STAFFING PATTERN FOR DIGITAL LIBRARIES IN COMPARISON WITH THE TRADITIONAL STAFFING PATTERN

A Thesis Submitted to

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For the Degree of Vidyavachaspati (Ph.D.)

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Submitted by

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CERTIFICATE

This is to certify that the thesis entitled "**Staffing Pattern for Digital Libraries in Comparison with the Traditional Pattern**" which is being submitted herewith for the award of the Degree of Vidyavachaspati (PhD) in Library and Information Science, Faculty of Moral and Social Sciences Tilak Maharashtra Vidyapeeth, Pune is the result of original research work completed by Ajit Sagaji Sonawane 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.

Place: Pune
Date: 29th May 2015

Dr. Prabhash N Rath
(Research Guide)

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Table of Contents

List of Tables and Figures

Abbreviations

ACRL	Association of Collage and Research Libraries
AICTE	All India Council for Technical Education
ALA	American Library Association
ASLIB	Association of Special Libraries and Information Bureau
CALIBER	Convention on Automation of Libraries in Education and Research
CD-ROM	Compact Disk Read Only Memory
CSIR	Council of Scientific and Industrial Research
CSIR-NCL	CSIR- National Chemical Laboratory
DELNET	Developing Library Network
DL	Digital Library
D-Lib Magazine	The Magazine of Digital Library Research
DLIS	Diploma in Library and Information Science
DOI	Digital Object Identifier
DRTC	Documentation Research and Training Centre
BARC	Bhabha Atomic Research Center
EC	Education Commission
e-Books	Electronic Books
e-Documents	Electronic Documents
e-Journals	Electronic Journals
e-Learning	Electronic Learning
e-Resources	Electronic Resources
GS	Google Scholar
HRD	Human Research Development
HRM	Human Resource Management
IASLIC	Indian Association of Special Libraries and Information Centres
IATLIS	Indian Association of Teachers in Library and Information Science
ICSSR	Indian Council of Social Science Research
ICT	Information Communication Technology
IFLA	International Federation of Library Associations
IGNOU	Indira Gandhi National Open University
IJILIS	Indian Journal of Information, Library and Society
ILA	Indian Library Association
INSDOC (NISCAIR)	Indian National Scientific Documentation Centre (National Institute of Science Communication And Information Resources)
IP	Intellectual Property
IPR	Intellectual Property Rights
IR	Institutional Repository
IRS	Information Retrieval Services
ISI	Institute of Scientific Information
IT	Information Technology
JAL	Journal of Academic Librarianship
JOI	Journal of Infometrics
KM	Knowledge Management

LIC	Library and Information Centres
LIS	Library and Information Science
M Phil	Master of Philosophy
MALA	Madras Library Association
MLIS	Master in Library and Information Science
MS	Maharashtra State
NASSDOC	National Social Science Documentation Centre
NCL	National Chemical Laboratory
NCRA	National Center for Radio and Astrophysics
NIC	National Informatics Centre
NISCAIR	National Institute of Science Communication And Information Resources
NML	National Medical Library
OA	Open Access
OC	Online Catlogues
OCLC	Online Computer Library Centre
OPAC	Online Public Access Catalogue
PG	Postgraduate
PhD	Doctor of Philosophy
R&D	Research and Development
RF	Reprographic Facility
SET	State Eligibility Test
SLET	State Level Eligibility Test (N. E. Region)
SLIS	School of Library and Information Science
SSCI	Social Sciences Citation Index
TR	Traditional Library
TIFR	Tata Institute of Fundamental Research
TISS	Tata Institute of Social Sciences
UEC	University Education Commission
UGC	University Grants Commission
UNESCO	United Nations Educational, Scientific and Cultural Organization
URL	Uniform Resource Locator
VL	Virtual Library
WIF	Web Impact Factor

Chapter 1: Introduction

1.1 Introduction:

Libraries are treated as power house of information since its inception from temple libraries to digital libraries. The main function of libraries is to acquire, organize and disseminate the information published to the mass. The different type of libraries may differ in their collection development but its main purpose is to provide knowledge to others for building new knowledge. Among the different functions of the libraries (acquisition, processing, organizing, managing) providing services to users is the main component. To maintain the library and its collection for providing services, the skilled manpower is required and also for any organization without staff it is not possible to fulfill the functions. Apart from these functions following different aspects also considered in libraries.

1. To identify and recognize different methods to procure documents for library i.e. intellectual collection development for information society.
2. To acquire books, periodicals, pamphlets, journals and grey literature and disseminate effectively to enhance its use.
3. To make aware of the publications published in the specific area to users and get recommendations for books if suited for library and its users and improve user based collection.

Due to revolutions in LIS, it is noticed that the libraries have transformed from manuscript to print and now to digital and undergone transformations due to changes in publishing trends from print to digital and it has also made impact on the different elements of the library like collection, policies, management, providing library services, understanding users ISB and also library staff in particular. To manage the traditional libraries effectively there is a need to have sufficient manpower especially for carrying out different tasks at a time and need for having more manpower as all the processes are manual which involve repetitive tasks. Though the information growth was under control but the printed documents need more processing to support different library activities. The librarian has to perform different task along with the fellow professionals like: book selection and proper qualitative acquisition, classification and cataloguing, indexing and abstracting, reference services and referral services, information services, planning for the future, registration and management of periodicals, charging and discharging of books (circulation) stack management and reading required services, etc. These

activities need manpower to control them effectively. The manpower also has to be well qualified and in more number especially where consideration to access is more.

In the present century information is growing at an exponential rate and in a variety of forms; due to ICT applications in the libraries, especially the digital media is growing fast equally along with the print media also. The present age is therefore called as an era of Information and Communication Technology and information explosion / information overload which is a significant factor in rapidly changing relationship between the user and information provider as well as librarians. The noticeable changes are visible in library profession due to massive applications of ICT internet technology, web technologies etc. These technologies and changing scenario in publishing information revolutionized the ways in which information is handled and maintained which bring new challenges to librarians. To manage these constraints, different technologies are being used in libraries right from accessing, gathering, manipulating, processing, preserving, handling and presenting information to information society by libraries.

The growing applications of ICT are the most significant achievements in the present century in libraries and libraries have no option but to use different technologies and manage the changes successfully to support information society. The process of globalization and use of information technology has also changed the role of higher education (HE) system and development of e-learning is initiated due to availability of digital resources supported by networked technologies. Hence academic libraries have created a pressure to support the changing environment with using appropriate technology to support educational systems. But to sustain this change libraries need proper manpower to support and manage the tasks. On the other hand user expectations from the libraries are enhancing and increasing as the users are now learning technologies and demand library services the services over the mobile and I pad's. User requires current awareness and selective information from the different library holdings and get oriented for use of library more effectively and becomes information literate. Users require electronic resources, web searches internet searches, online catalogues, databases both offline and online search systems and get access to electronic data / information. In addition to these libraries now provide online journals, OPAC services, scanning facility, reprographic facility, reference service, referral service to the users. Library is the heart of any organization, library staff has to disseminate information from the available global resources to the users.

Users require e- resources form various publishers in the globalization and in information competitive era the libraries are bound to subscribe the online journals. To provide all these facilities libraries need specialized manpower having all qualities in addition to traditional need. The traditional libraries managing with mono print media has different issues of staff but due to shift from traditional digital media arise different issues of staff. Managing libraries with insufficient and unskilled staff is a great challenge to the library professionals in managing libraries and forced to shift the library functions and different processes using modern tools and technologies. It is also observed that library professionals have adopted new technologies, tools, skills as and when revolution in information industry has witnessed.

Users require current awareness and selective information from the library holdings as well as oriented for use of library and information literacy in it. Users require electronic resources, web, online catalogues, database search systems and access to electronic publications 24/7, library nave to provide online journals, OPAC services, scanning facility, reprographic facility, reference service, and referral service to the users. As library is the heart of any organization, library staff should disseminate information from the available resources to the users. Users require e- resources form various publishers in the globalization and competitive era the libraries are bound to subscribe the online journals.

1.2 Need of Manpower in Libraries:

For managing libraries and to provide library services to users there is a need to have trained manpower. The manpower requirement always depends on the nature of libraries and functions and services carried out in the libraries. For performing the different activities in libraries staff deployed on different positions and have qualifications suiting to it. From librarian position to attendant and helpers different categories of manpower is deployed to carry out the functions systematically in traditional libraries. In any type of libraries minimum following sections were visualized and the staff was deployed for its efficient management.

- Acquisition : Books
- Subscriptions: Journals periodicals
- Acquisitions : Journals
- Processing (Classification, Cataloguing, Indexing and Abstracting)
- Reference and Referral service
- Library and information Services

- Circulation and stack maintenance
- Reading Hall and Book bank

The number of staff in each section is considered on the basis of size of collection, nature and type of library and nature of task to be performed. These different sections in small libraries are amalgamated where as in moderate libraries the sections may be same and in large libraries some more activities are carried out and activities are increased. The manpower requirement is also decided on the basis of intake of volume and information services provided to users from libraries.

The efforts were made by Dr. S R Ranganathan and many others to fix the need of manpower based on the different components and fixed the staff needed for the different types of libraries. This pattern was manageable and acceptable in the print era but in digital era the situation is different and now there is a need to develop another staff pattern to manage. The use of ICT altered the environment and the multimedia is replacing the traditional mono media. The visible changes due to technology adaptations are:

- Global digital information availability in e – form and in different formats.
- Affordable technology to all.
- Affordable cost of e-resources, literature and databases even much comfortable in using consortium.
- Different models for acquiring e – resources at commercial rate.
- Reduces the budget constraints.
- Users increasing as well as multidisciplinary needs are solved save e-text due to availability of information resources over the net.
- Affordable technology in any libraries.
- Shifting trends in publishing industries from print to multimedia digital for ease in publicity at cheap rate.
- New models for the procurement of e-resources are cost effective than print and easy to access.
- Users are demanding new methods of gathering literature which serves purpose.
- Concept of resource sharing is increasing as the technology and media are favoring to it.

- E-Learning and teaching systems are introduced even at higher education system due to technology.
- Increased R & D and research activities and organizations including academic institutes need fast retrieval of information.
- Availability of global information through online shops.

This is visualized data to applications of technology, digital technology including web and internet technology and networked resources etc. Komza (2002) rightly indicated that the impact on information is due to various situations, such as knowledge management (KM) and information explosion / revolution, as well as ICT revolution. The only issue is of manpower deployment which sustain in the change environment. Different efforts are made to fix the staff pattern required to manage traditional libraries and now digital libraries since Dr. Ranganathan's efforts.

1.3 Efforts towards Staff Patterns:

The first Education Commission under the chairmanship of Dr. S Radhakrishnan recorded the functions of university libraries and after careful analysis pointed out that there is a need of adequate and well qualified staff for managing academic as well as all types of libraries. Each type of academic libraries needs different categories of staff to run the library properly and support user needs.

The commission also suggested three tire staff system for university libraries for support in higher education

- Librarian
- Deputy Librarian and
- Assistants

For professional activities for Technical services

Staff is required to manage the library system and staff management is known as personnel management or HRM etc. In general the staff deployed in academic libraries imparting to higher education has different categories and their job descriptions varies according to their status.

- Professional

- Semi Professional / Technical
- Non – Professional
- Administrative

The different committees and commissions made efforts to design job descriptions to these different categories but due to changes in system the job descriptions also goes on changing e.g. development of e-libraries, digital libraries and virtual libraries etc. Hence there is always a need felt to analyze the staff requirement and Job Description required for every positions. Since then many committees especially Dr. S R Ranganathan discussed at length about staff and need of job allocation. The efforts for staff pattern and details of staff requirement, staff formula are discussed elaborately in Chapter 4. Thus it is observed from different efforts that staffing need following considerations.

- Appoint qualified staff
- Assign job description
- Provide job analysis / evaluation
- Suggest norms for staff motivation
- Analyze staff requirement

It is observed that efforts are made to device staff formulas and staff pattern TL system but in the digital era efforts are visualized very less. No doubt the staff is required equivalent or even less as compared to traditional library system but their role or job description and nature of work might change considerably due to revolutions.

There is need to assess the present future trends in the profession and put forward the staff pattern which could develop proper library system. This study highlights the pattern of shift in the digital era with its job description to perform to perform as well as number of staff required with different categories.

1.4 Reason to Select the Research Topic:

The researcher is a well experienced librarian and worked for the engineering library for more than two decades and managed traditional as well as taken efforts to convert the traditional libraries to digital libraries. The researcher has changed his mindset due to user technologies and faced the issues of manpower witnessed in the profession and thought all the time the new

dimensions in profession and the need of staff and their skills to survive in the ICT era. The digital era, application of OSS, KM, digital publications etc. provided maximum benefits to libraries and also to users. The researcher has adapted the trends and techniques in profession to provide better services to users and witnessed the weakness of staff to manage the trends.

Libraries in the 21st century are managing information and communication technologies in all functions right from acquisition to dissemination of information very well but still do better after using trends. The rare and valuable collection of traditional libraries is also transformed in to digital due to benefits and utilities both along with subscribing to born digital. To manage the libraries in the new environment librarians are to be re-engineered using different technologies and maintain tools for the benefit of users. Using ICT initially the automation is completed by the librarians and then switching towards DL and VL using internet and web technologies for providing user based services. Thus the efforts are towards development of digital libraries and networking of libraries for managing effective resource sharing at different level to achieve economy in collection development and providing user based services.

The impact of ICT and all the technologies made an impact over the collection, organization and dissemination of information. In comparison with the traditional libraries the need of manpower is altered as many operations are carried out by the computers and using different technologies. In traditional libraries since the task were manually operated obviously more staff is required to carry out functions but using ICT the manpower in the libraries is reduced to bare minimum**.** Dr. Ranganathan devised staff formula / pattern for the staff in libraries based on intake of documents and the formula was suitable to libraries at that point. But in case of digital libraries and in digital era there is no standard staff pattern yet presented like Dr. S R Ranganathan which can be marked as a unique one. Many scholars are trying to study and present staff pattern but is not suiting as staff formula enunciated by Ranganathan.

Nagi Reddy and Uma (2009), Francis (1997) have presented communications related to re-engineering of manpower in digital era and also presented the staff formulas /pattern suiting to universities. The researcher, Sonawane and Rath (2014) has also tried to develop the staff pattern formula based on the different presentations made by scholars for the digital environment however the researcher has felt that there is a still need to discuss the staff pattern and essential requirement for the digital libraries in depth and hence decided to undertake this topic as a

research study and entitled as **"Staffing Pattern for Digital Libraries in comparison with the traditional patterns".** The researcher in this study planned to conduct a study of the staff patterns already available for traditional libraries and based on it analyses the task in digital age and present an analytical study for staff pattern, skill sets requirement, qualifications etc. to manage libraries in digital era. The researcher can present pattern / formula for the libraries in general for digital environment. The researcher is also aware of the fact that there is no pure digital library developed but the efforts are made by many special libraries like to develop digital libraries like CSIR labs (CSIR-NCL), IUCAA, NIC, TISS, BARC, TIFR, IIT's, IIM's, IISER's, etc and many universities. The efforts are now in progress in university libraries like SPPU Pune, BAMU Aurangabad, and other places and slowly college libraries are also planning towards this mission. The main reason is INFLIBNET is supporting to modern libraries by supporting digital resources .The researcher decided to undertake this study which might be useful to the forthcoming library professionals planning to develop digital libraries in their institutes and discuss challenges and staff pattern required. At present the libraries are procuring only e-books, e-journals, databases etc. only. The requirement of manpower for the development of digital libraries and future libraries is not yet consider which is different than the traditional library system. Hence researcher felt that there is a need to initiate such studies which are beneficial for the future professionals and this is the main reason behind selecting this complicated topic in which more focus is required not any to fix number but job description qualities, qualification a skill set required by library staff.

The users are also technology savvy and libraries are also applying different technologies for providing different and advanced services not only from the single library but group of libraries using the technologies like computer applications, programming languages, networking technology, communication technology, telecommunication technology, barcode technology, RFID technology, Mobile computing technology, reprography technology, internet technology, cloud Computing, wireless technology, Wi-Fi etc. and information made available over smart phones and I phones, IPods, Mobiles etc. to users as per their demand.

The staffing patterns laid down by Dr S R Ranganathan, Kothari Commission, Mehotra Committee, Khandala Committee, and the governing bodies like AICTE, UGC, announced the pattern for academic and traditional library staff but in this research study the researcher has

made an attempt in proposing staff model or formula or pattern where the digital libraries and ICT applications might be considered.

1.5 Need of Present Research Study:

It is observed that every library is migrating to advanced libraries modernizing ICT. However it is noticed that librarians are always challenging the weakness of staff either insufficient or unskilled or untrained etc. It is quite obvious that for the adaptations of new technologies in libraries a different natured manpower is required as well as due to automation the manpower required in libraries need is also less as compared to traditional and have different qualities. The researcher in this study after identifying the facts suggests a pattern for staff required in the digital libraries. Since no standard guide lines for the staff requirement for the digital libraries are made available except Dr Ranganathan. It is felt essential to take this topic and deduce a model. Few scholars have thrown light on this issue but a detailed investigation brings out qualitative concepts.

1.6 Aim and Purpose of the Study:

The main aim behind the research study is to identify different staff formula or patterns, or models presented by different scholars for traditional libraries as well as digital libraries and after analyzing the contents researcher is trying to present a model for the digital libraries in general which is useful for academic libraries. The purpose is to develop a formula and pattern for the librarians to use it while converting traditional to digital libraries and provide value added services.

1.7 Statement of the Problem:

The statement of problem for this study is fixed as **"Staffing Pattern for Digital Libraries in comparison with the traditional patterns"** in which researcher is discussing staff pattern for digital environment libraries based on traditional libraries efforts.

1.8: Objectives:

For the present study the researcher has considered following objectives:

1. To study different staff formulae, standards, guide lines, procedures etc. developed by different scholars committees, commissions etc. for the traditional libraries as well as digital environment.

2. To study the transformation in libraries. (Traditional library to modern in digital age) .
3. To study the efforts made by scholars for developing staff patterns for the digital environment.
4. To understand in depth the features and the requirements of the digital libraries in the changing environment.
5. To study and analyses the job identification and description to be performed by digital librarians to manage the digital library
6. To study and compare the traditional manpower with digital library manpower.
7. To study the strategies for the manpower required in the digital library environment.
8. To suggest best practices and plan of action to keep library professionals updated in the era of changing technologies. (capacity and capability building of the staff)
9. To develop a model pattern for staff useful for digital library environment.

1.9 Hypothesis:

For the present study the researcher has considered following hypotheses

1) In future librarians have to migrate towards digital environment and use for modern digital / virtual libraries
2) The staff pattern is different from the traditional libraries and has to identify a pattern useful to run the libraries in future more effectively.

1.10 Research Methodology:

Research method is generally based on the topic and area selected for research. The researcher has considered following methods to undertake the present research study.

Descriptive research is considered in which the survey of literature, documentary (secondary) analysis method is considered. The researcher has collected different published literature in different sources and analyzed them to drag out the concepts related to staff patterns in addition to this the researcher has discussed with the library professionals to seek their opinion in respect of staff required in digital libraries based on their digital library development experience.

In addition to this researcher visited following institutes where digital libraries are established or in process.

1. CSIR – NCL
2. TIFR

3. NCRA
4. NIC@BAMU
5. TISS
6. IGIDR
7. BARC

The visit to these institutes gives insight to develop plan and staff pattern in digital environment.

Thus the research method is mainly based on the secondary analysis and interviews of professionals and computer experts as well as personal visits to organizations where Digital library projects has been initiated or in process.

In addition to this the researcher has conducted the survey of libraries to analyze the present status of the libraries in terms of modernization using ICT.

In short for this study the researcher decide to use following research methods.

1. Historical research method in which analysis of past literature to understand the development in the staff pattern which is also called as secondary analysis/ documentary analysis in which all the published literature is collected analyzed and used in study to fix the opinions.
2. Descriptive research: In this method researcher analyses status of present libraries based on survey of academic libraries.
3. Case study method: In this method researcher visits CSIR- NCL Pune, TIFR, Pune University, NCRA, TIS Mumbai, IGDR Mumbai and review the developments and manpower pattern in digital era. Researcher through unstructured interview and personnel visit collect the data. The institutes selected where the libraries fully computerized and digitized practices.

University Libraries:

Higher education sector has witnessed a tremendous change and increase in the number of universities/university level institutions and colleges since independence. The number of universities has been increased 34 times as on today. The number of universities in India were 20 in 1950 and now reached to 677 in 2014. The education sector consist of different type of universities and in which about 45 central universities, 40 are under the purview of Ministry of Human Resource Development, 318 state universities, 185 state private universities, 129 deemed

to be universities, 51 institutions of national importance established under Acts of Parliament under MHRD viz. Indian Institute of Technology's - 16, National Institutes of India – 30 and Indian Institute of Science Education and Research 5 *(*IISERs- 5).

Every university has its own well set libraries as libraries are treated as heart of any institute which provides services to user and backing up activities in education sector. The higher education system in India recognizes the role of libraries as key responsibility in training teachers, in establishing links with teacher training institutions at other levels and in training teacher trainers and learners. Efforts are being made to bring in teachers from the commercial and social sectors to facilitate interchange and build links with the education system. Higher education has evolved in divergent and distinct streams with each stream monitored by an apex body. The system of higher education in India has undergone a remarkable transition from an elite system to mass system using e-learning system. This is possible due to the use and applications of ICT and e-publications. The numbers of higher learning institutions have played an active role in the social transformation and has increased rapidly after independence and the structure of governance and role of universities have also significantly changed in the passage of time. The e-publications and ICT has transformed the university activities from traditional to modern but this is slow in developing countries.

In Maharashtra state alone there are 42 universities functional at different levels and listed below.

- **State Universities**

1. Dr. Babasaheb Ambedkar Marathwada University, Aurangabad-431 004.
2. Dr. Babasaheb Ambedkar Technological University, Lonere-402 103
3. Kavi Kulguru Kalidas Sanskrit Vishwavidyalaya, Nagpur-441 106
4. Maharashtra University of Health Sciences, Nashik-422 013
5. Mumbai University, Mumbai-400 032.
6. Maharashtra University of Health Science, Nashik-422003
7. North Maharashtra University, Jalgaon- 425 001.

8. Pune University, Pune-411 007.
9. Sant Gadge Baba Amravati University, Amravati-444 602.
10. Shivaji University, Kolhapur-416 004.
11. Smt. Nathibai Damodar Thackersey Women's University, Mumbai-400 020.
12. Solapur University, Solapur, Solapur Pune Road, Kegaon, Solapur-413 255.
13. Swami Ramanand Teerth Marathwada University, Nanded-431 606.
14. The Rashtrasant Tukadoji Maharaj Nagpur University, Nagpur-440 001 (M.S).
15. Yashwant Rao Chavan Maharashtra Open University, Nashik-422 222
16. Godwana University,Gadchiroli-

- **Agricultural Universities (State Universities)**

17. Konkan Krishi Vidyapeeth, Dapoli, District Ratnagiri-415 712
18. Maharashtra Animal & Fishery Sciences University, Seminary Hills, Nagpur-440 006.
19. Dr. Punjabrao Deshmukh Krishi Vidyapeeth, Akola-444 104.
20. Mahatma Phule Krishi Vidyapeeth, Rahuri-413 722.
21. Marathwada Agricultural University, Parbhani-431 402.

- **Central University**

22. Mahatma Gandhi Antarrashtriya Hindi Vishwavidyalaya, Post Box No. 16, Panchtila, Umri Village, Arvi Road, Wardha, Mumbai - 442 001

- **Deemed Universities**

22. Bharati Vidyapeeth Bharati Vidyapeeth Bhawan, Lal Bahadur Shastri Marg, Pune-411 030 Maharashtra
23. Central Institute of Fisheries Education Fisheries University Road, 7 Bungalows, Andheri West, Mumbai-400 061 Maharashtra
24. D.Y. Patil Educational Society Line Bazar, Kasaba, Bavada, Kolhapur-416 006 (Maharashtra)

25. Datta Meghe Institute of Medical Sciences Atrey Layout, Pratap Nagar, Nagpur-440 022 (Maharashtra)
26. Deccan College Postgraduate & Research Institute Pune-411 006 Maharashtra
27. Dr. D.Y. Patil Vidyapeeth Sant Tukaram Nagar, Pimpri, Pune-411 018 Maharashtra
28. Gokhale Institute of Politics & Economics BMC College Road, Deccan Gymkhana, Pune-411 004 Maharashtra
29. Homi Bhabha National Institute Regd. Office: Knowledge Management Group, Bhabha Atomic Research Centre, Central Complex, Mumbai-400 085 Maharashtra
30. Indira Gandhi Institute of Development Research General Vaidya Marg, Santosh Nagar, Goregaon East, Mumbai-400 065 Maharashtra
31. Institute of Armament Technology Girinagar, Pune-411 025 Maharashtra
32. International Institute for Population Sciences Govandi Station Road, Deonar, Mumbai-400 088 Maharashtra
33. Krishna Institute of Medical Sciences Malka Pur, Karad, Distt. Satara-415
34. MGM Institute of Health Sciences MGM Campus, Sector-18, Kamothe, Navi Mumbai-410 209
35. Narsee Monjee Institute of Management Studies VL Mehta Road, Vile Parle West, Mumbai-400 056 Maharashtra
36. Padmashree Dr. D.Y. Patil Vidyapeeth Vidya Nagar, Sector 7, Nerul, Navi Mumbai-400 706 Maharashtra
37. Pravara Institute of Medical Sciences P.O.-Loni BK-413 736, District Ahmednagar Maharashtra
38. SYMBIOSIS - International University, Senapati Bapat Road, Pune-411 004 Maharashtra
39. Tata Institute of Fundamental Research Homi Bhabha Road, Mumbai-400 005 Maharashtra
40. Tata Institute of Social Sciences VN Purav Marg, Deonar, Mumbai-400 088 Maharashtra

41. Tilak Maharashtra Vidyapeeth, Vidyapeeth Bhawan, Gultekedi, Pune-411 037 Maharashtra
42. Institute of Chemical Technology Matunga, Mumbai Maharashtra

There are plans to add some more educational institutes in future too. Bur they have to face different environment viz. Digital. The staff problems are common in all era but in digital environment staff qualifications, staff skills and job descriptions might be different than traditional. Nature of job and job description might be an essential concept in future and differs from traditional. Since there is no fixed quantum of information coming in to the libraries and reduction in nature of activities everywhere staff is an issue and hinders the development. The earlier patterns and formulas established are no doubt excellent but in changing scenario it is difficult to apply the same. Many have tried to formulate the patterns for staff in digital environment as more information is now available in e-form and users are also technology savvy and after getting e-resources which are convenient for use. Thus changing environment in libraries is a challenge for the librarians of present and future centuries. The researcher tried to formulate new pattern for the digital library staff based on job description and skill sets required to sustain in the profession.

Sample for Survey

In fact the traditional staff formula enunciated were based on print media where quantum of activities can be quantified and develop the formula as mono-media was used everywhere and standard systems were used, but in case of digital resources there is change in the format which is shifted to digital from print which is easy for sharing. Due to this change there is difficulty in identifying number of intake in libraries and no staff formula / Pattern is reported which can be applied as standard so far for digital libraries. At present there are no pure academic digital libraries in existence and they are either multimedia or hybrid in nature as on today. Many scholars have discussed staff requirement for digital library but the efforts reflected towards only staff patterns but no staff formula equal to Dr Ranganatahn is presented.

The researcher finds difficulties in identifying pure academic libraries and selected few libraries where maximum resources are acquired in digital form and circulated all over the campus for use especially IIT, CSIR-NCL etc. The survey is a supplementary tool used in this research as the documentary evidences are more powerful which covers the digital library structure developed at international level. The secondary analysis method is mainly used to focus on the study in which researcher identified many clues and used these for fixing the points in developing patterns in digital era. The purpose of survey is only to assess the present situation not in any particular area of academic section but consider overall progress like academic and special. The purpose of survey was to just assess the status of libraries from different sectors of education to know the progress towards modernization i.e. using e-resources and staff development activities. To understand the status of libraries in present ICT and digital era it is essential to formulate some norms and the researcher has acted on this concept using random sampling of few academic and research library activities towards digital environment and staff used or appointed for this.

Thus the survey is based on the concept the libraries those have acquired digital resources and circulated over the campus using intranet as well as few libraries to assess the progress. Hence randomly selected few academic institutes from Pune and Mumbai and few other places known to researcher. The population and sample is random and using e-resources maximum. Thus following institutes are covered in the survey. The main focus is on secondary analysis and survey is supplementing and hence not discussed in deep.

The academic institutes randomly selected for the survey are listed in the following table.

Table No. 1.1 Academic Institute surveyed:

Sr No	College / Institution
1.	Modern Education Society's College of Engineering 1999
2.	JSPM's Rajarshi Shahu College of Engineering
3.	Indian Institute of Management Kozhikode (IIMK)
4.	Smt. MMK College of Commerce & Economics, 1961
5.	Moze College of Engineering

6.	Mrs. H C Magarathna JRD Tata Memorial Library Indian Institute of Science Bangalore -12
7.	Bhavan's Hazarimal Somani College of Arts, Science and Commerce, Estd:1965 Mumbai.
8.	Dr. B M N College of Home Science Estd 1984. Mumbai
9.	Gharda Institute of Technology-2007 Ratnagiri.
10.	MET's Institute of Engineering, Bhujbal Knowledge City, Adgaon, Nashik (MS)
11.	Pimpri Chinchwad College of Engineering- 1999
12.	PCCOE College of Engineering
13.	D. Y. Patil College of Engineering Pune
14.	Swami Vivekananda College of Arts and Commerce, 1998
15.	K J Somaiya College of Engineering Pune
16.	University of Kashmir 1969
17.	P.E.S. Modern College of Engineering Pune-05 Establishment Year : 1999
18.	SAS Research & Development India Pvt Ltd 2001 Pune
19.	NHPC Ltd. Faridabad Estd. in 1975
20.	N.S.S.College of Education. 1990 Mumbai
21.	Gautam Buddha University, Greater Noida 2008
22.	Dr. Babasaheb Ambedkar Marathwada University Aurangabad.
23.	PEC University of Technology/1956 Chandigarh
24.	Dr. P.S. RAJPUT, Mohanlal Sukhadia University, Udaipur, Raj. 1962
25.	K.K.Wagh Inst.of Engg.Education and Research, Nashik
26.	Dr. Ram Manohar Lohiya National Law University/2006
27.	Hon.Shri.Annasaheb Dange Arts, Com. & Science College, Kolaphur
28.	Sri Guru Gobind Singh College, Sector 26, Chandigarh Estt. in 1967
29.	Doodhsakhar Mahavidyalaya, Bidri Tal. Kagal, Dist – Kolhapur
30.	Swami Vivekanand Night College of Arts and Commerce Thane

31.	DESIDOC, DRDO, 1967 Delhi
32.	Bharati Vidyapeeth University Social Sciences center Pune-38
33.	Sinhgad College of Engineering , 1996
34.	Vishwakarma Institute Of Information Technology 2002 – 2003
35.	Vishwakarma Global Business School Pune.
36.	National Institute Of Bank Management Establishment Year 1969
37.	JSPM Narhe Techanical Campus 2011
38.	Dnyanganga College Of Engineering and Research Establish 2007
39.	Guru Gobind Singh College of Engineering & Research Centre, Nashik
40.	STES Sinhgad Institute Of Technology & Science E. Year 2008
41.	Deccan College Post- Graduate & Research Institute, (Deemed University) - Estd in
42.	Gokhale Institute Of Politics & Economics, Pune
43.	British Library E. 1960
44.	Indira Gandhi Govt. Medical College , Nagpur Establishment year 1981
45.	CSIR National Chemical Laboratory E. 1950
46.	Sandip Foundations Sandip Institute Of Technology and Research Centre Nasik E. in 2008
47.	Dhole Patil College of Engineering 2008-09
48.	Shatabdi Institute Of Engineering Research Agaskhind Nashik
49.	The University of Burdwan (1960)
50.	Center for Development of Advanced Computing
51.	AISSMS Institute Of Information Technology Est. 1998
52.	Maharashtra Institute of Technology Kothrud Pune
53.	Indira Gandhi Institute Of Development Research (ISTDR) 1987
54.	Indian Institute of Science Education and Research Pune
55.	AISSMS College Of Engineering
56	KK Wagh Institute of Engineering of Engineering Education and Research Nasik
57.	Indira College Of Engineering & Management Pune Es.2007

58.	MIT Academy & Engineering
59.	DR. V.N Bedekar Institute of management Studies
60.	Army Institute of Technology Pune (1994)
61.	Modern Education Society's Ness Wadia College of Commerce, Pune
62.	College of Engineering pune ESTB 1857
63.	Savitribai Phule pune University Jayakar Library Establishment 1950
64.	M.D. Shah Mahila College) Mumbai
65.	Bharati Vidyapeeth, Social Sciences Center, Pune.
66.	Mes.s IMCC
67.	Ruby Hall pune
68.	*Moze College* of Engineering, Pune
69.	Thane, Maharashtra, India - Swami Vivekanand Night College, Dombivli
70.	K.J Somaiya College of Engineering Mumbai
71.	Vidya Prasarak Mandal's K G Joshi College of Arts and N G Bedekar College of Commerce Chendani Thane
72.	Gokhale Education Society's College of Education and Research Parel, Mumbai, Maharashtra, India.
73.	Prahladrai dalmia lions college.
74.	Dr BMN College of Home Science. Mumbai
75.	Government college of nursing Alappuzha Kottayam
76.	University of Mumbai, Department of *Library* Science, India.
77.	Mumbai, Maharashtra, Library & Information Centre at Khandwala College
78.	Ruia College *Library Nagpur*
79.	Bharat College of Commerce and Science, Badlapur, Thane
80.	VPM TMC Llaw college Thane
81.	Kolhapur - *J*ayawant College Ichalkaranji.
82.	Yashwantrao Chavan Maharashtra Open University Nashik
83.	Raigarh, Maharashtra, India M.g.m.college of engineering.
84.	MET Bhujbal Knowledge city Nasik.
85.	MKSSS' Cummins College of Engineering for Women

86.	VIIT Pune
87.	Bhivarabai Sawant College of Engineering & Research Pune
88.	Indian Institute of Technology Delhi.
89.	IIT Delhi
90.	College of Engineering Osmanabad.
91.	S.B Patil College of Engineering Inadapur
92.	Anjuman College of Technology, Andhra Pradesh
93.	Shri Shivaji Education Society (SSES), Amravati,
94.	Birla Institute of Management Technology Noyida
95.	National Council of Educational Research & Training, (NCERT), New Delhi.
96.	IILM Academy Of Higher Learning, Jaipur
97.	RBS, Management Technical Campus, Khandhari Farma,Agra.
98.	Department of library and Information Science Manipur
99.	Indira Gandhi Memorial *Library Calcutta*
100.	CCSHAU, Hisar Haryana
101.	Manipur University
102.	Manipur University
103.	Andhra University
104.	Jiwaji. University, Gwalior (M.P.)
105.	National Institute of Gahoi
106.	Jiwaji University, Gwalior
107.	IIT Bombay
108.	Indira Gandhi Memorial *Library Hyderabad*
109.	Vikram University, Ujjain,
110.	PVG Pune
111.	Modern College of Arts Commerce and Science
112.	Jahangir Nursing Library
113.	Nawrosgee Wadia college
114.	Indian Statistical Institute Bangalore
115.	Ministry of Defense Government of India New Delhi India

116.	Institute of Information Technology and Management Delhi
117.	Director DESIDOC Delhi.
118.	Maulana Azad National Urdu University, Gachi Bowli Tamilnadu
119.	Jiwaji University, Gwalior.
120.	Deshbandhu College University of Delhi
121.	Mohanlal Sukhadia University(MLSU), Udaipur
122.	*Infosys* Technologies
123.	Software Engineering and Technology Labs, Infosys Technologies Ltd.
124.	Rajasthan University
125.	PEC University of Technology, Chandigarh
126.	Banasthali Vidyapith (a deemed university institution), Rajasthan
127.	Central Institute of Technology Kokrajhar.
128.	TIFR Pune

1.11 Scope and Limitations

The scope of the study is limited to defining staff pattern for the digital libraries after deep analysis of the survey of libraries and their present status for academic libraries. Analyze literature and the opinions of the experts in respect of staff pattern. The institutes selected for the survey are based on requirement for digital libraries, initiation of digital libraries. This helps in identifying the need of staff in the digital environment.

The present study is focused on the following points:

- To study the traditional practices used for identifying the staff required for efficient running the libraries.
- To study the transformations in libraries since print to digital and shift in nature of activities of libraries due to IVT and e-publishing trends in LIS
- To study the efforts made by scholars in identifying requirements of staff in digital libraries
- To study and compare the traditional and digital staff patterns suggested and establish a pattern suitable for academic libraries

- Since the main focus is on staff pattern in digital environment and there are no pure digital libraries in developed countries so far the researcher has taken shelter of secondary analysis method in which different literature published by scholars in the area of staffing for traditional and digital are focused. The literature indicated that many issues discussed about need of staff in digital libraries but they are just assumptive. Hence the researcher has considered to evaluate the literature published in depth and suggested a pattern **might useful** for academic libraries considering the different aspects of DL's.

- The supplementary weightage is given to survey conducted randomly selecting few academic and research institutes have digital resources more in number and also circulated over the campus and few libraries marching towards the initiatives just to assess the status. Hence random selections of institutes known are selected for the survey.

- The model is suggested based on the facts and conclusions derived from literature and experts from libraries and computer sciences and considering the future digital libraries.

1.12 Structure of Research Study

The present research study is completed in nine chapters.

Chapter 1: Introduction: An introductory chapter in which need of the research, aim, purpose, objectives, scope and limitations, research methods, and structure of the study is elaborated which gives plan of research study.

Chapter 2: Literature Review: In this chapter detailed review of the published literature is presented in the different facets related to the study. It is noticed that many efforts are carried out to device staff pattern for traditional library and digital library but skills efforts are required.

Chapter 3: Transformation in Libraries: This chapter covers the changes and revolutions undergone in libraries and deduces the present need of manpower requirements based on different activities. This chapter also presents the role and job description of library staff in digital media or digital librarianship

Chapter 4: Staff Patterns for Libraries: In this chapter different staff patterns formulas principles guides lines brought out by the scholars are discussed and compared.

Chapter 5: Library Staff Requirements in Digital Era: This chapter elaborates the nature of duties and skills sets required for the staff to manage the new technologies in libraries.

Chapter 6: Data Analysis

This chapter is the presentation of analysis of the data collected from different academic libraries evaluate to its present status. Based on this staff requirements and patterns can be deduced for future libraries in digital environment.

Chapter 7: Findings of the survey: This chapter focuses findings based on the survey of libraries conducted user questionnaire, interview and literary analysis.

Chapter 8: Staff Model for Digital Library: This chapter is the theme chapter which provide staff pattern to run the future libraries especially in digital era.

Chapter 9: Suggestions, Recommendations and Conclusion: This chapter is the basis for suggesting the need of staff and skill sets as well as capacity building of staff to manage the future. The suggestions might help in building the capacity of library staff in digital era and the study is concluded with discussions of objectives and hypothesis and scope for further research etc.

1.13 Benefit of Present Research Study :

The present study is very useful for library professionals who are planning for developing or re–arranging libraries of any kind and nature, but especially focused to academic libraries. This study highlights the reasons for adaptation of new technologies to new entrants in the library profession. This study is also helpful to students and teaching professionals to enhance their syllabus to prepare the future libraries and role of library professionals.

Summary of the Chapter:

The present chapter analyses the impact of technology and the changing role of libraries as well as librarians. The research methodology formulated for this study covering aim, objectives, hypothesis, scope and structure of the study is well defined. This is the basic plan of research study presented by the researcher. The following chapter is the review of literature in which different literature collected is analyzed and presented on the topic of research.

References:

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- Martensen and Gronholdt. (2003) “Improving Library Users' Perceived Quality, Satisfaction and Loyalty: An Integrated Measurement and Management System.” The Journal of Academic Librarianship, Vol. 29, No. 3, p. 140-147.
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Chapter 2 Literature Review

2.1 Introduction:

The researcher before finalizing research topic conducted a detailed library search on the topic of research which supports to the idea of research.

Literature review narrates and develops the concept related to proposed research which is related to prior research conducted to find new avenues in it and analysis. It helps in indicating the originality and relevance of research problem and identifies the status of research and its newness from other past reported studies. Literature review justifies proposed methodology and demonstrates preparedness to complete the research in systematic manner.

2.2. Role of Literature Review in Research

The research study is a substantial and lengthy piece of professional work and has to satisfy number of academic requirements. The literature review is one of these important academic requirements. The literature review is a critical discussion and summary of literature that is of `general' and `specialized' relevance to the particular area and topic of the research problem in statistics. Researcher has to spend lot of time on literature review because it helps in designing most of the part of dissertation. Every statement in a literature review must be supported either by a reference to published literature. In a literature review, do not present all of the details found in the references. By providing the sources of the references, advisor and committee can go to the original reference for verification of the details to assess the reference.

Literature search this helps in:

- Discover what statistical knowledge exists related to research topic (retrospective manner)
- increase knowledge in research area and identify gaps in published research and generate new original ideas
- avoid duplicating results
- justify the relevance of proposed research and its useful to information society

A literature review is a proposal is long enough to convince committee that researcher have thoroughly explored the research topic by searching relevant literature to the topic.

The literature review performs a number of important functions like:

- It demonstrates to a Ph.D. committee that the student has read enough amount of literature to prove that the researcher is aware of the wide range of research in theory and methodology related to the proposed research topic.
- It provides proof to a Ph.D. committee that the student has deep understanding of area in which he is working gives new impact to researcher.
- The published research related to the topic of the dissertation.
- It should convince the Ph.D. committee that the student can communicate under-standing of the literature and its relationship to the proposed research.
- By identifying gaps in the literature, the student can justify the originality of the proposed dissertation research.
- In the proposal emphasize or stress is on the presentation of originality in the dissertation.
- With-out a good literature review, it is not possible to convince committee that the proposed research is original.

Thus the Literature Review is more than a summary of publications, which provides evidence that research is new and supported by relevant contribution.

2.3. Facets of Literature Review for Study

Following facets are considered for the literature search as these might help in the formulating study systematically

1. Functions of Libraries
2. Traditional libraries: Pros and Cons
3. Transformation in Libraries: Trends and Changing Scenario
4. Staffing Patterns, functions Policies and Commissions
5. Staff : Management
6. Resource Management
7. Future of libraries

2.3.1 Functions of Libraries

Edwards (1998) predicted the changes in the library system and information dissemination due to use of computers, application software's, internet, networking etc. Due to this there is a significant change in the functions of libraries. Along with technology there is a need to deploy effective staff to process and disseminate the information for the benefits of users.
Purnima Devi (2006) indicates qualities of qualified and educated skilled staff in the library. The staff fulfills the objectives of libraries by giving exact information in form of books to the user. Manpower is required with proper knowledge, skills in the digital environment to give pinpointed information in the digital era. Day by day technology changes and manpower need to upgrade their knowledge with sufficient staff requirement.

Hamedan Branch (2009) emphases that libraries and the librarians are planning to manage the digital libraries due to transformation as well as providing traditional print based facilities to users. This article highlighted the function of digital libraries and implementation of digital libraries from traditional and considered administrative and staffing perspectives in it. In the changing environment special staff with computer and programming efficiency is required as per the opinion of the author.

