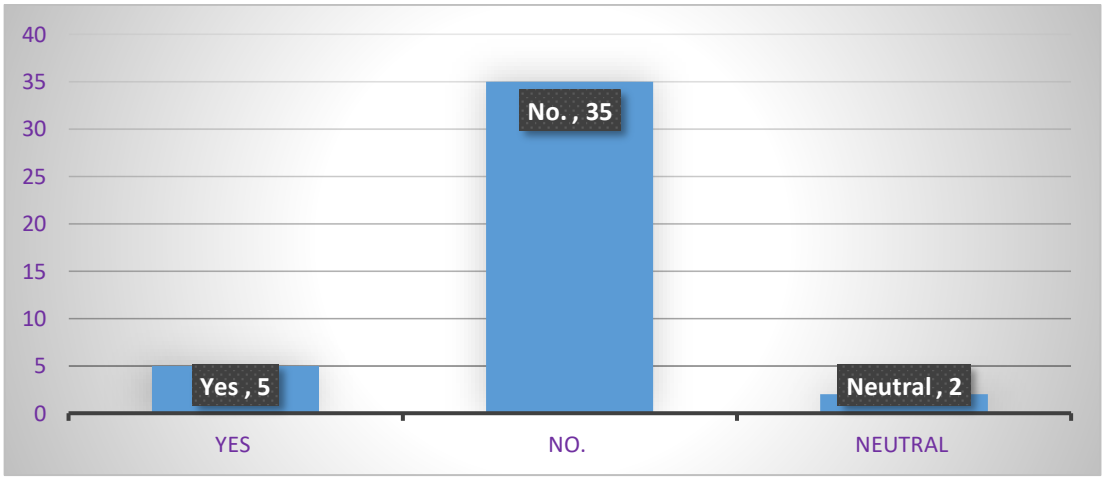


Figure 5.13 Specific Trainings Organized by the Institution

From table 5.13 and figure 5.13 it is found that 11.90 percent respondents reported that the Institution has arranged special training program for the extension and decentralization of digital library. They also quoted that resources are collected from the teachers of colleges. There is limited involvement of librarian in the creation of digital library at the institutional level. 83.34 percent respondents has

reported that the Institution has not arranged any special training program for the extension and decentralization of digital library through the involvement of librarian's role. 4.76 percent respondents did not response to this question they remain neutral.

5.3.15 Frequency of Special Training on Digital Library

(Q.15) To know the opinion of respondents on frequency of special training program working on digital library the question has been asked. The response are shown in the table 5.14

Table 5.14 Frequency of Special Training on Digital Library

Sr. No.	Frequency of special training on digital library	Number of response	Percentage (%)
1.	Monthly	00	00
2.	Quarterly	00	00
3.	Half yearly	08	22
4.	Yearly	29	78
	Total	**37**	**100.00**

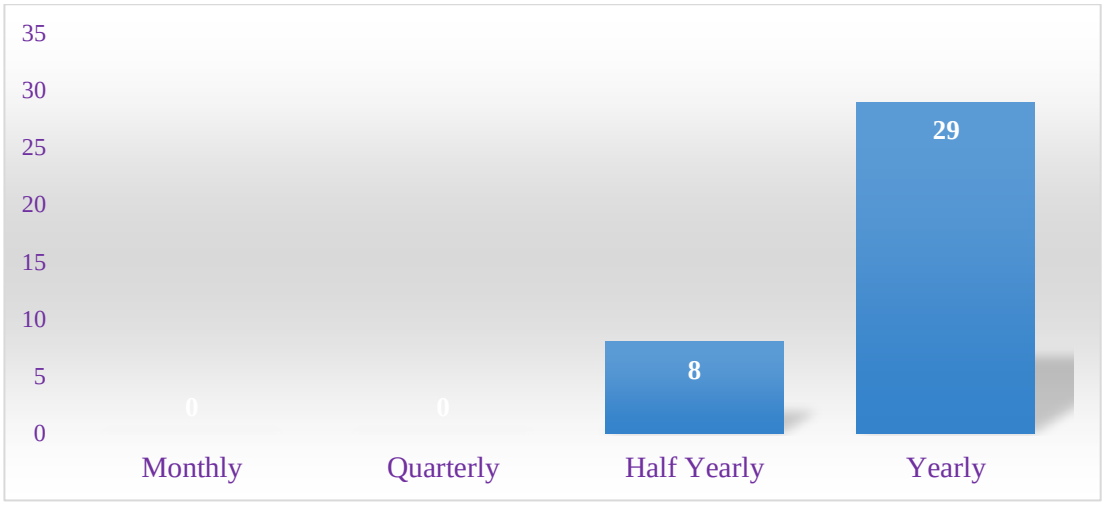


Figure 5.14 Frequency of Special Training on Digital Library

From table 5.14 and figure 5.14 it is observed that 22 percent respondents report that frequency for special training program should be half yearly. 78 percent majority respondents report that frequency for special training program should be

yearly. There is no any response for monthly and quarterly need for arranging the special training program on digital library.

5.3.16 Budget Provision for Digital Library

(Q.16) The question is asked to know the separate provision in library budget for purchase of e-resources, subscription of databases / digital library development is made or not. Equally it also traces the need of separate library budget. The response are shown in the table 5.15

Table 5.15 Budget Provision for Digital Library

SR. No.	Budget for digital library	Yes	No.
1.	Is it separate provision for purchase of e-resources, subscription of databases in a library budget?	02 (5%)	40 (95%)
2.	Do you think that there should be separate provision for development of digital library in the library budget?	37 (88%)	05 (12%)

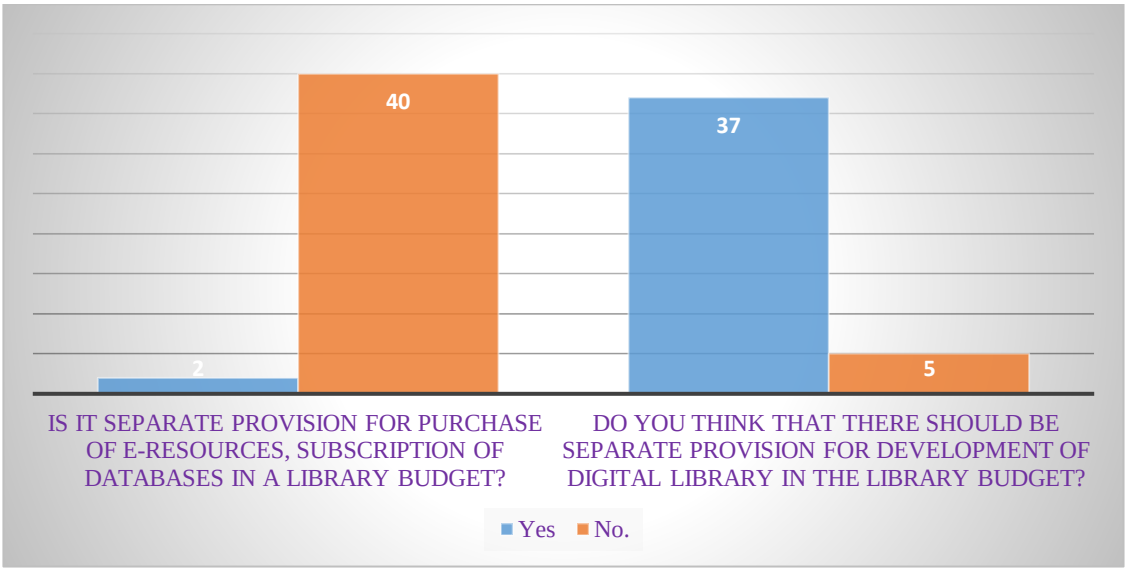


Figure 5.15 Budget Provision for Digital Library

From table 5.15 and figure 5.15 it is found that 95 percent respondents reports that there is no separate provision for the purchase of E- resources, subscription of databases in a library budget. Only 5 percent respondents reports that yes there is separate provision for the purchase of E- resources, subscription of databases in a library budget.

It is also found that 88 percent respondents think that there should be separate provision for the development of digital library in the library budget. Whereas 12 percent respondents think that there is no need for separate provision for the development of digital library in the library budget.

5.3.17 Digital Library Policy and ICT Strategy

(Q.17) The purpose behind this question is to know the, written policy and ICT strategy for digital library is followed in the colleges or not

It is found that 100 percent respondents reveals that they do not have any written policy and ICT strategy for the creation and development and maintenance of digital library.

5.3.18 Factors for Policy and ICT Strategy Development to Digital Library

(Q.18) The question is asked to know the factors which are essential for policy and ICT strategy development of digital library. The response are shown in the table 5.16

Table 5.16 Factors for Policy and ICT Strategy Development to Digital Library

Sr. No.	Written policy and ICT strategy for DL	Number of response	Percentage (%)
1.	Objective of the library	42	100
2.	Committee for organizing the digital library	40	95
3.	Budget	40	95
4.	Human resource	38	90
5.	Content	32	76
6.	Format	29	69
7.	License	42	100
8.	Supporting hardware and software	42	100
9.	User demand	25	60
10.	Copy right issue	38	90

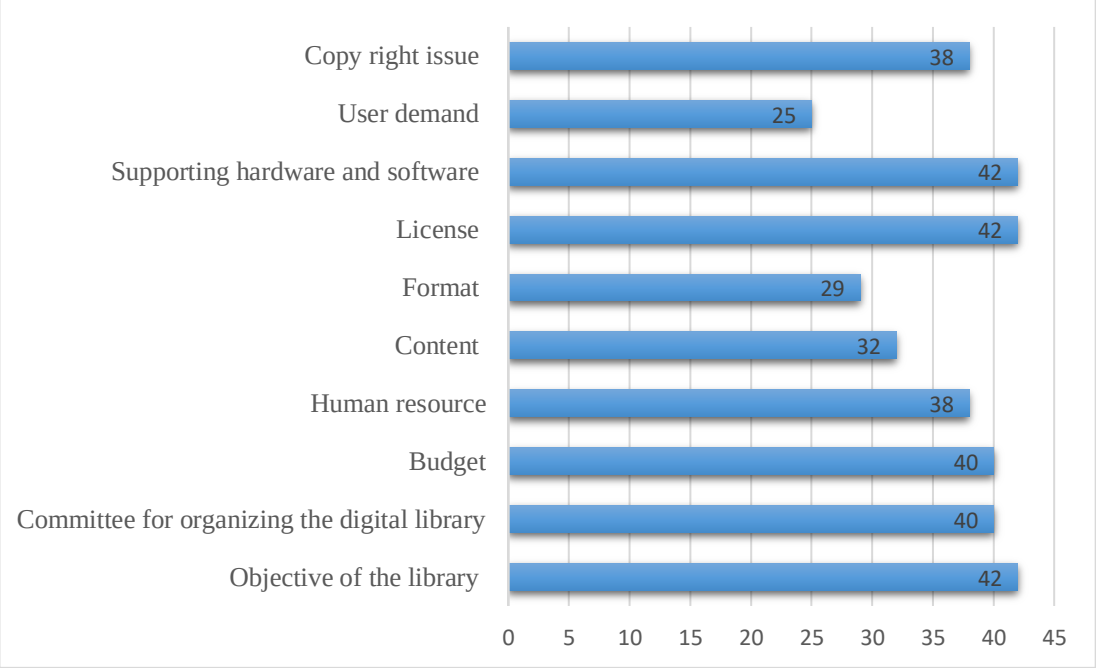


Figure 5.16 Factors for Policy and ICT Strategy Development to Digital Library

From Table 5.16 and Figure 5.16 it is observed that 100 percent respondents noted that while framing policy and ICT strategy on digital library objectives of the library, various licenses for hardware and software are must. 95 percent respondents reported that while framing policy and ICT strategy on digital library committee for organizing digital library and making separate provision for budget is must. 90 percent respondents reported that while framing policy and ICT strategy on digital library professional human resources and copyright issues should be highlighted. 76 percent respondents reported that while framing policy and ICT strategy on digital library content should be given more importance. 69 percent respondents reported that while framing policy and ICT strategy on digital library format of content should be given more importance and lastly but most important is that 60 percent respondents reported that users demand is very important while framing the policy on the digital library.

5.3.19 Digital Library Hardware Facility

(Q.19)The functioning of digital library mainly depends on the hardware component / infrastructure available in a library. To know the satisfaction regarding hardware infrastructure facility the present question has been asked. The response are shown in the table 5.17

Table 5.17 Digital Library Hardware Facility

Sr. No.	Digital library Hardware infrastructure facilities	Number of response	Percentage (%)
1.	Fully Satisfied	38	91
2.	Partially Satisfied	03	07
3.	Somewhat Dissatisfied	01	02
4.	Not satisfied	00	00
	Total	**42**	**100**

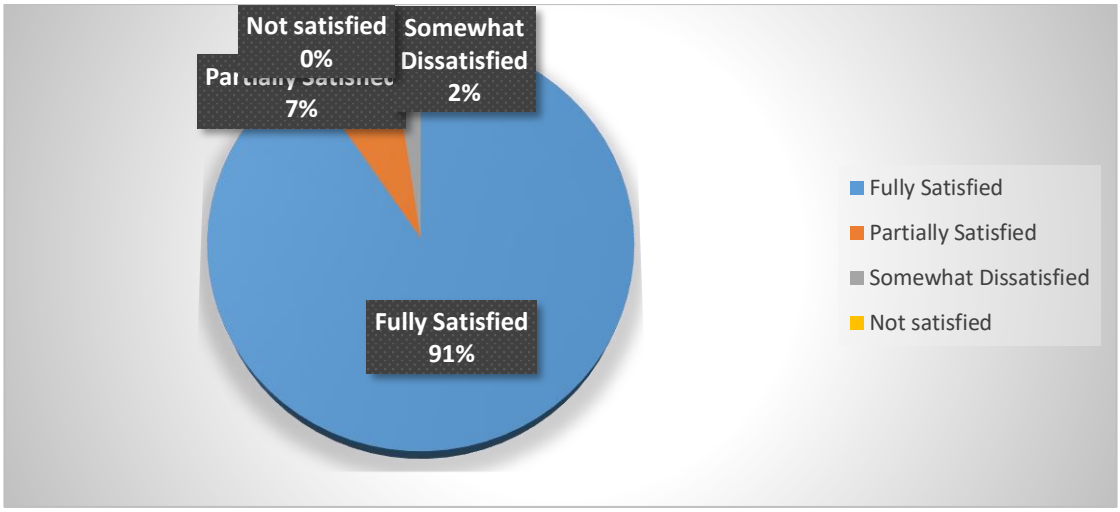


Figure 5.17 Digital Library Hardware Facility

From table 5.17 and figure 5.17 it is observed that 91 percent respondents reported that they are fully satisfied with the hardware infrastructure used in the digital library of an organization. 7 percent respondents reported that they are partially satisfied with the hardware infrastructure used in the digital library of an organization. Whereas 2 percent respondents reported that they are somewhat dissatisfied with the hardware infrastructure used in the digital library of an organization.

5.3.20 Digital Library Architecture

(Q.20) To know the digital library architecture used by the organization while creation of the digital library present question has been asked.

It is found that an organization has used website based technology for the creation of digital library. It has not used Standard digital library architecture for the creation of digital library.

5.3.21 Digital Library Software Facility in the College Library

(Q.21) for creation of digital library Software play important role, without it can't work. The additional software such as operating system such as Linux, Window, Scanning Software, Adobe Software, and CD/DVD writes Software. Library Automation Software, Software for CD/DVD Management, Digital Library Software, Content Management Software, E- Learning Software, Citation Management Software, E-book Reader, Federated Search Engines, Optical

Character Recognizer (OCR) Software, Web designing Software such as Java and Storage Software. The respondents reported the following responses in a table 5.18

Table 5.18 Digital Library Software Facility in the College Library

Sr. No.	Availability of digital library software	Number of response	Percentage (%)
1.	Operating Software Linux	33	78.57
2.	Operating Window	09	21.42
3.	Scanning Software	42	100.00
4.	Adobe Software	42	100.00
5.	CD/DVD Write Software	35	83.33
6.	Library Automation Software	42	100.00
7.	Software for the CD/DVD Management	00	0
8.	Digital Library / Institutional Library Software	01	02.38
9.	Content Management Software	0	0
10.	E- Learning Software		0
11.	Citation Management Software	0	0
12.	E-book Reader	0	0
13.	Federated Search Engines	0	0
14.	Optical Character Recognizer (OCR) Software	0	0
15.	Web designing Software such as Java	0	0
16.	Storage Software	0	0

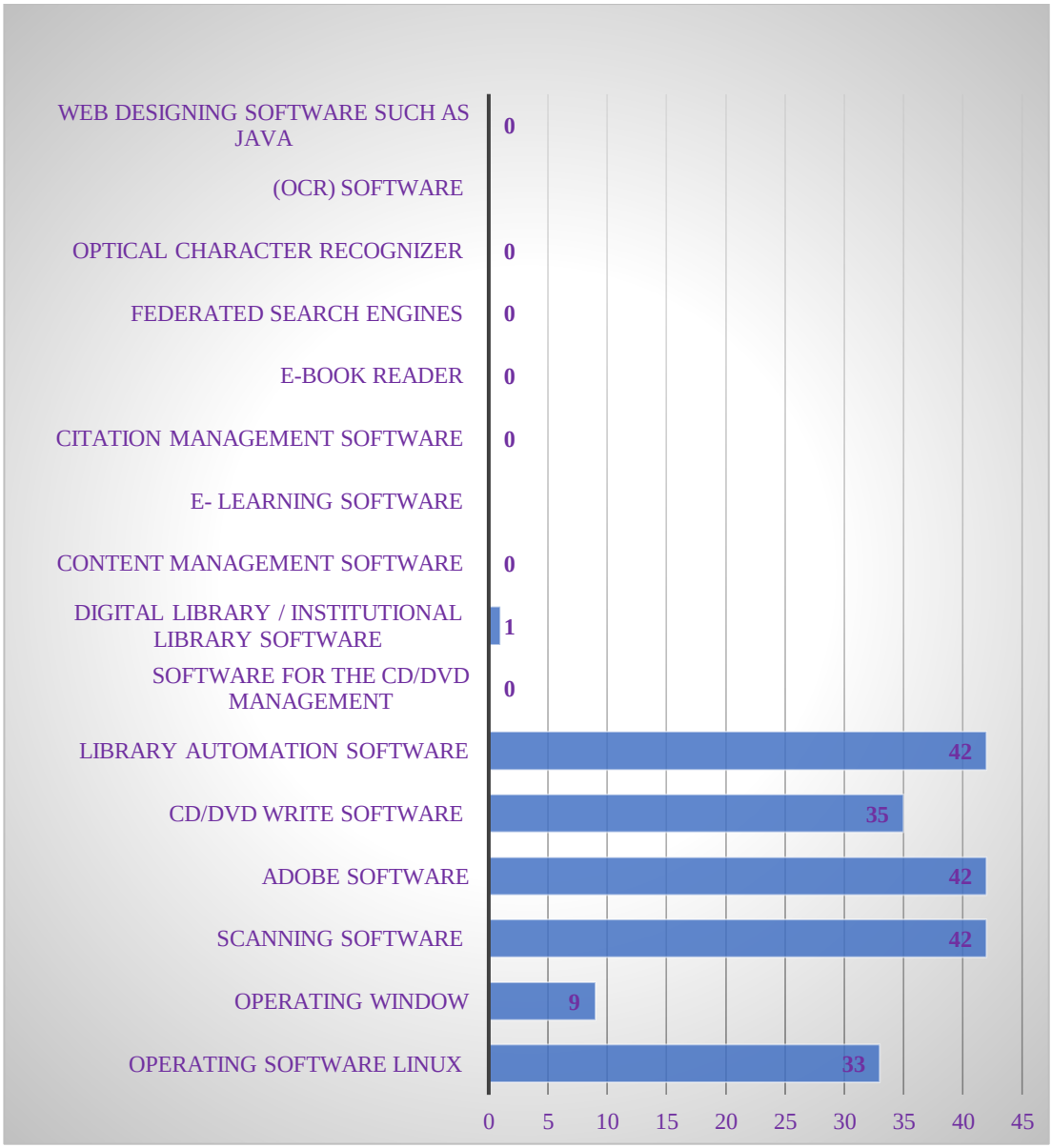


Figure 5.18 Digital Library Software Facility in the College Library

From table 5.18 and figure 5.18, it is found that the 100 percent respondents reported that they are having Scanning, Adobe and library Automation Software. 78.57 percent respondents noted that they are using Linux operating system and 21.42 percent respondents reported that they are using window operating system. 83.33 percent respondents are having CD/DVD Write Software. Only 2.38 respondents are having Digital library Software. No any respondents reported that college library are having Software for the CD/DVD Management, Citation Management Software, E-book Reader, Federated Search Engines, Optical Character Recognizer (OCR) Software, Web designing Software and Storage Software.

5.3.22 Technology for Digital Library

(Q.22)The basic aim of this question is to know the satisfaction level of using website based technology in the Rayat Knowledge Bank (digital library). The response are shown in table 5.19

Table 5.19 Website based Technology for Digital Library

Sr. No.	Website based technology for digital library	Number of response	Percentage (%)
1.	Yes	04	10
2.	No.	38	90
	Total	**42**	**100.00**

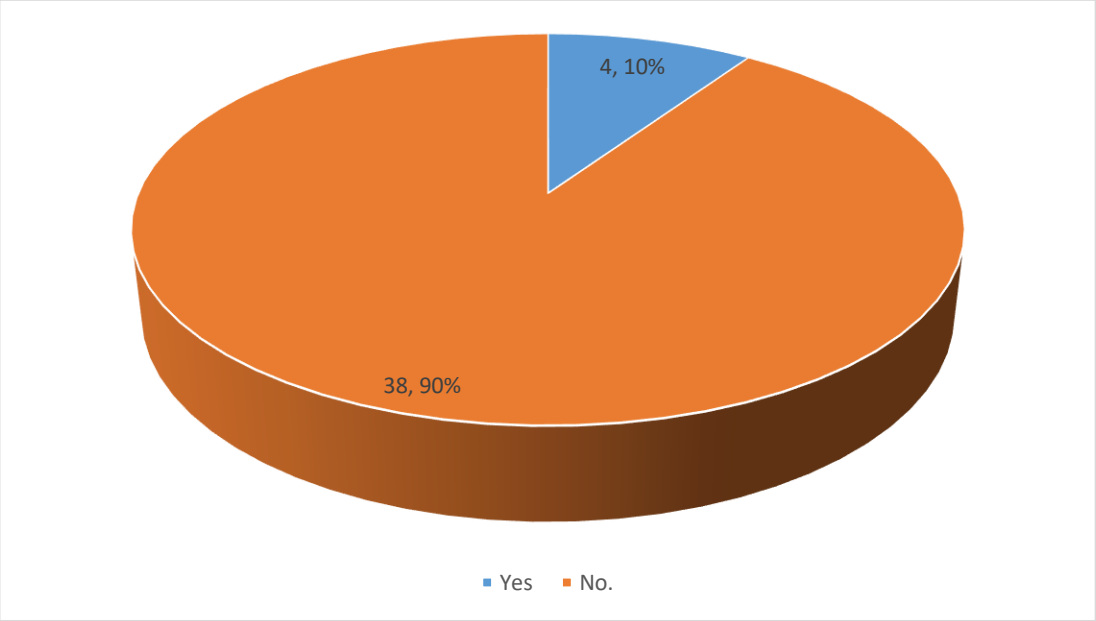


Figure 5.19 Website based Technology for Digital Library

From table 5.19 and figure 5.19 it is observed that 10 percent respondents reported that they are satisfied with the use of website technology based the digital library. Whereas 90 percent respondents reported that they are not satisfied with the use of website based technology in the digital library.

5.3.23 Software for The Rayat Knowledge Bank (DL)

(Q.23)The purpose of this question is to select appropriate digital library software for creation of the Rayat Knowledge Bank (digital library). The response is shown in table 5.20

Table 5.20 Software Useful to the Rayat Knowledge Bank (DL)

Sr. No.	Software useful to the Rayat Knowledge Bank (DL)	Number of Response	Percentage (%)
1.	Open Source (E.g.Dspace, EPrint, Fedora, Green stone)	31	74
2.	Commercial (E.g. ContentDM, DLXS, VITAL	05	12
3.	House made / Own Software	02	5
4.	No Response	04	9
	Total	**42**	**100.00**

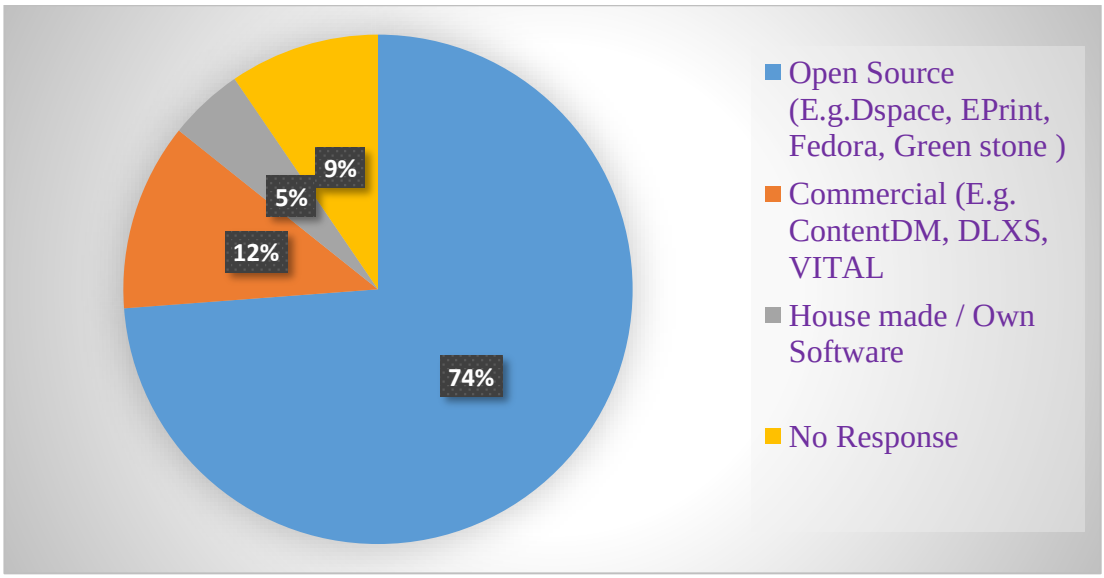


Figure 5.20 Software Useful to the Rayat Knowledge Bank (DL)

From table 5.20 and figure 5.20 it is observed that 74 percent respondents reported that Open source software will be useful for creation of the digital library. 12 percent respondents reported that commercial software will be useful for creation of the digital library. 5 percent respondents reported that house made software will be useful for creation of the digital library. Whereas 9 percent respondents remain neutral for selection of software.

5.3.24 Open Source Software for the Rayat Knowledge Bank

(Q.24) The purpose of this question is to select appropriate open source software to be used for creation of the Rayat Knowledge Bank (digital library). The response are shown in table 5.21

Table 5.21 Open Source Software for the Rayat Knowledge Bank

Sr. No.	Name of open software	Number of response	Percentage (%)
1.	DSpace	20	65
2.	Eprint	02	06
3.	Fedora	01	03
4.	Green Stone	08	26
	Total Response	**31**	**100**

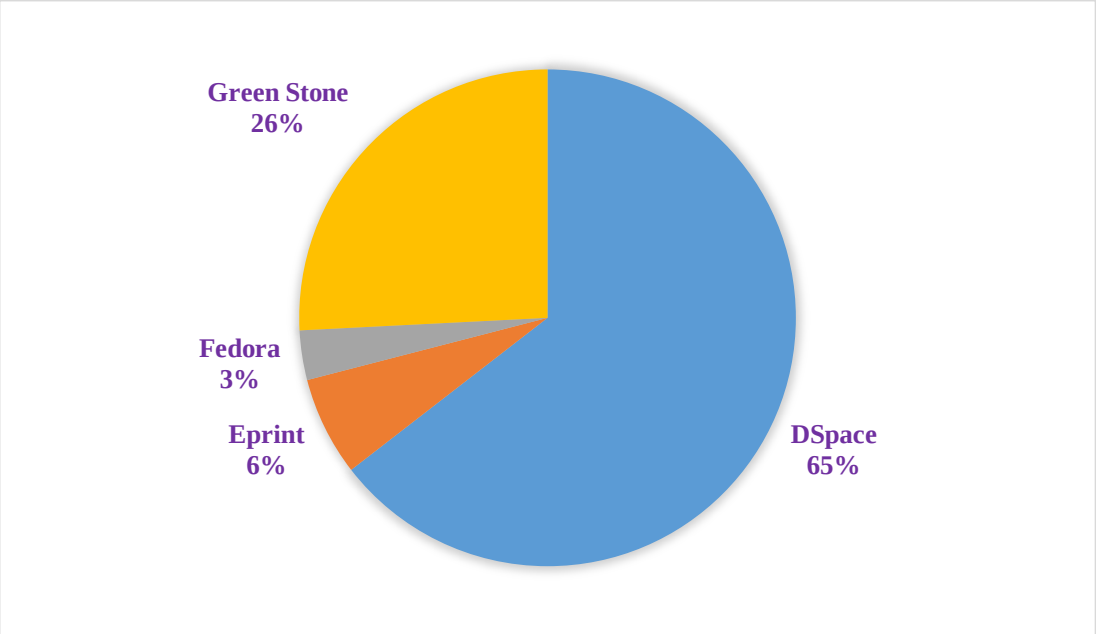


Figure 5.21 Open Source Software for the Rayat Knowledge Bank

From table 5.21 and figure 5.21 it is observed that Out of 31 respondents 65 percent respondents reported that Dspace software will be useful for creation of Digital library. 26 percent respondents reported that Green stone software will be useful for creation of Digital library. 6 percent respondents reported that Eprint software will be useful for creation of Digital library. Whereas only 3 percent respondents reported that Fedora will be useful for creation of Digital library.

