STUDY OF LIBRARIAN'S ROLE IN PROMOTING OPEN ACCESS RESOURCES WITH SPECIAL REFERENCE TO LIBRARIES OF RESEARCH INSTITUTES RECOGNIZED BY UNIVERSITY OF PUNE.

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December 2019

DECLARATION

I hereby declare that the thesis entitled **"Study of Librarian's Role in Promoting Open Access Resources with Special Reference to Libraries of Research Institutes Recognized by University of Pune."** completed and written by me has not previously been formed as the basis for the award of any Degree or other similar title upon me of this or any other University or examining body.

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CERTIFICATE

This is certify that the thesis entitled “Study Of Librarian’s Role In Promoting Open Access Resources With Special Reference To Libraries Of Research Institutes Recognized By University Of Pune” which is being submitted herewith for the award of the Degree of Vidyavachaspati (Ph.D) in Library and Information Science Faculty of Moral and Social Sciences of Tilak Maharashtra Vidyapeeth, Pune is the result of original research work completed by Ms. Bhakti R. Gole 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 her.

Place: Pune
Date:

Dr.Mrs.Jayashree Kanetkar
Research Guide

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Abstract

In the current study, the researcher studied the librarian's role in promoting open access (OA) resources with special reference to libraries of research institutes recognized by university of Pune**.** The researchers no doubt play a vital role, but at the same time, they are dependent on the information services provided by their respective libraries. Due to various reasons, the scholarly communication which is important for researchers is now happening through OA resources and all over the world the OA movement is gaining importance due to its benefits to all the concerned stakeholders from research point of view. Hence librarians cannot ignore OA resources relevant to their users' requirements. At the same time, different forms of OA resources, their management, copyright issues, searching and retrieving, publishing types etc. makes them complicated. The researchers may or may not be aware of these OA resources hence the librarian's job is to educate and promote them through various activities and services.

Objectives:

1. To study the types of available open access resources and ascertain their importance in scholarly communication.
2. To study librarians' awareness about 'Open Access' phenomenon.
3. To study the institutional policy with respect to open access for their own publications.
4. To explore librarians' role in promoting use of open access resources in their organizations and to ascertain the difficulties faced by the librarians in promoting OA resources
5. To know end users view points about role of libraries in promotion of open access resources.
6. To find out status of publishing in OA resources by librarian as well as users.
7. To suggest actions to be taken by librarians to promote the use/dissemination of OA resources.

Hypotheses:

1. Majority of librarians from research institutes are promoting use of open access resources in their own organizations (Majority is taken as 90% or more)

2. Majority of research institutes are adopting open access policies for their own publications. (Majority is taken as 90% or more)
3. Majority of users are satisfied with the OA Promotional activities done by library staff. (Majority is taken as 75% or more)

Scope and Limitations of study:

The present study is limited to the librarian's role in promoting OA resources in the research institutes which have got recognition as "Research Institute" by UoP pertaining to its jurisdiction area i.e. from Pune, Nashik and Ahmednagar. The study does not cover any other research institutions. The recognized research institute may or may not be PhD research center.

From the recognized research institutes, only those libraries having full time professional librarian to serve the users, who may be working on permanent or on contract basis are considered.

Population and Sampling:

Out of 73 research institutes recognised by University of Pune, 32 institutes found eligible for the survey as population. 28 librarians from these research institutes responded giving response rate of 82.35%. The users i.e. researchers were broadly grouped in three categories according to their positions in the research institutes viz. Scientists / Researchers / Faculty, Junior Scientist / Junior Research Fellow / Research Assistant and PhD Students. Number of users ranged from 5 to 1262 in the 28 research institutes. Total users were 4266. 5% users from each institute formed the sample for data collection. Total number of users in the sample was 213 out of which 130 responded giving response rate of 61%. The 5% users were selected from each institute randomly based on their availability and care was taken that the users selected were from all three categories.

The research methodology used is Descriptive research method. Survey method is used for collecting the primary data. Two types of questionnaires were developed – one for librarian and one for users i.e. researchers who are engaged in research activities.

The present study is organised in five chapters as follows:

1. Chapter 1 - Introduction:
2. Chapter 2 - Review of Literature:
3. Chapter 3 - Open Access Resources:
4. Chapter 4 - Data Analysis and Interpretation:
5. Chapter 5 - Observations, Conclusions and Suggestions:

Major findings based on librarians' data analysis:

- 27 librarians (96%) have responded that they are aware about concept of "OA" resources and are guiding the users to the important and useful OA resources as per their requirements.
- It is observed that through various sources librarians became aware about OA resources in which Internet / social media (86%) played most prominent role followed by workshops / conferences / seminars (75%) and reading professional literature / journals has got 3rd preference (71%).
- While checking the views of librarians it is observed that 89% librarians agree that Research Libraries (RLs) should educate the users about OA resources. 92% librarians agree that research library staff should have necessary skills for managing OA resources and providing related services. 89% librarians agree that due to exponential growth in OA publications, there is a great need to increase awareness amongst users' community. 86% librarians agree that OA resources are very useful from research point of view. 89% librarians agree that RLs should educate researchers about copyright issues of traditional as well as OA resources. 82% librarians agree that RLs should encourage the researchers to publish their scholarly content in OA resources. 71% librarians feel that that like traditional journals, impact factor are applicable to OA journals as well. 68% librarians agree that RLs should develop the OA policy of its own. Majority of librarians disagree that OA movement will fail in absence of active participation of all RLs.
- For promotional activities, librarians are using various mediums such as print, online or events. The most common channels used are email (96%), informal discussions (75%), training sessions / workshops / information literacy

programs (61%), library website (57%) and phone (46%). The other channels are used as per convenience of librarian depending on the event and as per requirements.

- Maximum libraries (82%) do not have separate budget for promotional activities. 6 librarians (21%) reported that they are not promoting OA resources.
- It is noticed that maximum libraries (71%) have their own library web-page however 57% libraries are using website for library promotional activities.
- It is observed that 64% librarians are consulted regarding journal quality by the users before publishing.
- Maximum librarians (71%) have not published in any OA resources.
- Institutional OA policy is not developed yet in 64% research institutes; at 14% research institutes it is in developmental stage, whereas 14% librarians have responded that they do not have any idea. Only two research institutes (7%) have well written institutional policy.
- 50% research institutes publish their research as OA resources and they are having their own subject / Institutional repository for OA resources. 3 institutes (21%) are registered with ROAR which indicates that the data is shared with outside users by these institutes only.
- For searching the relevant OA resources, Google scholar is the most used source by librarians followed by Directory of Open Access Journals (DOAJ) and Directory of Open Access Repositories (DOAR).
- OA journals are used as most preferred source of OA type followed by OA books at second position and Subject repositories / Institutional Repositories are at third position.
- For promoting use of OA resources; it is observed that there are three major activities carried out by more than half of librarians (54%). These are: listing important and relevant OA sources on library webpage / portal, including OA resources in CAS/SDI services and introducing OA in library orientation sessions / information literacy program.
- The most common problem faced by the librarians while promoting OA resources is absence of OA policy in library / institutional level (82%). Other issues observed are copyright / license term issues (82%), lack of required

skills / competencies (75%), increase in work burden in view of collection development, providing information and reference services to users (61%) etc.

- More than half the librarians (54%) feel that there is a need for separate post of library professional for providing OA related services. All librarians (100%) felt that there is a need for short training course for managing OA resources and providing related information services.
- It is observed that out of 28; only 4 librarians (14%) have taken feedback from users through survey after promoting OA resources.

Major findings based on users' data analysis

- 123 users (95%) are aware of OA concept with reference to scholarly communication.
- Maximum users are getting information about OA resources from Internet / Social media (78%) followed by reading professional literature / journals (68%), through discussions with institutional colleagues (54%) and through Library staff (45%) which is at 4th position.
- Maximum users (54%) are using the OA resources most of the time, 35% are using sometimes. 11% of users showing seldom or no usage at all.
- 48% users have published in OA resources.
- While checking the users views about OA resources, it is found that maximum users agree that:
    a. OA resources are very important from research point of view (54% strongly agree and 37% agree).
    b. Researchers should publish their research work in OA resources for wide reach (53% agree and 35% strongly agree).
- Maximum users (71%) acknowledged that their libraries are promoting OA resources.
- Maximum users (55%) are satisfied with current promotional activities by librarians; whereas 12% are very satisfied. 26 % remain neutral while 6% are dissatisfied.
- While checking the views of the users about promotion of OA resources and expectations from library staff, it is found that maximum users agree that:

a. Library can play a strong role in promotion of OA resources (37% strongly agree and 54% agree).
b. Library staff should educate users about copyright aspects of OA resources (35% strongly agree and 58% agree).
c. Library staff should be more trained for promoting OA resources (38% strongly agree and 51% agree).
d. Management of Institutional Repositories is library's responsibility (19% strongly agree and 53% agree).

Major suggestions given are as follows:

1. For research libraries, appointment of full time professional librarian is highly recommended as there cannot be substitute for same.
2. All research institutes should consider adopting OA policy at institute level especially those having funding from government.
3. Sufficient professional library staff in comparison to available users is required with necessary skill sets.
4. It is highly recommended that OA resources should be included along with other resources in library collection development policy.
5. Training for developing the skills / competencies for managing various OA resources may be arranged for librarians.
6. It is recommended that small part of library budget or institutional budget may be allocated for promotional aspects of library resources.
7. The management support is vital for various activities such as funding for updating the IT infrastructure, promotion activities of library, training of library staff for OA related activities as and when required, availability of sufficient professional staff etc.
8. Through advocacy skills, librarians should educate the users to utilize OA resources for research, teaching, training and education purpose.
9. As part of M.Lib.I.Sc. Syllabus, more weightage may be given to OA resources and related aspects which will be beneficial for new entrants in the library profession.
10. Library staff should always keep themselves updated with latest and future predictions related to OA.

11. It is necessary that library infrastructure should be a state of the art infrastructure
12. Planning and creating a library web-page / web-site with a separate menu for listing relevant OA resources can be planned.
13. Based on the findings of current study and literature review, the researcher has devised a model plan for promotional strategies of OA resources.

In this study, the objectives are fulfilled and hypotheses are tested. The study is concluded by giving suggestions for further research. As found in the study, though librarians are playing an important role in promotion of OA resources at institute level, still more efforts are required at various levels and also it is important to educate the users about latest developments taking place in related areas. The users are also expecting more from librarians as it will save their time and help them in their research to avoid duplication. It is essential that librarians should update their knowledge and skills to provide better services to users in view of upcoming trends, challenges and expectation of users.

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Abbreviations

Abbreviations	Full form of the terms used
APCs	Article Processing Charges
ARL	American Research Libraries
ASN	Academic Social Networking
B.Lib.I.Sc.	Bachelor of Library and Information Science
BI	Bioline International
BMJ	British Medical Journal
BOAI	Budapest Open Access Initiative
CARL	Canadian Association of Research Libraries
CAS	Current Awareness Services
CC	Creative Commons
CEC	Consortium for Educational Communication
CODATA	The Committee on Data
CSIR	Council of Scientific and Industrial Research
DBT	Department of Biotechnology
DOAB	Directory of Open Access Books
DOAJ	Directory of Open Access Journals
DOAR	Directory of Open Access Repositories
DOI	Digital Object Identifier
DOIR	Institutional repository
DRTC	Documentation Research and Training Centre
DST	Department of Science & Technology
ETDs	Electronic Theses and Dissertations
FAS	Faculty of Arts and Sciences
GIPE	Gokhale Institute of Politics and Economics
GOI	Government of India
GST	General Service Tax
ICAR	Indian Council of Agricultural Research
ICSSR	Indian Council of Social Science Research
ICSU	International Council for Science
ICT	Information and Communication Technology
ICTs	Information and Communication Technologies
IF	Impact Factor
ILL	Inter Library Loan
IMCC	Institute of Management and Career Courses
IMF	International Monetary Fund
INFLIBNET	Information and Library Network
INTED	Indian National Theses Database
IRs	Institutional Repositories
ISI	Indian Statistical Institute
IUC	Inter-University Centre
IUCAA	Inter-University Centre for Astronomy and Astrophysics
JCR	Journal Citation Reports
JIF	Journal Impact Factor

JOSS	Journal of Open Source Software
LISA	Library Information Science Abstracts
M. Lib. I. Sc.	Master of Library and Information Science
MANLIBNET	Management Libraries Network
MOA	Mixed Open Access
NARS	National Agricultural Research System
NCERT	National Council for Education Research and Training
NDL	National Digital Library
NDLTD	Networked Digital Library of Theses and Dissertations
NDSAP	National Data Sharing and Accessibility Policy
NDSAP	National Data Sharing and Accessibility Policy
NET/SET	National Education Test / State Education Test
NKC	National Knowledge Commission
NPTEL	National Programme on Technology Enhanced Learning
OA	Open Access
OAC	Open Access Contribution
OAI	Open Archives Initiative
OAI	Open Access India
OAI-PMH	Open Archives Initiative Protocol for Metadata Harvesting
OAJ	Open Access Journals
OAJSE	Open Access Journal Search Engine
OASPA	Open Access Scholarly Publishers Association
OATD	Open Access Thesis and Dissertations
OAWG	Open Access Working Group
OB	Open Books
OCS	Open Conference Systems
OCW	Open Courseware
OD	Open Data
ODB	Open Data Barometer
OER	Open Educational Resources
OHS	Open Harvester Systems
OJS	Open Journal Systems
OMP	Open Monograph Press
OpenDOAR	Directory of Open Access Repositories
Ph.D.	Doctor of Philosophy
PKP	Public Knowledge Project
PLOS	Public Library of Science
PNAS	Proceedings of the National Academy of Sciences
RDR	Research Data Repository
RL	Research Library
RLs	Research Libraries
ROARMAP	Registry of Open Access Repository Mandates and Policies
RoTs	Receive only Terminals
RWU	Ranking of Web of Universities
SDI	Selective Dissemination of Information

SET	Social Exchange Theory
SITs	Satellite Interactive Terminals
SJR	SCImago Journal Rank
SNIP	Source Normalized Impact per Paper
SOAP	Study of Open Access Publishing
SPARC	Scholarly Publishing and Academic Resources Coalition
SPPU	Savitribai Phule Pune University
SRs	Subject Repositories
SSRN	Social Science Research Network
STEM	Science, Technology, Egineering, and Medicine
STM	Science, Technology & Medicine
UCL	University College London
UGC	University Grants Commission
UNESCO	United Nations Educational, Scientific and Cultural Organization
UoP	University of Pune
UTAUT	Unified Theory of Acceptance and Use of Technology

Chapter 1: Introduction

1.1 Introduction:

Research in any field is important for the development of the society and human kind. Research institutions are engaged not only in pure but also in applied research which results in innovations and new intellectual property. The researchers no doubt play a vital role, but at the same time, they are dependent on the information services provided by their respective libraries. These information services are important for any researcher at various stages of his/her research. In the beginning of new research, a researcher needs an overview of existing literature related to his / her area of research, during the research to keep abreast with latest developments, and at the end to review again. This is possible with the help of library associated with the parent institution, popularly known as “Research Library’’(RL). These libraries help to fulfil the vision and mission of the parent institution by providing various information services as per requirement.

1.2 Research Libraries (RLs):

There are different types of libraries such as academic, public or special library. A special library is defined ("Special Library," n.d.) as ‘a privately owned library that forms a unit of a business firm or other organization, specializes in books and other material of special interest to the organization of which it is a part, and usually serves only the staff or members of this organization’.

The RLs are special libraries having specific collection in a particular subject and allied areas. Such specialised libraries when are attached to research institutes where research is conducted are known as Research Libraries. These research institutes may be from various areas such as Science and Technology, Social Science, Management etc. These research institutes are funded and supported by Government or private sector or industries. The information needs of the researchers working in these research institutes are catered by their own RLs.

Apart from regular library services, the Research librarian is also expected to provide specialised services like preparation of exhaustive bibliographies, regular scanning of various information sources such as indexing and abstracting periodicals, documentation services such as Selective Dissemination of Information (SDI),

Current Awareness Services (CAS), reference and referral services, online searches, standard / patent services, translation services, library bulletins, etc, depending on the subject domain. They are expected to provide pin-pointed, up-to-date and prompt information in a useable form as and when necessary by the researchers, irrespective of its format.

There are several challenges for RLs, such as:

1. Every year librarians are facing big problems in managing the available budget in view of increasing cost of journals and other resources. Especially in case of research libraries, in the absence of required information, the research activities of the organizations may get affected. This is very serious as it may result in duplication of effort and wastage of time and money. In today's scenario, where intellectual property is considered highly valuable, librarians cannot neglect the relevant and important sources of information, irrespective of format. However, cost is the major hurdle in acquiring the essential information.
2. To overcome budgetary crunch, libraries are coming together for consortia and for resource sharing. Yet, it has limitations due to specialised and sometimes interdisciplinary subjects, ever increasing proliferation of different types of information sources for scholarly communication, especially with reference to online resources as compared to printed ones due to the benefits associated with them. There is a shift from owning the document to getting access to the document.
3. The impact of emerging trends in Information and Communication Technologies (ICTs), especially for information handling activities has changed the scenario of scholarly communication. This has resulted in new challenges for information professionals in the way of providing qualitative services to its users. Libraries have to play an important role as an aggregator for various sources of information which have increased multi-fold in recent years in contrast with printed documents in the past. The channels for getting research information is not limited to traditional printed journals or books but they are expanded to other online forms, such as, online journals, e-books, various bibliographical and statistical databases, blogs, wikis, podcast, social media platforms such as Facebook, twitter, academia, slide share, etc. Every

format is different, with peculiar features; hence it is important that library professionals should acquire skills and knowledge about these formats. Also, easy access to information is possible with increased use of gadgets like mobiles, tabs in addition to laptops. Cheaper internet rates and easy availability of wi-fi also makes it easier for users to get access to information.

4. There are other complicated factors such as escalating prices of e-resources in view of available budget, technology up-gradation as and when required, necessary infrastructure development for getting the access to these online resources, signing of licence terms and conditions of contracts which are complicated, but without which, access to e-resources is not available, marketing of the highly priced resources to ensure that they are used properly and efficiently by users, orientation of new users, personal as well as skills development of all library staff members to manage these e-resources to provide better services, etc. Even after paying for e-resources, there are restrictions for usage, access and sharing, etc.

   In absence of access to any of required e-resources, resource sharing or inter library loan is the only option left. But again, it is dependent on the other library as it should not result in any kind of breach in contracts signed.

5. Both, researchers and management have high expectations from RLs to provide better and efficient services to researchers in the available budget. At the same time, users have a tendency of searching information on Internet on their own instead of approaching the library, due to various reasons. Hence, for RLs, it is a matter of existence, also to demonstrate importance and relevance of research library and librarian. In many research institutes, internet use and access is restricted due to highly confidential information or research work they carried out. In such a scenario, the scientists are depending mainly on library professionals for required, up-to-date and timely information.

6. There is a big revolution in the publishing industry as emphasis on online or e-publishing is increased in last few years. According to the white paper from Simba Information (2019), the global market for scientific, technical and medical (STM) publishing generates more than $20 billion in annual sales, and the industry's top players consistently report adjusted profit margins above 30%. Even though it is expected that with digital publishing, the cost would be less as compared to printed documents, the publishers are increasing the cost

every year citing reasons such as technology cost involved, constant up – gradations due to rapidly changing ICTs scenario, challenges faced due to depletion of subscriptions of journals by libraries because of high pricing, cost involved for editorial teams, marketing etc. There is a debate on the cost involved for digital publishing as Swapan, D. (2004) argues that journals should not be expensive as writing, editing, reviewing and typesetting are done free of cost by researchers. Because of the high pricing, he emphasizes that the research libraries in India and the libraries in the third world in general are the worst sufferers because of paucity of funds allotted to them for journal collection.

Irrespective of the challenges, RLs have to perform and provide expected outcome by providing efficient and effective services to researchers. It is mainly achieved by RL by emphasising acquisition or getting access to the scholarly content popularly known as 'Scholarly communication' as per researcher's requirement, since these are essential and important and form basis for research deliberations.

1.3 Scholarly communication:

According to UNESCO (2015) 'The scholarly communication is the process of sharing, disseminating and publishing research findings of academics and researchers so that the generated contents are made available to the global academic or research communities'. There are various channels used for scholarly communication such as scholarly journals, conference proceedings, research monographs, dissertations, research reports, working papers, patents etc. Since nineteenth century, scientific societies, research institutions, university presses and other learned communities were involved in publishing their own scholarly journal for disseminating the results of the research carried out by them. The oldest academic journal traced is The Journal des Sçavans (Scientific journal, n. d.) published in Europe. Its first issue was released on 5th January 1665 and it is still published as Journal des Savants (ISSN: 0021-8103).

Most common channel used for scholarly communication is journals. There are well known scientific journals which are published over a century and have made great impact on advancement of knowledge in respective subjects. These journals are prestigious, due to which publishing a paper in such a journal is also important from researcher's point of view. Due to peer review process, where the research work is

reviewed by the experts in same domain area, quality, ethical standards and presentation formats are assured. Over the period, journal publishing, which was non-profit making was taken over by commercial agencies or multinational companies and their aim was profit making.

During 1970s, the “Science Citation Index”, a bibliographic tool based on citations and designed by Eugene Garfield has led to the development of a journal metric called the Journal Impact Factor (JIF). According to Laakso et al. (2019, January) JIF metric has resulted in the competition among scholarly journals. JIF also got importance as a means of research evaluation, based on which researchers manage to publish. Eventually, the prices of scholarly literature began to rise well beyond the inflation rates observed since the 1980s. This trend has increasingly burdened universities and research institutions across the world, which had to cancel the journal subscriptions due to high pricing. This scenario was popularly known as ‘serial crisis’. Online publishing started around mid 1990s, which changed the focus from buying the journal copies to negotiating the licence terms for rights of access. The practice of grouping all the journals of a publisher into ‘Big deals’ was introduced, where libraries had to pay for entire collection of journals, irrespective of their requirement of selected titles. Thus, library budgets were dominated by the policies of publishing companies. Other aspects like legal issues (copyright law and licence agreements) and technological issues (digital rights management for blocking access to unauthorised users) culminated into more complex situation termed as ‘permission crisis’ by Suber, P. (2003).

Simultaneously, there was exponential growth in research literature due to more specialisation of research areas in to micro levels subjects. But funding available to RLs was decreasing due to exchange rate fluctuations of currencies. Also, due to online resources, part of library budget was used for infrastructure development such as computers and networking. Most of the RLs are funded by government, but in some cases, there are private and autonomous institutes also doing research in specialised area. These institutes have different reasons for doing research, such as, commercial purpose / industry related projects due to which they may also face funding issues. Publishing their research outcome is also limited due to commercial aspects involved or confidentiality.

Overall, it was observed that the researchers who contributed to the scholarly journal through their research articles could not get access to own publication, being costly for their own library subscription. The waiting period for publishing the research paper in well known journal from sending the paper, to its acceptance and actual publication was more than that of similar journals. Overall, the research community all over the world was more interested in disseminating their research results in a faster way. These trends lead to the development of Open Access Movement.

In such a scenario, "Open Access" movement is a blessing not only for librarians but also for end users (scientists, researchers, faculty members working in academic institutes, students etc.).

1.4 Open Access Movement

1.4.1 OA Movement at international level

'Open Access' (OA) term is not new for library science profession. In the past and even today, traditional libraries used this method where the users are allowed direct entry to open shelves to take books from and use them as per requirement. In case of closed access, the users are not allowed direct access to the material. They have to fill up the requisition form and can get material later on. This has physical restriction and access is limited to the users of that library. If required, access is possible either on inter library loan or by referral service to other library where the document would be available. Most important is that the document is not free as library has to purchase / subscribe it from its budget.

Now since past few years, "OA'' term is frequently used for online material available on Internet, having free access without any restrictions. Due to technological advancement both in Information and Communication Technology (ICT) and publishing industry, more and more resources are now available on Internet or in online format.

The basic principle behind the 'OA' movement is that since research is funded through public funding, the society has a right for unrestricted access to research information for transparency purpose. In simple terms, OA literature means the online resources available on Internet that are free of cost and without any copyright and licensing restrictions.

Open access (OA) is defined as follows:

> "By 'open access' to this literature, we mean its free availability on the public internet, permitting any users to read, download, copy, distribute, print, search, or link to the full texts of these articles, crawl them for indexing, pass them as data to software, or use them for any other lawful purpose, without financial, legal, or technical barriers other than those inseparable from gaining access to the internet itself. The only constraint on reproduction and distribution, and the only role for copyright in this domain, should be to give authors control over the integrity of their work and the right to be properly acknowledged and cited" (Budapest Open Access Initiative, 2002, Para 3)

Hart (Project Gutenberg, 1992) the founder of Project Gutenberg in 1971 explained the philosophy behind the project which was to make information, books and other materials available to the general public in forms a vast majority of the computers, programs and people can easily read, use, quote, and search. It is considered as the first attempt of free electronic books, or eBooks. This project offers over 59,000 free eBooks as on today.

It was followed by creation of different subject repositories. The most prominent one is arXiv.org established in 1991. It is popular as being highly-automated electronic archive and distribution server for research articles in the fields of mathematics, physics, astronomy, computer science, statistics etc. (Cornell University, 2019). Social Science Research Network (SSRN) (1994) in the field of social sciences and humanities and NIH PubMed (2000) in the field of medical sciences etc. are similar examples of specialised subject repositories.

Scholarly Publishing and Academic Resources Coalition (SPARC, n.d., who we are) originated in 1998. More than 200 members are from US and Canada. Together with international counterparts such as SPARC Europe, SPARC Japan, and the newly launched SPARC Africa, more than 600 libraries and research institutions around the world are members. SPARC helps the research institutions in promoting OA like scholarly articles, sharing of research data, and Open Educational Resources (OER)

adoption on their campuses by providing resources and support. In 2007, SPARC launched the concept of Open Access Day, which is now celebrated as Open Access week every year in October, based on some theme. Many libraries around the world celebrate Open Access Day / Week and organise various programmes based on a theme to increase the awareness and to promote OA.

Public Library of Science (PLOS) (PLOS, n. d.) was launched in 2003 and is doing promotion of OA through various activities. PLOS was founded as a non-profit OA publisher, innovator and advocacy organization with a mission to advance progress in science and medicine through transforming research communication. It publishes PLOS ONE a peer reviewed journal. It is world's largest multidisciplinary journal and developed Article-Level Metrics.

Various meetings, conferences were organized at international levels on Open Access. The prominent ones are as follows:

- Budapest Open Access Initiative (BOAI):

The first one was organised on February 14, 2002 at Budapest, Hungary. BOAI was first initiative to use OA term and also gave its definition. Budapest Open Access Initiative recommended following strategies for achieving OA for scholarly journal literature:

I. Self-Archiving ("green OA"): This is by creating open electronic archives where the scholars deposit their referred journal articles. This practice is known as 'Self archiving'. It requires tools, assistance, standards, search engines so that users make use of them.
II. Open-access Journals ("gold OA"): These are the journals which will be disseminated as widely as possible without any restriction for copyright and access, free of charge to ensure permanent OA to all articles. These journals will use alternative ways including foundations, government funds, endowments, the universities and laboratories that employ researchers for same, etc.

Open access is of two types (Suber, 2008):

- Gratis OA: It is online access free of charge, and

- Libre open access: It is online access free of charge and with some additional usage rights.

In 2012, a worldwide campaign for open access (OA) was launched by BOAI to all new peer-reviewed research besides scholarly journals. It reconfirmed the benefits of OA as follows:

‘‘Ten years of experience led us to reaffirm that green and gold OA “are not only direct and effective means to this end, they are within the reach of scholars themselves, immediately, and need not wait on changes brought about by markets or legislation.”

BOAI (BOAI, 2012) also gave recommendations for next 10 years for the development of OA policies through developing Institutional policy for OA, licensing and reuse, infrastructure and sustainability, advocacy and coordination. It also recommended that research institutions, including research funders, should support the development and maintenance of the tools, directories, and resources essential to the progress and sustainability of OA.

To mark the 15th anniversary, BOAI organised online global community survey in 2017 and got 300 responses from various countries. Two main important areas recognised were the need for incentives for scholars for sharing their work in OA mode and lowering the cost of OA publishing.

- Bethesda statement

On April 11, 2003 as a part of Bethesda statement, new definition for OA publication was released. Open Access Publication is defined as follows:

An Open Access Publication is one that meets the following two conditions:

1. The author(s) and copyright holder(s) grant(s) to all users a free, irrevocable, worldwide, perpetual right of access to, and a license to copy, use, distribute, transmit and display the work publicly and to make and distribute derivative works, in any digital medium for any responsible

purpose, subject to proper attribution of authorship [2], as well as the right to make small numbers of printed copies for their personal use.

2. A complete version of the work and all supplemental materials, including a copy of the permission as stated above, in a suitable standard electronic format is deposited immediately upon initial publication in at least one online repository that is supported by an academic institution, scholarly society, government agency, or other well-established organization that seeks to enable open access, unrestricted distribution, interoperability, and long-term archiving (for the biomedical sciences, PubMed Central is such a repository). (Suber et al, 2003, Definition of Open Access Publication)

It also included different statements for various stakeholders such as Institutions and funding agencies, libraries and publishers, scientists and scientific societies. For libraries, developing and supporting mechanisms for OA publishing, giving high priority in educating the users about OA publishing and OA journals and listing of OA journals in library catalogues and other databases were proposed.

- Berlin declaration (October 2003)

The Berlin Declaration (Max Planck Society, 2003) on Open Access to Knowledge in the Sciences and Humanities is an international statement. It was released in a conference on open access hosted in Berlin by the Max Planck Society in 2003. Open Access Contribution (OAC) is defined as follows:

1. Open access contributions must satisfy two conditions: The author(s) and right holder(s) of such contributions grant(s) to all users a free, irrevocable, worldwide, right of access to, and a license to copy, use, distribute, transmit and display the work publicly and to make and distribute derivative works, in any digital medium for any responsible purpose, subject to proper attribution of authorship (community standards, will continue to provide the mechanism for enforcement of proper attribution and responsible use of the published

work, as they do now), as well as the right to make small numbers of printed copies for their personal use.

2. A complete version of the work and all supplemental materials, including a copy of the permission as stated above, in an appropriate standard electronic format is deposited (and thus published) in at least one online repository using suitable technical standards (such as the Open Archive definitions) that is supported and maintained by an academic institution, scholarly society, government agency, or other well-established organization that seeks to enable open access, unrestricted distribution, inter operability, and long-term archiving. (Max Planck Society, 2003, Definition of Open Access Contribution)

OAC also included original scientific research results, raw data and metadata, source materials, digital representations of pictorial and graphical materials and scholarly multimedia material.