Naga Raja Rao (2013) indicated in his communication that present new technologies are being used in library and information science and is the main reason in changing environment of libraries, but staff needed to manage the new digital libraries is to be flexible in adapting and adopting new skills and levels of awareness. Librarians have to adapt different skills to cope up with new technologies. This article displays the changing role of librarians in a higher education sector and it has adapted to a new social as well as changing educational agenda. The paper basically covers the assumption that only its role has expanded due to changed formats of publishing documents. Technology alone cannot help in bringing out the required changes but also need efficient staff to manage the change. Attitudes, practices, and policies need to change if libraries in India are to truly benefit themselves and their community of users by the application of new technologies. LIS professionals have been playing a versatile role beyond their traditional job. They have to gather adequate knowledge of computer and communication technologies, networks and networking, operating systems, internet concepts, database management systems, along with adequate practical exposure to handle technological devices.

Summary

From the literature review it is noticed that the functions of libraries remain same but their operations and practices are changing due to applications of different technologies. The function like library services is totally changed. To manage with the revolution in libraries the staff has different qualifications and skill sets which are either to be obtained or hired to manage libraries in digital era. The staff pattern required in digital era is different.

2.3.2 Traditional Libraries: Pros and Cons

K. Nageswara Rao, and Babu (2001) highlighted the development in libraries from traditional to virtual which has brought drastic changes in the profession. The network technology and the internet using ICT has given the librarian a new dynamic role to perform as information scientist. The features of web, multimedia, collaborative multiprotocol, hypermedia oriented architecture made absolute revolution in information handling using different tools and technologies. Ultimately these avenues gave rise to digital library along with access to traditional library and staff pattern is different as compared to traditional library.

Liz Burke (2001) indicated that the virtual libraries and the digital libraries are the same but has a narrow difference in it. The future libraries can transform from traditional to digital and to the electronic and virtual movement. The librarians may require special skills having knowledge of web development, networking skills, hardware, software interface and creating web pages to provide information in the changing environment to users.

Emmanuelle Bermès(2011) developed a digital library repository using OAIS model and indicated to accept the change and librarians and the supporting staff should have appropriate skills to develop knowledge bases to maintain the digital library more usable. The digital information available in multiple formats and to arrange the huge data is the main activity of the library acquiring technical skills.

Bas Savenije (2000) focused on ultimate changes of traditional libraries from book savvy users to online grasping information. Innovative changes are seen in traditional and academic libraries. The users demands of locating information on desk tops is been considered with the availability

of electronic books and online information. To retrieve and disseminate the information and maintain storage, preservation of information is important factor. This concept of providing information to the users gives rise to electronic media and expert staff to manage the information.

Summary

The traditional libraries no doubt performing very well in the era they served to information community, but revolution and adaption of practices in libraries made the change. There are few drawbacks in the traditional library as compared to DLs environment in which all the practices are changed. Therefore the staff pattern and capabilities are also enhanced; in digital era to fulfill user's exceptions from the digital libraries.

2.3.3 Transformation in Libraries: Trends and Changing Scenario

Lynne Brindley and Derek Law (1997) pointed that the digital library movement is initiated everywhere including developing countries. International organizations, govt. sectors, private organizations are using the digital resources and library tools for information retrieval and dissemination to manage funds and infrastructure appropriately. The digital library concepts are rapidly changing the traditional concepts. The ICT and electronic resources have been used in digital library and has changed the functioning of the libraries and role of librarians. Burke (2001) discussed on virtual libraries and the digital libraries which are the same but has a narrow difference in its meaning. The future libraries have to move from traditional to digital and to virtual and called as Libraries 2.0. The librarians have to acquire special skills of web development, networking skills, hardware, software interface and creating web pages to provide information in the changing environment and act as Librarian 2.0.

Linda Marion (2001) has discussed skills required for digital librarian to sustain in the modern age. There is a need to have digital librarians, systems librarian, reference librarian who supports the web based information delivery. The study ended with listing the skills and knowledge required for the librarians in the digital era.

Ghosh, and Kelkar (2003) focused on convergence of technologies and it is useful for significance for digital libraries in engineering colleges. Based on the widely accepted concepts of ICT, authors suggested various ways. The convergence of technologies includes community radios, Internet radio, local area networks, telecommunication -centers, information kiosks,

mobile phones, WAP applications etc. Use of convergence Technologies reduces the skew in knowledge distribution between rich and poor, educated and uneducated, rural and urban and men and women. ICT driven public libraries should act as intermediary center with suitable awareness programs and act as the nerve center for improving literacy, awareness, welfare and cultural awakening. It is the intention to put libraries in the right perspective to arrive at a single window integrated environment for information dissemination concerned with all aspects of human life.

NKC (2005) has been set up to transform India and suits for 21st century environment. The focus of the NKC report is to build excellence in the educational system to meet the knowledge challenges of the 21st century and increase India's competitive advantage in fields of knowledge, promote creation of knowledge in S&T, social sciences and other academic institutions. NKC set up the "Working Group on Libraries" with the broad terms of reference redefine the objectives of the country's Library and Information Services sector. The task force members have to identify constraints, problems and challenges relating to the LIS sector and take necessary steps to mobilize and upgrade the existing Library and Information Systems and services, taking advantage of the latest Information Communication Technology (ICT).

Ziming Liu (2006) has clearly stated that ICT and technologies, electronic resources and the implementation of digital libraries have made the tremendous impact on traditional libraries and its staff. Author in his survey which was conducted in Toronto listed the finding which indicates that young age people are more familiar with the electronic sources. The author said that the users are moving from traditional to digital libraries. The traditional and digital libraries have different roles where users demand is for both to satisfy their needs. The library has to play similar role in disseminating the information to users.

Lynne Brindley (2006) indicates the challenges faced due to new technologies used in the libraries and the necessity of changing the skills, services and techniques of the library staff in the ICT environment. The library is a place where the users hunt for information in form of books and the digital information. Libraries are seen as most trustworthy, reluctant, cooperative providing more accurate information than search engines. The enormous and infinite changes in providing and dissemination the information with new electronic and digital resources in the changing environment provides a new shape to redefine the roles and skills of the libraries for the future generations

Subrata Sur (2007) has remarked Information Communication Technologies are being implemented in libraries to give traditional and digital information to the users. Librarian needs to redesign the infrastructure and skill to provide pinpointed information to the users in digital libraries and also highlights the professional skills required and technological facets required for the development of library staff to perform the future and current needs of the users.

Sharma (2007*)* listed skills required for the librarian to survive in the information commination era. The internet has made information easily available anywhere to the users through the search engines. Information can be accessed in electronic form by the users using electronic resources. Now in the digital era the librarians have to serves as e-specialist and provide information to the users. The traditional libraries providing digital information in the changing environment require technical skills like such as, operating systems, programming languages, networking, coding, etc. Digital library concept has change the working of the library environment.

G. Thamaraiselvi, (2009) discussed aspects of information and communication technologies which are changing everyday with rapid information explosion, made activities more complex. The knowledge society is depended upon the technological changes using electronic and digital resources etc. The impact of web based technologies has changed the library professional attitude and has to use internet based information services, multimedia, electronic resources, global networking for managing libraries in efficient ways. The new techniques and technologies permitting access to electronic knowledge resources and librarians have to change their role from traditional librarian to information scientist by learning and adapting new skills, new programming languages, networking etc. The library staff requires essential skills to work in the changing environment

Mathews (2009) found a substantial need for Web development, project management, systems development, and systems applications in the library profession. This suggests that librarians are incorporating a significant subset of IT professionals' skill sets. The author has also predicated requirement of IT skills. Technology is changing and the librarians have to adapt IT skills in the changing environment to disseminate and satisfy the user's requirement.

Shiou – Luan Wang's (2009) studied revealed the impact of ICT in university libraries to understand the users demand using ICT. The users require pinpointed information and guidance to use and refer the information generated and retrieved for the e-resources, the library staff has to computer savvy with IT knowledge to retrieve and disseminate the information to the required

users. Varalakshimi (2009) justifies in the era of digital technology accompanying with traditional and print technology the library professionals must perform their duties according to both environment. To access organize and retrieve digital information, the LIS curriculum need to add the digital trends in the syllabus. Author has suggested redesigning and re-engineering contents in syllabus.

Nonthacumjane, Pussadee. (2011) discusses the key skills and capability of a new generation of LIS professionals and digital era which impacts on the changes occurring in libraries skills and knowledge of LIS professionals working in a digital era and related researches. Author focused on key skills and competencies of a new generation of LIS professionals which can be classified as personal skills, generic skills, and discipline specific knowledge with the image of the new generation of LIS professionals. In conclusion, to work efficiently and effectively in the fast-changing digital age, a new generation of LIS professionals should have the qualifications in providing information as well as dynamically exercising personal skills, generic skills and discipline-specific knowledge.

GharibTarzeh et al (2012) in his paper has investigated different factors for user's satisfaction and evaluating digital libraries. The digital library is being used in almost all the organization followed by traditional libraries. The electronic resources, digital software's, are being used to provide digital information to the users around the globe. The users get satisfaction if the information is generated and disseminated properly to the users. The staff should have proper skills to retrieve and disseminate information to the users.

Summary

From the above discussion it is noticed that transformation in library system is appearing fast due to application of ICT and different other tools supporting to information gathering. The libraries are shifting from traditional libraries to library 2.0 and library professionals as Librarian 2.0. Transformation of in libraries is visualized as different tools are used for dissemination of information like web tools, mobile teaching, SMS services, remote messaging etc. Transformation is positive and staff required to manage it is different from traditional library system. The NKC is also supporting concept of transformation and suggested the action to manage LIS and support educational system in academic sector. From the library it is felt that to manage transformation there is a need to re-define the role of staff using skill sets required.

2.3.4 Staffing Patterns, Formulas Policies and Commissions

Francis (1998) has discussed the role of ICT in transfer of information and its delivery in the form of books, electronic resources, over I Pads, I phones etc. Author has presented the staff formula in the changing environment and also considered aspects of hardware and e-resources while designing the model of staff formulae.

Samuel Adewale Ogunrombi (1999) has highlighted the problems and difficulties while handling the ICT applications in Nigerian University to get a specific staff for catering the modern technologies. Author has pointed out that there is a need to reconsider the staff pattern for managing modern libraries due to explosion of knowledge and information which is made available through e – resources based on networks and net. This new change has affected the staffing pattern which has developed in the past to recruit staff in professional and academic library. Author is of the opinion that there is a need of re-engineering staff pattern looking in to the new trends in the profession.

McGinty (2009) commented on exploration of digital technologies used in the academic libraries which is growing at an alarm speed. Author remarked on management and organization and also suggested that libraries have to handle the needs situation of the users in different way in his digital era. The new models or structure for staffing in the digital era is disused in this article. In future librarians have to process and subscribe digital materials with the print media resources. Librarians have to acquire the new skills within the organization to maintain digital and academic libraries.

Tikeakar (2009) discussed about the changing environment of university and college libraries in India. In the 21st century academic libraries are facing challenges like library software's, automation, retrospective conversion, digital library etc. and discussed on these issues. To provide library services which requires are more skilled in the changing environment. The information required by the user and to disseminate it to then, if need to adapt the latest technologies in the profession.

Hamedan Branch (2009) said emphasis on the libraries and the librarians who are planning to manage the digital libraries as well as providing traditional print facilities. In the digital libraries different skills and different technical education is required. Author proposed formulation of managerial policies related to technologies and utilization of staff optimally.

Nagi Reddy and Uma (2009) distinguished between traditional and modern services in the libraries. It compares the staffing formula of Dr. S R Ranganathan and the staff required in every section in ICT by taking the data from IGM library Hyderabad, They have given the recruitment and promotion polices in their communication.

Summary

The literature published on the staff pattern/formula in digital era is scanty, even staff formula, polices in Traditional libraries is also not available abundantly except Dr Ranganathan staff formula.

Every author is of the opinion that there is a need to have staff pattern for Digital library. Hence it was decided to analyse present status of academic libraries and deduce staff pattern with job description and skill sets in digital library environment.

2.3.5 Staff : Management

Parikh,(2000) emphasized on discussions on sustaining the library and information science professionals in the digital era. The author pointed out that to provide immediate and instant access to the information to users, the librarians has to change the skills and adopt new skills for proper functioning of the digital libraries. The author indicates the changing scenario due to applications of ICT in the libraries and information centers. There is a need to manage human resources to re-engineer the infrastructure of library, and librarians have to adapt additional skills to manage the digital library in addition to traditional skill sets. The copyrights, quality of information, acquisition of digital resources, maintenance, dissemination etc. is highlighted in his paper elaborately.

Karen and Henderson (2002) in their paper highlighted the job descriptions required in different advertisements and descriptions. They have pointed out that for using internet and Google or any search engines, consortia services, retrieving online publications and making them available to the users requires technical and interpersonal skills in the changing ICT era. The findings of the study explored the technology that has made changes in dissemination of information by the librarians and it is required by the users at the other end getting information in traditional form as well as with electronic and digital resources. Thus authors are of the opinion that there is a need of qualified and well trained manpower for the libraries and the advertisements need to cover the job descriptions in detailed.

Danielle Bodrero Hoggan (2002) says that in the age of digital era information is available through many resources viz. web resources, databases, internet resources etc. and the scientist / users use only one or two databases from which they retrieve very few information links. Author suggested that librarian's using their special skills search for required and pinpointed information for the scientists using controlled vocabularies while searching. Librarians can assist to scientists in using multiple digital electronic resources and virtual information sources to download the information from various sources either paid or free. The skilled librarians using right strategies and tools can disseminate more web- based information which solves the user's needs to initiate activity.

Hanna Kwasik (2002) in his paper emphases on the technological skills which are required in the careers of librarians due to electronic and digital resources in the 21st century. The author highlights the new skills which are required for online acquisitions and dissemination of information through electronic resources. The librarians require knowledge of integrated library systems in automated library, knowledge of software applications, programming languages, creating websites using open source software's.

Conaway and Lawrence (2003) in their paper discussed the resources in print and digital media and compared the allocations made for these resources, Authors identified functions and resources associated with e–material used by the library and concluded that librarians and management are acquiring more digital resources in library with physical materials. The findings in this paper are staff and aggregate infrastructure, material resources are estimated to be few in all digital library. Authors have expressed the requirement of staff in the digital resources.

Vara Lakashmi (2003) highlighted the standards developed by ACRL, for evaluation of college libraries. The author has emphases on the standards, norms and rules for functioning the college libraries and the guidelines given by UGC. University Grant Commission has to develop standards for the change in technology in the 21st Century. The standards for library staff, organization, and administration should be developed in the current scenario where information is disseminated to the users at any location.

Lisa Allen (2005) indicated that due to globalization and information explosion and user needs are changing as per the change in technology to access the information in higher education. A hybrid service staff model is prepared to improve the services and provide new services and

orientation for the librarians. Training and development of hybrid librarians with proper and technical qualification is required. Library is giving traditional as well as hybrid services. Academic and college organizations have to develop awareness to computer oriented skills among the staff to face the new challenges of technologies in virtual environment.

Rosenberg (2005) conducted a survey to find out the status of digital libraries in 2004 and also conducted a pilot study concluded to know staff skills acquired by librarians to handle digital library resources, negating skills, e-management, dissemination of information etc. The author suggested that syllabus of library education have to be reformed and new professionals recruited have to acquire advanced skills to handle the digital library resources.

Mazumdar (2007) discussed the library functions with the networking and telecommunication networks, computer networks which are related to web based library. The author highlighted the skills required for the librarians and its staff in the IT era. The information dissemination on the desk top to the users using IT and human resource management is discussed in the communication and need for the manpower to face the future. The borderless library can become global information hub with skilled staff in the library as concluded by the author.

Subrata Sur (2007) remarked that librarian and the supporting staff needs to be more educated and have to redesign and update their knowledge in the changing environment form traditional to digital era. In the changing environment the library staff should have knowledge of programming languages, good communication skills, retrieving and dissemination the information to the users. The major challenges for librarians are scrutiny of information and knowledge, transformation of ICT, expansion of ICT, and the demand of users through digital and electronic resources.

Robert Boyd (2008) discussed in his paper the principles of organizational analysis and job analysis to identify caliber of staff for employment in the information age, Author clarifies the development of information commons and standards followed by all library staff and same to be used during appointing the staff and calculating the performance appraisal of the staff.

Michalis Gerolimos (2008) has identified 38 skills and qualifications after verifying 200 job advertisements form UK Canada, Australia and USA from 2006 – 2007. The highest degrees in Library science with communication skills, interpersonal skills, organizational skills, web design, research knowledge, searching techniques, multimedia, ability to control software hardware and occurring technologies is required.

Archana Saxena (2009) observed that the method for collection, storage and retrieval is changing in the age of Information explosion and technology applications. Author made an attempt to review the change and discussed the impact of E-publishing over academic libraries. In changing scenario, the librarian is going to be a highly skilled professional whose total commitment have to develop navigators to global intellectual resources as facilitators, instructors, gatekeepers of knowledge interpreters, evaluators, consultants, researchers, information managers, promoters and has improved the image of the librarians by playing all the roles successfully.

Vinodh Kumar Mishra (2009) discussed the staff recruitment polices and experience in the digital era. Author says the staff working in the digital environment should have technical skills and IT skills. In the ICT environment working methodology and the tools and techniques used in the libraries are changing very rapidly and due to this it is very difficult to manage library system and challenging for the employer to get the employee who is having ability to satisfy the present and future requirements of the complex information needs of the users. The author demands for different discipline required for performing job in the digital era.

Choi, Youngok and Rasmussen, Edie (2009) suggested job requirements for librarians in the changing era and discussed abilities required, such as web page design, internet searching, and skills including technological skills adaptation. The study shows that current awareness and appropriate technological skills and experience in the digital library environment, knowledge and experience in creation and management of digital information, and metadata are the most required qualifications for digital librarian.

Parka et al (2009) the study examined the similarities and differences in the significant predictors of the digital library acceptance across countries and continents. Further, the authors suggested that external variables that affect perceived ease of use and usefulness need to be considered as important factors in the process of designing, implementing, and operating digital library systems.

Halder (2009) has highlighted the changing profession of librarians and the library staff in the ICT era. The new roles performed by libraries in ICT era are explained like Information Scientists, Information officer, Information Consultant, Content Manager, Knowledge Manager etc. The author has mentioned the working of librarians using current trends like library 2.0, Web

2.0, Cloud Computing, mobile computing, digital library etc. The design objectives of library professional are the same but the working culture has changed due to digital environment.

Summary

In any age there is a need of manpower to organize and function of the system. The difference is in number and job description. The opinion of the different scholars regarding staff management though varies but their main focus on re–engineering in staff management in digital era and for this there is a need for adjusting new management skills sets. The different skills set required for libraries in digital era are elaborated as under:

- Technological skills
- Information Retrieval skills
- Databases and internet resources
- Use of controlled vocabulary
- Federated searching skills
- Web sites and development skills
- Evaluation skills
- Communication skills

2.3.6: Resource Management

Griffiths (1995) discussed in his communication that in the 21st century the information available through electronic multimedia sources through networking and due to benefits. The information society is moving from the industrialization age to information and technological age. The role of librarians is also shifting to Information officer, facilitator, and information searcher and as a guide to the user due to new role played in the profession. Bas Savenije (2000) had focused on new techniques and trends in library and information science. All traditional libraries are facing challenges and impact of internet and applications of new technologies in the profession. The library collection is now developing in e-form along with the traditional print resources and also using networked and Internet resources. Thus librarians have to manage the e-resources in the current scenario.

Carol Tenopir et.al (2003) discussed many research studies in which have focused on how people use electronic resources or on assessing their feelings about use of electronic and print

resources in the library. Libraries prefer digital collections for many reasons, including digital journals databases etc. Access can be provided from the user's home, office, or dormitory whether or not the physical library is open; the library can get usage statistics which is not available for print collections; and digital collections save space and are relatively easy to maintain. When total processing and space costs are taken into account, electronic collections may also result in some overall reductions in library costs.

Nyamboga, and Kemparaju (2003) pointed towards the situation of Indian libraries which are still in process of getting access to electronic resources. Few developing countries like Kenya, Thailand are in process of using electronic resources, publications for retrieval of information. The authors discussed on the changes in technologies which has been used in the developed countries and is reflected on the developing countries for attributing new technical skills for library staff and the users. The World Wide Web has played a challenging role creating development of online and off line information through electronic and digital resources.

Jeevan (2004) focused on use of digital resources, optical media which has cut down the infrastructure and storage cost in the developed countries. The information can be reached to the end users on their desk tops. In India the digital library development need infrastructure that makes information to reach to the users at an alarming speed. Use of digital resources spread information around the globe with internet connectivity. To maintain the digital content require essential staff.

Youngok Choi (2006) predicts due to information available in digital and electronic formats, training the library staff in the digital era is the important issue in the libraries. Young Choi has conducted the survey with digital library professionals to analyze what skills are required in the digital library. To meet the requirement the digital library and skills required is the important issue. The author analyzed the LIS curriculum should be restructured adding interpersonal and communication skills, practical knowledge, to handle and access the digital information.

Alicia Garcia Medina (2007) says due to development of internet and telecommunication technology, multimedia technology the information is available in audiovisual forms, videos, audio recordings including the traditional print information can be catalogued with MARC 21 giving links and through.

Summary

All the authors opined that hence forth use of ICT and e- publishing there is a need to manage e – resources in the libraries, e – resource management its preservation takes leading role in the libraries as well as resources available over the networks and internet is also to be managed. The library professionals have to develop the e – resource management skills for its efficient use.

2.3.7 Future of libraries

Denna Marcum (2003) has emphasized on the need of digital libraries in the ICT era. For the future digital libraries the infrastructure like ICT, resources, budget and user's satisfaction are the key factors. Collection and dissemination of information in proper format is essential. The information has to be easily accessed and disseminated to all types of users with support of skilled and experienced staff.

Fourie Ina (2004) identified the knowledgeable and user friendly staff to handle the ICT era .The author claims the new roles of the librarians in the ICT and digital environment ,are librarian has to learn and train the users to get information through internet and web resources, and also listed different roles of the librarians as web trainer, cultural role, negations, advising, projection of time, information organizations, website development, handling databases, information management, archival management, information retrieval and researching, Subscription of online journals etc. The LIS schools have to develop a vision for the future roles of the librarians. Survival skills are now necessary to implement in the curriculum.

Viviane Reding (2005) highlights the importance of library as collection of information and disseminate to the users. Library has the information of the past and the present and they satisfy the user's needs with the technological changes, adopting different applications, electronic resources. Viviane in his survey pointed out that the European libraries employed 337 thousand staff in 2001. This indicates the social impact of the libraries due to transformation. To meet the future challenges there is a need to employ skilled and technical staff who has to manage digital libraries.

Qian Zhou (2005) has focused on the development of and shaping the digital libraries in china. Author has focused on various projects in digital libraries in China. The working and quality of traditional librarian and digital librarians is highlighted in the paper. This paper highlights the

importance and requirements for digital libraries and the skilled digital librarians. Expert skilled quality librarians require developing the libraries. The librarian acts as a convener for the revolution of human knowledge.

Anne Adams (2005) has assessed the changing information in the ICT era due to electronic resources and digitized information interviewing and observation of 150 users. The study focuses mainly on the digital libraries. User's information demand changes as the new resources and technology changes. The digital library designers have to consider the changing needs and demands of the users. The digital library features should be supportive to the users and should implement the staff to provide required information to the users.

Vinitha and Kanthimathi (2006) expressed the development between developing countries and developed countries and initiated that still users prefer print material to access information along with digital. The advancement of science and technology forced to shift the library environment to change the information dissemination activity through the digital and electronic media using digital resources. Authors narrated the technological skills, communications required for the further development in future.

Youngok Choi (2006) has made a remark on working in digital library with unskilled staff. In digital library the staff has necessary skills to perform the task and retrieve the information for the end users. The education policy for recruitment of digital librarians is required to change. From the outcome of the survey conducted it was felt that the knowledge and skills and the technical competencies are required for the future digital librarians.

Pravakar Rath (2006) has highlighted the trends and developments in library profession from traditional library to digital library, library cooperation to resource sharing and networks, collection development to content development, conventional education to web based education, and information society to knowledge society etc. The government of India to overcome the impact of Information technology in the 21st century has declared Information Technology act in 2000, e- Governance Right to Information Act in 2005, and Library and Information Networks, Knowledge Commission in 2005 and 2009. The requirement is of qualified information managers, having good technical skills and communication skills.

McKnight Susan (2007) highlighted the knowledge management system which is essential to the librarians to cope up with the new technologies evolved in library for identifying and disseminating the information to the users with learning new skills to satisfy the demands of the users. In the following era librarian have to deal with content management systems, instructional repositories , customer relating management systems with help of federated search engines and internet. The traditional library management system might change by open sourcing, networking tools as blogs wikis. In the digital age the purchasing online, copyright laws, on lying buying, requirement, organizing, fluency, communication skills, technical barriers are the important factors to be considered.

Bhide et.al (2007) narrates use of information technology and digital and electronic resources and clarifies in most of the academic digital libraries the usage is very low. The communication focused on the making a new look of research academic digital library through disseminating the information using web applications so as to reach information to end users at any location.

Jadish Arora (2009) has emphases on new technologies, its products techniques providing new electronic resources to retrieve the information. Most of the libraries are moving to digital libraries providing digital information as well as traditional information with the communication technologies and networking technology. The librarians and the library staff have to develop new skills to perform their duties in the changing environment. The author concluded that librarians should have proper skills in the ICT era to support in the profession of future.

Summary

The different opinions have been put forth by authors while describing the future of libraries. The opinions are digital era, digital resources, ICT applications, web and net usage networks are growing fast and users are familiar of its use. The future libraries though have same functions but its nature of service might be different. The staff must be technology savvy and use technology for better functioning of the library. This future of libraries needs different challenges and skills to manage the library profession.

From the total literature review it is noticed that:

- There are very well efforts made to develop staff pattern during the traditional library system

- Transformation of libraries due to use of different technologies and techniques made changes in the libraries
- Since automation is completed now librarians are moving towards digital libraries
- The staff required in digital library is not related to number but skills to manage new environment libraries.
- The staff pattern for the digital libraries is discussed but there is a need to develop a suitable staff pattern.
- There is an acute need to work on staff pattern for the digital libraries as the forms and formats of the documents are shifting towards e-publications.

Keeping these points in mind the researcher has understand the need to conduct a study to initiate the activity towards development of staff pattern for digital libraries based on traditional library patterns, Job description in changing scenario etc. This is the main reason to conduct the study on staffing patterns in digital environment.

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Chapter 3: Transformation in Libraries

3.1 Introduction:

Librarians and Librarianship have witnessed the revolutions in the LIS system and libraries are transformed from the manuscript libraries to virtual and cloud libraries. The revolutions have brought many changes in the professional activities as well as manpower requirement. There are many challenges also to be faced by the library profession also while adapting the rapidly changing environment in which librarians are expected to work differently than before. The information society is moving from industrial age to information age due to more usage of ICT. To manage with the changes library professionals have to transform themselves and their activities using ICT and trends. The revolutions libraries transformed different phases of libraries like: temple libraries (oral communications), manuscript Libraries (primitive libraries), Paper / Print Libraries (Traditional libraries), microform libraries, electronic libraries, digital libraries, virtual libraries, networked libraries and cloud libraries etc. These transformations are basically due to application of technologies prevailing during the period.

The management of libraries depends on the technologies and its application and hence every time librarians have to face different challenges in financial support and staff support. The changes are managed efficiently by the librarians by deploying the responsibilities and trained the staff to sustain in the profession. The impact of the changes is mainly reflected on: collection development, staff strength, library services, content management, finance, library organization, library profession etc. However major impacts are reflected on the finance, information profession, information activities and manpower structure (skilled and number).

The trends in the profession and its impact have been discussed by the different scholars since many years, viz. Fritz Machlup, Daniel Bell, Marc Porat, and others (Griffiths 1999). The traditional information access and management roles played by the information professions are expanding, particularly in the design and development of new information products and services and use tools to support information seeking and selection, analysis and synthesis of information content on behalf of users, and user instruction. The emerging recognition of companies as learning organizations, reinvention of government agencies, new directions for education in universities, colleges, and schools, promise new opportunities for information specialists to

reinforce and expand their facilitation of communication and learning process in organizations and communities (Griffiths 1999).

3.2 Status of Library System: General Overview

Libraries have a very old traditions and functions to support information society to develop culturally and academically strong society with the help of public, academic and special library systems. Education system is well supported by information published in different forms like books, journals, reference material, teaching and research aids and helps in extension of knowledge. Libraries in earlier period were collecting information in different forms like clay tablets, papyrus and due to invention of paper knowledge spread in the form of books etc. and temple or manuscript libraries transform to print media libraries. Libraries provide a useful reference service to the users form the decades in the traditional as well as in the digital libraries also. Libraries provide information as per the demands of users and the technology is used in the changing environment to support the different activities carried out in the libraries.

The role and functions of the libraries goes on changing from traditional print media and then to digital where information is being made available on the desk top of users. The users also require pinpointed information from the metadata available on the internet. The role and responsibilities of the librarian are changing day by day including traditional staffing pattern for performing different functions in the libraries. The education system is using both formal and non-formal informal ways for propagating higher education in India in e – learning and teaching. Libraries perform their roles in providing information form the period where informed is stored and preserved in the four walls of library. Library plays dominant roles in extracting knowledge and information from books, periodicals, magazines, old manuscripts, archives, articles, standards, reports, Government resolutions etc. The major changes in the libraries occur due to adaptation and use of technologies.

3.2.1 Developments in Libraries: Past to Present Scenario

Traditional era of publication started with maintaining information written and preserved on stones, cloths and metal wall’s and maintained and exploited information to society. The development of libraries is essential for the development of the civilization. From the old Gurukul system where knowledge was given to the students orally by the teachers / gurus was

the development of information recording in form of information sources used. The initial libraries were started from the temples and called as temple libraries. The information was written on the walls of temples so as to get information about society, culture etc. and needy person. In the initial period libraries were attached to the holy places and later transformed to public places.

Earlier information was provided through non – verbal communication such as signals, drumbeats, signs, symbols, facial expressions, and body language. After non – verbal communication verbal communication was introduced in form of origination of languages and then written communication was used to store information in form of cave paintings, clay tablets, ink, papyrus etc. The printing era began with Gutenberg in 1456. In 1883 Dewey became librarian of Columbia College, and in the following year established the School of Library Economy, the first institution for the instruction of librarians ever organized. In India the Central Library of Banaras Hindu University, Varanasi, established in 1917 with the assistance of Sayajirao Gaekwad III Maharaja of Baroda state (1875 to 1939), known for establishing libraries throughout his state.

India has also a rich cultural tradition of higher learning centers from the old times. These centers were identified as Gurukula, Paatshala, Taxila, Nalanda and Vikramshala where the courses were offered for advanced studies. Modern Universities in India came into existence with the recommendation of Wood Dispatch of 1854. In India three universities were started in Calcutta, Bombay and Madras in 1857 by the Britisher's.

After Independence various commissions were appointed by Government of India. University Educations Commission was set up in 1948 under the Chairman ship of Dr S Radhakrishnan and Education Commission was set up in 1964 under the chairman ship of Dr D S Kothari which contributed for the improvement of higher education in India (1964– 1966) UGC was established in 1956 to promote and coordination of university education and establishing standards for teaching learning and knowledge extension. There were 20 universities before independence and now there are about 500 universities in India. UGC Committee for University and College libraries was setup in 1957 under Chairmanship of Dr.S.R. Raanganathan and Education Commission setup in 1964-66 under the chairmanship of Dr.D.S. Khothari have significantly contributed for the improvement of library conditions in universities.

The University education commission (1948– 49) headed by S Radhakrishnan had recommended that the University Librarian is the position equivalent to University Professor who has specialized in some aspects of library sciences and who has capacities for organization and management.

University grants commission appointed a committee in 1957 under the chairmanship of Dr S.R. Ranganathan for the higher academic and professional qualifications, the combination of academic and administrative responsibilities, and the practice in the universities all over the world indicate that the status and the salary scale of library staff should be same as that of teaching and research staff.

After the development of public libraries many universities and colleges (academic) libraries were developed. Later development took place and different parameters set for library staff, their nature of jobs, functions, working conditions, salary structure was laid down, keeping in consideration the traditional staffing pattern enunciated by of Dr SR Ranganathan, UGC, Kothari Commission, AICTE Norms etc. New subjects streams were introduced in the academics and information was required by the users through library. To cater the needs of the users the libraries provided information using books periodicals magazines reference books, maps, articles, standards specifications etc. Information was scattered throughout the globe. Libraries which were considered as the store houses of knowledge and used by researchers, teachers, students, academicians, lawyers, doctors etc. The information provided by the traditional library is print based referring to catalogues and indexes. Academic libraries were the sole custodians of the library in the traditional era. The change in the education systems came into existence after 1991 in India when globalization, privatization and liberalization was announced under the chairmanship of Prime minister P V Narsimarao, and due to this anyone can introduce their goods in any market. The competitive nature started in every organization system, to prove their knowledge and wealth. During 1990 the computers came into existence in India. Due to globalization and impact of information communication technology, information explosion and growth of internet technology the information was available in e- formats; e- books .which changed the role of library from traditional to digital era.

In the 21st, century, the digital information in electronic format was required by the user to cater to their needs. The libraries and the librarians have to face new challenges in dissemination of

information in the changing scenario where information is available thought globe. Thus development of libraries from clay tablets, traditional library, digital library virtual library, electronic library and now in the current scenario the libraries on cloud is active and further development might take place based on developments. In all the conditions staff is an important factor to manage and provide services to the users as the technology changes the practices also changes and the staff strength with job requirement also shift. In the current ICT era it is proposed to have additional technical staff to carry out the services and provide immediate information to the users.

3.3 Transformation of Libraries.

Haldar (2009) indicated that innovation and development of Information and Communication Technologies (ICTs) and different library software's and its application in the field of Library and Information Science (LIS) brought transformation in library management system. Not only library system changed due to these but the professional roles have also been changed and library professionals called as information advocate, consortia manager, consultant, content manager, facilitator, guide/teacher, intermediary, knowledge manager, researcher, sifter, technocrat web designer etc. Application of information and communication technologies (ICTs), in the library environment has shifted libraries from the traditional to hybrid and then automated library, digital library and virtual library. At presently it is shifted to Library 2.0. due to use of web tools and social media such changes, caused the transformation in the structure nature of library and LIS profession in a dynamic way. Now in this present situation the LIS professionals are playing all-round, multimodal roles to satisfy the different approaches of the end users using ICT. The librarians have to face the challenges due to ICT and other technologies and tools.

The major challenges in the profession are due to:
Role of librarian form administrative to multimodal.

- Need of different skills like Technical skills, Information Technology (IT) skills, Managerial skill (Sridhar, 2004).

- According to National Knowledge Commission, India, skills required are: Library and information handling skills, Service orientation, ICT knowledge skills, Communication and training skills, Marketing and presentation skills and knowledge mapping skills.

Sridhar (2004) also narrated different skills required to run the libraries and capacity building array the library professional in the electronic environment of twenty first century is a need.

Information is generated and disseminated at the higher speed with the new resources available in the electronic form. The advanced technology in processing information, storage and transferring information at higher speed has changed role of libraries in providing information services to the users. The librarians and the library staff have to face new challenges due to transformation. The libraries are changing their way and style of working with due to the advent of new technologies. The new developments in disseminating and storage of information, the growth of new devices to store and retrieve the information in the digital form, the fast access of internet and web pages, competitive search engines, availability of very high networks with high bandwidth and the information made available in the form of electronic publishing has made the changes from traditional to digital libraries. Information communication technologies have brought dramatic changes in the working of library from traditional library to digital library. The library staff is providing information to the users in traditional form as well as using different resources available over net.

As technology is changing the information is stored in different formats for easy access by the users. The users need print material as well as online information to meet their demands. Earlier the users refer to books, hand books, reference books, articles, print journals to cater their needs. Now the user demands have increased as multiple information sources are being made available in databases or using search engines such as Google, Yahoo, Google scholar etc. Internet has played a major role in changing of library working in organizing and disseminating the information to its users and transformed the activities due to use of ICT in libraries for performing different functions.

The library profession is use and managing resources is also transferring due to librarians in digital form and library staff have to acquire knowledge of networking programming languages, digital library software's, web site development, cloud computing, mobile computing, Server architecture, SQL, Video Conferencing etc. to adjust with transformation.

This new technologies transformed the role of librarian and libraries. Users also transferred their ways and now require information in digitized form and to get information access around the globe. With the advent of E-learning and teaching information is generated more in e - resources to support this new education system and due to this has changed the working of library and information services in academic libraries facing new challenges in the library profession. The information available in various electronic formats and making them available to the users is now challenging role of the libraries and librarians and here to shift from traditional to e - information content management by learning new skills, like automation and new technologies to manage and provide required piece of information to the users in the Knowledge society quickly. The information explosion even in the e-publishing is witnessed around the world due to web based information and communication technologies, globalization of networks and internet etc.

The impact of web based e-learning and teaching environment has influenced every facet of library and information services in academic libraries and providing new opportunities and challenges to library professional for involvement in knowledge based society including electronic and multimedia publishing, internet based information services global networking web based digital resources. Similarly emerging challenges of acquiring and providing access to electronic knowledge resources require librarians to change their role to information scientist by learning and applying new skills by understanding the evolving technologies to manage and provide quality online information service to the knowledge society users.

Due to globalization in the competitive world many libraries are automating their service providing information at greater speed. Developed countries like Australia USA, Brittan are offering online services to the users. In India many libraries are offering different kinds of online services such as online and, mobile catalogue access, two way text communication and podcasts which has digital collections modified for IPods, smart phones, online subscribed journals, e books. In the ICT era libraries and librarians have to produce more skilled manpower staff to generate information in the digital and physical form creating the portal through which the users can access the information to get more and more knowledge. Users are very much familiar with the technological advances in the networking and on the web. They require information on the

desktop with multiple electronic resources. The libraries and librarians now have to give traditional services as well as digital services to the users.

3.3.1 Causes of Transformation:

The applications of ICT and other techniques in different activities of libraries are the basic causes of transforming traditional libraries. The functions of libraries though remained same but transformed its methods due to digital content environment and its management. The main transformation visualized in libraries because the publishers and create more and more bibliographies, guides, syntheses, and higher-level abstractions of information content, directories, and so on, and increasingly involved in the creation information product activities. The analysis, synthesis, and packaging processes are going to increase dramatically due to use of digital technologies. Due to digital environment the information system is going to advanced and different search techniques used to mine the data from the warehouses. The overall change in the collection, organization, collection management, information staking, information retrieval and repackaging are the major areas in the library profession.

The need for transformation or re-engineering libraries is mainly due to:

- Information explosion as well as information overload
- Increased R and D in all sectors
- Readers varied demands and needs
- Limited budget
- Applications of ICT in all fields
- Availability of free information resources on internet and digital media

Among all these ICT revolutionized the system as information technology represents convergence of three strands of technologies, viz. computer, microelectronics and communications. There are many other technologies took part in addition to ICT like Internet technology, network technology, web technology, mobile technology, e-publishing, social networking etc. Rapid changes in information technologies during past three decades have drastically changed the functions and activities of information professionals in libraries. Thus it is the ICT which reshaped the library processes. In addition to these there are many aspects which support to transformation which is also based on the ICT factors like, development of

library home page, web page, subject gateway, library portal, webinars, RSS Feeds, Vodacasting, Podcasting, wikis, blogs, and news groups etc. caused the transformation in the functions.

3.3.2 Components of Transformation:

The transformation of the library system is due to mainly following developments:

- Computer and communication technology
- Library automation
- Networking of libraries and information resources
- Bar code, RFID and Smart card technology
- Web and Internet technology
- Social networking (Blogs, Facebook, Twitter, Apps, Skype, Wikipedia) etc.

3.4 Functions of Library Staff:

The basic function of libraries and the library staff is to provide pinpointed information to the users from the available resources. Many authors have described about the function and roles of libraries. In NKC report 2006 (2008) the function of libraries and staff reported and few other researchers have pointed out functions of libraries are:

3.4.1 Traditional:

- For proper functioning of the libraries the librarian and his subordinate staff performs their duties in acquisition section, cataloguing Section, classification section, periodical section as well as different sections as per need.
- To identify and recognize different methods to procure books in library economically and qualitatively.
- To acquire books, periodicals, journals through proper vendors and as recommended by users and the management authorities.
- To circulate publisher catalogues among the faculties for the recommendations of books based on need.
- To communicate with the teaching faculty to recommend different tittles, print journals required for the syllabus.

- To prepare budget for the purchase of different resources and equipment's in libraries.
- To record properly acquired resources both print and digital.
- Process the material for access by catalogues and classify books, and prepare index terms and organize collection for effective use.
- To provide indexing; abstracting; reference service; information services etc.
- To provide information from the traditional sources including access to digital resources.
- To Provide Current awareness services as well as Selective dissemination service to the users using different resources.

3.4.2 Digital:

- To provide easy access to information to users available in various electronic formats.
- To identify the user's needs and procure the information resources for the users.
- To procure e-Books and online journals and other digital publication to the users as per needs.
- To subscribe online journals, e-books, databases and provide internet facility for the utilization of resources to gain knowledge.
- To automate the library with library software and provide faster access and reference service to the users.
- To provide OPAC service with networking facilities to the users and help in resource sharing.
- To develop library website for getting information from different locations by giving links to resources.
- Libraries should have digital library software to access the digital contents subscribed and analyzed by the library.
- To provide access to back issues of online journals to the users.
- Learn skills to maintain the digital library in addition to technical.
- Library staff has knowledge of hardware and software to provide traditional as well as digital, electronic and virtual services using digital collection to users.

- Provide pinpointed information services using different digital resources like databases, reference sources

3.5 Exceptions of Users from the Libraries:

Users of academic libraries are generally students, teachers, researchers, scientists, managers, technical assistants, administrative personalities, engineers, doctors, public etc. Users require information on the topic of study and create new information using published data. To support user needs libraries to have to have good infrastructure, printed and digital books, periodicals, curriculum based books, different reference books etc. purpose. The users need to be oriented to use information resources efficiently and aware themselves about the services provided. Users also desire to collect information using technologies and electronic resources using web, online catalogues, database search systems and access to electronic publications etc.

The library provide online journals, OPAC services, e-books, scanning facility, reprographic facility, reference service, referral service to the users. The library staffs have good skills and provide information to the users more effectively and efficiently. Library is the heart of any organization and library staff disseminates information from the available resources to the users. The library hours extended for the students, users, teachers 24/7 providing online information using Wi-Fi.

Organization subscribe online journals form various publishers such as ACM Digital Library , ASCE Journals,ASTM standards and digital library, EBSCO Databases, Elsevier Science Direct, Emeralds e Books, IEEE/IEE Electronic library, McGraw-Hill Access Engineering to refer the articles published by research scholars. In the globalization and competitive era the libraries are bound to subscribe the online journals. The Library should have Bibliographic databases such as INSPEC, MathsScinet, SciFinder Scholar, Scopus Databases, Web of Science, for students, teacher higher studies.

User requires access to the digital library 24/7and for this library has to put all this services on the web providing user id and pass word to the students. In the ICT, era students and the users are familiar with the electronic resources and are dependent on the print publications as well as on electronic and digital information. The librarian has to play a crucial role in the acquisition

and dissemination of both print and electronic resources of information. In the globalization and ICT era where knowledge is the important factor, the education system and the users are utilizing the pinpointed information. Information on the web and journals is vast; thousands of articles are published by the research scholars. The librarian using the technique of literature search has to provide the user the required article.

3.6 Impact on Library Functions:

The impact of different technologies have affected on different functions right from acquisition to the dissemination of information to the users and the staff of the libraries too. The drastic changes may be seen in the book trade industry and libraries due to e-publishing and e-resource generation at optimal level. This might change the acquisition, processing, organization, digital resource management, information services and information delivery, digital rights management etc. The terms and conditions and pricing structure of the information resources in digital environment are going to change drastically and new economic pricing models have developed including consortium activities. Thus the transformation is visualized in all the activities of the libraries and information centers.