5.3.25 OCR Software to the Rayat Knowledge Bank

(Q.25)The purpose of this question is to know the OCR software to be used in of creation of the Rayat Knowledge Bank. The responses are indicated in the table 5.21

Table 5.22 OCR Software to the Rayat Knowledge Bank

Sr. No.	OCR software to The Rayat Knowledge Bank	Number of Response	Percentage (%)
1.	Adobe Capture	26	62
2.	Abby Fine Reader	05	12
3.	Omnipage Pro	06	14
4.	WordScan	05	12
	Total	**42**	**100**

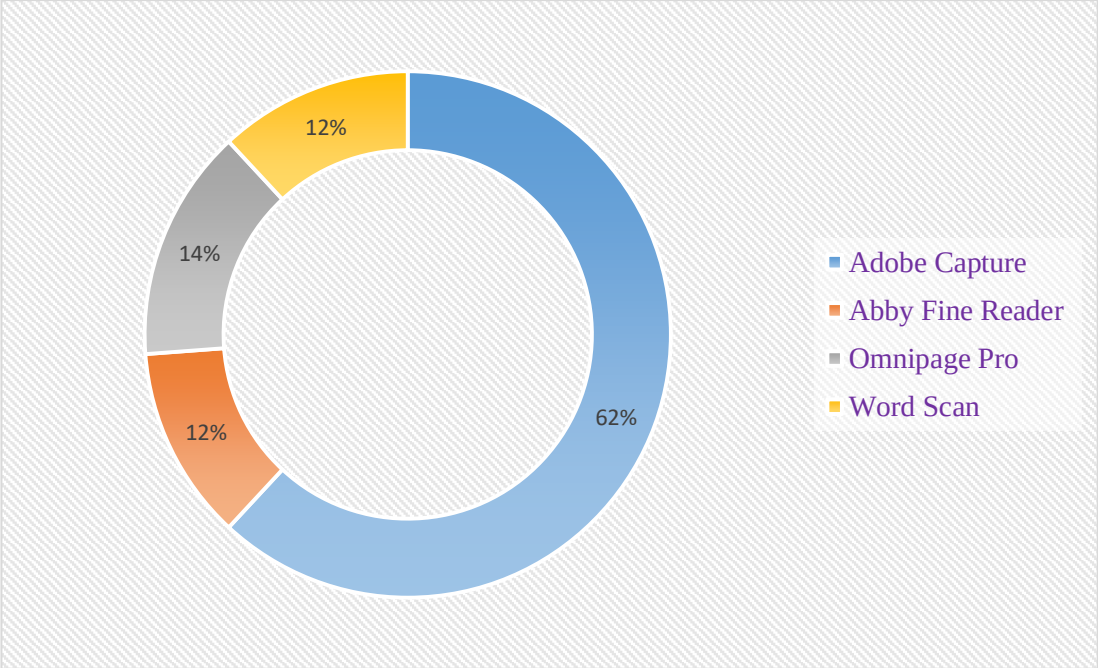


Figure 5.22 OCR Software to the Rayat Knowledge Bank

From table 5.22 and figure 5.22 it is observed that 62 percent respondents reported that Adobe Capture OCR software to be used in the Rayat Knowledge Bank. 12 percent respondents reported that Abby Fine Reader OCR and Word Scan software to be used in the Rayat Knowledge Bank. 14 percent respondents reported that Omnipage Pro OCR software to be used in the Rayat Knowledge Bank.

5.3.26 Supporting Application Software for the Rayat Knowledge Bank

(Q.26) The purpose of this question is to know the respondents opinion for using additional supporting application software in the Rayat Knowledge Bank. The response are shown in table 5.23

Table 5.23Application Software for the Rayat Knowledge Bank

Sr. No.	Application software to The Rayat Knowledge Bank	Number of response	Percentage (%)
1.	Acrobat PDF	29	69
2.	Adobe Photo Shop	13	31
3.	Any other (Pl Specify)	00	00
	Total	**42**	**100**

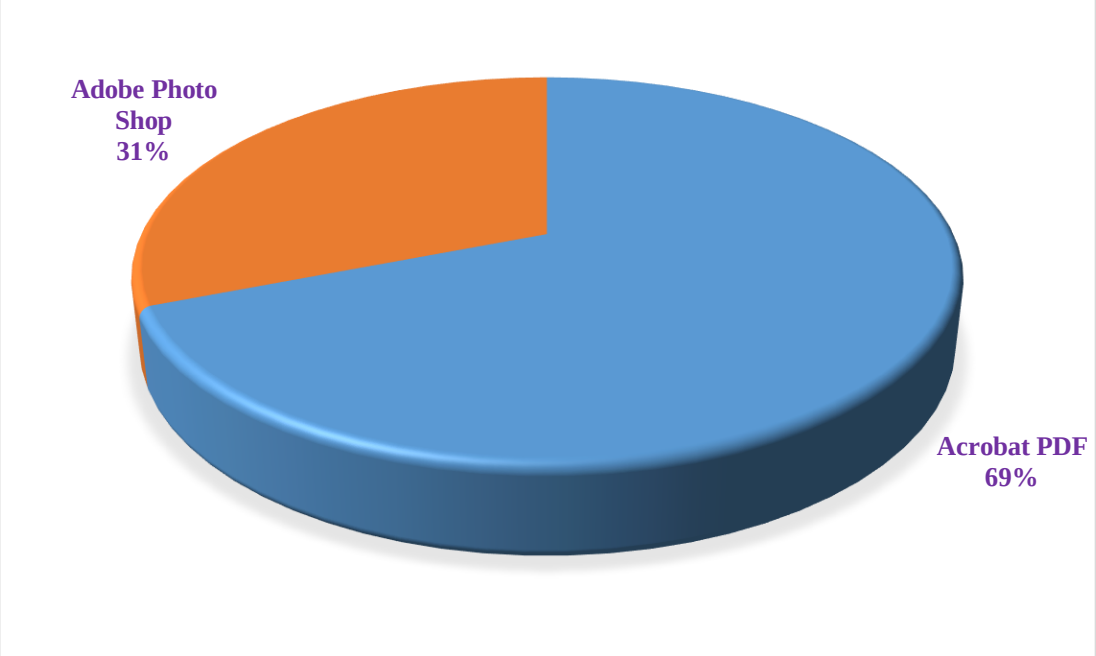


Figure 5.23 Application Software for the Rayat Knowledge Bank

From table 5.23 and figure5.23 it is observed that 69 percent respondents reported that Acrobat PDF software should be used in the Rayat Knowledge Bank. Whereas 31 percent respondents reported that Adobe Photo Shop software should be used in the Rayat Knowledge Bank. No other additional software suggested by the respondents.

5.3.27 Copyright Issue and Preservation of Digital Resources

(Q.27) The copyright issue for preservation of digital resources is very crucial and important in the digital library creation. To know the opinion regarding the copyright issues the present question has been asked. The response are shown in table 5.24

Table 5.24 Copyright Issue and Preservation of Digital Resources

Sr. No.	The copyright issue for preservation of digital resources	Number of response	Percentage (%)
1.	Acquire the written permission from copyright holder	15	36
2.	Use the Open source only	07	17
3.	Use the old material which is beyond the copyright act	12	28
4.	Referencing is given while preparation of Education and learning PPTs, & PDF etc	08	19
	Total	**42**	**100**

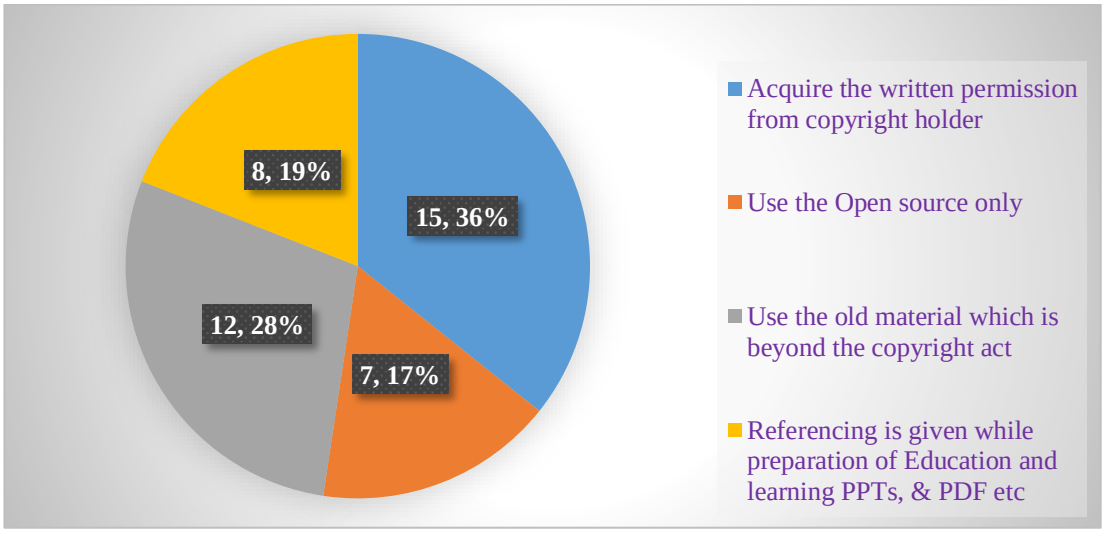


Figure 5.24 Copyright Issue and Preservation of Digital Resources

From table 5.27 and figure 5.27 it is observed that 36 percent respondents report that acquire the written permission from copyright holder. 17 percent respondents reported that use the open source only. 28 percent respondents' report that use the old material which is beyond the copyright act. Whereas 19 percent respondents report that Referencing is given while preparing educational and learning materials.

5.3.28 Availability of Digital Collections in the Library

(Q.28) The main purpose of this question is to know actually availability of digital collection in a library. The response for the same is highlighted in table 5.25

Table 5.25 Availability of Digital Collections in the Library

Sr. No.	Availability of digital collections	Number of response	Percentage (%)
1.	E-books	42	100.00
2.	E-journals	42	100.00
3.	Online database	24	57.14
4.	Websites	42	100.00
5.	Projects	05	11.90
6.	Proceedings	00	00
7.	Images	42	100.00
8.	Events photographs	42	100.00
9.	Open source	30	71.42
10.	Lectures PPT's	25	59.52
11.	Audio recordings	05	11.90
12.	Video recordings	03	7.14
13.	Study materials	05	11.90
14.	Institutional repository	05	11.90

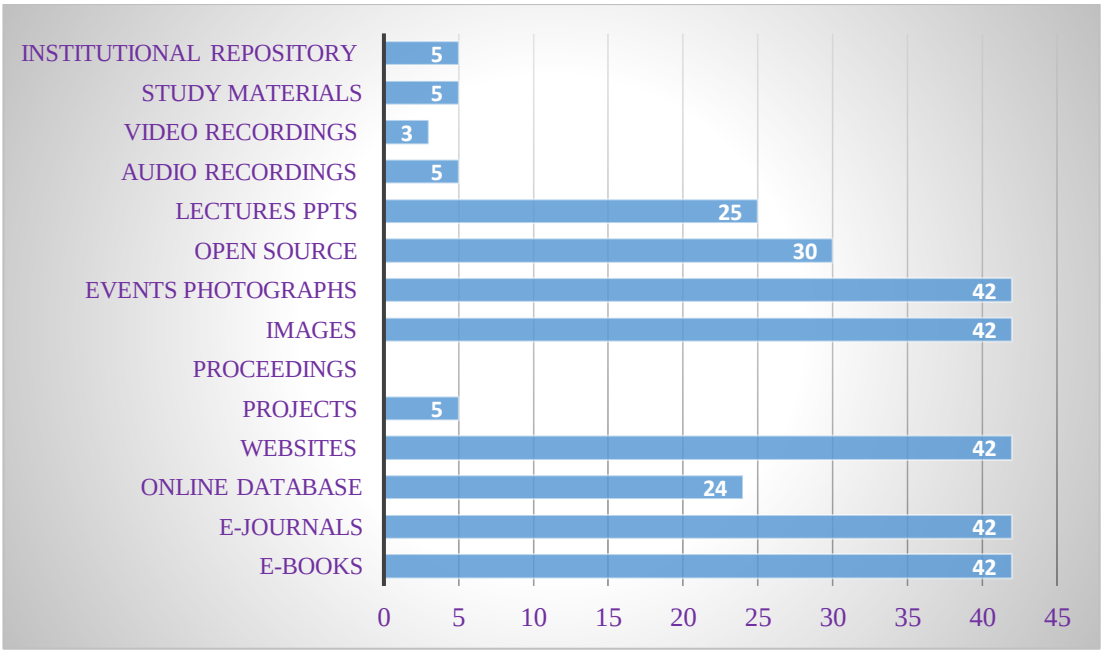


Figure 5.25 Availability of Digital Collections in the Library

From table 5.25 and Figure 5.25, it is found that 100 percent college libraries are having digital collection in the forms of e- books, e- journals, websites, images and event photographs. 57.14 percent libraries are having online databases, 11.90 percent libraries are having projects, Audio recordings, study material and Institutional Repository. 71.42 percent libraries are using open resources such as DOAJ, NPTEL and other resources. 59.52 percent libraries are having Power point presentation in their collections. No library have been proceedings in the electronic form.

5.3.29 Resources to the Rayat Knowledge Bank

(Q.29) To enrich the digital library of the Rayat Shikshan Sanstha, the opinion of the respondents will play important role, there are number of resources that will be helpful to enrich the library, because of the same present question has been asked. This is multi choice question. The responses for the same is shown in table 5.26

Table 5.26 Resources to the Rayat Knowledge Bank

Sr. No.	Resources to the Rayat Knowledge Bank	Number of response	Percentage (%)
1.	Manuscripts on the Rayat Shikshan Sasntha	28	66.66
2.	Rare Books	32	76.19
3.	Rayat Talent Search Examination books and Question Set of previous years	35	83.33
4.	The Rayat Shikshan Sanstha's important circulars	30	71.42
5.	Educational Material Such as PPT, Slides, Audio and video recordings	42	100

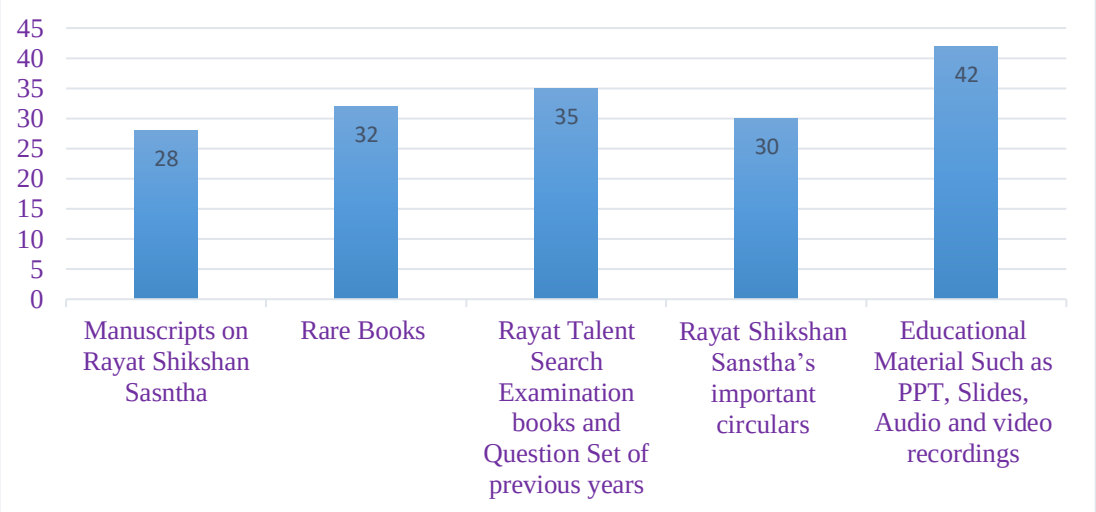


Figure 5.26 Resources to the Rayat Knowledge Bank

From table 5.26 and figure 5.26 it is observed that 66.66 percent respondents reported that manuscripts on the Rayat Shikshan Sanstha should be added to the Rayat Knowledge Bank. 76.19 respondents reported that Rare Book should be added to The Rayat Knowledge Bank. 83.33 percent respondents reported to add Rayat Talent Search Examination books and question set of previous years. 71.42 percent respondents reported that to add the Rayat Shikshan Sanstha's important circulars.

Whereas 100 respondents report that educational material such as PPT, Slides, Audio and video recordings should be added to the Rayat Knowledge Bank.

5.3.30 Acquisition Method for Digital Collection

(Q.30) To know acquisition method followed by an organization for building digital collection the present question has been asked. The response is shown in the table 5.27

Table 5.27 Acquisition Method for Digital Collection

Sr. No.	Acquisition method of digital collection	Number of response	Percentage (%)
1.	Acquire	07	17.00
2.	Convert	08	19.00
3.	Born digital material	22	52.00
4.	Buy access portals	05	12.00
		42	**100**

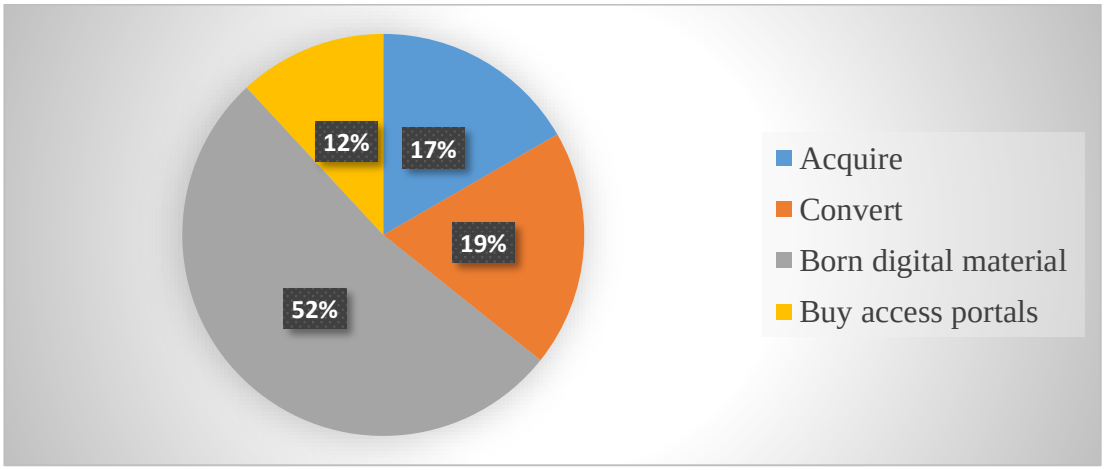


Figure 5.27 Acquisition Method for Digital Collection

From table 5.27 and figure 5.27 it is observed that 17 percent respondents reported that acquire the digital collection from the creator. 19 percent respondents reported that convert the digital collection from print to digital collection. 52 percent respondents reported that born digital material are used for building digital collection. Whereas 12 percent respondents reported that buy access portals for the building digital collection.

5.3.31 Digital Resources Processing

(Q.31) The digitization is the main process for converting printed material to digital material. For converting textual matter to digital matter number of hardware and software will require. To handle the digitization processing proper staff is also necessary. For this large amount of investment on the purchase and installation will be required. To know the opinion regarding the in house digitized unit to be established or allocated the work to some agencies by outsourcing the work or follow both the ways. The present question has asked. The response shown in table 5.28

Table 5.28 Digital Resources Processing

Sr. No.	Digital resources processing	Number of response	Percentage (%)
1.	In House digitized	10	24
2.	Outsourcing	27	64
3.	Both	05	12
	Total	**42**	**100.00**

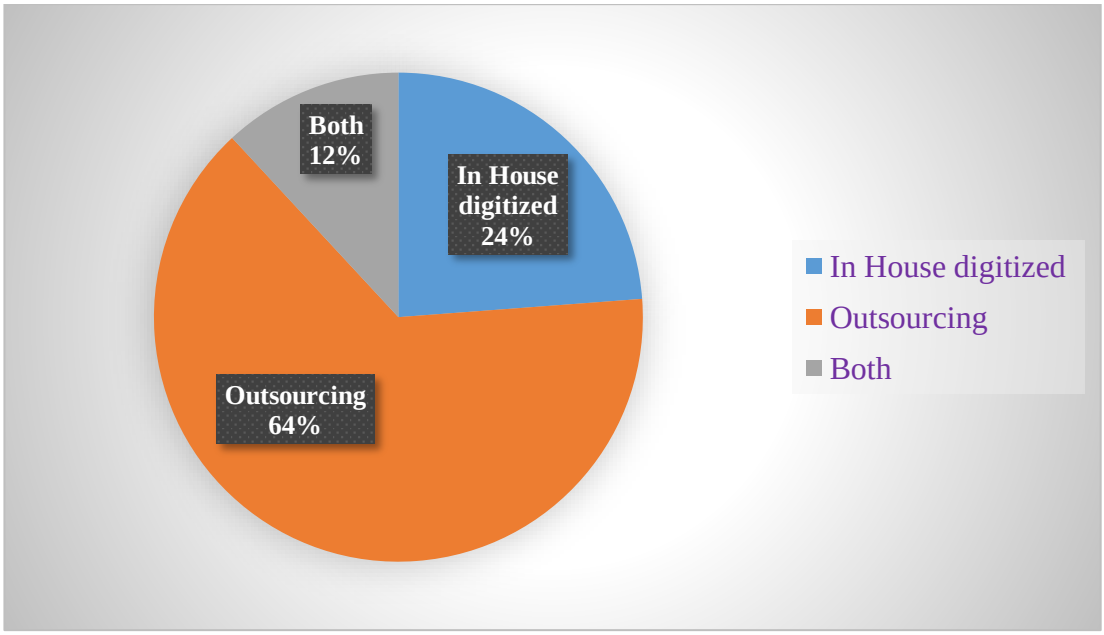


Figure 5.28 Digital Resources Processing

From table 5.28 and figure 5.28 it is found that 24 percent respondents reported that in house digitization should be followed. For carrying out digitization processing. 64 percent respondents reported that outsourcing to be followed for the digitization. Whereas 12 percent respondents remain neutral they do not reply to the question.

5.3.32 Storage of Digital Resources

(Q.32) for storing digital resources CD-ROM, DVD-ROM, FMD-ROM and Hard Disk are used. To know the opinion of the respondents' college the present question has been asked. Which will be the media to be used for storing digital resources. The responses are shown in table 5.29

Table 5.29 Storage of Digital Resources

Sr. No.	Storage of digital resources	Number of Response	Percentage (%)
1.	CD-ROM	03	07
2.	DVD-ROM	07	17
3.	FMD-ROM	05	12
4.	Hard Disk	27	64
	Total	**42**	**100**

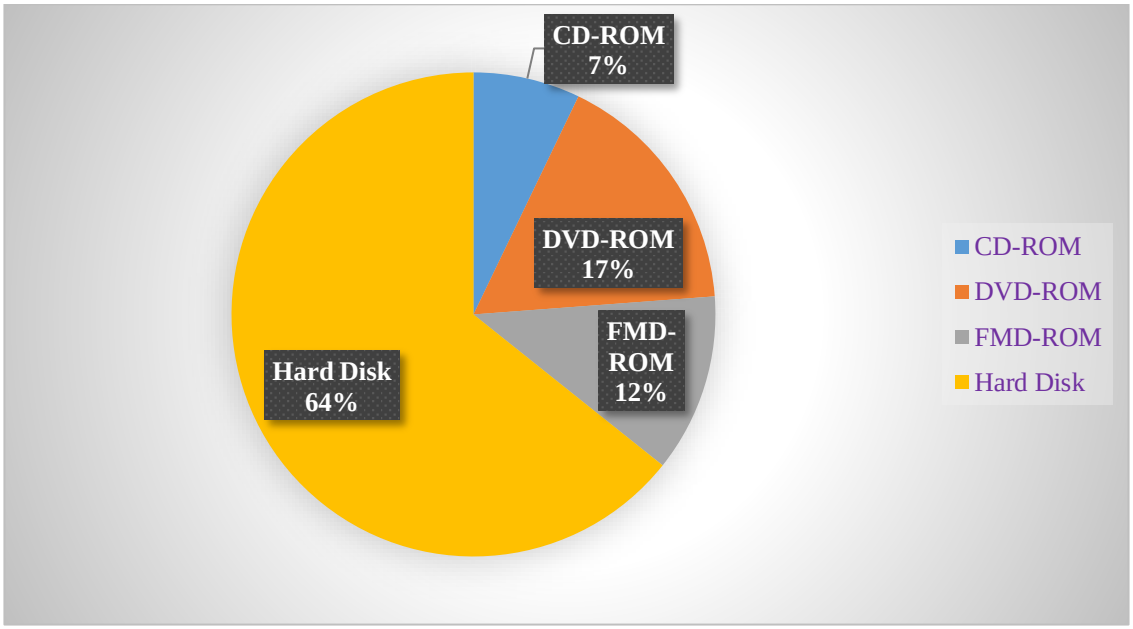


Figure 5.29 Storage of Digital Resources

From table 5.29 and figure 5.29 it is observed that 7 percent respondents reported that CD-ROM should be used for storing digital resources. 17 percent respondents reported that DVD-ROM should be used for storing digital resources. 12 percent respondents reported that FMD-ROM Should be used for storing digital

resources. Whereas 64 percent respondents reported hard disk will be prefect media to be used for storing digital resources.

5.3.33 Use of Metadata, Object Naming and Unique Object Identifier

(Q.33) To know the use of Metadata, object Naming and Unique object Identifier followed in the digital library of an organization the present question has been asked. The response are shown in the table 5.30

Table 5.30 Use of Metadata, Object Naming and Unique Object Identifier in the Digital Library

Sr. No.	Use of Metadata, object Naming and Unique object Identifier in the digital library	Number of response	Percentage (%)
1.	Yes	00	00
2.	No.	37	88
3.	Neutral	05	12
	Total	**42**	**100.00**

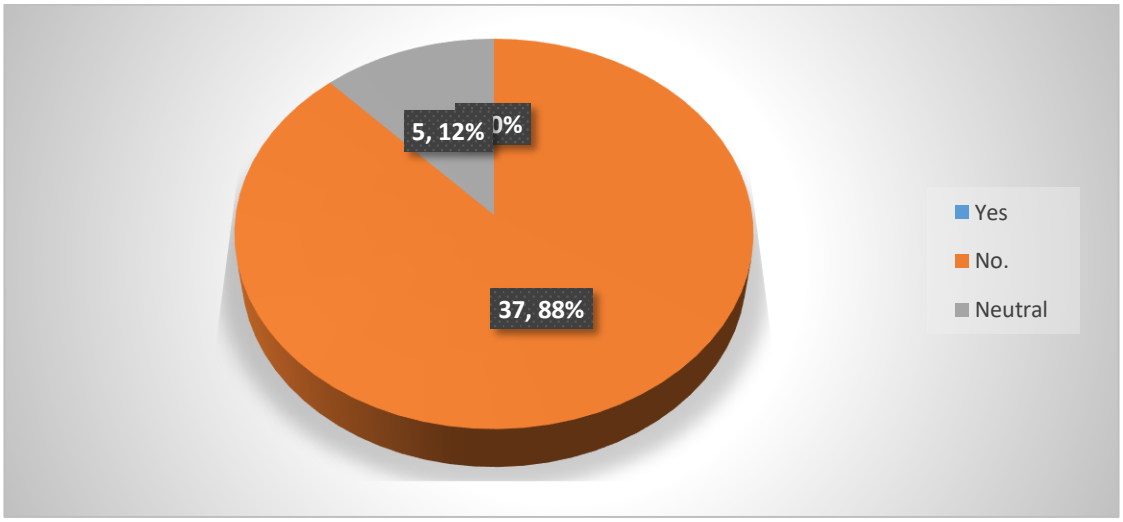


Figure 5.30 Use of Metadata, object Naming and Unique Object Identifier in the Digital Library

From table 5.30 and figure 5.30 it is observed that 88 percent respondents reported that the use of Metadata, object Naming and Unique object Identifier was not followed in the digital library of an organization. 12 percent respondents did not report anything they remain neutral.

5.3.34 Mode of Information Organization in The Rayat Knowledge Bank

(Q.34) The organization of information is very important in the digital library. To know the satisfaction regarding information organization followed in the Rayat Knowledge Bank the present question has been asked. The response are shown in the table 5.31

Table 5.31 Information Organization in the Rayat Knowledge Bank

Sr. No.	Information Organization in The Rayat Knowledge Bank	Number of response	Percentage (%)
1.	Fully Satisfied	04	10
2.	Partially Satisfied	05	12
3.	Somewhat Dissatisfied	19	45
4.	Not satisfied	14	33
	Total	**42**	**100**

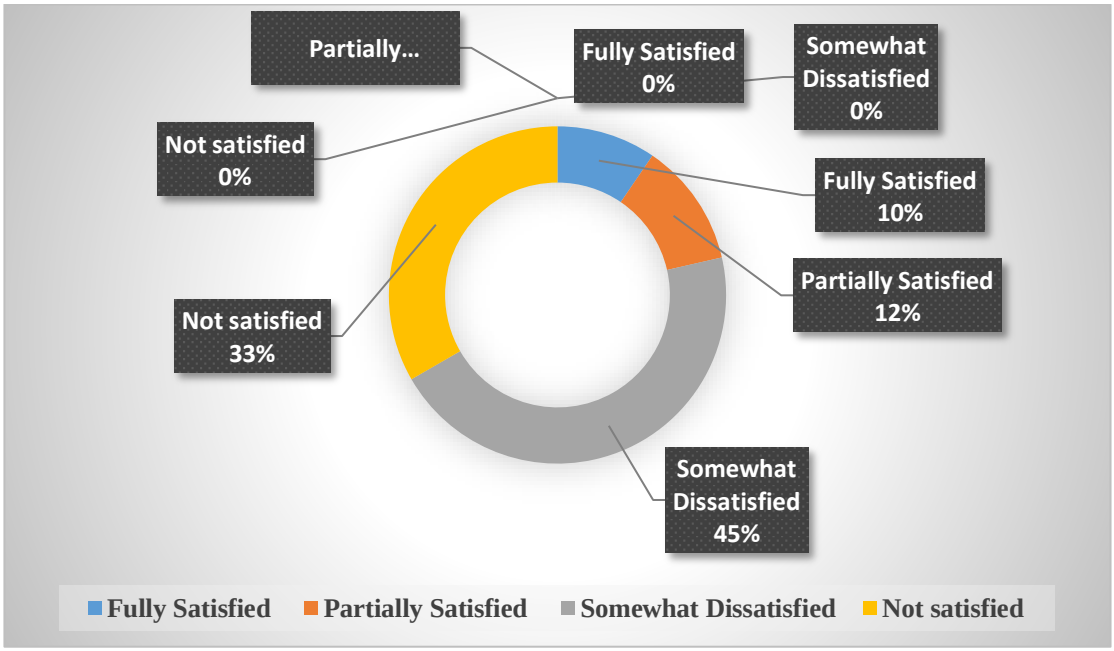


Figure 5.31 Information Organization in the Rayat Knowledge Bank

From table 5.31 and figure 5.31 it is observed that 10 percent respondents reported that they are fully satisfied with the information organization in the Rayat Knowledge Bank. 12 percent respondents reported that they are partially satisfied with the information organization in the Rayat Knowledge Bank. 45 percent respondents reported that they are somewhat dissatisfied with the information

organization in the Rayat Knowledge Bank; whereas 33 percent respondents reported that they are not satisfied with the information organization in the Rayat Knowledge Bank.