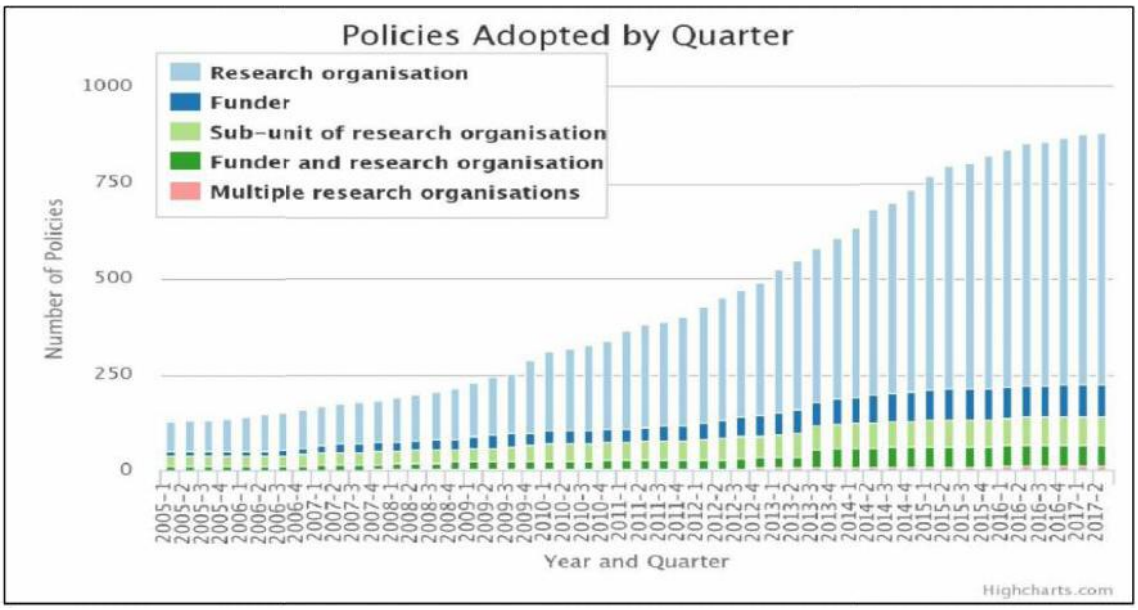
Prominent organizations working at global level also made a great impact in spreading the OA movement. These are as follows:

- United Nations Educational, Scientific and Cultural Organization (UNESCO) has adopted the OA policy (UNESCO, n. d.). It provides irrevocable right of access to copy, use, distribute, transmit and make derivative works in any format within certain constraints. It applies to all UNESCO Publications published from July 31, 2013 onwards. Also it publishes several documents for increasing awareness about OA in general public. It has developed OA Course for librarians as well as researchers.
- International Monetary Fund (IMF, n. d.) has adopted Open Archives policy to promote openness and for transparency purpose on 17th December 2009 with some exceptions.
- World Bank is also promoting open access through various initiatives.

Consequently, Governments and the Institutions all over the world started adopting open access policies. Harvard Magazine (2008) claimed that The Faculty of Arts and Sciences (FAS) of Harvard University was the first university mandate for OA by creating a searchable online repository in 2008. It was adopted by the faculties. It was possible as the faculty members retain the copyright for the articles they have written, and in case they transfer the copyright to the publisher, then it is subject to the nonexclusive license to Harvard, so as to distribute the article freely and openly.

Similarly, worldwide different stakeholders started adopting OA policies worldwide. Registry of Open Access Repository Mandates and Policies (ROARMAP) is a database of such adopted OA policies worldwide. The fig. 1.1 shows the growth of OA policies over last couple of years as studied by Ayris and Ignat (2018).

Fig. 1.1 Growth of OA policies worldwide.



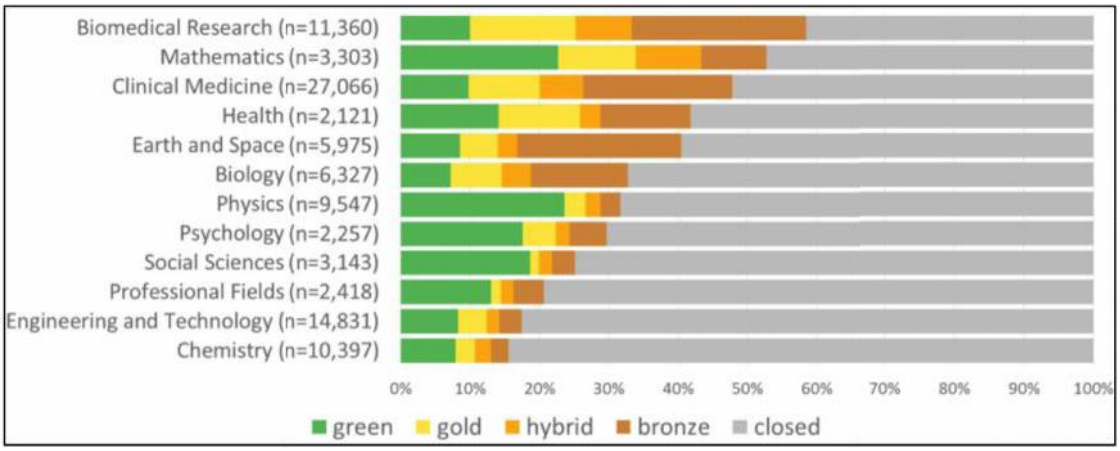
The table 1.1 shows the current status of members worldwide in ROARMAP.

Table 1.1 ROARMAP members status

Sr. No.	Member types	No of Members
1.	Funder	86
2.	Funder and research organisation	56
3.	Multiple research organisations	11
4.	Research organisation (e.g. university or research institution)	767
5.	Sub-unit of research organisation (e.g. department, faculty or school)	76

The OA phenomenon is not restricted to any or few disciplines but observed in almost all domains as observed by Piwowar et al., (2018) and shown in Fig. 1.2

Fig. 1.2 Percentage of different access types of a random sample of WoS articles and reviews with a DOI published between 2009 and 2015 per NSF discipline (excluding Arts and Humanities).



1.4.2 OA movement in India:

In India also, open access movement was promoted not only by government but also through various forums.

- Government of India (National Knowledge Commission, 2009) recommended that all research articles published by Indian authors receiving any government or public funding must be made available under Open Access and should be archived in the standard OA format on his/her website.
- As a result, various institutions adopted the open access policy such as:
    - CSIR in 2009 (“CSIR to create open access repositories.’’, 2013)

- ICAR in 2013 (ICAR, n. d., ICAR adopts Open Access Policy)
- Department of Biotechnology (DBT) and Department of Science & Technology (DST) in 2014 (Department of Biotechnology and Department of Science & Technology, 2014).

- UGC Notification (University Grants Commission, Ministry of Human Resource Development, 2016) led to development of Shodhganga, which is a digital repository of Indian Electronic Theses and Dissertations (ETDs) set-up by the INFLIBNET Centre and Shodhgangotri is a repository of Indian research in progress. As a result, the researchers from not only India but also from abroad can access the PhD thesis of Indian researchers.
- National Data Sharing and Accessibility Policy (NDSAP) was published in 2012 (Department of Science and Technology, 2012 March 17) due to which open data is now possible at national, state and even city level.
- Open Educational Resources are launched through various platforms such as NPTEL (National Programme on Technology Enhanced Learning), SWAYAM, National Digital Library, NCERT Books, Balbharati Books etc.
- Institutional repositories are established in various educational and research institutes. 92 are registered in Directory of Open Access Repositories (JISC, n. d.) which is a global level directory. Various training programs and workshops are regularly organised which covers from the installation till management of IRs.
- 283 OA journals are published from India (DOAJ, 2019) currently.
- Various conferences, workshops and seminars are being organised where OA related aspects are chosen as one of the theme. Few are mentioned as follows:
    I. One day workshop on ‘Open Data Development Initiatives’ on 17 May 2013 at Gokhale Institute of Politics and Economics, Pune organized by The World Bank, New Delhi in partnership with (GIPE).
    II. Indian Library Association in association with the Dept. of Library and Information Science, Bangalore University had organized an International Conference on “Open Access – Scholarly Communication Reincarnated: A futuristic approach” during 19-20 August 2013 at Bangalore University, Bangalore

III. National Workshop on "Open Access: Applications in the libraries" organized by MANLIBNET in association with Institute of Management and Career Courses (IMCC) during June 13-14 2014 at IMCC, Pune.

IV. DRTC/ISI and ICSU/CODATA organised International Workshop on Open Data Repositories between March 1-3 , 2017 at ISI Bangalore

V. OpenCon 2018 New Delhi was conducted on 3 February 2018 at Acharya Narendra Dev College (University of Delhi).

VI. Joint symposium on Data Representation and Organization Techniques was organised by DRTC, Bangalore and Drexel University during 2-4 July 2019 at Bangalore.

- Open Access India (OAI): The Open Access India is a community of scientists, researchers, faculties, librarians etc. working in various government and autonomous organizations formed on 8th July 2011. They advocate OA, Open Data and Open Education in India through various activities such as webinars, workshops and meetings for increasing awareness among researchers about usefulness of open access. Librarians and students are trained about open access and then help them in disseminating the knowledge further. Delhi Declaration on Open Access (Open Access India, 2018) was published which aimed at various stakeholders of OA such as scientific communities, scholarly societies, publishers, funders, universities and research institutions to promote openness in science and research communications for the benefits of public in India.

1.5 Benefits of OA:

The OA movement has made a big impact on various stake holders, especially in the scholarly communication area as it has several benefits due to which it is getting popular day by day. To enjoy the benefits of OA resources, it is assumed that the necessary infrastructure such as computer, electricity and network with high speed connectivity is available.

Following are the benefits of OA:

- For researchers / authors:
    1. Easy access to other's research without any restriction.
    2. Results of own research can be shared easily with others at global level, ensuring greater visibility.
    3. Research has shown that OA helps in getting more citations as it reaches maximum audience than paid subscriptions
    4. It can help in reaching out to wider audience in less time when compared with traditional publishing.
    5. Authors can retain the copyright as per their choice
    6. Supports advancement of knowledge and innovation as it helps to increase impact and usage.
- For Institutions:
    1. It helps to showcase Institutional research / publications in the society.
    2. As a result, more opportunities can be available for collaborations with other institutions.
    3. More funding can be available for further or new research.
- For librarians:
    1. OA resources being free, librarians can easily provide access to their users.
    2. No budgetary constraints issues like earlier.
    3. Even in budgetary crunch, librarians can provide various services using OA resources
    4. With own skills, librarians can build their image by guiding users to the relevant sources which are otherwise difficult to search from users' perspective
- For teachers and students:
    1. Being free, OA resources can be easily accessed by teachers and students for learning or education purpose.
    2. There are no geographical restrictions for knowledge sharing purpose.
    3. Cost of text books is saved, hence most beneficial, especially for under privileged students.

- For Society:
    1. Since most of the research is sponsored by the taxpayer's money or public funds, society can see the actual use of their own money.
    2. Due to easy and unrestricted access, OA resources are accessible to under privileged people also, provided necessary infrastructure is available. It helps to develop the society as a whole.
    3. It helps to remove the digital divide.
    4. Most important is OA promotes more research

1.6 Impact of OA on scholarly communication:

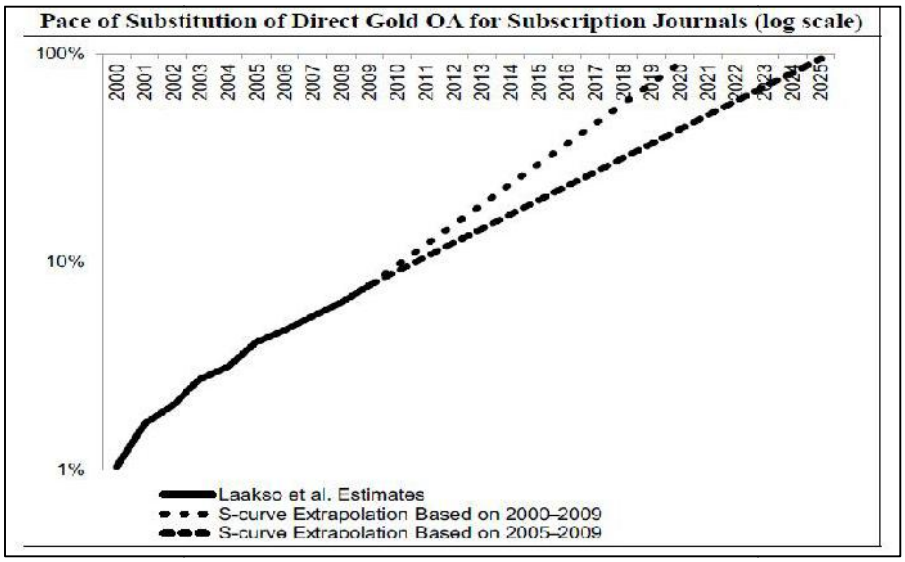
There is no doubt that OA has made a great positive impact on scholarly communication. Already, due to the benefits associated with it, there is growth in OA publications as well as usage can be seen from various studies undertaken till now.

Open licenses have been extremely beneficial since they allow redistribution; reuse or even constructing derivative works so as to make best use of digital resources as observed by Cockerill and Knols (2008). An increasing number of open-access publishers are now using open licenses for research publication. This will help the researchers and funders of research too as it ensure wide reach and more citations for their research work in the long run. Other organizations from developing countries also reported similar success on open-access initiatives. A joint Brazilian/Canadian project, Bioline, is one such example through which researchers across globe could access the journals from 24 low income countries and as a result their usage is increased tremendously. The number of full text articles downloaded in 2006 increased from 27,000 in 2000 to 2.5 million. Cockerill and Knols (2008) emphasize the OA benefits, especially in bringing researchers across globe into a single connected community.

There are various factors that contributed in the growth of OA resources. These factors are - availability of various open source software such as Open Journal system (OJS) through which OA journals publishing is possible, various platforms such as Directory of Open Access Journals (DOAJ), OA search engines, or Google Scholar for discovery purpose, Creative Commons which provides a legal framework.

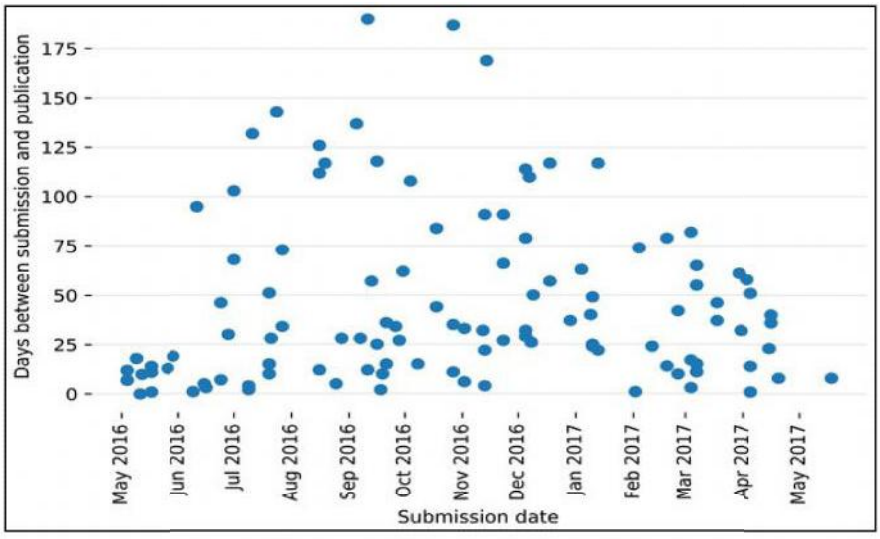
According to Lewis, D. W. (2012) these factors will boost increasing growth in open access journals in future too, as per his prediction and as shown in fig. 1.3.

Fig. 1.3 Prediction for OA journals growth



Smith et al. (2018) have claimed that due to various features provided in their Journal of Open Source Software (JOSS), such as, rigorous peer review process, functionality that help authors to get feedback from peers, publish, and also get information about citations they get for their research. At the same time, as shown in fig. 1.4, due to various OJS, the publishing process is fast as compared to traditional publishing, and hence the research can be shared with others in less time.

Fig. 1.4 Days between submission and publication of the 111 articles JOSS published between May 2016–May 2017



Most important benefits associated with OA resources are that they are e-resources hence all benefits of e-resources are also applicable to them besides being free online. These benefits are 24 X 7 availability; easy for searching with search engines or directories available, hyper linking is possible, many times alerts services are available whenever new relevant document is published, saves paper etc.

Due to enormous benefits associated with OA, OA movement is getting support from all the stake holders especially the Governments across the globe. The most prominent impact is that OA policies have been adopted at the national, institutional and funder levels in these countries. For e.g. UK Government adopted OA policy In July 2012, in 2017 Australia released its policy statement about OA, the Danish Ministry of Research of Denmark released national policy for OA in 2014 etc.

Earlier, only learned societies or some few publishers were engaged in OA publishing, but in last few years, almost all well – known publishers like Elsevier, Wiley, Sage, etc. started adopting OA publishing as per their own policies, where OA articles are published in regular journals based on Author Processing Charges (APCs). Similarly, publishers have own policies for self-archiving permissions and conditions of rights given to authors on a journal basis. This has also resulted in increase in Institutional Repositories as the authors even though they publish their research in traditional journals, can make available their research as pre-print / post-print by allowing OA to all. This is possible because of SHERPA RoMEO (JISC, n. d.)

SHERPA RoMEO is an online resource that collects and analyses publisher's open access policies from all over the world and provides summaries of self-archiving permissions and conditions of rights given to authors on a journal-by-journal basis as shown in Table 1.2. RoMEO does not provide self-archiving information on books, monographs, theses or conference papers; however, some series titles may be covered.

Table 1.2 RoMEO colours for archiving rights

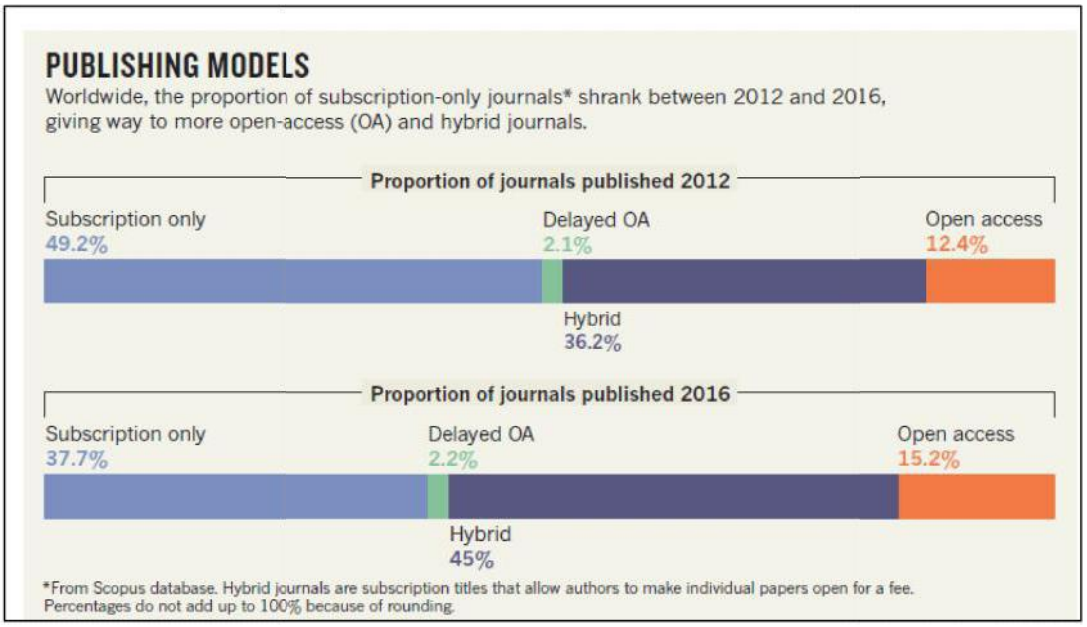
ROMEO colour	Archiving policy	Publishers	%
green	Can archive pre-print and post-print	1063	41
blue	Can archive post-print (ie final draft post-refereeing)	843	33
yellow	Can archive pre-print (ie pre-refereeing)	181	7
white	Archiving not formally supported	475	19

Similarly, SHERPA Juliet (JISC, n. d.) is a tool useful where up-to-date information about funders' policies and their requirements on open access, publication and data archiving is available. Due to this, open data is now available easily to all.

The publishers engaged in OA publishing (Open Access Scholarly Publishers Association, n. d.) (OASPA) have come together and developed an association. The association is building and promoting best practices and solutions for the progress of open access, in order to protect the reliability of scholarship.

Else (2018) observed that proportion of open access journals and hybrid journals published in 2016 is more than that in 2012 as shown in fig. 1.5. The journals available on subscription basis, but which also publish OA articles as per their policies are called hybrid journals. Delayed OA journals are those journals which make articles free after certain time (embargo). This trend is showing the inclination towards OA publishing.

Fig.1.5 Proportion of journals publishing over a period of time



From library point of view, while summarising the uses of OA in libraries, Crawford (2011, p. 6) noticed, that researchers can get access to the latest research in their own subject domain without adding burden on library's budget as library cannot provide all relevant literature to their patrons. It is observed that earlier library budget was used mainly for online and print journals especially in the area of science, technology, engineering, and medicine (STEM) due to which other areas were neglected but with OA, balanced expenditure of library budget is allowed.

1.7 Importance of marketing and promotional activities for libraries:

Till recent years, librarians were giving specialised services to users using available resources in the library and if not available through Inter Library Loan (ILL). With subscribed e-resources, the boundaries vanished as libraries started giving services by providing access to e-resources subscribed but with still limited access. With availability of OA resources, the earlier restrictions are also gone.

Today, the users find it easy to use mobile phones, laptops or tabs to get required information instantly than to go to the library, search and then use the material. This is true in both cases of free online content as well as online resources subscribed by the library. The value of library and librarian seems to be diminishing from user's point of view. Occasionally only, the users approach the library staff for some specific information. As a result, there is a question mark on the efficacy of library and

librarian in the digital era, where almost all the information is now available at the finger tips.

But in research libraries, the researchers are busy in research based activities and their expectations from library are high due to availability of several information products, variety of their technical features, and complex nature of information from searching point of view. Also, sometimes due to security concerns, the internet connection are not available to researchers, hence dependence on libraries is more. At the same time, all information is not free for all. Research and academic libraries are spending huge amount from their budgets sponsored by their parent institution not only to buy the required sources but also updating and enhancing their infrastructure as per user's convenience and requirements. It is the responsibility of librarian to justify the amount spent on resources and infrastructure to the management if they are not properly used.

It is observed that almost all stake holders of scholarly communication, like researchers, research institutions, funders, governments and even publishers are promoting OA through various activities / policies / events etc. It is bound to impact the libraries as well hence librarians have to deal with OA resources in various ways i.e. by using them in information services, increasing awareness among users through promotional activities, providing orientation to users, publishing in OA publications etc. For this, they need to update their knowledge about OA, learn new skills required for their management and do lot of basic work like searching, selection, organising and then retrieval as per users requirement. Librarians have to bridge the gap between OA resources and their users by promoting them in their libraries as all users especially new ones may not be aware about them.

In marketing, promotion (Promotion, 2019) refers to any type of marketing communication used to inform or persuade target audiences of the relative merits of a product, service, brand or issue. Same concept can be used in libraries also. Lara (2015) shared her study results where one librarian has opined that libraries can educate users and also advocate benefits of OA. Librarians can instruct the users about benefits of OA publishing and also encourage them for publishing in OA journals, depository requirements for federally funded research, etc.

Hence, it is very much essential that library staff should organise some programs or activities to inform users about new developments taking place, resources available in the library and guide the users ensuring the proper usage of the available resources. These are nothing but various aspects of marketing plan.

1.8 Necessity of promoting OA resources to library users

Many times the existing users feel that the library services are unimportant due to availability of vast information on Internet. However, this information is scattered and its authenticity and accuracy is questionable. New users are generally hesitant to approach library staff for their queries, or may not be tech savvy to use library services on their own. In such cases, promotional policies are required to get attention of such users and turn them into regular users of library and its services.

Swan (2012) has mentioned that there are three types of strategies for promoting OA:

i. Policy oriented strategies have been used at various levels such as national and international level. These are also implemented at institutional and at government level by bringing required legislature.
ii. Advocacy strategy is for advocating importance of OA resources. Targets are policymakers, researchers and increasingly, students who are direct beneficiaries of OA movement. The research library community has a strong voice in Open Access advocacy and hence research libraries can also play a strong role in promotional activities.
iii. Infrastructural development is essential for enabling global access and interoperability of data, especially in case of Institutional Repositories (IR) / Subject Repositories (SRs.)

The research libraries are well suited for promoting OA resources. Librarians are subject experts, know how and where to search, ways of managing the resources, providing various information services relevant to users' requirements, have developed domain expertise with experience, have knowledge of institutes vision and mission along with users requirements.

According to Gole and Kanetkar (2018), promotional activities are important and necessary in case of OA resources, due to following reasons:

1. Many research studies have been conducted which have proved that all the researchers / users are not aware about OA resources and their benefits. It has been suggested by many such studies that libraries should promote use of OA resources through various activities since they are dealing with different types of information resources already with their specialised skills. Such studies are already covered in literature review chapter. Hence it is also important to guide the users in making them aware and also educating them about importance of OA resources from research point of view.
2. Unlike printed documents available in library, OA resources are available on Internet though free but are scattered and requires special skills for searching. Through promotion, librarians can inform users about theses specialised OA sources and their collection.
3. There are different types of OA resources available such as OA Journals, OA Books, OA Data, Open Educational Resources (OER), Open Thesis and Dissertations, Open Images, Open videos etc. It is very much necessary that users must be aware about these types of OA resources along with its benefits; so that they can use these sources as per requirement.
4. There are various technical issues related to OA resources. While promoting OA resources, users can be educated about such issues such as predatory journals, quality and peer-review practices followed, Metadata Harvesting (OAI-PMH), difference aspects such as green OA, gold OA etc. It is vital that OA resources must be checked, verified for the quality where librarian can help the users by advocating the same. Also copyright concerns, search platforms, OA directories such as DOAJ (Journals), DOAB (Books), DOIR (Institutional repository) etc. can be demonstrated for increased usage which will benefit users also.
5. There is a need for developing institutional policy for OA resources as they are very important from research point of view. This is possible bye by promoting use of OA resources and their benefits.
6. Promotional activities of OA resources also help the library in following ways:
    i. To attract the users to use OA resources for various purposes such as research / teaching / education / training.

ii. Useful for converting inactive users into potential users for OA resources

iii. Researchers can start publishing their research in OA resources

iv. To encourage more usage of OA resources in view of budgetary constraints

v. To increase the awareness of users about the existing library services / activities and also newly launched if any related to OA resources such as listing of important OA websites on library website, institutional repository etc.

vi. It ensures the customer satisfaction as wide variety of OA resources are made available to the users

vii. For image building of library among users

viii. With wide range of sources available and proper users training about various aspects of OA resources, the users' dependency on library staff can be reduced.

ix. Since OA resources are available immediately for access, the users get to know current status relevant to their research areas helping them to get abreast with latest developments.

Librarians may use various channels for promoting OA resources such as library website, e-mail, Internet, newsletters, leaflets, guides, events such as information literacy program / library orientation session, training, workshop, guest lecture, personal informal discussion and web 2.0 tools such as blog, facebook, twitter etc.

For doing any promotion of a product / service, the library staff first needs to understand the importance and usage of the said product / service from user's point of view. It is important that library staff should be well versed with its various features and knows how to use those resources so as to guide the users whenever necessary and effectively.

For libraries, promotion of any type of resources is not limited to its marketing or just increasing awareness among users community about it but also doing things which will help in popularising the resources and ensuring their usage also. This may be achieved by various activities.

1.9 Selection of the topic:

The researcher has a working experience of more than 19 years in various research institutes. Over the years, researcher has experienced the different issues and evolving areas which made a great impact while giving information services to users, both in technological areas and also publishing industry. As per the availability of budget, various full text databases and statistical packages used to be subscribed by the library for which licenses were signed. Simultaneously, researcher also noticed the overall increase in availability of free resources on Internet over the years. In 2008, when for the first time OA Day celebration was announced, the researcher along with a senior colleague had published a small column in local newspaper about OA awareness, which was appreciated by library users and other professional colleagues. In recent years, the researcher started using not only OA journals but also OA thesis, and open data, for e.g., Census data of India and also banking data from RBI while providing various information services to users. It was observed that OA resources are important for research and can be used for various information services as all users are not using them due to various reasons. Hence, as and when possible researcher started promoting OA resources through various ways by sharing latest developments, data and cases for increasing user's awareness. At the same time, researcher came across many difficulties due to which the OA promotion was not possible on continuous basis. Hence, a need was felt to study the librarian's role in similar organizations i.e. research institutes to know the current status of awareness, use and promotion of OA resources and solutions for the problems observed.

1.10 Statement of Research problem:

Libraries cannot neglect the OA phenomenon while providing information services to users. In fact, the librarians have to play an important role in educating the users about OA resources, their various aspects including the benefits and are also expected to promote, make use of OA resources in providing various information services along with dissemination of information about latest developments happening about OA resources among users in their research institutes. For this, the librarians should be convinced about importance of OA, benefits of OA resources from research point of view; be aware of the different types of OA resources, and then only they will be in a better position to give relevant services to researchers. Having knowledge about

various aspects of OA resources and implementing it practically in day to day life for the users are two separate things.

Hence, it is important to know librarians views about OA resources, how they come to know about it, whether they are aware about availability of different types of OA resources, whether the librarians are promoting the use of OA resources among user community, if they are promoting then how they are doing it, if they are not promoting then reasons for the same, activities carried by out by them, which will help them in promoting the OA resources directly / indirectly, whether they face any issues in OA promotion, if they are convinced about OA movement then whether they publish in OA format or not and reasons for same, status of institutional policy for OA , etc.

When librarian's role is discussed, it is also important to know the views of researchers also - their opinions about OA resources and its different aspects along with use, if they know about OA resources then the role of library in making them aware, OA promotional status by their libraries and their satisfaction, whether they publish or not their research in OA publications and reasons for same, library's role in promoting OA resources and suggestions if any.

This study will be useful to find out the overall picture of level of awareness of librarians with respect OA resources, their role in educating users and promoting these resources, problems faced by them, their organization's policy about open access. Hence following title for current study was selected.

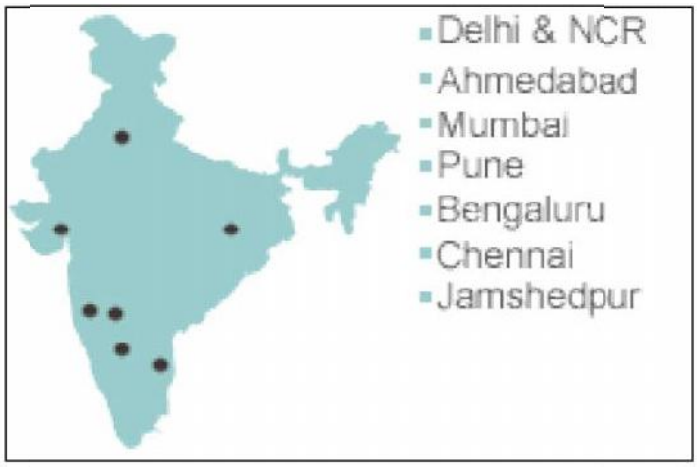
Study of Librarian's Role in Promoting Open Access Resources with Special Reference to Libraries of Research Institutes Recognized by University of Pune.

1.11 About Pune:

Pune is not only famous as the cultural capital of Maharashtra but is also known for its educational background due to existence of well known educational and research institutes both at national and international level. It is famously called as oxford of the east which is apt.

Pune is one of the seven clusters associated with research and development in India (India Brand Equity Foundation, 2017) as shown in Fig. 1.6

Fig. 1.6 Research and development clusters in India



Pune being a metropolitan area, has an advantage due to various reasons such as infrastructure development, industrial development, educational facilities, great weather conditions, connectivity advantage with other important national and international destinations by road, train and air and most important availability of talented and an educated manpower.

At present, there are several research institutes engaged in research in various disciplines either supported by central or state government or are autonomous and private. Many industries have also established their R&D units in Pune for the development of new products and innovation in existing products. Many well known hospitals are also doing research in various areas and have courses affiliated to University of Pune (UoP).