It is very clear obvious that any of the functions of the libraries might not disappear in the process of transformation but might change the values in terms the functions and becomes on demand in nature viz. physical collection, library services and also staff strength (Number and quality of skills) etc. The libraries definitely exists bur readers profile may change and libraries has to go to the users by providing desk top services. In the passage circulation activity may also diminish slowly and less prominent as the most of the collection will go over the digital. The library services may shift from generalized to user centric.

The major impact of ICT on the libraries is shifting the collection from print to digital and traditional libraries to digital libraries. The library services are changed and have based on the digital libraries or network and internet resources etc. In addition to these information storage and information retrieval is also shifted from print to digital.

3.7 Library Staff in Changing Environment:

In the light of profession, library is treated as a trinity of collection, user and library staff. Library is the center place where users find information in form of books periodicals, journals, E - journals CD,s CD-ROM DVD’s, primary sources, secondary sources, tertiary sources,

conventional and nonconventional sources. To get the information in organized form librarian and the management has to play a vital role which analyze and disseminate the information to the users in technologies which has changed the working of librarians from traditional library to digital library. User require information on the desktop instead visiting to libraries. The resources available to disseminate information to the end users are made available in e-forms, e- books and on line journals , hypertext, hypermedia, multimedia, video lectures , online conferences, CD's, DVDS, e-Learning resources, document delivery systems etc. There are the new avenues in the profession. This needs the changing patterns in librarianship from traditional to advance in the technological era. Library is important unit of any organizations or institutions. Library provides information to desired users from different resources. The libraries are continuously adapting effective ways to respond to the fundamental and interconnected missions of research, teaching and public service. Library is a trinity which works together to satisfy goals linking documents for users in effective way through library personnel. The technologies are now more used and caused changes in the practices in libraries. New resources in the form of electronic provide information to the users more effectively and efficiently. User demands are rapidly changing with the invention of new resources and technologies. Librarians and the library staff are trying to provide information services to the users over the desk top with the help of limited staff.

3.7.1 Library staff:

The library staff plays an important role in performing different functions of a library. Library staff helps user to get desired information from the documents required by them. In the traditional environment library staff is categories differently to carry out tasks.

1) Professional Staff who performs (Technical, professional and managerial task of libraries and are higher qualified in the profession). In academic libraries university libraries, the different positions like librarian, deputy librarian, assistant librarian, professional assistant, are considered as professional positions.

1) Supporting technical / Para – professional / Semi Professional (This group assists to technical work and has initial entry level qualifications in the profession), Involved in processing of documents technical work and delivering the different services to users.

2) Administrative and non-administrative Support: (This group of staff assists in administrative work of the library as well as helpers, shelves and attendants etc.) These groups are volatile and reformatted accordingly to type of libraries.

3.7.2 Role of Library Staff

The role of libraries is changing with the acceptance of Information and Communication technology. The libraries are moving from traditional libraries to digital libraries providing information to the users. Libraries collect all the information in form of books journals e books for the users so as to generate new technology. Libraries are changing their infrastructure and moving towards automation and computerization to give immediate access to the users using library software's and OPAC services.

The role of librarian and library staff while performing advanced duties for user's is changing with the change in technologies. The documents now used by the users are available in electronic form, digital form, online subscription etc. in addition to print media. For assisting users the library professionals have to acquire knowledge of networking, advanced computer applications, managing e-resources etc. In all the era library staff has its own importance. The National Commission Report chaired by Dr Kalpana Das Gupta briefed in her report the need, qualities and importance of library staff. Many researchers have highlighted different criteria specific to the importance of library staff and their role.

- Library disseminating information from the available resources and guide to the students and users from globalization to internationalization and helps in getting the desired information available in any form and format to the users.
- Libraries are now better known as Knowledge Resource Center (KRC) due to its support to user's community and satisfying the mission and vision of institutions or organization.
- Libraries act as a lifelong learning process and information provider to the users.
- Libraries collaborate with other institutions and develop social culture and user's welfare.
- Library personnel's participate in conferences, workshops, and seminars to update their knowledge and provide information to the users in current scenario.
- Library transforms with the technological change for the effectiveness of its organization.
- For the vision and mission of institute the library staff has to plan budget for purchase of curricular resources in print and e – resources.

- Libraries and librarians have to help and support users to find out information in all sequences appearances providing desired results for the benefit of the organization.
- Library requires, use based and qualitative resources and organize them for the benefit of all the users.
- The library puts the information on library web and institutional web for easy access around the globe as well as for resource sharing.
- The library integrates orientation lectures etc. workshops for the users to make them user-friendly with the library resources.
- Library provides services to the users as per the need using technology. It gives traditional as well as digital service to its users as and when required.
- The library provides multiple access to the users and provide assess and download the required information.
- Library provides access to standard books, e resources, consortium, supporting research and motivation and vision of the organization.
- Library provides multiple primary generated information and knowledge increasing the college and intuitional strength.
- Library provides pinpointed information access using digital collection of library as well as other libraries.
- Library preserves old manuscripts documents of rare collection in digital form, print form etc. for users.
- Library gives education in all the streams through books, online journals, print journals, scholarly journals to the institute teachers and students.
- Library is place where people understand the new developments sit together and interact with each other create knowledge and disseminate new knowledge to others.

- Library environment enhances researcher to carry out his research satisfactorily. Libraries have dynamic infrastructure which creates an environment for study of virtual information to carry out the research activities.
- Library provides immediate information with huge reading space, and reference section (virtual)**.**
- Library has good atmosphere and has intuitional membership with other academic libraries, research libraries, IITs, IIMs for gathering of new knowledge.
- Libraries take more responsibility to understand the queries of the users and support them by providing documents to solve it.
- Libraries have interpersonal intelligence and ability to understand user needs and support by providing pinpointed information for the benefit of the organization.
- Libraries understand the emotions of the users through self-control, trustworthiness adaptability, innovation to facilitate the require task.
- Librarians have social skills such as leadership, team capabilities, communication for the vision of the institution.
- Libraries through its resources guide the students and users to get knowledge and information from the resources available in the era of globalization, privatization and liberalization.
- Libraries are lifelong learning, supporting to value education and life skills development institute.
- Libraries are connected through EDUNET to different libraries for exchange of books and library resources.

The libraries came into existence in India after Kothari Commission and under the Chairman ship of Dr S R Ranganathan who gave more importance to the libraries and staff. The traditional libraries and academic libraries were functioning with fulfilling the demands of the users. New subjects are introduced in the curriculum. The information is rapidly increasing day by day and

the librarians acquired the books to satisfy the user needs. After 1991 the computerized system was introduced in India. Libraries started the process of automation with using user friendly library software's. The digitization of old copies processed to keep the traditional information a live for the users. Libraries started developing digital libraries as well as traditional libraries with same staff. Information was exploded at higher speed to gain more and more knowledge and keep update with the current information. Libraries started providing information using digital and electronic resources. Multimedia, hypertext, animation, videos, presentations, lecture videos, online journals, e-books are new kind of resources. In a traditional library books, manuscripts, magazines are acquired for the organization and for the use of the users.

The digital library concept came into existence due to information explosion. Information was generated at the higher speed and it was required by the users, teachers, scientist, and research scholars. In traditional library the users had to move from one library to another for searching information but in digital library using computer and communication system where the information is accessed stored, organized and searched effectively. Information could be collected form any place using internet and satisfy the user needs. Internet has played giant role in getting information on the desk top of the users at ease. The libraries faced the challenges in organizing, acquiring and analyzing the information in all the formats so as to easily cater to the needs of the users. The development of libraries started in the 21st century moving from traditional library to digital library and now providing information on the cloud server to get 24/7 access to all the users.

3.7.3 Modernization of Libraries.

The traditional concept was changed in modernization of libraries. The new technologies are introduced in the information age to satisfy the user needs. Automation and computerization tasks are taken up and completed by the libraries to provide immediate services to the users. The digitization and information retrieval process was started using ICT. The libraries provide multiple accesses and started promoting the poly-media, electronic, digital and virtual libraries. Information technology used to manage the data processing into information and to store and retrieve the information. Libraries started using electronic and microelectronic equipment's for processing and communication of information to its users. The use of telephone, radio, television, satellite transmission, computer, microprocessors are replaced by floppies, diskettes,

CD-ROMs, DVDS, Pen drives, Portable Hard Discs to provide infinite storage space of information. Libraries in India are very much influenced by the Information technologies. Day by day new technologies are introduced for storing and dissemination of information and libraries started using these technologies to store and retrieve the information. The internet technology is the development for accessing universe of knowledge available in multiple metadata forms, and users can get information sitting at any place. The libraries in the 21st century are in process to provide the information to the user 24/7. For these the staff in the library should have proper skills to process the information and disseminate to the users in the 21st century where the world is under globalization, privatization and liberalization. Libraries in the 21st century are the providers of information, processors of standard information using information technology and networking facilities.

3.8 Library Professionals in Digital Era:

Librarians have to perform their duties in different environment like technical expertise in computing and telecommunication, commitment in solving organizations' and user's information needs knowledge of information seeking, and information use and commitment for information access and dissemination. Librarians are now facing difficulties and challenges due to new trends in information access and ICT. In the present electronic/digital era the professionals have to change themselves as the information profession which has changed. Now information specialists have to work and manage e-information resources in which various professional groups are expected to map out the strategies that lead to produce, manage, maintain and service to the users in providing information. Information professional has to work based on the nature of job as librarian, record manager, archivist, information manager, information adviser/instructor, information broker, and system networking. The roles of the modern librarians are briefed as follows –

Librarians – In addition to being library manager, they also act as technical processors and information provider and taking care of information quality in digital era.

Information Manager – To meet information needs of the user and know how to manage and deliver appropriate information to users by means of library services.

Information instructor/adviser – Ensure that user/staff know how to access relevant sources of Information in print and e - forms.

Information Broker – Collecting information from different sources and repackaging the same in the required format as per the requirement of information seekers.

Apart from these, information processor, metadata manager, information searcher are the terms used for the librarians. Information broker uses different technologies and techniques in handling, archiving, preserving and disseminating information. It is not only the role of libraries may shift but the activities may also change in libraries due to use of ICT.

Mainly the basic functions of a modern library are acquisition, processing (arrangement, classification, description, and housing), organizer reference & access to information, preservation and management and provide information services. But the main task performed in the digital era is transformation and activities carried out in different sections of libraries are:

a) Acquisition – Deals with acquisition of publications and records from creators' custody as well as those lying scattered in different places. This has become major problem to the information professionals. The publications are available in multiple forms. E-publications involve complicated process of purchase due to nature, cost structure and licensee etc.

b) Processing – Preparation of digital materials for long-term storage is another problem faced by archivists and librarians usually used to put call marks on books to associate with the physical item with its storage location. Archivists used to pull staples, perfect order, refolder, and stabilize fragile materials. Today, they may need to think in terms of Dublin Core, full-text search engines, and SQL queries. Librarians are worried about temperature and humidity for digital storage and its processing procedure. The task of metadata development and digital resources management and preservation needs special efforts and skills of librarian.

c) Reference and Access – The library and information professionals needs to know not only the acquisition and processing of digital material but also to learn new skills. Since most of the data available in future libraries or digital libraries is in digital form. The services changed to virtual reference services and different information services using digital resources. The reference queries are conducted differently, but in digital-era patrons prefer self-service though different digital resources but they are ignorant about it. The library professionals' role may be evolving from gatekeeper to guidance.

Preservation:

In the digital era there is no stable medium, librarians and records professionals may need to develop ongoing programs to counter recurring technical obsolescence.

Management:

Not all library professionals work directly with holdings. Managers need to know enough to ensure that the work is being done well. When repositories contract work to information technology specialists, it is essential to know how to manage those projects so that the work is robust and fits into a larger program.

3.9 Skills, Knowledge, Competencies Required for LIS Professionals

The basic goal of library and information profession is to provide access to information to needy users. The activities realizing this goal have evolved and transformed over the years due to use of ICT. The different activities includes information activities which have been guided by the developments in the field of storages, presentation and archiving of knowledge, collection development and organization of knowledge, information explosion and computers in information retrieval. Information professional involved in information gathering, storage, retrieval and dissemination on one hand and on the other hand the computer specialists who supports the needs of informational professionals. For successful implementation of digital library, it is essential that LIS professionals have to be trained and possess requisite knowledge and skills in this regard.

Digital revolution has altered library profession. Remarkable advances in computer and telecommunication and the advent of Internet have changed the entire information scenario. These rapidly changing conditions demands for efficient librarian's activities. The skills of digital librarian are to be enhanced. The different skills to be acquired by the librarian are:

. Management Skills: which covers:

(i) Conceptual Skills – The mental abilities needed to analyses and interpret the information received from various sources and take complex decisions are the called the conceptual skills. It Includes the capacity to analyses and synchronize.

(ii) Administrative Skills – Abilities to follow policies and procedures, process all work speedily and minimize the expenditure.

(iii) Human Relationship Skills - It is the ability to interact effectively with the user, and to build team work at all levels. Librarian has to keep pleasant relation with the customers (user)

. Communication and IT Skills: In digital era, a library professional should acquire following technical knowledge skills:

* Operating Systems – Windows, UNIX, LINUX.
* Word processing, graphics, spreadsheet and presentation.
* Bibliographic DBMS skills.
* Programming Skills (C, C++, Java, VB, Scripting Languages.)
* Web Page Development skills (HTML, ASP, PHP etc.)
* Information Retrieval Software skills Online CD-ROM and Internet security.
* Software Development and Support Environments skills – Oracle, MySQL, SQL Server.
* Content Management skills
* Networking skills etc.

. Scanning technology - Scanners-Scanning file formats, OCR software

- Omni page- Text bridge-Fine Reader. Acrobat – Reader – Writer etc. digital camera – image capturing and storing, building a digital library projects skills etc.

. Information Skills:

Information professional must have Skills of information collection, structuring, retrieval and filtering, conducting and use related skills. Skills of digital information and reference service as well as information retrieval skills form various information resources either print or non-print, digital etc.

. Presentation Skills: These skills relate to cultivate reading habits among all levels of users. Present information to user as per their needs after repackaging; convey information to users using varied presentation technique.

. Measurement / Evaluation Skills: These skills help in performing qualitative information resource collection development in libraries. These skills helps in evaluating the quality of information, regular and periodic analysis and assessment of user needs and design new resources and services by evaluating the result of present use.

. Search and Dissemination Skills: helps in sound knowledge about tools and techniques, strategies, engines related to search, expertise in searching database, Web resources and catalogues etc.

. Knowledge Skills

Information professionals need to know about knowledge resources technological facilities online resources (computer, online catalogues, websites, LANs file servers etc.) Financial resources (budget), management of human resources (skills for manpower training) and their development. The competencies required in LIS professionals is to: acceptance for the change, knowledge of user interaction with knowledge resources, provide quality based services and adoptive, flexible and resistant. Resourceful, Possess important excellent communication skills; constantly updating personal knowledge base by keeping in touch with the latest development, Create awareness among the users, make them accept the changes and be an information management strategist, etc. To work in the ICT era the librarian has to acquire technical knowledge and skills like operating systems having knowledge of Windows, UNIX, LINUX, word processing, graphics, spread sheet & presentations. In addition to this Database Management Systems (DBMS) including the skills general purpose programming, networking of libraries and web page development and content management etc. Information Retrieval Software for online usage, CD-ROM and internet, library software packages, acquaintances with digital library tool.

Summary:

Rapid growth of information technology, particularly, the Internet and associated technologies, has opened up an entirely new medium for providing improved information services and resources for the users. The future may require the librarians to reorient themselves, think creatively and adopt new technology skills to generate services and resources where their skills of structuring and organizing resources are put to its best use.

To cope up with the trends, LIS professionals have to move in right direction with having a vision of the traditional ways and to adapt to social and technological changes. The libraries are distinct from the internet cafes, librarians are the only suited professionals to guide scholars and citizens towards an appropriate evaluation of online resources to provide accurate information to the needy scholars. The digital or virtual library uses technology and networks to link people to resources with a goal of providing universal access to these libraries. Normally the linkages between other digital libraries and information services are transparent. Digital libraries are systematic means to collect, store, organize, and distribute information and knowledge in digital form. For the most part they are an efficient medium to deliver information to all sectors of

society. The librarian must attempt to bridge gaps of understanding, or sense making and accepting the transformation process improving the LIS culture.

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Chapter 4: Staff Patterns for Libraries:

4.1 Introduction:

Library is an important asset in the society and whereas academic libraries are segment of social institutes and are responsible for capturing and disseminating knowledge to the users. UGC plays an import role in academic sector and support financially to academic libraries for building qualitative collection, to provide different services from the libraries and to acquire literature trained library staff to become qualified staff who can handle efficient tasks in any environment. The number of staff required for managing the different activities of or identified libraries cannot be isolated quickly and to avoid the variations, different staffing patterns are developed for different types of libraries and discussed by the scholars to solve the conflict of manpower. Among the different studies available on staffing pattern Dr. Ranganathan's staffing formula is still in use in case of traditional libraries. But now in the digital environment and changing circumstances the staff pattern is modified. There is a need to review the staff requirement in digital environment. In this chapter researcher made efforts to study different staff formula and staff patterns suggested by scholars and librarians. This study helps researcher in identifying staff in digital environment.

4.2 Development of Staffing Patterns: Review: In this chapter the first staffing formulae is based on the recommendations made by library committee under the chairmanship of Dr. S R Ranganathan in 1958. This formula was modified later in 1965 and 1979 by UGC. The efforts made by Dr S R Ranganathan while developing staff formulae is based on different sections of library to identify different sections of library its workflow and requirement of staff to manage the activity. In brief volume of documents and providing services to the users is the main base. This formula is suitable for printed media and physical entities added to the library and information centers.

The Indian Library Association (ILA) took initiative in 1982 and 1985 and had a discussion on the problem of staffing pattern for libraries and suggested to revise the staffing pattern but this identification filed as suggestions only. Later Maharashtra Government designed staffing pattern for college libraries in 1979. This was discussed because drastic changes took place in education system. This staff formula put forth maximum number of post of class IV employees and less

staff in class III categories. The formula suggested one class IV servant for every 250 students in the college and every fourth is a clerk. However this formula or pattern does not provide minimum core staff required to run a college library. Similar status was reported in other states also. Till 1979 no staff formula or pattern was justifiable except Dr Ranganathan and this is due to lack of job analysis and job description associated with different posts in college libraries or academic libraries. This situation created the missing link among the staff available and number of staff is required.

Thus it was identified that there is a need to conduct systematic study which provides detailed analysis of work and indicate pattern in digital environment. To frame the staffing pattern and job analysis it is necessary to understand the status of academic or college libraries. In the previous chapter 3 the researcher has tried to narrate transformation of libraries due to usage of technologies and different activities carried out in the libraries where man power is necessary which is of different kind. The different staffing formulae were stated as Government of Maharashtra, Government of Kerala and UGC. Few more efforts are also witnessed in the state of Karnataka, Himachal Pradesh and AICTE. To develop staffing pattern the following efforts are considered by researcher.

a) Status of education system.
b) Transformation in library activities and work culture due to revolutionary changes in libraries.
c) Job Analysis and Job description.
d) Categorization of work (Division of work Load)
e) Capacity of staff members to undertake the job
f) Skills required.

The status of the present education system is changing from formal to informal using e – learning teaching system which is based on e–resources which are abundantly available in all sectors including academics and higher education system. Similarly the use of ICT in libraries in performing different functions has transformed all the activities and services. Now libraries using ICT are supporting to e–learning system as libraries are heart of education system. The modern techniques e–publishing, digital information resources, internet resources changed the practices in libraries. The change is not any in transformation of functions but also on job analysis and job

description of staff. The staff patterns are also changing in digital era. Though the tasks are same, activities are same but IT applications reduce repetitive tasks and less man power. Hence the review of Job analysis and description is now necessary and the need of staff with new categories is to be defined in the digital era. To understand the role of modern librarianship there is need to identify activities in digital and technological era and elaborate the skills required to manage libraries in new environment. Thus the staff analysis and requirement is to be evaluated in the light of ICT/ Digital era decides the job pattern required for it.

4.3 Need for Staff Formula.

Innovation and change are the two main factors which help human being to adjust with the changing environment. Darwin's principle of survival of the fittest is useful in all the areas of knowledge. Many changes are reported in the library profession due to use of technologies changing education system, increasing user exceptions form libraries and increase in digital environment. The functions of libraries have constantly changed due to different factors from time to time, manuscript to digital libraries etc. Though the functions of libraries remain same but the nature of performing jobs are shifted. Every time efforts are made to identify the change / challenges and educate the library manpower to sustained in the profession. Based on the activities carried out in libraries the requirement of staff also changes. Dr S R Ranganathan proposed in his staff formula when only print media and limited branches of knowledge available. Due to application of technologies the change in environment witnessed to develop digital resources wherein the nature of functions of different units changed and the maintenance of traditional library was reduced considerably. Due to this a situation is felt where the function either remains same but activities shifted using digital media. For every change there is a need to review the requirements of staff in relation to Job and its description.

Staffing is one of the important areas in every library management and generally called as personnel management or human resource management. The HRD and HRM are two types used for staff controlling. In general staff of any library is divided into four types:

1 Professional: Professional staff is well qualified and trained in LIS and can manage the library independently with responsibility. Under this category the different positions like librarian deputy librarian and assistant librarian are included. The personnel of this cadre are heading the

departments or sections in the large academic libraries with the help of semi – professional staff. They are well qualified and having different skills

2. Semi – professional: In this category the library assistants, cataloguers, classifiers, indexers, library clerks are covered having less qualification or graduate in LIS. The task carried out by this group is managing acquisition, organization and processing of the documents providing information services etc. under the supervision of professional staff.

3. Non – professional: This category of staff is supporting staffs and helps in who under take administrative jobs like stenography, clerical work, finance and managing correspondence.

4. Technical staff: this category of staff manages Xeroxing operation of different machines in libraries maintaining equipment's etc.

For effective management of library activities library needs not only sufficient number of staff but a well-educated and knowledgeable staff to carry out the desired work. A right person is to be deployed for the each right job in libraries. Every person appointed in library should know his her responsibilities duties and requirement of the institute to fulfill mission and vision. This is generally called as job description. Job description is fixed or defined for every post. Job description is not an easy task for which there is a need to analyze various jobs, function activities carried out in the libraries and this is Job analysis. Thus for each position in the library it is necessary to analyse Job description and Job analysis. In addition to this there is a need to decide how much work is to be done and how much staff is required to carry out the task qualitatively.

The staffing is mainly concerned with:

1. Number of qualified staff.
2. Identifying and fixing job description.
3. Analyze and evaluate job activity.
4. Develop norm for motivation and staff.
5. Shift in nature of Job

In addition to these few more points like comprehensive man power system, planning identifying long term staffing etc. need to be covered modernization, skill achievement, staff development program etc. are also necessary for survival.

Libraries transformed continuously and require new skills to manage the advanced libraries. The staff formula discussed earlier by the scholars is not functional in the era of digital environment hence considering different concepts for deriving staff formula the researcher felt to review the changes occurred in libraries due to technologies as well as discuss job description and job analysis based on newer concept in the profession. No doubt there is a need to review staff formula or staffing pattern based on newer concepts adapted in libraries. The technological revolutions prompted researcher to study in detail the staff required with their skills to manage the change and deduce a pattern for staff in digital media as slowly traditional libraries are migrating towards digital and virtual libraries and there is a need to assign staff pattern in digital libraries.

4.4 Status of Staffing Pattern:

The researcher has decided to identify staff pattern for academic environment as this is the major component in higher education society. The academic environment mainly covered college and university libraries due to their nature of work, Colleges are now acting as research centers and getting help from all the academic resources like UGC (IINFONET). On reviewing the literature it is observed that following major staffing patterns in terms of staffing formula are identified by many scholars. A brief analysis of staffing patterns is discussed as under.

4.4.1 Dr. Ranganathan Staff Formula:

Dr. S.R. Ranganathan in his book “Library Administration” 2nd edition has recommended the following staff formula based on intake of libraries

a) **Professional staff Pattern :** The formula stated by Dr. Ranganathan is :

SB+ SC+ SL+ SM+ SP+ SR+ ST

Where:

a) S = Staff

b) **Non-professional skilled staff**

B/30,000+ S/100

c) **Unskilled staff**

SB/ 4+SC/ 2+SL+SM/4+SP/2+SR/8+A/20,000+D/500+B/60,000+

(S/100)/4+V/30,000

Explanation

SB = Number of persons in book section

SB = A / 6000 = Number of books accessioned in a year / 6000

SC = Number of persons in circulation section

SC = G / 1500= Number of gate-hours for a year / 1500

One gate hour= one counter gate kept open for one hour

SL = Number of persons as librarian and his deputies

= HW/1500= Number of hours library is kept open in day* Number of working days in a year/1500

SM = Number of persons in maintenance section

= A/3000 = Number of volumes accessioned in a year/3000

SP = Number of persons in a periodicals section

= P/500 = Number of periodicals currently taken/500

SR = Number of persons in reference section

=(R/50) (W/250) = (Number of readers per day/50) (Number of working days in a year/250)

ST = Number of persons in technical- that is classification and cataloguing-section.

= A+40D/2000=Number of volumes accessioned in a year+ 40* Number of periodicals abstracted and indexed in a year/2000.

B = Annual budget allotment in rupees

S = Number of seats for readers

A = Number of volumes accessioned in a year

D = Number of periodicals abstracted and indexed in a year

V = Number of volumes in the library

It may be noted that requirement of staff for each section has been calculated on the basis of experience. According to formula, the number of professionals required for a periodical section is based on the assumption that one professional is sufficient for procuring and recording 500 periodicals per year. Similar assumptions form the basis of the formula.

4.4.2 Staff Pattern for Public Libraries

S.R. Ranganathan has also recommended the following staff formula for the public library system, which is different than academic libraries but treated mostly important in society development. (Krishan Kumar; 1987; 84).

Summary: The staffs required in the library based on Dr Ranganathan formula in different sections are:

1. **Book Section**: One person for every 6,000 volumes, added in year.

2. **Periodical section**: One person for every 1,000 periodicals currently taken.

3. **Classification and Cataloguing Section**: One person for every 2,000 volumes added per year.

4. **Maintenance Section**: One person for every 2,000 volumes added in a year and one person for every 50,000 volumes in the library for maintaining the total collection.

5. **Publicity Section**: Minimum one artist.

6. **Administrative Section**: Minimum one library accountant, one steno-typist and one correspondence clerk is necessary to take care of administration.

7. **Reference Section**: One person for every 50 readers using the library in a day of the year.

8. **Circulation Section**: One person for every 1,500 hours for which one wicket-gate of the library has to be kept open in a year.

9. **Supervisory Section**: One librarian and one deputy librarian.

The professional and non-professional staff that may be required for a public library service has been estimated by the Advisory Committee for Libraries set up by the Government of India (Kumar; 2003; 151) as follows:

1. **State Central Library**- One state librarian, one deputy librarian, one assistant librarian, twenty-two Non-professionals.

2. **District Library**- One librarian, one assistant librarian, three professional assistants and nine other non-professional personnel's.

3. **City Library-** One librarian, one deputy librarian, (except in cities with a population of less than 5 lakhs), one assistant librarian (except in cities with a population of less than 2 lakhs), professional assistants minimum 2, and maximum 18 according to population served.

4. **City Branch Library**- One librarian, two professional assistants and five non-professional personnel's.

5. **Mobile Library**-Two professional assistants and three other personnel's.

6. **Block Library**- One librarian and two other personnel's.
These public libraries staff need is also suggested**.** But it is very sure that this staff strength is not available in any of the libraries and has to consider the issue

4.4.3 Staffing Formula Suggested by UGC

First staffing formula developed for academic college libraries was the outcome of recommendation of the library committee appointed by the UGC under the chairmanship of S R Ranganathan in 1958. The formula suggested the post of librarian, one post of deputy librarian, one post of accountant, one position of steno-typist and one clerk. These positions in libraries look after the administrative and management tasks. In addition to these two main managerial positions every function or unit in the library is managed by Asst. Librarian and hence the following staff is to be added as per demand. (Satarkar, 2000 p. 71-72)

(1) **Book section and Acquisition Section**: One person for every 6000 volumes added in a year.
(2) **Periodical Publication Section**: One person for every 500 current periodicals subscribed.

(3) **Documentation section**: One person for every 1000 entries prepared in a year for the development of information products like bulletins.

(4) **Technical section**: One person for every 2000 volumes added in a year and processing it for the availability in library viz. cataloguing, classification and indexing.

(5) **Maintenance Section**: One person for every 6000 volumes added in a year, one person for every 500 volumes to be replaced in a day and one person for every 100000 volumes in the library.

(6) **Publicity section**: No staff provided for this section as this was not considered in libraries.

(7) **Administrative section**: Minimum one accountant, one steno typist and one clerk for managing administrative jobs.

(8) **Reference section**: One person for every 50 readers (other than the users of the textbook collection) in a day for providing short range and long range reference services as well as referral services.

(9) **Circulation section**: One person for every 1500 hours for which one wicket gate of the library has to be kept open in a year who looks after all the circulation activities.

(10) **Supervision section**: One librarian and one deputy librarian for undertaking managerial tasks.

(11) **Unskilled staff**: One cleaner for every 30000 volumes in the library , one attendant each for every 6000 volumes added in a year, one attendant for every 500 current periodicals taken, and for each of the shifts in the circulation section, besides unskilled and the semi-skilled workers normal to any institution.

The staff pattern initiated by UGC is accepted but S.R. Ranganathan suggested few more additions to remove the gaps and the following changes are suggested in UGC formula in 1965.

(1) Periodical publication section: 1500 periodicals subscribed.

(2) Documentation section (to supplement the work done by the INSDOC and the international abstracting services): 30 research workers in the university.

(3) Maintenance section: 1500 volumes newly added, 50000 volumes to be looked after

The staff formula in the current situations, But it is necessary to weakness of the formula and discussed and few points raised were:

(1) It is difficult for any college library to subscribe to 500 current periodicals, therefore, a person to look after the periodicals work independently may not be available. This can be true in case of university library

2. Similar situation raised for maintenance work as the college may not have collection of one lakh books (newly initiated).

3. No college library can add 6000 volumes in a year as the cost of books has increased enormously. Hence this work is also to be carried out in part only.

4. One person for 1500 gate hours is also not suitable as in these situation the average working days in a college comes to 280 roughly so only one person can be available for this work.

5. The formula does not suggest staff for property counter, watchman, reading room, Xeroxing, etc. This is the weakness.

The standing committee of the UGC on university and college libraries in its meeting held on August 30, 1979 approved the following staffing pattern for college libraries: "A college having an enrolment of 500 and 10000 volumes in the library should have a staff of one librarian, one assistant librarian and attendants. For every additional enrolment of 500, one library assistant and one attendant may be provided." Unfortunately, these recommendations were also not implemented by the state governments. Further, the formula does not suggest any semi – professionals like library assistants from the beginning. It also does not provide the position of peons, watchman's or person for property counter. It also does not suggest core staff for colleges having strength of student less than 500 students. Hence the formula was inefficient for the small institutes initiated newly. (UGC 1980 pp. 181-186)

4.4.4 Staffing Pattern Suggested by All India Council for Technical Education (AICTE).

The All India Council for Technical Education (AICTE) is another accrediting body in India for recommendations in technical education throughout the country. It has developed norms and standards for engineering colleges (degree programs) in 1990 (AICTE 1990 p. 53-54), and has

made them applicable too. These norms gave number of staff admissible and job description, the council proposed following minimum staff for engineering college libraries:

Librarian One, Assistant librarians Two, Library Assistants Four, Library attendants Two.

(There is no provision for deputy librarian in this formula)

Taking into consideration the number of users in engineering colleges (about 500,) the staff seems to be sufficient, but the formula does not suggest staff for other purposes persons like sweepers, peons, watchman, etc. The formula does not give proportion of increase in staff if number of readers, documents or timings of the library increase. Further, this staff seems to be sufficient for one shift only. It is difficult to manage library functions for more than seven hours a day with the quantum of staff proposed. The AICTE has also provided standards for job description for library staff and details are as follows:

1. **Librarian:** The librarian is responsible for planning and developing the library of the college and provides the necessary library service to the students and staff of the college. He is responsible and report to the principal in all matters connected with the library activities. The job of responsibility is :
   - To manage the library efficiently by looking after general administration of the library .
   - Preparing annual budget.
   - Looking after acquisition of book / periodicals / video tapes including its selection .
   - Planning and developing the library for modernizing and
   - Overall supervision.
2. **Assistant Librarian:** The assistant librarians are responsible to manage the sections. Job Description for this position covers assisting the librarian and in his work, cataloguing and classification of books and periodicals including supervising maintenance of stacks etc.
3. **Library Assistant:** The library assistants are responsible to support the activities carried out by assistant librarian and the librarian. The Job Description covers Issuing and receiving of books, replacing the books and periodicals etc.

4. **Library Attendants:** The library attendants are helpers to librarian and assistant librarians. The Job Description covers checking at entrance, control over property counter, maintenance and upkeep of library, labeling and pasting, repair of books etc.

AICTE has suggested the number of staff and their job description but the pattern suggested by AICTE has lacunas in it as it has not covered all jobs carried out in a college library. The description does not mention the work relating to rendering facilities the services like reference service, documentation, Xeroxing etc. Further, the formula has suggests only core staff and does not permit any addition in it. (AICTE 1990 pp. 53-54)

4.4.5 Staffing Formula in Karnataka

The Government of Karnataka issued orders in 1981 and prescribed the staff pattern for college libraries as under: (Karnataka, Government. 1981 p3). The Karnataka state suggested staff pattern for two types of libraries viz. population less than 1500 students and colleges having population more than 1500 students (users).

(a) For colleges having less than 1500 students: The staff suggested is as under

Librarian – 1, Library Assistant – 1, Clerk – cum Typist – 1, Attendants – 2.

(b) For colleges having more than 1500 students.

Senior Librarian – 1, Librarian – 1, Clerk – cum Typist – 1, Attendants – 3.

It is observed that the staff prescribed according to the formula is inadequate. It does not consider timings of the library, number of documents available and readers to be served, the library services like reference service, documentation, extension activities, number of counters or area of library building reading room facilities etc. In case libraries belonging to (b) the post of assistant librarian is converted into librarian and librarian to senior librarian. Only one attendant is added. This staff pattern is insufficient. (Karnataka, Government. 1981 p3)

4.4.6 Staffing Formula in Himachal Pradesh

The Himachal Pradesh Government has suggested minimum (core) staff for academic colleges in their manual for college libraries. (Himachal Pradesh, Govt. p 263). The pattern is prepared for two types of colleges' viz. 1 Undergraduate and 2 Postgraduate college libraries.

4.4.7 Staff pattern for Undergraduate Colleges:

College librarian 1, Professional assistant 1, Semi – professional Assistant 2,Senior Library Attendant 1, Junior Library Attendant 2, Library Cleaner 1. In all staff recommended is 8.

4.4.8 Staff pattern for Postgraduate Colleges:

Core staff for postgraduate colleges was suggested assuming the enrollment of 1000 students and number of volumes in library as 15000.

College librarian 1, Professional assistant 2, Semi – professional Assistant 2, Reprography assistant 1, Clerk – typist 1, Senior Library Attendant 2, Junior Library Attendant 2, Library Cleaner 1, In all recommended staff is 12.

It is further suggested that in the formula for every additional enrolment of 500 students, one semi – professional assistant and one library attendant may be added to manage the library functions. It can be observed that this formula provides reasonable, adequate number of staff but does not consider the extended timings of the library reading room. While increase in number of students is considered the number of documents is not taken in to account. Further, it does not suggest staff for college libraries having less than 500 students.

4.4.9 Staffing Formula in Kerala (Government of Kerala, 1971)

In 1971, the Kerala Government issued orders regarding staffing at colleges in Kerala (Government of Kerala, 1971) and classified the college libraries into four grades and prescribed norms for appointment of librarians. Further, in 1982 the pattern of non – teaching staff in science and arts colleges was revised (BavaKutty p252). According to both orders the staff pattern is summarized in the following table.

Table 4.1: Staffing pattern by Kerala

Grade of	Book collection	Annual Book	Librarian	Attendant

colleges		Circulation		
First	Above 15000	Above 30000	One (with Degree in Lib. Sci.)	3
Second	10000 to 15000	20000 to 30000	One (with Degree in Lib. Sci.)	2
Third	5000 to 10000	10000 to 20000	One (with Degree in Lib .Sci.)	2
Fourth	5000 and below	Less than 10000	One (with Degree in Lib. Sci.)	1

One additional attendant can be appointed if number of books is above 20000 and book issue is more than 40000, further one more attendant can be added for each of the postgraduate libraries. The formula suggests only librarians and attendants and not other professional or semi – professional, clerical staff is considered in developing staffing pattern. This affects the technical work in the library. The formula does not consider strength of the students, teachers, and timings of the library or area for maintenance work.

The state government of Kerala appointed a committee in 1992 (1995) under the chairmanship of V.P. Joy , Director of Collegiate Education, to consider the situations in college libraries, but the committee did not change the pattern of the staff. The committee suggested the formula for staffing in college libraries as under:

$$S = \frac{A + (10(B) + 50(X + Y + Z + T) + D}{1000}$$

Where

S = Total staff (excluding the chief librarian)

A = Pre-degree Students

B = Degree Students

X = Postgraduate Students

Y = M.Phil. Students

Z = Research scholars

T = Teachers

D = Documents (Books and non – books)

Though the committee considered almost all aspects of working areas in college libraries and suggested the improvements in the activities, it is surprising to note that the committee is of the opinion that the existing staff is surplus as indicated in table 4.1 .The report shows the number of required staff as follows:

Total number of existing supportive staff in government college libraries in 1992 was 134. The committee suggested it to be reduced to 118. In private colleges the existing number was 541 whereas the committee suggested reducing to 526. It appears that the committee was solely guided by the fact that the government should not have to bear additional financial burden. The committee thus totally ignored the work, services in the library and staff required for it. The Implicit idea that the library should be run only with Class IV staff is not tenable at all. The report of the Joy Committee of Government of Kerala has been criticized by Shobha Sharma (1996, pp. 81-84) and stated that: The staff formula given by the Joy Committee report is very vague. It does not specify whether the number arrived through the formulas is for professional staff or for the total staff or for total staff which includes professional and non-professionals etc. The author further suggested that if the college has to get sufficient professional staff then who can look after the library and information services of the quality and nature essential in degree and postgraduate college, and she has suggested the revised staff formula for professionals as follows:

For Professionals in LIS

$$S = \frac{A + 20(B) + 100(X + Y) + 200(Z + T) + D}{10000}$$

For non-professionals

$$NS = \frac{A + B + X + Y + Z + T + D + C}{10000}$$

Where C = Actual circulation of the documents

in spite of the revision stated, by Sharma also does not consider all factors responsible for assessment of number of staff required in a college library. Further, it has not specified the qualifications of professionals and non – professionals, minimum core staff, etc. It has not provided the job description for each post.

4.4.10 Staffing Formula in Maharashtra

In Maharashtra government issued orders in 1980 regarding the staff for academic college libraries (Maharashtra Govt. Resolution 1980 p 3) for the first time to specify the library staff to be appointed in academic college libraries. The resolution for the staffing pattern for academic college libraries are stated as under:

Librarian:

According to resolution every affiliated college is entitled to have a position of librarian as per the UGC recommended scale of the pay (the prescribed qualifications for the post is Master's degree and degree/diploma in library science) who is the in charge of the library. In addition to the librarian, colleges may hire for additional library staff for performing different roles ((with technical qualification and for purely clerical and / or Class IV as follows related to strength of students. (At the degree college and the junior college levels together)). The resolution in addition to the librarian suggested the following position in academic college libraries.

Assistant librarian: if the strength of students in the college is more than 2000. The qualifications prescribed are Bachelor's degree in any discipline with degree / diploma in library science in pay scale Rs 365 – 740 (which later revised to Rs.4500 – 7000)

In addition to this post two supporting library staff in addition to the librarian (wherever admissible) shall be added @ one person for 250 students. Every fourth member of such supporting staff may be junior clerk and the remaining persons shall be in the Class IV category i.e. library attendants. This indicates that till the strength of a college reaches to 1000 no separate clerical staff is available for the library as such there is a provision for the peons only. (For the clerical help required by the librarian then he has to be taken from office only). The minimum prescribed qualification for the post of junior clerk is SSC and the prescribed revised scale shall be Rs 260 – 495 (This was revised to Rs 3050 – 4590 later on). However, if junior clerk holds a post SSC certificate in library science, the revised scale admissible to him shall be Rs 290 – 540. (This was revised to Rs 3200 – 4900 later on). The prescribed revised scale of pay for the post of library attendant is Rs 200 – 280 (i.e. Rs 2550 – 3200 revised)

4.4.11 Review of Staff Formulae

From the study of different staff formulae following drawbacks are noticed by the researcher.

Uneven distribution of staff category

Library Timings

Nature of services and working

Reading Room facilities

Number of readers served

Circulation, work in two shifts

Job description is not considered

Scale of pay not considered

Qualifications not considered

Till the college reaches strength of 1000 there is no clerk, hence in the absence of librarian the library is to be managed by class four servants only.

If a college is having the strength of less than 250 students, only there is a provision for one librarian and no other staff member is admissible.

Formula does not propose any library assistants posts or post relating to sweepers, watchman, etc.

All technical work is carried out by the librarian till college reaches the strength of 2000, and might be loaded with different jobs including management and administration. Thus hampers the librarians task and users are main suffers.

Formula is based on number of students only and does not consider timings, number of documents available, number of readers in college, etc.

Minimum core staff is not proposed to manage the libraries.

Formula does not give job description.

The concept of ICT, digital libraries, advanced libraries difference and nature of staff is not considered in any of the formula.

The different formulae was criticized by D.B Madiwale (1985 pp 265-275) in his communication presented at ILA conference in 1985. He suggested a formula for college libraries in India in 1979 at the UGC conference. Further he has suggested the staff as under:

Librarian: From beginning of the college.

Assistant librarian: After enrolment of 1000 students.

Technical Assistants: After the enrolment of 2000 students.

Library Assistants: (a) From the beginning of the college – one. (b) In addition to the above for every 750 students one library assistant to be added.

Clerk – cum Typist: From beginning of the college library – one

Library Attendants: (a) From beginning of the college library – two. In addition to the above, for every addition of 1000 students – one.

- The resolution also taken care of reading room facilities and if it is open for more than normal working hours, one library attendant and one peon should be added in the staff list to rename anomalies of previous formulae.
- If the cleaning of the floor of library is not done by sweepers one peon should be provided for this job.
- Among every five library assistants, five library attendant, five peons and one library assistant, library attendant , peon should be promoted to the posts of senior library assistant, senior attendant and senior peon (generally called as Daftari)

In spite of this the drawback in the pattern is that this formula does not suggest the job description, and there is no provision for reprography assistant, watchman, sweeper etc. The formula considers that more staff is required in open access system. A peon cannot do the job of sweeper as suggested in the formula. Further, this formula was suggested in 1985 but still no action has been taken. The author has suggested the formula considering his college situations hence a detailed survey of present situations in the colleges throughout the state seems essential so as to draw logical conclusions. Recently, the Government of Maharashtra has accepted the recommendation made by the committee (1997 p 2) for staffing pattern for universities in Maharashtra, including library staff. The report states that the staff of the university is to be divided into various status i.e., Class I to Class IV with proportion of each cadre as follows

Class I (Group A): 4 %

Class II (Group B): 6 %

Class III (Group C): 57 %

Class IV (Group D): 33 %

The committee has recommended various sections in the university library and suggested staffing pattern for the same. However, the committee has suggested the job description for each section and not for the post. If the status of this cadre with that of college libraries, the proper proportion of Class I to Class IV cadre should be proposed. Since the state government has accepted the formula for university libraries, logically the same may be accepted for the college libraries to maintain uniformity.