5.3.35 Expected Mode of Information Organization in The Rayat Knowledge Bank

(Q.35)There are different ways to organize information such as communities, collection and items wise or Bibliographic formats such as Book, Journals, CD/ DVD. The organization of information system in helpful sequence will help to find the right information in a definite time. To know the mode of information organization to be follow in the digital library the present question has been asked. The response is shown in table 5.32

Table 5.32 Expected Mode of information Organization in the Rayat Knowledge Bank

Sr. No.	Organization of information in The Rayat Knowledge Bank	Number of response	Percentage (%)
1.	Communities, Collections, items etc	31	74
2.	Bibliographic formats such as Book, Journals etc	07	17
3.	Neutral	04	09
	Total	**42**	**100**

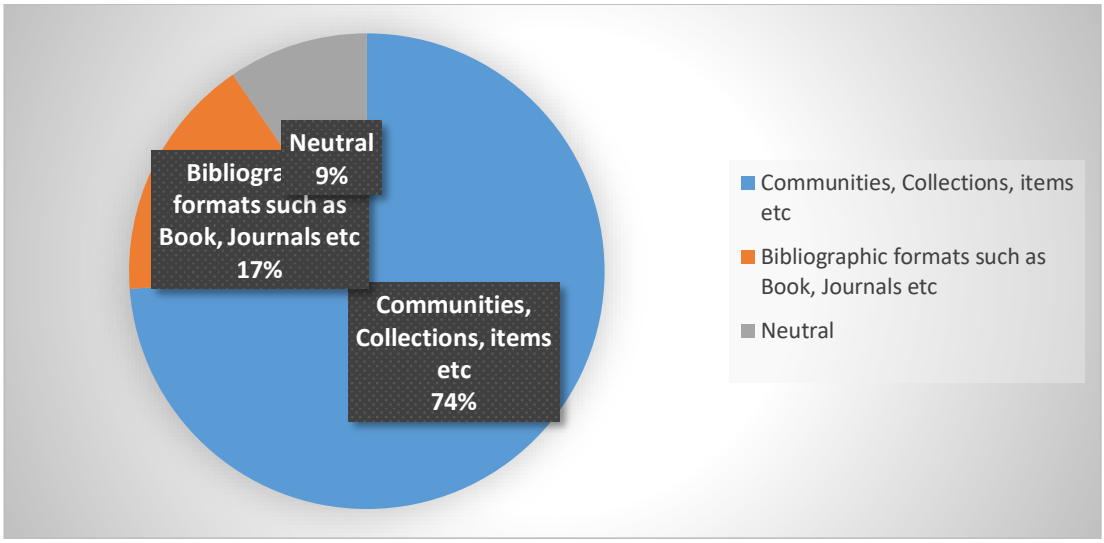


Figure 5.32 Expected Mode of Information Organization in the Rayat Knowledge Bank

From table 5.32 and figure 5.32 it is observed that 74 percent respondents reported to use Communities, Collections, items wise arrangement of information. 17 percent respondents reported to use Bibliographic formats such as Book, Journals etc. whereas 9 percent respondents remain neutral they did not reply anything.

5.3.36 Access to The Rayat Knowledge Bank

(Q.36) to know the opinion of the respondents regarding Access to the Rayat Knowledge Bank / digital Library. The responses are shown in the table 5.33

Table 5.33 Access to the Rayat Knowledge Bank

SR. No.	Access to The Rayat Knowledge Bank	Number of Response	Percentage (%)
1.	Yes	37	88.00
2.	No.	04	10.00
3.	Neutral	01	02.00
	Total	**42**	**100.00**

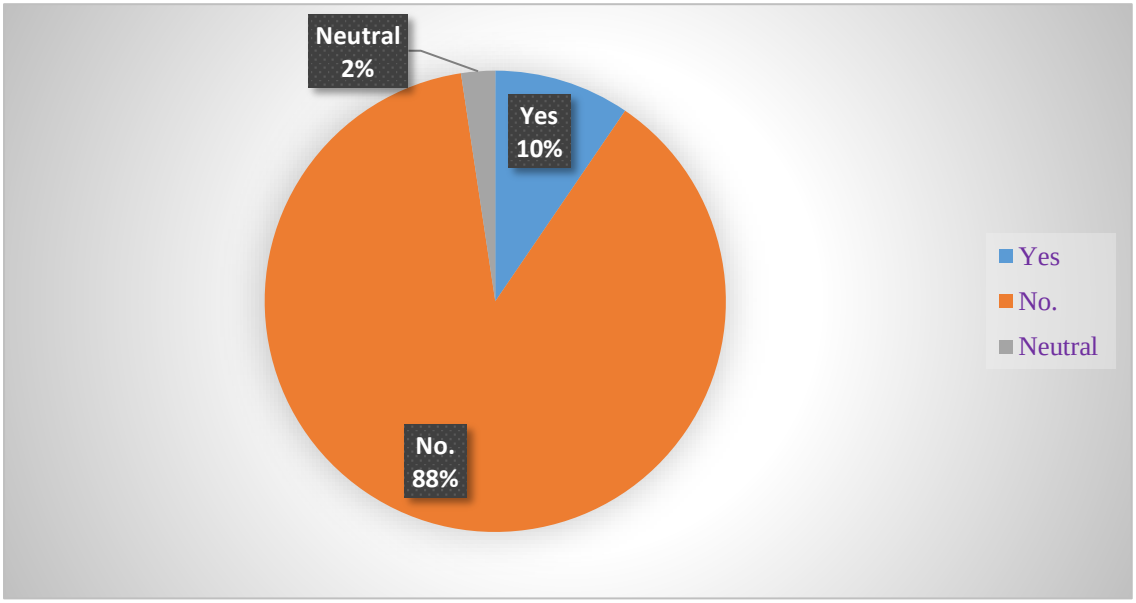


Figure 5.33 Access to the Rayat Knowledge Bank

From table 5.33 and figure 5.33 it is observed that 88 percent respondents reported that they are satisfied with open access. 10 percent respondents thought

there should be close access system. 2 percent respondents remained neutral. They did not reply anything.

5.3.37 Authenticated Access to the Rayat Knowledge Bank

(Q.37) Access to the Rayat Knowledge Bank is open to everyone. To control the access present question has been asked. The response shown in table 5.34

Table 5.34 Authenticated access to the Rayat Knowledge Bank

Sr. No.	Authenticated access to The Rayat Knowledge Bank	Number of response	Percentage (%)
1.	Password based Access to registered users	26	70
2.	Authenticated / Restricted Access	10	27
3.	Selective Access depending upon nature of Material	01	3
	Total	**37**	**100**

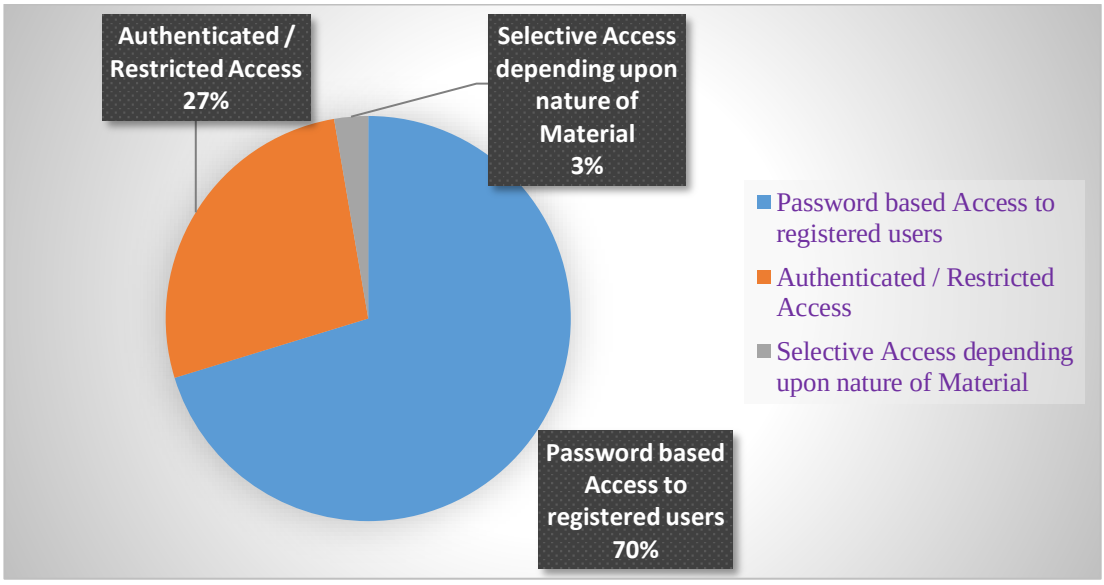


Figure 5.34 Authenticated Access to the Rayat Knowledge Bank

From table 5.34 and figure 5.34 it is found that 70 percent respondents reported that password based access to registered users to be provided. 27 percent respondents reported that Authenticated / Restricted Access should be provided. 3 percent respondents repiled that selective access depending upon nature of Material should be provided to users.

5.3.38 Access Option for the Rayat Knowledge Bank

(Q.38) Access option such as search, advanced search, browse navigation interface and links to the subject gateways are the pre requisite of the digital library. The present question has asked to know the use of these option are followed in the present digital library. The responses are shown in the table 5.35

Table 5.35 Access Option for the Rayat Knowledge Bank

SR. No.	Access option for The Rayat Knowledge Bank	Number of Response	Percentage (%)
1.	Yes	03	07
2.	No.	37	88
3.	Neutral	02	05
	Total	**42**	**100.00**

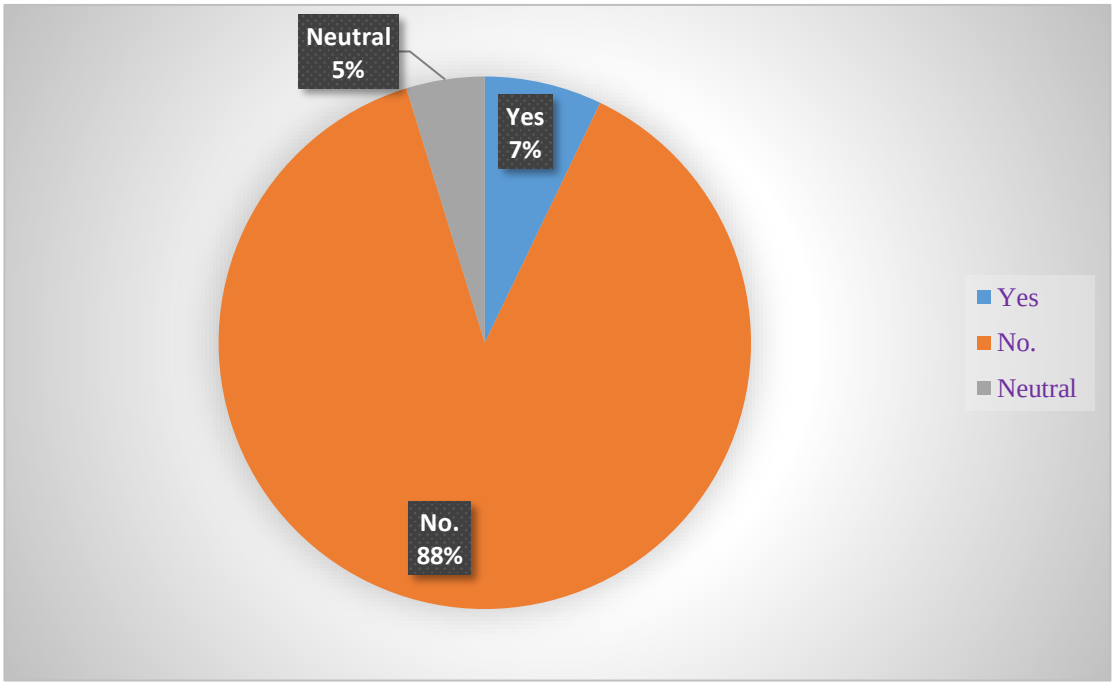


Figure 5.35 Access Option for the Rayat Knowledge Bank

From table 5.35 and figure 5.35 it is observed that 7 percent respondents reported that access option is provided in the digital library. 88 percent respondents reported that access option is not provided in the digital library. Whereas 5 percent respondents remains neutral for the question they did not reply to the question.

5.3.39 Digital Library Services

(Q.39) The main purpose of this question is to know actually the digital library services provided by a library. Libraries provide different types of services using digital resources such as OPAC / WEB OPAC service, Current Awareness Service, online external database service, CD-ROM database Service, Internally Published Newsletters, Reports and Journals Service, Email, Bulletin Board Service, Audio and Video Communication, Electronic table of contents, Electronic Document Delivery Service, Electronic Thesis and dissertations, Digital Reference Service, E-Publishing, Discussion Groups and Forums, Central Storage facilities for hosting digital collections and indexes and Special Collection Service etc. The following are the responses received from the respondents see the table 5.36.

Table 5.36 Digital library services

Sr. No.	Digital library services	Number of response	Percentage (%)
1.	Catalog database (OPAC / WEBOPAC)	42	100.00
2.	Current Awareness Service	10	23.80
3.	Externally Purchase Databases (e.g. N-LIST)	24	57.14
4.	CD-ROM databases	00	00
5.	Internally Published Newsletters , Reports and Journals	05	11.90
6.	E-mail	42	100.00
7.	Bulletin Board Service	09	21.42
8.	Audio and Video Communication	15	35.71
9.	Electronic table of contents	05	11.90
10.	Electronic Document Delivery Service	15	35.71
11.	Electronic Thesis and dissertations	00	00
12.	Reference Service	05	11.90
13.	E-Publishing	09	21.42
14.	Discussion Groups and Forums	05	11.90
15.	Central Storage facilities for hosting digital collections and indexes	42	100.00
16.	Special Collection Service	00	00

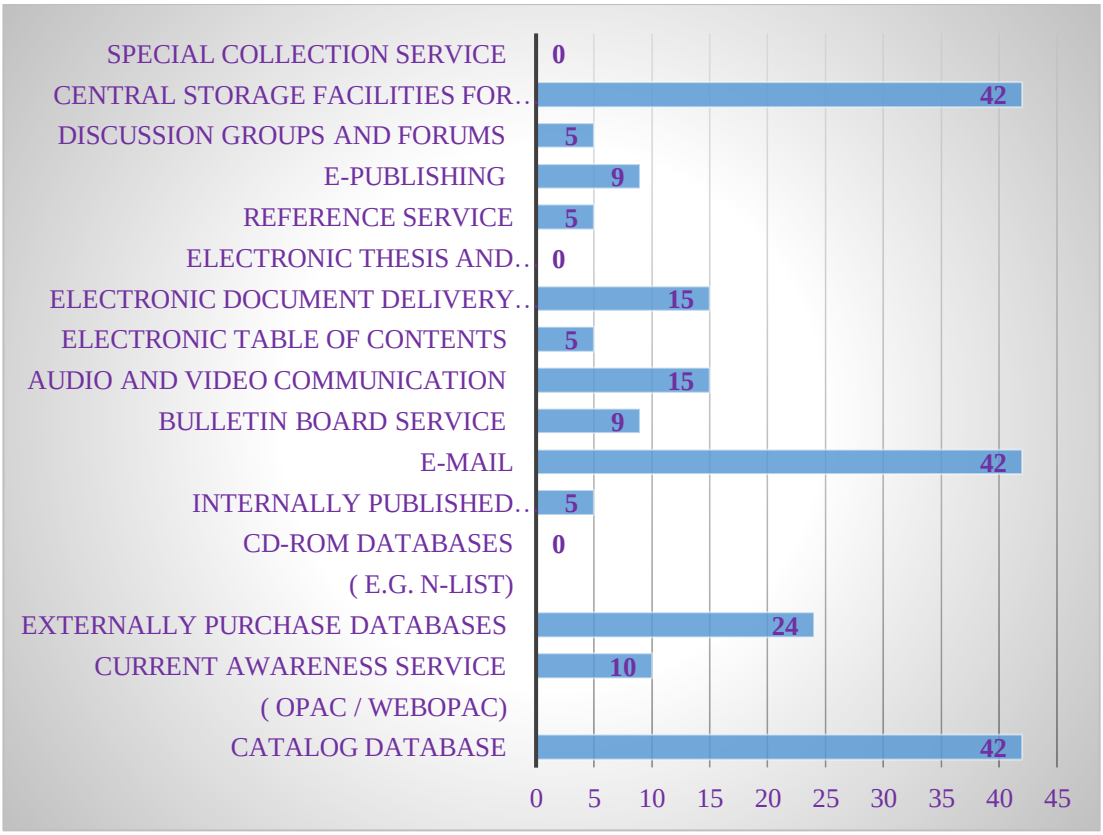


Figure 5.36 Digital Library Services

From table 5.36 and Figure 5.36, the study reveals that 100 percent respondents' college libraries are providing OPAC / WEBOPAC, Email and Central Storage facilities for hosting digital collections Service. 23.80 percent respondents reported that college libraries provides Current Awareness Service by using digital library service, 57.14 percent respondents reported that college libraries have online external database such as NLIST database. 11.90 percent respondents reported that college libraries provide Internally Published Newsletters, Electronic table of contents, Digital Reference Service and Discussion Groups and Forums digital library services. 21.42 percent respondents reports that college libraries have provided Bulletin Board Service and E-Publishing services. 35.71 percent respondents reported that college libraries provides Electronic Document Delivery Service, Audio and Video Communication, No any respondents reported that college library provide CD/ DVD ROM database , Electronic Thesis and dissertations, and Special Collection Service.

5.3.40 Advance Digital Library Services

(Q.40) The advanced digital library services such as E-Alerts, RSS Feeds, Ask an-expert and eDD etc are very important in the digital library. The present question is asked to know the use of these advanced digital library services are followed in the present digital library. The responses are shown in the table 5.37

Table 5.37 Advance Digital Library Services

SR. No.	Advance digital library services	Number of Response	Percentage (%)
1.	Yes	05	12
2.	No.	37	88
	Total	**42**	**100.00**

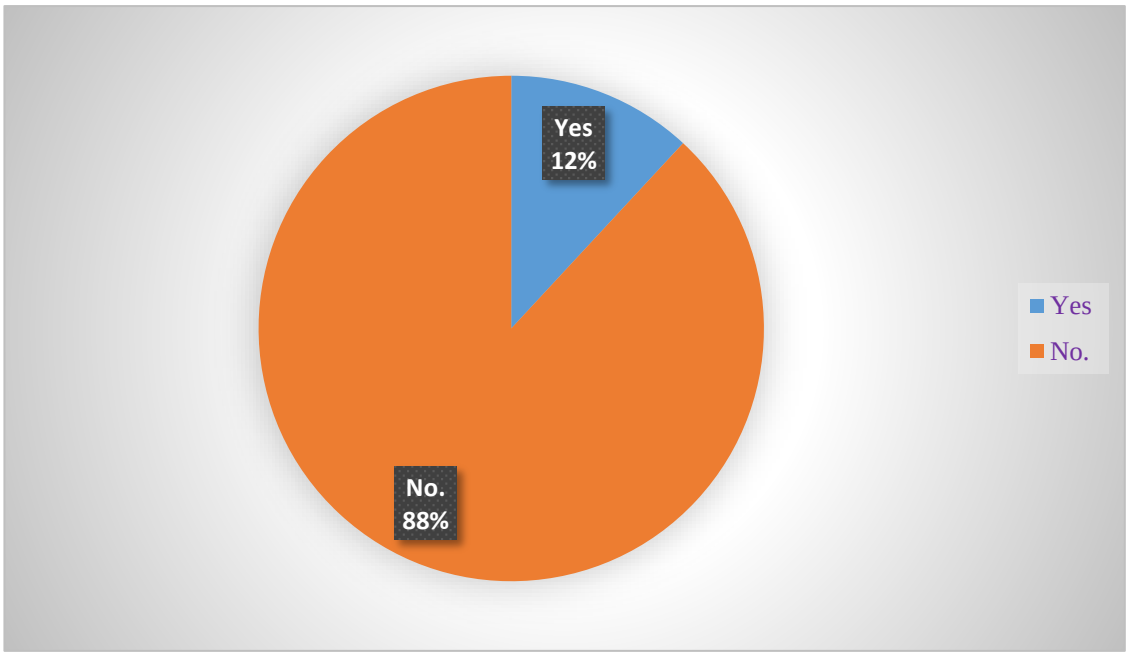


Figure 5.37 Advance Digital Library Services

From table 5.37 and figure 5.37 it is observed that 12 percent respondents reported that the advanced digital library services are followed in the present digital library. Whereas 88 percent respondents reported that the advanced digital library services are not followed in the present digital library.

5.3.41 File Formats for the Rayat Knowledge Bank

(Q.41) The purpose of maintaining digital collection is to preserve the rare material. To improve access by making the information available on the web. The file formats for storage of information are text, image, Audio, video files. Database, Web Archive, tabular data, Containers, Geospatial and statistics etc. Table 5.38

Table 5.38 File Formats for the Rayat Knowledge Bank

SR. No.	File formats for The Rayat Knowledge Bank	Format	Preference response	Percentage (%)
1.	Text Files	PDF	10	23.82
		XML	09	21.42
		SGML	07	16.68
		HTML	06	14.28
		ASCII	05	11.90
		UTF-8	03	07.14
		No Response	02	04.76
		Total	**42**	**100.00**
2.	Still Image	PDF	08	19.04
		JPEG	07	16.68
		IMG	06	14.28
		GIF	05	11.90
		TIFF	05	11.90
		BMP	04	09.52
		PNG	04	09.52
		No Response	03	7.14
		Total	**42**	**100**
3.	Moving Images	MPEG	11	26.19
		MXF	06	14.28
		AVI	05	11.90
		MP4	05	11.90
		DAT	05	11.90
		MOV	04	09.50
		WMV	03	07.14
		No Response	03	07.14
		Total	**42**	**100**
4.	Audio File	WAVE	08	19.04
		AU	07	16.68

		AIFF	06	14.28
		MXF	06	14.28
		MP3	06	14.28
		MIDI	05	11.90
		No Response	04	09.52
		Total	**42**	**100**
5.	Database	XML	22	52.38
		CSV	17	40.47
		No Response	03	07.14
		Total	**42**	**100**
6.	Web Archive	WARC	39	92.85
		No Response	03	07.15
		Total	**42**	**100**
7.	Tabular Data	CSV	40	95.24
		No Response	02	04.76
		Total	**42**	**100**
8.	Containers	ZIP	21	50.00
		GZIP	13	30.95
		TAR	08	19.05
		Total	**42**	**100**
9.	Geospatial	SHP	13	30.95
		DBF	12	28.57
		GEOTIFF	10	23.80
		NetCDF	05	11.90
		No Response	02	04.76
		Total	**42**	**100**
10.	Statistics	ASCII	14	33.33
		DTA	12	28.57
		PGR	09	21.42
		SAS	05	11.90
		SAV	02	04.76
		Total	**42**	**100**

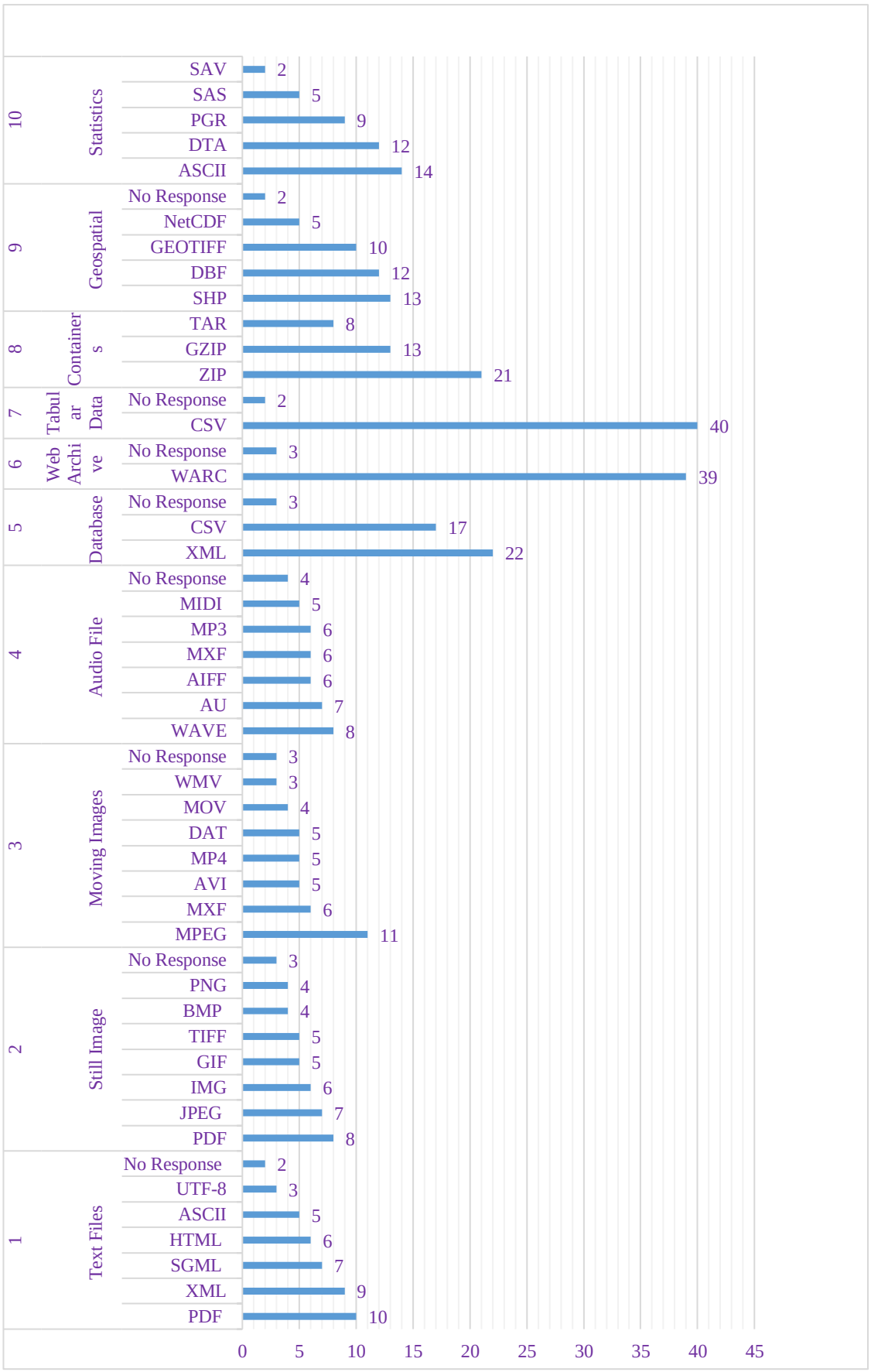


Figure 5.38 File Formats for the Rayat Knowledge Bank

From Table 5.38 and Figure 5.38 it is found that

1) For storage of text file 23.82 percent respondents has given preference for PDF format. 21.42 percent respondents has given preference for XML format. 16.68 percent respondents has given preference for SGML format. 14.28 percent respondents has given preference for HTML format. 11.90 percent respondents has given preference for ASCII format and 7.14 percent respondents has given preference for UTF-8 format. Whereas 4.76 percent respondents did not reply to a question.
2) For storage of still image file, 19.04 percent respondents has given preference to PDF format. 16.68 percent respondents has given preference to JPEG format.14.28 percent respondents has given preference to IMG format.11.90 percent respondents has given preference to TIFF and GIF format. 9.52 percent respondents has given preference to BMP format and 7.14 respondents did not response to particular option.
3) For storage of moving image files, 26.19 percent respondents has given preference to MPEG format. 14.28 percent respondents has given preference to MXF format. 11.90 percent respondents has given preference to AVI, MP4, DAT and MOV format respectively. 7.14 percent respondents has given preference to WMV format. Whereas 7.14 percent respondents did not response to any particular option.
4) For storage of audio files, 19.04 percent respondents has given preference to WAVE format. 16.68 percent respondents has given preference to AU format. 14.28 percent respondents has given preference to AIFF, MXF and MP3 format respectively. 11.90 percent respondents has given preference to MIDI format. Whereas 9.52 percent respondents did not response to any particular option.
5) For storage of database files, 52.38 percent respondents has given preference to XML format. 40.47 percent respondents has given preference to CSV format. Whereas 7.14 percent respondents did not response to any particular option.
6) For storage of web archive files, 92.85 percent respondents has given preference to WARC format. Whereas 7.14 percent respondents did not response to any particular option.

7) For storage of tabular data files, 95.24 percent respondents has given preference to CSV format. Whereas 4.76 percent respondents did not response to any particular option.
8) For storage of containers files, 50.00 percent respondents has given preference to ZIP format. 30.95 percent respondents has given preference to GZIP format. 19.05 percent respondents has given preference to TAR format.
9) For storage of geospatial files, 30.95 percent respondents has given preference to SHP format. 28.57 percent respondents has given preference to DBF format. 23.80 percent respondents has given preference to GEOTIFF format. 11.90 percent respondents has given preference to NetCDF format. Whereas 4.76 percent respondents did not response to any particular option.
10) For storage of statistics files, 33.33 percent respondents has given preference to ASCII format. 28.57 percent respondents has given preference to DTA format. 21.42 percent respondents has given preference to PGR format. 11.90 percent respondents has given preference to SAS format and 4.76 percent respondents has given preference to SAV format.

5.3.42 Meta Data Standards to the Rayat Knowledge Bank

(Q.42)The Meta data standards play important role in building digital library. The main purpose of this question is to know the opinion of respondents in respect of Meta data Standards to be used in the Rayat Knowledge Bank. This is multi choice question. The response is shown in table 5.39

Table 5.42 Meta Data Standards to the Rayat Knowledge Bank

Sr. No.	Meta data standards to The Rayat Knowledge Bank	Number of response	Percentage (%)
1.	MARC- Machine Readable Catalogue	42	100.00
2.	Dublin Core (DC)	42	100.00
3.	METS- Metadata Encoding and Transmission Standard	39	92.85
4.	MODS- Metadata Object Description Schema	38	90.47
5.	VRA Code- Visual Resources Association	35	83.33
6.	EAD- Encoded Archival Description	37	88.09
7.	Locally Developed Schema	30	71.42
8.	ISAD (G)	39	92.85
9.	Z39.50	42	100.00

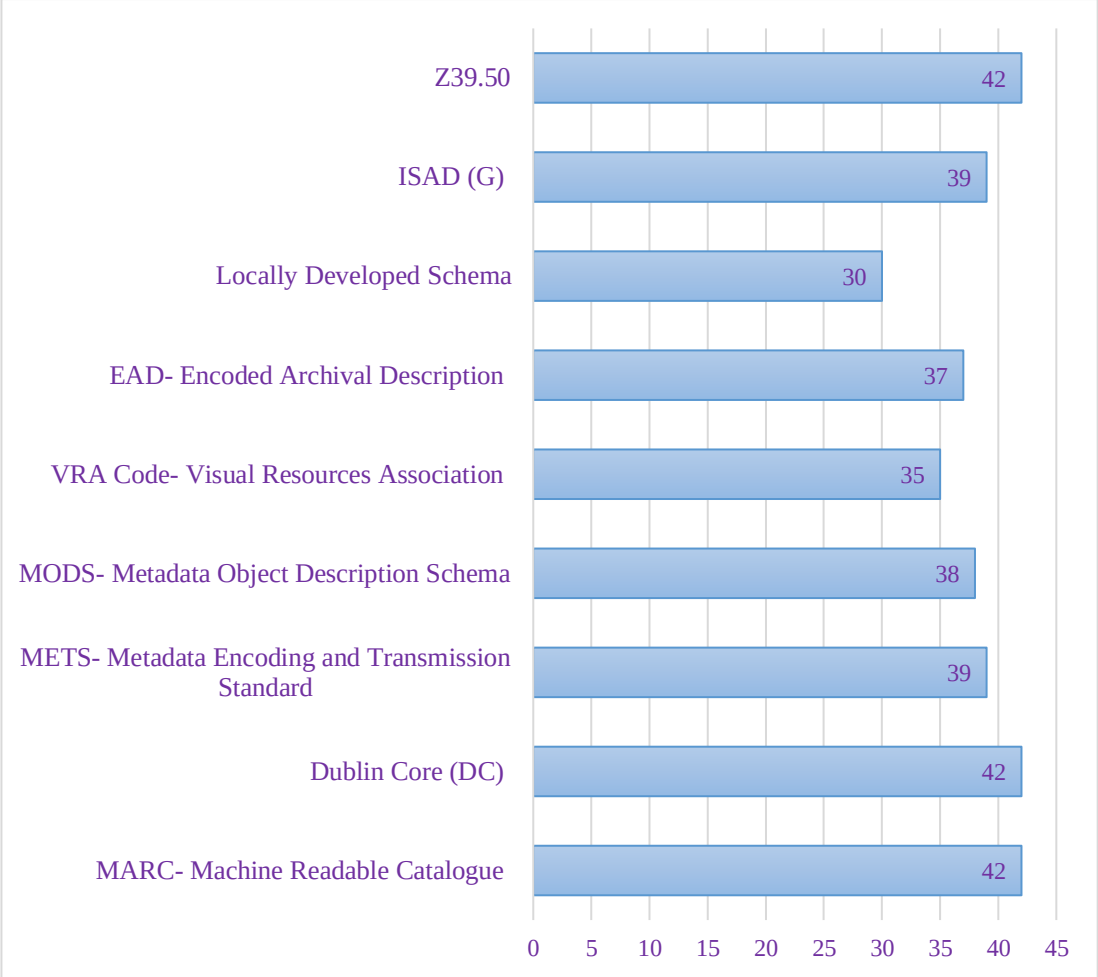


Figure 5.39 Meta Data Standards to the Rayat Knowledge Bank

From table 5.39 and figure 5.39 it is observed that 100 percent respondents reply to use Meta Data Standards are MARC- Machine Readable Catalogue, Dublin Core (DC) and Z39.50. 92.85 percent respondents reply to use METS- Metadata Encoding and transmission Standards and ISAD (G). 90.47 percent respondents reply to use MODS- Metadata Object Description Schema. 83.33 percent respondents reply to use VRA Code- Visual Resources Association. 88.09 percent respondents reply to use EAD- Encoded Archival Description. Whereas 71.42 percent respondents reply to use Locally Developed Schema.