1.12 About University of Pune (UoP)

Savitribai Phule Pune University is the new name for University of Pune (Savitribai Phule Pune University, 2014). But for the convenience and as per approved topic for research, whenever UoP is mentioned, it is for Savitribai Phule Pune University (SPPU) only.

UoP was established on 10th February, 1949 under the Poona University Act at a campus which is spread across 411 Acres (Savitribai Phule Pune University, n. d.). It is popularly known as the 'Oxford of the East'. Its jurisdiction covers Ahmednagar, Nasik and Pune districts. UoP has secured 7th ranking in the Times Higher Education

World University Ranking in 2018 (Savitribai Phule Pune University, n. d.). In National Institution Ranking Framework, UoP is on 10th position among top 100 Universities. (Department of Higher Education, Ministry of Human Resource Development, 2019)

Circular No. 221 of 2013 (University of Pune, 2013) gives well defined procedure for getting the recognition as research institute.

1.13 Objectives:

1. To study the types of available open access resources and ascertain their importance in scholarly communication.
2. To study librarians' awareness about 'Open Access' phenomenon.
3. To study the institutional policy with respect to open access for their own publications.
4. To explore librarians' role in promoting use of open access resources in their organizations and to ascertain the difficulties faced by the librarians in promoting OA resources
5. To know end users view points about role of libraries in promotion of open access resources.
6. To find out status of publishing in OA resources by librarian as well as users.
7. To suggest actions to be taken by librarians to promote the use/dissemination of OA resources.

1.14 Hypotheses:

H01(null) - Majority of librarians from research institutes are promoting use of open access resources in their own organizations.

(Majority is taken as 90% or more)

HA1(alternate) - Proportion of librarians from research institutes promoting use of open access resources in their own organizations is significantly smaller than 90%)

H02 (null) - Majority of research institutes are adopting open access policies for their own publications.

(Majority is taken as 90% or more)

HA2 (alternate) - Proportion of organizations adopting open access policies for their own publications is significantly smaller than 90%)

H03 (null) - Majority of users are satisfied with the OA Promotional activities done by library staff.

(Majority is taken as 75% or more)

HA3 (alternate) - Proportion of users that are satisfied with OA promotional activities done by library staff is significantly smaller than 75%).

1.15 Research Methodology:

The research methodology used is Descriptive research method. Descriptive Method is appropriate to know the present situation for the research. Survey method is used for collecting the primary data. An extensive literature survey was done to know the current trends in the area of Open Access Resources and related aspects and to avoid duplication of topic. This also helped to get an idea about various studies undertaken by other researchers. Relevant information and data was collected in this process which helped in current study.

1.15.1 Scope and Limitations of study:

The present study is limited to the librarian's role in promoting OA resources in the research institutes which have got recognition as "Research Institute" by UoP pertaining to its jurisdiction area i.e. from Pune, Nashik and Ahmednagar. The study does not cover any other research institutions. Also it does not cover all PhD research centers recognized by UoP. The recognized research institute may or may not be PhD research center.

From the recognized research institutes, only those libraries having full time professional librarian to serve the users, who may be working on permanent or on contract basis are considered.

1.15.2 Population and Sampling for librarians:

List of research center's / research institutes of the university (University of Pune, 2013) was referred by the researcher at the initial stage of research. The status of these institutes is shown in Table 1.3.

Table 1.3 Status of research center's / research institutes recognized district wise

No.	District	No of centres
1.	Pune	159
2.	Ahmednagar	25
3.	Nashik	25
4.	Outside Institutes (Mumbai, Thane, Ahmedabad, Dehradun, Dhule, Delhi, Hyderabad, Aurangabad, Bhatgoan, Jalana, Gandhinagar, Bangalore, Gadanki etc)	24
	Total	233

The mentioned list was mix in nature as it contained institutes having recognition only as research centres (For Ph.D.) or Research Institutes or both. Besides the jurisdiction of University there were outside institutes also who have received recognition as "Research Institute" as Ph.D. research centre as well as for their research in particular domain area or both.

Hence researcher tried to get only the list of recognized research institutes for which annual report, website and other university documents were checked. Finally, researcher has consulted the Diary of University of Pune (University of Pune, 2017, pp. 78 - 80) for the official list of recognized research institutes based on which the study is based. As per the list, the statuses of recognized research institutes were as follows:

Table 1.4 Research Institutes Area wise

Sr. No.	Area	No of Institutions
1.	Pune Urban	51
2.	Pimpri Chinchwad	6
3.	Pune Rural	6
4.	Ahmednagar	3
5.	Nashik	7
	Total	73

As per the available list of research institutions recognised by UOP, Pune district is further sub-divided as Pune Urban and Pune Rural. Also Pimpri Chinchwad area is separately mentioned since it is now very well developed and due to existence of various research institutions along with other recognised and affiliated colleges. The list covered total 73 research institutes.

In preliminary study, the researcher contacted the librarian if available / other administrative staff to inform the purpose of the survey and to know the status of libraries in their institute and also gathered information about users. From this preliminary study, the researcher observed the status of recognised research institutes as shown in table 1.5.

Table 1.5 Status of recognised research institutes

Eligibility condition	**Status**	**No. of Institutes**	**Total no. of Institutions**
Total Number of research institutes	Total Population	73	73
No. of ineligible institutes	No professional full time librarian / Vacant post	25	41
	Institutes closed / no website / contact available	4	
	No affiliation as research institute	12	
No. of eligible institutes	Final Population	32	32

32 institutes were found eligible and it was decided that all would be considered for the study undertaken. In some institutes, permission was sought for the survey as per requirement. For librarians, out of 32 research institutes which were found eligible for the study, data was collected from 28 research institutes. Final list of eligible institutes from whom data was collected is given as Appendix 1.

In case of the remaining four institutes out of 32, there was no response from two institutes, and permission to conduct survey was not received from two institutes, as shown in table 1.6.

Table 1.6 List of eligible institutes from where data could not be collected

Sr. No.	Area	Permission was not granted
1.	Pune Urban	Poona Hospital and Research Centre
2.	Pimpri - Chinchwad	Emcure Pharmaceutical Ltd., Bhosari, Pune -26
Sr. No.	**Area**	**Response was not received**
3.	Pune Urban	Forum for Culture Studies Institute of Advanced Studies in English, Aundh Pune - 7
4.	Nashik	Sandip Institute of Technology & Research Centre, Nashik

In case of ineligible institutes, it was observed that either the librarian's post was vacant or full time professional librarian was not available in 25 institutes. 4 Institutes are closed now. In 12 research institutes, during the enquiry, the researcher was informed by the concerned staff that they don't have affiliation as research institute now due to various reasons. List of ineligible institutes (41) is given as Appendix 2.

1.15.3 Population and Sampling for users:

Information about total number of users i.e. researchers were either taken from Librarian or from the institute's website. The users i.e. researchers were broadly grouped in the following three categories according to their positions in the research institutes.

1. Scientists / Researchers / Faculty
2. Junior Scientist / Junior Research Fellow / Research Assistant
3. PhD Students

The total numbers of users were 4266 in all three categories. Considering the high population researcher checked Krejcie and Morgan table to decide the sample size. With reference to table 1.7, 351 sample was suggested for population size of 4000.

Table 3.1

Table for Determining Sample Size of a Known Population

N	S	N	S	N	S	N	S	N	S
10	10	100	80	280	162	800	260	2800	338
15	14	110	86	290	165	850	265	3000	341
20	19	120	92	300	169	900	269	3500	346
25	24	130	97	320	175	950	274	4000	351
30	28	140	103	340	181	1000	278	4500	354
35	32	150	108	360	186	1100	285	5000	357
40	36	160	113	380	191	1200	291	6000	361
45	40	170	118	400	196	1300	297	7000	364
50	44	180	123	420	201	1400	302	8000	367
55	48	190	127	440	205	1500	306	9000	368
60	52	200	132	460	210	1600	310	10000	370
65	56	210	136	480	214	1700	313	15000	375
70	59	220	140	500	217	1800	317	20000	377
75	63	230	144	550	226	1900	320	30000	379
80	66	240	148	600	234	2000	322	40000	380
85	70	250	152	650	242	2200	327	50000	381
90	73	260	155	700	248	2400	331	75000	382
95	76	270	159	750	254	2600	335	1000000	384

Note: N is Population Size; S is Sample Size *Source: Krejcie & Morgan, 1970*

4. Considering that there is a vast variation in number of users from 8 to 1262 in these research institutes, it was decided to have an equal percentage of users from each institute.

Accordingly 5% users were selected randomly from each institute based on their availability and care was taken that the users selected were from all three categories.

Table 1.8 gives details of sampling of users and response received. The Institute code given for each institute is explained in Appendix 1.

Table 1.8 Sampling of users and response received

Sr. No.	Institute Code	Total number of users	5% of users as sample	No. of responses received
1.	ARI	150	8	5
2.	CWPRS	241	12	10
3.	Deccan	23	1	1
4.	GO	250	13	10
5.	HEMRL	400	20	12
6.	HKJMRI	16	1	1
7.	IIE	23	1	1
8.	IITM	295	15	8
9.	IMCC	24	1	1
10.	IPD	30	2	2
11.	IUCAA	63	3	3
12.	KKWAGH	271	14	14
13.	KSMYM	8	0	1
14.	LRP	1262	63	0
15.	MCCIA	25	1	1
16.	MIMRT	17	1	1
17.	MIT	53	3	3

Sr. No.	Institute Code	Total number of users	5% of users as sample	No. of responses received
18.	NARI	35	2	2
19.	NCCS	205	10	8
20.	NCL	535	27	23
21.	NCRA	35	2	3
22.	NIA	30	2	2
23.	NIBM	30	2	2
24.	NIV	96	5	5
25.	PEIM	12	1	1
26.	SIIRF	10	1	4
27.	VAMNICOM	26	1	1
28.	VSI	101	5	5
	Total		213	130

1.15.4 Tools used:

Questionnaire tool is used for collecting primary data. Questionnaires were developed on the basis of literature review done, and also on the basis of interviews of subject experts in OA field. Two types of questionnaires were developed – one for librarian and one for users i.e. researchers who are engaged in research activities.

Librarian's questionnaire is divided in various sections as shown in table 1.9

Table 1.9 Structure of Librarian's Questionnaire

Sr. No.	Section	No. of main questions covered
A.	General information (Institute)	5
B.	General Information: Librarian	9
C.	About Library	13
D.	OA resources awareness and views	5
E.	OA promotion	8

F.	OA Publications	2
G.	Institutional Policy about OA	7
H.	Services for OA resources	11
	Total	60

For collecting the primary data, the researcher has made frequent visits to these research institutes especially from Pune. The researcher could personally interact with the respondents (both librarians and users) to know their views related to the study undertaken. In case of only few librarians, the questionnaire was sent by post / email. Out of 34 research institutes which were found eligible for the study, 28 librarians from these research institutes responded giving response rate of 82.35%. Users' questionnaire is divided into various sections as shown in Table 1.10.

Table 1.10 Structure of Users Questionnaire

Sr. No.	**Section**	**Questions covered**
I.	General information (About user)	2
II.	OA awareness	6
III.	Publishing in OA resources	3
IV.	Library OA promotion and Institutional policy for OA resources	7
Total questions asked		18

Number of users ranged from 8 to 1262 in the 28 research institutes. Total users were 4266. 5% users from each institute formed the sample for data collection. Total number of users in the sample was 213 out of which 130 responded giving response rate of 61%.

In some cases, data was collected with the help of librarians, where the direct contact with the users was not possible due to unavailability of researchers or security restrictions. In order to obtain maximum response, online questionnaire was also developed with the help of 'Google forms' and shared with users through emails. Out of 130 researchers, data for 30 researchers (23%) is collected through online questionnaire, while 100 researchers (77%) filled up the printed questionnaire. Data collection was done during the period November 2017 till June 2018.

The researcher came across various issues while collecting the data like some respondents were hesitant to respond to questionnaire on grounds of confidentiality of the organization, for some organizations, repeated reminders were needed to be sent by email to the users with link for online questionnaire, delay due to permission sought etc.

1.15.5 Analysis and Interpretation

After the data collection was complete, the filled questionnaires were examined for completeness and the data was entered in Excel sheets for statistical analysis. The analyzed data is systematically presented with the help of graphs, charts and tables as per requirement. There are various statistical tools / software available for analysis but researcher preferred the Excel as found convenient to use and Minitab for hypothesis testing.

In the present study, descriptive statistics such as Frequencies, Percentages, Mean values have been used. For the purpose of convenience, the percentages are rounded off to the nearest whole number.

1.16 Chapter-wise Research Plan:

Following is the tentative outline of chapters' arrangement on broad aspects:

1. **Chapter 1 - Introduction:**

   This chapter deals with research libraries and challenges faced by them, scholarly communication and Open Access movement at international and national level, benefits of OA and its impact on scholarly communication, importance of marketing and promotional activities for libraries, necessity of promoting OA resources. It also discusses selection of current topic for study, hypotheses, objectives, scope and limitations and research methodology etc.

2. **Chapter 2 - Review of Literature:**

   In this chapter, the reviewed literature is presented under various sub-headings. The researcher has consulted various primary and secondary sources relevant for the study and based on it, literature review is grouped under different themes as per suitability after analysing which helped in conducting the study various ways. The themes covered are OA for scholarly

communication; Importance of OA for research community; Citations and Impact factor for OA resources; Acceptance of OA by various stakeholders; OA Publications from Indian Research Institutions; Tools created for popularizing / promoting OA; Libraries / Librarians as promoters of OA.

3. **Chapter 3 - Open Access Resources:**

   This chapter covers various types of OA resources available along with their benefits, features / characteristics and how librarians can contribute in their usage as per requirement in making users aware of such resources.

4. **Chapter 4 - Data Analysis and Interpretation:**

   This chapter is based on the analysis and interpretation of data collected through two questionnaires. This chapter is divided into two parts, A & B.

   Part A is about data analysis and its interpretation based on librarian's questionnaire and Part B is data analysis and its interpretation based on User's questionnaire.

5. **Chapter 5 - Observations, Conclusions and Suggestions:**

   This chapter covers major findings based on chapter 4 and gives suitable suggestions for improving the promotion of OA resources by the librarian and conclusions based on the overall study. A model plan is also proposed for promotional strategies of OA resources. This chapter also discusses the hypotheses testing and gives suggestions for further research.

Summary:

The main function of research libraries is to accelerate the research by providing pin-pointed, up-to-date and information services relevant to user's requirements. Due to several changes in information processing and presentation formats, technological advancement, publishing industry, trends observed at global level has impacted the scholarly communication over a period of time. The librarians are required to update their knowledge and skills to be in better position to serve the users. Exponential growth in various types of OA resources is also changing the library services and role of librarians in

view of expectations of users which are always demanding in nature. There is a need to study the readiness of librarian to face these challenges and also expectation of users from librarian. The current chapter is introductory in nature and provides the research design for the study undertaken.

The next chapter is about literature review and covered related research on the topic of research.

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Chapter 2: Literature Review

2.1 Introduction

In the earlier chapter, the researcher discussed the background for current study and its importance in present situation. Also related aspects such as objectives, hypothesis, scope and research design for current study was discussed. This chapter covers the literature review done for similar studies and observations made based on these.

Literature review is an important step in conducting any research as it helps to understand and analyse the previous research conducted on a particular topic. It helps the researcher in updating the knowledge of researcher of the relevant work done by others in same or allied areas which may directly or indirectly affects his / her investigations. It also supports our own research by clarifying our thoughts showing either gaps in earlier research / as evidences to the findings later on.

The present study looks at the librarians' role in promoting open access resources especially in research libraries and also user's perspective on use and dissemination of open access sources. For this, extensive literature review is done. The researcher has consulted various primary and secondary sources relevant for the study. Various databases like ABI/Inform Complete database, EBSCO Business Source Complete, J-Gate, Google Scholar, Library and Information Science Abstracts, blogs, books, journals, reports etc were consulted.

2.2 Aspects for literature review:

Based on the literature consulted, the researcher has divided the chapter in the following sub-themes:

1. **Open access for scholarly communication**
2. **Importance of OA for research community**
3. **Citations and Impact factor for OA resources**
4. **Acceptance of OA by various stakeholders**
5. **OA Publications from Indian Research Institutions**
6. **Tools created for popularizing / promoting OA**
7. **Libraries / Librarians as promoters of OA**
8. **OA impact on libraries**

2.2.1 Open access for scholarly communication

Scholarly communication is vital from research point of view hence there are several studies conducted about various aspects of it. Some of them have been consulted by the researcher.

According to Sompel, Payette, Erickson, Lagoze & Warner (2004), various factors such as increasing subscription prices of journals, copyright issues, time delay between the research done and its publication, restrictions on usage etc. contributed to the dissatisfaction of the traditional scholarly communication system. These reasons lead to the OA movement for scholarly communication.

OA is beneficial for scholarly communication from librarian as well as user's point of view. According to Suber (2009) due to OA, there are no cost barriers (such as subscriptions, licensing fees or pay-per-view fees) and permission barriers (copyright and licensing restrictions).

In today's scenario when we discuss OA and close access in terms of journals we cannot neglect the other phenomenon such as resource sharing or file sharing which are in practice for both libraries as well as scientists. Gaulé, P. (2009) remarked that the absence of institutional subscriptions to important relevant journal titles does not indicate absence of access as it is also possible through different ways. Through his survey, he found that 84 % of Indian biologists had either contacted an author himself or a friend with better access to request a copy of the article they wanted. The majority of requests are successful. Thus, in practice, even if there are restrictions from publishers for accessing the required literature, the researchers' finds a solution for getting access directly or indirectly through librarians on resource sharing basis denoting the importance of openness.

To get maximum benefits of OA, it is essential that more and more researchers should publish their research in OA format. Yiotis (2005) remarked that individual scholars must decide when and how to maintain their copyrights while publishing their articles along with where to publish their research.

Frass and Cross (2013) reported that 33% of their respondents in a survey feels that through OA, greater circulation is possible than publication in a subscription based journal but also opined that OA journals are of inferior quality than subscription based journals. They carried out two identical surveys of author community on behalf of Research and Business Intelligence Department of the well know publisher Taylor & Francis to know their views on OA publishing and their level of participation with it, and many related topics, such as licensing, re-use, peer review, and metrics from future perspective. The two surveys differed only by the words "think will happen" and "would like to happen" over the next ten years. The questionnaires were sent to those authors, who had published in 2011 in Taylor & Francis journals. The two surveys were sent to each half of the population.

E. C. (2019) has recommended that there is a necessity to develop strategies for scholarly publishing by both universities and research institutions which should match with their institutional missions. Libraries as dynamic intermediaries of scholarly communication and publishing activities should get support from their organizations in all important functions. With the help of their libraries and university presses universities and research institutions can redefine their publishing activities and their role in scholarly communication system.

Arunachalam and Muthu (2011) recommended that the heads (or the board of management) of each research institution should mandating open access to all research publications of their institute. Similarly the funding institutes / agencies also should mandate the open access for research publications of their research projects. This will help the research community. They also recommended that concerned persons should be given training for setting up and maintaining their own repositories. Researchers should be trained for self archiving of their publications and librarians should be trained for to access and sharing these resources.

Summary:

Due to several reasons such as higher pricing, restrictions for access etc. resulted in dissatisfaction of traditional scholarly communication system. OA movement is developing all over the world due to various benefits associated with it such as price free, permission free and legal free for usage. OA resources are now preferred as a channel for scholarly publication. More and more researchers and organizations

should contribute for its success by redefining their publishing activities and supporting their libraries for OA related activities so as to increase awareness among users. For this, institutional policies for OA should be in place.

2.2.2 Importance of OA for research community

Due to the ICT and the information revolution generated by the Internet which has also spread to scientific publishing, there is general perception that scientific research should not be limited by publishing in costly journals but should be freely available to everyone. The concept has particularly got significance especially when research is funded by government agencies. According to Sweeney (2014) there are lots of benefits of OA which are significant from researchers and economic point of view at global level.

Björk et al. (2010) found that it was very common to publish in OA journals in fields such as chemistry, biochemistry, and medicine whereas in all other fields, manuscript copies posted by authors dominated the picture. They also pointed out that the results should generate interest among academic publishers, as they have to consider other factors such as OA as a part of their business strategies, copyright policies and also research funders. They studied the proportion of peer reviewed full text scholarly journal articles available on the Internet. The study was done by selecting random sample of 1837 titles and using a web based search engine. It was observed that the overall OA percentage found was 20.4% in which 8.5% articles were freely available at the publishers' sites of total articles which were published in 2008 and 11.9% were available as free manuscript versions which could be found using search engines. It was also found that Earth Sciences was the highest (33%) and Chemistry had the lowest (13%) overall share of OA.

Dallmeier-Tiessen et al. (2011) undertook an online survey of scientists across disciplines and around the world on large scale to study the attitudes and experiences of researchers with regard to OA publishing through SOAP (Study of Open Access Publishing) project in 2010. Using mailing lists of the publishers who were participating in the consortium, the questionnaires were distributed. More than million individuals received the questionnaire. The survey was on for almost seven months. 46,006 respondents out of total of 53,890 were identified as active researchers. Out of

those active researchers, 38,358 were considered for the further analysis who had published at least one peer-reviewed research article in the last five years. It was observed that, 89% researchers felt OA publishing as helpful in their research field. After discipline wise further analysis, this fraction was higher than 90% in most of the Social Sciences and Humanities, and around 80% in Chemistry, Astronomy, Physics and Engineering. Also those who had not published any OA publication (29% of sample) were asked to give reasons for same. The most common reasons given were lack of funding, or the necessity to pay fees (39%) and the lack of suitable quality journals in their field (30%). In follow-up study, respondents were asked to rate the importance of various statements given to know their views as authors for OA publishing. It was found that the openness of content, the quality of the journal, the journal's Impact Factor and the absence of fees were the main reasons for publishing in OA mode. In the follow-up study, various statements were given to the respondents to rate their significance as authors from publishing point of view. It was found that the four most important drivers for publishing in OA are accessibility of content to readers, the perceived quality of the journal, the journal's Impact Factor and the absence of fees. Those who had never published in OA (29% of the sample) were asked to give reason for same and reasons given are the lack of funding, or the necessity to pay fees, being a barrier for 39% of respondents, and the lack of good quality journals in their area of interest being a barrier for 30%.

Lewis, D. W. (2012) predicts that Gold OA (i.e. publishing in OA journals) could account for 50 percent of the scholarly journal articles sometime between 2017 and 2021, and 90 percent of articles as soon as 2020 and more conservatively by 2025. This is because of OA, researchers get easy access and do further research based on the findings of others without any restriction. At the same time, immediate access to the latest research findings is available to teachers and students also throughout the world.

Schroter (2006) shared his study results where 75% of authors mentioned that it was very important or important for them to have free access to all readers to the specific paper they had published on bmj.com as their decision to submit their paper to the British Medical Journal (BMJ) depended on it. The researcher had sent email to the first author of 479 research articles published during January 2003 to 31 March 2005 and asked whether cessation of free access to research articles would influence future

submission of their research articles to the BMJ. The researcher concluded that for authors OA to their research publications is vital and it's a deciding factor while submitting the article to BMJ.

Summary:

It is observed that authors prefer OA publishing especially gold OD i.e. publishing in OA journals. This is seen in scientific as well as social science field also. There are some barriers for OA publishing according to some authors such as some OA journals charge Author Processing Charges (APCs) and lack of good quality OA journals. Still considering the benefits the authors prefer OA while publishing the article.

2.2.3 Citations and Impact factor for OA resources

For authors Journal Impact Factor (JIF) of the journals is very important since it is universally taken to be a sign of the quality of a journal and its articles. In any given year, the impact factor of a journal is the average number of citations received per paper published in that journal during the two preceding years. Thus, citations are important for getting higher JIF. From journals point of view, "Gold'' Open access is relevant.

Journal Citation Reports (JCR) are published annually and are widely used by all researchers and librarians in variety of ways such as to know the JIF of particular title based on the citations received, top journals in a particular subject domain or most important institutions engaged in particular subject / research. It's considered very much prestigious for journals to be included in JCR.

Antelman (2004) establishes that open-access articles have a greater research impact than articles that are not freely available. For this study articles from four disciplines viz. political science, electrical and electronic engineering, philosophy and mathematics were studied at different phases of OA implementation to check their impact by measuring their citations in the Web of Science database when these are made available online freely on Internet. An important point about "dark matter" of OA was also discussed as it was observed that in some disciplines, the majority of freely available articles are found on individual sites of authors than in a repository or in an OA journal. It was also observed that, in different disciplines, OA practices are

adopted by scholars at an astonishingly high rate. As a result, they are rewarded for same in the form of traditional measure of research impact.

Elena (2010) found that presence of OA journals in Social Sciences edition of JCR 2008 is so low (1.52%). But these few OA journals rank in the top fifty (0-50) percentiles with a 54.05% share. In case of Science edition of JCR 2008 OA journals representation is also low (5.38%) with 38.62% share in the top fifty (0-50) percentiles. The author concluded that OA journals are still new compared to traditional journals but still they can compete with them if quality is ensured with prestige and reputation. The author compared the JCR with Directory of Open Access Journals (DOAJ) to know about impact factor of OA journals with a hypothesis that unrestricted access might result in more citations and as a result will ensure good Impact Factor indices.

Similarly Eysenbach (2006) found that self-archived OA articles are having less impact than OA articles published on journals website. It was also found that even if the journal is available in research libraries, OA articles are retrieved and cited by fellow researchers quicker than non OA articles from same journal. For this study, OA and non-OA articles published between June 8, 2004, and December 20, 2004 were studied by the author for longitudinal bibliometric analysis. For this, all articles selected were from same journal (PNAS: Proceedings of the National Academy of Sciences). Citation data between the two groups of articles were compared and analysed at different points in time. Different variables were analysed using multiple regression models.

Lawrence (2001) indicated that correlation exists between the number of times an article is cited and the probability that the article is online. By investigating citation rates, research team studied the impact of freely available online articles. They studied 119,924 conference articles in computer science. It was concluded that free online availability makes it easy for sharing among scientists or research groups through emails, discussion groups and also easy for indexing by web search engines etc. It was recommended that to increase authors' impact, publishers should aim to make research more accessible to all.

Davis (2011) argued that OA journal articles may reach more readers because of its free access if compared to those published in subscribed journals and also are downloaded more but it does not convert into more citations. There are several reasons for downloading the articles by the users besides citations hence citation advantage of OA resources may be an artefact of other causes.

Summary:

Impact factor is very much important for researchers as it is based on number of citations the journal received. It is proved that OA journals have high impact factor than those who don't have free access as articles are easily available to users without any restrictions and that too immediately after they are published. OA journals being new in comparison with traditional journals need to maintain quality so that they can compete with them. It is also observed that OA articles published in journals have high impact factor than those are available from self-archiving or IRs. It is also observed that the number of times article gets cited then its availability on Internet is more. At the same time, number of downloading the article does not mean the same number of citations as the user may download for reading / checking purpose only.

2.2.4 Acceptance of OA by various stakeholders

Dulle, Minish-Majanja, and Cloete (2010, August) in their study have observed that attitude, effort expectancy, social influence and performance expectancy were highly ranked as factors that could facilitate the adoption of open access scholarly communication. They had carried out the study with objectives to know about general awareness and open access usage; to find out factors that assist researchers in adoption of open access and recommend strategies to increase the adoption of open access in the study area. Data was collected through self-administered questionnaire from 544 respondents selected through stratified random sampling from a population of 1088 university researchers at six public universities in Tanzania. It is observed that less than 20% of the respondents published in open access outlets as compared to 62% of those who accessed free scholarly content from the Internet. Also factors like slow Internet connectivity, inadequate skills for information searching and publishing in the digital environment were identified as the main hindrances for researchers to exploit open access opportunities. They have recommended strongly that the open access advocates campaigns should be done at all levels from institutional to national

levels to increase the awareness and also in depth knowledge of open access movement amongst researchers.

Reinsfelder and Anderson (2013) in their study found that for the success of institutional responsibility towards OA depends on the support of Academic administrator. Administrators' encouragement to faculty researchers and also librarians in the form leadership and financial help is important for implementing OA related activities. A survey was carried out in 2012. It was distributed electronically to library directors to know their views and observations of the OA environment and for getting feedback on the contributions of members in each stakeholder group (faculty, librarians, publishers, and academic administrators. Out of 1135 sample, only 298 respondents completed the survey with a response rate of 26.26%. Factor analysis was used to discover the dimensionality of the survey items and ensure the validity of the primary variables, which were constructed by creating multi-item scales. This study thus highlights administrators 'role and influence in promoting OA culture in the organizations.

According to Chan and Costa (2005), to ensure increase participation from the stakeholders such as faculty and university administrators in developing the OA scholarly communication, it is important that they should be made aware of its benefits. Once they are aware, they will start contributing in it.

Implementing open access is highly beneficial as it enhances visibility not only for the researchers / authors but also for the universities / institutions involved. Olsbo (2013) has observed that there is a link between ranking of Web of Universities (RWU) and ranking Web of Repositories. Harvard University which also hosts the number one institutional repository Smithsonian/NASA Astrophysics Data System is first ranked university in RWU. MIT and University of Michigan also have highly known repositories in other top 5 universities. RWU is based on composite indicator, which is built on four indicators: presence (weight 16.7%), impact (weight 50%), openness (weight 16.7%) and excellence (weight 16.7%). It shows that in university's presence rank, IRs or archives play an important role. Also, repository openness is also impacting rank.

Harish and Geetha (2013) insist that awareness, availability, as well as adoption of OA journals were always higher in case of Karnataka based researchers. They studied

the usage of OAJ (Open Access Journals) of researcher scholars from engineering colleges of six universities from Karnataka. In fact, 80% of the respondents reported that they are dependent on OA journals for their laboratory experiment purpose. Less than 20% of the respondents are dependent on open access journal for teaching purpose while 21-40 % of the respondents use it for research purpose. It was also found that majority of the respondents (62.33%) were highly satisfied with the resources available in open access journals.

Sawant (2009) expressed that Mumbai based librarians were aware about open archive initiative. They supported the OA concept being cost effective. In her survey, population comprising 50 librarians were randomly selected from different academic and corporate libraries. Response rate was 78%. She also opined that libraries can be more important and useful from users' point of view, if librarians start new services on their own for the users.

Lwoga, and Questier (2014) have suggested improvement in existing ICT infrastructure like increased bandwidth and power supply and sufficient technical support to enable use of OA among researchers. A study was conducted in all eight health sciences universities in Tanzania. From total population of 679 of researchers and library staff, 415 samples were selected through stratified random sampling. For collecting data, a structured questionnaire was used. 71.1% response was recived. Based on the social exchange theory (SET), and the Unified Theory of Acceptance and Use of Technology (UTAUT), the study developed a model suitable for assessing OA adoption and usage in academic institutions. The binary logistic regression was conducted to determine factors affecting actual use and behavioural intention on OA usage. It was observed that faculty's actual use of open access is for extrinsic benefits and professional recognition in particular. Faculty's behavioural intention for OA usage is determined by contextual factor, which is an attitude factor. Other factors that determined actual usage of OA included facilitating conditions, behavioural intention, and copyright concerns.

Dulle and Minishi-Majanja (2009) noticed that researchers are using OA resources to access. But they are not keen in publishing their research as OA because of various reasons such as adequate skills, researchers'' fear and absence of policy. This was found during a survey which was conducted to explore the awareness, usage and

perspectives of Tanzanian researchers on OA as a mode of scholarly communication. Through stratified random sampling, 544 respondents were selected from a population of 1088 university researchers of the six public universities in Tanzania. 73% response was received. It was concluded that most of these researchers would support OA publishing more if issues such as quality, ownership and recognition were resolved. For individual researchers, self-archiving is difficult as it depends on the rights or availability of technological facilities, but these are more readily available within universities or organisations. Hence it is suggested that to increase dissemination and improved knowledge sharing of research output, institutional repositories should be established by the developing countries.