As regards the academic colleges, there are arts; science, commerce, law, education colleges and availability of these faculties differ from college to college. There is a lot of diversity in the structure of the academic colleges in Maharashtra. The colleges differ in number of students ranging from 60 to 5000, from single faculty college to multi faculties, number of documents available ranges from undergraduates to post graduation or even research facilities. Taking into consideration these diversities and complexities it seems rather difficult to propose a single, feasible and comprehensive staffing formula unless a carefully study of the present situation and future requirement is done. Further it is essential to apply principles of personnel management for the various activities performed in the academic libraries. It is also essential to suggest minimum core staff for single faculty college so as to give effective services. The UGC is a recommending body and formula suggested are not accepted by many state governments and each state has issued its own separate circulars for supporting staff and in the academic college libraries only.

4.4.12 Efforts of National Knowledge Commission:

According to NKC, Providing access to knowledge is the most fundamental way of increasing the opportunities of individuals and groups. Therefore, it is essential to revitalize and expand the reach of knowledge in society. In this context NKC has submitted recommendations on areas such as right to education, libraries, language, translation, portals and knowledge networks. For the libraries NKC proposed to revamp the Library and Information Services and NKC has recommended a comprehensive census of libraries, modernizing management of libraries to ensure greater community participation, including models for public private partnerships in LIS development and leveraging ICT for various applications. For sustained attention to the sector, NKC has recommended the setting up of an independent National Commission on Libraries which would streamline all development initiatives in the sector. NKC has suggested to Re-assess Staffing of Libraries for sustaining in new environment. In the changed context, it is necessary to assess the manpower requirements for different types of libraries and departments of library and information science, keeping in mind job descriptions, qualifications, designations, pay scale, career advancement and service conditions.

Summary:

In the traditional staffing pattern all formulae focus on the Print collection and e-books or e-publications are not considered. There is a need to propose a staffing pattern, which caters to the need of today's users and information storage considering this fact the researcher has selected the study which may highlight the staff requirement , pattern, job description, qualification and skills required etc. which are discussed in following chapters.

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Chapter 5: Staff Pattern in Digital Era

5.1: Introduction:

Human resource development is an activity which directs staff towards mission and vision of organization to achieve its goal successfully. Trained manpower provide its goals for maximum individual contribution under proper working relationships and conditions including selection, allocation, utilization and development of employees as well as organization by obtaining maximum productivity. The National Knowledge Commission (2005 – 07) is a landmark in the direction of requirements from the libraries to sustain in future. It has pin- pointedly relates to all aspects of services in all types of libraries and the skills needed for the present day library professionals. In the advanced technological age libraries serves as local information centers of information and learning and local gateways to national and global knowledge. Nagi Reddy and Uma (2009) presented comparative analysis of functions and manpower analysis in detail and pointed out the major issues as related to Staff and Job.

5.2 Traditional Tasks in Libraries:

The traditional libraries have different tasks based on the physical and print media performed manually. Right form the acquisition to dissemination of information and different library and information services to users are based on manual ordering, preparation of on order cards, classification & cataloguing, assigning subjects, headings, sorting & filing of cards, preparation of monthly list of additions, Kardex maintenance, sending reminders, manual issue and return of books, reservations, collection of overdue charges, inter library loans, photocopying of articles, abstracting and indexing, referral service etc. are based on print media, using staff**.** The nature of the work was purely manual and repetitive in nature and hence more manpower was required at different fronts to work successfully. The main weakness was the services and information provided from the single library's collection and has many limitations in the process. The collection development was costly a need space to maintain it.

5.3 Modern Function in Libraries:

Since the use of ICT in libraries the nature of tasks or functions of libraries though remains same but the duplication in activities is reduced to bare minimum due to use of different technologies and e - publications. The activities of the libraries are managed by the computers, networks in the libraries and communication system involving computer generated ordering of books, down

loading and uploading of bibliographic details from OCLC or LOC for library, OPAC. Digitization and building metadata, recording of journal issues, remainder generation for non-receipts, electronic journals and databases subscription, circulation unit, management system, managing web resources, emailing of articles and providing Document Delivery Services (EDDS), knowledge mapping by surfing internet, report generation of budgets, maintaining accounts etc. The processes and functions though remained almost same but the automation, made processes fast and in less manpower as computers and communication and other technologies taken care of the tasks.

5.4 Libraries in ICT Era:

There is a need to access the status of libraries in ICT era as ICT had made revolutionary changes in practices and functions. Due to e-learning and e-publishing the education system is also vary from traditional to digital. Since library is heart in almost all educational and academic sectors, there is a need to transform the activities of libraries to suit the need of current education system and support its functions. It is also noticed that there are massive changes in the library system and they are suffering from old pattern to new patterns to new including staff, functions and activities. The brief activities of libraries in ICT era are elaborated in the following paragraphs.

1) **Acquisition Process** (Books and Periodicals). Traditional libraries acquire of books and periodical in print form and have two separate entities. This is due to difference in acquisition process as books have to be procured and then paid the charges where as in journal subscriptions, advance payment is required and then receipt is to be monitor properly received through different vendors. In the ICT and digital era the task of ordering is much easier as compared to traditional. The activities are taken care by computers and communication system as well digital publications where in many subscription models are available. The manpower required to run two units is now possibly managed by a single unit staff as the process of ordering has reduced as well as media of subscription is shifting slowly from print to digital in case of both books and Job. The only issue of fixing the price models of books and journals. In digital era

evaluation, negotiates, communication and qualitative collection development skills are necessary.

2) **Processing:** The traditional libraries have to manage with cataloguing classification and indexing of collection. In digital libraries the task is managed with developing metadata of collection**.** The unit entry for digital publication takes care of the activities related to cataloguing and OPAC is instantly developed using software's. The document data can be downloaded from LC or OCLC databases including class number, indexing terms and subject headings etc. Thus for processing manpower is reduced in digital environment due to elimination of manual work.
3) **Reference**: The reference service in the traditional library was more prominent and essential with the help of print documents using secondary and tertiary literature, but in digital environment the task of the reference service converted to virtual Reference Desk (VRD) as the digital reference sources are more popular and the task is managed by the chief librarian in addition to his other duties and also freed from manpower. The different services like "Ask Librarian" are also managed in reference service of digital libraries using virtual and internet resources.
4) **Circulation**: In the traditional libraries circulation is the most prominent activity where most of the manpower is required to manage the unit, but now in electronic and digital environment access to documents is over the network and hence man less circulation is possible, (e-book environment**)** Single manpower is sufficient in case of hybrid library. Most of the activities are managed by computers. However self-managed circulation desks are now developed using Kiox board. Man less circulation system is used and users can themselves operate the circulation activities. The remote logon facility is also helps in reducing the load on the staff.
5) **Stack Maintenance**: It is observed that Hybrid Libraries are mostly operated and hence the manpower is required to some extent but since the access to documents in future shift to digital documents then there is no need to deploy maintenance staff to manage the print and e-collection both. Maintenance of e – collection / digital collection is called as "Digital Resource Management" and "Digital Resource Preservation". These functions need specialized skills.

6) **Information services**: Since the data is available in digital form the users are themselves expert in getting the information directly on line. In case of traditional libraries the information services plays an important role and also need more manpower as all the activities are based on manual exercises. In case of digital collections and use of Internet the literature is available in abundance and more services are provided to user in a limited staff.
7) The administrative work and tasks are also reduced due to e-mail facilities. Even data maintenance is carried out in electronic files. The physical verification is managed through computers. The data is stored in e–files and developed paperless offices. The replies to queries are possible using e–data.

5.5 Staff Pattern in Digital Era:

American Library Association in 1947 pointed out the principles for deciding quantum of library staff, which is based on the "The number of staff members in a library should be sufficient to provide consistently efficient service at all hours when the library is open to the readers, and to perform the duties involved in assembling (acquiring), organizing and interpreting the information materials required by the users of the library. The size of the staff for any given library or library system must be based upon the program of service adopted by the library, the population and size of service area, financial support, and more specifically, number of departments, branches and other organized units, the amount of circulation and reference service, the plans of the library buildings, the hours of opening, and other factors". In short ALA considered the input material services provided, sections and activities carried out in libraries while fixing the library staff.

The efforts made by the different authorities in building or proposing library staff is as under:

1) ALA Developed staff formula, 1947.
2) The formula with minor changes recommended by the library committee of the UGC (1957) and Dr. S. R. Ranganathan was the chairman.
3) Dr. S R Ranganathan staff formula, 1959.
4) Academic library system in the fourth plan period, Dr. S. R. Ranganathan (1965) Revised or presented staff formula.

5) ALA, 1956 and which effective in 1960 presented minimum standards for library staff requirement. This was revised in 1966.
6) Roberts committee (1972) recommended a staff formula for the urban libraries in England.
7) Revise staff formula in a seminar on "work flow in libraries" held under the Indian National Scientific Documentation Centre (INSDOC) and UGC between 21-24.Nov. 1966 at New Delhi.
8) (In UK the) Parry committee and Robbins committee on University Libraries and UK (1967) had emphasized the necessity of development of library personnel.

These were related to the traditional libraries but later emergence of technologies, changes due to ICT. The staff requirement is shifted towards ICT used in libraries.

After analyzing all the staff related studies conducted by organizations / agencies and experts, the investigator identified that the foresaid formulae are not applicable to the present day system due to changes. This is mainly due to the developments and applications of ICT in the library field. The traditional libraries have changed to digital, automated, virtual, internet and intranet libraries and depending on e-resources heavily. Therefore, it is necessary to revise the staff formula for the library in the ICT or digital era.

In ICT and knowledge exploration era, new technologies are introduced in libraries and transferred the traditional libraries usually print versions, to hybrid libraries electronic or digital libraries. The manpower is replaced by equipment's and library software's programs like computers and networks. The readers are also advanced and using technologies for searching information as they need right information at the right time from any place. Most of the readers use libraries only for e - books and e - journals, databases and e-resources available in the library on a particular topic. Libraries are connected with consortiums for managing modern practices. The developments in the library are enormous due to different factors discussed earlier and the old patterns of staff are not feasible in present era for sustenance. Libraries need staff of different quality based on the quantum of incoming data and services provided.

Therefore, it is a necessity to revise the staff formula and patterns for developed previously based on the digital contents and e-libraries. The base is now activities carried out to perform the duties involved in assembling, organizing and interpreting the materials required by the program of the library.

5.5.1 Manpower in Traditional Libraries:

A library generally need a spacious space building , and adequate collection comprising of books and other reading materials, but libraries cannot function well without efficient, trained and qualified staff. In the academic sector especially in university libraries the number of staff is more as the manual processing facilities / functions need more manpower. Dr Ranganathan staff formula presented in 1959 is still effective in case of traditional libraries, as it is based on the documents received as per volumes to users and services provided. The deployment of the staff and job description is based on the activity of the unit. In traditional libraries workload is more as the tasks and functions are repeating. The staff, the documents and the users make up the fundamental trinity of a library. The overall hierarchy of library staff in academic library (University Library) is indicated in the following flow chart. The number of Assistant Librarians and library assistants is based on the sections and load of work in the libraries. The designations in the academic libraries are as under

Librarian (Chief of all)

↓

Deputy Librarian (For all section heads)

↓

Assistant Librarian (Supporting to each every section and reporting to Deputy Librarian

↓

Library Assistant (For involvement of technical work)

↓

Senior Library Attendant } Maintenance stack and other activities

↓ }

Junior Library Attendant

↓

Clerk ⎫

↓ ⎪

Daftry ⎬ Administrative staff supports to maintenance.

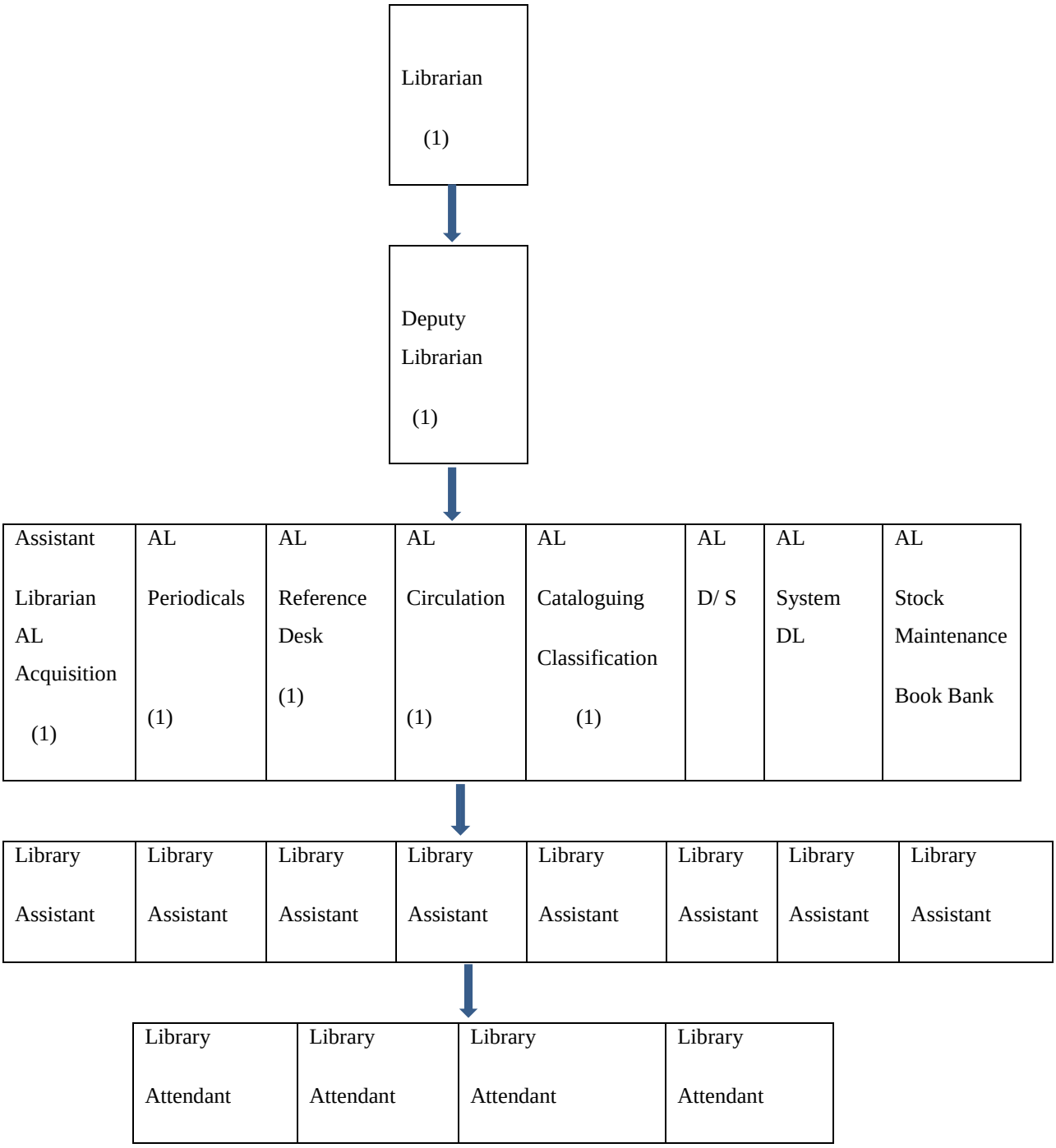
↓ ⎪

Peon ⎭

The qualifications may vary differently for different positions in libraries but depending on the post and job allotment. Librarians and deputy librarians in the university libraries need to have qualifications equivalent to professor (Masters with first class in any discipline and masters with first class in Library and information science), difference may be in amount and kind of experience. A senior professional have to contribution in the professional literature. The skills required to manage the traditional libraries have: Technical skills (Classifying, cataloging, indexing etc.), administrative, managerial and preservation skills, communication skills, etc.

The Library Committee set up by the University Grants Commission in 1957 laid down the staff formula for the university and college libraries in India. The staff formula laid down by the University Grants Commission (Krishan Kumar; 1987; 85) is presented in the flow chart:

5.5.2: Staff / Manpower in Traditional Libraries



(Source : Kishan Kumar 1987 p.85)

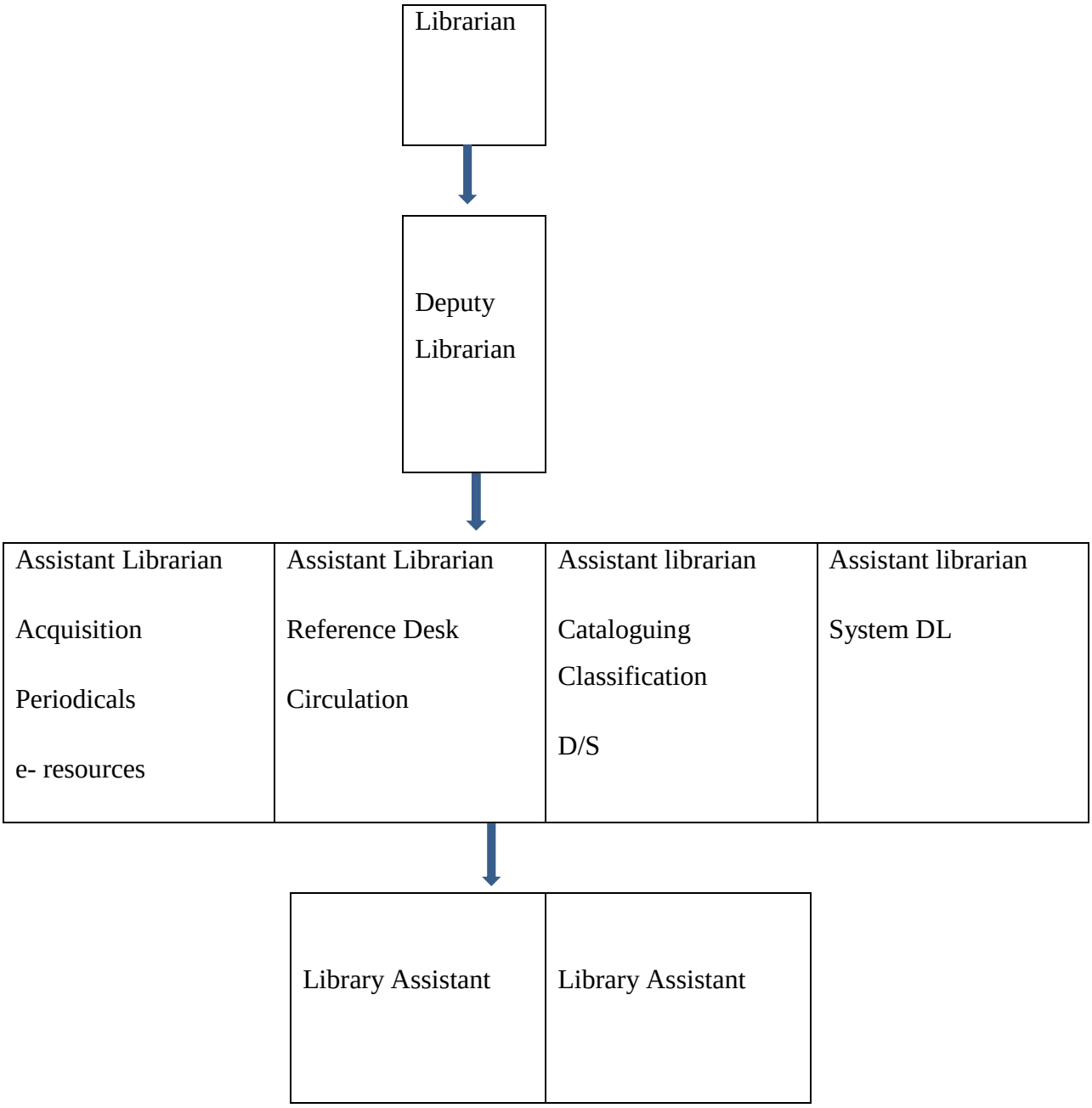
In Traditional Library system as discussed in above table, The different positions in academic libraries are : Librarian (1) Deputy Librarian (1) Assistant Librarian (8) Library Assistant (8) Unskilled: Attendant (4) Clerk (1) Accountant (I) has been by Krishan Kumar (1987). Later few more scholars shared their views in terms of staff requirements and patterns.

5.5.3 Staff in Digital Libraries

The present and future and technology is the main cause in considering re-engineering of HRM and HRD. Technologies are forever changing the way that librarians have to serve their patrons, and indications point out that change is continues in nature. The human resource is essential for successful managing libraries in technology-based service, and libraries are challenged to develop and implement new services along with traditional services, often with no increase in staff. The support of electronic services requires manpower with special skill sets. Each library has to develop individual solutions to manage libraries in digital era.

Computer and Telecommunication systems have dramatically revolutionized worldwide library systems. Applications of information technologies in libraries have developed the digital libraries. The role of librarian and functions of libraries are changing due to constant changes. The job descriptions for different positions have also changed. The staff requirement in the digital libraries is presently difficult to analyze as there is no library that is totally digital. All the libraries are in the stage of migration and generally called as hybrid libraries or multimedia libraries since they contain print and digital media both. However the staff formula based on the different programs in libraries where digital data and documents are made available has different pattern than before and also job descriptions and skill sets required are also different in practice.

On the basis of collection, functions, user needs, technology advancements, services provided, initiative for new projects like IR development, database development, data conversion, digitization etc. the investigator designed the new staff formula for “Digital Libraries” especially useful for academic libraries (College and University libraries) is indicated in the following figure.



In digital libraries the desired staff requirement is as under:

Digital: Librarian: (1) Deputy Librarian: (1) Assistant librarian (4), Library Assistant (2), Thus in all 8 staff required in Digital library; however staff for teaching is not considered.

5.5.4 Identifying Staff in Digital Environment:

There is no pattern or formula practiced so far as the manpower is need for digital library, but few efforts made to find the need of the manpower in the digital era. The need of staff is decided on the following factors:

- Identify the trends in the LIS profession including trends in ICT and management.
- Identify the need and expectations of the users form the libraries in relation to the change.
- Consider the mission and vision of the organization as well as financial support from the organization to accept the trends.
- Adapt new skill set required to sustain in the digital era.
- Identify the challenges to be faced by the library professionals and capacity building to face them.
- Describe the job description of staff working at different levels in new era based on activities.

5.5.5 Trends in profession:

While considering theses aspects of the trends in LIS which are changing fast due to advancing technologies, education reform (e-Learning), societal changes, information literate customers, and globalization of 'everything' and their impact on librarianship and libraries, is obviously crystal clear. 21st Century librarianship may drastically be different from all previous (traditional) concepts of librarianship. It requires professionals who adapts the potential of technologies, creatively finds appropriate ways to implement technologies into library services, and one who has more diverse – even 'unconventional' – skills than ever before. The 21st Century Librarian is a professional who understands the Millennial library customer, and adapt existing services and create new ones to meet their community's needs, and change the public perception of "library". The changes are thus mainly due to ICT and other technologies which helped librarians to provide better services to user community in advanced manner.

5.5.6 User Expectations from Libraries:

On the other hand users and their demands are changing as they are using technologies and Internet, e-resources over the mobile. The user expectations from the libraries are different than previous. They need pinpointed information from the vast ocean of knowledge bases on their desk top. The users are technology savvy and also need information services using social media

and web tools. Library professionals are always accepting the changes for providing better services to the users and try to fulfill the vision and mission of the institutes and libraries. But alone libraries desire to accept the trends is not sufficient, the support from management for financial assistance is also required to sustain in the changed environment. If these conditions are favorable then professionals can manage the change easily.

5.5.7 Professional Challenges:

The challenges in the profession are many and vary from library to library depending on the culture. Many scholars have predicted the changes arising due to technologies and management tools, but current challenges arise due to technological impact including e-publications and e-Learning and teaching. The major challenges isolated form the literature browsed are:

- Reach to the customer by providing outreach services, the users in modern era are digital fugitive, digital immigrants, and digital native etc. and to reach to the customer there is a need to follow outreach programs in the profession.
- Need of information literacy and information literate staff is also a sort of challenge who knows themselves the availability of information and different resources.
- It is sometimes predicted that computers and technologies may take over the role of libraries.
- Transition of libraries towards digital content is a major change faced by the librarians and hence there is a need to search the new path to sustain in the profession.
- If technologies and challenges are not accepted at the right time then the values of the libraries may reduce in future digital contents
- To manage the change there is a need to develop personal skill sets to match with the new environment.

Thus the challenges in the profession of library are many but can be managed well using technologies and converting print media to digital with OCR technology.

5.5.8 New Roles in the Profession:

The library professional's role is changing in the digital era and tuning with the profession there is a need to acquire additional set of skills which suits to the needs of the modern era in addition to the traditional skill sets. The skill sets like technological, internet searching, online searching are necessary in the current digital world. The librarians are moving into dramatically different

roles as new services are implemented in the profession. Technology driving changes are across the entire range of library profession which transforms the responsibilities.

Acquisitions librarians have to deal with "access without ownership" and face issues involving leased licensing for electronic databases, full-text journal article access services and other services that are acquired virtually (Grodzins-Lipow 1997). These new resources arrived with new policies of licensing issues. Librarians have to analyze the information product and after ensuring that electronic product license agreements are appropriate for local circumstances and anticipated patron use patterns. Catalogers are also moving into new roles as they attempt to provide enhanced access to the new resources. They now process not only books, but also CD-ROMs, computer discs, and multi-format items. Catalogers have to provide link to electronic journals and managing various databases. Catalogers today create records that accommodate multiple means of accessing a particular resource. Patrons are coming to expect records that include print holdings, microforms, and direct links to an electronic version of the document item. Records must successfully interact with not only the library OPAC, but also with a growing variety of indexes, full-text services and browsers. In addition to acquiring and processing resources in a variety of new formats, libraries are increasingly involved in the creation of resources. Digital library (a term still being defined) initiatives generate many local-content information resources that require different bibliographic control schemes.

Reference librarians have recently been experiencing double jeopardy. While continuing to serve patrons from service points in the library, many reference librarians are now supporting need of growing clientele of remote-access patrons, and "more demanding, less patient users who have greater expectations" (Rettig 1993). Now patrons often require special support from reference librarians, even if the remote access patrons are using the same (electronic) resources save as the walk-in users. Users submit questions through email and linked web pages require attention from reference staff, and the virtual reference transaction can be more complex and time-consuming than traditional in-library service. As technology advances, reference librarians are increasingly involved as teachers of "information literacy" (Osorio 1997). Many libraries now use their web sites as exclusive platform for electronic patron services. Librarian input is necessary to develop a well-designed web interface and a page-linking structure that facilitates efficient use. Thus,

libraries are faced with the need to effectively apply limited staff resources to meet the growing number of technology-driven challenges.

These facts have forced library professionals in rethinking existing staffing patterns and assignments, recruiting new staff to change the mix of skill sets and the use of creative supervision which can help libraries to develop solutions that solve current problems but are flexible enough to accommodate future changes. The staff pattern based on these factors the researcher has presented the staff pattern and qualities required to face changes in academic libraries especially university and colleges. To sustain in the profession in the digital era are library professionals have to undertake different activities:

• Conduct continuous assessment (Users and information both) • Be service oriented (innovative and value added services) • Employ marketing strategy (marketing and revenue generation)
The skills required in the profession at the present technological era needs:

• Cloud Computing
• Customer or user oriented services
• Crowdsourcing
• Digital Discovery
• Open Innovation
• Social Networking

• Learn and re-learn
• Use constantly changing technology
• Master in devising new ways to find Information (Data gathering)
• Efficiently problem solver
• Effectively communication
• Create strategic collaborations

All these skills help in building strong sustenance in the profession for the professionals.

Staff for university Library this in the digital era is summarized as under:

Digital Acquisition (DA) = 1 Professional to manage acquisition and periodicals unit

Digital Processing and Asset Management (DPAM) = 1 Professional and 1 Attendant (Circulation monitoring)

Digital Library Services (DLS) = 1 Professional

Reference Desk (RD) = 1 Professional

Information Products Development (Database and IR) (IPD) =1 Professional

Digitalization Project (DP) =1 Technical or semi professional

Library Hours 7 AM to 10PM = 2 (Attendants)

ICT staff (Network, internet and Web page Developing) = 1 Professional

The qualifications required for the librarian, deputy librarian and assistant librarian need the masters in any discipline and masters in LIS in addition to this technological background are essential. To manage libraries in ICT era there is a need to have additional education which supports to managing and re-engineer libraries. The skill set is also required in addition to traditional skills which are also essential but need to have additional skills like technological skills, networking skills, negotiation and evaluation skills, ICT skills, Internet skills, Information retrieval and searching skills, digitization skills etc.

In addition to this database manager, system administrator, network manger positions are is to be added to manage the ICT and suit the trends. Francis (1997) deduced the staff formula keeping in view the ICT Era, and framed a standard for calculating the total number of professionals. In the changed ICT environment, it is found that adoption of the available standards and formulae need to be revised. The publishing technology has completely revolutionized the earlier concept of the number of documents. Now, a single CD-ROM can occupy lakhs of pages of information. Hence, the calculation of quantum of staff based on the number of library documents has become irrelevant. A formula giving weightage to the components of users, documents and budget for calculating the total number of professional by Francis (1997) in his communication presented a formula noted below.

S = U + D + B

where;

S = Total number of professional staff

U = User component

D = Document component

B = Budget component

$$U = \frac{(UG \times 1)+(PG \times 2)+(RS \times 3)+(OM \times 1)+(IM \times 10)}{100}$$

Where;

UG = Under Graduate students

PG = Post Graduate students

RS = Research Scholars

OM = Other members including External Members

IM = Institutional Members

$$D = \frac{(PD \times 1)+(CD \times 50)+(MF \times 5)}{20,000}$$

where;

PD = Printed Documents

CD = CD-ROMs

MF = Micro Film/Fiche and other micro documents

$$B = \frac{\text{Library Budget excluding salary and inclusive of equipment budget}}{10,00,000}$$

This formula is not specifying the meanings for the figures used for division. The staff in a university library is given below by the researcher after analyzing different formulae and patters or models.

Staff= total users (U) + Intake of documents (D) + Other budget (B)

Where;

S = Total number of professional staff

U = User component

D = Document component

B = Budget component

$$U = \frac{(UG \times 3)+(PG \times 2)+(RS \times 3)+(OM \times 1)+(IM \times 1)}{100}$$

Where;

UG = Under Graduate students for three years

PG = Post Graduate students for two years

RS = Research Scholars for minimum three years

OM = other members including External Members for one year

IM = Institutional Members for the period one year

This may give % of users in the campus using library facility

For calculating documents intake the formula used can be

$$D = \frac{(PD \times 1)+(CD \times A)+(MF \times B)}{20{,}000}$$

Where;

PD = Printed Documents

CD = CD-ROMs

MF = Micro Film/Fiche and other micro documents

Where A denotes documents in CD

Where B is frames in per Fiche contain documents.

For need of library budget

B = Total Budget of Organization X 10% (AICTE prescribed)

The number of professional staff thus arrived may be grouped into two categories, i e., UGC Cadre and Non-UGC Cadre. The number of staff needed in each category may be arrived at considering the qualifications, level of technical competency, experience, etc. required to perform the various functions in a university library. It is suggested that a Minimum of 50 percent of the total professional staff may be in the UGC Cadre.

- **Staff for university Library**

Digital Acquisition (DA) = 1 Professional Manage Acquisition and Periodicals unit

Digital Processing and Asset Management (DPAM) = 1 Professional and 1 Attendant (Circulation monitoring)

Digital Library Services (DLS) = 1 Professional

Reference Desk (RD) = 1 Professional

Information Products Development (Database and IR) (IPD) =1 Professional

Digitalization Project (DP) =1 Technical or semi professional

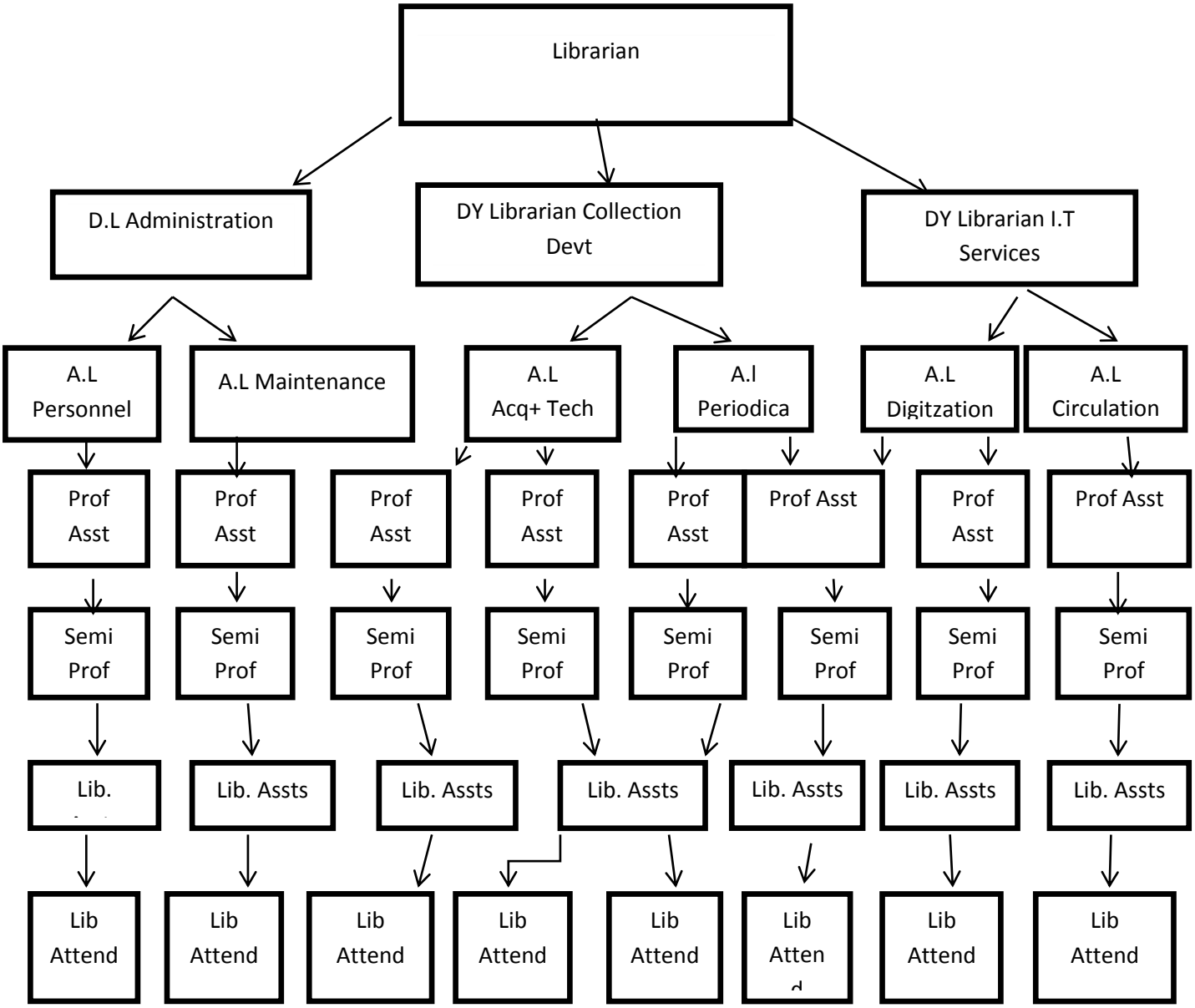
Library Hours 7 AM to 10PM = 2 (Attendants)

ICT staff (Network, internet and Web page Developing) = 1 Professional

The qualifications required for the librarian, deputy librarian and assistant librarian need the masters in any discipline and masters in LIS in addition to this technological background are essential. To manage libraries in ICT era there is a need to have additional education which supports to managing and re-engineer libraries. The skill set is also required in addition to traditional skills which are also essential but need to have additional skills like technological skills, networking skills, negotiation and evaluation skills, ICT skills, Internet skills, Information retrieval and searching skills, digitization skills etc.

5.6 Staff required to Mange Change:

The transformation in LIS impacted directly on different elements including staff**.** The staff required in ICT and Digital systems are being implemented in LIS but other conditions favorable need new manpower with different skill set to manage new era and designated librarian as ICT manager, system administrator, database manager, network manager etc. These new positions are to be introduced or possibly existing staff is to be retrained for few activities. Nagi Reddy and Uma (2009) also predicted that the ratio of the manpower in the TL: DL is 1:3.The authors have suggested the following structure of the staff in digital era for university libraries.



(Source : Nagi Reddy and Uma 2009)

5.7. Role of Library Staff in Digital era:

Sharma (2007) has defined the role of librarians in the digital era including skills and competency sets for effective management of DLs. The author opined that the treasure of information available on internet and in digital resource media changed the practices of librarians. Whereas in case of traditional libraries the access points such as, library catalogues as well as library collections are in print based and their management is by and large manual. This needs the skill set for managing monotonous media and the maintenance skills, management skills, collection development skills, cataloguing and classification skills are the need of the present and future era.

But in case of automated and digital libraries access points and housekeeping operations are computerized and called automated libraries. The graphic records are still print-on-paper publication. The access point as well as the graphic records are in electronic/digital form when these electronic/digital libraries are connected via various networks, particularly the internet, this is called virtual library. The role of librarians in such conditions is changed to manage digital data. The competencies needed for managing digital collection relates to different environment and librarian in addition to being library manager, also act as collection development, technical processor, reference librarian, taking care of information quality. The librarian's role becomes Information Manager and has to meet information need of the user and have to manage and deliver appropriate information services. Librarians become Information adviser / instructor and ensure that user / staff knows how to access relevant sources of information (literacy). Library professionals have to get them trained and act as system & networking administrator for delivery of information to their users in an appropriate manner and design appropriate systems.

Skills, knowledge, competencies required for LIS Professionals:

These are discussed by Mishra (2009) in his study on Professional information skills and elaborated following skills.

• Knowledge management: skill covers information architecture, ICT skills, technical (traditional) skills etc.

• Subject expertise: skill covers collection management; collection description, technical (traditional) skills etc.

• Information technology: skill covers design, application, systems, user support (problem solving) etc.

• **Information** Service development: skill covers user information analysis, survey, ISB, service impact analysis, planning and evaluation, promotion and marketing

Apart from these skills library professionals need following Generic skills**:** which covers**:**

• Project management: skill covers people management, research skills, bids and proposals etc.

• Critical skills: covers thinking, analysis, problem solving, research etc.

• Leadership: skill covers generic management, communication skills, strategic management, people skills, and financial skills etc.

• Promotion and marketing skills: presentation skills, communication skills

Knowledge and other Skills: Covers knowledge resources (books, journals, i.e. resources, Internet) Teleological facilities and resources (computer, online catalogues, websites, LANs file servers etc.) Financial resources (Budget) Human resources (Skills for manpower training) Competencies required in LIS professionals are:

- Acceptance of change.
- Knowledge of user interaction with knowledge resources.
- Provide quality service.
- Be adoptive, flexible and resistant.
- Be resourceful
- Possess excellent communication skills, constantly update personal knowledge base by keeping in touch with the latest development.
- Create awareness among the users, make them accept the changes
- Be an information management strategist, etc.

Technical and technological Knowledge required for libraries to work more efficiently in ICT era are:

- Operating systems - Windows, UNIX, LINUX.
- World processing, Graphics, Spread sheet & Presentations.
- Database Management Systems including the skills in Bibliographic Database Management Systems.
- General purpose programming, Networking
- Web page Development and Content Management
- Information Retrieval software for online, CD-ROM and Internet.
- Library software packages, acquaintances with Digital Library Tools.

The basic goal of library and information profession has always been to provide access to information to those who need it. The activities realizing this goal have evolved and transformed over the years. This includes available technology and need evolving information society. Information activities have been guided by the developments in the field of storage, presentation and archiving of knowledge, collection development and organization of knowledge, information explosion and computers in information retrieval. Librarian and information professional involved in information gathering, storage, retrieval and dissemination on one hand and on the other hand the computer specialists who supports the library and informational professionals in this endeavor. For successful implementation of digital library, it is essential that LIS professionals are to be trained and possess requisite knowledge and skills in this respect.

Summary:

The world of information is undergoing rapid change. Development of information technology is playing a crucial role in restructuring of the libraries. Shift from human dependent operations to machine dependency, mechanization (data processing) to knowledge processing, stand-alone system to network computing, local LAN to wireless access protocol systems have developed. Document centered information to user (Access) centered information; print media to electronic (Access) media, data capture methods, human to machine oriented. Library automating (in-house) to web-enabled services (WAN Access), online information retrieval to CD-ROM Databases, to Internet are the new avenues in the profession. These prolonged shift in application of innovative IT to library and information profession can be attributed to the changes emanated in the last two decades.

The role of librarian has changed in the digital library era. It is, therefore pertinent on the part of the librarian to acquire new skills required for developing and managing the digital libraries. The library and information professionals are required to acquire such knowledge and skills as the library is one of the highly IT influenced service profession. The empowerment of library and information professionals with IT skills is aimed at providing services that are expected from the clientele in the new environment. Digital age has brought a tremendous change in the way information is stored and accessed. This has brought about a change in the concept of librarian, their collection and services. Many new terms viz. Digital Librarian, Libraries without walls, virtual libraries, are emerging to describe the libraries of digital age.

The information professional of the future need to be user oriented and maintain a focus on the user and not become distracted by the knowledge resources. Secondly, as a professional have to deliver information to the user. Thirdly, act as team players and be cooperative and collaborative in profession. Librarians are increasingly going to participate in and be critical members of user teams. This is related to the need for increased analysis, synthesis, and packaging of information on behalf of users, and becomes responsible for the information-gathering function for the team.

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Chapter 6: Data Analysis and Presentation

6.0 Introduction:

The researcher has made an effort to understand the status of academic libraries and problems faced while creating digital environment. Hence a questionnaire containing 40 questions was prepared and circulated among the academic libraries and also uploaded over the net. The population and sample selection was based on the random selection of academic institutes and a feedback received from 63 respondents out of 100 (63%) circulated in Pune, Mumbai and on the net from the different places of India. The sample selection covers all type of educational institutes like engineering, arts, commerce and science, Management, etc. The response is almost 63% and the different questions asked in questionnaire to get the data pertaining to libraries to understand their status in respect of digital environment. The analysis of the data compiled and presented below:

6.1 Review of Academic Institutes under survey:

Questions 1 and 2 are of general nature and added in the questionnaire to get the details of communication of the responded academic institute library.

6.2 Facilities in Academic Libraries:

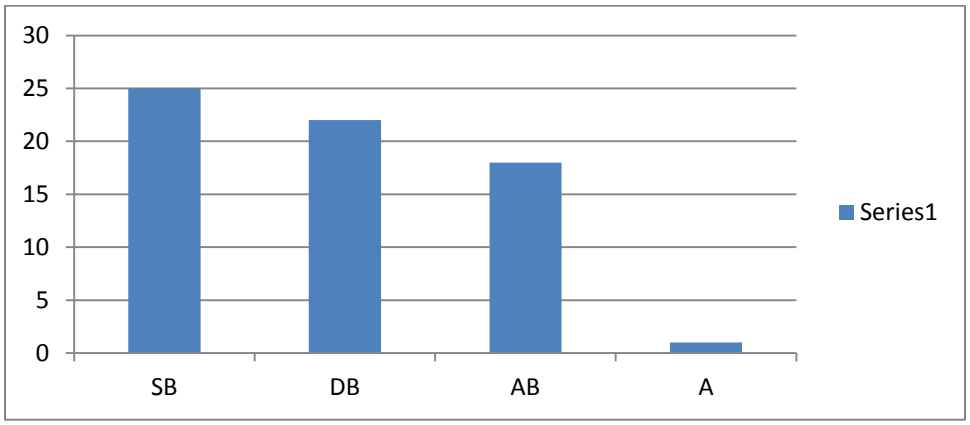
It is observed that in all most all educational academic institutes have the library facilities and the services are made available to the users in the premises including reading room facilities to the students, undertaking UG and PG studies.