5.3.43 Challenges for Creation of Digital Library

(Q.43) The impact of Information and communication technology has influenced every field. Library profession has also evolved many new activities and services through electronic ways. Library automation, use of databases and creation of digital library are the new product and challenges of the present era. The creation of digital library is important as well as challengeable in the electronic era. There are lot of challenges involved in the creation of digital library such as creation and maintenance of digital infrastructure, budgetary challenges, and trained staff etc. To know the opinion of respondents researcher has asked the present question. This is multi choice question. The responses is shown in table 5.40

Table 5.40 Challenges for Creation of Digital Library

Sr. No.	Challenges for creation of digital library	Number of response	Percentage (%)
1.	Lack of funding	42	100.00
2.	Lack of skillful staff and relevant expertise	42	100.00
3.	Lack of technical knowledge	42	100.00
4.	Lack of training	38	90.47
5.	Inadequate infrastructure	42	100.00
6.	Lack of management support	20	47.61
7.	Security problems	30	71.42
8.	Identification of valuable and reliable resources	25	59.52
9.	Copyright / digital right management	39	92.85
10.	Attitude of publishers	25	59.52
11.	Lack of standards	20	47.61
12.	Lack of content	15	35.71
13.	Lack of policies and strategies	39	92.85
14.	Lack of marketing skill for dl	15	35.71
15.	Rapid changing digital world	40	95.23
16.	Interoperability among different media input and formats	42	100.00

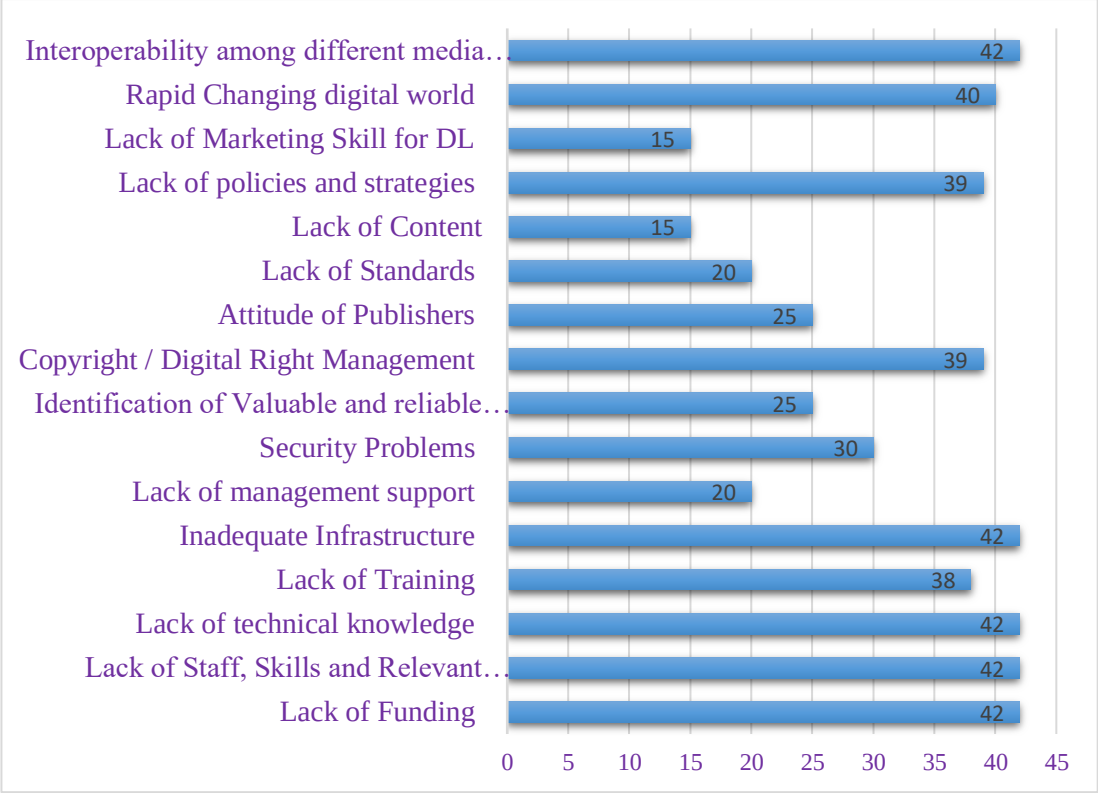


Figure 5.40 Challenges for Creation of Digital Library

From table 5.40 and figure 5.40 it is observed that 100 percent respondents reported that Lack of funding, skillful Staff, technical knowledge, inadequate Infrastructure and Interoperability among different media input and formats are the challenges involved in creation of digital library.90.47 percent respondents reported that there is need of training. Through and periodical training is demanded by the researcher at the Institution level. 47.61 percent respondents reported that there is lack of management support and digital library standards while creating the digital library. 71.42 percent respondents reported that there is security problems while developing the digital library.59.52 percent respondents reported that there is challenge involved in selecting valuable and reliable resources as well as Attitude of Publishers for the digital library. 92.85 percent respondents reported that there is Copyright / Digital Right Management and Lack of policies and strategies challenges involved while developing the digital library.35.71percent respondents reported that there is lack of contents and marketing skill while creating the digital library. 95.23 percent respondents reported that there is Rapid Changing digital world is the major challenge in the creation of the digital library.

5.3.44 Marketing of The Rayat Knowledge Bank

(Q.44) Creation as well as marketing of the Rayat Knowledge Bank is equally vital. To know the opinion of the respondents in regards to popularize the Rayat Knowledge Bank the question has been asked. This is multi choice question. The response is shown in table 5.41

Table 5.41 Marketing of the Rayat Knowledge Bank

SR. No.	Marketing of The Rayat Knowledge Bank	Number of Response	Percentage (%)
1.	Collaboration with other Digital library	35	83.33
2.	Focus on the core values of the institution.	39	92.85
3.	Provide user centric service	42	100.00
4.	Open platform to users	40	95.23
5.	Look for added value	36	85.71
6.	Use more information technological application	39	92.85

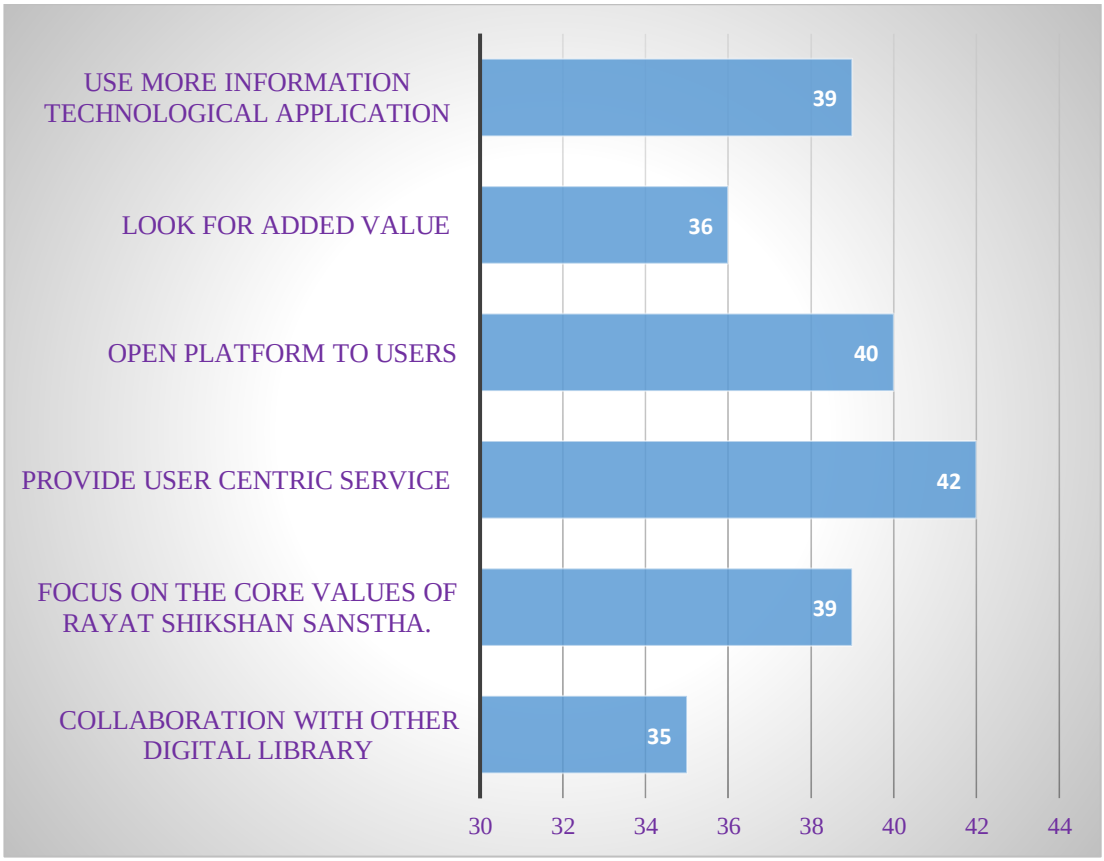


Figure 5.41 Marketing of the Rayat Knowledge Bank

From table 5.41 and figure 5.41 it is observed that 83.33 percent respondents note that collaboration with other digital library will help to market the Rayat Knowledge Bank. 92.85 percent respondents note that Focus on the core values of the institution will help to market the Rayat Knowledge Bank. 100 Percent respondents note that Provide user centric service will help to market the Rayat Knowledge Bank. 95.23 Percent respondents' note that Open platform to users will help to market the Rayat Knowledge Bank. 85.71 Percent respondents note that Look for added value will help to market the Rayat Knowledge Bank. Whereas 92.85 Percent respondents note that Use more information technological application will help to market the Rayat Knowledge Bank.

5.3.45 Suggestion for Development of Digital Library

This was open end question following are response to the question

Table 5.42 Suggestion for Development of Digital Library

Sr. No.	Suggestion for development of digital library	Number of response	Percentage (%)
1.	Develop infrastructure facility for the use of digital library such as No. of computers, Excellent bandwidth / connectivity and power backup facility	12	28
2.	Subscribe databases centrally at institutional level for achieving greater economy.	07	17
3.	Hire the service of professional scanning and OCR techniques from outside vendor.	05	12
4.	No response	18	43
	Total	42	100

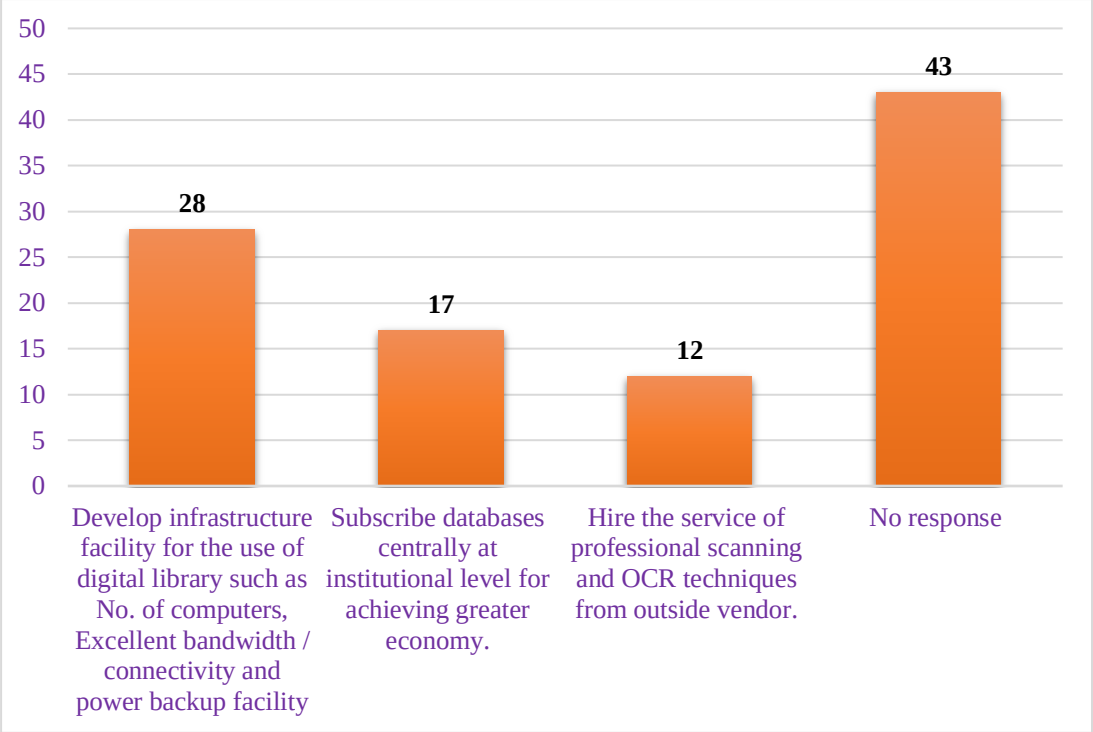


Figure 5.42 Suggestion for Development of Digital Library

From table No. 5.42 and figure 5.42, it is found that 28 percent respondents response that develop infrastructure facility for the use of digital library such as No. of computers, excellent bandwidth connectivity and proper power backup facility for the working of the digital library. 17 percent respondents' response that subscribe databases centrally at institutional level for achieving greater economy. 12 percent respondents' response that hire the service of professional scanning and OCR techniques from outside vendor. Whereas 43 percent respondents do not response to the question.

CHAPTER - 6

USER'S VIEW'S ABOUT THE DIGITAL LIBRARY WITH SPECIAL REFERENCE TO THE RAYAT SHIKSHAN SANSTHA

6.1Introduction

The situation is rapidly changing from traditional library to digital library. The Information communication technology has made tremendous impact on the library and information discipline. The RayatShikshan Sanstha and its colleges are the part of the changing the situations from print media to the digital media. To cope with the situation user's expectation and experience are very vital while developing the digital library. The change in the situation requires a systematic understanding of user view and implementation of right change. % percentage method is used to test the hypothesis. This chapter deals with findings about users view regarding development of the digital library.

6.2 Data Collection

In the present research, descriptive method of research and case study method is used. For collection of data survey techniques is used. The questionnaire tool has been used to collecting data from librarian, faculty member and the student.

A survey was conducted on the basis of objectives and hypothesis to assess and extend the use of digital library created by the Institution. This study helps to find the effective and efficient functioning and provide right kind of digital library to the organization as well as to the whole society.

Second set of questionnaire sent to 378 users of college libraries of the Rayat Shikshan Sansthaout of that 294 questionnaire from 42 college libraries received. The response is 77.77 percent.

6.3 Data Analysis and Interpretation

6.3.1 Status of Respondents

(Q.1) Totally 294 questionnaires received from faculty and student members of 42 colleges of the Institution. The analysis of same is as follow table 6.1

Table 6.1 Status of Respondents

Sr. No.	Status of respondents	Response	Percentage (%)
1.	Faculty	126	43
2.	Research scholar	015	05
3.	PG student	038	13
4.	UG student	115	39
	Total response	**294**	**100**

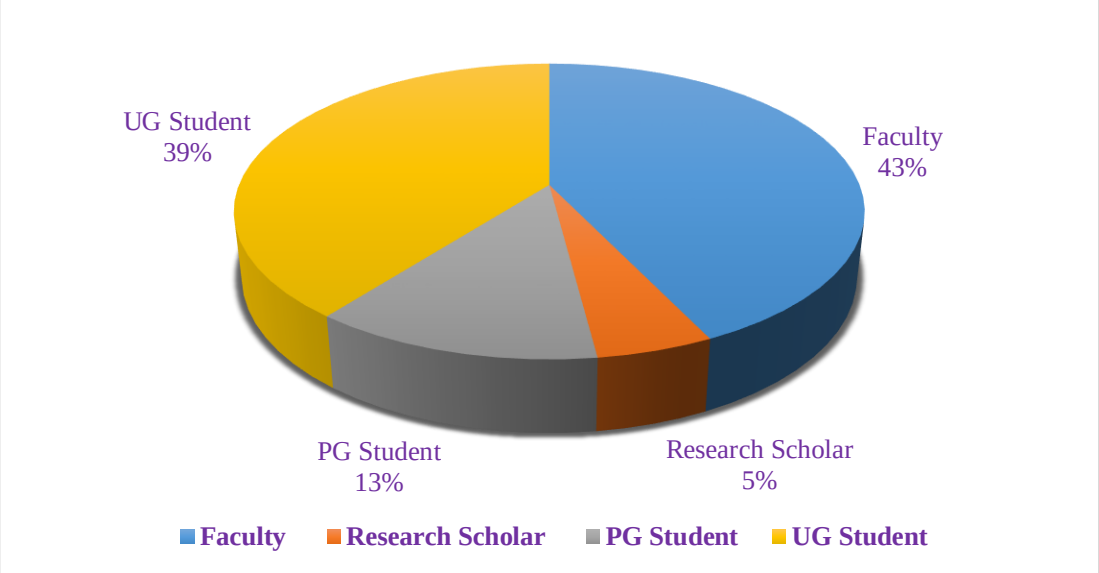


Figure 6.1 Status of Respondents

From table 6.1 and figure 6.1. It is observed that, 43 percent respondent are faculty member. 39 percent respondent are UG Student Member. 13 percent are PG student member. Whereas only 5 percent research student member response to a questionnaire.

6.3.2 Frequency of Users Visit to College Library

(Q.2) The question is asked to determine how often the user visit to college library. Received the following response as shown in table 6.2

Table 6.2 Frequency of Users Visit to College Library

Sr. No.	Frequency of visit	Response	Percentage (%)
1.	Daily	017	05.78
2.	Twice a weak	038	12.92
3.	Weekly	126	42.85
4.	Once in month	099	33.67
5.	Rarely	014	04.76
6.	Never	000	00.00
	Total response	**294**	**100**

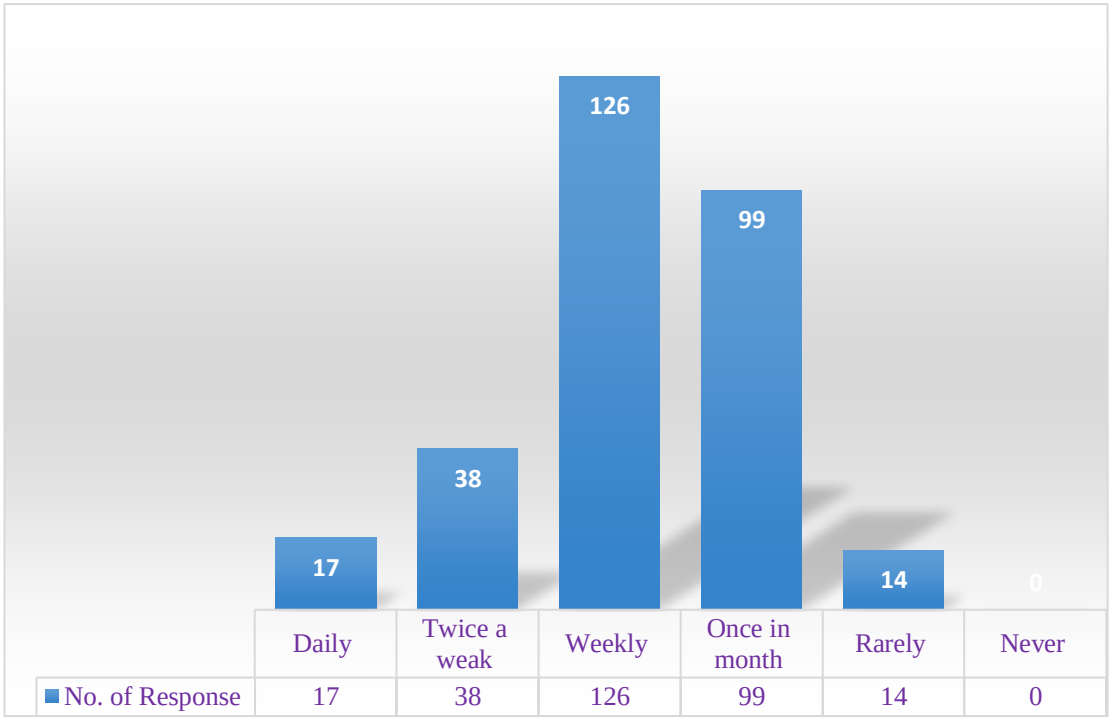


Figure 6.2Frequency of Users Visit to College Library

From table 6.2 and figure6.2it is observed that, 5.78 percent user daily visit to library. 12.94 percent user visit to library twice a week. 42.85 percent user weekly visit to library. 33.67 percent user visit to library once in month. Whereas 4.76 percent user rarely visit the library.

6.3.3 Purpose of Visitto Library

(Q.3) The question is asked to determine the purpose of visit by user to the college library. This is multiple choice question. The response is shown in table 6.3

Table 6.3 Purpose of Visit to Library

Sr. No.	Purpose of visit the library	Response	Percentage (%)
1.	To issue / return library books	294	100
2.	To consult periodicals / journals	159	54.08
3.	To take photocopy / printout of material	091	30.95
4.	To find and collect material for assignments	258	87.75
5.	To find and collect material for research	15	5.10

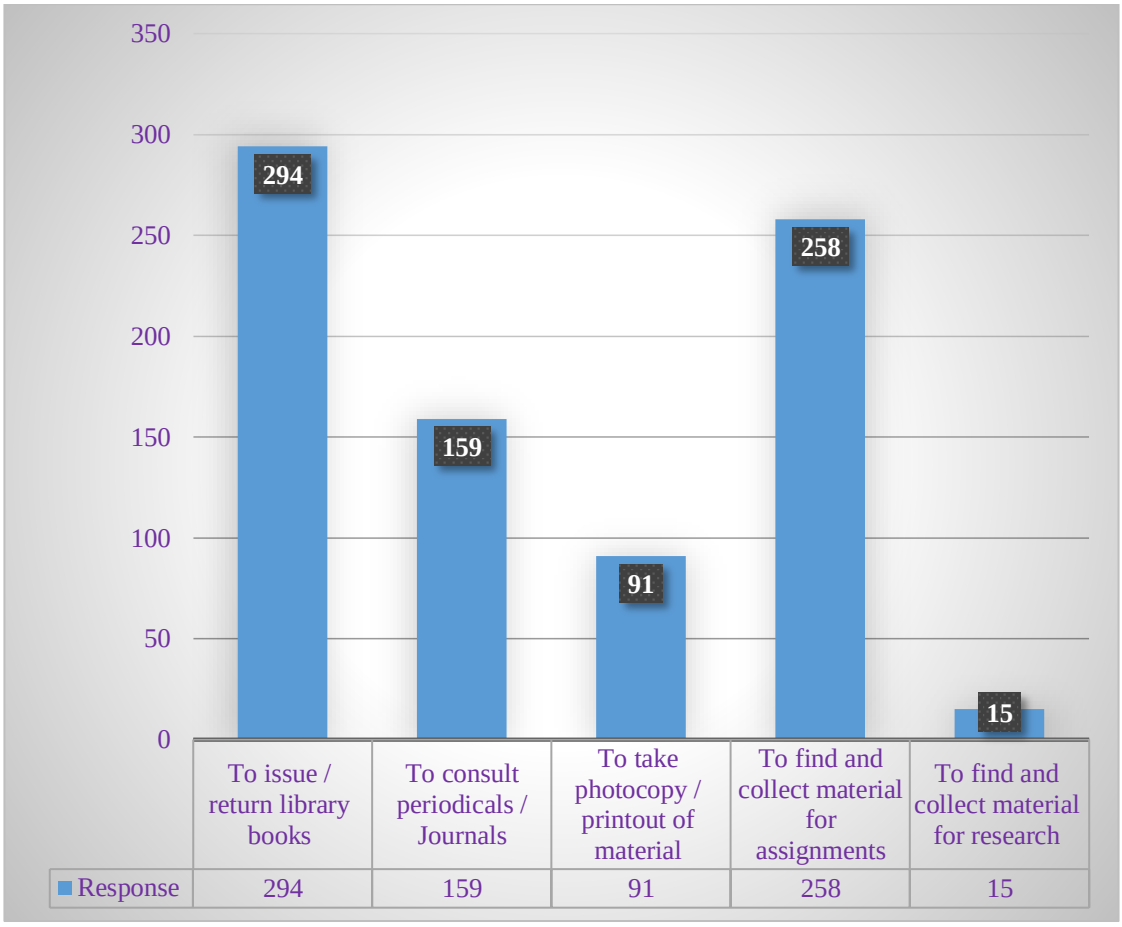


Figure 6.3Purpose of Visit to Library

From table 6.3 and figure 6.3, it is observed that, 100 percent respondent reports that, they visit the library for issue and return of library books. 54.08 percent respondent reports that, they visit the library for consulting periodicals / journals. 30.95 percent respondent reports that, they visit the library for taking photocopy / printout of material. 87.75 percent respondent reports that, they visit the library for finding and collecting material for assignments. Whereas only 5.10 percent respondent reports that, they visit the library for finding and collecting material for research purpose.

6.3.4 Type of Information Resources

(Q.4) The question is asked to know the type of information resources prefer by the users for study / research. The response is shown in table 6.4

Table 6.4 Type of Information Resources

Sr. No.	Type of information resources	Response	Percentage (%)
1.	Print resources	26	67
2.	Digital resources	08	20
3.	Both type of resources	05	13
	Total response	**39**	**100**

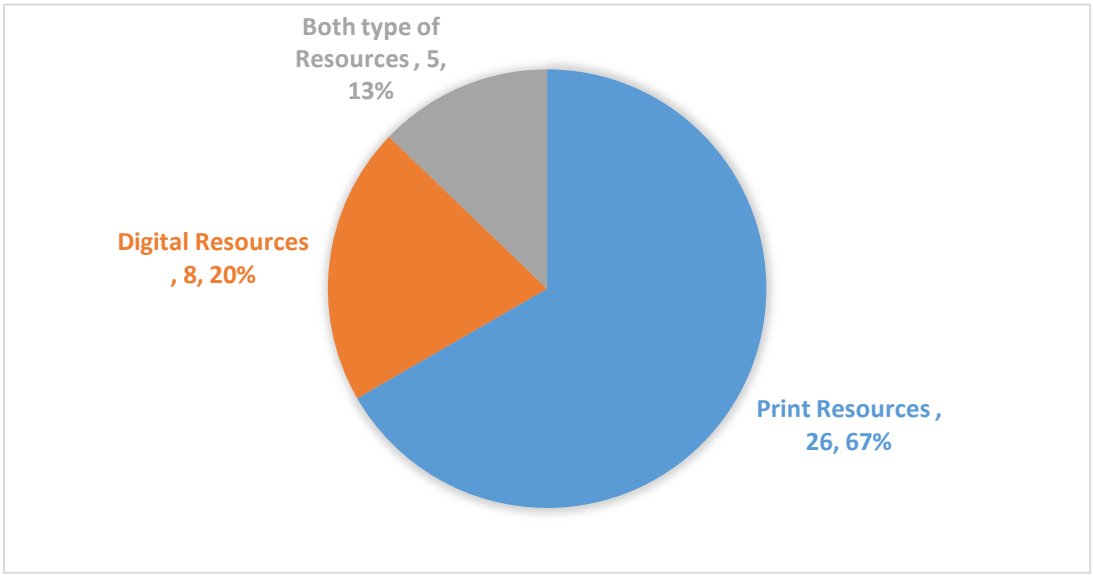


Figure 6.4Type of Information Resources

From table 6.4 and figure 6.4. It is observed that, 67 percent respondent reports that, they prefer print resources for study. 20 percent respondent reports that, they prefer digital resources for study. Whereas 13 percent respondent reports that, they prefer both (print and digital) type of resources for study and research.

6.3.5 Digital Information Resources Awareness

(Q.5) The question is asked to determine the awareness of the user regarding digital information resources available in the library. This is multiple choice question. The response is shown in table 6.5

Table 6.5 Digital Information Resources Awareness

Sr. No.	Digital information resources awareness	Response	Percentage (%)
1.	E-Books	156	53.06
2.	E-Journals	153	52.04
3.	Proceedings	068	23.12
4.	Theses and Dissertation	015	05.10
5.	Lectures PPTS	260	88.43
6.	Audio recordings	089	30.27
7.	Video recordings	071	24.14
8.	Study materials	294	100.00

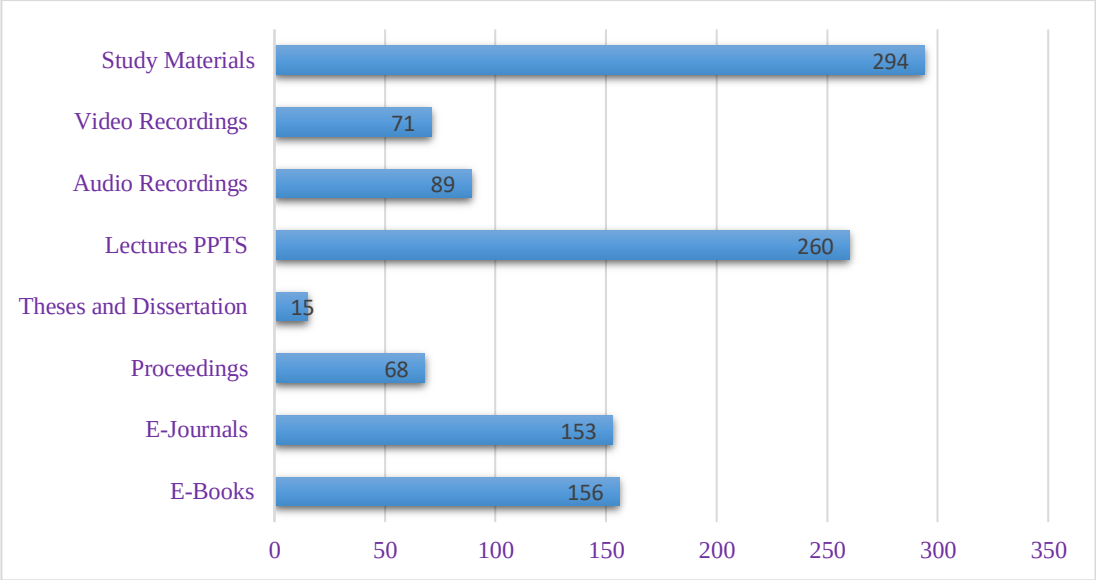


Figure 6.5Digital Information Resources Awareness

From table 6.5 and figure 6.5. It is observed that, 56.03 percent respondents report that, they are aware of the digital information resources such as e-books. 52.04 percent respondent reports that, they are aware of the digital information resources such as e-journals. 23.12 percent respondent reports that, they are aware of the digital information resources such as proceedings. 88.43 percent respondent reports that, they are aware of the digital information resources such as Lectures PPTS. 30.27 percent respondent reports that, they are aware of the digital information resources such as audio recordings. 24.14 percent respondent reports that, they are aware of the digital information resources such as video recordings. Whereas 100 percent respondent reports that, they are aware of the digital information resources such as study material.