Lorenz (2014) argues that though OA is part of the everyday work especially for librarians working for journal management but they do not promote them actively. Though OA publications are considered to be very important but it was observed that, OA processes differs from library to library and their application (or dissemination) is limited due to fear of additional costs. It was observed that there is a significant gap between theoretical knowledge about OA and its practical application. Though user is focused but it is not reflected in library activities or services. No doubt OA has affected publishing industry as a whole. But there are some positive changes as some publishers are also accepting the OA phenomenon. Sweeney (2014) has expressed that publishers have been innovative in OA implementation as realistic and workable OA options are offered by them to authors and institutions such as fee offsetting schemes provided by some publishers, and green OA options provided by almost all publishers today.

Summary:

Publishing OA resources requires technical knowledge like for OA journals, knowledge about Open Journal System (OJS), metadata, copyright etc. are required. It's important to have national level campaign for increasing OA awareness among researchers and administrators, as with their involvement only promotion and use of OA resources will increase. Many research studies have shown that the researchers are depending on OA journal for their research. To increase the OA usage among researchers, infrastructure support such as adequate bandwidth for internet connection, uninterrupted power supply and technical support is essential. Librarians

being facilitators should work proactively for OA resources promotion. In many countries it is observed that though librarians are aware about OA concepts practically they are doing nothing. The publishers are also supporting OA through green OA policies and also publishing OA articles as per their policies. OA resources are beneficial to all the stakeholders hence it is important that all should contribute to its success.

2.2.5 OA Publications from Indian Research Institutions

National Knowledge Commission (NKC) on Open Access and Open Educational Resources has recommended the increase of OA content from India and to increase the public awareness and utilisation of OA material (National Knowledge Commission, 2007). The report has recommended that at the policy level, all research articles published by Indian authors receiving substantial government or public funding must be made available under Open Access and should be archived in the standard OA format at least on his/her website and also recommended development of national academic OA portal.

Hirwade and Rajyalakshmi (2006) have highlighted the various open access initiatives started by various organizations in India and pointed out that there are many hurdles and misunderstanding about OA in Indian research community. They suggested promotion and co-ordination of OA publishing systems, improvement in OA awareness at national level and training programmes for Librarians covering promotion and usage of OA journals and archives in libraries.

Bhat, M. H. (2009) has revealed through his study that percentage of research articles of Indian research institutes published in OA journals is very less as compared to other priced journals. To identify the top research contributing institutions of India, he used Elsevier's Scopus database and their corresponding research output during the period of 2003 to 2007. Five institutions contributed 17,516 research articles which were published in 4232 journals. All the 4,232 journal titles were then searched in the Directory of Open Access Journals and Google search engine to find out which are openly accessible. The data were tabulated and analysed in a systematic way. Out of 17,516 articles, 1367 (7.8%) were published in 245 open access journals with 884 (64.66%) published in 77 Indian OA journals and 483 (35.33%) articles published in

168 foreign OA journals. Limitation of the study is only Scopus database was considered.

Fernandez, L. (2006) has suggested best practices to promote the OA. In this study, information professionals from India especially from research institutes responsible for implementation and management of online research repositories were interviewed. The study was to know various aspects related to the repositories such as participants, institutional culture, software selection, nature of funding, submission policies, promotion methods, user feedback, institutional support, barriers and future plans etc. Promotion of the OA benefits among faculty and more participation of Subject librarians were recommended.

Gutam, Guttikonda & Hariharan (2012) had carried out 'NARS Open Access Survey' to study attitude and awareness about open access among the researchers from National Agricultural Research System (NARS) in India in which they found that about 49% of the respondents are not aware of what is 'Open Access' and 66% had not published in any open access journals. They opined that a strong open access advocacy and capacity building should be there in NAS which would enable the researchers in NARS to showcase and share their research for public good.

Goswami, R. (2014) in his article has criticized that Open access journals are considered as untouchable and faculty members mostly do not make a version of their publication freely accessible – be it on their own institution's website or in other formats online. More than 99% of Indian higher education institutes do not have any open access research content on their websites. He had also given reasons for this as according to him experienced faculty members feel that others may copy them in case if they made available freely a copy of their publication and whereas younger faculty members considered publishing in subscription based journals would add more value to their curriculum vitae.

Mukherjee and Mal (2012) hold the view that Indian OA journals are widely viewed by the researchers. However, most of these highly cited journals belong to science discipline. They carried out a study in 2011 about status of Indian OA journals with reference to various factors such as year, subject, publisher and citations by using Directory of Open Access Journals (DOAJ) in all discipline. It was found that 155 different publishers were publishing total 307 OA journals from India. 18 publishers

publish more than one OA journal while remaining 133 publishers publishes only single journal. It was concluded that it will be more helpful if institutions of higher learning give importance to development of interoperable institutional repositories which will allow researchers to make their research articles freely available online and also if government starts publishing OA journals.

Nazim and Ahmadi (2018) observed that contribution of Indian researchers in OA journals is relatively higher than other countries of the world; India is ranked at 11th position in OA digital repositories and India is at third position in terms of percentage of OA publications (proportion of papers published in OA journals based on the whole research output). They pointed out that in spite of such large quantity of scholarly content is produced by India; still it is not acknowledged at global level. The reasons given for same are research quality is missing and research output is published in local journals. As a result, low citations are observed. The aim of their study was to examine the growth and development of OA initiatives in India through survey of literature and data collected from various sources.

Summary:

In India also, there are several examples showing OA initiatives. Many have opined that librarians should be trained and do more promotional activities and manage the archives in the libraries. They should share the best practices with other libraries. The publishing trend is mix as many organizations do not publish OA resources. There are significant publishers involved in publishing the OA journals. Though research output in OA format is more by India compared to other countries still it is not acknowledged as the quality is missing and local journals are chosen while publishing. Hence it's important that while publishing, the researcher must check quality of publications and also research done.

2.2.6 Tools created for popularizing / promoting OA

As the importance of OA resources are established, there are many who are engaged in creating various tools to know which can be the best OA medium / resources for publishing from author's point of view.

West, Bergstrom and Bergstrom (2014) have developed an interactive tool to help authors compare among alternative OA venues and thereby get the most for their article processing charges (APCs). They also recommended that journals with higher article influence scores and lower APCs. During their study, they observed that those OA journals (71%) which do not charge article processing charges whatsoever account for about 1/3 of the citations received. They defined the cost effectiveness of a journal as (1000 *Article Influence / article processing charges). They provided cost effectiveness values for the major OA journals discipline wise with ranks given as the most to the least cost effective. But drawback was that only for those journals which were listed in Thomson-Reuters' JCR, Article Influence scores were able to computed.

MacGregor, Stranack & Willinsky (2014) have explained role of Public Knowledge Project (PKP) played in developing various new generation publishing tools which resulted in new trends in scholarly communication. This also helped in open access movement. These tools are Open Journal Systems (OJS), Open Conference Systems (OCS, for managing conferences), Open Monograph Press (OMP, for managing book publication), and Open Harvester Systems (OHS, for metadata harvesting). Different choices for publications are made available by PKP tools for scholars.

Till now researchers are aware about tools such as Google Scholar, Zotero and Mendeley. Tay (2018) has recommended new tools useful for researchers. These include free as well as paid tools also. Due to proliferation of OA resources new tools with various features are emerging. For OA resources, Microsoft Academic, Dimensions, Open Knowledge Map, Open Access Button and many more are available now.

Prasad and Madalli (2007) recognised the contribution of Open source movement by contributing valuable tools for different applications. Many of these applications can be used for OA resource repositories and archives. Digital Repositories are useful for managing institutional / domain based / community based resources in an organised way and making them accessible to all. There are other good open source tools also that can be used in various activities such as (i) software for OA repositories; (ii) Metadata Harvesting software; (iii) software for publishing and managing the journals and (iv) Software for Digital Preservation.

Developing an institutional policy for OA is an effective tool for increasing awareness among all stakeholders of the institute, using as a guideline for future course of action, deciding the role and responsibilities of staff involved, planning, installation and management of required software, training of concerned members, and implementation of the tasks.

Summary:

There are several tools available for OA resources for searching, publishing, to check quality issues, digital preservation, metadata harvesting etc. with various features. Some are free and some are priced. But one needs the technical knowledge to use these tools and hence training is required for same.

2.2.7 Libraries / Librarians as promoters of OA

There are several studies conducted earlier where librarian's role in promoting OA resources were studied with respect to various aspects such as librarian's own contribution to OA resources, barriers to OA promotion for librarians, OA promotion at various types of libraries etc.

Mercer, H. (2011) highlighted that librarians who are in highly influential positions, and who are already promoting OA can support adoption of OA practices and policies in research. Also recommended enticements and benefits for those who opt for OA (irrespective of method) as encouragement in alignment with requirements and objectives of researchers including librarians. He had studied OA publishing and self-archiving behaviours of academic librarians. He selected dataset covering articles published in English only by using LISA, Library Information Science Abstracts in which library and information science journals, are indexed. The articles published in OA and subscription-based journals were included. Initially 4,641 articles published in 2008 were identified. Based on the analysis of citations, the author removed all articles without at least one author identified as an academic librarian, resulting in 3,873 articles. Two categories of citations were formed with one group having articles authored by academic librarians and other group consisting articles authored by anyone else. It was observed that almost 49 percent of authors who were academic librarians were available as open access but by methods other than self-archiving. This self-archiving rate was found on higher side than by previous studies. Around 40% (1,574) of articles had some kind of version (pre-print, published version or

author final draft) available as OA either on personal or through other website, as a part of an institutional / subject repository or in OA journal or through journal / publisher website.

Sharp, C. (2014) highlights that management of OA payment centrally from library is most useful way for providing efficient service in an institution of University College London (UCL) size. An Open Access Funding Team is formed at UCL which manages open access funds. The team guides authors on various issues such as publishers' and funders' requirements, managing payments and coordinating with publishers. The team also offers OA advocacy programme in the institution where library is also involved.

Hood (2007) observed in one of the surveys carried out of American Research Libraries (ARL) that 75% respondents' report that they don't promote OA resources separately specifically but they do help in increasing users awareness about them by informing users about relevant OA resources. Other way of promoting OA resources are in various ways such as listing OA resources in library catalogs, many include OA resources in pathfinders or subject guides (79%), through during instruction sessions (54%), in newsletter articles (48%), promote them using library Web pages (46%), discuss them during the reference interview (45%), and send e-mail alerts about newly available OA resources (36%). Other methods include campus programs and by means of flyers, meetings, etc. The objective of this survey was to identify whether and how ARL member libraries are providing and promoting use of OA research literature among their patrons through various processes by using established library resources such as the OPAC and link resolvers. The study was conducted in March 2017 in which questionnaire was sent to 123 ARL member libraries with a return rate of 58%.

Sweezie, J., Caidi, N., & Chan, L. (2007) pointed out that time constraints is one of the important barrier in adopting OA journals even though librarians are often aware about them. They have studied inclusion of Bioline International (BI) journals in the 76 libraries' collections from their websites first. 59 bioscience journals published from different developing countries are included in BI and it offers OA to all. From Canada all 46 libraries were selected whereas for US sampling technique was used to select 30 libraries. Afterwards a questionnaire was emailed to all 76 librarians to

know about their views about use of OA journals in library collections, as well as about institutional policies and decision making surrounding OA journals. It was found that most libraries were aware of BI titles. However, in both countries inclusion of all 59 BI journal titles was still relatively low (under 11%). The reasons for such low inclusions of BI titles in library lists were institutional policy, dearth of time for librarian to search and catalogue new titles, OA journals credibility issues, lack of inclusion in any indexes or databases, publishing span of a journal etc. It may not be considered a true picture as they received only 17 responses out of 76.

Ghosh, M. (2009) focuses on various challenges faced by information professionals working in the libraries as present information landscape is complicated due to various factors such as self-archiving, OA repositories, metadata harvesting, electronic resource management, interoperability in searching, etc. Systematic approach is very much essential in information handling with the support of IT staff and scholars for successful OA. She elaborates the important role of information professionals in the development and promotion of OA resources and give recommendations for further improvement

Many libraries support authors by compensating article processing charges (APC) charged by some OA journals. This is possible through OA publishing funds which is managed based on some standard practices. Hence to articulate best practices for successful open access fund management, the Open Access Working Group (OAWG) of the Canadian Association of Research Libraries (CARL) carried out a survey. Through this survey Glushko et al. (2015) suggested establishment of benchmarks, assessment and a solid policy framework to allow discussion on the value and sustainability of OA funds. Through a web-based survey, 14 Canadian institutions known to have open access publishing funds and also members of CARL participated in it. These funds were managed from the library's collections budget; few were entirely by the library whereas some funds were supported jointly by the library and other campus sources. They also predicted that the OF funds will be managed effectively if good practices are developed and shared consistently.

Giannoulakis, Zervas and Artemi (2012) establish that though academicians are aware of OA movement, still lot of efforts will be required to encourage them in trusting and using OA resources. A survey was conducted to know the awareness and difficulties

faced by academicians about OA so as to help the library in promotion of OA and IR within the university. Data for this survey was gathered using an online questionnaire. It was observed that 68.32% of respondents were aware about OA. 47.52% of the people wish to use OA for the dissemination of their publications. From 77.23% of the people, who publish between 1 and 3 articles per year; only 15.84% of them deposit their publications into the Institutional Repository Ktisis. Main reason was they were not aware Ktisis. It was also observed that younger members have increased rates in being aware of OA.

Martin, R. A. (2010) emphasizes that academic libraries are keen to acquaint their users to OA materials in their databases, digital repositories, and Web sites. This OA material includes journal literature, textbooks, and open educational resources. By indexing open metadata and link resolvers to quality Internet resources in library catalogues, discovery of OA content has been improved. This has helped the library in saving users time and in turn library is benefitted from less subscription costs and by promoting regional intellectual capital.

Swapan, D. (2004) asserts that like Open Archives Initiative (OAI), there is a need for uniform policy to bring the research libraries in India under one umbrella to enable the efficient dissemination of digital resources. He also recommended that research libraries can play an important role by publicizing OA journals to faculties. They can also run and facilitate OA servers.

Davis et al. (2016) highlighted the role of subject librarian played at Utah State University in exploring a collaborative approach to integrate Open Educational Resources (OER) in faculty members' courseware with the help of their ability and familiarity with the courses, as well as their subject area expertise, to further evaluate available free open resources. They pointed out that the OER movement is evolving fast and libraries should use this opportunity to explore in order to provide related services in their campus so as to reach both students and faculty. Detailed workflow is given for other libraries which will help them to adapt easily to make OER part of their faculty outreach toolkit.

Simon and Richardson (2012) observed that library staff working on institutional repositories require formal training as they require specific skills set such as technical skills, management skills, copyright knowledge, collection management skills etc. to

perform the required work. Though intuitional repositories is one of the type of OA resources still similar skills sets are also required for management of other OA resources. Hence training for library staff is very much required.

Bala and Sharma (2018) shared their observations about various aspects of OA resources. In a survey, one hundred questionnaires were distributed to the researchers of various streams of the Punjab Agricultural University, Ludhiana. Out of 87 questionnaires, which were received back only 83 questionnaires were considered for study purpose. It was observed that 37.34% respondents face difficulty in searching relevant OA resources, 31.33% users were not sure about the quality of these resources. Majority of the researchers' access research articles and 46.99% researchers make use of OARs on daily basis. Majority of researchers came to know about OA resources through mandatory one semester credit course - Library and Information Services and Technical Writing'. The researcher suggested that more importance to be given to OA publishing as it is beneficial for librarians and researchers also.

Summary:

The librarians can play an important role in promoting and providing related services such as email alerts, listing of important OA resources, managing IRs, indexing OA resources and link resolvers to OA resources based on quality, subject guides, library instruction sessions, through newsletter, through library web pages, informal discussions etc. For OA resource management, special skills are required for library professionals for which training is required. Providing APCs through library is also practiced by many foreign libraries. The librarians being information experts can play strong role in setting up the policy and benchmarks for OA publishing at institute level.

2.2.8 OA impact on libraries:

There are new trends observed as a result of increasing OA resources. OA Journals and conventional journals will coexist for some period. Though OA movement does not provide immediate budgetary relief, but it definitely will give alternative approach to authors for publishing their research.

Christian (2008) pointed out that part of the OA challenge is misunderstandings and lack of awareness about benefits of OA publishing. This may be due to lack of internet access and even those who have internet may not be aware about OA concepts. Those who are aware may have some misconceptions about it.

Albert (2006) pointed out that OA issues may impact decision making in serials acquisition and management. Though there is a greater increase of access due to various models of OA still libraries have to subscribe most of the relevant titles as per users' requirements. The publishers may compensate their loss by increasing the prices as seen in the past.

Goodman (2004) predicted that conventional journals with low standards may try to continue expecting libraries to support them based on the low cost. He also expects that only library profession can help the users and authors in a period of increased confusion due to nature or speed of change taking place with respect to OA resources.

Mavodza (2013) emphasised that it's important to be aware of the variety of open access resources available at world-wide level as this can help to understand better as how scholars can use these resources to get maximum benefits out of them.

Jain (2012) insisted that librarians play an important role in the overall promotion and publicity of OA benefits among the faculty and all other stakeholders by directing them towards OA resources. She also discusses hindrances and challenges faced especially by developing countries in relation to OA.

Grabowsky (2015) expressed that OA materials should never be thought of as completely "free" since there are costs involved with selection, description, cataloguing and maintenance. Materials must be made "discoverable" by description, cataloguing, and/or being provided with access points and they must be promoted to users in some way. Like purchased and leased materials, OA materials should be periodically evaluated for weeding or cancellation purposes. Libraries must decide the criteria for funding in case they will be encouraging OA publishing by assisting authors with publishing fees.

Lewis (2012) mentioned that some libraries have started playing an important role in OA publishing by means of hosting Open Journal System software and providing other support to the editors on their campuses. It may affect the disruption of

academic publishers especially University Presses. According to Lewis, due to hybrid OA journals, libraries may demand lower subscription rates as some articles will be available freely. As a result, there is a possibility that some hybrid OA journals may change to Gold OA mode as it is found more effective business model for publishing.

Schmidt and Carstens (2005) reiterates that both traditional publishing and OA publishing will coexist. Though there are various challenges for OA publishing but also it offers opportunities as well. The libraries will have to find solutions to serve their users in the new mixed open access–traditional (MOA) environment. For this, there is a need for redesigning the libraries through monetary as well as human resources.

To give better services to users it is very essential that librarians should first themselves understand the benefits of OA resources so that they can promote them better in user community and can play major role in popularising the OA resources including formalising the OA policy for their respective institutions.

There are some drawbacks of OA also like proliferation of fake OA publishers / journals. The librarians should warn the users about such fake journals. Beall (2015) published potential, possible, or probable predatory scholarly open-access publishers since 2011 and Potential, possible, or probable predatory scholarly open-access journals since 2013 based on his own developed criteria.

Esfe et al. (2014) also suggested some measures to identify the fake journals based on various aspects such as asking their funding, features, advertisement techniques etc.

Summary:

OA movement will definitely impact the way libraries used to function till now. Due to co-existence of OA resources and paid products, libraries have to manage and plan the budgets accordingly. They need to check and manage their acquisition and management processes for OA resources. They will require manpower to manage these resources with skills sets required. Some libraries have initiated publishing OA journals for their institutes. Like other resources, librarians must consider the weeding out of unwanted OA resources which no longer relevant and does not exist online due to technical reasons. Librarians have to carry out various promotional activities for

increasing awareness and usage of OA resources among users considering their benefits.

Conclusion:

From the literature review done it is no doubt that open access is playing an important role in scholarly communication. Open access resources will be future preference for authors as well as for researchers for both publishing their own research and also getting knowledge about others research in their own area of interest. Several studies have been made at national and international level featuring various types of libraries such as academic libraries, research libraries etc. Most preferred way in all these studies were observed as survey and most preferred way of collecting data was the questionnaire. These studies were conducted to know more about various aspects of open access resources from different perspectives. They also emphasised the important role libraries and librarians can have in promoting OA resources and their usage by increasing awareness among user community with their specialised skills in variety of ways.

At the same time, it is also observed that many studies were conducted to know the OA awareness of users, their views, their usage of OA resources etc. But a need was felt to concentrate on the role of librarians in promoting OA resources especially from research institutions. The selected topic was found unique. There are many research institutions established in and around Pune hence, present study is undertaken to know the librarians role in promoting OA resources in research libraries, their views about OA resources, problems faced by them while promoting etc. through Survey mechanism. Since librarian's role is discussed hence users' survey is also conducted about their views of OA resources, usage, publishing preference and also expectations from libraries. Questionnaire tool is used to collect the data required for study.

The next chapter 'Open Access Resources' covers various types of OA resources useful for scholarly communication along with their features, status at international and national level, different sources as examples and how librarians role in related services or making users aware about it.

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Chapter 3: Open Access Resources

In earlier chapter of literature review, various research studies at national and international level were covered. Various aspects of open access resources were included in the literature review giving the current status of awareness, use, its impact etc.

The first objective of this study was to learn about various types of Open Access (OA) Resources along with its sources where we can find them, their benefits, features / characteristics and how librarians can contribute in their usage as per requirement in making users aware of such resources. Literature review was found to be very effective way of getting the required knowledge about these available OA resources. It is observed that:

1. Almost all types of scholarly resources are available in open access format and hence it was found essential to list them selectively at one place. It is very much vital that librarians are aware about different types of OA resources and their related aspects.
2. Research is disseminated through many channels such as personal web sites, blogs, discussion forums, email lists, wikis, RSS feeds and other social media sites such as facebook, twitter etc. However, in this chapter, different types of OA resources used as channels for scholarly communication only are considered.
3. Most of the OA resources have Creative Commons (CC) copyright licenses. These licenses are managed by The Creative Commons Global Network, USA.

3.1 Creative Commons (CC) copyright licenses

According to CC, copyright licenses are legal tools that creators and other rights holders can use to offer certain usage rights to the public, while reserving other rights.

It is very important to know about CC licenses. Librarians should be aware of these licenses as it will help in guiding the users when dealing with OA resources and also in using OA resources in better way while providing various services. These licenses may vary in terms and conditions and accordingly there are different types of licenses available. They are as shown in Table 3.1

Table 3.1 Types of CC Licenses

Sr No.	Icon	Right	Description
1.		Attribution CC BY	This license lets others distribute, remix, tweak, and build upon your work, even commercially, as long as they credit you for the original creation. This is the most accommodating of licenses offered. Recommended for maximum dissemination and use of licensed materials. e.g.: Public Library of Science (PLOS) publishes articles under licence CC BY.
2.		Attribution Share Alike CC BY-SA	This license lets others remix, tweak, and build upon your work even for commercial purposes, as long as they credit you and license their new creations under the identical terms. e.g.: Wikipedia articles, such as photos and illustrations, are licensed under CC BY-SA
3.		Attribution-NoDerivs CC BY-ND	This license allows for redistribution, commercial and non-commercial, as long as it is passed along unchanged and in whole, with credit to you. e.g.: Drupal, a free and open source software package, released its security report under a CC BY-ND license.
4.		Attribution-NonCommercial CC BY-NC	This license lets others remix, tweak, and build upon your work non-commercially, and although their new works must also acknowledge you and be non-commercial, they don't have to license their derivative works on the same terms. e.g.: Singer and songwriter Jonathan Coulton started sharing his music for free online under a CC BY-NC license.

Sr No.	Icon	Right	Description
5.		Attribution-NonCommercial-ShareAlike CC BY-NC-SA	This license lets others remix, tweak, and build upon your work non-commercially, as long as they credit you and license their new creations under the identical terms. e.g.: MIT OpenCourseWare — web versions of all MIT course content has been releasing its materials under a CC BY-NC-SA license since 2004.
6.		Attribution-NonCommercial-NoDerivs CC BY-NC-ND	This license is the most restrictive of our six main licenses, only allowing others to download your works and share them with others as long as they credit you, but they can't change them in any way or use them commercially. e.g.: TED Talks are licensed under the CC BY-NC-ND licenses. This licence allows their videos to redistribute unmodified for non-commercial purposes.

(Source: Creative Commons. (n.d.). *Creative Commons Licenses* Retrieved July 16, 2018, from https://creativecommons.org/use-remix/cc-licenses/)

The authors ready to share their work with others can opt for CC license based on which rights they would like to keep with them and which they wish to share so others can reuse their work. The actual usage of resources by others is expected based on type of license. CC offers the new users to select the appropriate license on their website for their work based on the choices they make.

3.2 Types of OA resources

For library professionals, OA resources are very significant as they are free and also relevant for researchers. Hence it is expected that library professionals must be aware about these resources and should incorporate them while providing various information

services, increase the awareness among the user community, promote their use and also help the user community to publish their research in these resources. To know each resource type in detail would be beneficial for librarians. This chapter gives an overview of all these OA resources with few selective examples. The examples mentioned are given at both global and national level, as per relevance and as representation of the said topic as it would be difficult to cover all relevant OA resources under one chapter. The examples given are randomly selected.

Following are the different types of OA resources available which are important for scholarly communication:

- **Open Books (OB)**
- **Open Data**
- **Open Access Journals (OAJ)**
- **Open Access Repositories**
- **Open Educational Resources (OERs)**
- **Open Thesis**
- **Conference proceedings**
- **Other Open Content**

Each OA resource type is discussed in brief.

3.2.1 Open Books (OB)

There are different types of books such as fiction and non-fiction. Majority of non-fiction books available in research or academic libraries are important for scholarly and academic use. From research point of view, books are very important as they cover a particular subject in a structured manner and are well researched, quality is checked by the publisher and they give references to cross check or for further reference.

Purchasing of new books is an important task, especially from budgetary point of view. Now print books and monographs are also available as e-books and audio books most of the time as publishers are investing highly in digital publishing. Also emergence of e-book readers such as Kindle, Kobo or various apps make it easy to use e-books on

various platforms such as tab, mobile phones and laptops. Librarians are considering user's requirements and preferences, pricing, access policy, licence agreements which may vary from publisher to publisher while purchasing e-books. However in view of high cost for both print as well as e-books where now GST (General Service Tax) is applicable, no library can purchase all relevant books with available budget. Yet it is interesting to see that, there is a steady growth in global e-book revenue (Statista, n. d.) in last few years, as shown in figure 3.1

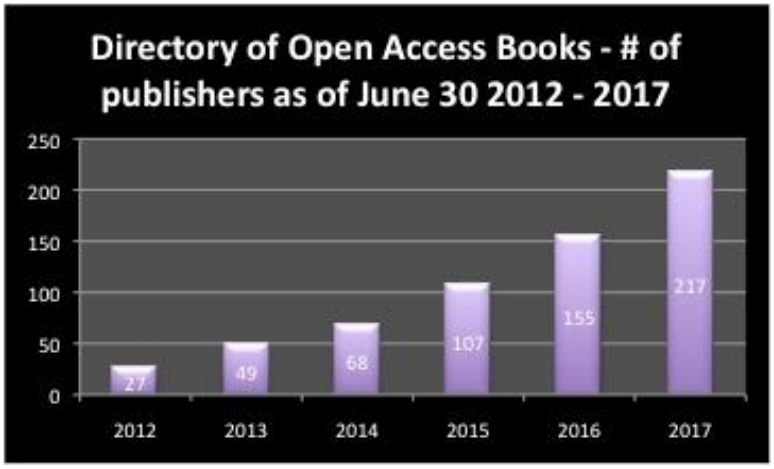
Fig. 3.1 Global ebook revenue from 2009 to 2016 by region



In such a scenario, open access books are a boon for both librarians and researchers. Like other resources, for OB also there are various publishing models such as institutional support, publication fees or through funding agency, double editions (free online copy as well as priced printed copy) through which publishers can get revenue,.

Directory of Open Access Books (DOAB, n. d.) is the single largest source where thousands of open access books are listed. As on November 2017, it included more than 10,000 books from 280 publishers. According to Morrison (2016), there is a growth in number of publishers for open access books category as shown in Fig. 3.2. As a result, there is growth in OA books also. DOAB uses OAI protocol for metadata harvesting (OAI-PMH). By using this protocol, harvesting the metadata of the records from the DOAB in the library's collection is possible.

Fig 3.2 Growth in OA publishers for books



Compared to OAJ, little research is done on OB. But recently Emery, Lucraft, Morka, & Pyne (2017) analysed the effect of OA on books, both quantitatively and qualitatively. It was observed in case of Springer Nature books, that OA books are more useful, easy to access and offers wide reach than non-OA books in all three categories as mentioned below:

a) Downloads: Within first year of publication, nearly 30000 chapters are downloaded per OA book which is higher than average non-OA book by seven times.
b) Citations: Over a period of four years, OA books get on average 50% higher citations than non-OA books.
c) Online mentions: Over a period of three years, OA books get an average of 10 times more online mentions than non-OA books.

Also when checked with authors and funders, it was observed that for publishing and funding of OA books, the most common reasons are greater dissemination and higher visibility.

According to Suber (2012), there is growing evidence that for some type of books, OA full text editions boost the net sales of priced published editions. OA may increase the royalties of authors rather than decrease them.

As a result, many well known publishers have now adopted the OA model for books. Few examples of policies published by the commercial publishers are available on their respective websites such as:

- SpringerOpen open access books (SpringerOpen, n. d.)
- Open Access Books (Emerald Publishing, n. d.)
- Open Access Books (Oxford University Press, (n. d.).
- Open Access for Palgrave Macmillan Books (Palgrave Macmilan, n. d.)

There are some issues in case of OB. There are some practical challenges (University of Michigan Press, n. d.) identified such as contract terms, discoverability, and sustainability so that OA works for the benefits of all users such as author, users, researcher and readers in general all over the world. Overall increase in number of OB over the past few years is a positive sign as it is beneficial for both users and libraries.

Following are a few sites where OA books from various disciplines are available. In some sources, fiction is also available.

- In humanities area, (Humanities Commons, 2017) open access especially in the area of American literature, library and information science and music area is offered by website of Humanities Commons (https://hcommons.org/core/)
- Website of Digital Commons Network (Digital Commons Network, n. d.) is a huge mix collection having book chapters, working papers, conference proceedings, journal articles etc. from educational institutes around the world. It covers multiple subjects. (http://network.bepress.com/)
- Through Google (Google books, n. d.) website, a comprehensive list of full text books can be searched and retrieved with the help of advanced search options (https://books.google.com/advanced_book_search). This is useful to search any type of books including OB and Google ebooks on any topic.
- Internet Archive website (Internet Archive, n. d.) is a collection of free downloadable books and texts (https://archive.org/details/texts). It offers over more 15,000,000 freely downloadable books in multidisciplinary subjects. The collection also includes various formats such as videos, audios, images etc. There

is also a collection of 550,000 modern eBooks which are available for borrowing provided one must have registered for free archive.org account.