6.3 Library Building:

Table: 6.1: Library Building status

Nature of Building	**Respondent**	**%**
Separate Building with departmental library system (SB) and Departmental Building (DB)	45	71%
Library in same administrative building(AD)	18	29%

Fig: 6.1: Library Building status



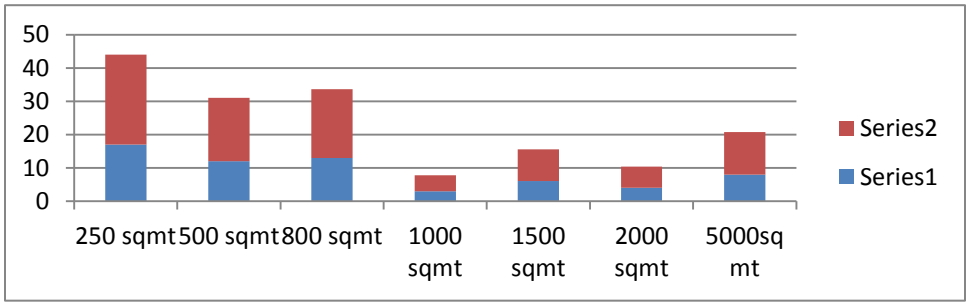
Finding: The libraries in academic institutes are located either in separate building or have departmental library facilities as per the convenience of the users. 71% of libraries have its own building or a departmental building but 29% libraries are situated in the main administrative complex

6.4 Area of the Library:

Table 6.2: Area of the Library

Area of the Library	**Respondent**	**%**
250 sq. mt	17	26.98
500 sq. mt	12	19.04
800 sq. mt	13	20.63
1000 sq.mt	3	4.76
1500 sq.mt	6	9.52
2000 sq.mt	4	6.34
5000 sq.mt	8	12.69

Fig 6.2 Area of the Library



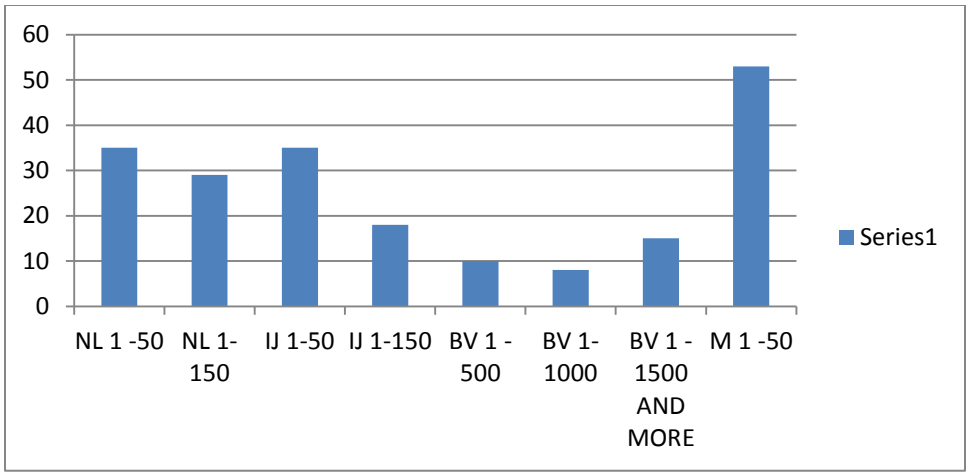
Finding: It is observed that on average libraries has insufficient space for maintaining its printed collection. Hardy 12% libraries have space more than 2500 SQMT. Respondents have not provided the section wise space utilized in the library premises. Space issues in digital environment can solve this issue in different ways.

6.5 Wealth of Library (Journals)

Table 6.3 Subscription to print journals

Print Journals Subscription	**Respondent**	**%**
National Journals 1 -50 (NJ)	35	55.5
National Journals 51-150 (NJ)	29	46.0
International Journals 1-50 (IJ)	35	55.5
International Journals 51-150 (IJ)	18	28.6
Bound volumes up to 500 (BV)	10	15.9
Bound volumes up to1000 (BV)	8	12.7
Bound volumes (BV) up to -1500 and more	15	23.9
Magazines / Newsletters 1 -50 (M)	53	84.1

Fig 6.3 Subscription to print journals



Findings: It is observed that the print journals subscribed are fairly good. On an average up to 50 national (Indian) journals are being subscribed in nearly 35 institutes. Up to 150 Indian journals are subscribed in 29 institutes. The foreign journals of international repute are also subscribed but have 35 and 18 academic institutes with up to 50 and up to 150 journals per annum. The current journals are bound together as per the norms and archived for the future use. It is noticed that International Journals are less subscribed in all libraries. Magazines and Newsletters are more in collection (84%)

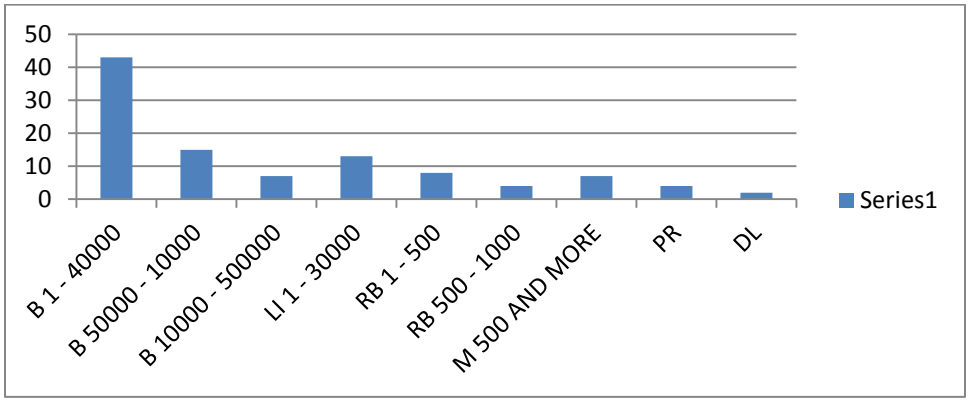
6.6 Total Collection:

Table 6.4 Collection Development Status

Nature of Collection	Volume of Collection in libraries	Respondent	%
Books (B)	1 - 40000	43	68.25
Books (B)	50001 - 100000	15	23.81
Books (B)	100001 - 500000	7	11.11
Loose Issues of Journals (LI)	1 - 3000	13	20.63
Rare collection (RB/RC)	1 - 500	8	12.69
Rare collection (RB / RC)	501 - 1000	4	6.34

Manuscript (M)	500 and more	7	11.11
Project Reports and Tech Data(PR)	PR	4	6.34
Departmental Library (DL)		2	3.17

Fig 6.4 Collection Development status



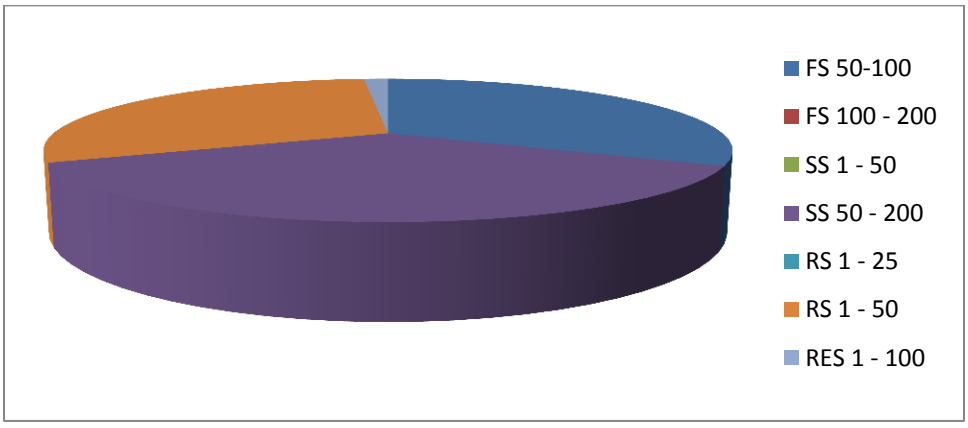
Findings: It is observed that in academic libraries more collection is of books and followed to it is by journals. The same status is visualized in this survey. Along with books and journals libraries have reports and dissertations etc. but they are less in number, whereas project reports and assignments and seminar reports are more. The collection of books is major part and 7 libraries have books in between 1 Lakh to 5 Lakh. Rest of the libraries has less than a lakh collection. Apart from the books other type of documents held in libraries are loose issues of journals, manuscripts and digital resources etc.

6.7 Seating capacity of Libraries:

Table 6.5 Seating Capacity

Seating Area	Number of Seats	Respondent Libraries	%
Rare collection (RS)	50-100	45	71.42
Faculty Space (FS)	100 - 200	0	0
Students (SS)	1 - 50	0	0
Students (SS)	50 - 200	51	80.95
Reference (R)	1 - 25	0	0
Researchers (RES)	1 - 50	42	66.66
Researchers (RES)	1 - 100	2	3.174

Fig 6.5 Seating Capacity



Findings: It is observed that space provision for using library is made separately for students and faculty as well as scholars at different places. The space is not sufficient for the students and researchers and avail library facility.

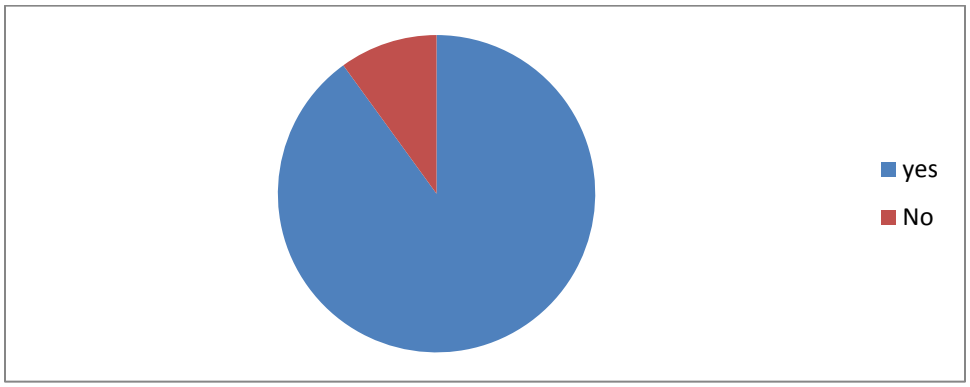
6.8 Access to Library:

Table 6.6: Access to Library

Single Access to	%

Library	
Yes	57 (90%)
No	6 (10%)

Fig 6.6: Access to Library



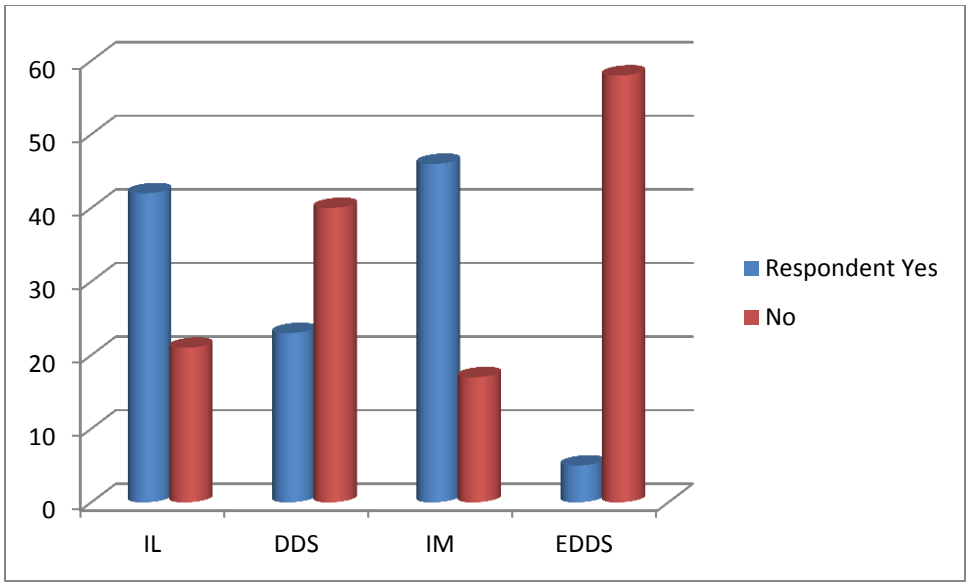
Findings: Nearly 90 % libraries have single entry and exit for library and this is very good for controlling the users. Libraries also hire staff for checking at exit doors, for checking / security purpose.

6.9 Resource sharing Activities:

Table 6.7. Resource sharing in libraries

Resource sharing activities	Yes	No
Inter Library Loan (IL)	42 (66.6%)	21 (33.4 %)
Document Delivery System (DDS)	23 (36.5%)	40(63.4%)
Institutional Membership (IM)	46 (73.1%)	17 (26.9%)
EDDS	5 (7.94)	58 (92.06)

Fig 6.7. Resource sharing among libraries



Finding: Resource sharing is very active and it is carried out mostly through ILL, DDS and Institutional Membership. This is a good start in professional society and manage E Resources and Budget. The activities of resource sharing are quite satisfactory at present. But EDDS is very less since digital collection is very less.

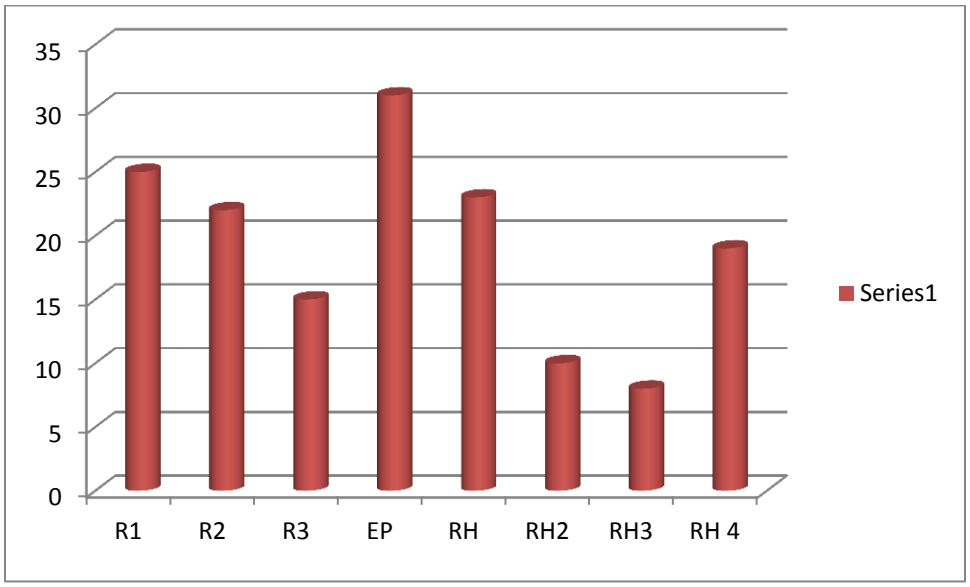
6.10 Library Working Hours:

Table 6.8 Library Working hours

Nature of working period	Timings of the Library	Respondent Number	%
R1	8 am to 6 pm	25	39.7
R2	8 am to 8 pm	22	35.0
R3	9 am to 6 pm	15	23.9
EP	8 am to 8 pm	31	49.2
RH	8 am to 8 am	23	36.5
RH2	8 am to 12 night	10	15.9
RH3	24/7	8	12.7

RH4	8 am to 6 pm	19	30.1

Fig 6.8 Library Working hours



Finding: It is observed that most of the libraries (47%) are working for 12 hours but during the exam period reading room facility is kept open for longer hours as special case. Libraries (40%) are kept open during the holidays also.

6.11 Holidays:

Table 6.9 Library Facility on Holidays

Holiday Service	Respondents	%
Yes	25	39.68
No	38	60.31

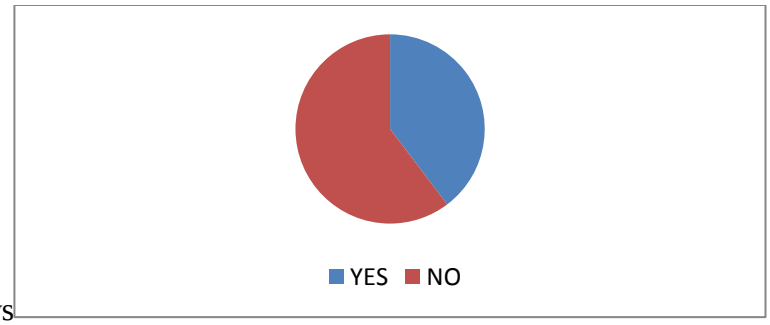


Fig 6.9 Library Facility on holidays

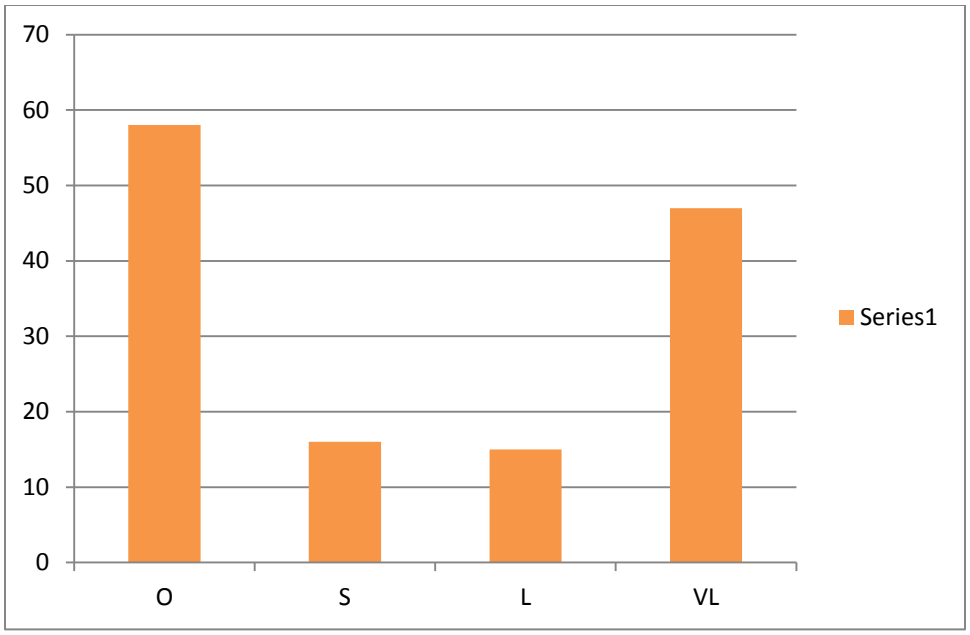
Finding: It has been observed that only 39 % libraries are kept open on holidays and 60 % libraries are closed on holidays. This is mainly due to manual system.

6.12 User Orientation:

Table 6.10 User Training Orientation Program

Type of Users Training support	**Respondent Number**	**%**
Orientation (O)	58	92
Seminars (S)	16	25
Lectures (L)	15	24
Visit to library (VL)	47	75

Fig 6.10 User Training Orientation Program



Findings: It is observed that about 58 (92%) libraries are trying to educate users through orientation classes, 31(49%) librarians are organizing seminars, and lectures on libraries and its use. Whereas 47 (75%) libraries undertake library tour of students to library and practically demonstrate the different functions, and provide orientation for efficient and effective use of library information services of library. This is at least a good activity conducted in libraries.

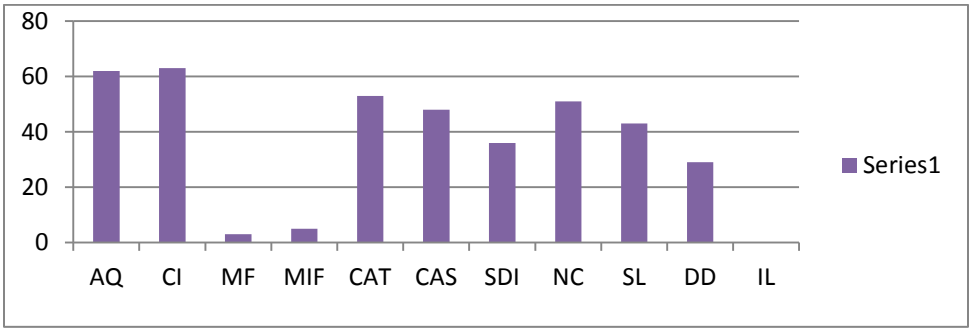
6.13: Services and Functions

Table: 6.11 Functions carried out and Services Provided

Functions and Services	**Number**	**%**
Acquisition (AQ)	62	98
Circulation (CI)	63	100
Microforms (MF)	3	4.8
Microfiche (MIF)	5	7.9
Cataloguing (OPAC)	53	84
Current Awareness Service (CAS)	48	76
Selective Dissemination Information	36	57

(SDI)		
News Paper clippings (NC)	51	81
Shelf List (SL)	43	68
Document Delivery (DD)	29	46
Interlibrary Loan (IL)	49	78

Fig: 6.11 Functions carried out and Services Provided



Findings: It is observed that generally functions like housekeeping operations are carried out in all most all institute libraries like acquisition, circulation, Processing of documents, CAS, SDI etc. But it is noted that home lending is at top of the services provided. In services newspaper clippings are at top followed by CAS and SDI at normal level below 50%.

6.14 Library Users

The natures of users are varied in academic / educational Institutes. It constitutes / faculty teachers, students, researchers / scholars and visitors etc.

Table 6.12.1 Faculty / Teachers

Teacher Users	Respondents	%
1 - 100	30	47.7
1 - 200	20	31.8
1 - 300	8	12.7

Fig: 6.12.1 Faculty / Teachers

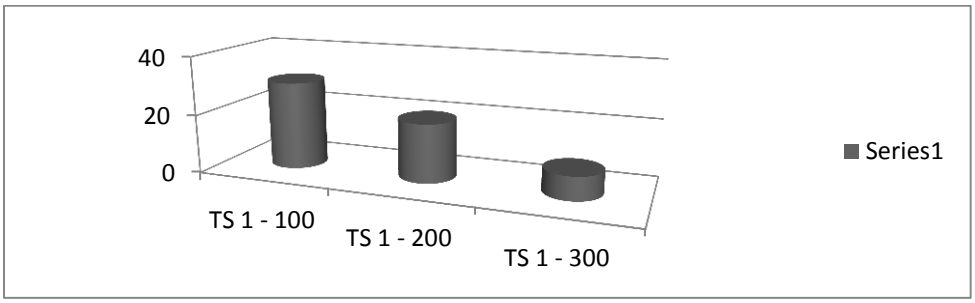


Table 6.12.2 Non-Teaching Staff Users

Non-Teaching Staff	**Respondent**	**%**
1 - 100	33	52.3
1- 200	20	31.8

Fig: 6.12.2 Non-Teaching Staff Users

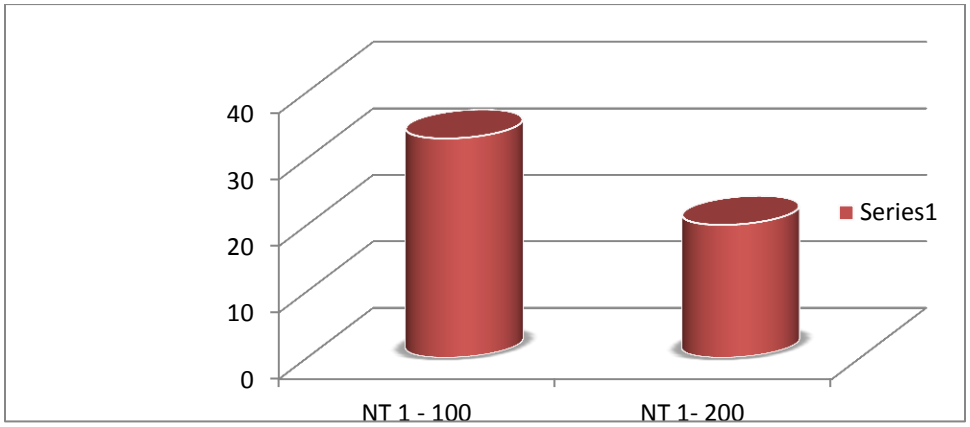
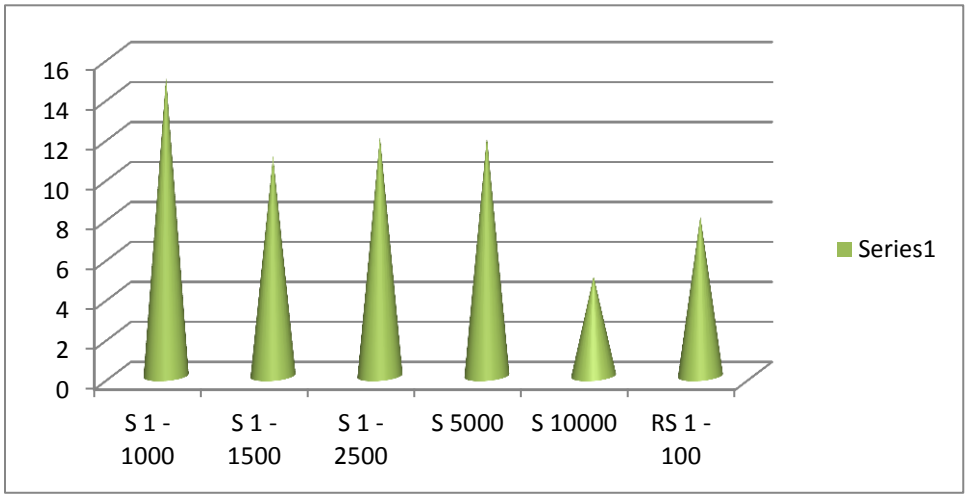


Table 6.12.3 Students and Researchers

Student Users	**Range**	**Number**	**%**
Students	1 - 1000	15	23.9
Students	1 - 1500	11	17.4
students	1 - 2500	12	19.0

Students	Up to 5000	12	19.0
students	Up to10000	5	7.10
Research Students	1 - 100	8	12.7

Fig: 6.12.3 Students and Researchers



Findings: Faculty users are 50% in academic libraries. They use libraries for general reading and reference reading or circulation purpose.

It is observed that among the different categories of the users students population is maximum as they depend on the text book and supplementary or reference collection in the library. The Use of the library by the students has different purposes includes, reading for general purpose curricular reading, newspaper reading, reading during exam period, preparing for seminar etc.

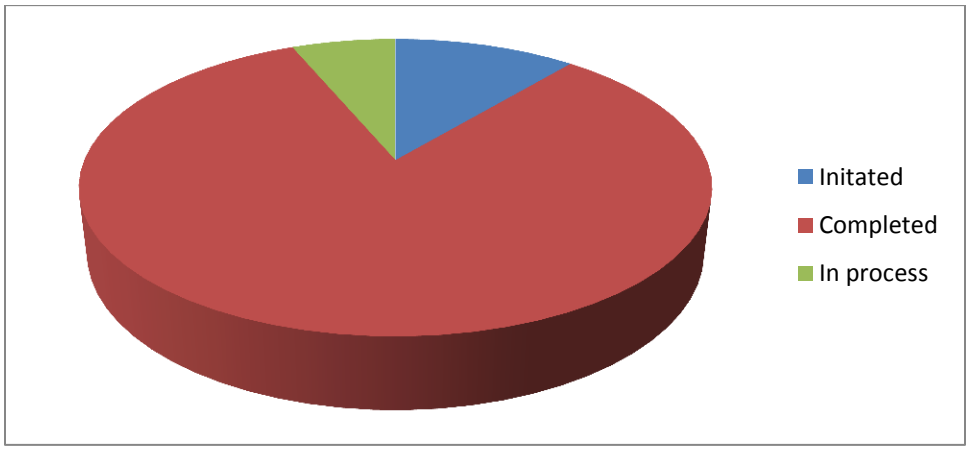
The teaching faculty is using libraries specifically for general purpose reading and specific course work reading for preparing class notes and checking assignments. The research students are very much keen in consulting the libraries for completing the dissertation work or research work. These are the real users of the libraries. Administrative staff has very less interest in using libraries as they are general purpose and recreational readers. Thus students, teachers and researchers are the main users of the libraries in academic sector.

6.15 Automation:

Table 6.13 Status of Automation

Automation Status	**Yes**	**%**
In Process	7	11.11
Completed	52	82.53
Partially started	4	6.34

Fig6.13 Status of Automation



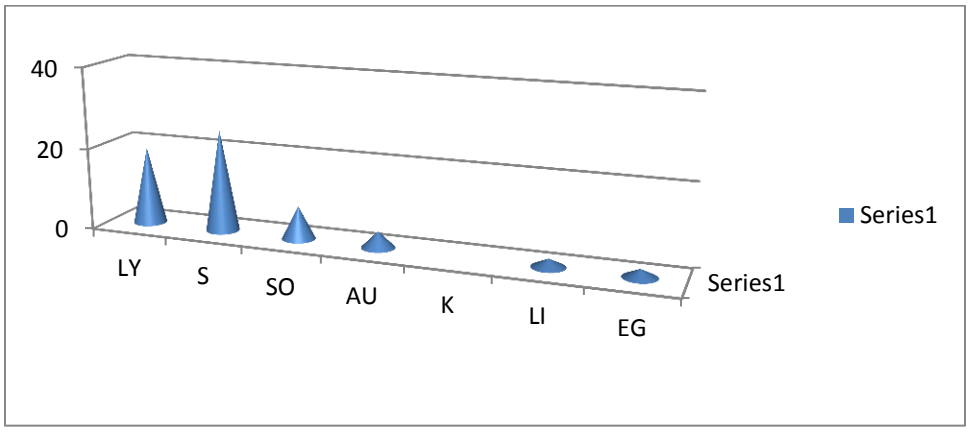
Findings: 82.5 % Libraries have completed automation of the libraries whereas remaining is in process of automating the library activities. The status of the automation is satisfactory and it is to the mark of the development.

6.16 Use of Library Software

Table 6.14: Use of Library Software's

Library Software's	Number	%
Lybsys (LY)	19	30
Slim 21(S)	25	40
Soul (SO)	8	13
Autolib (AU)	4	6.3
Koha (K)		0
Libsuite (LI)	2	3.2
E Granthalaya (EG)	2	3.2

Fig 6.14: Use of Library Software's



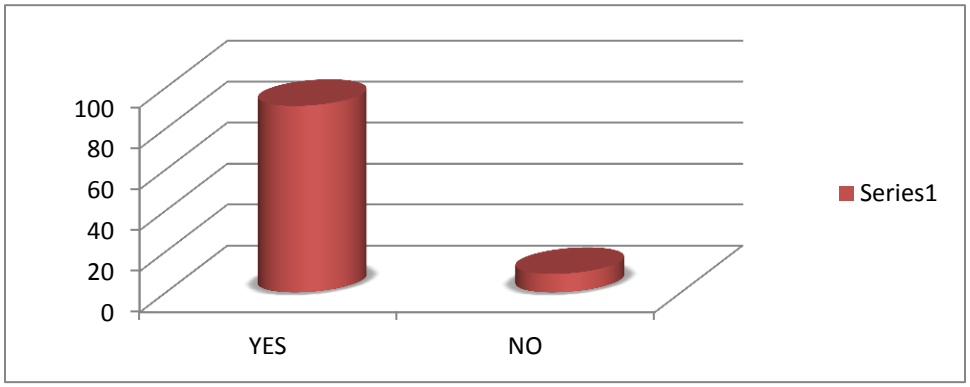
Findings : 70 % libraries use Libsys, Slim, Soul and Autolib which are the most powerful and commonly used software's in the library. Some library uses local library software.

6.17 Open Access

Table 6.15: Open Access

Open Access	Respondent Institutes	%
YES	57	90.4
NO	6	9.5

Fig 6.15: Open Access



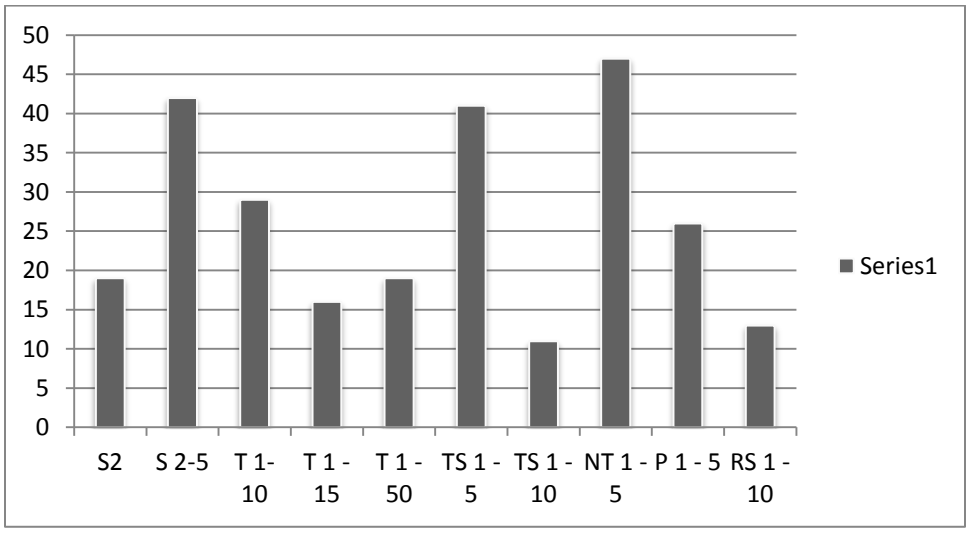
Findings: 91 % libraries are providing open access facility to their users. This is for the users of the libraries.

6.18 Books Issued

Table 6.16: No of Books Issued

Users	Books Issued	Respondents	%
Students (S)	2	19	30.15
Students (S)	2 - 5	42	66.66
Teachers (T)	1- 10	29	46.03
Teachers (T)	1 - 15	16	25.39
Teachers (T)	1 - 50	19	30.15
Technical Staff (TS)	1 - 5	41	65.07
Technical Staff (TS)	1 - 10	11	17.46
Non – Teaching (NT)	1 - 5	47	74.60
Peons (P)	1 - 5	26	41.26
Research Scholars (RS)	1 - 10	13	20.63

Fig 6.16: No of Books Issued



Findings: Books are issued to users as per the group and vary in numbers to different group of users and number of books issued are changing as per category of users e.g. for students 2-5, Teachers 10 – 50, Research Scholars 5 -10 etc. This is sufficient number of issue to users.

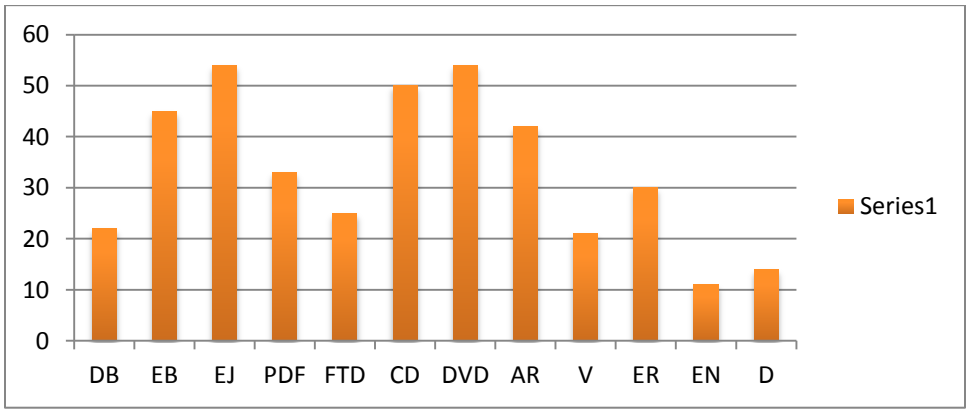
6.19 Status of Digital Collection

Table 6.17: Status of Digital Collection

Digital Collection	**Institutes**	**%**
Digitized books (DB)	22	35
E Books (EB)	45	71
E Journals (EJ)	54	86
PDF Articles(PD)	33	52
Full Text Database (FTD)	25	40
CD	50	79
DVD	54	86
Audio recordings (AR)	42	67

Videos (V)	21	33
E Reports (ER)	30	48
E News Paper Clipping (EN)	11	17
Bibliographic Database (BD)	14	22

Fig 6.17: Status of Digital Collection



Findings: It is noticed that e- Journals (86 %) are being subscribed more in comparison with other e-publications followed by 35 % e – books in collection. In addition to these digitized books are also processed. Internet access is provided to users form the library terminals for getting e – documents and other resources.

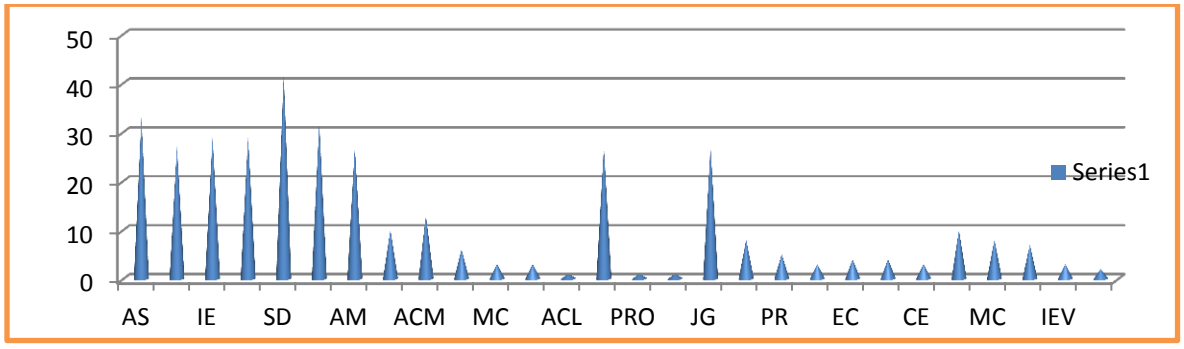
6.20 Online Journal

Table 6.18: Online Journal

Journal Databases	Number	%	Databases	Number	%
ASME	33	52	Proquest	1	1.6
ASCE	27	43	Black Willey	1	1.6
IEE AP	29	46	J Gate	27	42.9
IEL	29	46	Chemical Abstract	8	12.7
Science Direct	42	67	Prowess	5	7.94
Emerald E Books	32	51	Capex	3	4.76

ASTM DL	27	43	Econlit	4	6.35
Emerald Full Text	10	16	Jet	4	6.35
ACM	13	21	Compendex on EI village	3	4.76
Social Science Index	6	9.5	Web of Science	10	15.9
MCGH Hill	3	4.8	Maths Science Net	8	12.7
Scopus	3	4.8	Scifinder Scholar	7	11.1
American Society Computing DL	1	1.6	Inspec on EI Village	3	4.76
Springer	27	43	Historical Abstracts	2	3.17

Fig 6.18: Online Journal



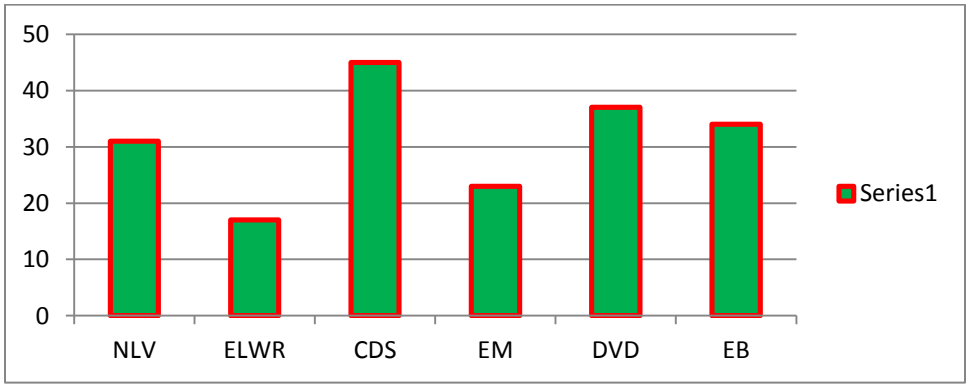
Findings: Different e journals which are made available to the users in academic libraries are different, but many are available through consortia agreements. The popular journals subscribed are IEEE, Science Direct, Emerald, ASTM, Social Science Index, Scopus, Springer, J-Gate, and Web of science, INSPEC etc. It is also found that facility like Chemical Abstracts is also provided in 12 % libraries which are specialized academic Institutes. Science Direct, Emerald ASME, Springer Link, J-Gate are subscribed in more than 40 % libraries.

6.21 E- Learning Resources

Table 6.19: E- Learning Resources

Learning Resources used in Library	Respondent	%
NPTEL Lecture Videos (NLV)	31	49.21
E Learning Web Resources (ELWR)	17	26.98
CDS	45	71.43
E Magazines (EM)	23	36.51
DVD	37	58.73
E Books (EB)	34	53.97

Fig 6.19: E- Learning Resources



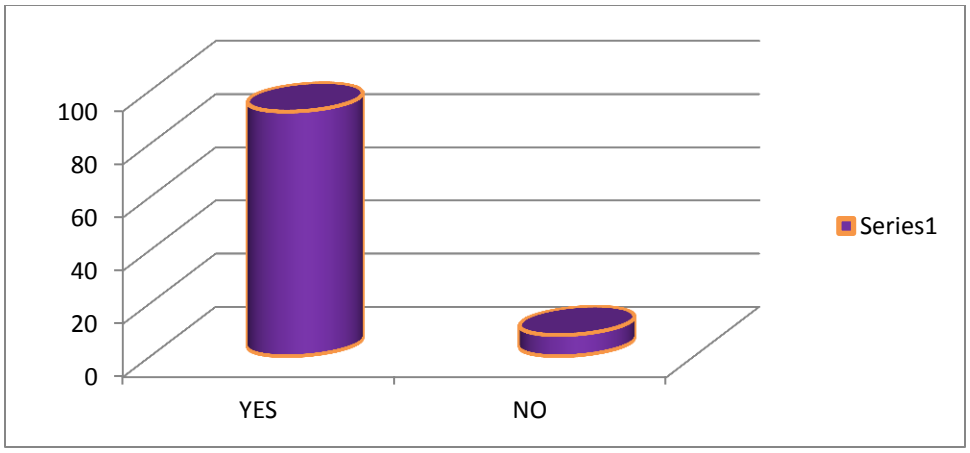
Findings: It is observed that libraries are tuning towards e – Learning system due availability and access to e-resources access either subscribed resources or internet resources.

6.22 Articles downloaded by users form e- resources

Table 6.20: Articles downloaded by users form e- resources

Library staff download articles from subscribed resources	Respondent	%
YES	58	92
NO	5	7.9

Fig 6.20: Articles downloaded by users form e- resources



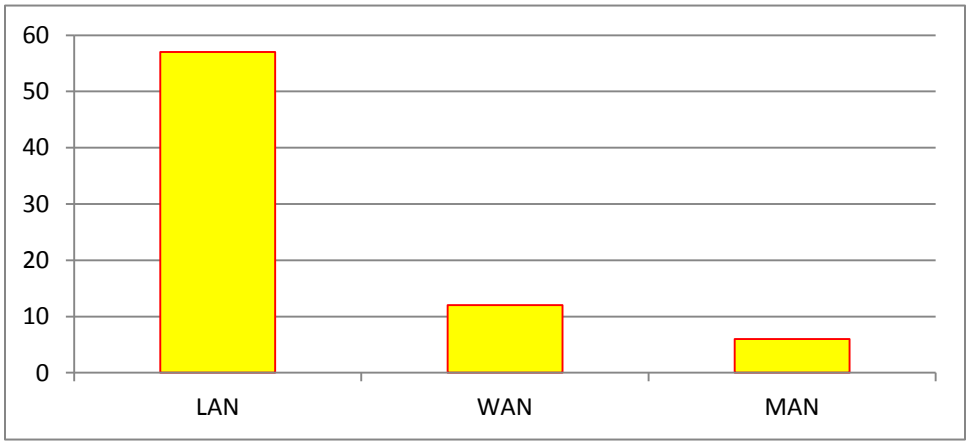
Findings: It is a good sign that 92% libraries permit users to download full text documents from the subscribed e- journals. This helps in building the awareness of the users in digital environment.