6.3.6 Purpose of Digital Information Resources

(Q.6) The question is asked to know the purpose of using Digital Information Resources by user. This is multiple choice question. The response is shown in table 6.6

Table 6.6 Purpose of Digital Information Resources

Sr. No.	Purpose of digital information resources	Response	Percentage (%)
1.	To get current information	294	100.00
2.	To prepare assignments	264	89.79
3.	As Study Material for preparing Examination	284	96.59
4.	To get literature Search for research	150	51.02
5.	To write research articles	148	50.34

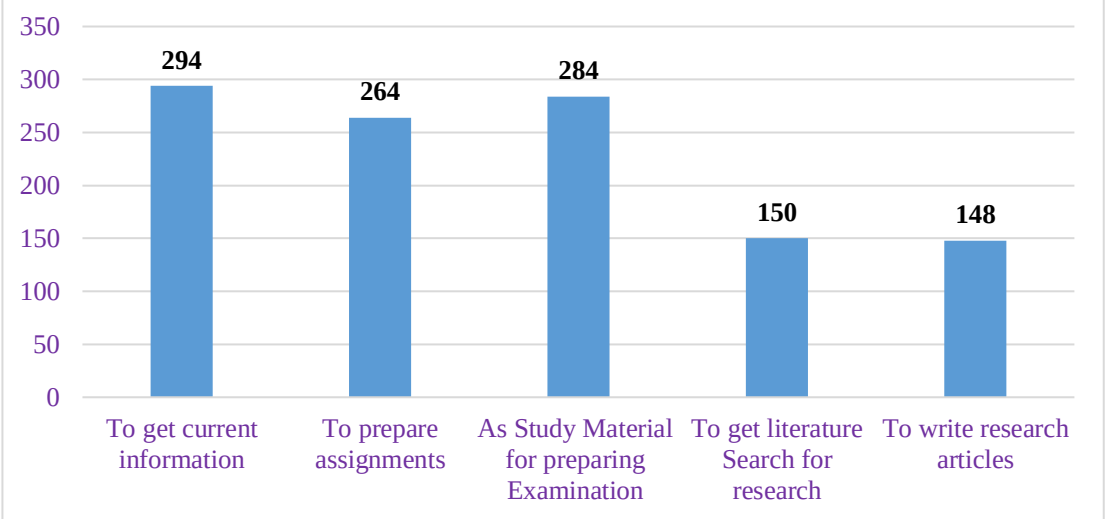


Figure 6.6Purpose of Digital Information Resources

From table 6.6 and figure 6.6, It is observed that, 100 percent respondent reports that, the purpose of using digital information resources is to get the current information. 89.79 percent respondent reports that, the purpose of using digital information resources is to prepare assignments. 96.59 percent respondent reports that, the purpose of using digital information resources as a study material for preparing examination. 51.02 percent respondent reports that, the purpose of using digital information resources is to get literature search for research. Whereas 50.34 percent respondent reports that, the purpose of using digital information resources is to write research articles.

6.3.7 Digital Information Resources Availability and Satisfaction

(Q.7) The question is asked to know the level of satisfaction with the digital information resources available in library. The response is shown in table 6.7

Table 6.7Digital Information Resources Availability and Satisfaction

Sr. No.	Digital information resources availability and satisfaction	Response	Percentage (%)
1.	Fully satisfied	188	64
2.	Partially satisfied	060	20
3.	Somewhat dissatisfied	026	09
4.	Not satisfied	020	07
	Total response	**294**	**100.00**

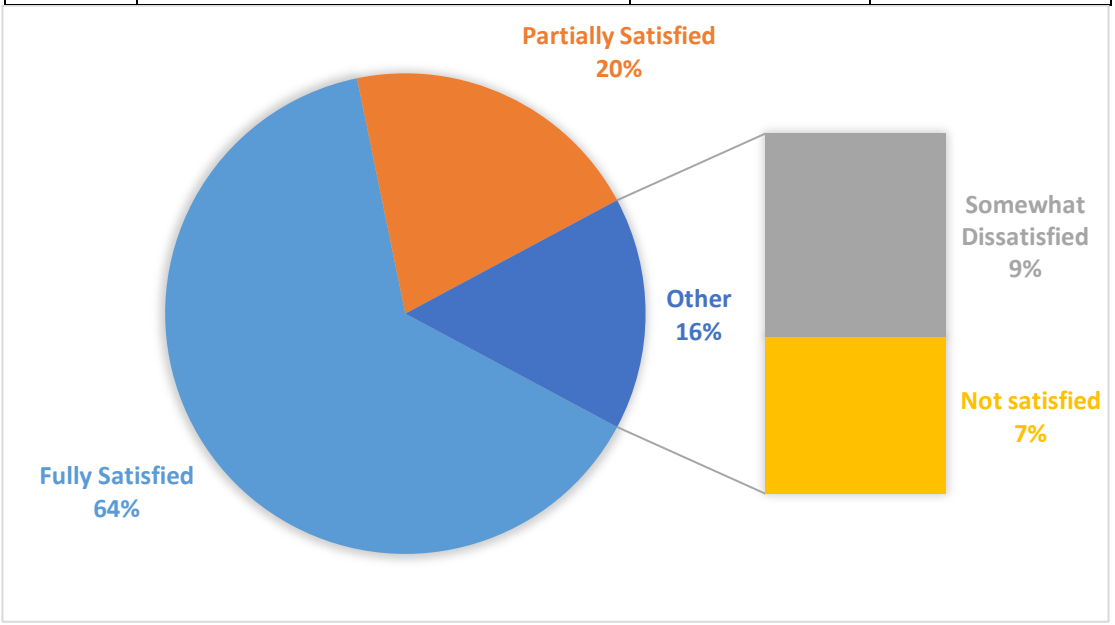


Figure 6.7Digital Information Resources Availability and Satisfaction

From table 6.7 and figure 6.7. It is observed that, 64 percent respondent reports that, they are fully satisfied with the digital information resources available in library. 20 percent respondent reports that, they are partially satisfied with the digital information resources available in library. 9 percent respondent reports that, they are somewhat dissatisfied with the digital information resources available in library. 7 percent respondent reports that, they are not satisfied with the digital information resources available in library.

6.3.8 Digital Information Services

(Q.8) The question is asked to know awareness of the digital information services provided by the library. This is multiple choice question. The response is shown in table 6.8

Table 6.8Digital Information Service

Sr. No.	Digital information services awareness	Response	Percentage (%)
1.	Catalog database (OPAC / WEBOPAC)	198	67.40
2.	Current Awareness Service	109	37.07
3.	Externally Purchase Databases (N-LIST)	088	29.93
4.	CD-ROM databases	025	08.50
5.	Internally Published Newsletters, Reports and Journals	079	26.87
6.	E-mail	178	60.54
7.	Bulletin Board Service	058	19.72
8.	Audio and Video Communication	064	21.76
9.	Electronic table of contents	045	15.30
10.	Electronic Document Delivery Service	048	16.32
11.	Electronic Thesis and dissertations	088	29.93
12.	Reference Service	045	15.30
13.	E-Publishing	042	14.28
14.	Discussion Groups and Forums	047	15.98
15.	Central Storage facilities for hosting digital collections and indexes	057	19.38
16.	Special Collection Service,	041	13.94
17.	Web based library Service	197	67.00
18.	Web based user education	081	27.55

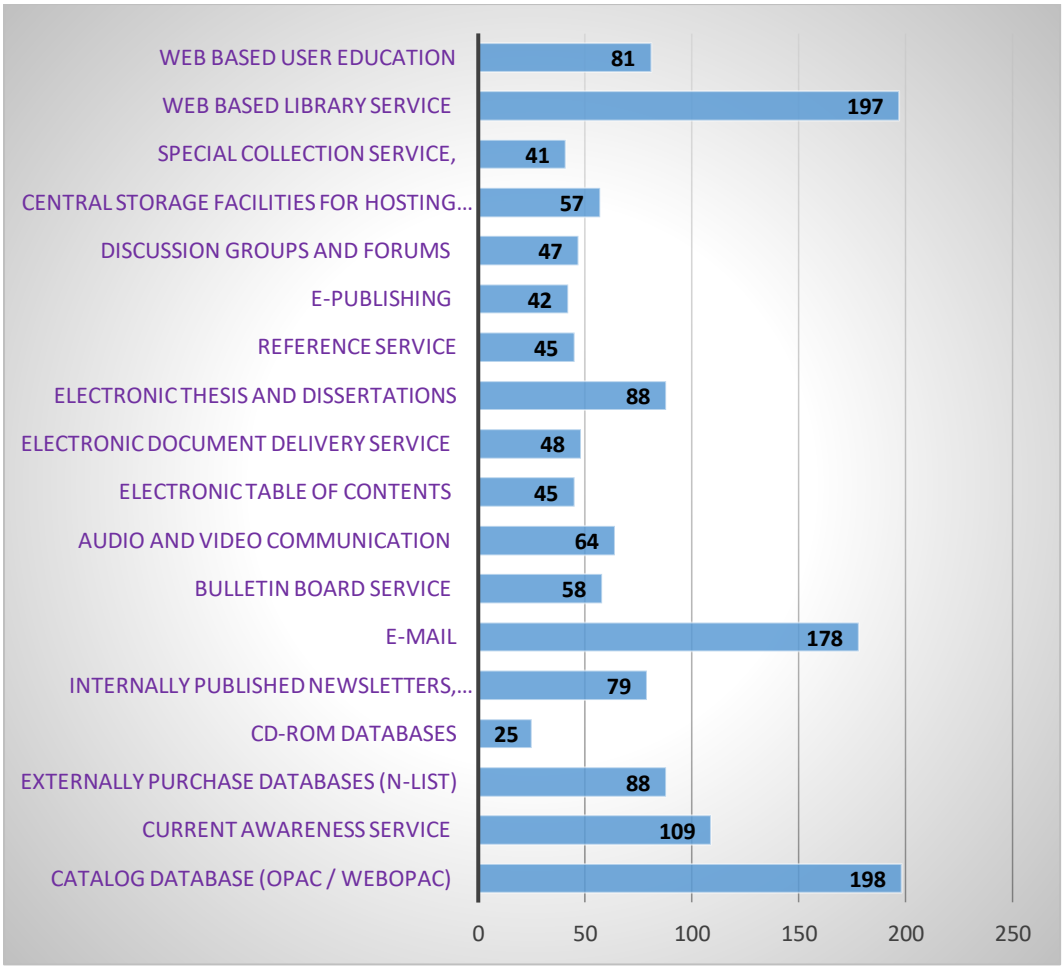


Figure 6.8 Digital Information Service

From table 6.8 and figure 6.8, 64.70 percent respondent reports that, they are aware of the digital information service such as catalog database (OPAC / WEBOPAC) services provided by the library. 37.07 percent respondent are aware current awareness service. 29.33 percent respondent reports that, they are aware externally purchase databases (e.g. N-LIST) provided by the library. 8.50 percent respondent are aware of CD-ROM databases provided by the library. 26.87 percent respondent are aware of internally published newsletters, reports and journals. 60.64 percent respondent are aware E-mail. 19.72 percent respondent are aware bulletin board service provided by the library. 21.76 percent respondent are aware audio and video communication service provided by the library. 15.30 percent respondent are aware of electronic table of contents service provided by the library. 14.28 percent respondent are aware of E-Publishing service provided by the library. 15.98 percent respondent are aware of discussion groups and forums service provided by the library. 19.38 percent respondent are aware central storage facilities for hosting

digital collections and indexesservice provided by the library. 13.94 percent respondent are aware special collection service provided by the library. 67 percent respondent are aware of web based library service provided by the library. 27.55 percent respondent are aware of web based user education service provided by the library.

6.3.9 Purpose of Digital Information Services

(Q.9) The question is asked to know purpose of using digital information services. This is multiple choice question. The response is shown in table 6.9

Table 6.9 Purpose of Digital Information Services

Sr. No.	Purpose of digital information services	Response	Percentage (%)
1.	To find the availability of material	294	100.00
2.	To get study/research related material	198	67.34
3.	To get material for class assignments	213	72.44
4.	To get literature for research	115	39.11
5.	To get the print out of required material	157	53.40

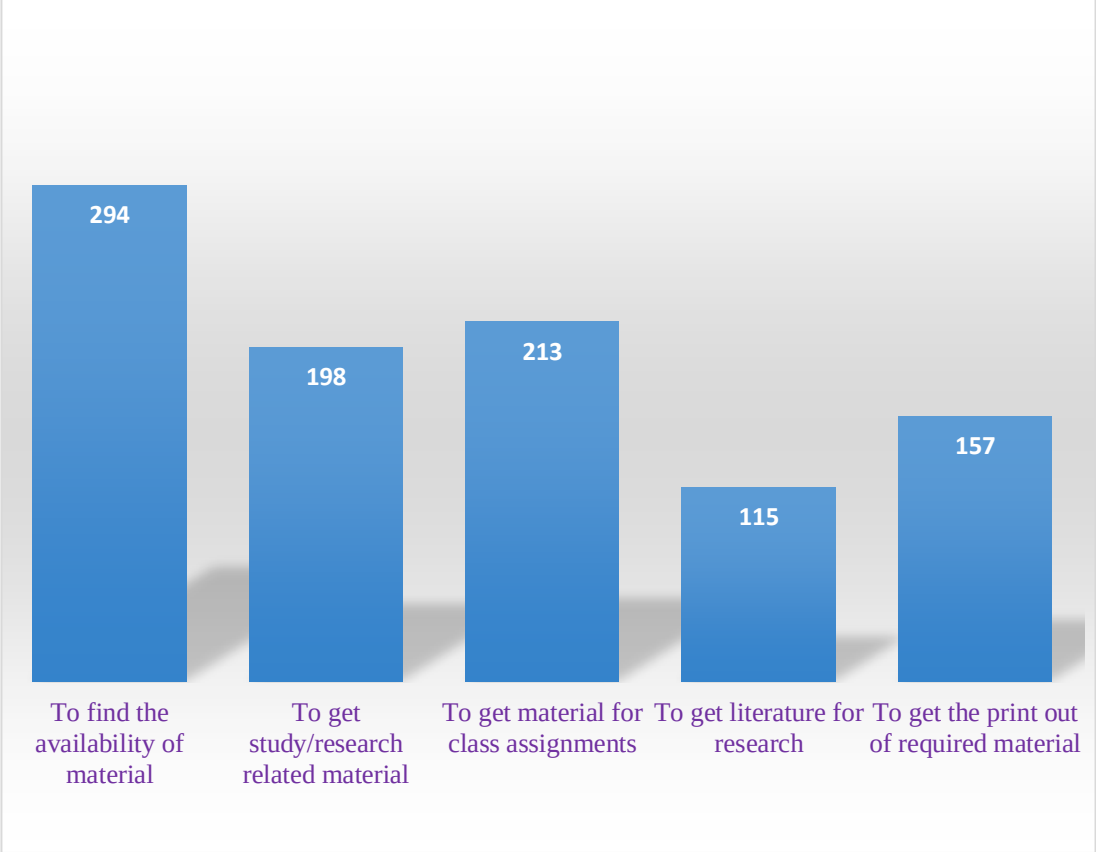


Figure 6.9Purpose of Digital Information Services

From table 6.9 and figure 6.9. It is observed that, 100 percent respondent reports that, purpose of using digital information services is to find the availability of material in a library. 67.34 percent respondent reports that, purpose of using digital information services is to get study/research related material in a library. 72.44 percent respondent reports that, purpose of using digital information services to get material for class assignments from the library. 39.11 percent respondent reports that, purpose of using digital information services to get literature for research from the library. 53.40 percent respondent reports that, purpose of using digital information services to get the print out of required material from the library.

6.3.10 Satisfaction towards Digital Information Service

(Q.10) The question is asked to know the level of satisfaction with the digital information services provided by library. The response is shown in table 6.10

Table 6.10 Satisfaction towards Digital Information Service

Sr. No.	Digital information services	Response	Percentage (%)
1.	Fully satisfied	091	31
2.	Partially satisfied	063	21
3.	Somewhat dissatisfied	028	10
4.	Not satisfied	112	38
	Total response	**294**	**100**

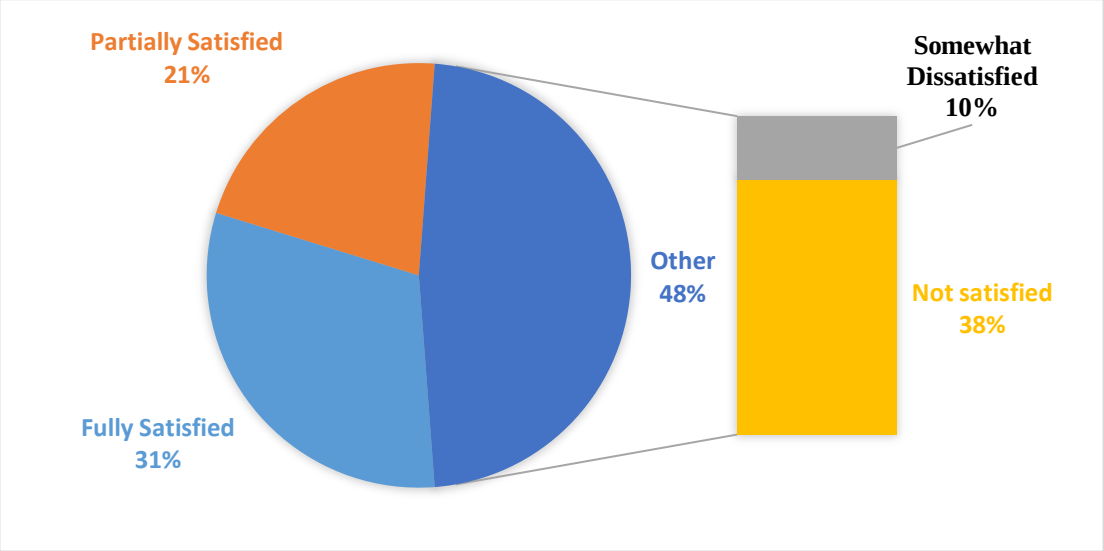


Figure 6.10Satisfaction towards Digital Information Service

From table 6.10 and figure 6.10. It is observed that, 31 percent respondent reports that, they are fully satisfied with the digital information services of the library. 21 percent respondent reports that, they are partially satisfied with the digital information services of the library. 10 percent respondent reports that, they are somewhat dissatisfied with the digital information services of the library. 38 percent respondent reports that, they are not satisfied with the digital information services of the library.

6.3.11 Digital Library Skill to Staff

(Q.11) The question is asked to know the required skill available in the library staff for handling digital library activity or not.The response is shown in table 6.11

Table 6.11 Digital Library Skill to Staff

Sr. No.	Digital library skill to staff	Number of response	Percentage(%)
1.	Yes	125	42
2.	No.	158	54
3.	No response	011	04
	Total	**294**	**100**

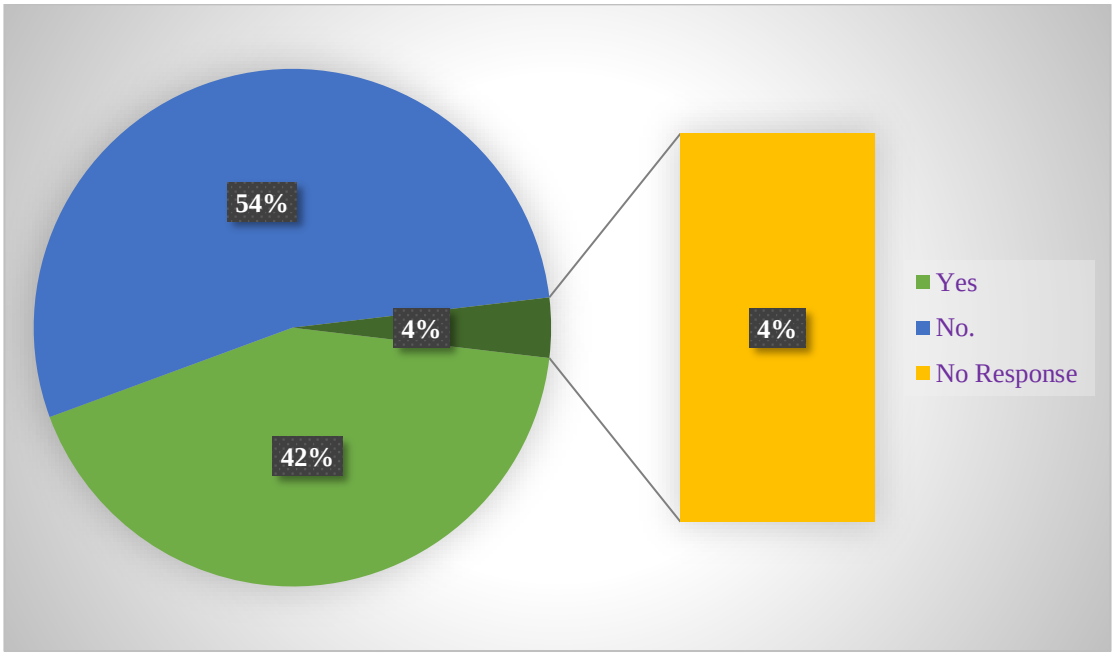


Figure 6.11Digital Library Skill to Staff

From table 6.11 and figure 6.11. It is observed that, 42 percent respondent reports that, yes the required skill available in the library staff for handling digital library activity. Whereas 54 percent respondent reports that, the required skill is not available in the library staff for handling digital library activity. 4 percent respondent remain neutral for the reply.

6.3.12 Training Program for Users

(Q.12) thequestion is asked to know does the library organizes any training program to educate the users. The response is shown in table 6.12

Table 6.12 Training Program for Users

Sr. No.	Training program for users	Number of response	Percentage (%)
1.	Yes	125	42
2.	No.	158	54
3.	No response	011	04
	Total	**294**	**100**

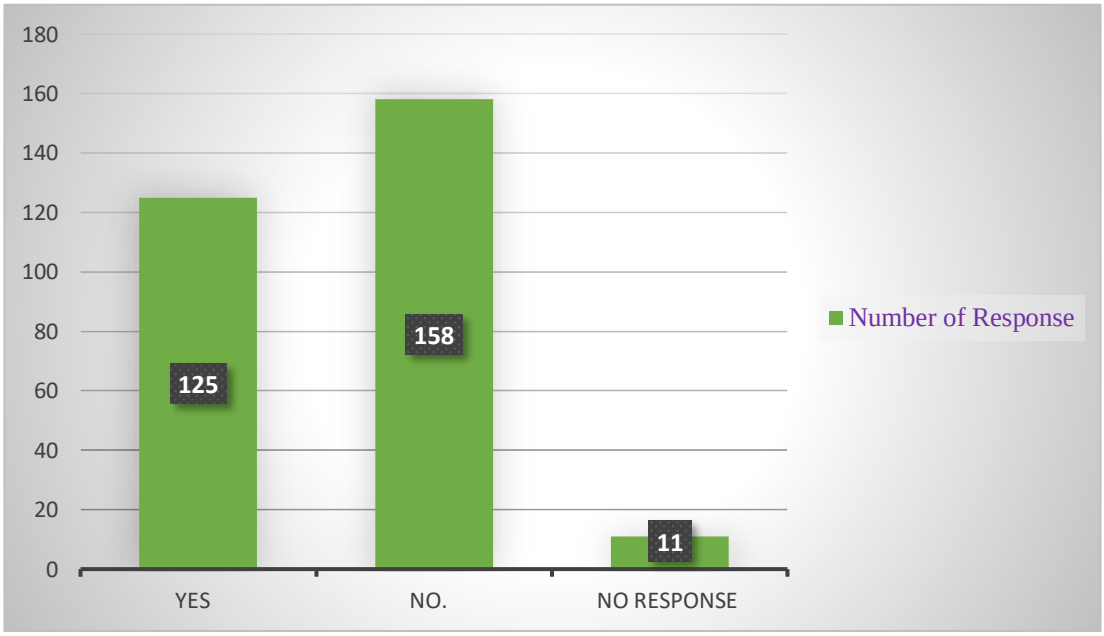


Figure 6.12Training Program for Users

From table 6.12 and figure 6.12. It is observed that, 42 percent respondent reports that, the library organizes training program to educate the users. 54 percent respondent reports that, the library does not organize training program to educate the users. Whereas 4 percent respondent remain neutral for the reply.

6.3.13 Frequency for Organization of Training Programs

(Q.13) to know the frequency of organizing training program by the library and information centre the present question has been asked, the following response received from the respondent table 6.13

Table 6.13 Frequency for Organization of Training Programs

Sr. No.	Frequency for organization of training programs	Response	Percentage (%)
1.	Monthly	00	00
2.	Quarterly	06	02
3.	Half yearly	20	07
4.	Yearly	99	34
5.	No response	169	57
	Total	**294**	**100**

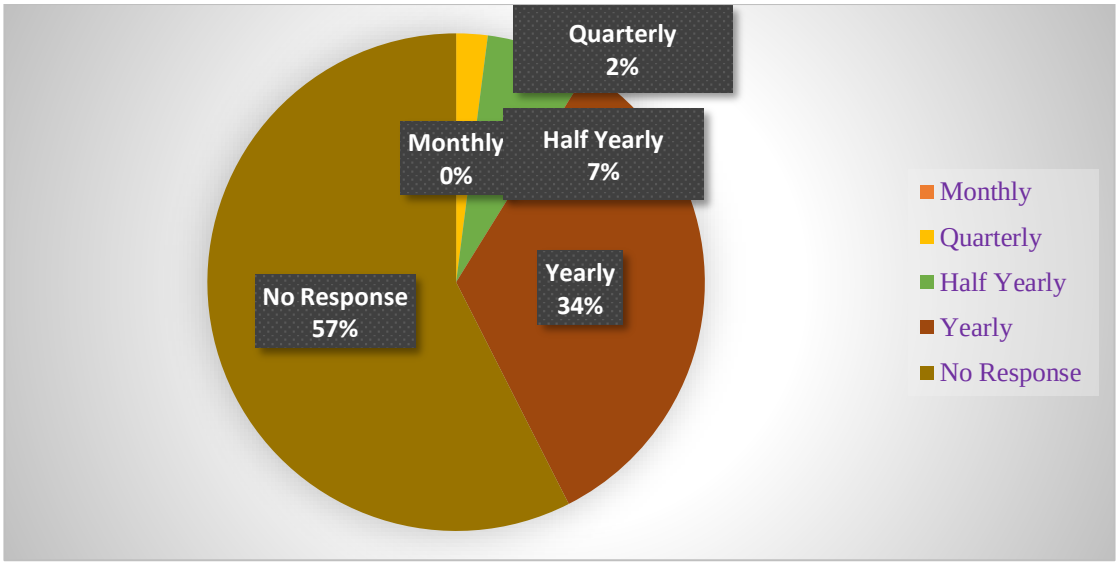


Figure 6.13Frequency for Organization of Training Programs

Fromtable 6.13 and figure 6.13 it has been observed that, 2 percent respondent reply that, library and information centre organize training programs to maximize the use of digital library quarterly. 7 percent respondent reply that, library and information centre organize training programs to maximize the use of digital library half yearly. 34 percent respondent reply that, library and information centre organize training programs to maximize the use of digital library yearly. Whereas 57 percent respondent does not response for the same.

6.3.14 Program Organized by Library

(Q.14)To know the program organized by library and information centre for maximize the use of digital library the present question has asked. The following is the response received from the respondents table 6.14

Table 6.14 Program Organized by Library

Sr. No.	Program organized by library	Response	Percentage (%)
1.	Workshop or seminar	00	00
2.	Conference	00	00
3.	Online or computer based tutorials	21	07
4.	Classes towards higher education	9	03
5.	Video presentation	06	02
6.	Individual instructions	89	30
7.	No response	169	58
	Total	**294**	**100**

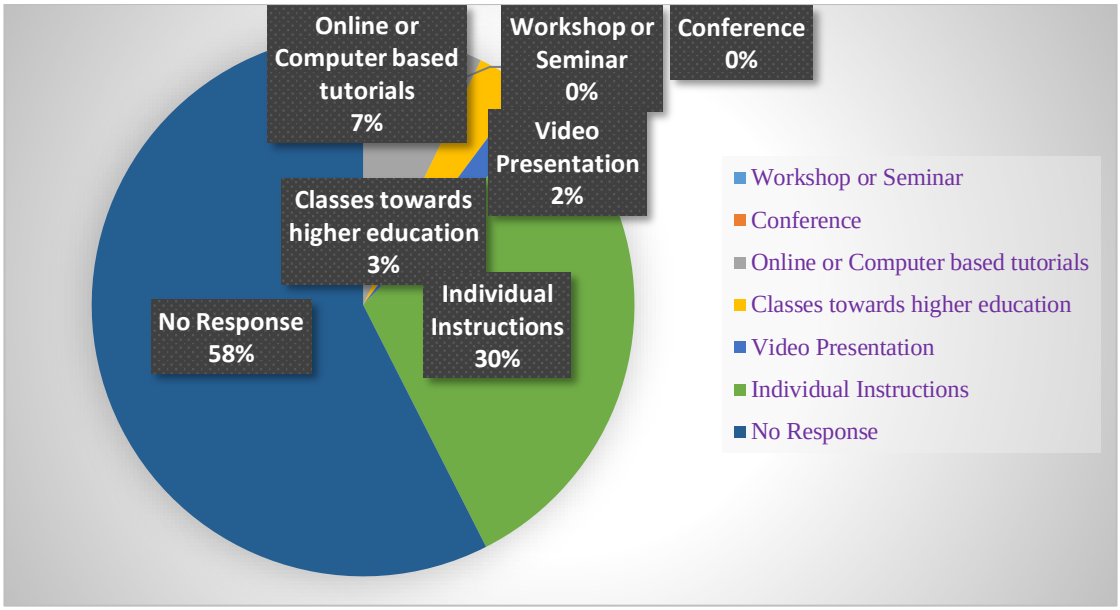


Figure 6.14Program Organized by Library

From table 6.14 and figure 6.14, it is observed that, workshop and conference has not been organized by library and information centre to maximize the use of digital library. 7 percent respondent reply that, library and information centre organized for online or computer based tutorials to maximize the use of digital library.3 percent respondent reply that, library and information centre organized Classes towards higher education tomaximize the use of digital library. 2 percent respondent reply that, library and information centre organized for video presentation to maximize the use of digital library. 30 percent respondent reply that, library and information centre organized for individual instructions to maximize the use of digital library. Whereas it is found that, 58 percent respondent did not response to the question.