- OAPEN website (OAPEN, n. d.) have a collection of mainly free academic books especially from humanities and social sciences along with other subjects. (http://www.oapen.org/home)
- JSTOR website (JSTOR, n. d.) offers thousands of OBs having high quality content and free MARC records which librarians can use to add in their catalogues along with links. (https://about.jstor.org/whats-in-jstor/books/open-access-books-jstor/). There are no need to login / register and no restrictions for downloading as well as printing also.
- Project Gutenburg website (Project Gutenberg, n. d.) provides access to more than 57,000 free eBooks (http://www.gutenberg.org). Formats are different, like kindle books or ebooks which can be downloaded or read online. The world's great literature is available here (copyright has expired in most of the cases.)
- National Digital Library of India website (National Digital Library of India, n. d.) offers around 7 lakhs books from 70 languages. (https://ndl.iitkgp.ac.in/)
- WorldCat website (WorldCat, n. d.) It is a union catalogue of digital resources. It uses OAI protocol for metadata harvesting (OAI-PMH). Searching and accessing ebooks from the libraries all over the world is possible.

Suggestions

- **Librarian's role in OA Books management –**

Since there are many sources available on Internet where these OA books are listed, it is difficult for users' to locate relevant books. Hence, librarians can help the researchers by:

1. Searching and finding sources for OB and list out at a single place.
2. Cataloguing OB with proper links so that users can search them easily.
3. Checking and revisiting on regular intervals to see whether these OA books are still available.

3.2.2 Open Data

For any type of research activity, data is required irrespective of its nature, i.e. primary or secondary. Individuals, organizations and even Government agencies collect data for various purposes.

At present, data is not available easily or it is scattered or unorganized. If made available, it can be used for various purposes, such as:

- By researchers in their research
- By corporates for deciding their future strategy
- By government for development purpose

Researchers do not get easy access to data generated in research from other organizations working in their subject domains. Based on the research data, articles are published in scholarly journals, but data may get neglected or not covered entirely due to various reasons. Based on the data sets, other researchers can verify data or can do their own research, especially in the social sciences area. Hence open data is useful for researches.

Opendatahandbook.org (2016) defines Open Data as ‘‘data that can be freely used, re-used and redistributed by anyone - subject only, at most, to the requirement to attribute and share alike.’’

Main reasons for making data open is to increase accessibility to data sets for other researchers, to increase possibility of getting more citations by allowing others to see, verify or use the data sets just like articles or book or because of the research funder’s / publisher’s mandate . As a result, the creator of data sets gains academic credit for own work. Research Data should be made available as Open Data. It has other benefits also as remarked by Tananbaum (2013) that ‘‘disseminating research outputs and data in a highly visible manner promotes sharing, discussion, and encourages follow-up science.’’

Along with data, it is essential to share other details as well such as methodology and procedures used in collecting the data, codes used, definitions used for variables, their field locations, frequencies etc. These details will vary based on research area, study design, data collected, and characteristics of the dataset. Government data is important

from research point of view as being official data and also from legal point of view it is people's data. Government data is useful for following reasons:

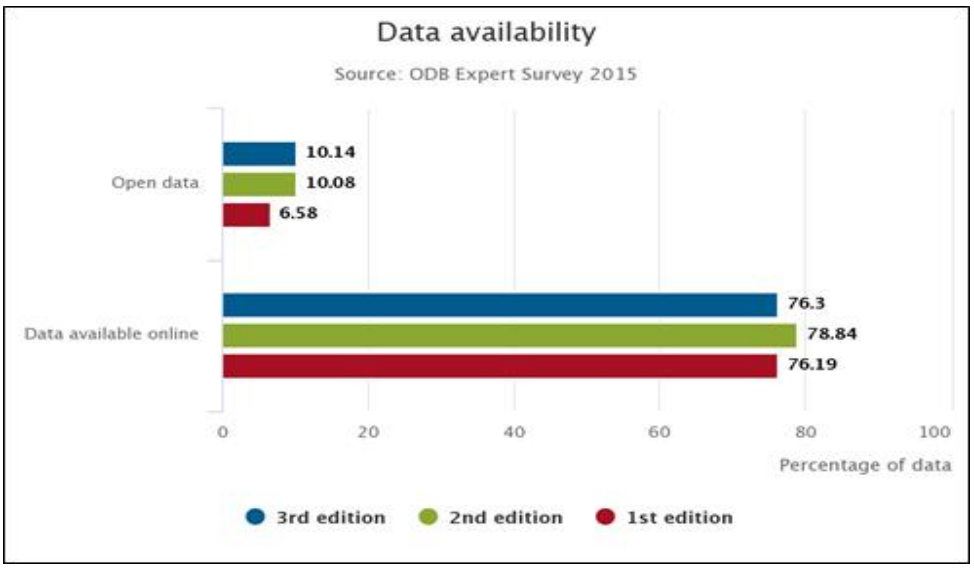
1. Brings transparency
2. Shows effectiveness of government policies
3. Helps to increase government efficiency
4. Measures impact of government services
5. Helps in introducing innovative programs
6. Improves knowledge of people through various data sets and patterns arising from such data

Sensitive data such as personal details or national security related data is not included as Open Data. Open Data is available in various disciplines (Open Knowledge Foundation, n. d.) as follows:

- Cultural: Data collection from galleries, libraries, archives and museums.
- Science: Data generated during scientific research
- Finance: Data such as expenditure and revenue or financial markets data (stocks, shares, bonds etc.)
- Statistics: Census data, key socioeconomic indicators.
- Weather: Data about climate and weather
- Environment: Environment related data such as level of pollutants

Due to its vital role in national development, and also from social and economic angles, Open Data is getting more importance. Due to enormous benefits associated with it, many countries open access policies are adopted by their governments. As a result, many countries have their data available as Open Data.

Fig. 3.3 Evolution of the availability of online data and open data. (Source: ODB Global Report, 2015)



In a survey conducted by Open Data Barometer (ODB, 2015), it was observed that an open data initiative is in place in majority of the countries (55%) and access to available datasets is provided through a catalogue prepared at national level. Moreover, new open data initiatives will be in place in other countries in the near future. It was observed in 93% of countries surveyed that, there is demand for open data especially by public at large and the technology related community, mainly for government data. At the same time, it is also observed that critical data is still not available in most of the countries, except two.

3.2.2.1 Initiatives at International Level:

- ✓ Country based open data – Majority of the countries are making their data available as open data. For e.g.:
    a. Australian Government website (Australian Government, n. d.) offers around 30,000 datasets. (https://data.gov.au/)
    b. In United States of America, federal agencies have made available their data open (Data.Gov, n.d.) (https://www.data.gov/open-gov/)
    c. United Kingdom has also made their data open in several areas (data.gov.uk, n. d.) (https://data.gov.uk/)

- ✓ World Bank Open Data is an initiative from the World Bank (The World Bank, n. d). It gives free access to global development data, where one can search the data either by country or any indicator.

  The World Bank works closely with other international agencies, regional development banks, donors, and other partners in:

  - Developing suitable frameworks, regulation and standards of good practice for statistics.
  - Building consensus and defining internationally agreed indicators,
  - Establishing processes and methods for data exchange.
  - Helping countries in improving statistical competence.

- ✓ Global Open Data Index (Open Knowledge Foundation, n. d.) is a comprehensive database including 166 datasets from 94 countries out of which 11% of the dataset entries in the index are open. (https://index.okfn.org/)
- ✓ Committee on data International Science Council (CODATA, n. d.) (www.codata.org) works to improve the availability and usability of data for all areas of research. CODATA works for enhancement in the interoperability to ensure more usage of such data. It also promotes its policy and technological and cultural changes that are important to make research data more extensively accessible and usable. It also organizes various programs such as conferences, workshops, and training for increasing awareness among public. CODATA also take initiatives to develop standards and policies for open data.

3.2.2.2 Initiatives in India:

There are several types of organizations working at different levels. These bodies are working towards implementing open access by adopting OA policy and promoting its usage by creating necessary infrastructure. There are several initiatives which has resulted in open data usage.

These initiatives are as follows:

- ✓ Right to Information Act

The Right to Information Act (RTI) was enacted in the year 2005 (Government of India, 2015, May) for the purpose of accountability and transparency in Government ministries / departments / organizations / agencies and autonomous bodies where public money is used for various purposes. It gave power to citizens of India by means of reasonable access to government information. Clause 4 of RTI act is about suo-moto disclosure of information where the concerned organizations / agencies are expected to share large of data / information to be displayed on their respective websites for public information. Thus the role of Open Government Data becomes important.

- ✓ National Data Sharing and Accessibility Policy (NDSAP):

National Data Sharing and Accessibility Policy (NDSAP) was published in 2012 (Department of Science and Technology (2012, March) by Government of India. It supports the requirement of responsible and transparent dispensation of government collected data through a robust platform (data.gov.in) in an open machine readable format. Through this facility, people can access the data freely or in some cases on payment basis. Data available is through open access, registered access and restricted access as per government policies. Guidelines have been provided for reusing the data.

3.2.2.3 Initiatives at state and local level:

Similar efforts are being made at state level and local i.e. city level.

State level -

a. Maharashtra State has made its data open (Maharashtra State Data Bank , 2014) of its various state departments.(https://mahasdb.maharashtra.gov.in/home.do)
b. Tamilnadu State has made available more than 15000 resources as open data (tn.data.gov.in, n. d.).

At city level also various municipal corporations are active such as Surat Municipal Corporation (surat.data.gov.in, n. d.) which, has made available more than 100 resources available online (https://surat.data.gov.in/)

This will help to eliminate data gaps, but still require increased awareness among general public for availability of the data and necessary training for using such data. Companies, researchers, students, NGOs, entrepreneurs can make use of this open data in variety of ways. At the same time, though efforts are being made, they are still not adequate in terms of quantity, variety and timeliness of data. In many cases latest data is still not available.

Open data concept is also applied to all the institutes engaged in educational and research areas, which are funded by the Government directly or through its authorised bodies. The number institutions where Government funding is the major source of funding and it is through public funded money is large.

Also in other private institutions / organizations where research is conducted, large quantity of data is generated which they may not share with all due to various reasons such as intellectual property or for commercial reasons. But irrespective of the purpose, all institutions must manage this data for archival, educational, future reference and most important, for research purpose. Hence, management of open data is very vital for institutions, where librarians can plan an important role.

Following institutions from India have shared their research data as per website details available (Harvard Dataverse, n. d.).

1) International Crops Research Institute for the Semi-Arid Tropics has developed free open data repository of ICRISAT research data including Social science, Phenotypic, Genotypic, Spatial and Soil & Weather data which are linked with open publications using Dataverse.
2) AgriGenome Labs Pvt Ltd. India
3) Indraprastha Institute of Information Technology Delhi, Delhi,
4) The National Academy of Agricultural Research Management (*NAARM*), Hyderabad
5) Indian Statistical Institute, Bangalore

3.2.2.4 Open Data Management:

Like any other resource, open data also needs to be stored, preserved, shared, organized and disseminated for its proper management which will help in searching and retrieving the correct dataset as per requirement. There are various ways in which data sets can be published. These are as follows:

a. Access from Publishers' website:

The Publishers may give access from their own websites by publishing data sets as supplementary material for the research articles published in the journals. These are called 'Data Journals'. Readers can access articles and also see the data simultaneously.
For e.g., Journal of Chemical & Engineering Data published by American Chemical Society publishes data generated from both experiments and computations, which can be accessed freely.

Candela et al. (2015) observed that huge investments are required for information technology infrastructure, relevant software and trained staff if 24/7 data repository services to be provided. Therefore, journal editors prefer third party repository providers for management of open data in most of the cases. At the same time, they also found that in the scientific literature, data journals are now recognized practice and there is significant growth observed in the number of published data papers and data journals.

b. **Uploading data sets on a publicly-available website:**

Uploading data sets on a publicly-available website, where files are available for download.
For e.g. India's census data sets are available for download from 1991 to 2011 Censuses (Ministry of home affairs, Government of India, n. d.).

c. Hosting data sets in a repository

Data repositories helps in data publication. There are various software available such as figshare, Dryad, Dataverse, Zenodo etc. These are called Research Data Repository (RDR).

There are various general or domain specific data repositories developed such as arXiv.org for Physics and other areas (Cornell University, n. d.), CiteSeerx with a focus on computers and information science (CiteSeerx, n. d.) etc.

re3data.org (Registry of Research Data Repositories, n. d.) is a global registry of such research data repositories which includes different academic data repositories from various disciplines. It provides permanent storage and access of data sets which is beneficial to all the stake holders such as researchers, funding bodies etc. According to Magazine (2017) the registry indexes over 1,821 RDR (as on 26 February 2017) with an extensive metadata description.

Like institutional repositories, data repositories work where open data is stored, preserved, organized and catalogued, which can also be searched easily. For managing open data, various software / platforms are in use all over the world. These are useful for organizing, cataloguing, publishing, sharing and searching the data. Commonly used platforms are CKAN, DKAN, Junar, Dataverse etc. There are special data platforms also available such as for Geospatial data - ArcGIS Open Data and GeoNode are used. These platforms / software are used by various countries / cities / institutions to share their data. Training and some expertise is required for managing these platforms.

The common features of the some of the available platforms, i.e. software, are search facility, easy access, machine-readable data access, metadata for various data sets, data licenses, data visualization, standard compliance, Application Programming Interface, security etc.

According to Magazine (2017), it was observed that ‘‘compliance with significant standards of Information Infrastructure and Library and Information Science (LIS) community are underused.’’ and suggested provision of Persistent Identifiers for research data sets or the use of common APIs. Inclusion of approved standards is vital for the successful implementation of any service hence it is recommended that this factor should be considered when planning, operating and improving a RDR.

The researchers may select the relevant RDR based on the cost involved (free or direct and ongoing cost for maintenance), Indexing / Search Engine Optimization, the policies and licences available, and its scholarly impact.

d. Publishing a data paper about the dataset:

A data paper may be published as a preprint or in a journal / in a data journal that is specifically dedicated to support data papers. The data may be hosted separately in a data repository or may be by the journal also.

3.2.2.5 Open data Search engines:

For open data, special search engines can be used. These are specifically created to search open data. Following are the few websites of such special search engines:

- http://www.re3data.org/ (Registry of Research Data Repositories**,** n. d.)
- https://www.opendatanetwork.com/ (Open Data Network, n. d.) Data is arranged in various subject categories as well as location wise. It is limited to United States of America.
- https://datasearch.elsevier.com/#/ (Elsevier, n. d.). This site is useful for searching data across various domains both general and specific including institutional repositories as well.
- https://www.quandl.com/ (Quandl, 2017). This website delivers financial, economic and alternative data at global level. Some services are free while some are paid.

3.2.2.6 Data Citations:

Data citations standards are are consistent and standardised referencing for datasets used. As reported by Data Publishing (‘‘Data publishing’’, 2018) following organizations have established data citation standards:

- CODATA Data Citation Standards and Practices Task Group
- Data Citation Working Group of the Research Data Alliance
- Data Preservation Alliance for the Social Sciences (Data-PASS)
- Data Citation Synthesis Group of FORCE11

- DataCite

- **Librarian's role is open data management**

1. Librarians can help the users by making them aware about various sources of available open data which can be used by the researchers for their own research, avoiding duplication and also checking validity of other's research by studying the available data. Librarians should understand the importance of such open data and be familiar in searching, using and managing such data sets.
2. Librarians can also encourage users to share their own research data in such open data platforms by helping them. Tripathi et al. (2017) have suggested that libraries have to work proactively for increasing researchers' awareness and for encouraging researchers to free their data for others use.
3. Even if such data is not shared with outside world, at lease at institutional level librarians must convince the management for storing such data sets in the library, for its management for future reference and as a knowledge management practice. Librarians have to decide and follow a process for data management. This is technical work and involves various stages as cited by Jadhav (2018). These are as follows:
    a. Data Acquisition
    b. Data Cleaning & Curation
    c. Formatting the data
    d. Adding License
    e. Publishing Data on Data Repositories
    f. Filtering & weeding out irrelevant data

It is very important that librarians should develop their skills for managing highly complex, statistical data sets.

3.2.3 Open Access Journals (OAJ):

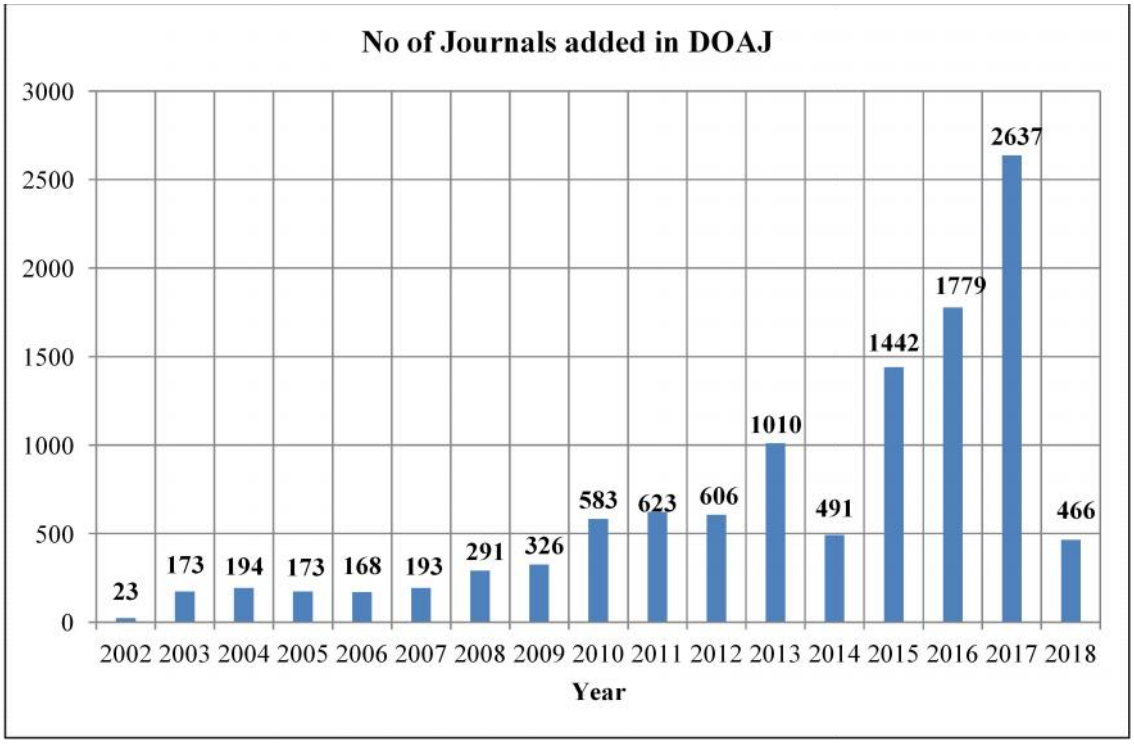
Open Access Journals (OAJ) are online journals which are freely available. Usually these are published with open license. They are important from research point of view as they contain scholarly articles. Some journals charge Article Processing Charges (APCs) from authors while some are completely free.

3.2.3.1 Search engines for OAJ:

I. Directory of Open Access Journals (DOAJ): It was launched in 2003 at Lund University, Sweden, and it covers all areas of science, technology, medicine, social science and humanities (Directory of Open Access Journals, n. d.). DOAJ define ‘‘open access journals as journals that use a funding model that does not charge readers or their institutions for access’’. For quality purpose, only those journals are listed which follow peer review process with an editor and an editorial board or editorial review.

In DOAJ, out of 13,930 journals 10,990 journals can be searched at article level. The total articles are 4,427,501. It provides different searching options such as subject wise, language wise, licence wise, publisher wise and also full text search. The number of open access journals is increasing due to the benefits as shown in figure 3.4

Fig 3.4 No. of journals added in DOAJ (Till April 2018)



II. Google Scholar: It is a powerful search engine for scholarly articles which includes patents and citations also (Google Scholar, n. d.). Advanced search options are also available. Links to full text are made available to preprints as per availability even if original published article is not available. One can create alerts as per requirement.

III. BASE: Bielefeld Academic Search Engine (BASE) covers more than 6000 sources holding more than 120 million documents (Bielefeld University Library, n. d.). 60% of the indexed documents are OA. It is managed by Bielefeld University Library, Germany.

BASE indexes metadata from all types of sources such as journals, institutional repositories, digital collections etc. having an OAI interface and use OAI-PMH for providing their contents.

3.2.3.2 Types of OAJ

Generally in case of OAJ the publisher publishes all the articles on the journal's website which are free to all. But there are some different publishing business models which split OAJ in following categories:

1. Diamond open-access journals: These journals are published free of charge. In this case, neither authors nor institutions have to pay to publish scholarly materials. Moreover, individuals and institutions get access to the published materials for free.
   For e.g. Discrete Analysis journal
2. Gold open-access journals: These journals charge some publication fees, also known as "article processing charge" from author or research funder.
   For e.g. Big Data & Society from Sage
3. Platinum open access journals: These open access journals are supported by a university or research organization due to which there are no charges for authors. For e.g. Beilstein-Institut, an independent, non-profit foundation based in Germany provides funds for Beilstein Journals.
4. Delayed open-access journals: These journals are first closed and later offer free access after definite period of publication, i.e., an embargo period, which may be after 6–12 months of publishing, or even more.

For e.g. Journal of Cell Biology published by Rockefeller University Press is an international, peer-reviewed journal. After six months of its publication, it is available as open access.

5. Hybrid open access journals: These are subscription based journals, but publishers allow open access partly to particular articles for which authors or research funder pay the publishing charges.

   Many well known commercial publishers have adopted this business model. For e.g., Wiley OnlineOpen gives open access option where Article Publication Charge has to be paid by the author or research funder in otherwise subscription based journals.

Following are not journal types but they are defined as per availability of articles. These types are little controversial in nature.

1. Bronze open access: Piwowar, et al. (2018), created this category for article which shares attributes of Gold and Hybrid OA resources. Bronze OA articles are hosted by the publisher. Such articles are not published in journals and they do not have license information. As a result, the articles are free to read but do not allow any other extensive reuse rights. Also whether these articles are temporarily or permanently freely available is also not sure.
2. Closed open access: As per classification of Piwowar et al., these are all other articles i.e. those published in traditional journals, including those shared only on an Academic Social Networking (ASN) sites such as ResearchGate and Academia.edu (which is popular but controversial due to self-archiving practices.)
3. Black open access: The articles are shared on illegal pirate sites and termed as black open access. Björk (2017) have acknowledged such articles as a OA subtype. For e.g. Sci-Hub and LibGen
    a. Science Hub (https://scihub.org/) - This website (Science Hub, n. d.) gives free access to content especially from Science and Technology related areas. It bypasses publisher paywalls by allowing access through educational institution proxies.

b. Library Genesis (http://gen.lib.rus.ec/) - This is a search engine for articles and books on multidisciplinary subjects with free access to content that is otherwise restricted as being pay walled or not digitized elsewhere (Library Genesis[2M], n.d.)

Like traditional journals, most of OAJ also follow peer review process. Hence, quality is maintained. Suber (2015) has remarked that most of the OA journals (70%) charge no author-side fees at all and also it is easier with OA Journals than non-OA journals to let authors retain copyright.

3.2.3.3 Important factors related to OAJ are as follows:

1. Open Journal Systems (OJS)

   OJS is a journal management and publishing system. It is developed by the Public Knowledge Project. It is free as it is open source software. Each and every step can be managed in the publishing process with the help of OJS from editorial to review process, various choices are available for design purpose, different roles such as author, editor, reviewer etc. can be assigned, options are given for rights management as per role and through an OAI-PMH interface dissemination of the article metadata for search engines and even library catalogues is also possible. If library professionals are familiar with OJS, they can guide the researchers in publishing their research in any open access journal and for publishing institutional journal in open access mode.

2. Predatory journals

   Like other fields, some bad practices are being followed in open access publishing too mainly for collecting money as author fees for publishing the articles. These journals do not provide the required services like editorial or publishing. Sometimes such journals are of low quality as there is no peer review process followed and some are even fraudulent journals. In such cases, it is necessary to study the authenticity of journals in which authors wish to publish. Librarians can play a vital role in guiding the users for publishing as well as providing information services

using authentic journals. Till January 2017, Jeffrey Beall, a research librarian of the University of Colorado published "Beall's List", a report in which he listed such predatory journals (Jeffrey Beall, n. d.). He coined the term, "predatory open access publishing". It was observed that most of these journals were mainly published from India and China. Later on this list was withdrawn.

Recently, Patwardhan, B. et al. (2018) studied an ‘approved list of journals’ published by University Grants Commission (UGC), New Delhi with specially developed criteria with the objective to ascertain journals which do not have good publishing practices. Out of 5699 UGC approved journals, 1336 journals were selected randomly. Excluding those 327 titles indexed in Scopus/Web of Science, 1009 journals were analysed. It was observed that over 88% of the UGC-approved list could be of low quality either due to important information was not available (34.5%) whereas majority journals provided false information (52.3%). In order to stop bad practices in scholarly publishing, new regulations are recommended along with more awareness programmes regarding publishing ethics in all educational and research institutes.

To maintain high quality of publishing in all academic disciplines, “UGC-CARE Reference List of Quality Journals” (UGC-CARE List) is maintained by UGC Consortium for Academic and Research Ethics (UGC – CARE, n. d.). This source is useful for checking high quality journals and thereby preventing publications which are sub-standard / predatory journals.

3. Quality of journals

For library professionals the quality of journals is important from subscription point of view, which also impacts the price. If journal is ranked as highly important then it is highly priced and vice versa. For researchers also, the quality of journals is important in view of publishing own research, getting citations and grater accessibility for others. There are some factors which are considered important for deciding the quality and rank for particular journal title. Few notable factors are as follows:

a. Journal Impact Factor (JIF) - (JIF) is used to measure the journals quality but recently, it has been criticised because it is not a very significant indicator in view of other factors such as self-citation, domain wise citations, fake impact factors etc. and also they are subject to manipulation.

   The impact factor (IF) is a measure of the frequency with which the average article in a journal has been cited in a particular year. It is used to measure the importance or rank of a journal by calculating the number of times it's articles are cited. The calculation is based on a two-year period. IF are published annually in ISI's Journal Citation Reports Database. Impact factors are only available for journals that are indexed in ISI databases.

b. Hirsch Index – It is also known as h-index. It helps in understanding citations of individual authors on their work basis but it does not help to know quality of a complete journal as a whole.

c. The SCImago Journal & Country Rank (https://www.scimagojr.com/) – Based on Scopus® database of Elsevier, this portal is developed which consists of the journals and country scientific indicators (Scimago, n. d.).

d. Scopus (https://www.scopus.com/home.uri) – It is a subscription based service. It contains more than 27,000 journals of which around 4000 are open access journals from over 5,000 international publishers (Elsevier, n. d.). It also includes monographs, edited volumes, major reference works and graduate level text books. It covers not only social sciences, arts & humanities, but also includes Science, Technology & Medicine (STM). Journal's performance can be analysed through the following two metrics given by The Scopus Journal Analyser:

   i. SJR (SCImago Journal Rank)

      Based on the Google PageRank algorithm, it does not treat all citations as equivalent. A source having more importance when cite another source with lower importance then the second one gets prestige from the first source by citing it. Thus, SJR is based on the prestige of a journal. Factors such as subject, quality, and status of the journal impact the value of a citation directly.

   ii. SNIP (Source Normalized Impact per Paper).

Based on the total number of citations received, SNIP uses a source's circumstantial citation impact in a particular domain area. It is helpful in comparing sources from different domain areas.

e. Altmetrics – It is used to measure and monitor non-traditional citations i.e. online interactions for scholarly publications. It is also called alternative metrics. It covers online media such as public policy documents, research blogs, news, bookmarks on reference managers like Mendeley, social networks such as Twitter etc. There are some free as well as commercial tools available. PLOS and SSRN use this technique to show the impact of the particular article.

With respect to OAJ various studies are conducted regarding impact factor, citations received for OAJ and accordingly scholars have given different views. Chua et al., (2017) recommended for publishing in an OA journal so as to get more citations instead of paying publishing charges which are high for higher IF journals. Björk and Solomon (2012) observed that like subscription journals, OA journals indexed in Web of Science and/or Scopus are also getting equal scientific impact and quality especially in biomedicine. Piwowar, et al. (2018) estimated that at least 28% of the scholarly literature i.e. of all journal articles which are freely available online is OA (19M in total) and that this proportion is growing, driven particularly by growth in Gold and Hybrid OA. They also found that OA articles receive 18% more citations than average. Thus OAJ are now important from research point of view in terms of impact and visibility and hence cannot be neglected.

- **Librarian's role in OAJ:**

1. Librarians can give access to the relevant OAJ to the researchers by cataloguing such titles in their databases or even through their library websites after evaluating OAJ based on pre decided criteria.
2. Librarians can use such OAJ or articles published with open access while providing various information services to users like in Current Awareness Service (CAS) or Selective Dissemination of Information (SDI).
3. Librarians can give demonstration of OJS to management if they have their own publications or want to start new ones.

4. Librarians can advocate the researchers and also encourage them to publish in good quality OAJ.
5. Librarians can increase the awareness about predatory OAJ among researchers and should be warned about such bad practices which will help them while publishing their research.
6. The journals analysis based on predefined criteria by librarians will help in identifying authentic and quality journals in a particular field.

3.2.4 Open Access Repositories

This format is known as Green open access, where articles are added or archived in OA repositories. These are online collections of articles published elsewhere in the form of preprint or post print. They are made available after an embargo period as per respective publisher's policy. OA repositories are of three types:

1. Institutional repositories
2. Subject repositories
3. Data repositories (It is covered under Open data)

No charges are required for archiving in such repositories. Before adding the articles from journals in these repositories, it is very essential to check the respective publisher's policy for archiving purpose, which differs from journal to journal.

3.2.4.1 Institutional repositories (IRs)

An institutional repository is a digital archive for collecting, preserving and disseminating copies of the intellectual output of an institution, particularly a research institution in digital format. In addition to articles, other research based items such as reports, working papers, monographs, thesis, etc. are also added as per the Institute's policy. Sometimes these repositories are available at intranet level only due to institutional policies, which does not support open access in a true sense. The IRs are generally managed on local servers, but now they are also managed on cloud based services.

According to Barton & Waters (2004), Universities and research libraries around the world use institutional repository in the following ways:

- Scholarly communication

- Storing learning materials and courseware
- Electronic publishing
- Managing collections of research documents
- Preserving digital materials for the long term
- Adding to the university's prestige by showcasing its academic research
- Institutional leadership role for the Library
- Knowledge management
- Research assessment
- Encouraging open access to scholarly research
- Housing digitized collections

Management of IR is a set of activities starting from its initial planning stage till its execution and management over a period. Mainly these activities are the selection of team, who will manage IR, assessment of resources that will be added in IR (out of which some may be available in digitized form but some may have to be digitized), funding for the infrastructure required (such as server or training of staff involved, digitization etc.) ,establishing IR policy for the institute, procedures to follow with workflows, selection of suitable software, actual execution of work, promotion of IR and time to time review for its smooth functioning. In addition, registration of IR and also institutional policy in respective directories at global level is necessary without which it will be incomplete and also not helpful to support OA policy. In majority of cases, IR is managed by library staff. Sawant (2012) observed that the management of IR in India too is done mostly by the library staff (64.29%).

There are several reasons due to which IR may fail. In absence of properly documented institutional policy for management of IR, lack of technical support, institutional funding, non-cooperation from stakeholders, management failure or incompetence of staff can cause failure of IR. Vishala and Bhandi (2007) opined that IR failure may result in either disruption of access, or even permanent loss of material stored in the institutional repository, and also pointed out that successful Institutional repository would promote the library's prominence and reputation from local to global levels. Some examples of IRs are given in Table 3.2.