6.23 Distribution of E- Resources

Table 6.21: Distribution of E - Resources

Networks	**No**	**%**
LAN	57	90.48
WAN	12	19.05
MAN	6	9.524

Fig 6.21: Distribution of E Resources



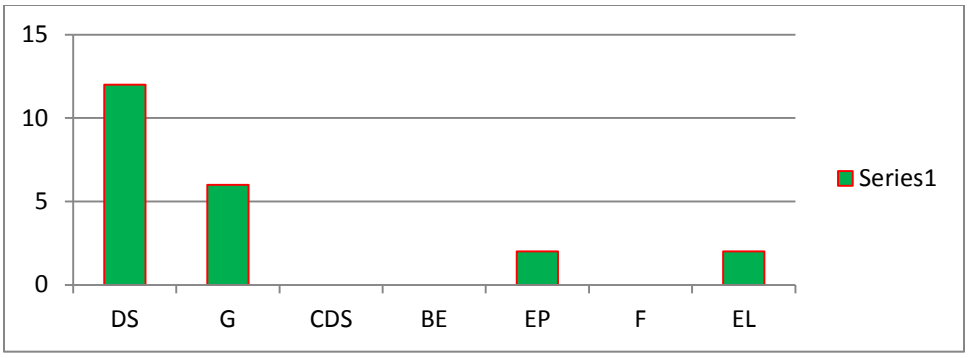
Finding: It is observed 90 % institutes distribute e-resources and made the e-resources available to users through local area network facilities.

6.24 Software's used for Digital Library Development

Table 6.22: Use of Digital Library Software's

DL Library software	Respondent Institutes	%
D Space (DS)	12	19
Greenstone (G)	6	9.5
CDS Ware (CDS)		0
BEPRESS (BE)		0
E-Prints (EP)	2	3.2
Fedora (F)		0
E Library (EL)	2	3.2

Fig 6.22: Software used for Digital Library Development



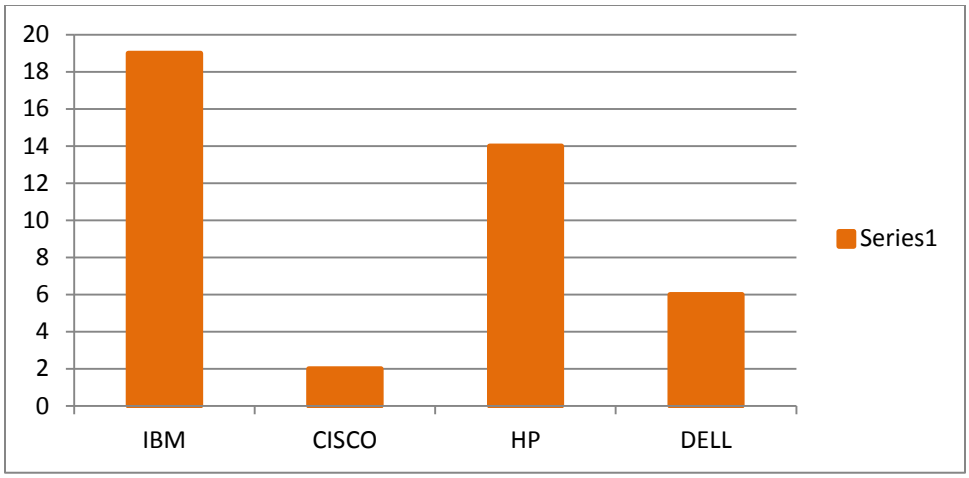
Findings: It is observed that librarian in academic era are now aware of software available for digital library development. Though only 25.4 % libraries use different OSS digital library software at the movement, but 19% libraries alone uses D-Space software for the creation of digital library.

6.25 Servers used

Table 6.23: Server used

Library Severs	**Institutes**	**%**
IBM	19	30.1
CISCO	2	3.1
HP	14	22.2
DELL	6	9.5

Table 6.23: Server used



Findings: 30 % libraries use IBM servers and 22% libraries use HP server for various purposes. Cisco and Dell are comparatively less used though these are also good companies.

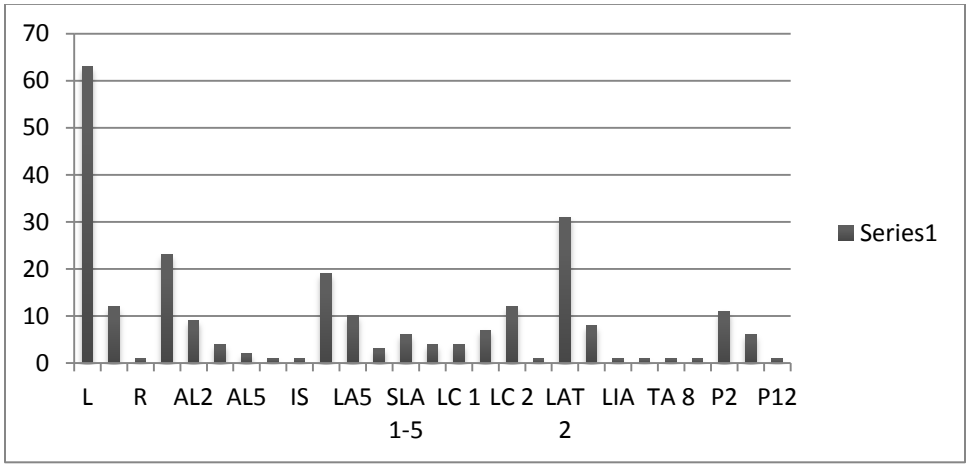
6.26 Staff in Libraries:

Table 6.24: Staff in Libraries

Staff in Libraries	Number	%	Staff in Libraries	Number	%
Librarian	63	100	Junior Library Assistant 1 - 5	4	6.35
Deputy Librarian	12	19	Library Clerk 1	4	6.35

Reader	1	1.59	Library Clerk 2 -5	7	11.1
Assistant librarian 1	23	36.5	Library Clerk 2	12	19
Assistant librarian 2	9	14.3	Library Clerk 5 - 10	1	1.59
Assistant librarian 4	4	6.35	Library Attendant 2	31	49.2
Assistant librarian 5	2	3.17	Library attendant 4	8	12.7
Documentation Officer	1	1.59	Library Information Assistant	1	1.59
Information Scientist	1	1.59	Technical Assistant 4	1	1.59
Library Assistant2	19	30.2	Technical Assistant 8	1	1.59
Library Assistant 5	10	15.9	Technical Assistant 12	1	1.59
Library Assistant 7	3	4.76	Peon 2	11	17.5
Senior Library Assistant 1- 5	6	9.52	Peon 4	6	9.52
			Peon 12	1	1.59

Fig 6.24: Staff employed in library



Finding: It is observed that almost all libraries have full time librarians position with derived qualification. It is also observed that the staff categorization depends on collection and services provided and hence staff in libraries is varying. However, only 12 % libraries appointed Deputy Librarians and librarians 82 %. Libraries have deployed Assistant Librarian for maximum functions of the libraries. 60 % library assistants (Junior and Senior) are deployed in these

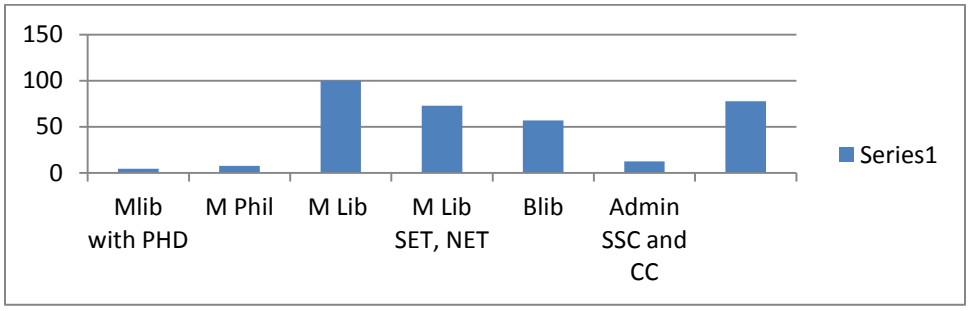
libraries. Only 4 % libraries have technical assistants. The Administrative staff helper's peon's bearer is also deployed depending on the nature of the libraries. It is observed that the appointment of information scientist and documentation officer is initiated in the present era.(31% Libraries) Thus it is observed that in university libraries full positions are available but in college libraries either Deputy librarian or Assistant Librarian are working.

6.27 Qualification of Library Staff

Table 6.25: Qualification of Library Staff

Qualification	Number	%
M Lib with PhD	30	4.7
M Phil	5	7.9
M Lib	63	100
M Lib with SET / NET	46	73.0
B Lib	36	57.1
Admin SSC and CC	08	12.6
Helpers / Bearers Below 10th	49	77.7

Fig 6.25: Qualification of Library Staff



Finding: It is observed that the qualification of staff appointed in academic libraries is to the mark having with B Lib, M Lib, having any basic degree (BA, B Com, and BSC). Now NET / SET qualifications are also required as an essential qualification or PhD in LIS At the time of entry. In the survey it is observed that 4.7 % library professionals have completed PhD degree and 8 % M Phil. In addition to M Lib 73 % staff employed in academic libraries has completed their NET SET qualification. The unique thing is that almost all libraries have M Lib degrees. Administrative and helper staff is less qualified as compare to professional staff, but they have

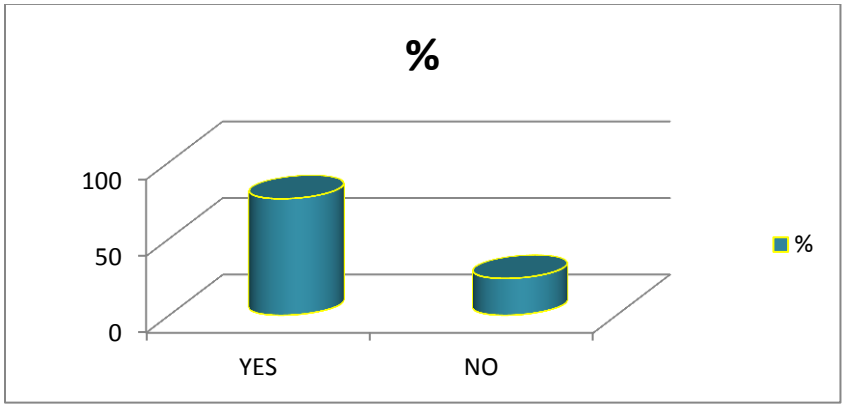
minimum SSC qualification and highest graduation or post-graduation. It is worth noting that few administrative staff have passed certificate course of 3 month duration run by local bodies approved by government. The helper and bearers have qualification below 10th standard.

6.28 Skills for Digital Libraries

Table 6.26 **Skills for Digital Libraries**

Skills to handle DL	Respondent	%
YES	48	76.1
NO	15	23.8

Fig 6.26: **Skills for Digital Libraries**



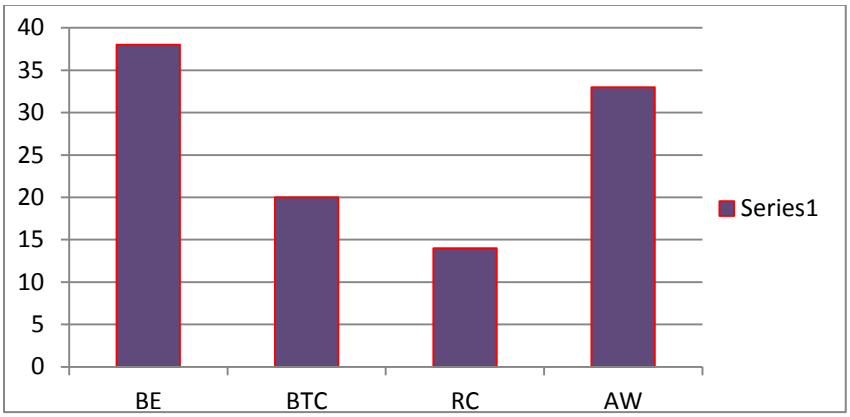
Findings: In 76 % library staff has acquired skills to manage DL, which covers communication, technological, capacity building, software, IR and Resource development etc but practically less used except university libraries.

6.29 Additional Skills Required and Obtained

Table 6.27: Means and ways of Acquiring Additional skills

Library staff acquired skills :Means and ways	Number	%
Experience (BE)	38	60.3
Technical courses (BTC)	20	31.7
Refresher courses (RC)	14	22.2
Attending Workshops (AW)	33	52.4

Fig 6.27: Means and ways of Acquiring Additional skills



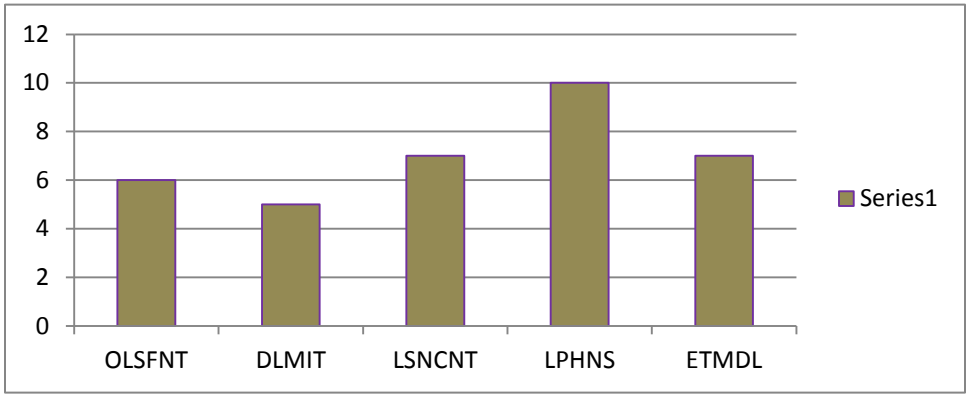
Finding: It is observed that in many cases existing librarian or library professionals get themselves acquainted with new skills required to sustain in digital era. Either they have attended different technical courses, workshops, refresher courses and by personal efforts etc. or they have acquired skills through courses like DIT, ADIT conducted by MKCL. It is found that librarians are keen to develop themselves to adjust with new environment, but this condition is visualized in not more than 50 % libraries.

6.30 Weakness of existing manpower in libraries

Table 6.28: Weakness of existing staff

Staff attitude and drawback	Number	%
Old staff not in favor of new technology (OLSFNT)	6	9.5
DL is managed by IT Department (DLMIT)	5	7.9
Library staff not competent to understand new technology (LSNCNT)	7	11.1
Library planning to hire new staff to run DL (LPHNS)	10	15.8
Exhaustive training to manage DL (ETMDL)	7	11.1

Fig 6.28 Weakness of existing staff



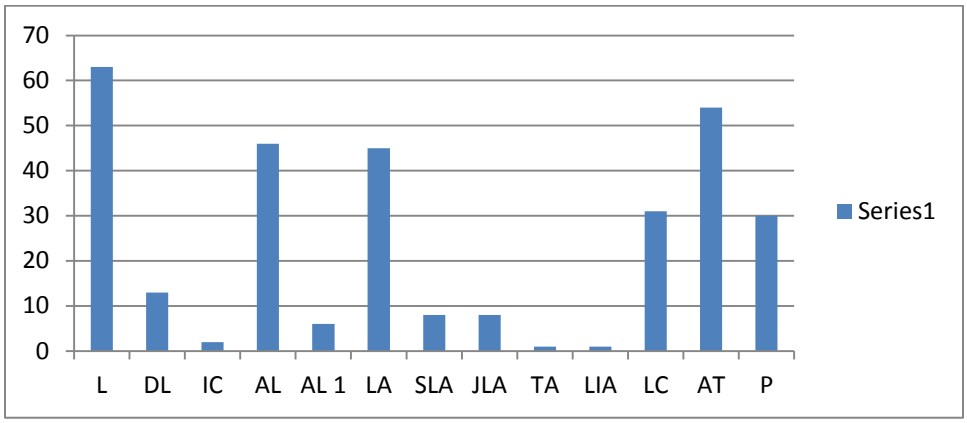
Finding: It is observed that in spite of many efforts of librarians to develop modernized libraries the weakness is mainly support from the staff. There are various reasons for this but it is noticed that mainly old staff is difficult to tuned to manage new technology viz unwillingness to get trained (10%), support given by management (8 %) hence staff is not reluctant to undergo training and get used to modern developments. In many cases it is observed that planning of the management is not supporting to develop modern libraries. But the researcher noted that the main drawback is that the staff is reluctant to adjust with new technologies and hence librarian has to depend on central facility of the institute or hired services for ICT. (27% opinion)

6.31 Job Description of Library staff

Table 6.29: Job description of library staff

Position	Job Description	Respondent	%
Librarian	General Administration, Development, Supervision	63	100
Deputy Librarian	Classification , Cataloguing, Assist to Librarian	13	20.6
Information Scientist	Provides using different resources information services	2	3.1
Assistant Librarian	Assisting librarian, Classification Cataloguing Books periodicals	46	73
Assistant Librarian 1	Assisting librarian, Classification Cataloguing Books periodicals	6	9.5
Library Assistant	Assist Assistant Librarian, Librarian, issue, return, and shelving	45	71.1
Senior library assistant	Issue Return, Purchase orders	8	12.6
Junior Library Assistant	Issue ,return, shelving	8	12.6
Technical Assistant	issue return, barcodes	1	1.5
Library Information Assistant	processing technical materials, circulation, Maintain DL	1	1.5
Library clerk	Typing , Accounts, Bill processing , issue ,return	31	49.2
Attendant	Cleanliness assists to Librarian	54	85.7
Peon	Cleanness	30	47.6

Fig 6.29: Job description of library staff



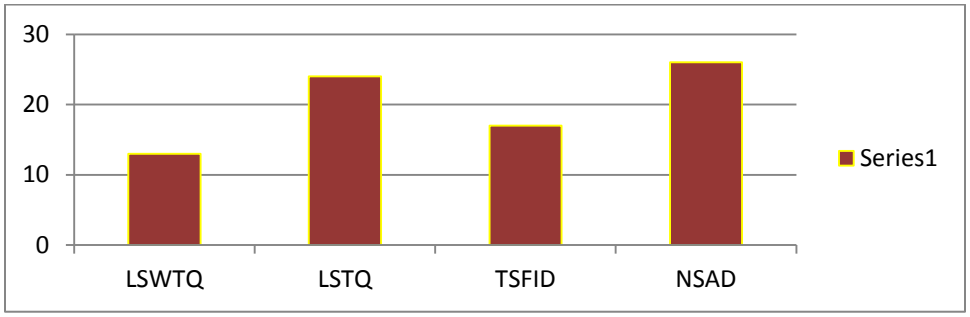
Finding: Job description for each position is necessary whatever may be kind of library. In the survey it was decided to find out the nature of job assigned to each position in the library. It is found that the total responsibility of the library development is a job description of the library. Deputy Librarian has to share the work of a librarian either in his absence or in addition to the normal services. Assistant Librarian have to manage different section in the libraries like acquisition , serial control , circulation ,stack management, processing unit, information services, modernization of libraries etc. Assistant Librarian with the help of senior library assistant and junior library assistant has to manage progress of the library as well as manage different sections effectively, whereas the role of technical assistant is to perform actual practical task like classification citation indexing etc. The management of the stack is assigned to library attendant, qualified with certification course or by experience. Helpers, peon's attendants are the persons who help in replacing the documents and generally involved in physical work instead of technical work.

6.32 Staff to Manage E Resources

Table 6.30: Staff to Manage E Resources

Resource person to manage E resources on Library server	Respondents	%
Library staff without technical qualification (LSWTQ)	13	20.6
Library staff with technical qualification (LSTQ)	24	38.1
Technical staff from IT Department (TSFID)	17	27
Network / System Administrator (NSAD)	26	41.3

Table 6.30: Resource Person to Manage E Resources



Findings: It is found that 43% libraries have network administrator to manage E resources and remaining libraries managed with the help of library staff. (37%), what user ICT based activities carried out so far in libraries are based on centralized staff or AMC but not by library staff.

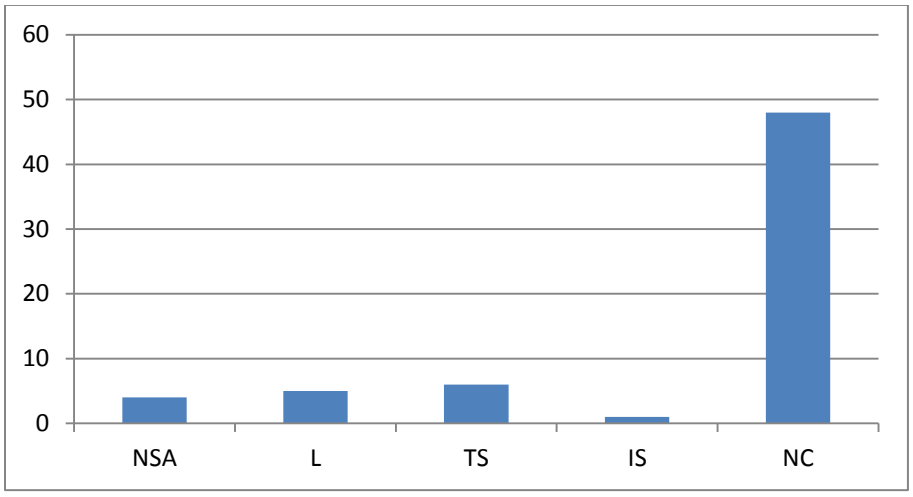
6.33 Clouds Initiation

Table 6.31: Cloud Initiation

Use of Cloud Server	Respondent	%
Yes	15	24%
No	48	76%

Use of Cloud Server	Institute	Percentage
Network System Administrator (NASA)	4	6.3
Librarian (L)	5	7.9
Technical staff (TS)	6	9.5
Information Scientist (IS)	1	1.5
No Cloud Server (NCS	48	76.1

Fig 6.31: Cloud Initiation



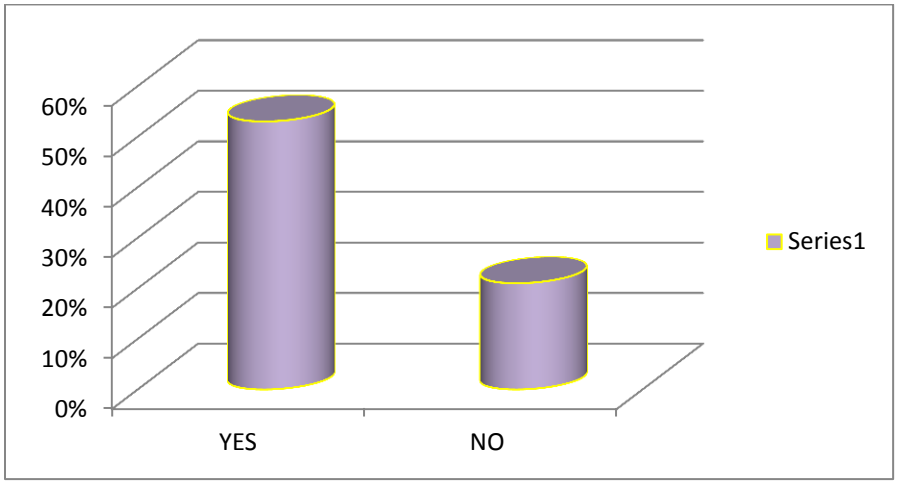
Findings: It is observed that only 24 % libraries are initiating cloud based library management and organization activity. Since the cloud is the upcoming technology in LIS it is used more carefully.

6.34 Library Websites

Table 6.32: Library Websites

Libraries deployed Website	Respondent	%
Yes	34	53.9
No	21	33.3

Fig 6.32: Library Websites



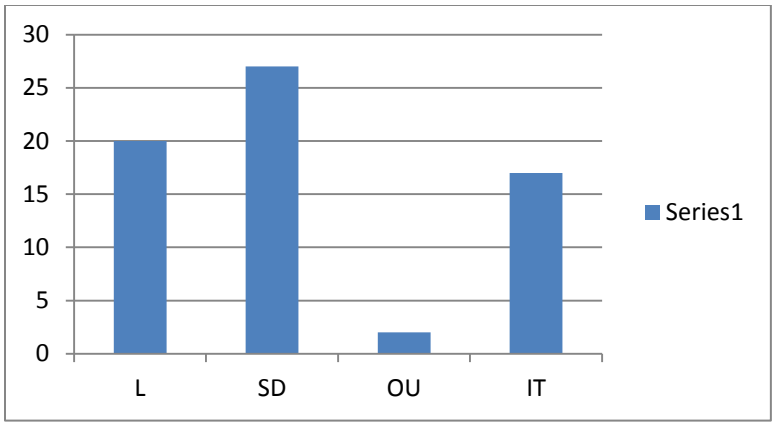
Findings: Only 53 % libraries have developed either its own web page or using organizational web page to provide library facility services and act as a library portal for the users from where different links to resources are available.

6.35 Linking Information Sources to web pages.

Table 6.33: Deployment of information on Website

Information Deployed on Website	**Number**	**%**
Librarian (L)	20	31.7
System Administrator (SA)	27	42.9
Out Sourcing (OU)	2	3.17
IT Person (IT)	17	27

Fig 6.33: Deployment of information on Website



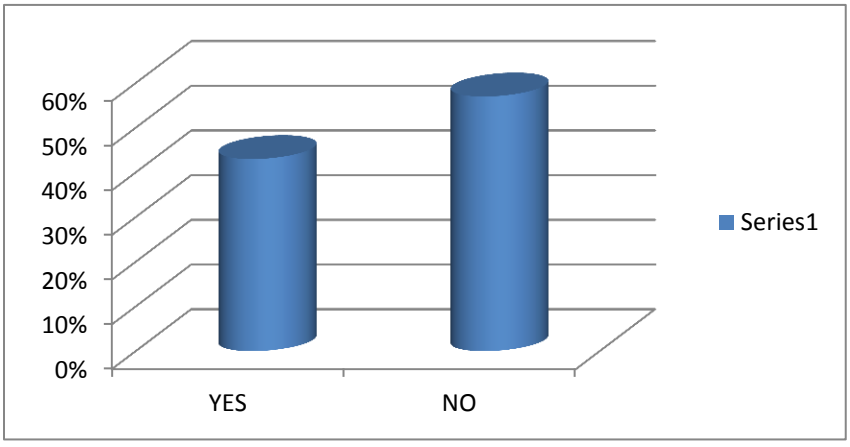
Findings: Librarians are maintaining web pages of libraries and 31% librarians are well versed with this technology and rest of the institutes take help of institutional ICT staff for developing web pages.

6.36 Manpower to Manage DL Contents

Table 6.34: Manpower to Manage DL contents

Manpower to Manage DL Contents	**Respondents**	**%**
Yes	27	43
No	36	57

Fig 6.34: Manpower to Manage DL contents



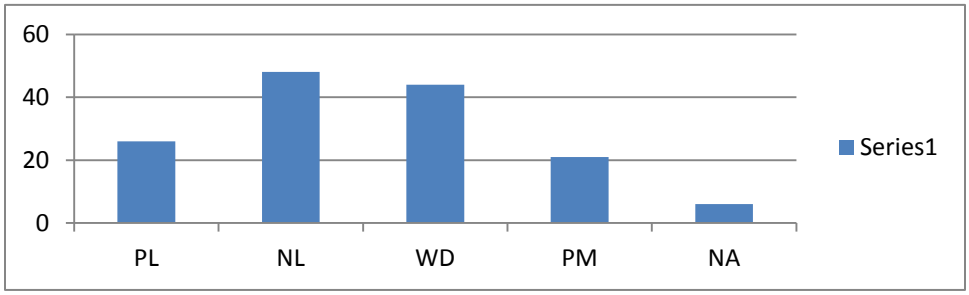
Findings: Only 43 % libraries have specialized manpower requirement to manage digital contents.

6.37 Skills for DL

Table 6.35: Skills for DL

Skills for DL	Number	%
Programming Languages(PL)	26	41.2
Networking (NL)	48	76.1
Web Development (WD)	44	69.8
Project Management (PM)	21	33.3
Not Applicable (NA)	6	9.5

Fig 6.35: Skills for DL



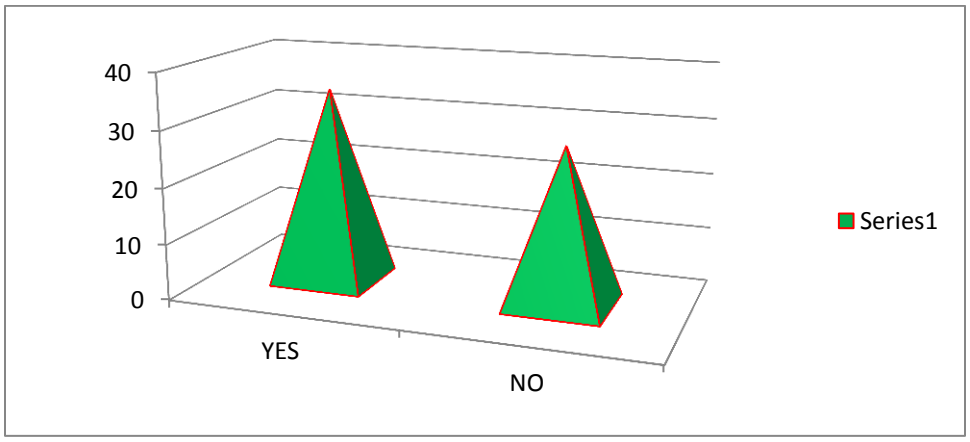
Findings: 70 % library professionals have opined that special skills to be acquired for development of DL. However it is observed that the skills mentioned are not sufficient for running the advanced stage of DL.

6.38 Additional Staff for Maintaining DL

Table 6.36.1: Additional staff to maintain DL

Additional staff required to maintain DL	Number	%
Yes	35	55.6
No	28	44.4

Fig 6.36.1: Additional staff to maintain DL



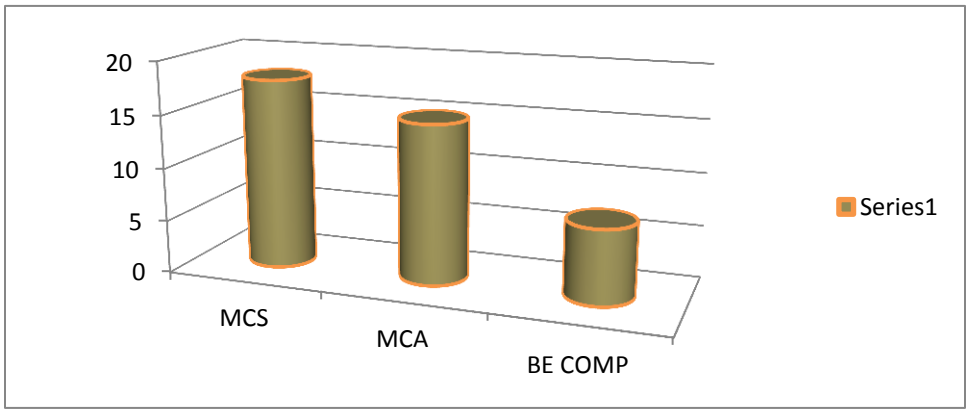
Findings: Only 55.6 % Institutes tried to provide additional staff to library for development of DL. It is observed that the staff provided is not permanent and hence the sustainable DL is not yet possible in much access.

6.38.1 Qualification of Staff to Maintain DL

Table 6.36.2: Staff to Maintain DL

Qualification	Number	%
MCS	18	45.5
MCA	15	37.5
BE COMP	7	17.5

Fig 6.36.2: Staff to maintain DL



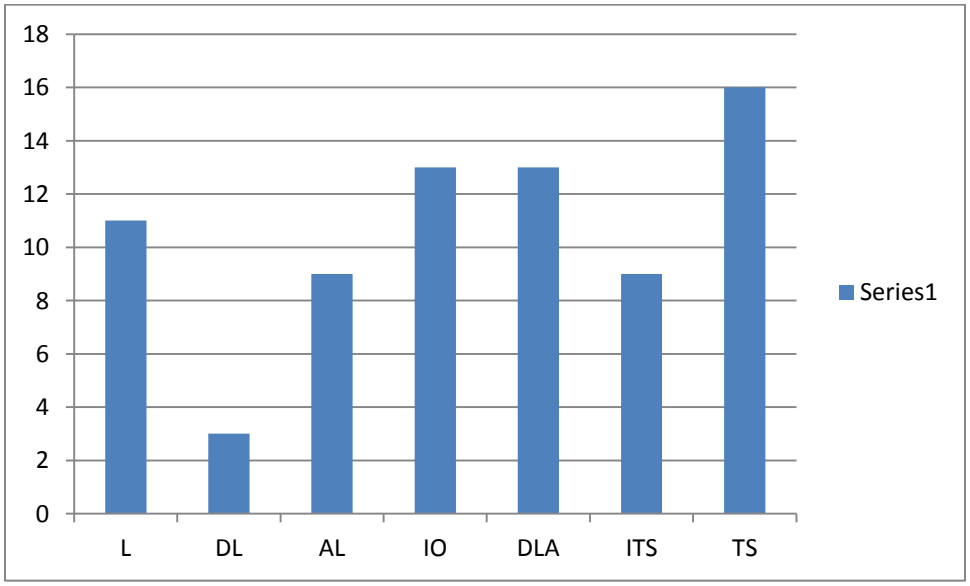
Findings: The staff proposed for developing DL is extra ordinary and need to have computer qualifications to maintain DL like MCS / MCA (83%). It is observed that only 17% libraries have BE computer graduates for maintaining DL. At present these staff is hired at central institute but they coordinate for library activities as and when required.

6.39 Organization of Library (After Automation)

Table 6.37: Organization of Library (after automation)

Position	Number	%
Librarian (L)	11	17.5
Deputy Librarian (DL)	3	4.76
Assistant Librarian (AL)	9	14.3
Information Officer (IO)	13	20.5
Digital Library assistants (DLA)	13	20.6
IT Staff (ITS)	9	14.3
Traditional Staff (TS)	16	25.4

Fig 6.37: Organizational structure of Library after fully automation



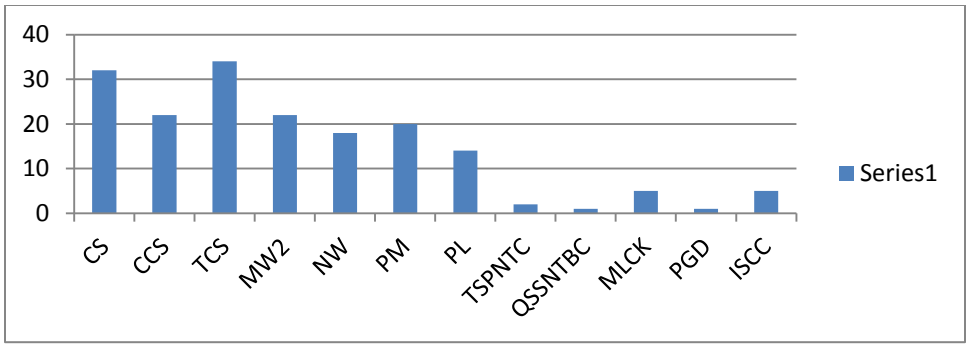
Findings: Researcher felt to access the need or the requirement of staff after automation and .It was noticed that the library professional have indicated that instead of traditional staff advanced staff capable of managing new environment is to be deputed to run the modern libraries .In the digital era advancement the structure of library staff though remains same but the number of staff may reduce and have minimum manpower for digital activities. The librarian's position remains as it is or can be replaced by information officer, Digital Librarian, Cybrarian etc. based on job / task performed.

6.40 Skills required for DL

Table 6.38: Skills required for DL

Skills	Institute	Percentage
Computer Skills (CS)	32	50.8
Communication skills (CCS)	22	34.9
Technical Computer skills (TCS)	34	54
Manage Web 2.0 (MW 2)	22	34.9
Networking (NW)	18	28.6
Project Management (PM)	20	31.7
Programming Languages	14	22.2
Traditional Pattern need to be changed (TSPNTC)	2	3.17
Qualification of supporting staff need to be changed (QSSNTBC)	1	1.59
MLIS with computer Knowledge (MLCK)	5	7.94
PGDCA Degree (PGD)	1	1.59
Information Scientist with Cloud Computing (ISCC)	5	7.94

Fig 6.38: Skills required for DL in Future



Findings: The skill sets identified by librarians in the survey, opined that there is a need to acquire advanced skills to manage digital librarians which contains computer and communication skills (85 %), technical skills (54 %) web technology (35 %), networking technology (28 %), programming language (22 %) in addition to LIS degree.

Summary: From the survey it is noticed that the present position of the library is still inclined towards traditional but efforts are being made to automate the library popularly known as e–library. 95% libraries have completed their automation process and remaining are in process of automation. Thus it is noticed that automation stage in academic libraries have achieved to satisfactorily level and migrating towards digital library. It is noticed that hardly 40 % of the libraries has achieved conversion from traditional to digital and subscribing to digital but still in Hybrid stage. The status of the present libraries is in hybrid condition and ranging to 60 %. The digital library established so far are still in initiation process except few like TIFR, IGDR, CSIR-NCL, BARC, IITs etc. The need of the staff is different and need to have advanced skills in developing as well as monitoring or managing DL's. The survey indicated that either to obtain advanced skills or appoint qualified staff. The 40% DL are now advancing towards Virtual libraries. However the library professionals are ready to migrate to new system for the benefit of users. The survey reflected that there is a need of restructuring the manpower requirement based on digital and virtual library projects.

Hence the researcher felt that the study to identify the modernization of libraries and undertake to device manpower requirement to manage advanced ICT based libraries is required and deduce the manpower need in Digital environment in comparison with traditional libraries. For this purpose there is a need to assess the functions, job requirements and manpower need to manage advanced libraries in digital era. The staff formula in the traditional period is now obsolete and

need to consider opinions on staff need in digital libraries based on functions. Hence the researcher has tempted to undertake the study to identify staff need, skills and task in the advanced libraries.

Chapter 7 Findings of the Study

From the data analysis it is noticed that the status of the academic libraries is developing considerably fast and marching towards the modernization. The major findings of the study deduced from survey, expert's opinion and literature published are presented in brief:

7.1 Findings:

1. In general academic institute libraries are growing and developing fast in all most all academic sectors. There is well-developed library system set up for every academic institute which has developed support to educational system.
2. The academic sector is slowly migrating towards e-learning system where e-resources are needed in teaching system viz. e-books, e– journals, databases etc. in comparison with formal education system.
3. The development of e-publications and use of ICT have developed different structure in education sector. Libraries have to work as focal point for providing all services to users using advanced resources.
4. The libraries in education / academic sectors have to develop a new system that supports to e-learning concepts. Hence the libraries in academic sector are undergoing metamorphic changes in their activities.
5. From the analysis of the data it is noted that all most all educational institute libraries have maintained well developed libraries to fulfill the need of the users. The libraries are stacked with different resources used for curricular fulfillment as well as general browsing on the subject.
6. Every library has either its separate building or the departmental library as per the convenience of the users. 71% of libraries have its own building or a departmental building but 29% libraries are situated in the main administrative area. It is observed that on average libraries has insufficient space for maintaining its collection. Hardy 12% libraries have space more than 2500 Sq. mt.
7. It is observed that the print journals subscribed are fairly good. On an average up to 50 national (Indian) journals are subscribed in nearly 35 institutes. Up to 150 Indian journals are subscribed in 29 institutes. The foreign journals of international repute are also subscribed but have 35 and 18 academic institutes with up to 50 and up to 150

journals per annum. The current journals are bound together as per the norms and archived for the future use.

8. It is observed that in academic libraries more collection is of books and followed by journals. The same situation is represented in this survey. Along with books and journals libraries have reports and dissertations etc. The collection of the books is major part and seven libraries have books in between 1 Lakh to 5 Lakh. Rest of the libraries has less than a Lakh collection.
9. It is observed that space provision is made separately for students and faculty as well as scholars at different places. The space is not sufficient for the students and researchers.
10. Nearly 90 % libraries have single access and exit door and this is very good for controlling the exit and entry of users.
11. Resource sharing is very active and it is carried out through ILL, DDS and Institutional Membership. This is a good start.
12. It is observed that most of the libraries (47) are working for 12 hours but during the exam period reading room facility is kept open for longer hours in special case. Libraries are kept open during the holidays also.
13. It is observed that generally functions like housekeeping operations are carried out in all most all institutes like acquisition, circulation, Processing of documents, CAS, SDI etc. using computer and automate their libraries.
14. The users are varied in academic / educational Institutes. It constitutes teachers / faculty, students, researchers / scholars and visitors etc.
15. 82.5 % Libraries have completed automation of the libraries whereas remaining libraries in process of automating the library activities.
16. Libsys, Slim, Soul and Autolib are the most powerful and commonly used software's in the 70 % library. Few more local library software's are also being used.
17. Resource sharing is very active and it is carried out through ILL, DDS and Institutional Membership. This is a good start in professional society and manages E Resources and budget. The activities of resource sharing are quite satisfactory at present. It is observed that most of the libraries (47%) are working for 12 hours but during the exam period reading room facility is kept open for longer hours as special case. Libraries (40%) are

kept open during the holidays also. It has been observed 39 % libraries are kept open on holidays and 60 % libraries are closed on holidays.

18. It is observed that about 58 libraries are trying to educate users through orientation classes, 31 librarians are organizing seminars, and lectures on libraries and its use. Whereas 47 libraries undertake library tour of students to library and practically demonstrate the different functions, and provide orientation for efficient and effective use of library information services of library.
19. It is observed that generally functions like housekeeping operations are carried out in all most all institute libraries like acquisition, circulation, Processing of documents, CAS, SDI etc. But it is noted that home lending is at top of the services provided. In services newspaper clippings are at top followed by CAS and SDI at normal level below 50%.
20. It is observed that among the different categories of the users students population is maximum as they depend on the text book and supplementary or reference collection in the library. The Use of the library by the students has different purposes includes, reading for general purpose curricular reading, newspaper reading, reading during exam period, preparing for seminar etc.
21. The teaching faculty is using libraries specifically for general purpose reading and specific course work reading for preparing class notes and checking assignments. The research students are very much keen in consulting the libraries for completing the dissertation work or research work. These are the real users of the libraries. Administrative staff has very less interest in using libraries as they are general purpose and recreational readers. Thus students, teachers and researchers are the main users of the libraries in academic sector.
22. It is noticed that e- Journals (86 %) are being subscribed more in comparison with other e-publications followed by 35 % e–books in collection. In addition to these digitized books are also processed. Internet access is provided to users form the library terminals for getting e – documents and other resources.
23. Among the different databases made available to the users in academic libraries are different, but many are available through consortia agreements. The popular database subscribed is IEEE, Science Direct, Emerald, ASTM, Social Science Index, Scopus, Springer, J-Gate, Web of science, INSPEC etc. It is also found that facility like

Chemical Abstracts is also provided in 12 % libraries which are specialized academic Institutes. Science Direct, Emerald ASME, Springer Link, J-Gate are subscribed in more than 40 % libraries.