6.3.15 Infrastructure Facility in Library

(Q.15)To know the infrastructure and computer facility available in the library the present question has been asked, the following were the response received which is shown in table 6.15

Table 6.15 Infrastructure Facility in Library

Sr. No.	Infrastructural facilities	Response	Percentage (%)
1.	Fully satisfied	031	11
2.	Partially satisfied	184	63
3.	Somewhat dissatisfied	025	08
4.	Not satisfied	054	018
	Total	**294**	**100**

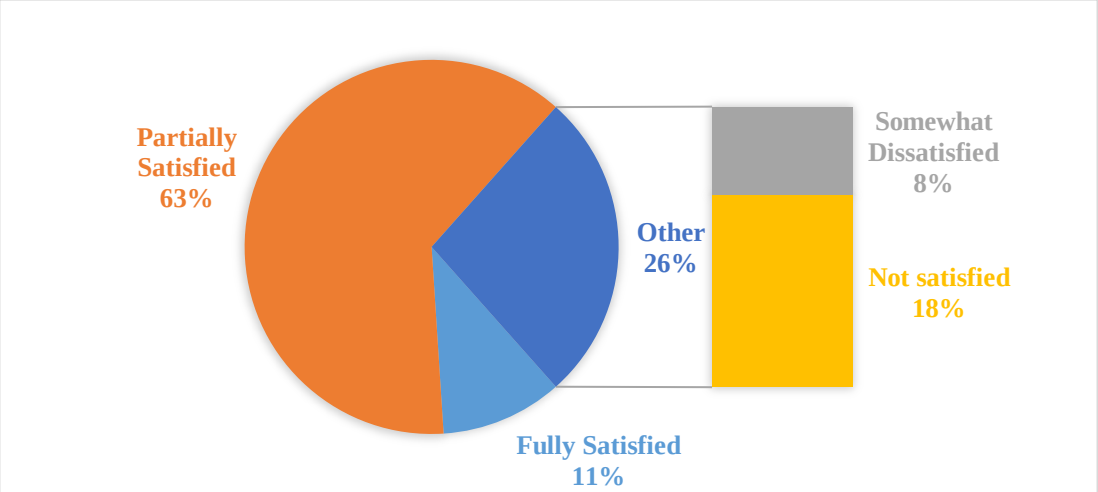


Figure 6.15Infrastructure Facility in Library

From table 6.15 and figure 6.15, it is observed that, 11 percent respondent reported that, they were satisfied with the infrastructure and computer facility available in the library. 63 percent respondent reported that, they were partially satisfied with the infrastructure and computer facility available in the library. 8 percent respondent reported that, they were somewhat dissatisfied with the infrastructure and computer facility available in the library. Whereas 18 percent respondent reported that, they were not satisfied with the infrastructure and computer facility available in the library.

6.3.16 Awareness for Rayat Knowledge Bank

(Q.16)To know the awareness of user of digital library created by the Rayat Shikshan Sanstha, which is popular known as the theRayat Knowledge Bank. The following were the response received from the respondents table 6.16

Table 6.16 Awareness for the Rayat Knowledge Bank

SR. No.	Awareness of User for Rayat Knowledge Bank	Number of Response	Percentage (%)
1.	Yes	248	84
2.	No.	46	16
	Total	**294**	**100.00**

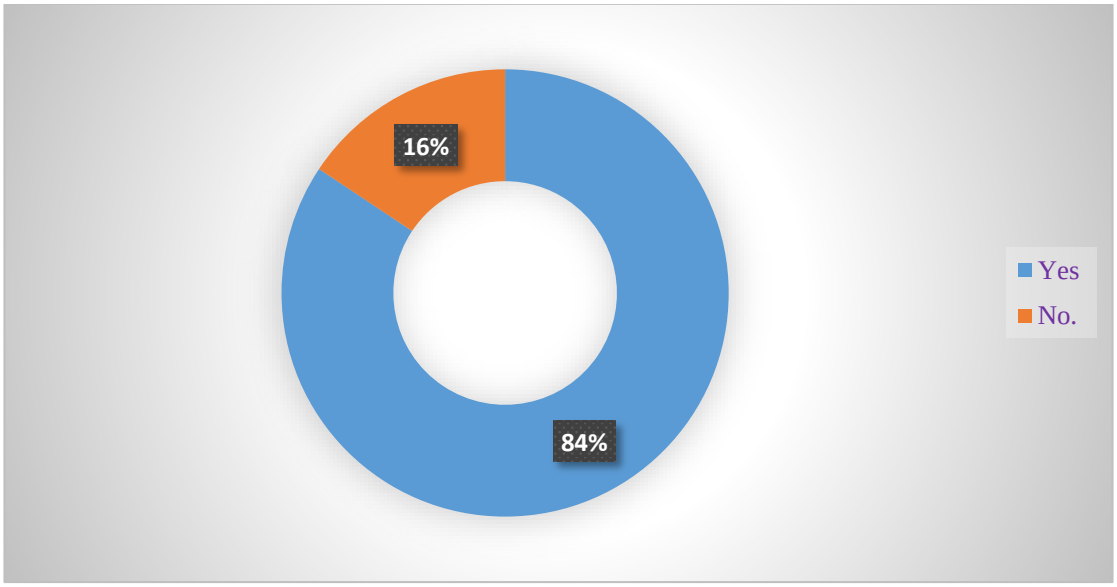


Figure 6.16 Awareness for the Rayat Knowledge Bank

From table 6.16 and figure 6.16, it is found that, 84 percent respondent reported that, they are aware of the digital library created by the institution which is popular known as the Rayat Knowledge Bank. Whereas 16 percent respondent reported that, they are not aware of the digital library created by the institution.

6.3.17 Digital Library Collection in the Rayat Knowledge Bank

(Q.17)To know the satisfaction view of user regarding digital library collection of the Rayat Knowledge Bank. The following were the response received from the respondents table 6.17.

Table 6.17 Digital Library Collection in the Rayat Knowledge Bank

SR. No.	Digital library collection of Rayat Knowledge Bank	Response	Percentage (%)
1.	Fully Satisfied	235	80
2.	Partially Satisfied	45	15
3.	Somewhat Dissatisfied	09	03
4.	Not satisfied	05	02
	Total	**294**	**100**

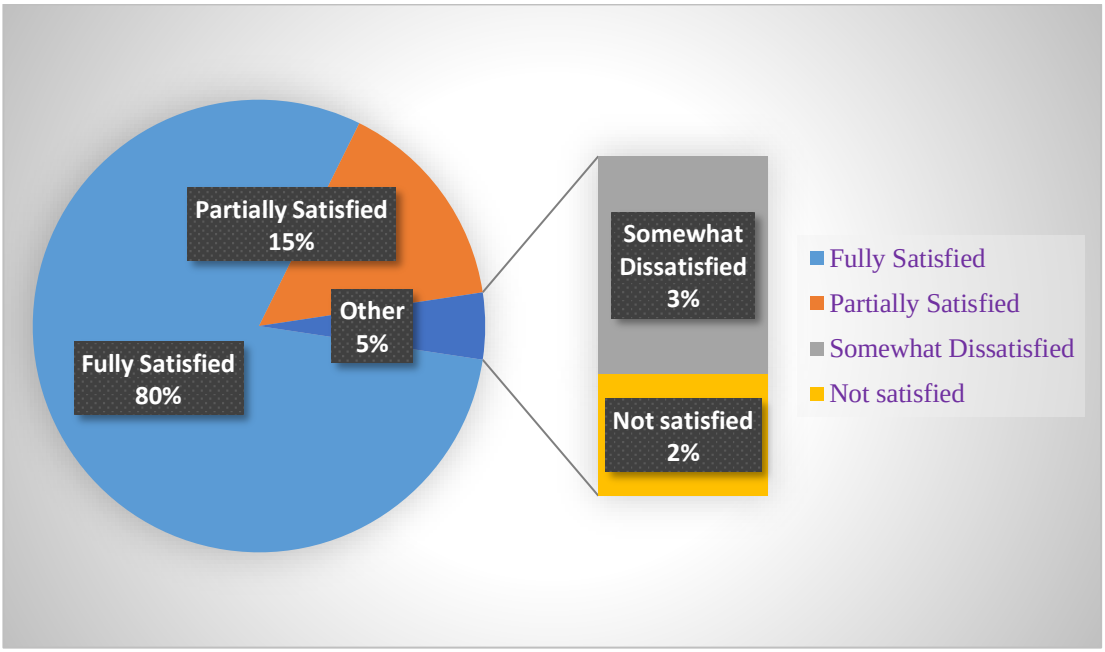


Figure 6.17Digital Library Collection in the Rayat Knowledge Bank

From table 6.17 and figure 6.17, it is found that, 80 percent respondent reported that, yes they are fully satisfied with the digital library collection of the Rayat Knowledge Bank. 15 percent respondent reported that, they are partially satisfied with the digital library collection of the Rayat Knowledge Bank. 3 percent respondent reported that, they are Somewhat Dissatisfied with the digital library collection of the Rayat Knowledge Bank. 2 percent respondent reported that, they are not satisfied with the digital library collection of the Rayat Knowledge Bank.

6.3.18 State of Art of Rayat Knowledge Bank

(Q.18).To know the users view regarding the Rayat Knowledge Bank the present question has been asked by the researcher. The question is based on multi choice s. The following are the views received from the respondent table 6.18

Table 6.18 State of Art of the Rayat Knowledge Bank

SR. No.	State of Art of Rayat Knowledge Bank	Response	Percentage (%)
1.	The material is relevant to subject	294	100.00
2.	This repository is easy to use	135	46.00
3.	Find the information quickly	091	30.95
4.	The files are quick to download	254	86.39
5.	The material is displayed in a format that is compatible	248	84.35
6.	Navigational assistance is available for help	015	5.10

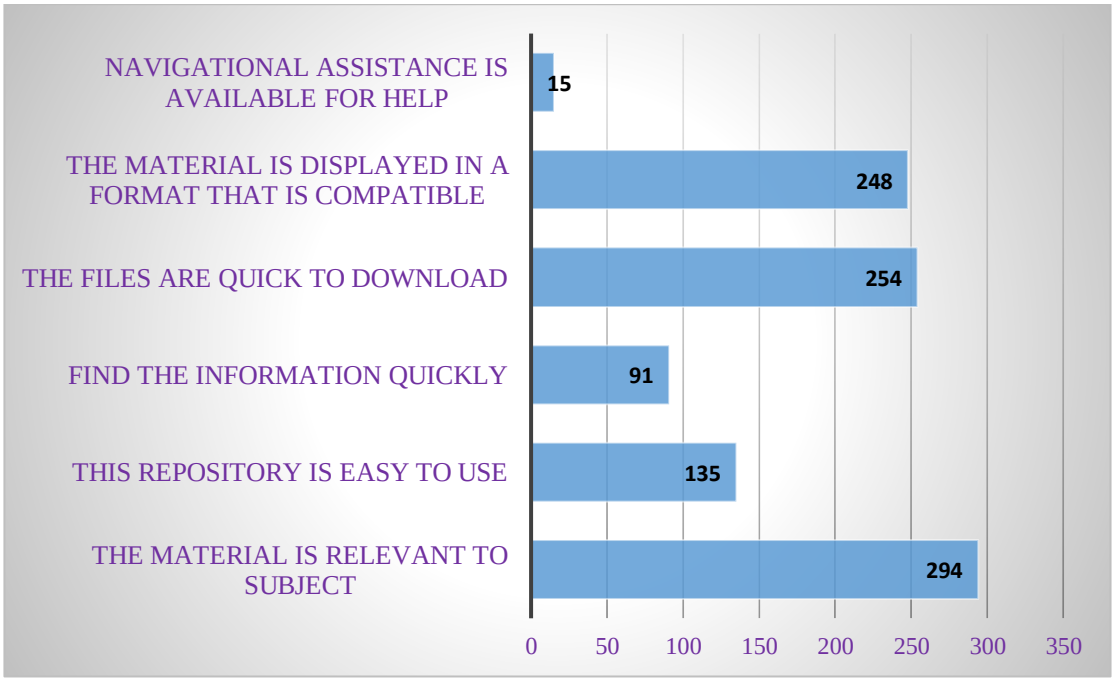


Figure 6.18 State of Art of the Rayat Knowledge Bank

From table 6.18 and figure 6.18it is observed that, 100 percent respondent reply that, the material is relevant to subject in the Rayat Knowledge Bank. 46 percent respondent reply that, the Rayat Knowledge Bank as a repository is easy to use. 30.95 percent respondent reply that, one can find the information from the Rayat Knowledge Bank quickly. 86.39 percent respondent reply that, one can download the required files from the Rayat Knowledge Bank quickly. 84.35 percent respondent reply that, as a digital library of the Rayat information / material is displayed in a format which is compatible to the present system. 5.10 percent respondent reply that, as a digital library navigational assistance is available for help in the Rayat Knowledge Bank.

6.3.19 Search Facility in Rayat Knowledge Bank

(Q.19) A question is asked to know the level of satisfaction with the search facility in the digital library. Received the following response from the respondent table 6.19

Table 6.19 Search Facility in the Rayat Knowledge Bank

Sr. No.	Search facility in Rayat Knowledge Bank	Response	Percentage (%)
1.	Fully satisfied	091	31
2.	Partially satisfied	025	09
3.	Somewhat dissatisfied	098	33
4.	Not satisfied	080	27
	Total	**294**	**100**

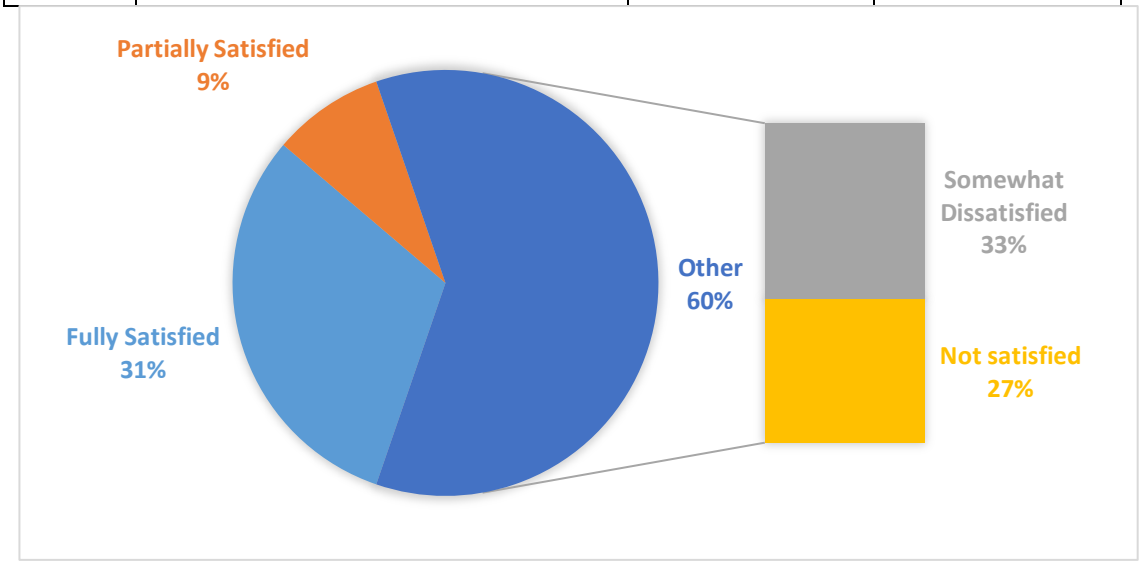


Figure 6.19 Search facility in the Rayat Knowledge Bank

From table 6.19 and figure 6.19. It is observed that, 31 percent respondent reports that, they are fully satisfied with the search facility in the digital library. 9 percent respondent reports that, they are partially satisfied with search facility in the digital library. 33 percent respondent reports that, they are somewhat dissatisfied with the search facility in the digital library. Whereas 27 percent respondents reportthat, they are not satisfied with the search facility in the digital library created by the institute.

6.3.20 Problem for Accessing Digital Library of an Institute

(Q.20)The present question has asked to know the problems faced while accessing digital library of the institution. The question is multi choice question. The following are the views of the respondents table 6.20

Table 6.20Problem for Accessing Digital Library of an Institute

Sr. No.	Problem for accessing digital library	Response	Percentage (%)
1.	Time Consuming	219	74.48
2.	Slow Speed	25	08.50
3.	Not easy to search	178	60.54
4.	Not familiar with the systems	045	15.30
5.	Not enough terminals to access information	198	67.34
6.	Lack of trained staff	175	59.52

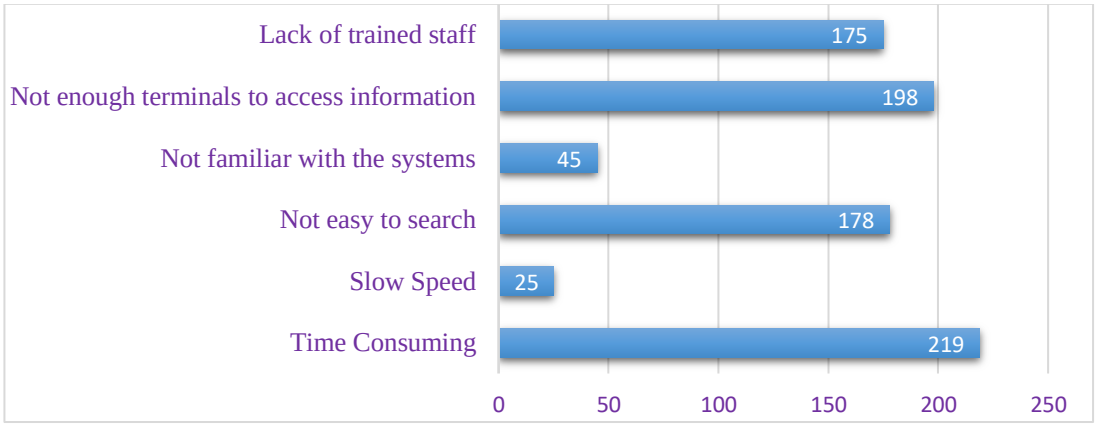


Figure 6.20 Problem for Accessing Digital Library of an Institute

From table 6.20 and figure 6.20 it is observed that, 74.48 percent respondent noted that, access to digital library of the institution is time-consuming. 8.50 percent respondent noted that, they faced the slow speed problem while accessing the digital library. 60.54 percent respondent noted that, the searching of digital library of the organization is not easy. 15.30 percent respondent noted that, they are not familiar with the system of digital library of the institution. 67.34 percent respondent noted that, there is not enough terminals to access information while accessing digital library of the organization in the college library. 59.52 percent respondent noted that, there is lack of trained staff in the college library for training to users for accessing the digital library.

6.3.21 Need of Central Digital Library for an Organization

(Q.21) The question is asked to know the level of satisfaction with the establishment of central digital library for an organization 6.21

Table 6.21Need of Central Digital Library for an Organization

Sr. No.	Need of central digital library for an organization	Response	Percentage (%)
1.	Fully satisfied	258	88
2.	Partially satisfied	036	12
3.	Somewhat dissatisfied	00	00
4.	Not satisfied	00	00
	Total	**294**	**100**

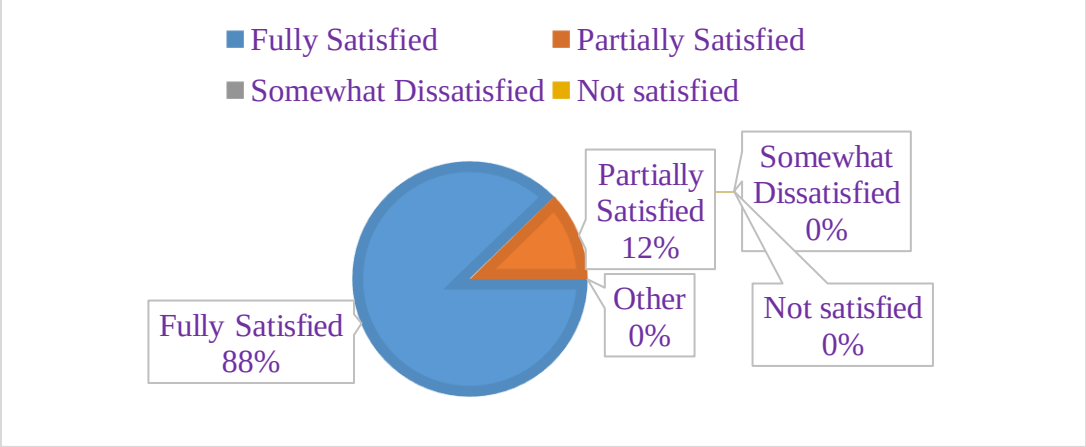


Figure 6.21Need of Central Digital Library for an Organization

From table 6.21 and figure 6.21,it is observed that, 88 percent respondent reports that, they are fully satisfied with the establishment of central digital library for an organization. 12 percent respondent reports that, they are partially satisfied with the establishment of central digital library for an organization.

6.3.22 Suggestions

In this study different type of question have been asked to the respondent regarding the following criteria**.**

a) Knowledge updates
b) Digital library collection
c) Digital library services
d) Digital library infrastructure
e) Digital library budget
f) Library softwares
g) Standards for digital library etc.

Due to wide response to the above questions, quantification of these is not done.

6.4 Hypothesis Testing

For testing hypothesis mean average test is used as a statistical tool.

Rating of Response from the Respondent

6.4.1 Hypothesis 1.The suitable ICT infrastructure required to create digital Library is available at the Organization.

Infrastructure consist of two parts such as hardware and software. First of all we will consider that,

A) The suitable ICT infrastructure required to create digital Library is available at the organization (Hardware facility).

The following are the response for hardware facility available for central digital library of an organization.

Table 6.22 Hypothesis Testing 1.1 (Response and Grade)

(Response in % Grade)

Above 70 %	**Strong**
60 to 70 %	Very Good
50 to 60 %	Good
40 to 50 %	Satisfactory
30 to 40%	Poor

Librarian's View

A. **Q.5.19 -** 91 percent respondent reported that, they are fully satisfied with the hardware infrastructure used in the digital library of an organization.
B. **Q.5.36 -** 88 percent respondent reported that, they are satisfied with open access to Rayat Knowledge Bank

User's View

A. **Q.6.15-** 63 percent respondent reported that, they were partially satisfied with the infrastructure and computer facility available in the library.
B. **Q.6.17-** 80 percent respondent reported that, yes they are fully satisfied with the digital library collection of The Rayat Knowledge Bank.

Table 6.23 Hypothesis Testing No. 1.1

Response (Question No.)	Grade (%)	
Q. 5.19	91.00	
Q. 5.36	88.00	
Q. 6.15	63.00	
Q. 6.17	80.00	
Sum	**322.00**	**80.50 %**

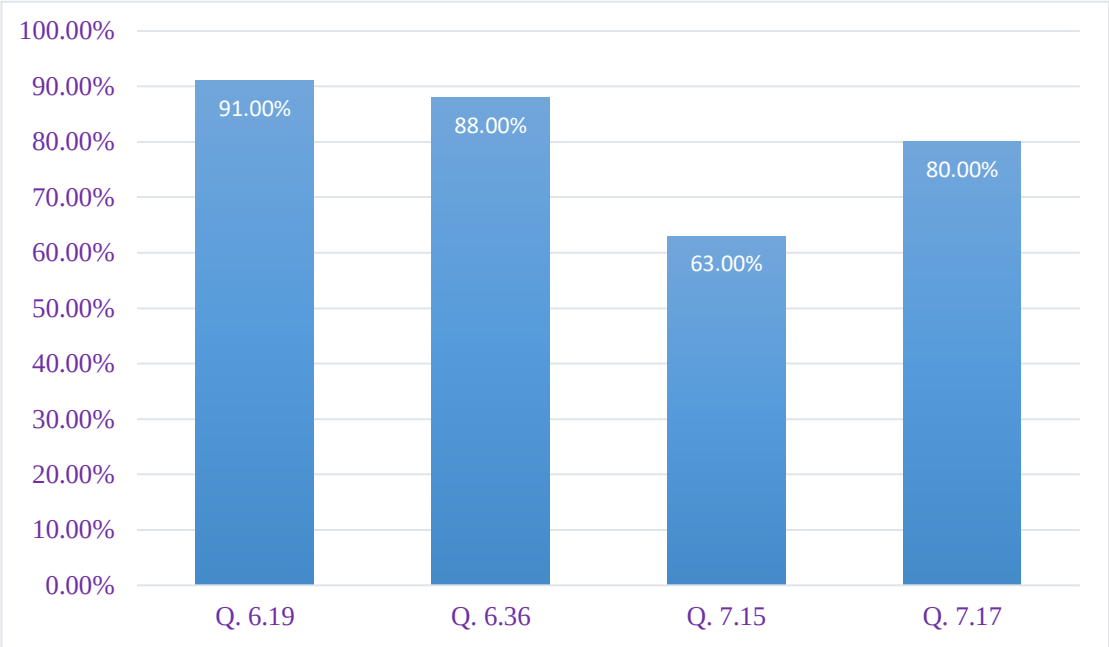


Figure 6.22 Rating of Response from Respondents Hypothesis 1.1

From table 6.23 and figure 6.22 it is observed that, 80.50 % respondent reports that, they are fully satisfied with the hardware infrastructure used in the digital library of an organization. The hardware facility used in The Rayat Knowledge Bank is satisfied hence the hypothesis the organization level suitable infrastructure is available for the digital Library is accepted.

B) The suitable ICT infrastructure required to create digital Library is available at the organization (Software facility).

Infrastructure consist of two parts such as hardware and software. The following are the response for Software facility used for central digital library of an organization.

Table 6.24 Hypothesis Testing 1.2 (Response and Grade)

(Response in % Grade)

Above 70 %	Strong
60 to 70 %	Very Good
50 to 60 %	Good
40 to 50 %	Satisfactory
30 to 40%	Poor

Librarian's View

C. **Q.5.21 -** 2.38 percent respondents are having Digital library Software.

D. **Q.5.22 -** 10 percent respondent reported that, they are satisfied with the use of website technology based the digital library.

User's View

C. **Q.6.19 -** 31 percent respondent reports that, they are fully satisfied with the search facility in the digital library.

D. **Q.6.20 -** 60.54 percent respondent noted that, the searching of digital library of the organization is not easy.

Table 6.25 Hypothesis Testing No. 1.2

Response (Question No.)	Grade (%)	
Q. 5.21	2.38	
Q. 5.22	10.00	
Q. 6.19	31.00	
Q. 6.20	60.54	
Sum	**103.92**	**25.98 %**

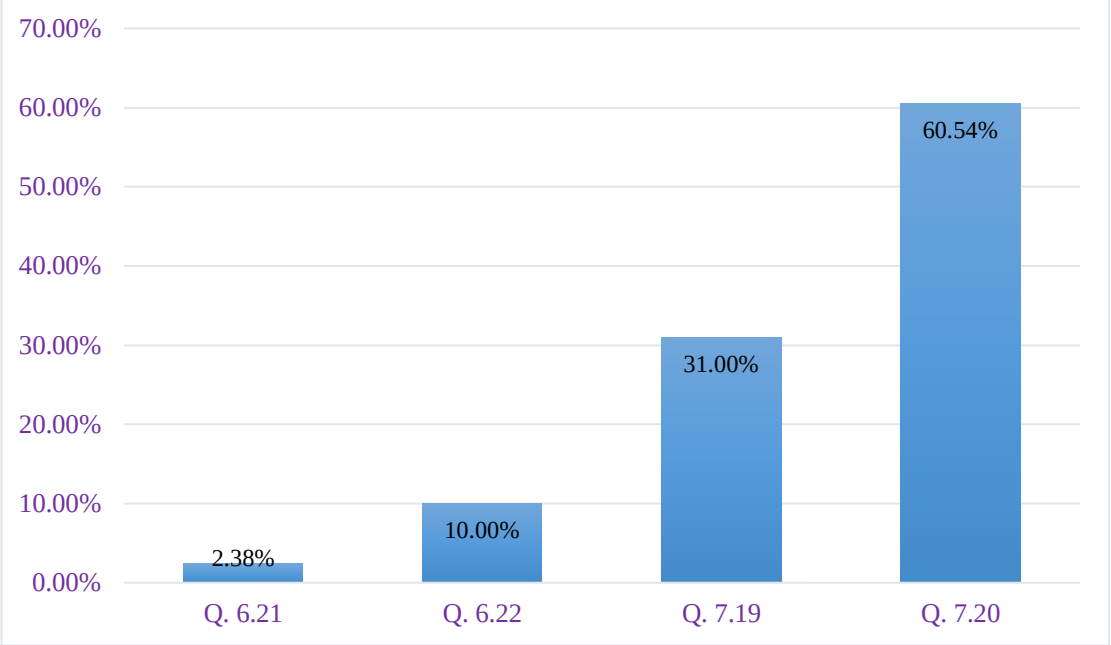


Figure 6.23 Rating of Response from Respondents Hypothesis 1.2

From table 6.25 and figure6.23 it is observed that, 25.98 % respondent reports that, they are fully satisfied with the Software facility infrastructure available in the digital library of an organization. The Software facility used in The Rayat Knowledge Bank is not satisfied hence the hypothesis the organization level suitable Software infrastructure is available for the digital Library is not accepted.

6.4.2 Hypothesis 2. The Library staff and users need periodical training to maximize the use of digital library.

Table 6.26 Hypothesis Testing 2. (Response and Grade)

(Response in % Grade)

Above 70 %	**Strong**
60 to 70 %	Very Good
50 to 60 %	Good
40 to 50 %	Satisfactory
30 to 40%	Poor

Librarian's View

A. **Q.5.11**- 92.85 percent respondent report that, for proper functioning of digital library professional staff is essential.

B. **Q.5.13 -** 88.09 percent respondent report that, yes the staff need special training working on digital library.

C. Q.5.14- 83.34 percent respondent reported that, the Institution has not arranged any special training program for the extension and decentralization of digital library through the involvement of librarian's role.

D. Q.5.15 - 78 percent respondent report that, frequency for special training program should be yearly.

User's View

A. **Q.6.12** - 54 percent respondent reports that, the library does not organize any training program to educate the users.

B. **Q.6.13**- 57 percent respondent did not response the question as Library and information Centre organize training programs to maximize use of digital library.

C. **Q.6.14**- 58 percent respondent did not response to the question. It means there is no arrangement of training program or users did not attain the same.

D. **Q.6.20 -** 59.52 respondent reports that, there is lack of trained staff in the college library for training to users for accessing the digital library.