Table 3.2 Examples of IRs set up

No	Institutional Repositories	Software Used
1.	National Chemical Laboratory, Pune, India http://ncl.csircentral.net/	Eprints
2.	Inter-University Centre for Astronomy and Astrophysics, Pune, India http://repository.iucaa.in:8080/jspui/	Dspace
3.	MIT Libraries, United States of America https://dspace.mit.edu/	Dspace
4.	Newcastle University, United Kingdom http://eprint.ncl.ac.uk/	Eprints
5.	Dépôt Universitaire Numérique des Étudiants (DUNE), France http://dune.univ-angers.fr/	Drupal

3.2.4.2 Subject repositories (SR)

Subject repository is an online collection of resources with open access in a particular field or subject. Such repositories accept wide range of OA documents such as conference papers, journal articles as preprint or post-print, working papers and theses collection etc. Resources included in subject repositories may or may not be peer-reviewed and these are distributed globally and searchable on the Web.

Common features of IR and SR are as follows:

- As per publisher's policy, the researcher may add preprint or post-print
- Same software can be used

Differences in IR and SR are as follows:

- Adding the work in SRs gives more visibility through more exposure among peers in the same field and thus may lead to more citations than IRs.
- IR can be set up at intranet level but SR is always available online.
- IR may be multidisciplinary but SRs are always subject specific.
- IRs are set up at the Institute level, which may be at local, national or international level, whereas SRs are set up by either one or more Institutes or agencies at international level.
- Management of SRs is costlier than IR

Xia (2008) found that author will prefer to add an article in one repository only. Also, scholars who submit their work in SR may not necessarily do so in an IR, and vice versa. While formulating the IR policy, it should be made mandatory to provide the accepted article within stipulated time period with all necessary metadata, and also these IRs should be available online. As a result, the resources are available to search engines to ensure easy access to all researchers. In case of SR, there is no mandatory policy as it depends on individual researchers mostly whether he / she would like to contribute own article in it. Some of the examples of SRs set up are given in Table 3.3.

Table 3.3 examples of SRs set up

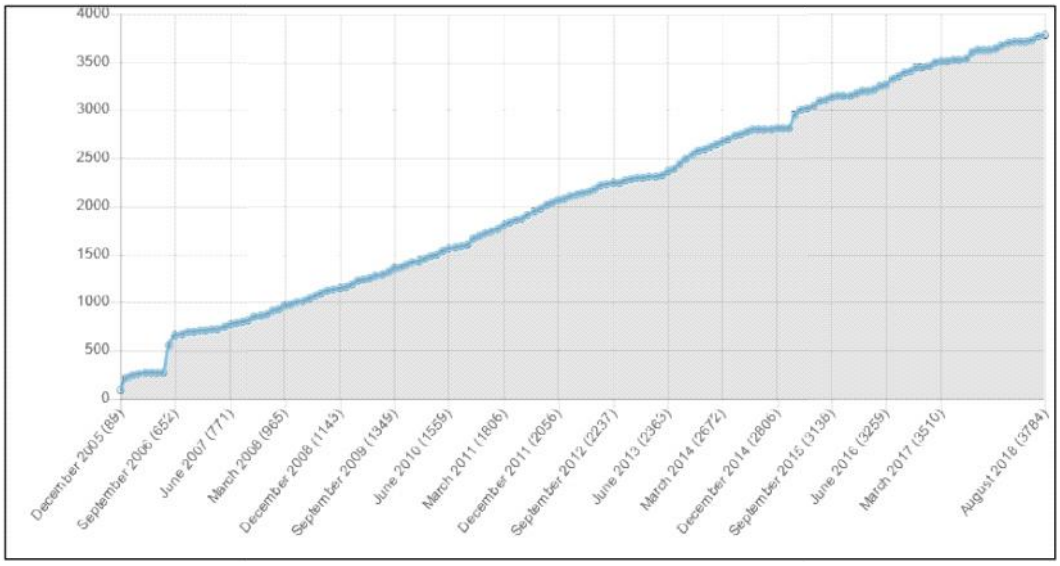
No.	Subject Repositories	Software Used
1.	Earth-prints Repository http://www.earth-prints.org/ It is created and maintained by Istituto Nazionale di Geofisica e Vulcanologia, Italy. This is limited to global research in the fields of Atmosphere, Cryosphere, Hydrosphere and Solid Earth.	Dspace
2.	OceanDocs- INSTM – Tunisia, Belgium http://www.oceandocs.net/handle/1834/137 It is supported by the Intergovernmental Oceanographic Commission (IOC) specifically to collect, preserve and facilitates access to all research output from members of their Ocean Data and Information Networks (ODINS). It is one of digital marine and aquatic repositories including the Aquatic Commons. It is supported by the International Association of Aquatic and Marine Science Libraries and Information Centers (IAMSLIC).	Dspace
3.	Kaleidoscope Open Archive (TeLearn), France https://telearn.archives-ouvertes.fr/ This is collecting material relating to research on technology-supported learning. A sizable number of streaming videos are available within the repository.	HAL
4.	ICOMOS Open Archive, France http://openarchive.icomos.org/ It is both, the institutional archive of the scientific documentation produced by the International Council on Monuments and Sites (ICOMOS) and also a subject archive open to the entire international scientific community in the field of heritage conservation.	Eprints
5.	e-LIS, It is a global archive for Library and Information Science http://eprints.rclis.org/	Eprints

3.2.4.3 OpenDOAR:

Directory of Open Access Repositories (OpenDOAR) is also known as global directory of open access repositories (JISC, n. d.) and it is managed by JISC engaged in providing digital solutions for UK education and research. OpenDOAR was launched in 2005 by University of Nottingham and Lund University as a joint association. It's new version will be available after November 21st, 2019 on it's website. Besides repositories, it also lists other types such as images or data-sets, provided metadata or adequate documentation is available due to which it can be reused.

Fig. 3.5 shows the exponential growth of repositories (JISC, 2018) from all disciplines and from all over the world irrespective of the software they used language, country, etc.

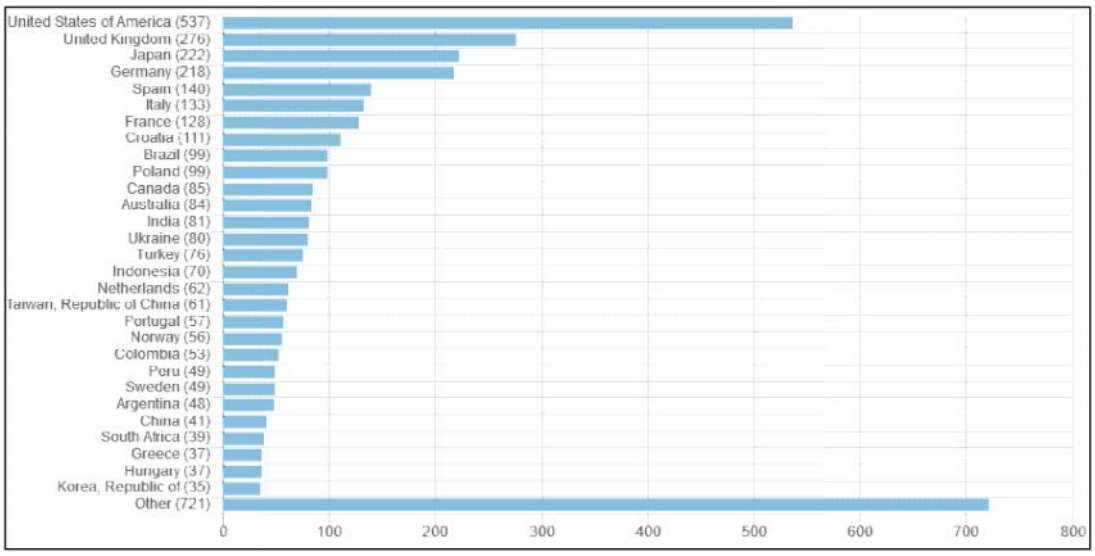
Fig 3.5 Growth of OpenDOAR



To participate in DOAR, institutional policy should be well written with all required details such as metadata policy, data policy, content policy, submission policy and preservation policy. In absence of clear policies, the basic purpose of having open access mechanism may fail as other organizations may limit their search based on the policies. As a result, it may impact the use and visibility of resources available in these IRs

As per DOAR, all over the world there are 3784 such repositories (August 2018). United States of America is at 1st position contributing 537 repositories, where as India is at 13th position contributing 81 repositories. Since many repositories are not registered in DOAR, the actual figures may vary.

Fig 3.6 Repositories country wise



From India, only one funding agency i.e. Indian Council of Agricultural Research is reflected but other agencies such as CSIR, DBT, DST, etc. are not listed.

3.2.4.4 Software available for management of IR / SR

There are several software available for management of IR, such as, DSpace, Eprints, Iselandora, Weko, and Greenstone. Mostly these are open source software i.e. freely available. Depending on the requirement and features available, suitable software can be selected. Several studies have been made in this regard on various aspects. Most commonly used software platform is Dspace (43%) followed by Eprints (13%) as per DOAR statistics.

3.2.4.5 Interoperability through Metadata Exchange

Open Archives Initiative Protocol for Metadata Harvesting (OAI-PMH) is a method for data sharing between repositories known as interoperability i.e. gathering the metadata details of records from an archive so as to built services using same metadata. It is

developed by Open Archives Initiative (OAI) organization. The OAI Protocol is used in software used for digital libraries, institutional repositories, and digital archives.

3.2.4.6 ROAMAP (Registry of Open Access Repository Mandates and Policies)

ROARMAP is an online database for open access mandates and policies adopted by universities, research institutions, and research funders from all over the world (University of Southampton, n. d.). Since these organizations have adopted OA policies, they appeal to their researchers to provide OA to their peer revived research articles by submitting these articles in an OA repository.

As in March 2018, following is the status as per ROARMAP data on the website:

- Funder (83)
- Funder and research organisation (56)
- Multiple research organisations (11)
- Research organisation (e.g. university or research institution) (716)
- Sub-unit of research organisation (e.g. department, faculty or school) (75)

From India, following research institutions have registered their OA policies:

1. Bharathidasan University
2. CGIAR
3. Council of Scientific & Industrial Research
4. Department of Biotechnology and Department of Science & Technology, Ministry of Science & Technology
5. International Crops Research Institute for the Semi-Arid Tropics (ICRISAT)
6. Indian Institute of Technology Hyderabad (IITH)
7. Indian Council of Agricultural Research
8. Indian Institute of Horticultural Research Bengaluru
9. Anjuman-I-Islam's Kalsekar Technical Campus (AIKTC)
10. M S University
11. Madurai Kamaraj University
12. Mahatma Ghandi University

13. National Institute of Oceanography
14. National Institute of Technology, Rourkela
15. National Knowledge Commission

- **Librarian's role in IR / SR:**

1. Librarians can take lead in setting up of IR by convincing the management its benefits to institution and also researchers
2. Librarians should encourage researchers to participate in IR activities by providing their research papers and other resources along with metadata within stipulated time period.
3. Librarians should promote the IR related activities for the benefit of institution as a whole and also for showcasing library visibility.
4. Librarians should update their knowledge about latest happenings in OA field, especially related to various policies developed such as Romeo-Sherpa or Juliet so that they can guide the users better while publishing the papers in a journal and also encourage them to contribute to either IR / SR.

3.2.5 Open Educational Resources (OER)

In education field, online education is a revolution since anyone can use this mechanism provided eligibility criteria is fulfilled and necessary infrastructure is available to access these education programs. There are several models available for the online education. As a result, there is a great need for online education resources especially those which are free, i.e., open to all.

From research point of view, these resources may not be useful directly for research but there are OER related to research methodology which can be useful for researchers' especially new ones who have just started the research.

In 2002, the phrase "open educational resources (OER)" was used for the first time at UNESCO's Forum on the Impact of Open Courseware for Higher Education in Developing Countries. UNESCO (n.d.). has defined OER as ''teaching, learning or research materials that are in the public domain or released with an intellectual property license that allows for free use, adaptation, and distribution.''

OERs are available in various formats such as textbooks, curricula, syllabi, lecture notes, assignments, tests, projects, audio, video and animation etc. OER are important mainly for academic or educational purpose especially for developing and under developed countries. The basic requirement is availability of fast internet access.

3.2.5.1 OER at global level

Many universities and well known institutions are engaged in creating online Open Courseware (OCW) with the help of their subject experts in various disciplines. They are made available to all freely. For e.g., an online course "Understanding Open Educational Resources (OER)" available from Commonwealth of Learning website (https://learnoer.col.org/home) is available free, and anyone who completes it will get a certificate for same. Following are some other well-known examples:

1) MIT OpenCourseWare (Massachusetts Institute of Technology, n. d.) (https://ocw.mit.edu/index.htm)

   Massachusetts Institute of Technology (MIT) launched the OCW for the first time in early 2000. Today, almost 2400 OCW are available. It is used by the educators, students, self learners and others for various purposes as mentioned on their website.

2) Khan Academy (Khan, n. d.). (https://www.khanacademy.org/)

   It is a private source, which is very much popular worldwide for online free courses in various streams. Mr. Bill Gates has appreciated and provided the financial grant for its development in 2010.

3.2.5.2 OER at Indian level

In contrast to other types of OA resources, efforts for OER have stated recently in India. These are as follows:

1) National Programme on Technology Enhanced Learning (NPTEL): (https://onlinecourses.nptel.ac.in/)

   It is a joint initiative of the IITs and IISc. Through this initiative, various online courses and certifications in various topics, especially in engineering, science and other disciplines are offered with different durations. Faculty development programs

are AICTE approved. The exam is optional for a fee and after passing the exam, certification is done. Registration is a must, which is free. It is the largest online repository in the world of courses in engineering, basic sciences and selected humanities and social sciences subjects (Ministry of Human Resource Development, , Government of India, n. d.).

2) Consortium for Educational Communication (University Grants Commission of India, n. d.) (http://cec.nic.in/Pages/Home.aspx)

   Consortium for Educational Communication popularly known as CEC is one of the Inter University Centres set up by the University Grants Commission of India. Across the country at various colleges, Academic Staff Colleges and Universities, through EDUSAT, a satellite exclusively devoted for educational sector, experts deliver the lectures through video conferring mode at over hundred Satellite Interactive Terminals (SITs) and Receive only Terminals (RoTs) are installed. Recorded lectures are available through YouTube. CEC is also engaged in development of e-content, learning object repository (LOR), e-learning resources in four streams.

3) SWAYAM (Ministry of Human Resource Development, Government of India , 2019). (https://swayam.gov.in/)

   This programme is run by Government of India to achieve the three main principles of Education Policy, viz., access, equity and quality. The courses hosted on SWAYAM will be in 4 quadrants-(1) video lecture, (2) specially prepared reading material that can be downloaded/printed (3) self-assessment tests through tests and quizzes and (4) an online discussion forum for clearing the doubts. These programs are from school level (9th class onwards) to post graduate level. It is user friendly, easy to search and use the online courses which can be accessed by anyone, anywhere at any time.

4) NCERT Books (NCERT, n. d.), (http://ncert.nic.in/textbook/textbook.htm)

   National Council for Education Research and Training (NCERT) has published all textbooks for classes I to XII in Hindi, English and Urdu on its website. The Entire book or individual chapters can be downloaded but re-publication is strictly prohibited as mentioned in the Copyright Notice.

5) National knowledge portals

As reported by Das (2011) with reference to Fig. 3.7, different knowledge portals in different streams have been created by various agencies for sharing open education contents in the respective area. These are available mostly in English and other regional languages.

Fig. 3.7 National knowledge Portals

National knowledge portals disseminating open educational contents

Name of portal	Implementing agency	URL	Languages covered
India Water Portal	Arghyam, Bangalore	www.indiawaterportal.org	English, Hindi, Kannada
India Environment Portal	Centre for Science and Environment, New Delhi	www.indiaenvironmentportal.org.in	English
India Biodiversity Portal	Ashoka Trust for Research in Ecology and the Environment, Bangalore	www.indiabiodiversity.org	English
India Energy Portal	The Energy and Resources Institute, New Delhi	www.indiaenergyportal.org	English
Teachers of India Portal	Azim Premji Foundation, Bangalore	www.teachersofindia.org	English, Hindi, Kannada, Tamil, Telugu, Oriya, Marathi, Gujarati
Sakshat: One Stop Education Portal	IGNOU, New Delhi	www.sakshat.ac.in	English
SKILLS India Portal	UNDP and Department of Science and Technology	www.skillindia.com	English
India Development Gateway (INDG)	Centre for Development of Advanced Computing, Hyderabad and Department of Information Technology	www.indg.in	English, Hindi, Telugu, Bengali, Tamil, Marathi
e-Shiksha: Collaborative Learning Portal	Shiksha India Trust, Gurgaon (CII-Shiksha E-Collaboration)	http://eshikshaindia.in	English

3.2.5.3 Quality of OER

There is an exponential growth of OER due to its importance and benefits, but main issue is the quality of content. There are several factors such as currency and accuracy of information, relevance, its efficacy based on which the suitable OER can be selected. It will be the responsibility of Institution / teacher responsible for creating the OER, as well as the end-user who may be an educator or student who is selecting the particular OER. Hence, it is better to know more about OER if one is doing any free course online at individual level.

Due to pick and choose model availability, it is easier for teachers / faculty to choose appropriate part as per syllabus and prepare the course material. There are several studies which have shown that such OER are very much cost effective. Dimeo (2017) quoted a study in which it was found that due to the use of open educational resources at community colleges, students at the participating institutions are saving, on average, $134 per course and such 76,000 students would be expected in next three years duration who

will use these OER. Similarly, Hilton et al. (2014) found that OER have great potential for saving money not only for students and parents but also for tax payers and claimed that OER could save at least a billion dollars for United States of America based on their findings.

- **Librarian's role in OER:**

1. Librarians have necessary skill set for searching the required information, evaluating it as per requirement and disseminating it to the concerned users. With these skills, librarian can find the relevant OER and make users aware through various promotional activities about its benefits and importance.
2. Librarians can convince the management in using the OER for education / training purpose, there, by saving the library budget for other useful resources.

3.2.6 Open Thesis

Worldwide, various universities and other institutions are engaged in providing full text access to thesis in all disciplines since long time. These are popularly also known as ETDs (Electronic Thesis and Dissertation). Theses are important resources for researchers as they are not only the by-products of getting formal degrees but also share new ideas and findings observed in the research. This helps in promoting more research in the respective subject domains.

Earlier, libraries used to have only thesis of local researchers in case of PhD research center or in-house researchers as thesis used to submit only in printed formats. But preserving these theses in electronic format has more benefits. Main benefit is preserving the content from being redundant. In case of old theses in printed format, digitization is the solution, whereas last few years theses are born digital.

Bandra (as cited in Farooqui and Raees (2017) identified the merits of ETD as follows:

- To empower students to convey a richer message through the use of multimedia and hypermedia technologies
- To improve graduate education by allowing students to produce electronic documents, use digital libraries and understand issues in publishing

- To increase the availability of student research for scholars and preserve it electronically
- To lower the cost of submitting and handling theses and dissertations
- To empower universities to unlock their information resources
- To advance digital library technology

There are many initiatives taken both, at international and national level to make these ETDs as open collection.

3.2.6.1 Open Thesis at international level:

1. Networked Digital Library of Theses and Dissertations (NDLTD) (http://www.ndltd.org)

   According to Networked Digital Library of Theses and Dissertations. (n.d.) the concept of electronic theses and dissertations (ETDs) was first discussed at a 1987 meeting in Ann Arbor, Michigan, organized by UMI and attended by representatives from Virginia Tech, the University of Michigan, and two small software companies. After several years of work, ETD database software was created at Virginia Tech, USA in 1996 and then it was made available worldwide. Every year the International Symposium on Electronic Theses and Dissertations is organised. As of August 2018, it includes 5,111,718 electronic theses and dissertations.

2. Open Access Thesis and Dissertations (OATD) (https://oatd.org)

   This source contains graduate theses and dissertations published around the world. It covers metadata from over 1100 colleges, universities, and research institutions. OATD currently indexes 4,555,428 theses and dissertations.

3. Open Thesis collection at various levels:

   In addition to national levels in various countries, universities and other institutions are engaged in creating and managing their own repositories for these which are being promoted by their respective libraries. Few of them are listed below:

Table 3.4 Example of open theses at international level

Sr. No.	Country/University / Institution	Collection size (August 2018)
1.	UK theses and dissertations, UK (http://ethos.bl.uk/)	4,80,000
2.	Australian National University, Australia (https://openresearch-repository.anu.edu.au/handle/1885/3)	8,991
3.	Bielefeld University, Germany (https://pub.uni-bielefeld.de/record?cql=type=bi*)	2,001
4.	Harvard Community, USA (https://dash.harvard.edu/)	95,050
5.	DART Europe (http://www.dart-europe.eu/basic-search.php)	784,764

3.2.6.2 Open Thesis at national level:

All universities / institutions engaged in higher education are playing an important role in academic research resulting in award of degrees to the researchers in various subject domains for which they submit theses at various levels such as post graduate, M.Phil. or doctoral research. Earlier these theses were made available through university libraries or institutional libraries where these researchers did the research or worked. So access to these resources was limited. Considering the vast amount of knowledge generated, open thesis are really helpful from research point of view.

3.2.6.2.1 Role of UGC:

In India, University Grants Commission (UGC) is an top body of Government of India (GOI) for the coordination, determination and maintenance of standards of university education in India (University Grants Commission, n. d.). It was formally established in November 1956. Major academic research is conducted in universities and affiliated colleges and at other national level institutions.

In 2005, University Grants Commission (UGC) drafted a policy framework entitled "UGC (Submission of Metadata and Full-text of Doctoral Theses in Electronic Format) Regulations, 2005" (Saurshtra University, n. d.). This was proposed mainly to improve the quality of research work done. This Regulation proposed following actions:

1. Creation of Indian National Theses Database (INTED)
2. Submission of PhD Theses in Electronic Form

But the real impact was due to the later UGC Notification (University Grants Commission, Ministry of Human Resource Development, 2009). Accordingly research scholars have to submit the soft copy of their theses and dissertations by the in universities which make them available to outside world through open access. As a result, it has also found helpful in raising the standard and quality of research. Under this initiative, Information and Library Network (INFLIBNET) Centre, which is an Autonomous Inter-University Centre (IUC) of UGC maintains following repositories:

a. **Shodhganga** – Shodhganga is the digital repository of Indian Electronic Theses and Dissertations (ETDs) set-up by the INFLIBNET Centre (INFLIBNET, n. d.) The repository uses Dspace software and captures, stores, indexes and disseminates electronic theses submitted by the researchers through Indian universities. There are more than two lakh thesis available in full text, contributed by more than three hundred and forty universities / institutions.
b. Shodhgangotri: Shodhganotri is a repository of Indian research in progress having more than five thousand synopses in its collection. It is managed by the INFLIBNET Centre (INFLIBNET). The research scholars / research supervisors at the time of registration for Ph.D. program, are supposed to submit the electronic version of approved synopsis to the universities. This is helpful to know the trends and changes in research in any subject from research point of view. For avoiding duplication of research also, such database is useful especially for new researchers.

In 2018, status of different types of Universities / Institutions engaged in higher education as per UGC is as shown in Table 3.5

Table 3.5 Universities in India

Sr No.	Type of Universities	Total
1.	Central Universities with UGC grant	47
2.	Central Universities without UGC grant	7
3.	State Universities	391
4.	Deemed to be Universities	13
5.	State Private Universities	282
6.	Institutions of National Importance	91
	Total	831

Research is done in these Universities, and the affiliated colleges, especially doctoral research. Thus, from other researcher's point of view, the data and knowledge generated is valuable and accessible easily as open theses. Apart from national level, efforts are also done for building theses collections at university / institution level. Few examples are as follows:

Table 4 Examples of theses repositories in India

Sr. No.	University / Institution	Collection size (August 2018)
1.	Indian Institute of Technology, Delhi (http://library.iitd.ac.in/thesis/index.php)	4843
2.	Indian Institute of Science Education and Research, Pune (http://210.212.192.152:8080/xmlui/browse?type=type)	743
3.	Kirshikosh: An Institutional Repository of Indian National Agricultural Research System (http://krishikosh.egranth.ac.in/simple-search?filterquery=Thesis&filtername=type&filtertype=equals)	84506

Sr. No.	University / Institution	Collection size (August 2018)
4.	National Chemical Laboratory, Pune (http://ncl.csircentral.net/view/types/thesis.html)	2046
5.	Ph. D. theses repository of Savitribai Phule Pune University (http://lib.unipune.ac.in:8080/xmlui/)	7987

3.2.6.2.2 Recommendations of National Knowledge Commission

The National Knowledge Commission (NKC) set up by GOI submitted various reports from 2006 to 2009 to transform India into a vibrant knowledge based society. In context of original research and development for enabling the research environment, the commission recommended that Ph.D thesis should be uploaded on the Internet, preferably on the proposed National Research Portal and also emphasised the need for more quality Ph.Ds (Pitroda, 2009). The Commission also recommended strongly the open access for publicly funded research literature. As a result, today theses are available online, with full text accessible to all.

3.2.6.2.3 National Digital Library (NDL):

The NDL is developed by Ministry of Human Resource Development (MHRD) under its National Mission on Education through Information and Communication Technology (NMEICT) as a framework of virtual repository of learning resources with a single-window search facility.(Ministry of Human Resources Development, Government of India, 2018). It contains theses along with other types of resources such as books, reports, data sets, monographs, manuals, articles, audio and video lectures etc. The novelty is that along with PhD thesis, it also includes theses at other educational levels such as undergraduate and postgraduate theses. As of August 2018, it included more that 1,14,500 theses in different streams with various file formats. This is a truly a unique database. NDL collect data from various repositories and direct the users to the relevant sources using metadata. Though access is free to NDL after registration, access to the documents is governed by the respective organization who is the contributor. Different icons used to show the various options available for access is shown in Table 3.7.

Table 3.7 Icons used for access in NDL

Sr. No.	Icon	Meaning
1.		Open: full-text available to all
2.		Limited: part of the text is available but full-text requires authorization by Source Authority
3.		Subscribed: full-text available from institutions that have subscribed to the Source
4.		Authorized: full-text access requires authorization by Source authority and separate login to the Source
5.		NDL: This signifies that the document can be accessed in full-text mode by any user who has logged into NDL India

3.2.7 Conference proceedings

Conferences are an important source for research communications for quick sharing with fellow colleagues in same subject area. Generally, these are peer reviewed and reported either in selective journals or published as conference proceedings. Earlier, the access to these materials was limited to those who attended the conference. There are norms for publishing research articles / presenting conference papers in academic field in performance evaluation process. There are a number of bodies such as UGC and Indian Council of Social Science Research (ICSSR), which provide monetary help to organise the conferences. Sometimes there are quality related issues for the papers presented in such conferences. Yet, for scholarly communication, conference papers are no doubt important for showcasing the current practices / research going in particular field. These papers are often available on internet as preprints in various repositories, but they are scattered. It is important and also logical that all the papers are made available at a single source which will be convenient for researchers and save their time. Various organizations are taking efforts to make available these papers as open access to all at one place. Some of them are also indexed in popular sources such as EBSCO database, ProQuest database, Google Scholar, etc. Few examples for open conference proceedings are as follows:

3.2.7.1 At international level:

1. OpenProceedings is a platform developed by two major Computer Science conferences (EDBT—International Conference on Extending Database Technology and ICDT—International Conference on Database Theory) to make their papers available to the general public as an Open Access strategy. (OpenProceedings, n. d.)
2. Atlantis Press publishes conference proceedings in Physics known as Advances in Physics Research (Atlantis Press, n. d.).
3. Web of Conferences is an open access platform for publishing and disseminating scientific conference proceedings in the areas of Physics & Astronomy, Engineering & Technology, Health Sciences, Biology, Chemistry, Social Science. (‘‘Web of Conferences’’, n. d.)
4. IOP Conference Series (IOP Publishing, 2018) is a platform for publishing conference proceedings in area of physics, materials science, environmental science, bioscience, and engineering.

3.2.7.2 At national level:

1 Information and Library Network Centre i.e. INFLIBNET is maintaining all the conference proceedings in its IR as open access. (INFLIBNET, n. d.).

2 IUCAA library is maintaining conference / workshops presentations in its IR (IUCAA, n. d.)

- **Librarian’s role in conference proceedings:**

1 Librarians can search and list out the relevant conference proceedings with open access available on Internet and make users aware about them.

2 Librarians can also convince management to make their conference proceedings as open access for benefit of all whenever such conferences are organised in their institutions.

3.2.8 Other content:

Besides regular content used for research purpose, following types of content are also useful for not only researchers but other users also. These are as follows:

3.2.8.1 Open Access Images

3.2.8.2 Open Access Clipart

3.2.8.3 Open Access Videos

3.2.8.4 Open Access Audio

3.2.8.5 Open Access Music

If the images / videos / cliparts etc. are created or developed by self then there is no issue, but generally such content are downloaded from various Internet sites and shared without checking the copyright details. Sometimes they are even modified without the permission of originator. Generally it is assumed that public domain images / videos have no restrictions to use, and you may alter, change, redistribute, adapt, etc. for private or commercial use. But such is not the case!

Prasad (2018) has reported that 12 papers published in reputable international journals by two faculty members from well-known institute in India have been retracted for image duplication.

In such scenario, open access content is really helpful as there are less or no restrictions depending on the type of license it holds. The users may or may not be aware about such issues and even how to use such content for research purpose. There are some sites which allows user to change or modify the content as per requirement but after giving due acknowledgement to the originator. Some sites even allow use of content for commercial purpose. But one needs to search accordingly as per the parameter given.

- The images used by the other researchers in their articles, presentations including videos etc may contain different types of formats such as pictures, statistical data,

charts, slides, which is useful for other researchers for updating their knowledge or even for their own research in variety of ways.

- OA clipart can be used mostly in presentations if found relevant and want to make presentations more interesting.
- OA audio formats can be useful especially for blind users. Important speeches recorded at various gatherings / occasions are generally available which are important to know the future trends in particular domain.
- OA music is less useful to researchers unless they are from music field, or are music lovers or want to use it as some background music for their short films made during their research journey as documentation part.

There are various sites where one can search for OA material as per requirement using advanced search options especially by giving required combinations. Following are few selective examples

3.2.8.1. Open Access Images

1. Creative Commons. - This sites searches images from various sources such as Goole images, You Tube etc as per requirement. There is separate option given for searching commercial purpose use as well. (Creative Commons, n. d.)
2. Flicker - One can search the images under Creative Commons license. (Flicker, n. d.)
3. Pixabay - One can search images, graphics, illustrations etc. including videos also. (Pixabay, n. d.)
4. Wylio - Registration is required for this site. It is free (with limited usage) as well as paid service. (Wylio, n. d.)

3.2.8.2. Open Access Clipart

1. Clipart - Images are categorized under different headings. One can become member also and upload own clip arts. Editing the images is also allowed. (Clipart, n. d.)
2. Clipart Library - This site allows you to search clip art images as well as upload your own. These images can be downloaded and allow edit too as per user requirement. One can download in various sizes. Some paid services are also available. (Clipart Library, n. d.)

3. Public domain clip art - It is free and no registration is required. They are arranged in various categories. Easy for searching also. (Public domain clip art, n. d.)
4. WPClipart - It includes public domain clip arts and images that are free of copyright concerns. It contains more than 80000+ images. Browse and search facilities are available. (WPClipart, n. d.)

3.2.8.3. Open Access Videos

1. Pexels - It offers completely free videos. All videos are licensed under the Creative Commons Zero (CC0) license. This means you can edit or change the videos and use them free for personal and even for commercial projects. One can upload own videos also. (Pexels, n. d.)
2. Vimeo – Though it is a paid service, it also offers Creative Commons-licensed videos. One can perform an Advanced Search and indicate within the options which license you are searching for. (Vimeo, n. d.)
3. YouTube – It is a popular site for videos, but one has to search specifically for Creative Commons-licensed videos. It allows sharing, remixing, and use commercially, or any combination thereof as per the license type. (YouTube, n. d.).