24. It is observed that education system is shifting towards e–Learning system due availability and access provided to e-resources access though the subscribed resources as well as internet resources and libraries have to support the change be acquiring e-resources useful to the users.
25. It is a good symptom that 92% libraries permit users to download full text documents from the subscribed e- journals. This helps in building the awareness of the users in digital environment.
26. It is observed 90 % institutes distribute e-resources and made the e-resources available to users through local area network facilities.
27. It is observed that librarian in academic era are now aware of software available for digital library development. Though only 25.4 % libraries use different OSS digital library software at the movement, but 19% libraries alone uses D-Space software for the creation of digital library.
28. 30 % libraries use IBM servers and 22% libraries use HP server for various purposes. Cisco and Dell are comparatively less used though these are also good companies.
29. It is observed that almost all libraries have full time librarians position with required qualification and skills. It is also observed that the staff categorization depends on collection and services provided and hence staff in libraries is varying. However, only 12 % Deputy Librarians and 38 % libraries have deployed Assistant Librarian depending on the function of the libraries. 60 % library assistants (Junior and Senior) are deployed in these libraries. Only 4 % libraries have technical assistants. The Administrative staff helper's peons bearer are also deployed depending on the nature of the libraries. It is observed that the appointment of information scientist and documentation officer is initiated in the present era.
30. It is observed that the qualification of staff appointed in academic field is to the mark having at senior level qualifications with B Lib, M Lib, having any basic degree (BA, B Com, BSC) In the survey it is observed that 4.7 % library professionals have completed PhD degree and 8 % M Phil. In addition to M Lib 73 % staff employed in academic

libraries has completed their NET/ SET qualification. The unique thing is that almost all libraries have M Lib degrees. Administrative and helper staff is less qualified as compare to professional staff, but they have minimum SSC qualification and highest graduation or post-graduation. It is worth noting that few administrative staff have passed certificate course of 3 month duration run by local bodies. Approved by government. The helper and bearers have qualification below 10^{th} standard.

31. In 76 % library staff has acquired skills to manage DL, which covers communication, technological, capacity building, software, IR and resource development etc.
32. It is observed that in many cases existing librarian get themselves acquainted with new skills required to sustain in digital era. Either they have attended different technical courses, workshops, refresher courses and by personal efforts etc. or they have acquired skills through courses like DIT, ADIT conducted by MKCL. However it is found that librarians are keen to develop themselves to adjust with new environment, but this condition is visualized in not more than 50 % libraries.
33. It is observed that in spite of many efforts of librarians to develop modernization in libraries; the librarian is weak due to no support from the staff. There are various reasons for this but mainly old staff is difficult to tuned to manage new technology viz unwillingness to get trained (10%), support given by management (8 %) hence staff is not reluctant to undergo training and get situated for modern development. In many cases it is observed that planning of the management is not supporting to develop modern libraries. But the researcher noted that the main drawback is that the staff is reluctant to adjust with new technologies and hence librarian has to depend on central facility of the institute or hired services for ICT.
34. It is found that 43% libraries have network administrator to manage E resources and remaining libraries managed with the help of library staff. (37%)
35. It is observed that only 24 % libraries are initiating cloud based library management and organization activity. Since the cloud is the upcoming technology in LIS it is used more carefully.
36. Only 53 % libraries have developed either its own web page or used organizational web page to provide library services and act as a library portal for the users from where different links to resources are available.

37. Librarians are maintaining web pages of libraries and 31% librarians are well versed with this technology and rest of the institutes take help of institutional staff.
38. The staff proposed for developing DL is extra qualified and need to have computer qualifications to maintain DL like MCS / MCA. It is observed that only 12 % libraries have BE Computer graduates for maintaining DL.
39. Researcher felt the need to assess the requirement of existing libraries after automation and manpower required for the same. It was noticed that the library professional have indicated that instead of traditional staff advanced staff capable of managing new environment is to be deputed to run the modern libraries more essentially. In the era advancement the structure of library staff though remains same the number may reduce to bear minimum manpower digital activities. The librarian position may remain as it is or can be replaced by information officer, Digital Librarian, Cybrarian etc.
40. The librarians in the survey opined that there is a need to acquire advanced skills to manage digital librarians which contains computer and communication skills (85 %), technical skills (54 %) web technology (35 %), networking technology (28 %), programming language (22 %) in addition to LIS degree.

From the survey it is noticed that the present position of libraries is definitely traditional but full efforts are made to automate the library popularly known as e–Library. 95% of the libraries have completed automation process and remaining are in process of automation. Thus it is noticed that automation stage in academic libraries have achieved satisfactorily and marching towards generation of digital libraries. However it is noticed that hardly 40 % of the libraries has achieved conversion from traditional to digital and subscribing to digital. The status of the present libraries is in hybrid condition and ranging to 60 %. The digital library established so far are still in initiation process except few like TIFR, IGDR, CSIR-NCL, BARC, IITs etc. The need of the staff is different and need to have advanced skills in developing as well as monitoring or managing digital libraries. The survey indicated that either to obtain advanced skills or appoint qualified staff. The 40% DL are now advancing towards virtual libraries. However the library professionals are ready to migrate to new system for the benefit of users. The survey reflected

that there is a need of restructuring the manpower requirement based on digital and virtual library projects.

Hence the researcher felt that the study to identify the modernization of libraries and undertake to device manpower requirement to manage advanced ICT based libraries is required and deduce the manpower need in digital environment in comparison with traditional libraries. For this purpose there is a need to assess the functions, job requirements and manpower need to manage advanced libraries in digital era. The staff formula in the traditional period is now obsolete and need to consider opinions on staff need in digital libraries based on functions. Hence the researcher has tempted to undertake the study to identify staff need, skills and task in the advanced libraries.

Chapter 8: Staff Pattern and Model for Digital Library Environment

8.1 Introduction:

As discussed in detail in earlier chapters, the reasons for the transformations in libraries, use of ICT by users and libraries, change in information dissemination, users becomes the searcher of the information and resources directly to end users etc. are the main causes in changing the library system. Similarly library staff patterns are also deviating due to changes in publication and archival system. The staff needed earlier to manage physical library is reducing to bare minimum as ICT and internet perform best task for providing services as well as acquisition of material in e-form.

Manpower always played an important role in library system as well as supporting educational system everywhere. Academic libraries are the major players in providing information collection and services to desired users, but it need efficient, qualified and skilful staff to manage libraries in digital world. The staff, documents and users are the fundamental units of the library system. Due to modernization and use of new media and ICT the habits of all the three components are affected. The system is totally changing due to the impact on all the three elements.

The traditional library system and digital library system have different approaches in nature and its maintenance and operations and also need different patterns of working including staff. The traditional library system was based on print media and right from acquisition to dissemination and providing library services need different skills and techniques and more manpower to manage the system well. In spite of all the methods used the use of the documents was limited due to provision of access to documents. In modern digital libraries the use of ICT, e-resources, internet recourses, fast and easy telecommunication, and social media net, network of libraries changed the library operations right from the acquisition to dissemination and library services. The manpower required to manage digital library is less in number but their skills and knowledge is different which need ICT skills and e-resource searching skills.

Before discussing the pattern and staff requirement for the digital libraries it is necessary to discuss the different elements of digital libraries and its changing functions. Following paragraphs explains the details in brief.

8.2 Digital Library Concepts:

Digital library concept emerged during 1994, with the Digital Library Initiative phase I and II programs in USA for which more funding was made available to developers. Slowly, the concept of DL initiatives spread all over the world libraries as everyone realized importance of digital libraries and its benefits to human life development in all sectors and started creating digital libraries of important documents available with them for effective use. Initially major projects were initiated in USA and Europe. After digitizing, libraries had challenge of organizing these collections. There were several commercial software available in the market which were initially used by big libraries have lot of funds. But the libraries from developing countries always had difficulties in managing the funds for creating successful digital libraries. During late 1997, Open Source Software (OSS) became quite popular all over the world and many organizations found a good relief to get rid of proprietary software solutions. Today, practically in all areas OSS solutions are available. In Library and Information Science also many Open Source Software applications are available and libraries have taken steps in using these tools for various library operations. OSS tools have made a revolution in libraries along with ICT and networked resources. In the area of digital libraries, many OSS tools are available for building digital libraries. Libraries have taken steps in using these software for building digital libraries for providing value added services to their library users. With a number Open Source Software available for creating "digital libraries" it was necessary to identify the skills of staff and job description required to manage these libraries. Hence there is need to assess the trends and set some staff patterns which suits well. The present study is an attempt to evaluate the staff requirements for building and maintaining digital libraries and discuss the need of staff for it. The digital libraries enhance the activities in limited processes and traditional activities may shift to different activities like maintaining digital resources, economical acquisition, library and information services, searching information using many e-resources together (Federated searching), and use of metadata instead indexing etc. Such changes may need staff who has library graduation with different other qualifications and skill sets along with traditional. This study is an effort made towards identifying the staff pattern useful for digital libraries. The concepts developed by the researchers from the different views of scholars synthesized from the literature published and views of library professionals and computer experts etc. The following

discussions are presented by the researchers in respect of staff pattern in DL after studying the traditional efforts.

8. 3 Library Management Functions: Electronic era

In the era of ICT, e-resources, Internet and social networks, library networks etc are playing an important role in discharging the functions of libraries in different ways. The main task of acquisition, processing, organization, information services and dissemination of information are totally replaced in digital era. In this era more and more documents are getting published electronically and internet resources are growing at an alarming sped in a month. Libraries of 21st century have to shift towards electronic and digital means for acquiring, processing and disseminating information (Venkatramana 2007). The technologies and the management tools introduced in the library and information science have made a significant change in the management functions of the library. With the new technologies, these changes have derived substantial benefits to the library staff as well as the users. The functions like acquisition, cataloguing, classification, circulation, reference services etc. have become less time consuming and with less manpower. The users are happy in getting their services quickly and accurately using digital information recourses as well as open literature.

Acquisition -

Internet helps in various activities of library and enhances its effectiveness and efficiency. Librarians can have easy online and quick access to the book suppliers, journals and electronic publications through internet. Major publishers and bookshops have set up their websites on the internet. These websites provides information review about their publications regularly, abstracts, annotation, price etc. are also made available for the evaluation purpose. In addition to these book sellers catalogues are now available on the Internet. These sources helped librarians in the selecting latest books for libraries and meaningful collection development is possible. Many publishers and book shops have made a provision to place orders directly online for books and periodicals subscriptions using e-mails as well as online shopping and carting. The book acquisition process is quite comfortable and economical as well.

Online book stores are more helpful in getting e-books within 24 hours by making online payment. Following bookshops are leading.

- Amazon.com and Barnes and Noble advertise themselves as the world's largest online bookshops.
- IBS Bookshop Co.UK .claims to be the Europe's largest online bookshop (IBS stands for Internet Book shop)
- D.K. Agencies is an online bookshop of Indian books which stocks and distributes most of the Indian books.

Periodicals:

Subscription agencies provide instant information regarding subscription of journals, arrival or announcement of new journals, and also manage online delivery of issues, to libraries. Libraries using e-mail for orders and correspondence purpose can avoid expensive charges occurred in corresponding to different publishers. Internet has made the whole subscription process much faster, cheaper and easier for libraries. The directories of e-journals are made available over the net like: (Venkatramana 2007) ARL Directory of Electronics Journals produced by association of Research libraries gives information on electronic journals and newsletters along with details of the subscription. Collection development activity is the heart of any libraries and collection development involves the identification, selection, acquisition, and evaluation of library resources for a community of users. (Yahya Haroon. K. 1999)

Advantage of Online Subscription -

Most of the reputed journals now have electronic version on the World Wide Web. These can be accessed through Internet using their websites directly by the subscribers. The online availability and access to journals and articles have several advantages over their print version. Advantages of online subscription -

- Several journals publish valuable supplementary material online. Such material may be experimental details, video clips or voluminous tables, which are not available in the print version of the journals. Thus the online subscription provides additional academic value to the subscriber.

- Several publishers like American Chemical Society (ACS), Online First (Springer), Ideal First (Academic), and Early View (Wiley) have policy to make their articles available on the web "as soon as publishable" (ASAP). An early availability to a new and latest idea provides critical advantage to a scientist or researcher especially while writing a project proposal, planning for new research and writing a research report.
- Electronic journals generally offer their articles in Portable Document Format (PDF), which has a smaller size of file compared to their scanned image of the print article. A modest size hard disk can store thousands of articles for offline access later on.
- Most electronic journals in their HTML versions provide links to their full text, tables, graphs, images, etc. This facilities one to scroll faster going backwards and forward in the article.
- Several journals provide early "table of contents" (TOC) alert for their new issues by e-mail or RSS feed. Similarly, several web-based databases provide e-mail alert on specified subject heading or search terms at regular interval. This is very useful for scientist or researcher to keep himself update on the latest developments in the area of his / her interest.
- The electronic contents are amenable to electronic search through the dedicated search engine on their websites. This provides one to search the huge contents fast and easily. A similar search on print journals can take weeks to gather literature and it may not be as exhaustive.
- The online subscription avoids difficulties occurred in print subscription like postal delays, transit damage and loss, etc. Its maintenance is cheaper also and requires no accessioning, binding, classification, shelving, etc. as well as no problems like pilferage, cutting and tearing of pages, defacing and disfiguring, dog-earing, etc. It requires no additional shelving space. The journals gather no dust and do not loose quality.
- The electronic subscription enables consortium approach of subscription which is not possible in case of print journals. Which provides economy in subscription. The consortium has better bargaining power with better terms of access.

Thus academic libraries of today are reorienting their collection and their collection development policies in the light of e-resources. E-journals and e-books are going to stay and in the light of it each library needs to develop its own model for collection development and manpower to manage the libraries effectively and efficiently. (Kaur 2007)

Cataloguing-

Catalogue is a key to open the treasure of a library to the users. Computers have facilitated the work of cataloguing easy because the introduction of library software and automatically generating OPAC according to AACR2 rules and also can retrieve the data on any search field by giving key words or combination search with Boolean operators without preparing catalogue cards like author, title, subject and so on as in the traditional method. This reduces labour, cost, time and benefited in accessing the catalogue even at remote places developing Web- OPAC. These new types of catalogues are a shift from "isolated information silos" to "interlinked computing platforms." In the past the information flow was mostly one way, from library to user. With new web tools information can be released to flow in every direction (library to user, user to library, library to library, and user to user)." (Wikipedia)

Classification -

Classification is as important to organize the library materials in a systematic way as cataloguing. The present software has a provision to copy the entire record of library of congress, and OCLC if the server has an internet connection. This comes in handy in classifying the new titles which are not already in the existence. (Syamalamba Rani, 2009)

Circulation -

The circulation of books is much easier as compared to past. The bar code and RFID technology has simplified the process of circulation. The automated issue and return system helps the user to know immediately the status of the book. It also helps to know how many books a particular user has had along with the due dates. (Syamalamba Rani, 2009)

Information services:

The information is disunited among the users by using different enhanced, extended and new services which users likes most in the global information availability era. ICT based services, digital library services, internet based services, social networked based services, mobile services, consortium based services are now initiated in digital era which are representing as user centric or based services. Along with this, new dimensions in LIS are developed like Union catalogues of Books, Journals, Technical Reports and Conference Proceedings, Inter Library Lending and Document Delivery in e-form, Electronic content loading, Contents generated by members and acquired on common server, archiving, Old back volumes and less used documents, development of enabling technologies, IR systems, Portals and other web interface, etc.

Thus new process management in digital environment altered the system and in less manpower the same tasks are being carried out in this digital era. The need is to assess the skills, qualifications, and manpower requirement to manage the libraries. The old pattern of the staff is not being applied successfully in this era. There is a vast difference in between traditional and digital library system.

8.4 Difference between Traditional and Digital Libraries:

The brief comparison is presented in the following table.

Table 8.1: Traditional Vs. Digital Libraries

Traditional Library System	Digital Library System
Monotonous type of material (only in Print form)	Multimedia applications are used to generate documents in digital form
Static Collection	Dynamic Collection
Slow Growth in collection	Collection unlimited due to internet and other open source literature along with commercial resources
Limited access	Unlimited access with multiple access points
Different sections and units to manage	Amalgamation of units and core service

acquisition, subscription, processing, organisation, circulation, reference desk, dissemination etc	pointers
Maintenance of physical collection is costly and time taking	Maintenance of digital archives initially cost involved but later cost effective
No models for acquiring print material	Different models of price structures with licences are available to develop cost economy
Technological elements are less used in libraries	Technology based libraries and different technologies are being used for data acquisition and dissemination
Reference section is difficult to manage due to cost	Virtual reference desk concept developed due to availability of virtual reference sources over the net and achieved economy
Library services were restricted, limited and common to all	User services are enhanced and user centric due to global availably of literature
The total manpower required is more to manage different physical libraries	Manpower is limited and reduced due to amalgamation of functions
Administrative nature	Cooperative nature
Costly management	Economical management
Access to resources limited	Access to literature unlimited
DDS	EDDS
Administration based	Technology based
Collection at one location	Collection spread globally but accessed from

	anywhere
Skill sets traditional administrative, technical, managerial	Skill sets are unique like technological, evaluative, collaborative and cooperative, negotiating, marketing, information product development, communication skills are required along with traditional

Thus it is observed that there is a difference and digital libraries due to many fold benefits are now preferred in information society as users are also using high end technology. In addition to many technologies web 2.0 technologies made libraries Library 2.0 and librarian as Librarian 2.0. The following table indicate the need of web 2.0 in libraries to provide better services.

Table 8.2: Use of Web 2.0 tools in LIS

Web 2.0 Tools	Description	LIS Application
Blogs	It is powerful two-way based tool. A blog is a website where library users can enter their thoughts, ideas, suggestions, and comments.	-Serves as a platform where the users can file their concerns, queries, and suggestions regarding the services and activities of the library. -As another form of publication. -As collection Development, where the users request the resources. -Marketing of the information as well as the library. -As discussion forum.

Wikis	A wiki is a webpage or set or Webpages that can be easily edited by anyone who is allowed access (Ebersbach et al,2006)	-Social interactions and discussions among the librarians & users as well. -Wiki can also be used by the users to share information and enhance the content, and a record of these transactions is archived for future reference. -Reference resources wiki can be built for frequently asked questions. -For creating subject guides, subject gateways etc.
RSS	RSS (Most commonly expanded as "Really Simple Syndication") is a family of web feed formats used to publish frequently updated works such as blog entries, news headlines, audio and video in a standardized format.	-Announcement of the availability new books and other resources in a given subject area. -Librarians can subscribe to RSS from the sources for compiling their customized alerts. -Enhance library instructions for different

		Web 2.0, Library 2.0, Blog, Wikis, RSS, Tagging, and Podcasting, IM/Programs/courses by integrating appropriate resources. -Announce availability of new research and learning opportunities in various academic / research departments. -Integrating library services through RSS feed.
IM	Instant Messaging (IM) is a collection of technologies that create the possibility of real-time text-based communication between two or more participants over the internet or some form of internal network / intranet.	-Instant clarification for the question from users and vice-a-versa. -Reference librarian can also send text, video, and audio files such as library instructions files, ready reference etc.
Social Networking	A social networking services focus on building online communities of people who share interest and/or activities, or who are interested in exploring the interest and activities of others	-Libraries can create a page to approach to new users. Social networking could enable librarians and patrons not only to interact but to share and change sources dynamically in an

		electronic medium. -For building network among the interested group in discussing the common interest. -+Users content can be added to the library catalogue, including users book reviews or other comments.
Pod Casting	A pod cast is a series of audio or video digital-media files which is distributed over the internet by syndicated download, through Web feeds, to portable media players and personal computers.	-Podcasts promotional recording about the library services and programs. -Podcast highlight about new resources. -Podcast enables librarians to share information with anyone at any time. -Podcasting can be publishing tool for users and librarian's oral presentations.
You Tube	Allows users to upload, tag, watch, rate, review, view, and blog, video footage,	-It can be used as publishing tool for marketing of library and library

	and even create play lists.	products.
Tagging	A tag is a keyword that is added to a digital object (e.g. a website, picture or video clip) to describe it, but not as a formal classification system.	-Tagging can be applied to the LIS for editing the subject heading from the user point of view and thereby enhancing the indexing and relevancy of the searches making the collection more dynamic. Tagging would greatly facilitate the lateral searching.

There are different tools apart from the above, available and can be easily made useful in libraries to provide the services at user's door place or desk tops.

To manage these technologies different skill sets are required in libraries. If compared with the traditional skills there is a need to review them seriously and adapt to manage the functions.

Table 8.3: Comparison of Skill Sets

Skills in Traditional Libraries	**Skills in Digital Libraries**
Administrative skills to manage library administration	Managerial skills to manage libraries using different management tools to achieve economic and useful collection
Information processing skills to catalogue, classify and index documents to provide	Hyper linking skills to connect different digital material and enhance the access of information, metadata skills to develop

better access to information collected	metadata of digital documents
Reference librarians skills by acquiring the searching of information from the information sources	Virtual reference librarians skills to collect the data form the universe of collection using different searching tools and techniques
Catalogue development and making update by using different techniques used in AACR	Development of OPAC and Web OPAC to propagate information on the net.
Information retrieval skills	Data mainlining skills to extract data based on patterns for the ocean of data embedded in warehouses
Simple search skills	Complex search skills, using federated searching
Offline searching skills	Online searching skills

8. 5 Best Practices in Present and Future Era:

The researcher would like to point our best practices for librarians to survive in the present and future digital era. There are number of practices which can be incorporated in the new digital era. In the present era more focus was application of technology for development of e-resources and its distribution and acquisition. The ICT made impact all over the disciplines. The future of academic libraries is discussed by many scholars in the seminar held at Jalgaon and in which one of the paper gave the clear vision of the future. (Dahibhate et al 2010). The paper discussed the following points which are suitable for the framing out future libraries and helps in developing the best practices to maintain it. The authors pointed out that future libraries may function as Lib 2.0 due to massive use of web 2.0 tools in education sector. This may create the changes in user information seeking habits like:

New user generation is ICT aware and needs open access to information. Expectations of users from future of libraries can be predicted as:

- User need information in e-form available globally over the desk top instead of print
- User need information available at different locations even away from home and workplace over the net
- Learning processes is changing from formal to informal and this system need online information in digital form to support e-recourses.
- Electronic media, internet based resources, social networks are preferred due to gathering information and filtering

The librarian's role is to observe the users behaviour and support to their requirement in their social circumstances in which they are performing the tasks. Libraries of the future have to focus mainly on digital storage and fastest access to information in qualitative form and also disseminated anywhere required. The same authors elaborated the vision of the future libraries based on the review of different personalities and analyse them as;

- E-learning system is in practice and accordingly needs of user can be met
- Use of multiple media extensively
- Visual infrastructure and use video displaying on wall, room theatres, learning cafeterias, and theme cantered constructions etc. may be more popular.
- Use of e-books, multimedia books, knowledge based packages, exhibits more used.
- Virtual conferencing leads the profession, webinars, and remote participation in debates.
- Extensive media storage, virtual reality,
- Academic librarians perform activities like "Cybrarians in InfoSapce", use of V-mails and diagnostic tools to customize the resources for user centric needs.
- Development of problem solving groups of library professionals
- Digital harvesting of information and knowledge, Extensive content building, advanced internet usage might play big role

The user's expectations are also analysed to develop the future of the libraries. The users of future needs the following from the libraries especially academic

- 24/7 services in digital form and deliverable at any suitable place
- Virtual, digital, mobile and real time archives of information
- Library 2.0 and use of e-books using e-readers like Kindle, I-Pods
- Active learning facilities supporting to current education system

- Wikis, IR's, mega information storage or knowledge base
- Use of IPODS, Blackberry, MP3 players etc. in the library premised to easy downloads and synchronization
- User centric and customized services from libraries
- Wireless communication and support to access information using portals, search engines, information gateways, uploading at IR and open access resources as well use of RSS and web 2.0 tools for scholarly communication
- Information availability from distance or distributed learning center's
- Saving of cost and availability of information using partnership moves similar to consortium

From the study of all these it is revealed that changes are to be accepted and redesigning of libraries are necessary.

8.6 Best Practices for Library Professionals:

Shaheen (2000) had suggested some practices to be adopted by the library professionals, such as:

• Have a service as a motto and desire to serve people / users.

• Practice new technology and have training. LIS professionals have to develop learning attitude and net worked related competencies to reap the benefits of ICT.

• LIS professionals have to take calculated risk. Library rules should be flexible and users oriented while providing the library services in any type of environment. Do not be rigid on the rules.

• Accept and implement changing role of librarians. Accept challenges. Redefine librarian's role.

• Improve human relationship, provide value added services, develop communication skill, and try to market your services.

• Create awareness about library services and how to use these services and inform users what library can do for them.

- Arrange training programs by devoted people to change the mind set and attitudes of the library staff.
- Try to develop subject specialization or scholarliness.
- Reduce bureaucratic attitude and develop quick service attitude.
- Try to read continuously new literature.
- Improve the visibility of libraries search and retrieval.
- Try to provide quality library and information services.
- Create awareness of importance of information.
- Bring users pressure on management for good cause of providing library services.
- Provide sufficient facilities to the users to visit, browse, read and refer the available resources.
- Arrange for effective end users training and raise the expectations of users and show your potential.
- Make use of events for library.
- Involve industry users wherever possible.
- Have a long term plan and vision.

The libraries of the future need to develop different facilities like:

Conference Room: The conference hall or conference room is a room which provides access to ideas representing all points of view on all subjects. Libraries which maintain meeting spaces, exhibit space or other facilities open to the public should make them available on equal terms to all persons, regardless of their beliefs or affiliations.

Discussion Room: The discussion rooms facilitate group to work and discussions collaboratively using the net. Typically, the facility provides furniture, overhead projectors, stage lighting, and a sound system and Wi-Fi.

E-learning mode:

E-learning can encompass disciplines such as collaboration, traditional learning and content management. It is also considered as a modern type of distance education that is delivered via the use of computers, Internet and multimedia presentation. Cisco defined e-learning as a combination of web-based tools that can enhance all traditional classroom modes - learning experiences, textbook study, CD-ROM and traditional computer based training.

Webinar Rooms: The term webinar is short for Web-based Seminar, a presentation, lecture, workshop or seminar that is transmitted over the Web, specifically a portmanteau of web & seminar, to describe a specific type of web conference. Web conferencing refers to a service that allows conferencing events to be shared with remote locations. Most vendors also provide either a recorded copy of an event or a means for a subscriber to record an event. The service allows information to be shared simultaneously, across geographically dispersed locations in nearly real-time.

Teleconference: A teleconference or tele-seminar is the live exchange and mass articulation of information among several persons and machines remote from one another but linked by a telecommunications system. Terms such as audio conferencing, telephone conferencing and phone conferencing are also sometimes used to refer to teleconferencing. The telecommunications system may support the teleconference by providing one or more of the following: audio, video, and/or data services by one or more means, such as telephone, computer, telegraph, teletypewriter, radio, and television.

User Orientation Program

User education program is of great help and it includes library orientation, lectures on library devices, collections etc. Through this program users are informed about the membership procedure, library rules, timing, various services, classification scheme, catalogue, etc. The main idea behind this is the user should know all the details about the library and the information sources and materials in order to use of library efficiently. It helps to guide students in independent scholarly pursuit of knowledge in their subject and to create an awareness of resources of the library and skilled acquired to exploit them. It also setup a channel of communication between the library, the students and the faculty.

Library Portals: A portal is launch pad for variety of inter-related web based service components. It is single window and as a single access point to valuable knowledge treasure of the library. The library portal is an integrated network of information source. The portal serves as web based interface to the in-house resource.

The change had made a major impact on the library and Information Science. The practices being followed in traditional way are becoming absolute and library professionals need to adopt the new practices as per the need of the present scenario.

Some of the important changes needed in our profession are:

- Modernise the libraries using ICT, Library management software's, use of e-resources, developing webpage of library or portal or subject gateway, IR etc. to support user needs.
- The library becoming a platform for generation, exchange and utilization of Knowledge (KGEU)
- Attitude should move from sole acquisition to collaborative access by interfacing with computer technology.
- Apply new technologies for information retrieval and information gathering wherein retrieval is using online catalogues and text or through searching of bibliographical databases.
- Move to the details of searching behaviour of users and natural language interfacing, with linguistic interpretation in a synthetic manner
- Librarian has become de facto intermediately between the user and the knowledge sought. Hence, the librarian while operating information have to analyse and synthesis "User Environment" and "Knowledge Environment"

8.7 Libraries of the Future:

The role of traditional libraries is the same no doubt in future also but there is a massive change in it. The libraries are metamorphosing soon.

- Libraries are treated as a knowledge resource centre instead of store house of information

- Role of librarian is very important in connecting users with information and hence he is also treated as an information specialist instead of librarian
- Information Technology is playing very crucial role and hence many challenges are seen in the library profession in the future
- There are issues whether libraries will survive? Yes, libraries will serve the users for ever but using advanced technology. The reasons for the survival are
    1. Everything is not available on the Internet.
    2. Digital libraries and commercial databases are not on the internet.
    3. Internet provides only public domain information, free
    4. Internet cannot replace libraries, but complements to it
    5. Library is less used physically but virtually more and it is difficult to measure
    6. Digital libraries also need manpower, but of different nature and skills
    7. Traditional libraries will not extinct so quickly (At least in developing countries)
    8. The functions of the libraries will remain the same but the methods will shift
- The libraries will be served better with the usage of the technology.
- Change is reported in the Libraries due to IT and Management. Most of the libraries are Hybrid (P+E).
- Publishing Trends are favourable to new media's and hence a time is not far long that we have to adapt the issues like Modernization of the libraries
- Functions of the libraries are : Acquisition (Acquiring books, journal and other materials) Processing of documents and information for quick information retrieval, Preservation and utility of information resources, Information services to users, Use of Online and Internet based searches, Database development etc.
- Libraries need to reshape due to Information explosion, price rise, more demand from the users, increase in R and D etc., but Very few libraries get adequate budget even though it is not enough for the satisfaction.
- Challenges in the profession are 1) Information Resources management (Storage and Archives), Information Access, critical use of information, Consortium development, etc.
- Functions of the future libraries may be 1) Expansion in bibliographic services 2) Digital archives and open access 3) Institutional repository 4) Multiple consortia

benefits 5) Information delivery at users' desk top 6) Development of specialized databases and linking them internally

1. Practices in Acquisition of Library material: Subscriptions to E Journal and Subject Databases will be more, Internet based data collection, On demand purchase system etc. . Online purchase from online vendors will be the practice and systems in the organizations must be developed for using this facility like credit or debit card facility.
2. Periodicals or Journals Management: E Journals and Consortium based. More access to the subject information using databases. (Negotiation of the models for the subscription will be the key role)
3. Collection development: It will be need based and more resource sharing activities to fulfil the gaps. Creation of the specialized collection databases at each laboratory. Meta data OPACS for the e books.
4. Processing of Documents: Since the status is fully automated, only once the data is fed in the computer and manipulated for the several functions. Fewer efforts for Classification and Cataloguing and more weight age for the Meta data development as it will take care of the digital information resources.
5. Preservation and archival: Mostly digital and retro conversion projects need to apply with OCR.
6. Information Services: These aspects will be developed fast. There will be a shift in the Information services. It can be provided to the in-house users but for revenue generation we can provide these to the industrial users. Such services will change its look.

1) Searching of various databases and providing analytical information to users as per the requirement using visualization methods. This will be based on the payments.
2) OPAC combination (CSIR KRC Libraries) and Inter Library Loan.
3) Regular alert, digest services on a particular topic using commercial databases.
4) Translation services with the help of Panel of translators.
5) Technical Writing Service with help of Panel (Suggested by Dr M G Kulkarni Sir)

- More use of Internet and Web application and hence everyone must be associated with this
- Collaboration and partnership will be increased
- Best management practices and skills, capacity building needed for library staff, hence Continuation education programs with practical management (Not theory based, hands on applications) are to be introduced.

From the above discussions it is understood that the digital library staff pattern is different than traditional. In the digital environment the intake of documents is in e-resources and hence volume of documents is not considered but in this case the new media, awareness of different commercial and free information resources and skills in providing different services. The environment is changing and staff requirement is also changing as discussed in previous chapters. The model developed for digital libraries based on the study is presented below in brief.

8.8: Staff Pattern for Digital Libraries:

Like traditional libraries many scholars have discussed differently for the staff required in the digital libraries. Since there is no standard digital library developed so far it is also difficult to suggest pattern for the staff. However the researcher based on the data, literature and experiences tried to deduce staff pattern for the digital libraries based on traditional system.

8.8.1 Job Descriptions

In digital environment collection development is in e-form and need less staff as its acquisition process is different than the traditional. This need revision in job descriptions of staff engaged at different levels. The task to be performed by staff is to be analysed and after fixing the position of staff the job description is to be fixed. There is a need to assess all these factors before deducing the pattern or formula. It is a difficult task to fix staff formula like Dr Ranganathan, but few scholars represented the fact is considered while developing pattern for the DL.

8.8.2 Professional Challenges for Librarians:

The challenges in the profession are many and vary from library to library depending on the culture. Many scholars have predicted the changes arising due to technologies and management

tools, but current challenges arise due to technological impact including e-publications and e-Learning and teaching. The major challenges isolated form the literature browsed are:

- Reach to the customer by providing outreach services, the users in modern era are digital fugitive, digital immigrants, and digital native etc. and to reach to the customer there is a need to follow outreach programs in the profession.
- Need of information literacy and information literate staff is also a sort of challenge who knows themselves the availability of information and different resources.
- It is sometimes predicted that computers and technologies may take over the role of libraries.
- Transition of libraries towards digital content is a major change faced by the librarians and hence there is a need to search the new path to sustain in the profession.
- If technologies and challenges are not accepted at the right time then the values of the libraries may reduce in future digital contents
- To manage the change there is a need to develop personal skill sets to match with the new environment.

Thus the challenges in the profession of library are many but can be managed well using technologies and converting print media to digital with OCR technology.

8.8.3 Comparison of Staff Patterns / Formulae:

Following table illustrate the staff pattern in brief:

Table 8.4: Comparison of Staff Pattern

Traditional	**Digital**
Based on the intake of volume of documents and services provided	Based on the acquisition of digital contents and information services provided
Only Dr Raganathan's formula is practical	NO effective pattern or formula is devices but discussed a lot by many

Based on print material only	Based on digital material and many other factors
Based on working of every section	Many sections are amalgamated due to digital environment
More manpower is required to manage the libraries and the intake can be quantified	Less manpower is required as digital resources are managed and intake is volatile or uncountable
This was quite possible	Complex to develop pattern and formula
Skill sets are not covered in patterns	Skill sets need to be considered

8.9 Proposed Staff Model / Staff Patten for Digital Library Environment:

8.9.1 Modern Functions in Libraries:

Since the use of ICT in libraries the nature of tasks or functions of libraries though remains same but the duplication in activities is reduced to bare minimum due to use of different technologies and e - publications. The activities of the libraries are managed by the computers, networks in the libraries and communication system involving computer generated ordering of books, down loading and uploading of bibliographic details from OCLC or LOC for library, OPAC. Digitization and building metadata, recording of journal issues, remainder generation for non-receipts, electronic journals and databases subscription, circulation unit, management system, managing web resources, emailing of articles and providing Document Delivery Services (EDDS), knowledge mapping by surfing internet, report generation of budgets, maintaining accounts etc. The processes and functions though remained almost same but the automation, made processes fast and in less manpower as computers and communication and other technologies taken care of the tasks.

8.9.2 Libraries in ICT Era:

There is a need to access the status of libraries in ICT era as ICT had made revolutionary changes in practices and functions. Due to e-learning and e- publishing the education system is

also vary from traditional to digital. Since library is heart in almost all educational and academic sectors, there is a need to transform the activities of libraries to suit the need of current education system and support its functions. It is also noticed that there are massive changes in the library system and they are suffering from old pattern to new patterns to new including staff, functions and activities. The brief activities of libraries in ICT era are elaborated in the following paragraphs.

1) **Acquisition Process** (Books and Periodicals). Traditional libraries acquire of books and periodical in print form and have two separate entities. This is due to difference in acquisition process as books have to be procured and then paid the charges where as in journal subscriptions, advance payment is required and then receipt is to be monitor properly received through different vendors. In the ICT and digital era the task of ordering is much easier as compared to traditional. The activities are taken care by computers and communication system as well digital publications where in many subscription models are available. The manpower required to run two units is now possibly managed by a single unit staff as the process of ordering has reduced as well as media of subscription is shifting slowly from print to digital in case of both books and Job. The only issue of fixing the price models of books and journals. In digital era evaluation, negotiates, communication and qualitative collection development skills are necessary.
2) **Processing:** The traditional libraries have to manage with cataloguing classification and indexing of collection. In digital libraries the task is managed with developing metadata of collection**.** The unit entry for digital publication takes care of the activities related to cataloguing and OPAC is instantly developed using software's. The document data can be downloaded from LC or OCLC databases including class number, indexing terms and subject headings etc. Thus for processing manpower is reduced in digital environment due to elimination of manual work.
3) **Reference**: The referent service in the traditional library was more prominent and essential with the help of print documents using secondary and tertiary literature, but in digital environment the task of the reference service converted to virtual Reference Desk (VRD) as the digital reference sources are more popular and the task is managed by the

chief librarian in addition to his other duties and also freed from manpower. The different services like "Ask Librarian" are also managed in reference service of digital libraries using virtual and internet resources.

4) **Circulation**: In the traditional libraries circulation is the most prominent activity where most of the manpower is required to manage the unit, but now in electronic and digital environment access to documents is over the network and hence man less circulation is possible, (e-book environment**)** Single manpower is sufficient in case of hybrid library. Most of the activities are managed by computers. However self-managed circulation desks are now developed using Kiox board. Man less circulation system is used and users can themselves operate the circulation activities. The remote logon facility is also helps in reducing the load on the staff.
5) **Stack Maintenance**: It is observed that Hybrid Libraries are mostly operated and hence the manpower is required to some extent but since the access to documents in future shift to digital documents then there is no need to deploy maintenance staff to manage the print and e-collection both. Maintenance of e – collection / digital collection is called as "Digital Resource Management" and "Digital Resource Preservation". This function needs specialized skills.
6) **Information services**: Since the data is available in digital form the users are themselves expert in getting the information directly on line. In case of traditional libraries the information services plays an important role and also need more manpower as all the activities are based on manual exercises. In case of digital collections and use of Internet the literature is available in abundance and more services are provided to user in a limited staff.
7) The administrative work and tasks are also reduced due to e-mail facilities. Even data maintenance is carried out in electronic files. The physical verification is managed through computers. The data is stored in e–files and developed paperless offices. The replies to queries are possible using e–data.

8.9.3: Model Suggested for Academic Libraries

Human resource development directs the need of staff considering future trends in profession, mission and vision of organization to achieve goals successfully. Trained manpower for any task is required to provide its goals with maximum individual contribution under proper working relationships and conditions including selection, allocation, utilization and development of employees as well as organization. In the advanced technological age libraries are migrating to digital libraries and serve as local information centers of information and learning or local gateways to national and global knowledge bases etc. but for this purpose the staff pattern required is different. The researcher has discussed the staff patterns for traditional and digital environment both in chapter 5 " Staff patterns in Digital Era" in which the different proposals discussed by the scholars discussed and narrated well, taking the basic concepts from the different opinions the researcher tried to develop his own pattern for the digital era. The model prepared is as under:

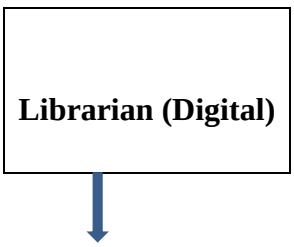
1) While fixing the staff pattern the basic concept considered is e-documents procurement and hence quantity is not considered (like traditional patterns and formula) only the nature of literature incoming in digital form is considered.

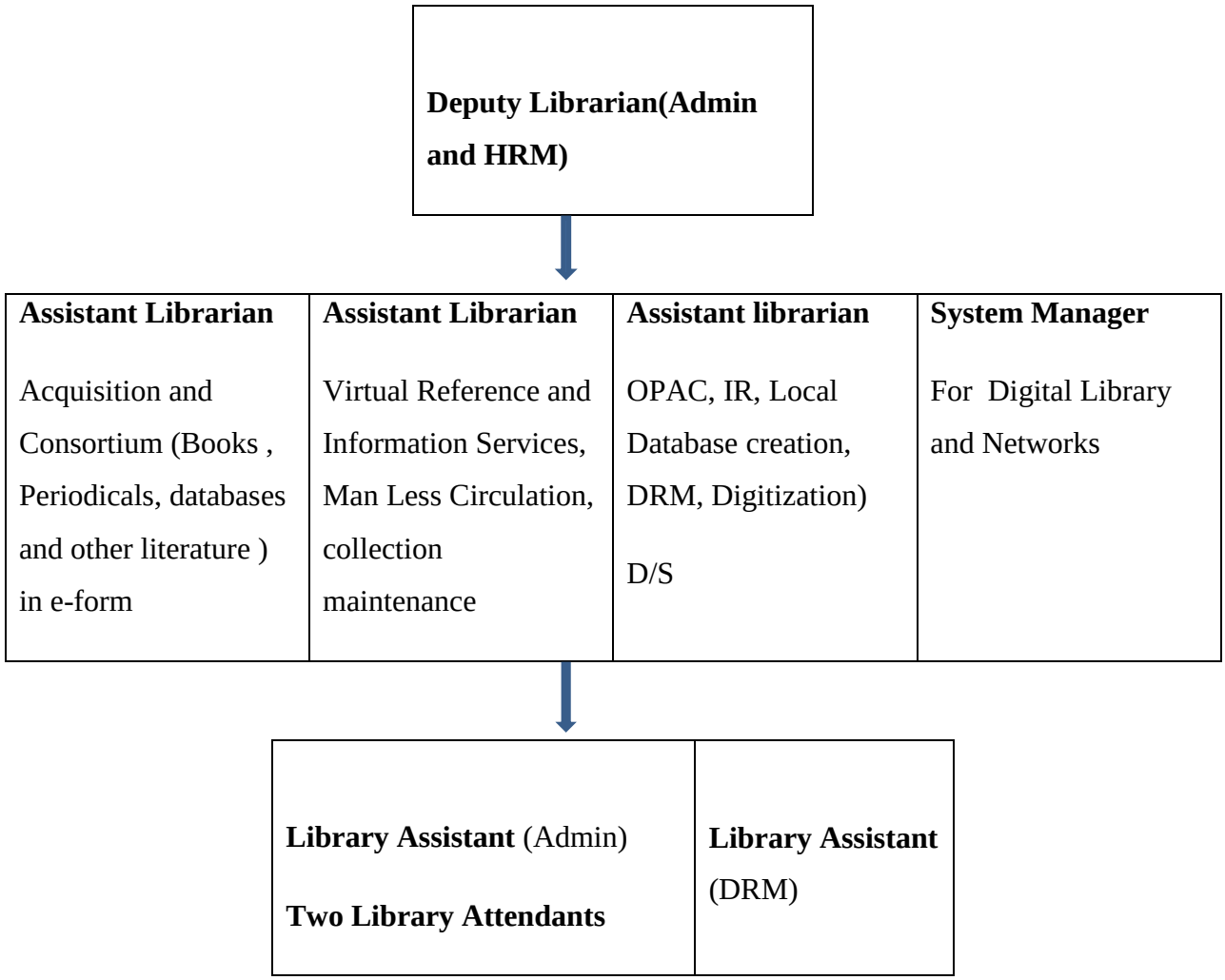
2) Different activities which worked out in the traditional framework are reshaped and reduced the units and main units considered are: acquisition of e-resources (books and periodicals and other type of literature is covered in one group), Digital Resource preservation and dissemination in another unit, reference and information services in one unit, circulation man less counter due to RFID or IP links, these sections are more prominent as compared to traditional since digital collection is considered. Thus one Main Librarian and three assistant librarians may take the lead of the work.