Table 6.27 Hypothesis Testing No. 2

Response (Question No.)	**Grade (%)**	
Q. 5.11	92.85	
Q. 5.13	88.09	
Q.5.14	83.34	
Q. 5.15	78.00	
Q. 6.12	54.00	
Q. 6.13	57.00	
Q.6.14	58.00	
Q.6.20	59.52	
Sum	**570.80**	**71.35 %**

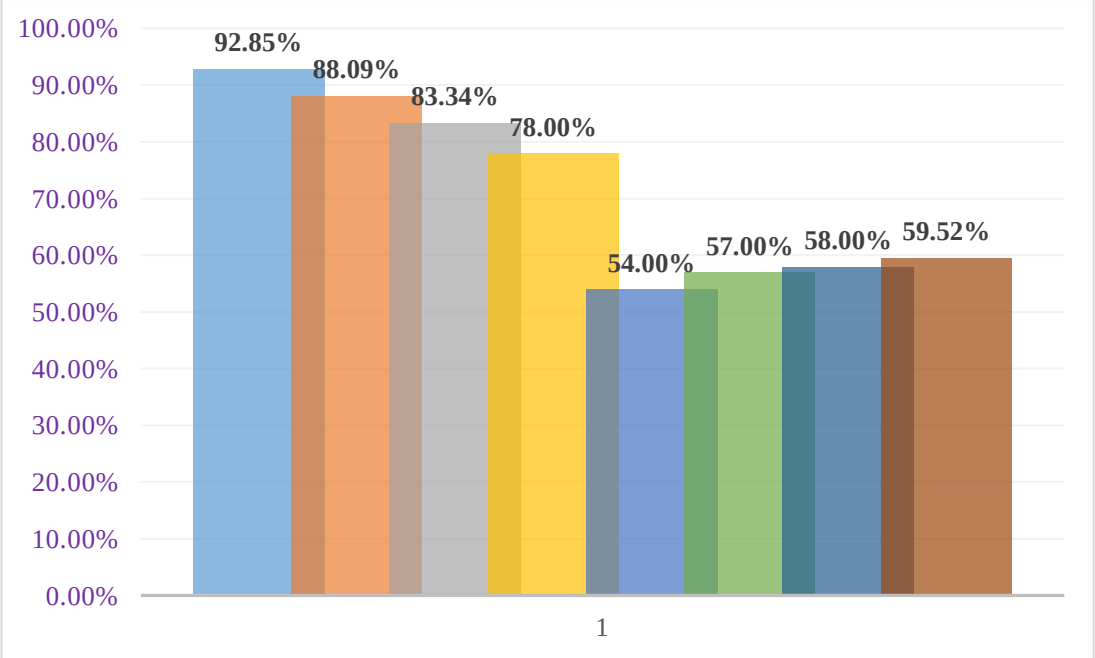


Figure 6.24 Rating of Response from Respondents Hypothesis 2

From table 6.27 and figure 6.24 it is observed that, 71.35 % respondent are in favour of need periodical training to maximize the use of digital library. Thus, we find that our hypothesis library staff and user's need periodical training to maximize the use of digital library is accepted.

6.4.3 Hypothesis 3. There is need of central digital library in the organization.

Table 6.28 Hypothesis Testing 3. (Response and Grade)

(Response in % Grade)

Above 70 %	**Strong**
60 to 70 %	Very Good
50 to 60 %	Good
40 to 50 %	Satisfactory
30 to 40%	Poor

Librarian's View

A. **Q. 5.8** - 90 percent college librarian strongly agree to have central digital library for the Rayat Shikshan Sanstha.
B. **Q.5.36** - 88 percent respondent reported that, they are satisfied with open access.

Users View

A. **Q.6.17** - 80 percent respondent reported that, yes they are fully satisfied with the digital library collection of the Rayat Knowledge Bank.
B. **Q.6.21** - 88 percent respondent reports that, they are fully satisfied with the establishment of central digital library for an organization.

Table 6.29 Hypothesis Testing No. 3

Response (Question No.)	Grade (%)	
Q. 5.8	90%	
Q. 5.36	88%	
Q.6.17	80%	
Q.6.21	88 %	
Sum	**346**	**86.5 %**

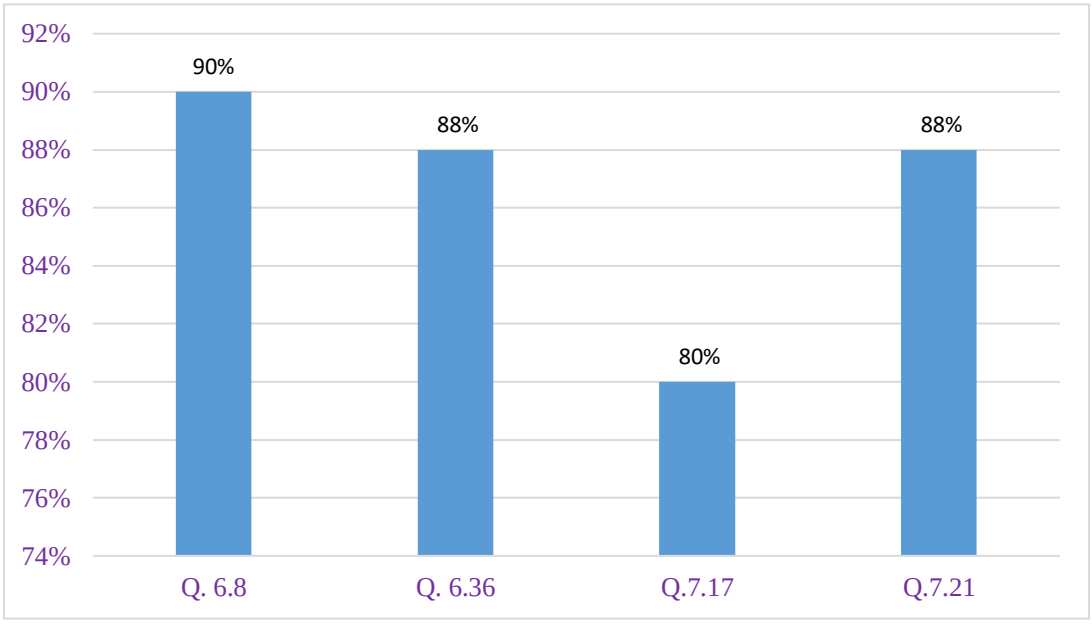


Figure 6.25 Rating of Response from Respondents Hypothesis 3

From table6.29and figure 6.25it is observed that, 86.5 % percent college librarian strongly agree to have central digital library for the Rayat Shikshan Sanstha. They are also satisfied with the collection of information resources and establishment of central digital library. Thus, we find that our hypothesis there is need of central digital library in the organization is accepted.

CHAPTER - 7

FINDINGS SUGGESTIONS AND CONCLUSION

7.1 Introduction

The study was carried out to find the present status of Central digital library of Rayat Shikshan Sanstha and its 42 college libraries, in the state of Maharashtra and also the centrally developed digital library by the institution. The digital library popularly known as **"Rayat Knowledge Bank".** To accomplish the objective of study of 42 questionnaires were sent to 42 college librarians. 100 % respondents responds to the questionnaires. Whereas 378 questionnaire sent to Users of the college library, out of that 294 respondents responds to the users' questionnaire. The response is 78 %. The analysis of the study is carried out in chapter 5 and 6 respectively. The response for every question in the questionnaire are coded in excel sheet and has been used for analysis. The analysis has been done by using excel sheet. The result is presented in tables, graphs the test conducted on the basis of analysis and interpretation of data and the findings are derived, which is considered as the ways to use for the creation and the development of digital library in all academic libraries. The findings of the study is based on the analysis are as follows:

7.2 Findings of the study : As per Librarian's questionnaires

7.2.1 Year of Establishment of the Colleges

It is found that, during 1947 to 2000, 42 colleges were established by the organization. Most of these colleges are in the rural Maharashtra. The institution was established before the independence of India. The institution have long historical and social background.

7.2.2 Financial status of Colleges

Maximum colleges of the institution are Government aided colleges, 3 colleges are self-financing colleges such as Engineering, MBA College and Law College. Recently one of its college has got an autonomous status by the UGC that is Shivaji College, Satara.

7.2.3 Professional Qualification of Librarian

The qualification of librarians of the institution are as per the minimum standards prescribed by the UGC that is M.L.I.Sc. With NET and SET qualification, Very few librarians is having M. Phil and Ph. D degree in library and information Science.

7.2.4 Faculty in Colleges

The institution has 42 colleges out of that, 20 colleges of the institution are having Arts, commerce and Science Faculty, and 10 Colleges are having Arts and Commerce faculty. One college is having Arts and Science faculty. 2 colleges have separate Commerce / Science College, one of them is Science College that is Yeshwantrao Chavan Institute of Science. 2 B.Ed. Colleges and Law, Management, Engineering and Polytechnic are professional colleges of the institution.

7.2.5 Post-Graduation Facility in the colleges

As per the response received from 31 colleges have Post Graduate education facility, 14 colleges have M.A. PG degree, 9 colleges have M.com. PG degree and 8 colleges are having M.Sc. PG degree education facility.

7.2.6 Accreditation Status of the colleges

It is found that, 14 colleges of the institution has been Re-accredited by NAAC with 'A' grade. 24 colleges of the institution have Re-accredited by NAAC with 'B' grade and 3 colleges Such as Engineering, Management, and Law are Re-accredited by the National Board of Accreditation (NBA) with B Grade. Polytechnic College does not have any grade.

7.2.7 Strength of Library Users

From the data received, it is found that, the strength of libraries of 12 colleges are up to 1000 Users, 13 colleges 1001-2000 strength Users, 5 colleges 2001-3000 and 3000-4000 strength of Users respectively. 4 colleges 4001-5000 strength of Users and 3 college libraries are having more than 5001 strength of library Users.

It is observed that maximum number of college library is having 1000-2000 strength of library Users.

7.2.8 Need of Central Digital Library

It is found that, 90 % college librarian strongly agree to have central digital library for the Rayat Shikshan Sanstha.

7.2.9 Digital Library Organization Committee

Maximum numbers of librarians expect that, they need the digital library committee at institutional level for advancement of digital library of the institution.

7.2.10 Librarian's Representation in Digital Library Committee

It is found that, every respondents accepts that, librarian's representation is must in the digital library committee for the future advancement in the digital library.

7.2.11 Human Resource for Digital Library

It is found that, for proper functioning of digital library professional staffs are very essential.

7.2.12 Skills to Handle Digital Library

The additional skill such as digitization, scanning, use of OCR and creation of metadata standards are required for the person handling digital library.

7.2.13 Special Training on Digital Library

The maximum librarian record that, the staff need special training working on digital library.

7.2.14 Organization of Special Trainings in an Institution

It is found that, 83 % respondents reported that, the institution has not arranged any special training program to extend and decentralization of digital library.

7.2.15 Frequency of Special Training on Digital Library

Maximum number of the librarians are demanding special training to be arranged at yearly and regular basis.

7.2.16 Budget Provision for Digital Library

This is found that, 95% respondents record that, there is no separate provision made for the purchase of E-resources, subscription of databases in a library budget. It is also found that, 88 % appellants note that, there is need for separate library budget provision for the development of digital library.

7.2.17 Digital Library Policy and ICT Strategy

No college library had any written policy and ICT strategy for the building and maintenance of digital library. It is also found that, 100 % respondents noted that, while framing policy and ICT strategy on digital library objectives of the library, various licenses for hardware and software are very essential. 95 % respondents note that digital library committee for organizing digital library and making separate provision for budget is required. 90 % respondents record that, professional human resources and copyright issue should be highlighted. 76 % respondents' note that, content should be given

more importance. 69 % respondents' keeps that, format of content should be given more importance and 60 % respondents record that, Users demand are very important while framing the policy of the digital library.

7.2.18 Digital Library Hardware Facility / infrastructure

It is observed that, 91 % respondents reported that, they are fully satisfied with the hardware infrastructure used in the digital library of an organization.

7.2.19 Digital Library Architecture

It is found that, an organization has used website based technology for the creation of digital library. It has not used prescribed digital library architecture for the creation of digital library.

7.2.20 Digital Library Software Facility in the College Library

It is found from the data received, that, 100 % respondents reported that, they are having Scanning, Adobe and library Automation Software. 79 % respondents note that they use Linux operating system and 21 % respondents record that, they use window operating system. 83 % respondents reports that, they are having CD/DVD Write Software and 2 % respondents have digital library software. it is observed that, No any respondents reported that, college library keeps software for the CD / DVD Management, Citation Management Software, E-book Reader, Fidgets Search Engines, Optical Character Recognizer (OCR) Software, Web designing Software and Storage Software. It is also observed that, Maximum college libraries have required number of software.

7.2.21 Technology for digital library

Maximum number of librarian record that, they are not satisfied with the use of web page based technology along with the use of html linkages in the digital library.

7.2.22 Software for the Rayat Knowledge Bank (DL)

Open source software will be useful for building the digital library. Maximum number of librarians prefer Dspace software for the creation and development of the digital library.

7.2.23 OCR software to the Rayat Knowledge Bank

This is found that, the respondents reported, 62 % Adobe Capture OCR software to be used in the digital library of the institution. 12 % appellants has given preference to Abby Fine Reader OCR and Word Scan software for using in the digital library and 14 % respondents has given preference Omnipage Pro OCR software should be used in the digital library**.**

7.2.24 Supporting Application software to the Rayat Knowledge Bank

It is found that, Maximum number of librarians are of opinion that, Acrobat PDF software to be used in Rayat Knowledge Bank.

7.2.25 Copyright Issue and Preservation of Digital Resources

This is found that, 36 % respondents note that, acquire the written permission from the copyright holder.17 % appellants record that, use the open source only. 28 % appellants record that, use the old information resources which is beyond the copyright act and 19 % respondents note that, proper citation to be given to the education and learning materials for the copyright issue.

7.2.26 Availability of Digital Collections in the Library

It is found that, Maximum number of the college libraries have some forms of digital collection e.g. CD/DVD, e-resources, subscription of databases, websites, projects, proceedings, images, photographs, open sources resources, power point presentation, Audio, Video recordings, study material and institutional repository etc.

7.2.27 Resources to Rayat Knowledge Bank

It is found that, the respondents' record that, 67% respondents reply that, manuscripts on the institution to be added in the digital library, 76% respondents noted that, rare book to be added in the digital library. 83% appellants thought to add Rayat Talent Search Examination books and question set of previous years. 71% appellants' record that, add the institutional important circulars and lastly 100% respondents keeps that, educational material such as power point presentation slides, audio and video recordings add to the digital library.

7.2.28 Acquisition Method for Digital Library

It is observed that, 17% respondents reported that, acquire the digital collection from the creator. 19 % respondents reported that, convert the digital collection from print to digital collection. 52% respondents reported

that, born digital material should be used for building digital collection. Whereas 12% respondents reported that, buy access portals for the building digital collection.

7.2.29 Digital Resources Processing

More number of respondents are in favor to carry out digitization processing through outsourcing only to avoid the studious work load of the digital library.

7.2.30 Storage of Digital Resources

From the study it is found that, maximum number of respondents record that, hard disk will be prefect media for storing digital resources.

7.2.31 Use of Metadata, Object Naming and Unique Object Identifier

It is observed that, 88% respondents reported that, use of Metadata, object Naming and Unique object Identifier was not followed in the digital library of an organization.

7.2.32 Mode of Information Organization in the Rayat Knowledge Bank

It is observed that, 45 % respondents reported that, they are somewhat dissatisfied with the information organization in the Rayat Knowledge Bank. Whereas 33 % respondents reported that, they are not satisfied with the information organization in Rayat Knowledge Bank.

7.2.33 Expected Mode of Information Organization in the Rayat Knowledge Bank

Maximum number of librarians are of opinion that, use the communities, collections and items wise arrangement for organization of information resources should be followed in digital library.

7.2.34 Access to the Rayat Knowledge Bank

Maximum respondents reported that, they are satisfied with open access provided to the digital library by the institution.

7.2.35 Authenticated Access to the Rayat Knowledge Bank

It is found that, more number of respondents record that, password based access to registered Users should be provided to the digital library, the content are for the public it should be free to the society.

7.2.36 Access option for the Rayat Knowledge Bank

It is observed that, 88 % respondents reported that, access option is not provided in the digital library.

7.2.37 Digital Library Services

It is observed that, 100 % college libraries produce services like OPAC, WEB-OPAC, E-mail and Central Storage facilities for hosting digital collection service. 24 % college libraries care Current Awareness Service, 57 % college libraries had online external database such as NLIST database. 12 % college libraries keeps Internally Published Newsletters, Electronic table of contents, Digital Reference Service, Discussion Groups and Forums digital library services. 21 % college libraries implemented Bulletin Board Service and E-Publishing services. 36 % college libraries keeps Electronic Document Delivery Service, Audio and Video Communication, No any respondents reported that, college library keeps CD/DVD ROM database, Electronic thesis and Special Collection Service.

7.2.38 Advance Digital Library Services

It is observed that, 88 % respondents reported that, the advanced digital library services are not followed in the present digital library.

7.2.39 File formats for the Rayat Knowledge Bank

1. It is found that, for the storage of text file respondents has given preference to 24 % for PDF format, 21 % for XML format, 17% for SGML format, 14 % for HTML format, 12 % for ASCII format and 7 % for UTF-8 format.
2. It is found from the data that, for storage of still image file respondents has given preference to 19 % PDF format, 17 % to JPEG format, 14 % to IMG format, 12% to TIFF & GIF format and 10 % to BMP format.
3. It is found that, for storage of moving image files the respondents has given preference to 6 % MPEG format, 14 % to MXF format, 12 % to AVI, MP4, DAT and MOV format respectively and 7 % to WMV format.
4. From the response, it is found that, for storage of audio files the appellants has given preference to 19 % WAVE format. 17 % to AU format. 14 % to AIFF, MXF and MP3 format respectively and 12% to MIDI format.
5. As per the response received, it is found that, for storage of database files respondents has provided the preference to 52% XML format and 40 % to CSV format.

6. For storage of web archive files, 92.85 % respondents has given preference to WARC format.
7. For storage of tabular data files, 95 % respondents has given preference to CSV format.
8. For storage of containers files the respondents has record the preference in the form of 50 % to ZIP format, 31 % to GZIP format and 19 % respondents has given preference to TAR format.
9. It is found that, for storage of geospatial files the respondents has given preference which is noted that, 31 % to SHP format, 29 % to DBF format, 24 % to GEOTIFF format and 12 % to NetCDF format.
10. From the response, it is find that for storage of statistics files the respondents has given preference 33 % to ASCII format, 29 % to DTA format, 21 % to PGR format, 12 % to SAS format and 5 % to SAV format.

7.2.40 Meta data Standards to the Rayat Knowledge Bank

It is found that, the appellants response are noted that, 100 % to use Meta Data Standards such as Machine Readable Catalogue (MARC), Dublin Core (DC) and Z39.50 respectively. 93% to use METS (Metadata Encoding and transmission Standards) and ISAD (G), 90 % to use MODS (Metadata Object Description Schema), 83% to use VRA (Code-Visual Resources Association) , 88 % to use EAD (Encoded Archival Description) and 71 % to use Locally Developed Schema for the creation of Meta data Standards in the digital library.

7.2.41 Challenges for Creation of Digital Library

This is found that, 100 % appellants record that, lack of funding, skillful staff, technical knowledge, inadequate infrastructure and interoperability among different media input and formats are the challenges for digital library. 90 % appellants note that, there is need for training. 48 % respondents thought that, there is lack of management support and digital library standards for creating the digital library. 71 % appellants record that, there is security problems while building the digital library. 60 % appellants record that, there is challenge involved in selecting valuable and reliable information resources and the attitude of publishers for the digital library. 93 % respondents record that, there is copyright / digital right management, lack

of policies and strategies challenges involved in the building the digital library. 36 % appellants record that, there is lack of contents and marketing skill for creating the digital library and 95 % appellants noted that, there is speedy changing digital world is the major challenge in the creation and development of the digital library.

7.2.42 Marketing of the Rayat Knowledge Bank

This is found that, 83 % appellants record that, collaboration with other digital library will help to market the digital library. 93 % respondents' record that, Focus on the core values of the Rayat Shikshan Sanstha's which will help to market the Rayat Knowledge Bank. 100 % respondents record that, made the users centric service which help to market the digital library. 95 % respondents report that, use of open platforms for Users will help to market the digital library of the institution. 86 % respondents record that look for added value that will help to market the digital library and 93 % appellants record that, use of information technological application will help to market the digital library of the institution.

7.2.43 Suggestion for Development of Digital Library

It is observed that, 28 % appellants record that, the infrastructure facility for the use of digital library such as number of computers, excellent bandwidth connectivity and proper power backup facility are very essential. 17 % appellants' response that, subscribe databases centrally at institutional level to achieve greater economy. 12 % respondents' response that, hire the service of professional scanning and OCR techniques from outside vendor.

7.3 Findings of the Study : As Per Users Questionnaire

7.3.1 Frequency of Users Visit to College Library

This is found that, 6 % users' daily visit to library. 13% users visit to library twice a week. 43 % users visit to library weekly. 34% users visit to library once in month and only 5 % users rarely visit the library.

7.3.2 Purpose of Visit to Library

It is found that, Most of the respondents visit to library for issue and return of library books. 54% appellants record that, they visit the library for the purpose of consulting periodicals. 31 % respondents record that, they visit the library for taking photocopies. 88 % respondents record that, they visit the library for finding as well as collecting material for class assignments and 5 % respondents visit the library for finding and collecting material for research purpose only.

7.3.3 Type of Information Resources

It is found that, 67 % respondents record that, they prefer print resources for study purpose. 20 % respondents notes that, they prefer digital resources for study purpose and 13 % respondents clear that they prefer both print and digital resources for study as well as research purpose.

7.3.4 Digital Information Resources Awareness

This is found that, 56 % respondents record that, they are aware of e-books. 52 % respondents record that, they are aware of the e-journals. 23 % respondents notes that, they are aware of e-proceedings. 88% respondents reports they are aware of the power point presentation. 30 % respondents clears that, they are aware of audio recordings and 24 % respondents response that, they are aware of the video recordings. This is also observed that, 100 % respondents is aware for the study material.

7.3.5 Purpose of Digital Information Resources

It is found that, 100 % appellants record that, the purpose of using digital information resources are to get the current information. 90 % respondents note that, the purpose of using digital information resources are to prepare class assignments. 97 % appellants clears that, the purpose of using digital information resources as a study material. 51 % appellants thoughts the purpose of using digital information resources are to get literature search for

research and 50 % respondents opinion that, the purpose of using digital information is to write research articles.

It is clear that, the purpose of using digital content is to find the current information, to get the literature review and to write the research article for the journals and publication.

7.3.6 Digital Information Resources Availability and Satisfaction

It is found that, 64 % appellants record that, they are fully satisfied with the digital information resources available in library. 20 % respondents note that, they are partially satisfied with the digital information in library. 9 % respondents thought that, they are somewhat dissatisfied with the digital information resources in library and 7 % appellants' clears that, they are not satisfied with the digital information resources in library.

7.3.7 Digital Information Services

This is found that, 65 % respondents are aware of the digital information service such as catalogue database (OPAC / WEB-OPAC), 37 % respondents aware of current awareness service. 29 % respondents aware of externally purchase databases e.g. N-List database of UGC-INFLIBNET. 9 % respondents aware of CD-ROM databases produce by the library. 27 % respondents are aware of internally published newsletters, reports and journals. 61 % respondents aware of E-mail. 20 % respondents are aware of bulletin board service. 22 % respondents are aware of audio and video communication service. 15 % respondents are aware of electronic table of contents service. 14 % respondents are aware of E-Publishing service. 16 % respondents are aware of discussion groups and forums service. 19 % respondents are aware of central storage facilities for hosting digital collections and indexes service. 14 % respondents are aware of special collection service. 67 % respondents are aware of web based library service and 28 % respondents are aware of web based users education service provided by the library.

7.3.8 Purpose of Digital Information Services

This is found that, 100 % respondents record that, the purpose of using digital information services was to find the availability of material from a library. 67 % respondents notes that, the purpose of using digital information services are to get study and research related material in a library. 72 % respondents

clears that, the purpose of using digital information services is to get material for class assignments, 39% respondents record that, purpose of using digital information services are to get literature on research. 53% respondents thought that, purpose of using digital information services are get the print out of required material from the library.

7.3.9 Satisfaction towards Digital Information Service

It is found that, 31% respondents record that, they are fully satisfied to the digital information services of the library. 21 % respondents notes that, they are partially satisfied services of the library. 10 % respondents reports that, they are somewhat dissatisfied to the services of the library. 38 % respondents' thoughts that, they are not satisfied to the digital information services of the library.

7.3.10 Digital Library Skill to Staff

It is found that, 54 % respondents' clear that, the required skill was not available in the library staff for handling digital library activity of the digital library.

7.3.11 Training Program for Users

It is found that, 54 % respondents clears that, the library does not organizes any training program to educate the Users.

7.3.12 Frequency for Organization of Training Programs

It is found that, 57 % respondents reply that, library and information centre do not response for the same. It mean there is need to organize training programs to maximize the use of digital library periodically.

7.3.13 Program Organized by Library

This is found 30 % respondents response that, library and information Centre organize individual instructions program to maximize the use of digital library, and 58 % respondents did not response to the question.

7.3.14 Infrastructure Facility in Library

Form the study it is found that, 63 % respondents were partially satisfied to the infrastructure and computer facility provided by the library. 8 % respondents' clears that, they were somewhat dissatisfied to the infrastructure and computer facility of the library and 18 % respondents noted that, they were not satisfied to the infrastructure and computer facility of the library.

7.3.15 Awareness for the Rayat knowledge Bank

Maximum number of users reported that, they are aware of the digital library developed by the institution which is popularly known as the Rayat Knowledge Bank.

7.3.16 Digital Library Collection in the Rayat knowledge Bank

It is found that, maximum number of the users are fully satisfied with the collection of institutional digital library.

7.3.17 State of Art of the Rayat knowledge Bank

It is found 100 % appellants response that, the material is relevant to subject in the Rayat Knowledge Bank. 46 % respondents clears that, the Rayat Knowledge Bank as a repository is easy to use. 31% respondents reply one can find the information from the institutional repository quickly. 86 % respondents note that, one can download the number of required files from the Rayat Knowledge Bank quickly. 84 % respondents' record that, as a digital library of the Rayat the information displayed in a format which was suitable with the present system and 5 % respondents clears that, as a digital library navigational assistance was available for help in the digital library.

7.3.18 Search Facility Rayat knowledge Bank

It is found that, Maximum number of Users are not satisfied with the search facility of the digital library created by the Institution.

7.3.19 Problem for Accessing Digital Library of an Institute

It is found that, 74 % appellants' record that, access to digital library of the institution is time consuming. 61 % respondents note that, the searching of digital library is not easy, 67 % respondents thought that, there is in sufficient terminals to access digital information in the library and 59 % respondents noted that, there is lack of trained staff in the college library to train the Users for the use of digital library.

7.3.20 Need of Central Digital Library for an Organization

It is found that, 87.75 % respondents' reports that, they are fully satisfied with the establishment of central digital library for an organization. 12.25 % respondents reports that, they are partially satisfied with the establishment of central digital library for an organization.

7.4 Suggestions based on Data Analysis

Basically the aim of any library is to provide search, advance search facility, for finding proper information. The present system used by the institution for managing the digital resources needs many improvements for the development of digital library.

1. **Need of Central Digital Library:** Extension and decentralization of digital library of an organization is very essential to maximize the use. Subscribe databases centrally at institutional level for achieving greater economy.
2. **Organization Committee for Digital Library:** The organization should develop the digital library committee with the representation of professional librarian, digital library consultant/expert, along with collaboration of many stakeholders such as Users, information providers and staff from all parts of an organization.
3. **Human Resource for Digital Library:** It is essential to have a full-time project manager for the implementation and completion of the digital library project. The technical personnel's should be appointed as per the requirement of digital library development plan such as in house or outsourcing for the building digital library. Professional Human resource are already exist in an organization only it need periodical training to become familiar with the system.
4. **Budget for development of Digital Library:** Make budget provision regularly for the development of digital library at college and an organization level respectively.
5. **ICT Infrastructure & framework:** Use the client-server architecture, Open Archives Initiative Protocol for Metadata Harvesting (OAI–PMH) Architecture and cloud computing along with use the technology such as computing, hardware and software networking, information storage and retrieval, multimedia and users interface design is essential for creation and development of the digital library.
6. **Software for Digital Library:** Use the standard open source software for creation of the digital library instead of using website based technology. Use Dspace Open source software for extension and modernization of digital library for an organization.

7. **IPR and Digital Right Management:** Follow the IPR and Digital Right Management issue properly. Arrange the various training programs sessions for different groups of digital library Users and organizer regularly. The digital library should have written policy on copyright and information communication technology strategy for the creation, development and maintenance of digital library.
8. **Digital Collection:** Annual Report, Faculty Publication, Workshop, Conference, Seminar Publication, Manuscripts, Rare books, theses, dissertations, project reports, audio and video lectures, songs and musical scores, educational learning material should be added to the digital library. Acquire, convert, use born digital resources and buy subject gateways. Outsourcing to be followed for the digitization activity. The Standard OCR Software such as Adobe Capture, OCR Software, Acrobat PDF Software to be used in the Rayat Knowledge Bank.
9. **Organization of Digital Resources:** Follow the Community, Collection and item wise arrangement of information in the digital library. Improvement in real time question answering, on demand help, information literacy and users involvement mechanisms should be follow in the system. The organization of information resources of the Rayat Karmaveer Prabodhini as well as from 42 colleges should have separate entity in the digital library. Use the institutional logo to design the interface of digital library, create menu and buttons to highlight the digital library activities. Use the proper font size and colour to make attractive design of the digital library. To know the use of digital library provide the visitor counter, Help menu should be provided for educating the Users.
10. **Access Infrastructure for Digital Library:** Password based Access to registered Users should be provided to Rayat Knowledge Bank for Security purpose.
11. **Digital Library Services:** Search and Advanced digital library services Such as E-Alerts, RSS Feeds, Ask an-expert or eDDs should be provided. Achieve the cost-effectiveness and improve the quality of service for strengthening the digital library activity. More attention should be given

for digital information services to satisfy the need and expectation of the Users.

12. **Standards and protocols:** Use the Standard format file such as
    a) For the storage of text file use the PDF, XML, SGML, HTML ASCII and UTF-8.
    b) For the storage of still image file use the PDF, JPEG IMG, TIFF, GIF and BMP format. For storage of moving images use the file MPEG, MXF, AVI, MP$, DAT, MOV and WMV format.
    c) For the storage of audio file use WAVE, AU, AIFF, MXF, MP3, MIDI format.
    d) For the storage of database files use XML, CSV format.
    e) For the storage of web files use WARC format.
    f) For the storage of tabular data files use CSV format.
    g) For the storage of containers files use ZIP, GZIP and TAR format.
    h) For the storage of geospatial file use SHP, GEOTIFF and NetCDF Format.
    i) For the storage of statistics file use ASCII, DTA, PGR, SAS and SAV format.

    The Meta data format such as Dublin Core (DC), Z39.50. METS (Metadata Encoding and Transmission Standards) and ISAD (G) are very useful while creation and development of the digital library.

13. **Search Facility in Digital Library:** Develop the pull technology such as visit to different websites, search and browse interface, library portals, web based users education, integrated search interface and also links the subject specific blogs. The facilities such as navigation, prompt retrieval, browsing and interaction are also need for improvement.
14. **Training for Digital Library:** To arrange the training sessions for staff and users periodically at organization and college level regularly to maximize the use of digital library. Develop various skills amongst library staff for handling the digital library activity.