3.2.8.4. Open Access: Audio books

1. Open Culture - This site has around 1000 audio books of Fiction, poetry, Literature and even non-fiction. Open Culture (n. d.) They also have free ebooks for kindle. (Open Culture, n. d.)
2. https://librivox.org – Thousands of books are available for free use on various subjects and languages. They get texts from Project Gutenberg, and the Internet Archive hosts audio files for free. (Librivox, n. d.)

3.2.8.5. Open Access: Music

1. FMA – This site offers western music and arranged category wise. They have arranged music as per role such as musicians, curators, filmmakers etc. (FMA, n. d.)
2. Storyblocks audio – It has royalty free music for both commercial and personal use. It has different sound effects also. (Storyblocks audio, n. d.)

3. Smartsound – It offers royalty free music. Music is arranged in different categories such as composer, instruments, emotions etc. (Smartsound, n. d.).

- **Librarian's role in other content:**
    1. It is essential that librarians should educate the researchers and other types of library users about various issues associated with such content, such as types of licensing used for images and videos, correct way of attributing it while making use of it, etc. Sometimes, there are some restrictions on the use, which users may not be aware of. One must take care and check that by using such content there is no infringement of any rights.
    2. Librarians can lists out and circulate websites available for such open access images and videos for users awareness and usage. Type of License for this content is also available hence helpful in appropriately usage.

3.3 Plagiarism

This term is defined as ‘‘the process or practice of using another person's ideas or work and pretending that it is your own’’ (Plagiarism, n. d). As mentioned by Pandey (2017, June 11) plagiarism shows the stealing of another person's intellectual property which includes ideas, inventions, original work of authorship, words, slogans, design, proprietary information, etc.

Many times, plagiarism and copyright violations are considered to be the same. But plagiarism is an ethical issue and different from copyright violations in general terms. It is difficult to say whether it is done intentionally or unintentionally. Today, due to easy availability of OA resources, there is more possibility of plagiarism incidences due to easy way of copy-paste without citing original source or with improper citations.

There are commercial software available in the market as well as free tools available on Internet which can detect plagiarism. Now a days, most of the publishers, journals and even some institutions have their own plagiarism policy for avoiding any issue later on. Recently, UGC has published regulations (University Grants Commission, Ministry of Human Resource Development, 2018) to keep check on plagiarism in higher education system.

Plagiarism can be avoided in two ways at initial stages itself. These are as follows:

1. Bailey (2015) has suggested a few steps for authors for avoiding plagiarism, such as, check copyright aspect while signing the contract as it is essential that author should retain the copyright; Choosing appropriate licence for your work where you give some rights to others but ensuring that those rights do not prohibit you from defending your work if it is plagiarized; Google your work often since titles, abstracts and beginning paragraphs are the most commonly used by others; If come across any site infringing your content then take legal step for avoiding further misuse and request search engine for removal of the site.
2. Librarians are handling all types of OA reources and other resources with copyrights and licence terms and conditions with dos and don'ts. They should pass this vital information to users during library orientation sessions as users are mainly responsible for using various sources in libraries. At the same time, they should be made aware about proper citations method especially students which will help them to avoid the plagiarism.

Conclusion

Librarians have been giving various services to researchers using both print and non-print materials. Payment was essential for purchasing these resources for access purpose. But with open access, the budgetary constraints are removed since OA resources are available freely to all. With exponential growth and varieties of OA resources, one must make use of them especially from research point of view. Considering OA resources as new a challenge, Library professionals have to update their knowledge and techniques, by playing a proactive role to aid the researchers in their research. From custodian to access driven person, the librarian is more powerful than before. They must extend their skill sets used for collecting, managing, organizing, distributing and searching traditional documents to the new type of documents, i.e. OA resources. This is required for survival in the future. Making people aware about OA resources, by promoting them and also using them for providing various information services to users is an important new

service. OA movement was started at worldwide level and is now growing at national level. It will have to be accepted and implemented at institute level to become successful.

Next chapter is about data analysis and interpretation which is done based on the data collected by using librarian’s questionnaire and user’s questionnaire.

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Chapter 4: Data Analysis and Interpretation

4.1 Introduction

The earlier chapter covered the various types of OA resources with their characteristics. The objective was to know important types of OA resources for scholarly communication. The current chapter is divided into two parts - Part A is about data analysis and its interpretation based on librarian's questionnaire and Part B is data analysis and its interpretation based on User's questionnaire. For this, two separate questionnaires were prepared.

Part 4A - Response to Librarian's questionnaire

The researcher prepared the questionnaire to collect the primary data from the librarians working in the research institutes. The head of library, who is responsible for all library activities is considered here as librarian. 28 librarians out of 32 eligible research institutes responded giving a response rate of 82.35%.

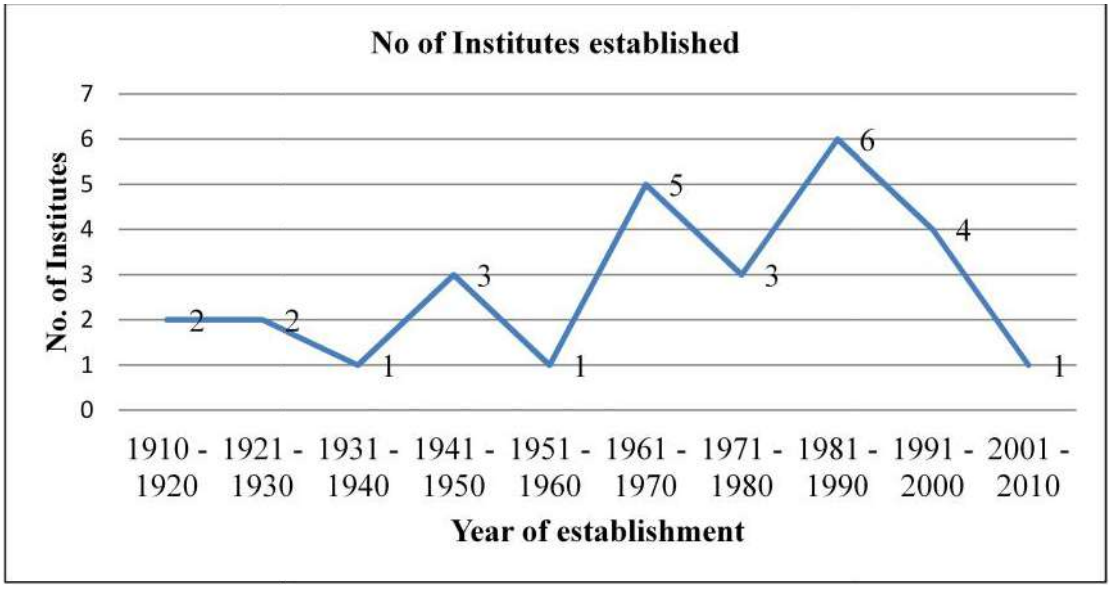
Researcher has made frequent visits to meet maximum librarians from Pune in person for getting the questionnaire filled. Queries regarding the questionnaire were answered telephonically or through personal visits. The questionnaires were also sent by post / email to few librarians from Pune as they were not available in person due to their busy schedules whenever approached and also those from outside Pune.

The data collected through questionnaires is systematically presented and analysed in this chapter. In the analysis, main heading / question asked in the questionnaire is given for easy reference. The given percentage is taken as whole number and not in fractions for convenience purpose.

A. General information: Institute

1. Establishment year of research institutes

Fig. 4.1 Establishment of research institutes



Observation:

The oldest research institute is Deccan Muslim Education and Research Institute, Pune established in 1915. The youngest research institute is Lupin Research Park, Mulshi founded in 2001 which is a private pharmaceutical company. The maximum research institutes (6) were established during the decade of 1981 – 1990.

2. Type of research institutes

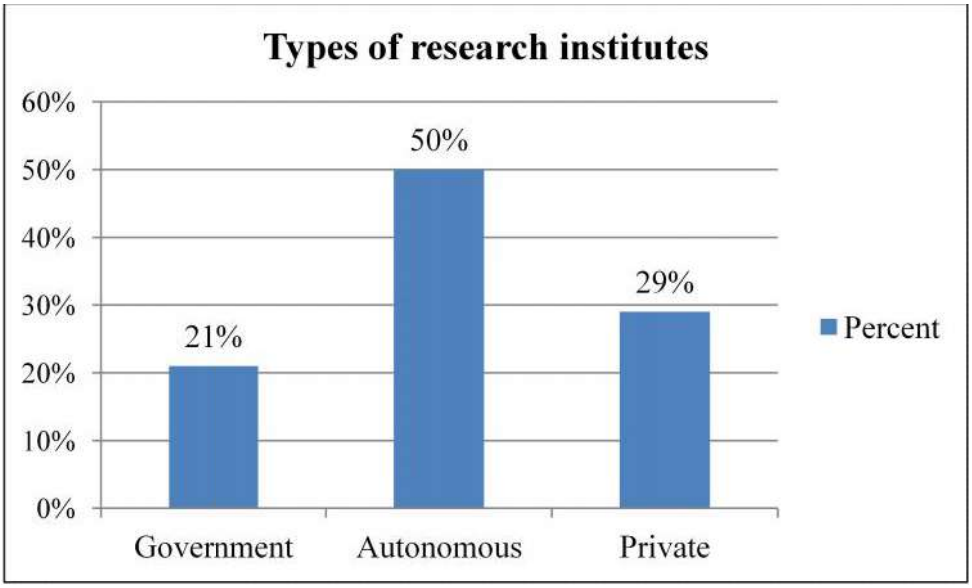
Table 4.1 Types of research institutes

Sr. No.	Types of research institutes	No. of responses	Percent
1.	Government	6	21%
2.	Autonomous	14	50%
3.	Private	8	29%
	Total	28	100

Observation:

Half of the research institutes (50%) are autonomous research institutes followed by 29% private research institutes. The least number of research institutes are (21%) Government funded.

Fig. 4.2 Types of research institutes



Observation:

Generally, it is assumed that research institutes are mostly government funded but the data indicates that autonomous and private research institutes are more, whose funding may or may not be through any government department / agency.

3. **Institutes as per subject domain**

Research institutes belong to different domain areas. The status is as shown in Table 4.2

Table 4.2 Subject domain of research institutes

Sr. No	Subject domain	No. of Institutes	Percent
1.	Science & Technology	16	57
2.	Social Sciences	3	11
3.	Management	5	18
4.	Any Other	4	14
	Total	28	100

Observation:

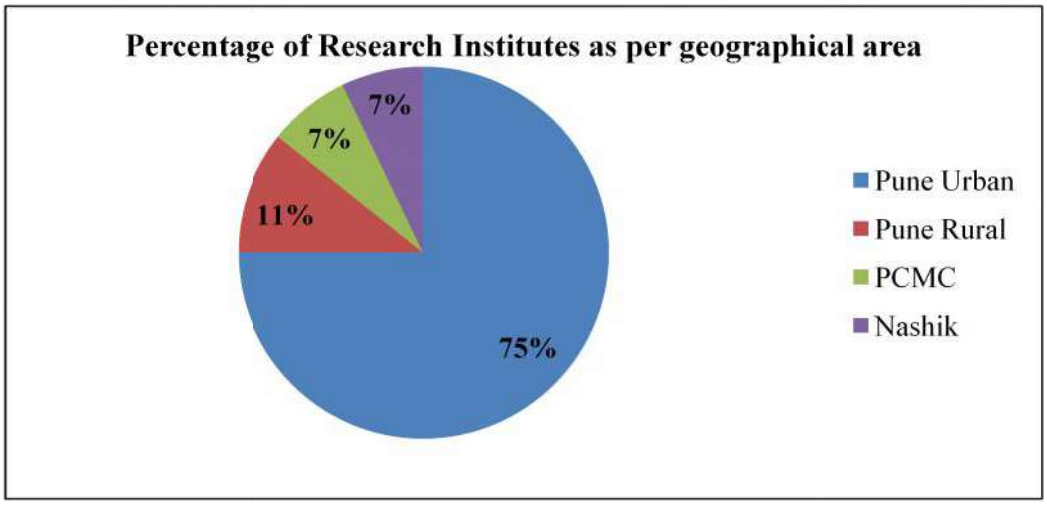
The maximum number of research institutes (57%) is from Science & technology area, followed by Management (18%). The least number of research institutes belong to Social science area.

4. Research Institutes as per geographical area

Table 4.3 Research Institutes as per geographical area

Area	No. of institutes	Percent
Pune Urban	21	75
Pune Rural	3	11
Pimpri Chinchwad	2	7
Nashik	2	7
Total	28	100

Fig. 4.3 Percentage of research institutes area wise



Observation:

As shown in figure 4.3, maximum research institutes are from Pune urban area (75%) followed by Pune rural area (11%). Percentage of Nashik and Pimpri Chinchwad is same (7%).

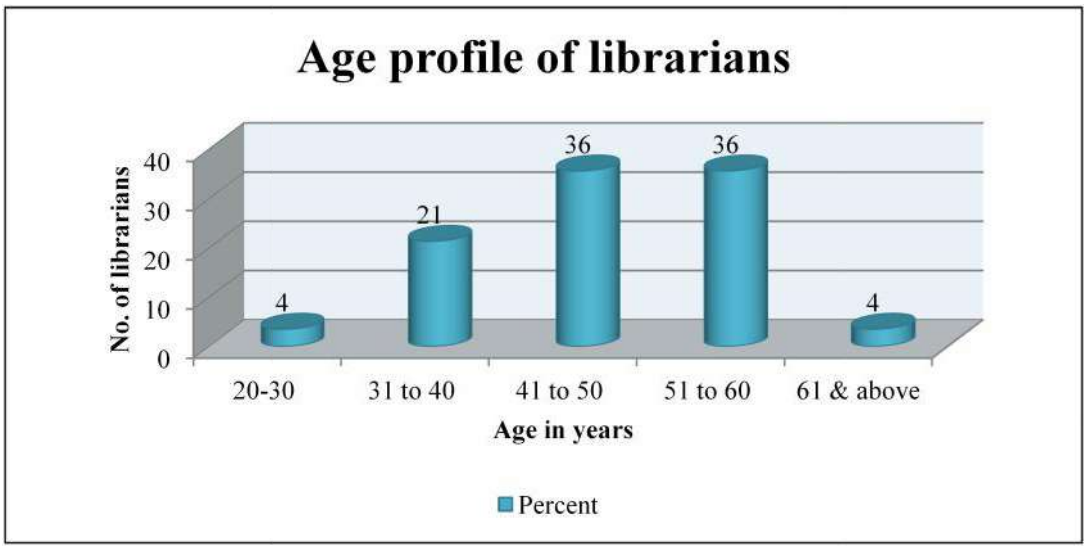
B. General information: Librarian / Library Head

1. Librarian's age profile

Table 4.4 Age wise profile of librarians

Sr. No.	Age in Years	No. of librarians	Percent	Cumulative Percent
1.	20-30	1	4	4
2.	31 to 40	6	21	25
3.	41 to 50	10	36	61
4.	51 to 60	10	36	96
5.	61 & above	1	4	100
	Total	28	100	

Fig. 4.4 Age profile of librarians



Observation:

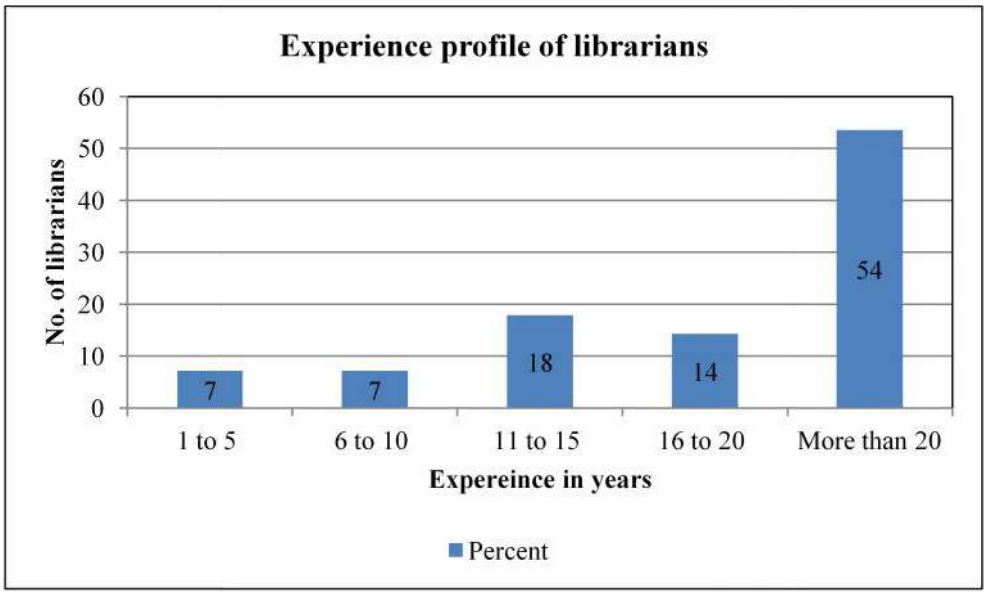
It is observed that the percentage of librarians in the age category 41 to 50 years and 51 to 60 years is same (36%). Their cumulative total (72%) shows that maximum number of librarians belongs to age group 41 to 60 years. Next category is of age group 31 to 40 years with 21% librarians. There are two categories with same lowest percentage (4%) indicating the youngest entrant to the profession and senior most professional.

2. Librarians experience profile

Table 4.5 Experience profile of librarians

Sr. No.	Experience	No. of librarians	Percent	Cumulative Percent
1.	1 to 5 Yrs	2	7	7
2.	6 to 10 Yrs	2	7	14
3.	11 to 15 Yrs	5	18	32
4.	16 to 20 Yrs	4	14	46
5.	More than 20	15	54	100
	Total	28	100	

Fig. 4.5 Experience profile of librarians



Observation:

The data indicates that more than half of the librarians (54%) are having experience of more than 20 years. They are followed by two categories 11 to 15 years (18%) and 16 to 20 years (14%). The cumulative total of lowest two categories of librarians is 14% for the experience 1 to 5 years and 6 to 10 years. Overall the 86% librarians are experienced with more than 10 years of experience.

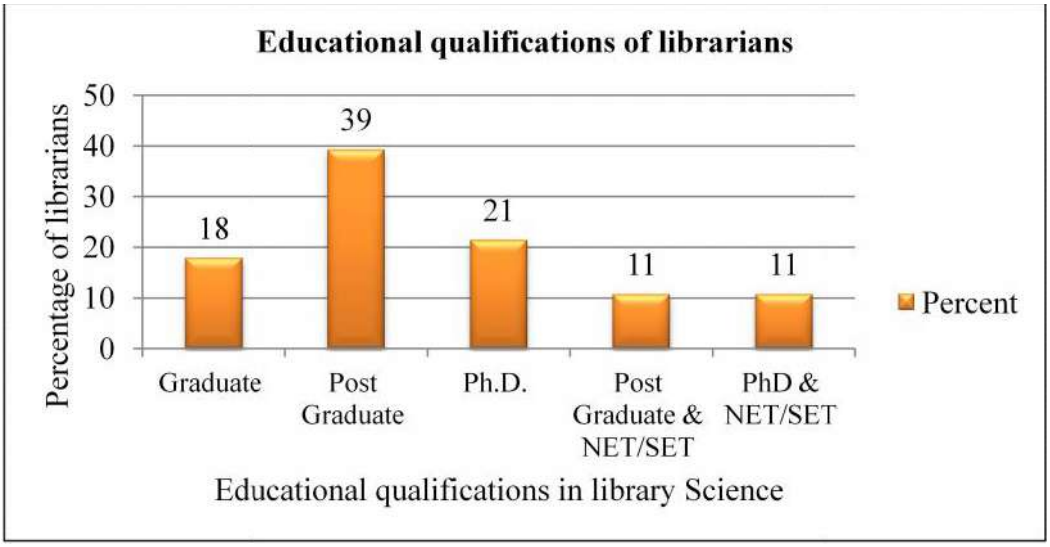
3. Librarian's educational qualifications

The analysed data is summarised as shown in Table 4.6

Table 4.6 Educational qualifications of librarians

Sr. No	Education	No. of librarians	Percent
1.	Graduate in Library Science (B.Lib.I.Sc.)	5	18
2.	Post Graduate in Library Science (M.Lib.I.Sc.)	11	39
3.	Ph.D. in Library Science	6	21
4.	Post Graduate & NET/SET in Library Science	3	11
5.	Ph.D. & NET/SET in Library Science	3	11
	Total	28	100

Fig. 4.6 Educational qualifications of librarians



Observation:

Maximum librarians (39%) are having post graduate degree (M. Lib. I. Sc.) in library science. 21% have Ph.D. and 11% also have NET/SET along with Ph.D.. 11% librarians have NET/SET qualifications. It is observed that 18% libraries are managed by the librarian having graduation in library science.

C. About Library:

To understand the library status, various questions were asked. Following is the analysis of specific questions relevant to the current study.

1. Working Hours

Being research libraries, the users i.e. researchers may be working late as and when required. Accordingly they may require library facilities beyond office hours.

Table 4.7 Library Timings on working days

Sr. No.	Library Timings on working days	No of responses	Percentage
1.	Regular Timings	20	71
2.	Extended Timings	8	29
	Total	28	100

Observation:

It is observed from Table 4.7 that, 71 % libraries (20) have regular library timings similar to institute timings where as only 29% (8) libraries have extended timings beyond the normal office hours.

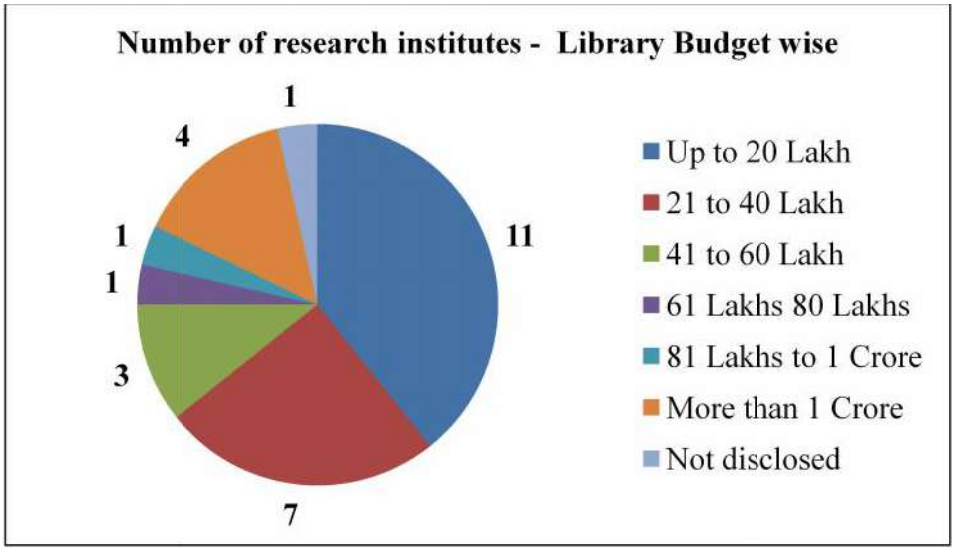
Table 4.8 Library facility on Sundays / Holidays

Sr. No.	Library facility on Sundays / Holidays	No of responses	Percentage
1.	Open	5	18
2.	Closed	23	82
	Total	28	100

Table 4.8 indicates that 23 libraries (82%) are closed on Sundays / holidays and only 5 libraries are open (18%).

2. What is the current annual budget of your library? (Excluding salary of library staff)

Fig. 4.7 Library budget of research institutes



Observation:

The librarians were asked about library budget for financial year 2017-18 to get an idea of their overall expenditure (excluding salary of library staff). It is observed that maximum libraries (11) have budget up to Rupees twenty lakh followed by seven libraries having budget more than 1 crore. One librarian did not disclose the library budget details due to confidentiality. The minimum library budget was Rs. 30,000/- and maximum library budget was Rs. 3 crore and fifty lakhs. It clearly shows that there is a vast difference between the availability of library budget for the research institutes.

i. How would you rate the available budget in view of users' requirements?

Table 4.9 Sufficiency of library budget

Sr. No.	Budget Availability	No. of responses	Percent
1.	Insufficient	6	21
2.	Just Sufficient	13	47
3.	More than Sufficient	9	32
	Total	28	100

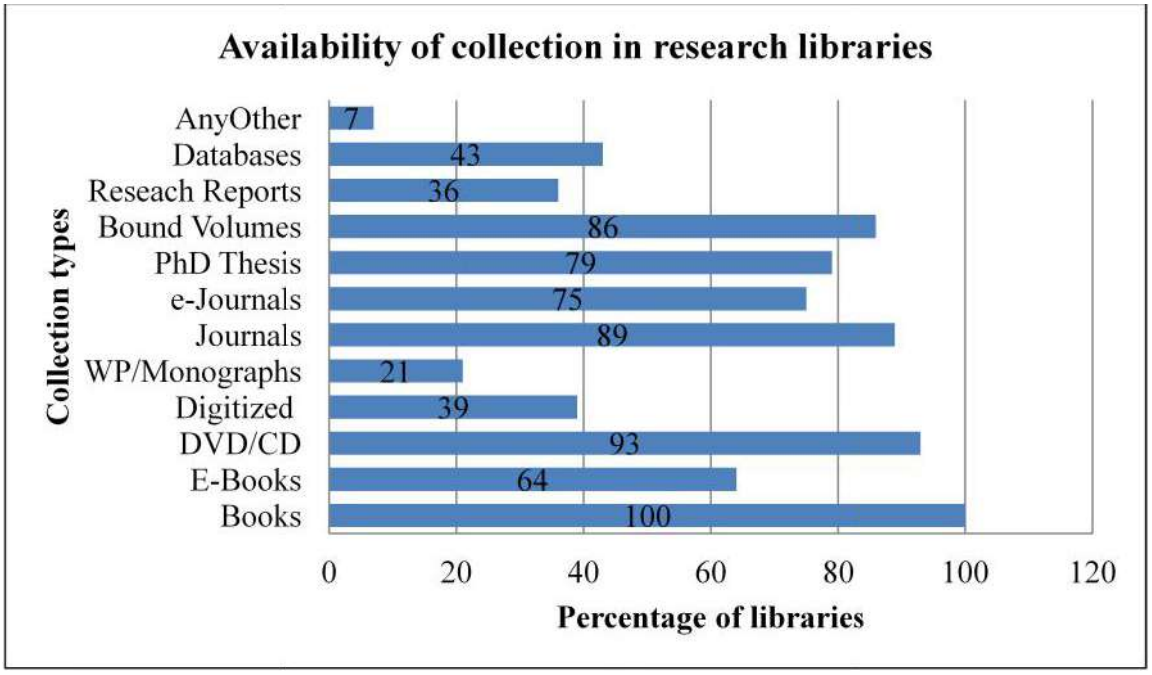
Observation:

Maximum librarians (47%) responded that the available budget was just sufficient where as 21% responded insufficient to meet the users' requirements. 32% responded as more than sufficient.

3. Collection details:

To find out the different types of collections held by the libraries, collection details were asked.

Fig. 4.8 Availability of collection in research libraries



Observation:

It is observed that the library collection is special collection pertaining to the subject domain of the parent institution. As shown in fig.4.8, printed books are available in all libraries whereas printed journals are available in 89% libraries. The second most common collection is of DVD / CD collection available in 93% libraries. Regarding e-collection, 64% libraries are having e-books whereas 75% are having e-journals. 43% libraries are having various kinds of databases subscribed. PhD theses are also part of collection in 79% libraries since many research institutes are also recognised as PhD research center. Bound volumes are also preserved for future reference in 86% libraries. The special collections such as working papers / monographs (21%) or research reports (36%) are comparatively less available in view of being research

institutes. Only 39% libraries have digitised collection. 7% libraries have other types of collection such as manuscripts, patents and circulars.

The collection size also varies from institute to institute. The biggest library with all collection types is with more than 1,62,000+ where as smallest library is with 1600 collection size. There are two libraries where all collections are available in only printed format.

4. Library staff

The manpower available in the library is given in the table 4.10

Table 4.10 Manpower available in the libraries of research institutes

Sr. No.	Total manpower	No. of responses	Percentage
1	1 to 3	12	43
2	4 to 6	11	39
3	7 to 9	3	11
4	10 and Above	2	7
	Total	28	100

Observation:

It is observed that the manpower varies from library to library of research institutes from 1 to 20. Maximum number of libraries i.e. 12 (43%) are having manpower up to 3. One library is managed by single person only. Percentage of the libraries having maximum manpower i.e 10 or more is 7%.

There are different types of staff working in the library such as library professionals and non-professionals which includes clerical or administrative staff, helpers etc. These are also either on permanent basis or temporary or contract basis. Accordingly, the data is analysed to know the status which is shown in table 4.11 and fig. 4.9

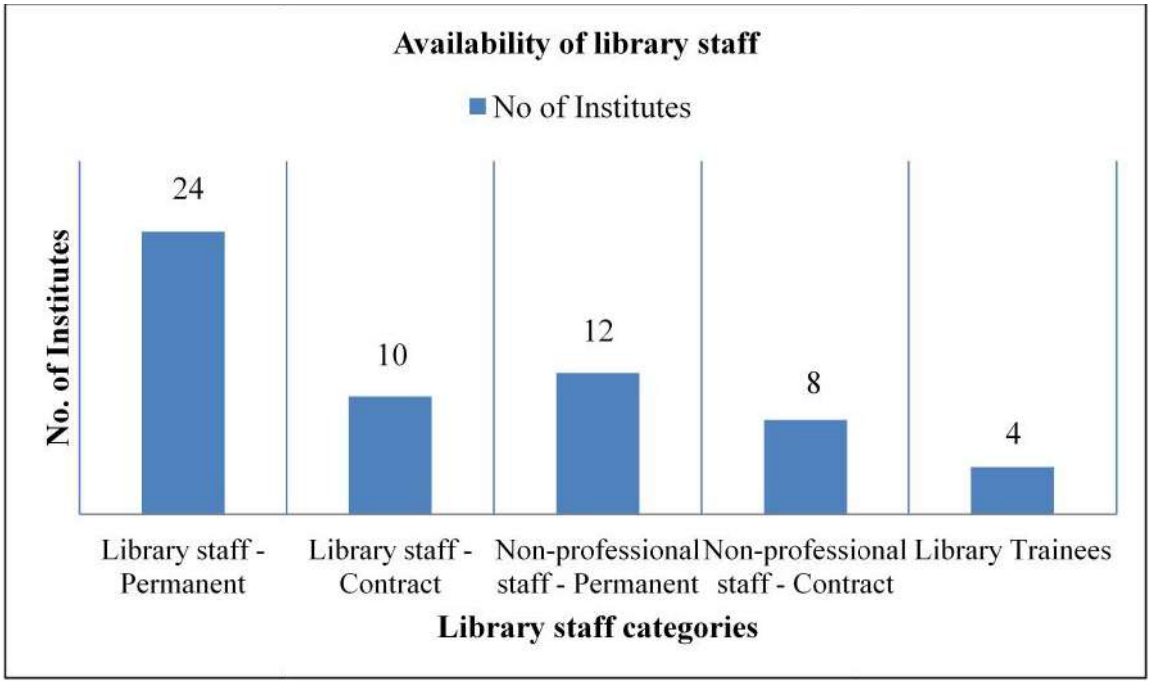
Table 4.11 Status of library staff in various categories

Sr. No.	Staff category	Total number of staff	Percentage
1	Library staff - Permanent	73	54
2	Library staff - Contract	19	14
3	Non-professional staff - Permanent	29	21

Sr. No.	Staff category	Total number of staff	Percentage
4	Non-professional staff - Contract	10	7
5	Library Trainees	5	4
	Total	136	100

It is observed that total 136 library staff is working in all 28 research institutes out of which 73 (54%) are library staff on permanent basis followed by 29 (21%) are non-professionals on permanent basis. Library professionals working on contract basis are 19 (14%) where as non-professionals are 10 (7%). Library trainees are only 5 (4%) which is lowest. Fig. 4.9 indicates the status of library staff category wise at institute level.