3) Considering the pure digital concept in which maintenance of network, LAN, Internet, DRM, IR development, issuing passwords and updating computer data, maintenance of servers, etc are added work in new set up libraries. For this one technical programmer and one assistant having computer background with degree in computer science is required to main the digital library.

In digital libraries generally the desired staff requirement may be considered by researcher after evaluating different concepts and presented a model as under in Fig No in which minimum six key personnel’s are needed when library is in pure digital form. Digital: Librarian: (1) Deputy

Librarian: (1) Assistant librarian (4), Library Assistant (2), Thus in all 8 staff required in Digital library; however staff for teaching is not considered in this model.





(Fig 8.1 Model Presented by Researcher)

Researcher has observed that there is no pattern or formula practiced so far as the manpower is need for digital library, but few efforts made to find the need of the manpower in the digital era. The need of staff is decided on the following factors:

- Identify the trends in the LIS profession including trends in ICT and management.
- Identify the need and expectations of the users form the libraries in relation to the change
- Consider the mission and vision of the organization as well as financial support from the organization to accept the trends
- Adapt new skill set required to sustain in the digital era
- Identify the challenges to be faced by the library professionals and capacity building to face them.

- Describe the job description of staff working at different levels in new era based on activities.

The nature of the Job in Digital libraries may be briefed as:

Digital Acquisition (DA) = 1 Professional to manage acquisition and periodicals unit

Digital Processing and Asset Management (DPAM) = 1 Professional and 1 Attendant (Circulation monitoring)

Digital Library Services (DLS) and Reference Desk (RD) = 1 Professional

Information Products Development (Database and IR) (IPD) =1 Professional

Digitalization Project (DP) =1 Technical or semi professional

ICT Staff (Network, internet and Web page Developing) = 1 Professional

The qualifications required for the librarian, deputy librarian and assistant librarian need the masters in any discipline and masters in LIS in addition to these technological background qualifications like PGDLAN, PGDLIM etc. are essential. To manage libraries in ICT era there is a need to have additional education which supports to managing and re-engineer libraries. The skill set is also required in addition to traditional skills which are also essential but need to have additional skills like technological skills, networking skills, negotiation and evaluation skills, ICT skills, Internet skills, Information retrieval and searching skills, digitization skills etc. In addition to this database manager, system administrator, network manger positions are is to be added to manage the ICT and suit the trends.

In addition to this database manager, system administrator, network manger positions are is to be added to manage the ICT and suit the trends. Francis (1997) deduced the staff formula keeping in view the ICT Era, and framed a standard for calculating the total number of professionals. In the changed ICT environment, it is found that adoption of the available standards and formulae need to be revised. The publishing technology has completely revolutionized the earlier concept of the number of documents. Now, a single CD-ROM can occupy lakhs of pages of information. Hence, the calculation of quantum of staff based on the number of library documents has become irrelevant. A formula giving weightage to the components of users, documents and budget for

calculating the total number of professional by Francis (1997) in his communication presented a formula noted below.

S = U + D + B

Where;

S = Total number of professional staff

U = User component

D = Document component

B = Budget component

$$U = \frac{(UG \times 1)+(PG \times 2)+(RS \times 3)+(OM \times 1)+(IM \times 10)}{100}$$

Where;

UG = Under Graduate students

PG = Post Graduate students

RS = Research Scholars

OM = Other members including External Members

IM = Institutional Members

$$D = \frac{(PD \times 1)+(CD \times 50)+(MF \times 5)}{20{,}000}$$

where;

PD = Printed Documents

CD = CD-ROMs

MF = Micro Film/Fiche and other micro documents

$$B = \frac{\text{Library Budget excluding salary and inclusive of equipment budget}}{10{,}00{,}000}$$

This formula is not specifying the meanings for the figures used for division. The staff in a university library is given below by the researcher rafter analyzing different formulae and patters or models.

Staff= total users (U) + Intake of documents (D) + Other budget (B)

Where;

S = Total number of professional staff

U = User component

D = Document component

B = Budget component

$$U = \frac{(UG \times 3)+(PG \times 2)+(RS \times 3)+(OM \times 1)+(IM \times 1)}{100}$$

Where;

UG = Under Graduate students for three years

PG = Post Graduate students for two years

RS = Research Scholars for minimum three years

OM = other members including External Members for one year

IM = Institutional Members for the period one year

This may give % of users in the campus using library facility

For calculating documents intake the formula used can be

$$D = \frac{(PD \times 1)+(CD \times A)+(MF \times B)}{20{,}000}$$

Where;

PD = Printed Documents

CD = CD-ROMs

MF = Micro Film/Fiche and other micro documents

Where A denotes documents in CD

Where B is frames in per Fiche contain documents.

For need of library budget

B = Total Budget of Organization X 10% (AICTE prescribed)

The number of professional staff thus arrived may be grouped into two categories, i e., UGC Cadre and Non-UGC Cadre. The number of staff needed in each category may be arrived at considering the qualifications, level of technical competency, experience, etc. required to perform the various functions in a university library. It is suggested that a Minimum of 50 percent of the total professional staff may be in the UGC Cadre.

Along with staff pattern the specialised skills are necessary which may be:

• Knowledge management: skill covers information architecture, ICT skills, technical (traditional) skills etc.

• Subject expertise: skill covers collection management; collection description, technical (traditional) skills etc.

• Information technology: skill covers design, application, systems, user support (problem solving) etc.

• **Information** Service development: skill covers user information analysis, survey, ISB, service impact analysis, planning and evaluation, promotion and marketing

Apart from these skills library professionals need following Generic skills**:** which covers**:**

• Project management: skill covers people management, research skills, bids and proposals etc.

• Critical skills: covers thinking, analysis, problem solving, research etc.

• Leadership: skill covers generic management, communication skills, strategic management, people skills, and financial skills etc.

• Promotion and marketing skills: presentation skills, communication skills

Knowledge and other Skills: Covers knowledge resources (books, journals, i.e. resources, Internet) Teleological facilities and resources (computer, online catalogues, websites, LANs file servers etc.) Financial resources (Budget) Human resources (Skills for manpower training) Competencies required in LIS professionals are:

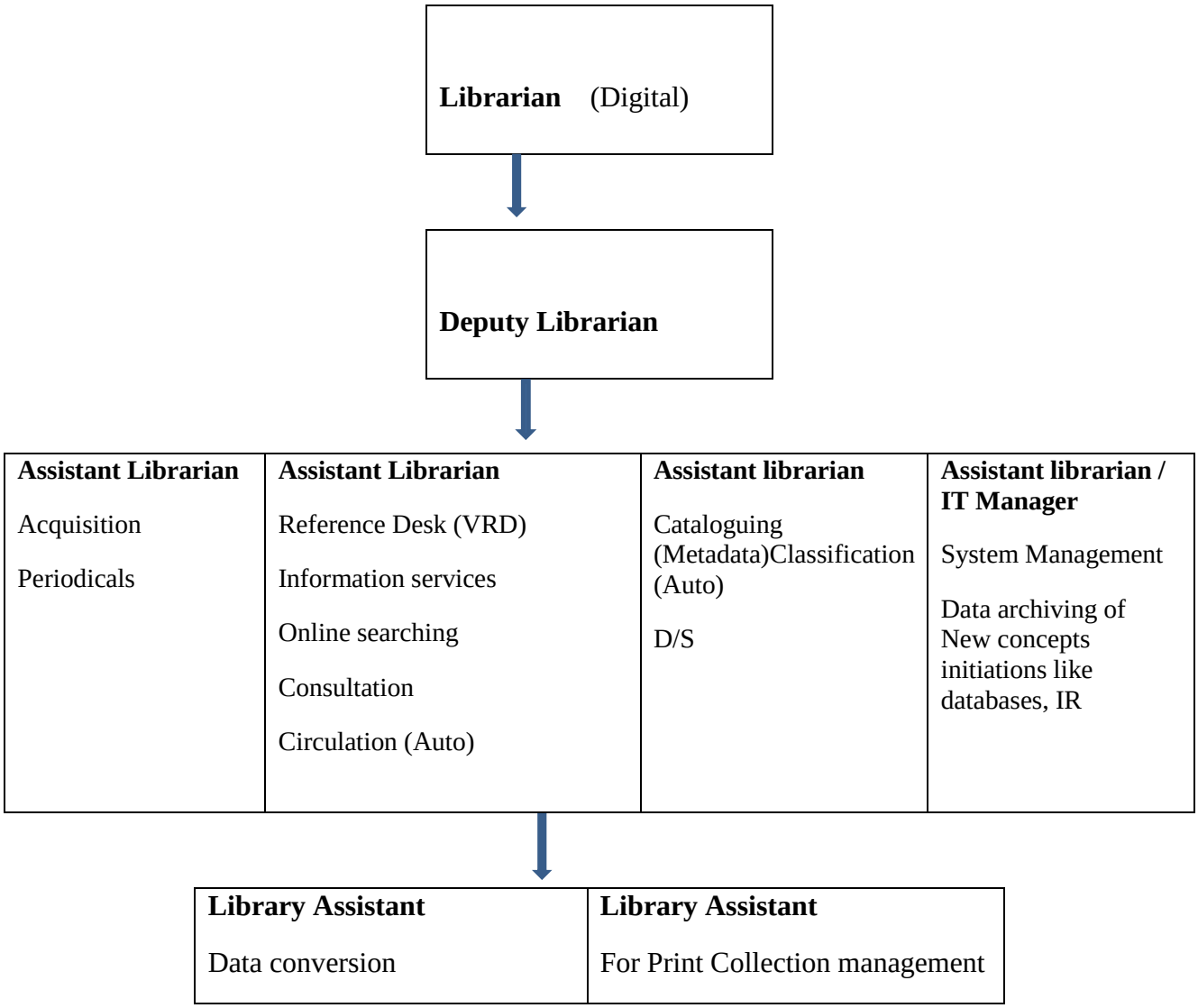
- Acceptance of change.
- Knowledge of user interaction with knowledge resources.
- Provide quality service.
- Be adoptive, flexible and resistant.
- Be resourceful
- Possess excellent communication skills; constantly update personal knowledge base by keeping in touch with the latest development.
- Create awareness among the users, make them accept the changes
- Be an information management strategist, etc.

Technical and technological Knowledge required for libraries to work more efficiently in ICT era are:

- Operating systems - Windows, UNIX, LINUX.
- World processing, Graphics, Spread sheet & Presentations.
- Database Management Systems including the skills in Bibliographic Database Management Systems.
- General purpose programming, Networking
- Web page Development and Content Management
- Information Retrieval software for online, CD-ROM and Internet.
- Library software packages, acquaintances with Digital Library Tools.

For successful implementation of digital library, it is essential that LIS professionals are to be trained and possess requisite knowledge and skills in this respect.

8.9.3.1 Academic Library (University Level)



Staff for university Library this in the digital era is summarized as under:

Digital Acquisition (DA) = 1 Professional to manage acquisition and periodicals unit

Digital Processing and Asset Management (DPAM) = 1 Professional and 1 Attendant (Circulation monitoring)

Digital Library Services (DLS) = 1 Professional

Reference Desk (RD) = 1 Professional

Information Products Development (Database and IR) (IPD) =1 Professional

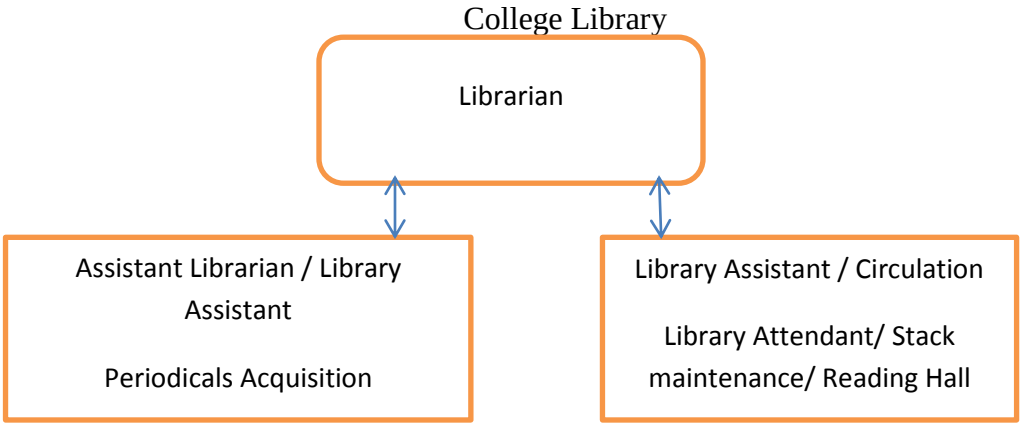
Digitalization Project (DP) =1 Technical or semi professional

Library Hours 7 AM to 10PM = 2 (Attendants)

ICT staff (Network, internet and Web page Developing) = 1 Professional

The qualifications required for the librarian, deputy librarian and assistant librarian need the masters in any discipline and masters in LIS in addition to this technological background are essential. To manage libraries in ICT era there is a need to have additional education which supports to managing and re-engineer libraries. The skill set is also required in addition to traditional skills which are also essential but need to have additional skills like technological skills, networking skills, negotiation and evaluation skills, ICT skills, Internet skills, Information retrieval and searching skills, digitization skills etc.

8.9.3.2 Staff Pattern for Academic Libraries: Colleges and Universities



L = 1

Al = 1

LA = 1

Library Attendant = 2 Total manpower required = 5 In Sufficient Staff.

Digital Library

L = 1 Acquisition + Digital Library + Administration

AL =1 = Circulation Stack maintenance

Attendant 2 = Opening

Total = 4

8.9.3.3 Infrastructure for Digital Library Management:

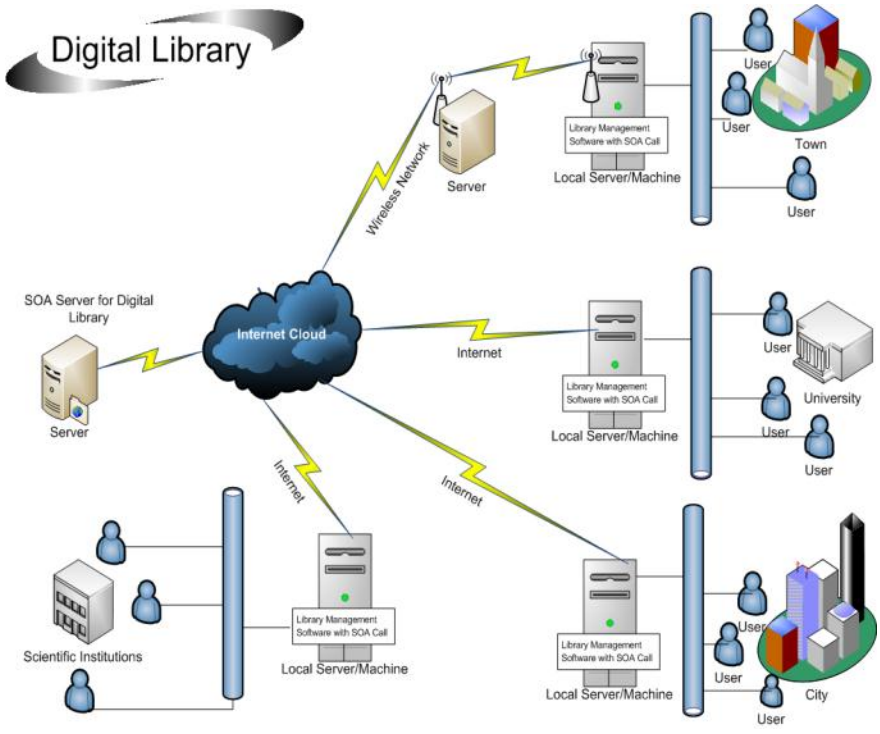


Figure: 8.8.3.3 Infrastructure for Digital library management

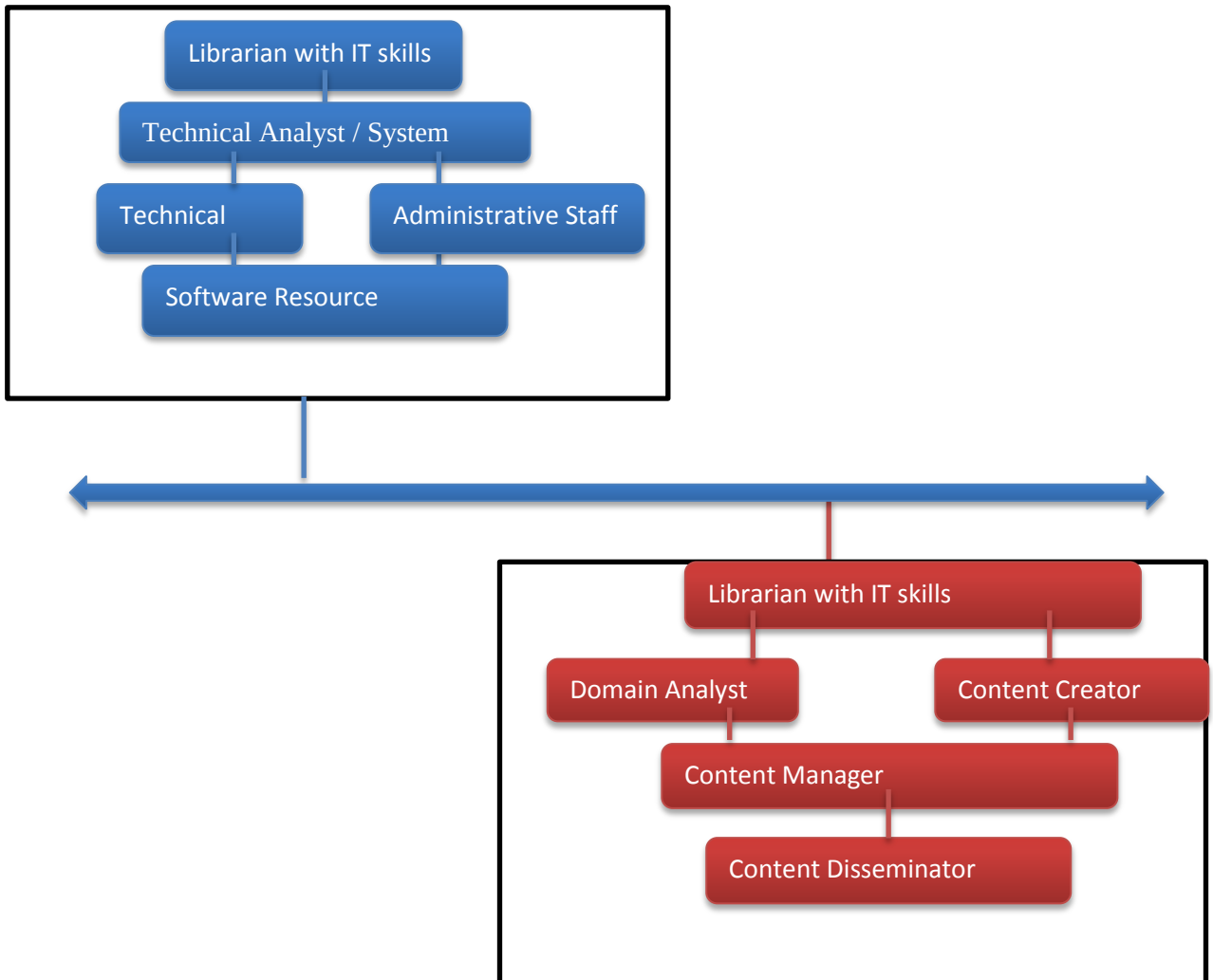
This library infrastructure requires hardware and software's but there is a need to have a professionally trained staff in the domain of information communication technology. Today digital information is growing at tremendous speed and the librarians along with his supporting staff needs to keep-pace with the every changing requirement of the library information storage, handling, management and access. In the figure 8.8.3.3 researcher made efforts in highlighting

infrastructure required for the new era libraries in which e-publications, digital and virtual collection is being used.

In future the digital libraries might be more functional and the library collection in digital form is stored and maintained in server called “Digital Library” having high storage capacity or even more servers linked to each other to accommodate SOA data (Service Oriented Architecture based servers) These servers may be maintained by some agencies in case of big libraries using cloud technologies.

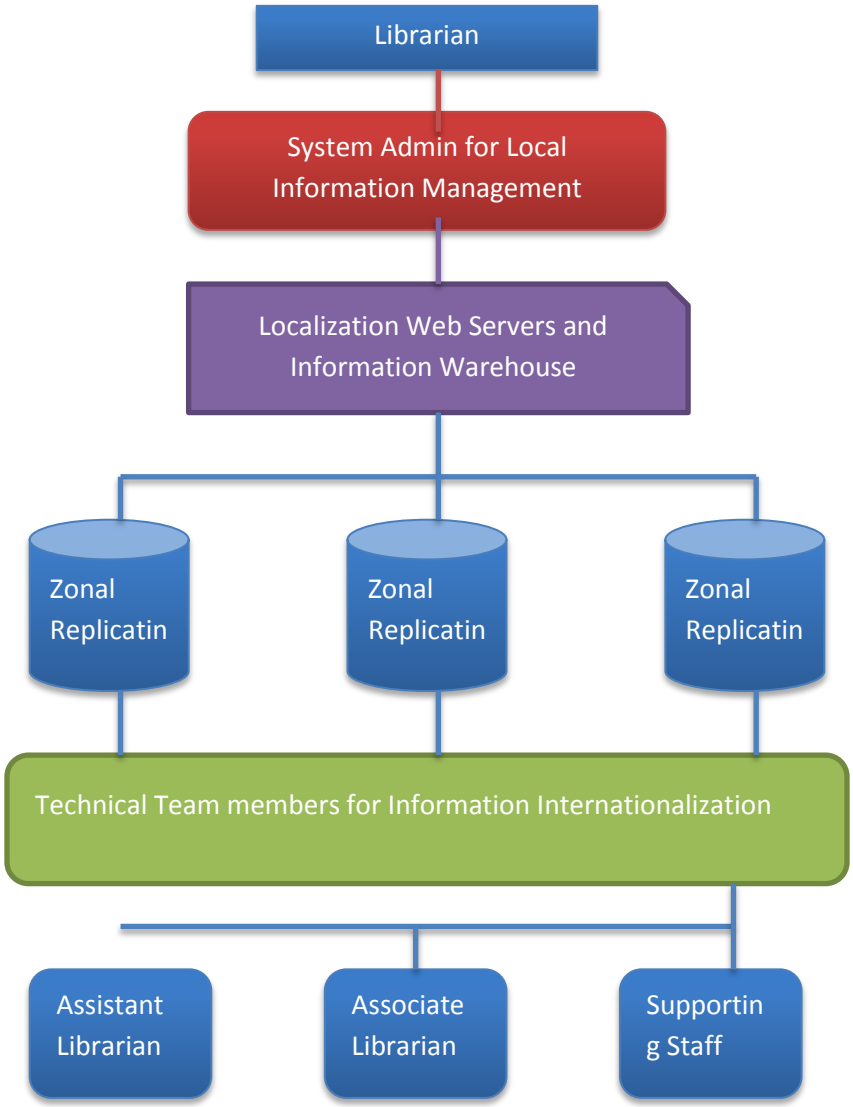
Using intranet and wireless LAN the servers may be connected to different locations in an institute. In the institute form central hub the data may be circulated to each department / section using intranet and the department users can use the data as required for their concept development. They have to use SQL and get the data from different databases.

8.9.3.4 Staffing Pattern for Digital and Networked Libraries



In the above figure 8.8.3.4 the technical analyst and the librarian have to possess technical skills which may help in connecting libraries apart and distributed in the global environment. The networked libraries may be connected to each other using web services and cloud resources the IAAS (Infrastructure As A Service) and PAAS (Platform As A Service) web based services are used in this architecture. The content management services and domain management web services may intercommunicate with each other for mutual information exchange. This might provide intercommunication and content dissemination from various libraries located over the globe.

8.9.3.5 Staffing Pattern for Hybrid Cloud Libraries:



In the above figure 8.8.3.5 data warehouse is located across the globe which needs to be accessed from different locations, this is possible using the localization and globalization web based services the information warehouse and zonal replication of the data is possible using the zone web services. The inter-process communications is possible using the web services which are communicating across the globe the zonal replicas might reduce the throughput for information exchange. All the associated web services may communicate the zones hence the throughput might improve and the information may be collaborated and disseminated to the intended users.

8.10 Scope for future study:

Any research study conducted is not complete in all aspects and factors and there is a scope for others to add the newness in to it. The present study has focused more on the development of staff pattern for the digital libraries as the environmental change is taking place at a greater speed. The study pointed out the changing environment, reasons of change, use of technologies, transformations in libraries and library functions and their impact on staff especially description of job, number of staff, skills needed by staff, role of libraries and librarians, discussions on staff requirement, and model for the staff in digital environment based on experience is elaborated. However there is a scope to add the flavour in to this. The future researcher can conduct a detailed study on actual data collection form the digital libraries developed in India and work out for the number of staff as discussed in staff formula enunciated by Dr Ranganathan.

Summary:

There is a need to develop staff pattern to manage future libraries to survive in the new environment. Use of ICT and application and modern techniques improves the status of libraries and reduces workload of library professionals as well as helps to provide better user services. There is need to revise the staff formula and pattern based on the environment which is changing continuously.

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Chapter 9: Suggestions recommendations and Conclusion

Researcher based on the analysis would like to suggest few workable suggestion which help librarians to fix staff pattern for their libraries

9.1 Suggestions

1. Since e – learning and teaching concepts are developing in academic sector and libraries have to support. There is a need to develop e–collection suitable for the aim and vision in libraries which support to the education system and trends.
2. The educational system is introducing e–learning in classes and also permitted to use ICT/ mobile technology / web technology / internet technology / networked resources in class room while teaching. Hence the libraries are to be re–engineered to support the educational system.
3. Though space shortage reported by librarians, but in future the nature of libraries may change and only 30% space required than the existing space which may find useful for developing ICT based library.
4. Most of the libraries are still print based, though initiated new practices but the nature is hybrid, but in future librarians have to face this issue.
5. There is a need to enhance the use of collection of libraries by different methods and for this development e–collection is must.
6. Librarians have to orient users using traditional and modern methods to increase use of library collection. Information literacy is most important aspect in future and librarians have to develop information as well as technological literacy among staff as well as users.
7. For automation of libraries in spite of costly software's which cannot be afforded by management in such cases OSS can be used like e–granthalaya, koha and for digital library D-Space and Eprint etc.
8. Library access can be enhanced using ICT and developing 24/7 libraries if digitized and networked.
9. The traditional function of library services can be changed using ICT and Digital library development. The advanced library services can be initiated using internet and networked based resources.

Apart from these few more suggestions based on literature digest are presented .

1. In the traditional library system importance was given to building, space etc. but now the space may be limited it has no issues as the resource development is shifting to digital where in space is required very less. But it suggested that now in IT era space needed to develop IT based infrastructure, manage network infrastructure and e-resources. For managing the H/W different arrangement of space is required and hence the existing space is either to be modified or a separate building with facilities for arranging manpower, servers, hubs, network equipment's, maintenance crew etc. is required. The Air Conditioning is necessary for storing the IT equipment's for better performance.
2. At present libraries do not have adequate space but in case of future libraries the existing space of 5000 sq. meter is sufficient with different facilities like space for

- discussion rooms
- demonstration rooms
- Online training classes
- Staff seating location
- Server rooms (High performance computers)
- Battery / Power back up rooms
- Equipment maintenance room
- Computer Network Access Hall (24 /7)

3. The collection development is mostly in print form. Though digital resources are now subscribed the compact of books are more than journals. In some libraries project reports and dissertations are also available. It is strongly suggested that the reference collection, journals of international reputation are to be subscribed more. It is also suggested that the consortium at institute level to imitate or network similar subject libraries in city to achieve RS.
4. It is pointed out by all the libraries that the budget allocation from the funding service is not sufficient even to develop proper collection and hence tasks like modernization and digitization is lagging behind though there is a need.
5. The libraries mostly have open access system for consulting library with single exit/ entry access. Some libraries have maintained manual supervising system vigilance

check. It is recorded that libraries should have developed auto control system and same staff can be used for maintaining collection or manual work in different section.

6. Resource sharing activities are visualized in about 60 % libraries but its nature is based on print media and traditional base like ILLA. It is strongly suggested that EDDS is needed in IT era. This might expand in future. EDDS might be more meaningful based on networked libraries.
7. The opening hours for library operators are normal but reading hall service is provided very well in nearly 40 % libraries but during exam 50 % libraries extend reading facilities. It is surprised to note that 12 % libraries are trying to support 24/7 reading hall facilities. It is suggested that the observation are based on manual system but in ICT era automatically. The library consulting hours might be 24/7 instead of only 12 %. Hence advanced facilities are to be achieved in libraries as early as possible.
8. At Print 92% libraries are conducting library orientation programs in different forms by way of conducting seminars / lectures 49 %, library visits 75 % which is traditional technique. Because on these facts researcher would like to suggest that new technique of library tours, like virtual tour, online demonstrations etc. are very useful. The new methods of orientation are required which may enhance the usage of library.
9. It is observed that query like housekeeping operations Acquisition and circulation are most profusely loaded activities. This is due to Traditional system. It is suggested that there is a need to subscribe to digital resources to reduce the load on HK operations. OPAC is developed initiate R/S sharing activity.
10. Services provided are ILL, newspaper clippings, CAS, SDI which are based on print collection. To enhance the use of libraries it is strongly suggested to provide user centric services and internet and network / social media based services.
11. It is noticed that among the different categories of users Faculty is using (50%) library services more than the students. It is therefore suggested that librarian have to conduct ISB of users regularly, find out their needs and feedback about the collection.
12. The status of automation is satisfactory. 82% libraries have completed the automation but there is no further growth in modernization and digitization or Digital Library development. It is suggested that there is a need to modernize libraries to provide better facilities to users. The DL and VL development is need of the time.

13. It is observed that all libraries (82%) are using Slim and Libsys software's as well as soul and Libsuite. It is suggested that libraries also have to experiment open source library software's like E- Granthalaya and Koha.
14. Books are circulated and issued to users for home reading purpose. The number of books issued to reader is suitable for teachers limit is 50. This is too high. 10 books maximum reader can issue. This strategy is good.
15. In the libraries now e – collection is slowly increasing in different forms. In some libraries also A- V material is also available. It is strongly suggested there is need to increase e collection and R/S programs among libraries.
16. Librarians are aware of OSS and using for different purpose like automation, DL etc. Librarians have to use more OSS for automation, information storage, DL etc. This help in developing modern libraries.
17. Librarians need to understand H/W, S/W, N/W. H/W required for different purposes. To develop digital libraries servers are used to store various data. Networking of libraries. DL needs different kind of H/W which librarian has to deal with.
18. Shifting from traditional to Digital different polices have to be formulated by librarian mainly staff having , In house staff training , acquisition of e-resources , retention polices, retro – conversion policies, equipment purchase policies, database development policies DL development policies, library service policies , library re – engineering policies etc.
19. Traditional libraries have more manpower of various categories with Job description associated to it. But development of DL need less manpower with different skills sets and positions are also different than traditional.
20. The new skills sets to be gained by librarian to manage academic library are.
21. The staff in Digital environment has to follow different tasks and their designations are also different

- System Administrator
- Network Administrator
- Data Compiler
- S/W analyzer
- Server Administrator

- System Controller

22. The staff in Digital library may have complex staff structure. Few tasks can be merged by traditional staff after training them for new environment, but ICT staff is a need and have to be recruited.
23. At present it is observed that in academic libraries especially in university libraries full staff strength right from librarian position is available, however few libraries still need librarian. The college libraries are managed by Deputy Librarians or Assistant Librarians and staff is scanty (not sufficient) to perform the new roles.
24. The funds provided to all the libraries are not sufficient since cost structure is rising, and information growth due to multidisciplinary areas and specialization in subjects. Majority of libraries are still print based and rest migrating to digital media due to its benefits. For all the additional tasks funds are not made available by management and hence librarian has to perform the traditional tasks. The researcher strongly recommends and migrates towards advancement using ICT.
25. Librarians are developing their skills by different means and ways but these are not sufficient as practices of librarianship are different and these cases may get basic knowledge. But it is strongly recommended that more practical oriented practices need to be implemented in syllabi of different university LIS courses. This helps in practically the qualitative manpower to information society.
26. In traditional libraries (universities) Job description is generally fixed but in college libraries there is no fixed job description. The structure of Traditional Library is different from digital library. Hence researcher is of the opinion that there is a need to develop job description for digital library staff which is totally different. The skill sets, qualifications experience is different in digital era.
27. It is strongly suggested that librarian have to develop web page of library and develop "Library portal" to provide libraries to different e – resources either form institute or available on the net. In addition to this IR project is also to be developed. At present 43% libraries develop web page using ICT personnel or system managers, web p9 developer etc. But 37 % libraries have tried to develop their own web pages getting help from ICT staff.

28. Though Digital library are not developed so far in academic in particular college libraries but staff is willing to proceed for digital library imitation since automation is completed. The researcher would suggest that librarians have to gain expertise in different fields associated with DL's and VL's. The awareness of pre-requisites is essential. Among the different skill sets networking, information security, webpage development, ICT skills need to be acquired.
29. It is observed that computer qualified staff is appointed in Institutes for managing total ICT activity and spared for library as and when developed. It is suggested that in IT/ Digital era at least staff having BCS/ MCS qualification is required to manage future libraries.
30. To manage future libraries there is a need manage modern library with the help of ICT personnel's who can assist the future and removes difficulties. It is preferred that at least one BCS/ MCS staff is needed in libraries in addition to other library qualified staff. The activities now have to consider these facts and view the qualification of libraries for IT staff.
31. Since the staff required is different after automation and managing future libraries there is an urgent need to present staff patterns for different types of libraries.

Conclusion:

The information professional of the future need to be user oriented and maintain a focus on the user and not become distracted by the knowledge resources. Secondly, as a professional have to deliver information to the user. Thirdly, act as team players and be cooperative and collaborative in profession. Librarians are increasingly going to participate in and be critical members of user teams. This is related to the need for increased analysis, synthesis, and packaging of information on behalf of users, and becomes responsible for the information-gathering function for the team. The librarians have to become self-trained to sustain in the profession and acquire different skill sets required for managing libraries of the future. The staff required in future libraries are definitely a combination of traditional and modern concepts and staff is required less but more resource full. It is predicted that the future libraries may reshape differently have more resources in limited budgets and managed within limited staff but need special skill sets which help them to sustain in profession..

The study initiated with the experience of change in the libraries due to e-publications and use of ICT in libraries for all the functions and all the areas. The transformation in libraries is taking place slowly and it need manpower to sustain in future. The traditional skill set and qualifications are not suitable for the managing new era libraries. Due to use of ICT the traditional functions are reduced to bare minimum due to elimination of repetitive tasks. The staff pattern required to manage the digital environment libraries is different than before. Hence the present researcher thought to undertake the topic of "**Staffing Pattern for Digital Libraries in comparison with the traditional patterns"** for the research study and the suitable objectives are set in the beginning with hypothesis.

The hypothesis considered for the study are properly discussed in the different chapters and found useful. The objectives set are discussed in the following chapters at length and based on it the model for staff pattern for digital environment model is developed.

Objective 1: " To study different staff formulae, standards, guide lines, procedures etc. developed by different scholars committees, commissions etc. for the traditional libraries as well as digital environment." This is discussed very well in chapters 4 and 5 and based on this study the researcher has presented a pattern for the DL in chapter 8

Objective 2: "To study the transformation in libraries. (Traditional library to modern in digital age) ." This objective is presented with different facts in chapter 3 and detailed out the reasons for the transformation and also need to accept the change.

Objective 3: "To study the efforts made by scholars for developing staff patterns for the digital environment." This is well illustrated in chapter 5 and also in chapter 4.

Objective 4: "To understand in depth the features and the requirements of the digital libraries in the changing environment." This objective is discussed well in chapter 3 and 5

Objective 5: "To study and analyses the job identification and description to be performed by digital librarians to manage the digital library based on present status of libraries." This is covered in chapter 5 and 8

Objective 6: “To study and compare the traditional manpower with that of digital library manpower.” This is presented in chapter 8 very well.

Objective 7: “To study the strategies for the manpower required in the digital library environment.” This is well illustrated in chapter 5 and 8

Objective 8: “To suggest best practices and plan of action to keep library professionals updated in the era of changing technologies.” The model is illustrated in chapter 8 based on the different facts.

Objective 9: “To develop a model pattern for staff pattern useful for digital library environment.” A suitable model is presented for academic libraries especially university and college.

The hypotheses considered are:

1. In future librarians have to migrate towards digital environment and use for modern digital / virtual libraries. This hypothesis is proved true after discussing the expectations of users and trend in the professions in chapter 5. It is true fact that the new trends in profession forced librarian to shift the libraries towards digital as library automation is fully achieved.
2. The staff pattern is different from the traditional libraries and has to identify a pattern useful to run the libraries in future more effectively. This hypothesis is also proved true as the staff patterns are quite different in both environments. In traditional the staff required was based on intake of volume of documents and based on this formula was devoiced but in case of digital environment the intake of volume is not a physical entity and hence the need of the staff for the different functions in libraries are amalgamate.

Thus all the objectives and hypotheses considered in the initial stage are well defined and based on this the study is completed.

There is a need to develop staff pattern to manage future libraries to survive in the new environment. Use of ICT and application and modern techniques improves the status of libraries and reduces workload of library professionals as well as helps to provide better user services. There is need to revise the staff formula and pattern based on the environment which is changing continuously.

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Appendix: A

Questionnaire for the research carried out in Tilak Maharashtra University

Research Student: Ajit S Sonawane

Guide : Dr Prabhash N Rath

"Staffing Pattern for digital libraries in comparison with the traditional Staffing pattern"

Q.1Name of the College/ Institution/ Organization. Establishment Year.

_____

__

Q.2Address of the College / Institution

_____

__

Q.3 Building of your library is situated in

Separate building

Administrative Building

Departmental building

Q.4Area of the library

_____

Q.5No of print National/ International Journals/ Magazines Subscribed

National ( )
International ( )
Bound Volumes ( )
Magazines ( )

Q.6Area of the library covering each section

Books stacking area (---------- sqft
Books Processing area (---------- sqft
Circulation section area (---------- sqft
Users reading room area (---------- sqft
Reference Section area (---------- sqft
Periodical Section area (---------- sqft
Xerox section area (---------- sqft
Digital Library area (---------- sqft
No of circulation counters ----------

Q.7Total collection in your library.

Books ( )
Loose Issues ( )
Rare Books ( )
Manuscripts ( )
Student Projects)
Others (Please specify)

Q.8No of seats available for the users

No of seats for faculty ----------

No of seats for students ----------

No of seats in reference section ----------

Q.9Does the library has single entrance

Yes

No

Q.10Do you provide resource sharing facility to the users? If yes through

a) Inter Library loan

b)Document Delivery Service

cInstitutional Memberships

Others please specify

Q.11Timings of the library

Regular working hours ----------

During examination period----------

Reading room ----------

Q.12Is your library open on holidays?

Yes

No

Q.13How do you educate your users to use library resources? Please tick

Orientation
Seminars
Lectures
Taking them for library visit
Other methods please specify----------

Q.14Services provided in your library.

Acquisition
Circulation
Reference service
Catalogues indexes for locating books
Microfiche
Microforms
Current awareness service
Selective dissemination Information
Newspaper Clipping
Shelf List
Inter library loan
Document delivery

Q.15No of Staff / students in your college.

Teaching Staff ( )
Non-teaching staff ( )

No of students ( )

Q.16Is your library automated?

Yes

In process

No

Q.17No of books issued in your library

Students ----------

Teachers ----------

Technical staff ----------

Non-teaching ----------

Peons ----------

Q.18Do you fallow open access system for faculty and students in the library?

Yes

No

Q.19Which software you have purchased for automation?

Libsys

Slim 21

Autolib

Libsuite

E Granthalaya

Sanjay

Soul

Others (Please specify)

Q.20Online Journals subscribed in your college / University / Institution/ Organisation.

ASME

ASCE

IEEE

IEEE digital Library

Science Direct

Springer

ACM

ASTM Digital Library

Emerald E books

Emerald full texts

Social science citation index

Q.21Do your library subscribe specific subject database?

EconLit

Prowress

Capex

America History and life

Historical abstracts

Others please specify ( )

Q.22Do you have the following digital collection in your library? If Yes Please specify the numbers

Digitized Books (No)

E Books

E Journals

Audio recordings

Videos

Pdf articles

CD Roms

DVDS

E reports

E Newspaper clippings

Full text database

Bibliographic Database

Others (Please specify :

Q.23Do you subscribe to Bibliographic databases?

COMPENDEX on EI Village

MathSciNet

SciFinder Scholar

Web Of Science

J Gate

JET

INSPEC on EI Village

Others (Please specify)

Q.24Do you have e learning resources in your library?

NPTEL lecture videos
E learning web resources
E Magazines
CDs
DVDs
E Books

Q.25Does your library staff download required articles for staff and students from the subscribed from the e resources on demand?

Yes
No

Q.26How do you distribute the downloaded resources to the users?

LAN
WAN
MAN

Q.27Does your library have software to maintain digital library? (Yes) (No) If yes please specify which of the following?

D space
Greenstone
CDSware
BePress
Eprints

Fedora

Elibrary

Others(Please Specify :

Q.28Do you have separate server in your library to provide digital and electronic information to the users?

IBM

CISCO

HP

Dell

Others Please Specify:

Q.29 Do you have monitoring software which monitors the usage of digital services?

Intranet

House made software

Others please specify :

Q.30 No of Staff employed in your College / Organization

Librarian 1

Deputy Librarian

Assistant Librarian

Library Assistant

Sr Library Assistant

Jr Library Assistant

Library Clerk

Library Attendant

Q.31 Please mention qualification of your library staff

Librarian
Dy. Librarian
Asst Librarian
Library Assistant
Sr Library Assistant
Jr Library Assistant
Library Clerk
Library Attendant

Q.32 Do you think your staff has necessary skills to handle the digital library?

Yes
No
If yes how the library staff has acquired the additional skills for managing digital library?

By experience
By doing technical courses
By Refresher courses
By attending workshops
Any other (Please specify :

If No Please specify the reason
a) Old library staff is not in favor of new technology

b) The Digital library is managed by IT department

c) The staff are not competent enough to understand new technology

d) The library is planning to hire new staff to run the digital library

e) The library is going to provide exhaustive bearing to manage the digital library

Q.33 Do you have a resource person to manage the E resources and the library server? Or currently who is managing the server to deploy the information.

Library Staff

Technical Person

IT qualified person

Network Administrator

Others

Q.34 If your information is available on cloud server who is responsible for handling the cloud server

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Q.35 Do you have a library website?

Yes

No

Q.36Who uploads the information on the library website?

Librarian

System administrator

Out Sourcing

IT person

Not applicable

Q.37Do you think you have sufficient manpower in your library to manage all your digital contents and the digital library server?

Yes

No

Q.38 What are the necessary skills required to maintain a digital library in the ICT era?

Programming languages: Visual basic, Java , C#, CC++, SQL

Networking : LAN , Network design, Network Security, Network Mangement

WEB development:HTML,XML, FrontPage, Dreamweaver, maintaining web sites,web 2.0

Project management: IT projects, Supervising personnel's

Not required

Not applicable

Q.39 Do you think we require additional staff to maintain digital library? (Yes) (No) If yes what should be the qualification of staff

MCS

MCA

BE Computer

Any Other

Q.40 Please enlist your opinion in brief about the skills to be required by library staff in the light of changing environment down the ten year time.

_____

_____

_____

Place :

Date : Librarian