15. **Right for adding resources in Digital Library:** To follow decentralization of adding resources in digital library. Extend the rights also to 42 college librarians.
16. **Marketing of Digital Library:** Users interface must be given to the Rayat Knowledge Bank, create the independent Web Page, Link the created webpage to the college website and also link webpage to the Rayat Shikshan Sanstha's prime website. Extensively market the digital library for maximize use.

7.5 Conclusion

The aim of creation of digital library for the Rayat Shikshan Sanstha is very appropriate step towards the digitization era. The material selected for the digital library is relevant to the subject. Only the use of website base technology, hyperlinks for organization of digital resources in the digital library in the forms of folders and subfolders. Absence of search facility in the digital library need professional improvement. The study has clearly established following views

a) The role of management authorities is very important for the building of the digital library.
b) The formation of the digital library committee at institution is very essential for the qualitative improvement.
c) The librarian's professional representation in the digital library will enhance the qualitative improvement in the digital library.
d) Separate library budget provision is very essential for the development of the digital library and its infrastructure.
e) For creation of digital library professional human resource is essential.
f) Establishment of proper infrastructure at institution and college level will be the pre requisite to the digital library.
g) Use the open source software for future development of the digital library.
h) Decentralization of adding the resources rights should be allocated to 42 college librarians.
i) 42 college libraries should be able to put the resources centrally in the server. Every college library will have its own identity, for building competitive and qualitative improvement in the digital library and its environment.

j) For the development of digital library periodic training to the staff as well as to the users is must.

k) Open access to the digital library is exactly appropriate steps toward the aim of the Rayat Shikshan Sanstha's "Education to Masses".

l) The digital library service need to be implement as per users expectations.

The development of digital library in the Rayat Shikshan Sanstha and its 42 colleges is very good. The efforts taken for creation of digital library is amazing. This is centrally created digital library for the institution, but it need professional touch from library and information views.

7.6 Digital Library Model for the Rayat Shikshan Sanstha

Based on the findings of the study, a model of digital library has been evolved by the researcher.

A) To continue the present digital library model self-hosting along with use of Standard software. The institute can make mirroring of digital library contents and replica can be hosted on other servers maintained by some commercial and professional firms. or

B) Outsource the digital library Server infrastructure and cloud computing: The digital library to be outsource to commercial and professional firms. The library automation process of Rayat Shikshan Santha's 40 colleges are already carried out centrally through MKCL, Pune by using libreria Software. They should use the open source integrated software such as Koha and Dspace for maintaining the library automation and digital library creation. This will help to achieve greater economy in infrastructure development and expertise for the development of digital library.

The option **B** will be most helpful for the organization to save expenditure separately on the use of library automation software and digital library software functioning, maintenance etc.

The steps for the advancement of digital library to an organization

The role of management is to constitute digital library committee with the involvement of librarian's representation. The digital library committee should

decide the use of digital library software and advancement of infrastructure plan in consultation with technical expert in the field of digital library.

Take the help of digital library consultant, along with appoint the full time project manager for the completion of the project in a systematic way.

The management has to make the separate budgetary provision for implementing digital library plan by using Open source software e.g. Dspace and use of Open Archives Initiative Protocol for Metadata Harvesting (OAI-PMH) Architecture for infrastructure advancement. Purchase the hardware and software as per the new requirement of the digital library. The college library has a right to add its own resources with their individual identity along with work for the whole institution.

Provide the technical training to staff recruited for implementing the digital library as well as to the library professional staff of the respective colleges of an institution. Internal arrangement should be community, collection and item wise system for organization of the resources which is indicated in table 7.1 and figure 7.1.

Table 7.1 Arrangement of Resources in the Rayat Knowledge Bank

Community	Karmaveer Vidya Prabhodhini (01) + 42 colleges' digital library separate identity.
Collection	Manuscripts, Rare books, Annual Reports, Digitized Books, Dissertations, faculty publication, workshop, conference and seminar papers, Newsletters, Journals etc.
Item wise arrangement	• E-books • E- Journals • Audio • Video • Images • PPT etc.

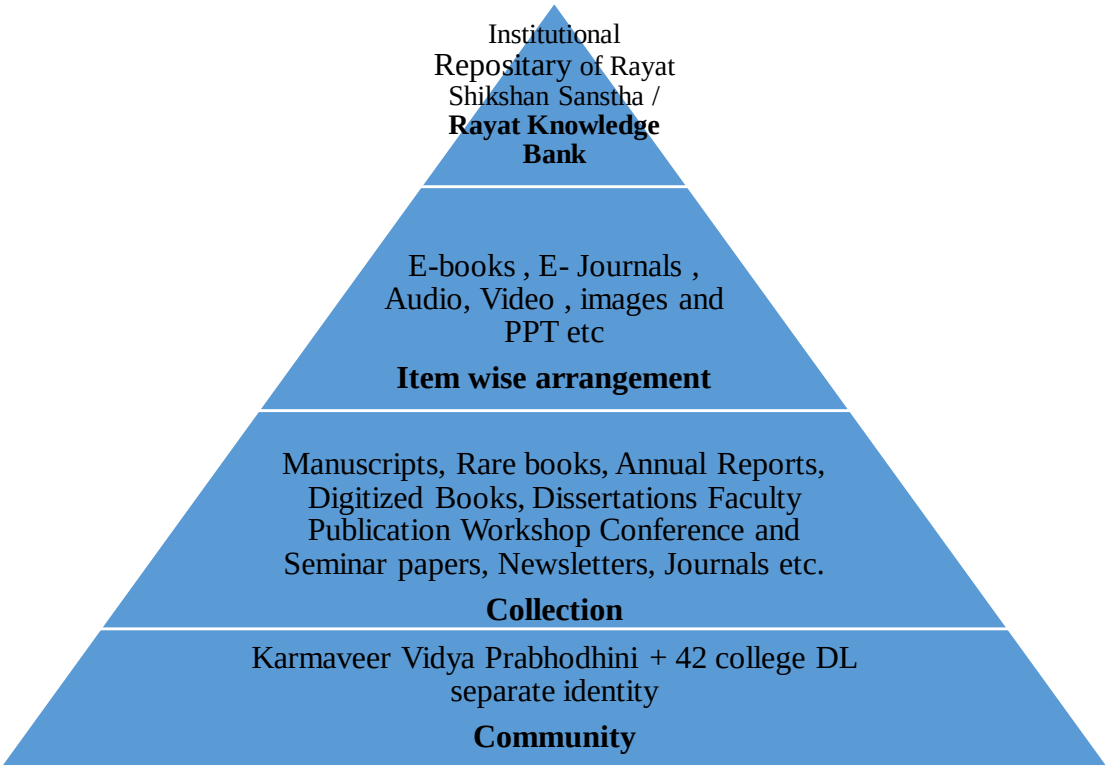


Figure 7.1 Arrangement of Resources in the Rayat Knowledge Bank

At organization level, subscribe the different database centrally from third party data sources to achieve cost effectiveness. Develop infrastructure facility at every college library by establishing 30-50 computer terminals laboratory, with 20-30 mbps bandwidth of internet connectivity and also provide power backup facility with 10 KV (UPS), implementing the use of database and open resources more effectively. Use the cloud server computing facility to extend the digital library.

Market the digital library by linking with college and institutional website. Arrange the Users training for educating the use of digital library effectively and periodically. Evaluation of this stage has to been done at institutional and college level periodically.

7.7 Area of Future Research

The progress of any subject is always depends on the research. Research is continuous process. The researcher recommends that, the following subject area is having potential for further research.

1. Evaluation of digital library created by the Rayat Shikshan Sanstha.
2. Use and Users study of digital library created by the Rayat Shikshan Sanstha.

3. Marketing of digital library created by the Rayat Shikshan Sanstha.
4. Evaluation of digital library created by different Universities.
5. Comparative study of digital library created by various institutes with the Rayat Shikshan Sanstha.
6. Development of human resource skills for the digital library.
7. A comparative study of digital library curriculum India with other country.

7.8 PAPERS PUBLISHED BY RESEARCHER BASED ON THE RESEARCH WORK

1. **Anandkar , Arjun Baburao and Dr. Daya Dalve (Patil)** . 2015."Creation of Institutional Repositries by using Open Source Software : An Overview." *New Age e-learning for Indian Higher Education.*(R.B. Narayanrao Borawake College, Shrirampur, Dist. Ahmednagar) ISBN 978-81-932117-0-0

2. **Anandkar, Arjun Baburao**. 2017. "An Evaluation of Institutional Repository Developed by Rayat Shikshan Sanstha, Satara." *Sanshodhan Samiksha, Monthly Peer Reviewed International Reserch Journal, Special Issue January 2017* (Aadhar Social Research and Development Training Institute) ISSN- 2278-9308 Page No. 30-33.

3. **Anandkar, Arjun Baburao, Dr. Dalve (Patil), Daya** . 2017. "Digital Library for Rayat Shikshan Sanstha." *Proceeding National Level Seminar "Cyber Crime and Cyber Security" (15th and 16th December, 2017)* Sponsored by BCUD and Savitribai Phule Pune University, Pune. organised by Department of Computer Science .B. Narayaranrao Borawake College, Shrirampur. ISBN- 978-81-932117-9-3 Page No. 45-52.

4. **Anandkar, A. B., & Dalve (Patil), D. B**. (2018, Febuary 3). Creation of digital library for the Rayat Shikshan Sanstha. (V. S. Hatole , Ed.) *Genius, VI* (II), pp. 84-95.

5. **Anandkar, A. B. (2018, Feburary)**. Rayat Knowledge Bank : A Digital Library. (B. S. Yadav, Ed.) *Research Journey International Multidisciplinary E- Research Journal*, pp. 214-219. Retrieved from www.researchjourney.net

7.9 Conclusion of thesis

The present study of digital library is for the Rayat Shikshan Sanstha and its colleges. The individual college library have many limitations for its creation, maintenance and expertise. The steps taken by the institution is appropriate towards the development of the digital library. Only it need to use the technology which is useful for creation of the digital library, which will help to build central digital library by allocating space to individual college libraries for hosting their resources. It will help to build competitive digital library.

Suggestions have been made to overcome the lacuna with the help of digital library literature and the present technology, which will help to improve the digital library of the institution and the research is also useful to the whole country.

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Appendix No. I

QUESTIONNAIRE FOR LIBRARIANS

1. Name , Address , URL and year of establishment of the College / Institution

Name of the College	Address	URL	Year of establishment

2. Financial status of College / Institute :
   - Government Aided
   - Self- financing
   - Autonomous
3. Name of the Library (If any) :
4. Is it an independent URL for the Library :

URL of the Library	**Tick Mark (√)**
Yes, Independent URL	
No , Separate URL	

5. Professional qualification of the Librarian :

Professional Qualification of the Librarian	**Tick Mark (√)**
M.Lib.Sci.	
M.Lib.Sci., NET/SET	
M.Lib.Sci., M.Phil.	
M. Lib. Sci.,SET/NET, Ph. D.	

6. Faculty in the college :

Faculty in College	**Tick Mark (√)**
Arts, Commerce and Science	
Arts and Commerce	
Arts and Science	
Arts	
Science	
Commerce	
B. Ed.	
Law	
Management	
Engineering	
Polytechnic	

7. **Post Graduate Education facility in the college**

Post Graduate Education in College	**Yes**	**No.**
M.A.		
M.Com.		
M.Sc.		

8. NAAC Re Accredited Grade -------
9. Total strength of the library users in the College / Institute :
10. Does your library have digital collection?
    - Yes
    - No
11. If yes, what type of the digital collections are available in your Library?

    (You may tick mark (√) more the one)
    - e-Books
    - e-Journals
    - Online database
    - Websites
    - Projects
    - Proceedings
    - Images /

- Events Photographs
- Open Source
- Lectures PPTS
- Audio Recordings
- Video Recordings
- Study Materials
- Institutional Repository
- If any more (Pl Specify)

12. Which are the digital library services provided by your library?

(You may tick mark (√) more the one)

- Catalog database (OPAC / WEBOPAC)
- Current Awareness Service
- Externally Purchase Databases (e.g. N-LIST)
- CD-ROM databases
- Internally Published Newsletters , Reports and Journals
- E-mail
- Bulletin Board Service
- Audio and Video Communication
- Electronic table of contents
- Electronic Document Delivery Service
- Electronic Thesis and dissertations
- Reference Service
- E-Publishing
- Discussion Groups and Forums
- Central Storage facilities for hosting digital collections and indexes
- Special Collection Service ,
- Web based library Service
- Web based user education

13. Mention the digital library hardware facilities which is available in your library?

(You may tick mark (√) more the one)

- Server With PV, i7, 10TB Hard Disk, 5GB RAM (Latest Configuration)
- Computer Terminals with latest configuration
- UPS (5KV)
- Scanners
- Digital Cameras
- Printers
- LAN Connection
- Internet Connectivity
- Networking

14. Mention the digital library software available in your library?

(You may tick mark (√) more the one)

- Operating Software Linux
- Operating Window
- Scanning Software
- Adobe Software
- CD/DVD Write Software
- Library Automation Software
- Software for the CD/DVD Management
- Digital Library / Institutional Library Software
- Content Management Software
- E- Learning Software
- Citation Management Software
- E-book Reader
- Federated Search Engines
- Optical Character Recognizer (OCR) Software
- Web designing Software such as Java
- Storage Software

15. Is there any written policy and ICT strategy for development of digital library?
    - Yes
    - No
16. If no, what are the factors which are essential for policy and ICT strategy development of digital library?

    (You may tick mark (√) more the one)
    - Objective of the Library
    - Committee for organizing the digital library
    - Budget
    - Human Resource
    - Content
    - Format
    - License
    - Supporting Hardware and software
    - User Demand
    - Copy right issue
    - If any (Pl Specify)
17. Is there a separate provision of library budget for development of digital library?

SR. No.	Particulars of Library budget	Tick Mark Yes	Tick Mark No.
1.	Is there a separate provision for purchase of e-resources, subscription of databases in a library budget?		
2.	Do you think that there should be a separate provision for development of the digital library in the library budget?		

18. Do the present manpower fulfill the demand of digital library?
    - Yes
    - No

19. If No. what should be the additional skills required to fulfill the demand?

    (You may tick mark (√) more the one)

    - Software Skill
    - Computer Hardware Skill
    - Web Designing Skill
    - Network Administrating Skill
    - Digitization process skill
    - Computer handling Skills

20. Does the library staff need special training working on digital library?
    - Yes
    - No.

21. If yes, what is the frequency of the special training program?

    (Please √ only one option)

    - Monthly
    - Quarterly
    - Half Yearly
    - Yearly

22. Name the training programs for users on the digital library?

    (You may tick mark (√) more the one)

    - Workshop or Seminar
    - Conference
    - Online or Computer based tutorials
    - Video Presentation
    - Individual Instructions
    - If any Please Specify

23. Are you aware that, Rayat Shikshan Sanstha has created the Central Digital Library known as the Rayat Knowledge Bank?
    - Yes
    - No

24. Whether there is a need for a separate digital library committee at the Institutional level for the development of the Rayat Knowledge Bank?
    - Yes
    - No.

25. If yes, is the librarian's representation necessary for proper functioning of the digital library in the digital library committee?
    - Yes
    - No.
26. Do you think that, professional staff is essential for the digital library?
    - Yes
    - No.
27. Are there any specific training organized by the institution for the extension, decentralization of the digital library for library professional?
    - Yes
    - No.
28. Would you like to suggest more resources to the Rayat knowledge Bank?

    (You may tick mark (√) more the one)
    - Manuscripts on Rayat Shikshan Sanstha
    - Rare Books
    - Rayat Talent Search Examination books and Question papers
    - Rayat Shikshan Sanstha's important circulars
    - Educational Material Such as PPT, Slides, Audio and video recordings
    - Any other (Please Specify)
29. Presently the access control to Rayat knowledge bank is open access worldwide, are you satisfied with the same?
    - Yes
    - No.
30. If yes, what should be the access to control the use of Rayat knowledge bank?

    (Please √ only one option)
    - Password based Access to registered users
    - Authenticated / Restricted Access
    - Selective Access depending upon nature of Material
31. What would be the mode of information organization in the Rayat knowledge bank?

    (Please √ only one option)
    - Communities, Collections, items etc
    - Bibliographic formats such as Book, Journals etc
    - Other if any please Specify

32. As a college librarian, do you carry any preservation activities for the Rayat knowledge bank?
    - Yes
    - No.
33. Presently, how is the digital resources processing to be adopted in your library?

    (Please √ only one option)
    - In House digitized
    - Outsourcing
    - Both
34. What should be the media used for storing the digital resources?

    (You may tick mark (√) more the one)
    - CD-ROM
    - DVD-ROM
    - FMD-ROM
    - Hard Disk
    - Any other (Pl Specify
35. How will you handle the copyright issue for preservation of the digital resources?

    (You may tick mark (√) more the one)
    - Acquire the written permission from copyright holder
    - Use the Open source only
    - Use the old material which is beyond the copyright act
    - Referencing is given while preparation of Education and learning PPTs , & PDF etc
    - Any other please specify
36. Presently the Rayat knowledge Bank uses website based technology for digital library. Are you satisfied with the same?
    - Yes
    - No.

37. If no, then name the software which will be useful to the Rayat knowledge bank?

    (Please √ only one option)

    - Open Source (E.g.Dspace, EPrint, Fedora, Green stone)
    - Commercial (E.g. ContentDM, DLXS, VITAL)
    - House made / Own Software

38. What would be the best open source software to be used for the Rayat knowledge Bank?

    (Please √ only one option)

    - DSpace
    - Eprint
    - Fedora
    - GSDL
    - Any other please Specify

39. Name the OCR software to be used in the Rayat knowledge Bank?

    (You may tick mark (√) more the one)

    - Adobe Capture
    - Abby Fine Reader
    - Omnipage Pro
    - WordScan
    - Any other, please Specify

40. Which is the supporting application software to be used in the Rayat knowledge Bank?

    (You may tick mark (√) more the one)

    - Acrobat PDF
    - Adobe Photo Shop
    - Any other (Pl Specify)

41. Mention the file formats for storage of information to be used in the Rayat knowledge Bank?

SR. No.	File Formats For Storage Of Information To Be Used In Rayat Knowledge Bank	Format	Tick Mark (√)
1	Text Files	PDF	
		XML	
		SGML	
		HTML	
		ASCII	
		UTF-8	
2.	Still Image	PDF	
		JPEG	
		IMG	
		GIF	
		TIFF	
		BMP	
		PNG	
3.	Moving Images	MPEG	
		MXF	
		AVI	
		MP4	
		DAT	
		MOV	
		WMV	
4.	Audio File	WAVE	
		AU	
		AIFF	
		MXF	
		MP3	
		MIDI	
5.	Database	XML	
		CSV	
6.	Web Archive	WARC	

7.	Tabular Data	CSV	
8.	Containers	ZIP	
		GZIP	
		TAR	
9.	Geospatial	SHP	
		DBF	
		GEOTIFF	
		NetCDF	
10.	Statistics	ASCII	
		DTA	
		PGR	
		SAS	
		SAV	

42. Name the Meta data Standards to be used in Rayat knowledge Bank?

(You may tick mark (√) more the one)

- MARC- Machine Readable Catalogue
- Dublin Core (DC)
- METS- Metadata Encoding and Transmission Standard
- MODS- Metadata Object Description Schema
- VRA Code- Visual Resources Association
- EAD- Encoded Archival Description
- Locally Developed Schema
- ISAD (G)
- Z39.50
- Any other please specify

43. Do you think that, user interface should be given to Rayat knowledge Bank?

- Yes
- No.

44. How should the Digital Library webpage be linked?

(You may tick mark (√) more the one)

- Independent Web Page
- Linked with the college website
- Link to Rayat Shikshan Sanstha's website

45. How will you market the Rayat Knowledge Bank amongst the users?
    - Collaboration with other Digital library
    - Focus on the core values of Rayat Shikshan Sanstha.
    - Provide user centric service
    - Open platform to users
    - Look for added value
    - Use more information technological application
46. What are the major challenges involved in the Rayat knowledge Bank development as well as for creation of digital library?

    (You may tick mark (√) more the one)
    - Lack of Funding
    - Lack of Staff, Skills and Relevant expertise
    - Lack of technical knowledge
    - Lack of Training
    - Inadequate Infrastructure
    - Lack of management support
    - Security Problems
    - Identification of valuable and reliable resources
    - Copyright / Digital Right Management
    - Attitude of publishers
    - Lack of standards
    - Lack of content
    - Lack of policies and strategies
    - Lack of marketing skill for DL
    - Rapid Changing digital world
    - Interoperability among different media input and formats
47. What are your suggestions for developing, strengthening, expansion and extension of the Rayat knowledge Bank / creation of the Model Digital Library for the Rayat Shikshan Sanstha?

Date: / /201 Signature
Place: with seal / stamp

Appendix No. II

QUESTIONNAIRE FOR LIBRARY USERS

1. Particulars of user :

Name of the User	Position held	College Address
	Faculty / Research Scholar / PG Student / UG Student	

2. Sex : **Male / Female**
3. How frequently do you visit the college library?

   (Please √ only one option)

   - Daily
   - Twice a weak
   - Weekly
   - Once in month
   - Rarely
   - Never
4. What is the purpose of visiting the library?

   (You may √ more than one option)

   - To issue / return library books
   - To consult periodicals / Journals
   - To take photocopy / printout of material
   - To find and collect material for assignments
   - To find and collect material for research
5. Which type of information resources do you prefer for your study / research?

   (Please √ only one option)

   - Print Resources
   - Digital Resources
   - Both type of Resources

6. Are you aware of the Digital Information Resources available in the library?

   (You may √ more than one option)

   - E-Books
   - E-Journals
   - Proceedings
   - Theses and dissertation
   - Lectures PPTS
   - Audio Recordings
   - Video Recordings
   - Study Materials
   - If any more (Pl Specify)

7. What is the purpose of using digital information resources?

   (You may √ more than one option)

   - To get current information
   - To prepare assignments
   - As study material for preparing examination
   - To get literature search for research
   - To write research articles

8. Are you satisfied with the digital information resources?

   (Please √ only one option)

   - Fully Satisfied
   - Partially Satisfied
   - Somewhat Dissatisfied
   - Not satisfied

9. Please tell whether you are aware of the Digital Information services provided by the library?

   (You may √ more than one option)

   - Catalog database (OPAC / WEBOPAC)
   - Current Awareness Service
   - Externally Purchase Databases (e.g. N-LIST)
   - CD-ROM databases
   - Internally Published Newsletters , Reports and Journals
   - E-mail

- Bulletin Board Service
- Audio and Video Communication
- Electronic table of contents
- Electronic Document Delivery Service
- Electronic Thesis and dissertations
- Reference Service
- E-Publishing
- Discussion Groups and Forums
- Central Storage facilities for hosting digital collections and indexes
- Special Collection Service ,
- Web based library Service
- Web based user education

10. What is your purpose of using the Digital Information Services?

    (You may √ more than one option)

    - To find the availability of material
    - To get study/research related material
    - To get material for class assignments
    - To get literature for research
    - To get the print out of required material

11. Are you satisfied with the digital information services?

    (Please √ only one option)

    - Fully Satisfied
    - Partially Satisfied
    - Somewhat Dissatisfied
    - Not satisfied

12. Does the present library staff fulfil the requirement of the digital Library?
    - Yes
    - No
13. Whether the Library organizes any specific training program to educate the users?
    - Yes
    - No

14. If yes, how frequently does the library and information centre organize the orientation programs to maximum use of digital information resources and services?

    (Please √ only one option)

    - Monthly
    - Quarterly
    - Half Yearly
    - Yearly

15. Have you attained any program organized by the library and information centre to maximize the use of the digital libraries more effectively?

    (You may √ more than one option)

    - Workshop or Seminar
    - Conference
    - Online or Computer based tutorials
    - Classes towards higher education
    - Video Presentation
    - Individual Instructions
    - If any Please Specify

16. Are you satisfied with the infrastructural facilities and number of computers available in your library?

    (Please √ only one option)

    - Fully Satisfied
    - Partially Satisfied
    - Somewhat Dissatisfied
    - Not satisfied

17. Are you aware about the Rayat Knowledge Bank?
    - Yes
    - No

18. The Rayat knowledge Bank uses website based technology for digital library, are you satisfied with same?
    - Yes
    - No

19. Are you satisfied with the digital library collection of the Rayat Knowledge Bank?

    (Please √ only one option)

    - Fully Satisfied
    - Partially Satisfied
    - Somewhat Dissatisfied
    - Not satisfied

20. Do you agree with the following statements about the Rayat knowledge Bank?

    (You may √ more than one option)

    - The material is relevant to subject
    - This repository is easy to use
    - Find the information quickly
    - The files are quick to download
    - The material is displayed in a format that is compatible
    - Navigational assistance is available for helpful

21. Are you satisfied with the search facility in the digital library (Rayat Knowledge Bank)? **(Please √ only one option)**

    - Fully Satisfied
    - Partially Satisfied
    - Somewhat Dissatisfied
    - Not satisfied

22. Which type of problems are you facing while accessing the Rayat Knowledge Bank?

    (You may √ more than one option)

    - Time Consuming
    - Slow Speed
    - Not easy to search
    - Not familiar with the systems
    - Not enough terminals to access information
    - Lack of trained staff
    - Any Other (Please specify)……

23. What are your suggestions for the maximum utilization of the digital resources / services and developing the Model digital Library for the Rayat Shikshan Sanstha?

Date: ---------- Signature ----------
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Appendix No. III

List of the Rayat Shikshan Sanstha's Colleges,

Year of Establishment and NAAC Reaccreditations

(Second Cycle) CGPA & Grade with URL of the college

Sr. No.	Name and Address of the College	Year of establishment	CGPA	Grade	URL of College
1.	Chh. Shivaji College, Satara	1947	3.10	A	http://cscsatara.com/
2.	Sadguru Gadage Maharaj, Karad, Dist. Satara	1954	3.11	A	http://www.sgm.edu.in/
3.	Azad College of Education, Satara	1955	3.14	A	http://www.azadcollegesatara.in/
4.	Karmaveer Bhaurao Patil Mahavidyalaya, Pandharpur, Dist. Solapur	1960	3.43	A	http://kbpmpandharpur.in/
5.	R.B. N. B. College, Shrirampur, Dist. Ahmedngar	1960	3.22	A	http://rbnbcollege.com/
6.	Rajarshi Chh. Shahu College, Kolhapur	1961	2.84	B	http://www.rcshahucollege.in/
7.	C.D.Jain College of Commerce, Shrirampur, Dist. Ahmednagar	1962	3.16	A	http://www.cdjcollege.com/
8.	Balwant College, Vita, Dist. Sangli	1963	2.45	B	-----
9.	Yashwantrao Chavan Institute of Science, Satara	1965	3.37	A	http://ycis.in/
10.	Dada Patil Mahavidyalaya, Karjat, Ahemadnagar	1965	2.83	B	http://www.dpcollege.in/
11.	Dahiwadi College, Dahiwadi, Dist. Satara	1965	2.79	B	http://dahiwadicollege.in/
12.	S.S.G.M. College, Kopargaon, Dist. Ahmednagar	1965	2.61	B	http://www.ssgmcollege.org/

13.	Annasaheb Awate Mahavidyalaya, Manchar, Dist. Pune	1966	2.63	B	http://www.aacmanchar.com/
14.	Arts, Science & Commerce College, Ramanandnagar, Dist. Sangli	1968	3.09	A	http://asccramanandnagar.org/
15.	D.P. Bhosale College, Koregaon, Dist. Satara	1968	2.61	B	http://dpbck.in/
16.	Ismailsaheb Mulla Law College, Satara	1968	….	….	http://www.imlc.ac.in/
17.	S.S.B. College of Education, Shrirampur, Dist. Ahmednagar	1970	3.04	A	http://ssbcollege.com/
18.	Mahatam Phule Arts, Commerce & Science College, Panvel	1970	2.86	B	http://mpasccollege.edu.in/
19.	Dhananjayrao Gadgil College of Commerce, Satara	1971	3.05	A	http://www.dgccsatara.edu.in/
20.	Arts & Commerce College, Madha, Dist. Solapur	1971	2.47	B	http://www.accmadha.com/
21.	Karmaveer Bhaurao Patil College, Washi	1979	3.28	A	http://kbpcollegevashi.edu.in/
22.	Karmaveer Bhaurao Patil Management Institute, Satara	1981	----	-----	http://www.kbpimsr.ac.in/
23.	Maharaja Jiwajirao Shinde Mahavidyalaya, Shrigonda, Dist. Ahmednagar	1982	2.93	B	http://mjsshrigonda.com
24.	Mahatma Phule Mahavidyalaya, Pimpri, Pune	1983	3.13	A	http://www.mpcollegepimpri.com/
25.	Shripatrao Kadam Mahavidyalaya, Shirwal, Dist. Satara	1983	2.73	B	http://skmshirwal.in/
26.	Karmaveer Bhaurao Patil Engineering College, Satara	1983			http://www.kbpcoes.edu.in/

27.	Karmaveer Bhaurao Patil College of Polytechnic, Satara.	1983			http://www.kbppoly.edu.in/
28.	Arts, Science & Commerce College, Mokhada, Dist. Palghar	1984	2.21	B	http://www.asccmokhada.com/
29.	S.M. Joshi College, Hadapsar, Pune	1986	3.09	A	http://smjoshicollege.com/
30.	Sharadchandra Pawar Mahavidyalaya, Lonand, Dist. Satara	1986	2.39	B	http://www.spmlonand.com/
31.	Laxmibai Bhaurao Patil Mahila Mahavidyalaya, Solapur	1989	3.03	A	http://www.lbpmsolapur.org/
32.	Radhabai Kale Mahila Mahavidyalaya, Ahemadnagar	1989	2.69	B	https://www.rkmmanr.org/
33.	Sou. Mangalatai Ramchandra Jagtap Mahila Mahavidyalaya, Umbraj,Dist. Satara	1989	2.27	B	http://www.mrjcollegeumbraj.org/
34.	Veer Wajekar Arts, & Commerce College, Phunde, Dist. Raigad	1989	2.26	B	http://veerwajekarascc.in/
35.	Savitribai Phule Mahila Mahavidyalaya, Satara	1989	2.14	B	http://spmmsatara.com
36.	Chandrabai-Shantappa Shendure College, Hupari, Dist. Kolhapur	1991	2.66	B	http://www.csscollegehpr.com/
37.	Shri. Raosaheb Ramrao Patil Mahavidyalaya, Savlaj, Dist. Sangli	1991	2.34	B	http://www.rrpatilcollege.com/
38.	Yashwantrao Chavan Mahavidyalaya, Pachwad, Dist. Satara	1991	2.28	B	http://www.ycmpachwad.ac.in/
39.	Bharatratna Dr. Babasaheb Ambedkar Mahavidyalaya, Aundhgaon, Pune	1991	2.07	B	http://www.bdbacollegeaundh.edu.in/

40.	Prof. N.D.Patil Mahavidyalaya, Malkapur, Kolhapur	1992	2.82	B	http://ndpmmalkapur.com/
41.	Abasaheb Marathe Arts & Commerce, Science College, Rajapur, Dist. Ratanagiri	1994	2.54	B	-----
42.	Arts & Commerce College, Pusegaon. Tal. Khatav, Dist. Satara	1994	2.29	B	-----

Screen shot of the Rayat Knowledge Bank