Fig. 4.9 Availability of library staff



Observation:

i. It is observed that 24 libraries (86%) are having library professionals as permanent staff members. Permanent library staff is always preferable as responsibilities can be assigned accordingly and since they are attached to the institution for longer period they also become the subject expert over the period of time. This is beneficial as it helps them in providing various services to users more efficiently.

ii. It is observed that non-professional staff on permanent basis is available in 12 libraries (43%) which are important for smooth running of libraries. In absence of non-professional staff especially administrative / clerical staff, the library staff is burdened by the other non-professional activities in addition to their professional work. This may result in de-motivating the library staff, poor service quality and lack of time for library staff to provide value added services.

iii. Non-professional staff on contract basis is available in 8 libraries (29%). If contract is renewed then there won't be any issue but if new persons are joined at regular intervals then they need training to get familiar with library activities and their job profile. Again the work burden is on permanent library staff to manage library activities smoothly. This may result in lack of motivation to carry out or maintain the existing regular and specialised services.

iv. There are 10 libraries (36%) having qualified library staff on contract basis. These are in addition to regular library professional staff in most of the cases. The work assigned to the library staff on contract basis is limited to routine jobs in most of the cases. It may help the regular library staff to provide new innovative value added services to users. Even though necessary training is given and motivated, they may not be in a position to give specialised services to users as experience and knowledge of subject domain also plays an important role.

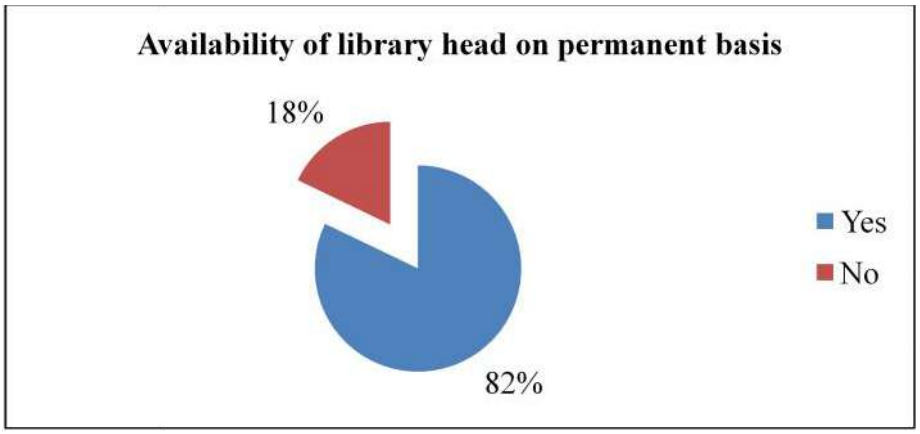
v. Library trainees are available in only 4 libraries (14%). Trainees are available only for short period; generally they are given routine jobs only as they may lack necessary skills and training for specialised tasks.

But if necessary training is provided to trainees, they can contribute more, being technology savvy and enthusiastic to learn new things.

Overall, providing the specialised and value added services in addition to routine depends mainly on permanent library staff. This may create extra work load, especially where manpower is an issue if compared with number of users.

5. Is Library Head appointed on permanent basis?

Fig. 4.10 Availability of library head on permanent basis

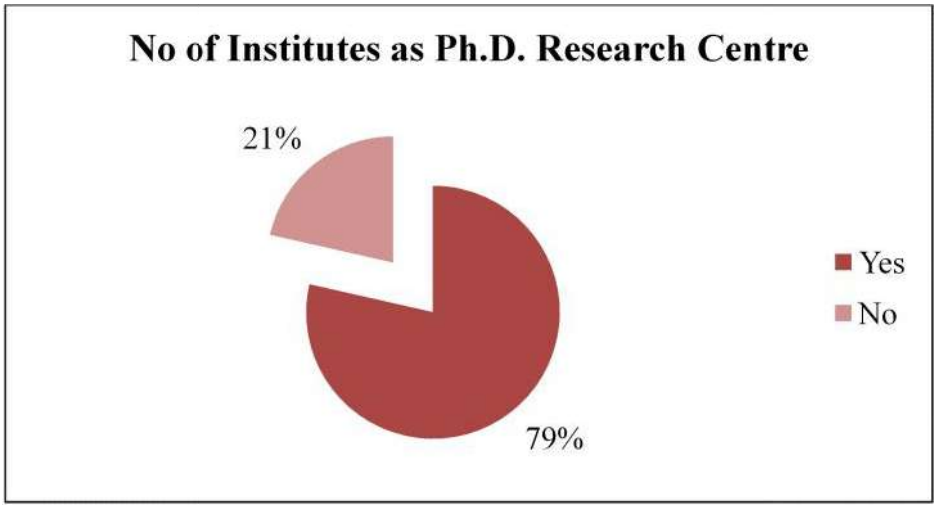


Observation:

23 libraries (82%) have library head on permanent basis whereas 5 (18%) libraries have library head on contract / temporary basis. Such condition is observed in small research institutes where funding is an issue. The library head is very much important to provide necessary services for researchers as per requirement and for overall smooth running of the library. But if available on contract / temporary basis, then it may affect the library services and in turn the researchers also.

6. Is your Institute recognized as PhD research centre by SPPU?

Fig. 4.11 Number of Institutes as Ph.D. Research Centre



Observation:

It is observed that majority of the research institutes (22, 79%) are recognised as Ph.D. research centre especially in their own subject domain and related areas. Out of 22, only National Chemical Laboratory is a part of AcSIR (Academy of Scientific and

Innovative Research) being one of the CSIR lab. Other research institutes are affiliated to UoP. Along with other researchers, Ph.D. students are part of the library users who also need current and latest information pertaining to their area of research.

7. Library software used:

This question was asked to know the status of automation of libraries.

Table 4.12 Library software used in research institutes

Sr. No.	Software	No. of Institutes	Percent
1	SLIM21	9	32
2	Libsys	8	28
3	Excel	2	7
4	Koha	3	11
5	Other	5	18
6	Manual	1	4
	Total	28	100

Observation:

Table 4.12 indicates that majority of librarians (32%) are using SLIM21 library software. Second most preferred choice is Libsys (28%). Koha, which is an open source free software, is used by 11% libraries whereas 7% libraries use simple Excel to maintain collection details. 18% libraries are using other software such as in-house software, e-granthalaya or tailor made software by local companies. Only one library (4%) is still managed manually.

8. Facilities available:

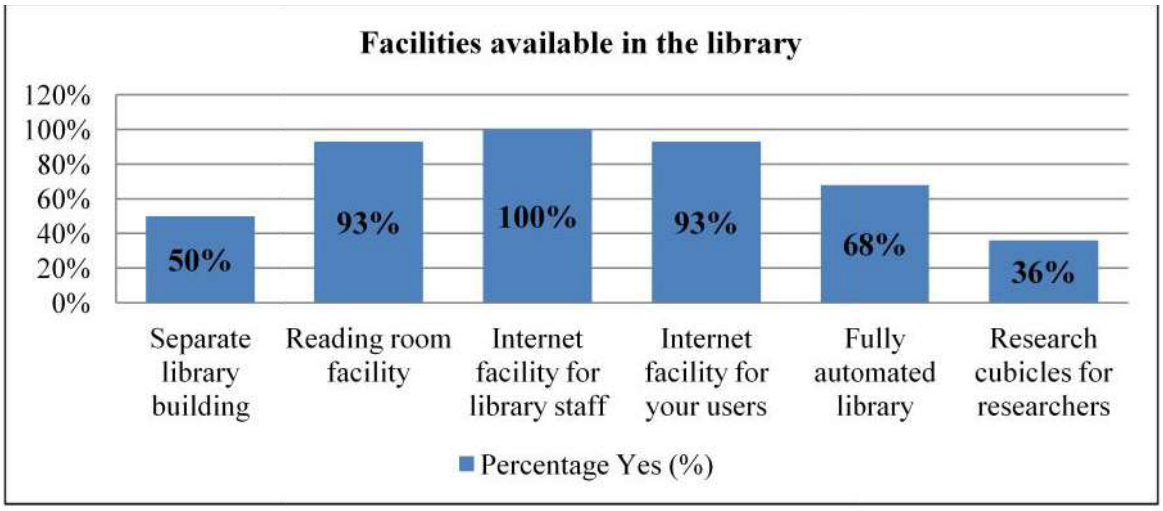
Since most of these research institutes came into existence since past many decades, a need was felt to know the status of the facilities available in their respective libraries.

Table 4.13 Facilities available in the library

Sr. No.	Question	Number of responses (Percentage)	
		Yes	No
I)	Has your library a separate building?	14 (50%)	14 (50%)
II)	Do you have reading room facility?	26 (93%)	2 (7%)
III)	Do you have Internet facility for library staff?	28 (100%)	0

Sr. No.	Question	Number of responses (Percentage)	
		Yes	No
V)	Is library fully automated? (Are all modules of your software used?)	19 (68%)	9 (32%)
VII)	Do you have research cubicles for researchers?	10 (36%)	18 (64%)

Fig. 4.12 Facilities available in the library based on 'Yes' responses



Observation:

Following are the observations:

I. Separate library building – Half of the research institutes have separate library building whereas half of them have library as one of the unit with other departments in one building.

II. Reading room facility – Maximum number of libraries (93%) have separate reading room. In today's digital era, where the sources are mostly available in electronic format reading room facility is still being made available which shows that researchers still use the library for their research purpose. 7% libraries do not have separate reading room.

III. Internet facility for library staff: All libraries have internet facility available for their library staff. This is one of the pre-requisites for accessing and using the OA resources and also for providing related services to users.

IV. Internet facility for users: Maximum libraries (93%) are providing internet facilities for users in the library. This is useful for researchers for accessing the

e-resources subscribed by the library in addition to OA resources. But 7% libraries do not provide the internet facility in the library.

V. Fully automated library: With reference to the earlier analysis for question C.7 most of the libraries are using some kind of library software. Normally there are various modules available in the library software like Acquisition, cataloguing, circulation, serial control, Online Public Access Catalogue (OPAC) etc. If all modules are used by the library, then that library can be known as fully automated library. It is observed that maximum libraries (68%) are fully automated libraries. 28% libraries are using only selected modules and 4% is still managed manually. This may be due to either limited staff, or some technical issues with software.

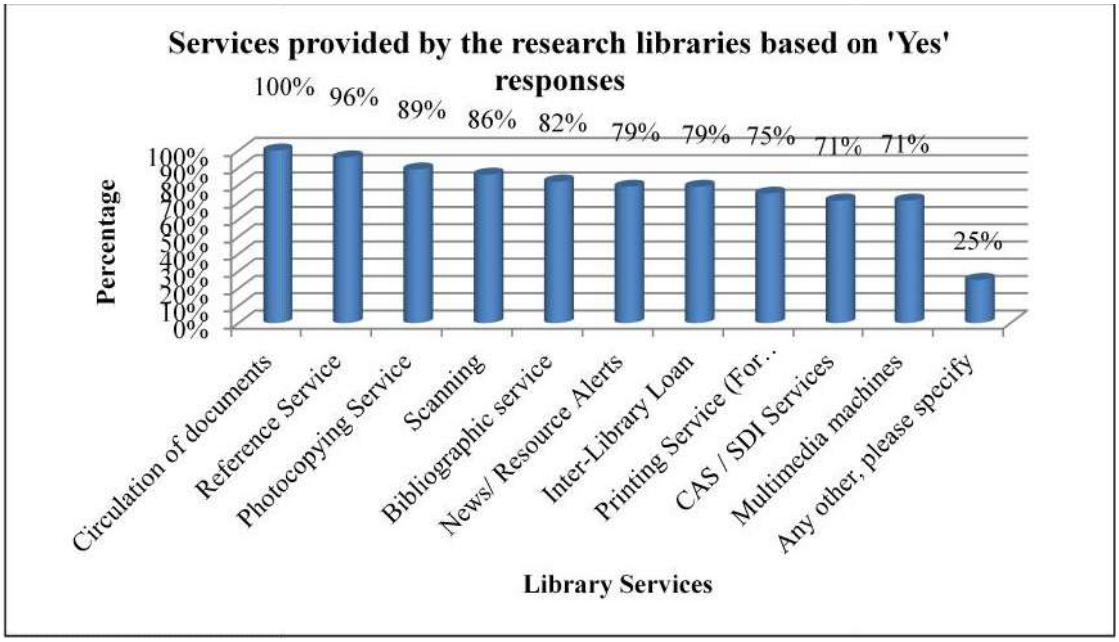
VI. Research cubicles for researchers: Only 36% libraries have separate research cubicles especially with separate library building with sufficient space. In small libraries such facility is not possible due to space constraint. Also due to e-resources availability in most of the libraries, the researchers can access them at their own place without visiting the library physically.

9. Indicate services provided by your library

Table 4.14 Services provided by the research libraries

Sr. No	Services	No. of Response (Percentage)	
		Yes	No
I)	Circulation of documents	28 (100%)	0
II)	Reference Service	27 (96%)	1 (4%)
III)	Bibliographic service	23 (82%)	5 (18%)
IV)	CAS / SDI Services	20 (71%)	8 (29%)
V)	News/ Resource Alerts	22 (79%)	6 (21%)
VI)	Photocopying Service	25 (89%)	3 (11%)
VII)	Printing Service (For users)	21 (75%)	7 (25%)
VIII)	Multimedia machines	20 (71%)	8 (29%)
IX)	Scanning	24 (86%)	4 (14%)
X)	Inter-Library Loan	22 (79%)	6 (21%)
XI)	Any other, please specify	7 (25%)	21 (75%)

Fig. 4.13 Services provided by the research libraries based on ‘Yes’ responses

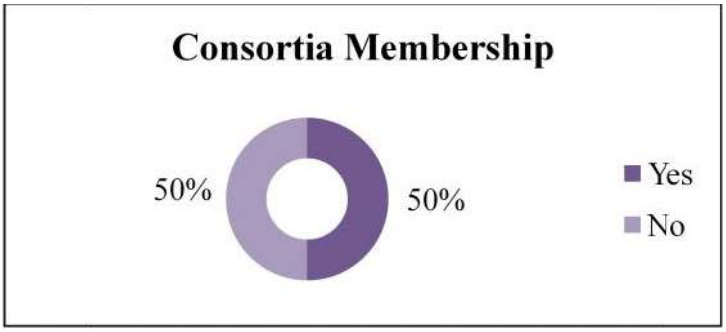


Observation:

The research libraries are providing various library services to researchers. Circulation of documents (100%) and reference services (96%) are commonly provided services. The specific services such as News/ Resource Alerts (79%), CAS / SDI services (71%), bibliographic services (82%) etc. which are important from research point of view are offered in selective libraries only. Inter Library Loan (ILL) service is available in 79% libraries. Being research library, such service is useful from researcher’s point of view for resource sharing purpose. Services like publishing news digest, referral services, anti plagiarism services and institutional publication related services are mentioned under ‘any other’ category.

10. Is your library a member of any consortia?

Fig. 4.14 Consortia Membership



Observation:

As shown in Fig. 4.14, it is observed that half of the research libraries are member of consortia whereas half of them are not. Consortia membership is useful for resource sharing purpose hence very important for researchers as the librarians can easily make them available the resources as per their requirement and also being cost effective. Mostly e-resources are available through consortia. These consortia are subject specific due to their specialised resources.

10.1 **If yes, please mention the consortia name:**

Table 4.15 Consortia members

Sr. No	Consortia Name	No of Institutes
1	Biotech Consortium of India Ltd.	1
2	CSIR-DST	1
3	CSIR-NISCAIR	1
4	DELCON DBT Library Consortia	1
5	DELNET	2
6	DRDO	1
7	E-Shodh Sindhu	1
8	FORSA	2
9	ICMR	2
10	Ministry of Earth Sciences	2

Observation:

There are total 10 different consortia in which 14 libraries are members as demonstrated in table 4.15.

11. Indicate the approximate users in below categories as per current status

The users belong to different categories. There is difference in nomenclature used for designations in various types of research institutes. The researchers were asked to indicate their category to which they belong to based on the position in the research institute.

Table 4.16 Number of users' category wise

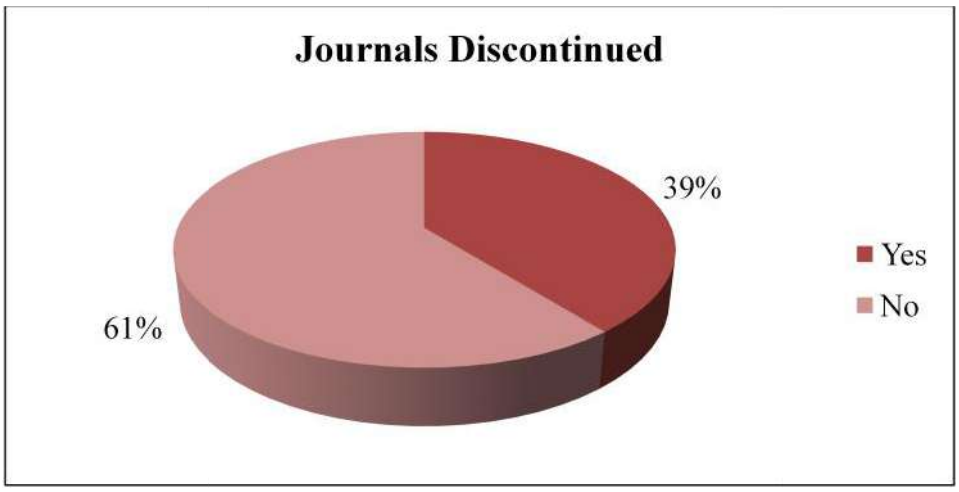
Sr. No	Users categories	Total numbers of users	Percentage
1.	Scientists / Researchers / Faculty	2954	69
2.	Junior Scientist / Junior Research Fellow / Research Assistant	508	12
3.	PhD Students	804	19
	Total	4266	100

Observation:

It is observed from Table 4.16 that the maximum number of users (69%) belongs to category of Scientists / Researchers / Faculty who are working in senior grade. These are mainly associated with research activities in the institute and use scholarly literature including OA resources for various uses. They are actively involved in publishing their research. Some of these research institutes are also recognised Ph.D. research centres. Hence PhD students (19%) are also included as researchers in users' category. The least member of users are in the category of Junior Scientist / Junior Research Fellow / Research Assistant, who are working at junior level or are new entrants. Total number of users / researchers is 4266.

12. In recent years, have you discontinued any journal subscription in view of high costs?

Fig 4.15 Journals discontinued

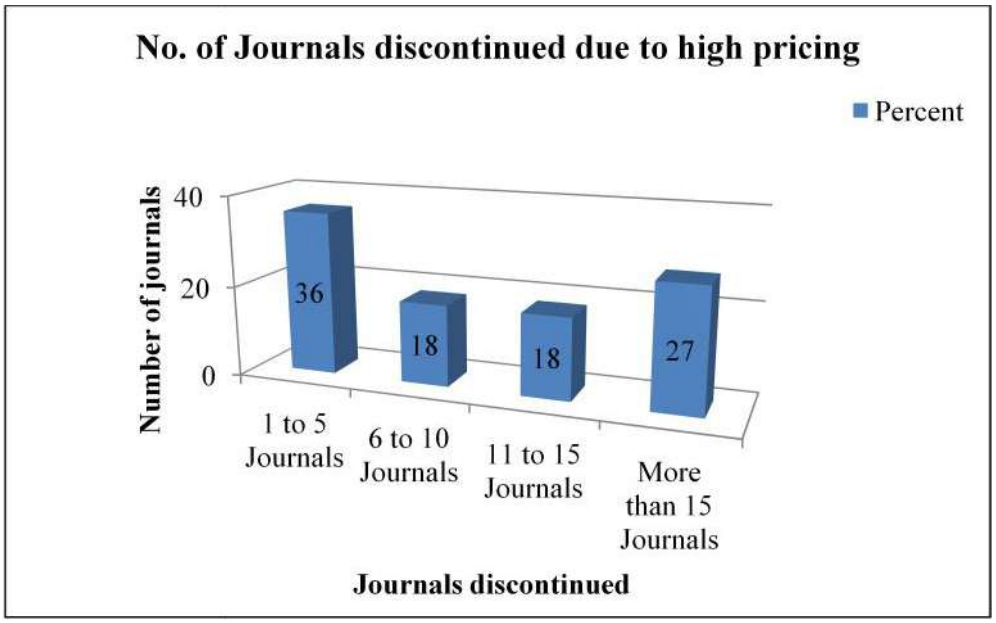


Observation:

Journals are important from research point of view as they publish original research articles. The traditional journals subscribed by the library are costly and every year there is an increase in subscription irrespective of it's format i.e. print or e-journal. As a result, library might have to discontinue the journal due to either low usage or high pricing. Libraries were asked regarding discontinued journals due to high pricing. 17 libraries (61%) reported that they have not discontinued any journal due to high pricing whereas 11 (39%) libraries reported that they have discontinued the journals.

12.1 **If yes, how many journals have been discontinued in last 3 years?**

Fig. 4.16 No. of Journals discontinued due to high pricing



Observation:

With reference to earlier question, it was observed that 11 libraries had discontinued the journals due to high pricing. To know the impact, number of journals discontinued in last 3 years was asked. The data indicates that maximum libraries (36%) had discontinued 1 to 5 journals followed by 27% libraries discontinuing more than 15 journals.

The subscription price of traditional journals is increasing almost every year, especially the well known, 'core' titles useful for researchers. Due to budgetary crunch, many times the library has no choice but to discontinue the important and

useful journals, which affects the research activities. OA journals of high quality can replace such traditional priced journals.

D. Open Access (OA) resources awareness and views:

1. Are you aware of the concept of "OA" resources with reference to scholarly communication?

Table 4.17 OA awareness among the librarians

Sr. No.	OA Awareness	No. of responses	Percent
1.	Yes	27	96
2.	No	1	4
	Total	28	100

Observation:

From the data, it is seen that 27 librarians (96%) out of 28 have responded that they are aware about concept of "OA" resources with reference to scholarly communication.

2. If yes, indicate the sources which have helped you to become aware about OA resource.

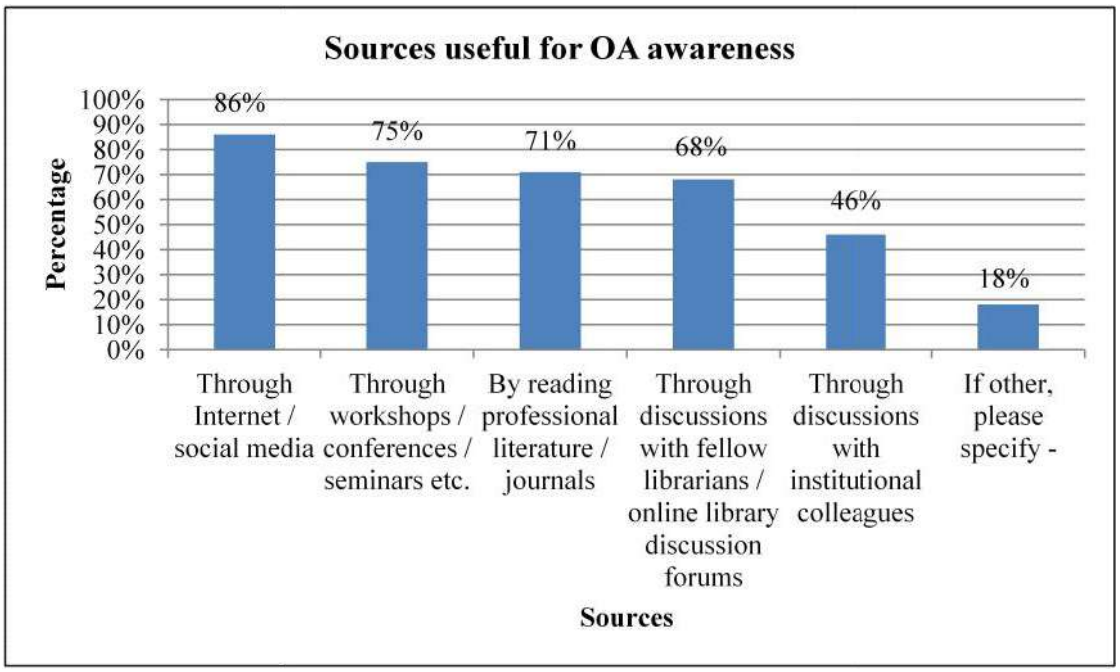
This multiple choice question was asked to know, the sources of information through which librarians became aware about OA resources.

Table 4.18 Sources useful for OA awareness

Sr. No.	Sources for OA awareness	No. of responses	Percentage	Rank assigned
1.	Through workshops / conferences / seminars etc.	21	75%	2
2.	By reading professional literature / journals	20	71%	3
3.	Through discussions with fellow librarians / online library discussion forums	19	68%	4

Sr. No.	Sources for OA awareness	No. of responses	Percentage	Rank assigned
4.	Through discussions with institutional colleagues	13	46%	5
5.	Through Internet / social media	24	86%	1
6.	If other, please specify -	5	18%	6

Fig. 4.17 Sources useful for OA awareness



Observation:

From the data analysis, ranks are assigned to various sources that helped the librarians to become aware about OA resources. As per the preferences given, the ranks have been assigned as shown in table 4.18. It indicates that Internet / social media (86%) play an important role for librarians' awareness about OA as first choice. It also indicates that a lot of literature is already available on Internet freely i.e. in open access mode, due to which the librarians can easily came to know about OA. It is followed by workshops / conferences / seminars (75%) at second position, which shows that OA is one of the hot topics discussed at these platforms due to increasing awareness. Reading professional literature / journals has got 3rd preference (71%), which means the librarians are taking efforts and giving time for updating their own knowledge in their field. Discussions with fellow librarians or through online library

discussion forum (68%) are at fourth position indicating the importance of knowledge sharing among librarians for updating their knowledge about latest trends. Discussion with institutional colleagues (46%) gets fifth preference probably due to less interaction with them due to various reasons. And last at sixth position, other reasons (18%) include the sources such as membership of editorial board of such publications, or email invitations for publishing in such platforms.

3. Please give your views regarding following statements. Please Tick mark for suitable answer

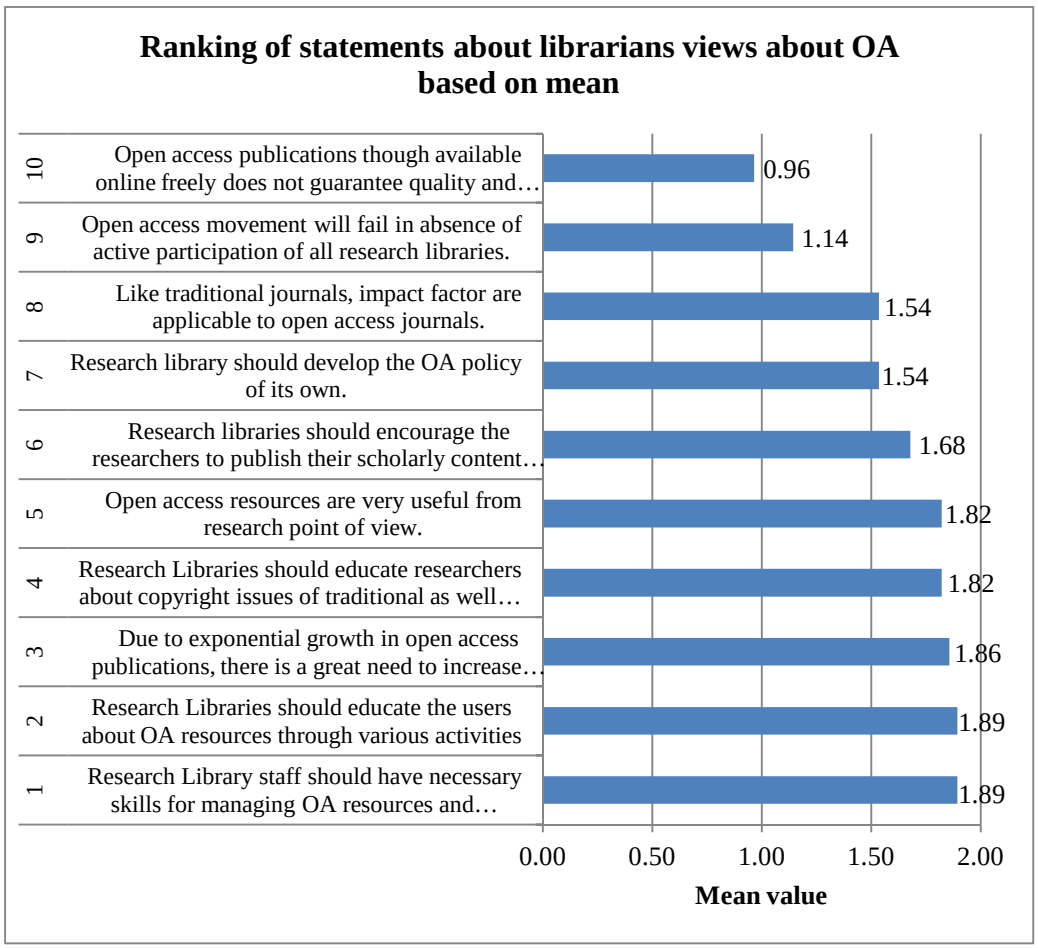
Librarians were asked to give their views about various statements about OA resources. The analysed data is tabulated in table 4.19

Table 4.19 Librarians' views about OA related statements

Sr. No.	Statement	No. of responses (Percentage)			Mean	Rank assigned
		Agree (2)	Disagree (1)	Not sure (0)		
1.	Open access resources are very useful from research point of view.	24 (86%)	3 (11%)	1 (4%)	1.82	3
2.	Open access publications though available online freely does not guarantee quality and accurateness.	9 (32%)	9 (32%)	10 (36%)	0.96	7
3.	Due to exponential growth in open access publications, there is a great need to increase awareness amongst user's community about it.	25 (89%)	2 (7%)	1 (4%)	1.86	2
4.	Open access movement will fail in absence of active participation of all research libraries.	11 (39%)	10 (36%)	7 (25%)	1.14	6
5.	Like traditional journals, impact factor are applicable to open access journals.	20 (71%)	3 (11%)	5 (18%)	1.54	5
6.	Research Libraries should educate the users about OA resources through various activities	25 (89%)	3 (11%)	0	1.89	1

Sr. No.	Statement	No. of responses (Percentage)			Mean	Rank assigned
		Agree (2)	Disagree (1)	Not sure (0)		
7.	Research libraries should encourage the researchers to publish their scholarly content in OA resources	23 (82%)	1 (4%)	4 (14%)	1.68	4
8.	Research Libraries should educate researchers about copyright issues of traditional as well as OA resources.	25 (89%)	1 (4%)	2 (7%)	1.82	3
9.	Research Library staff should have necessary skills for managing OA resources and providing related services	26 (92%)	1 (4%)	1 (4%)	1.89	1
10.	Research library should develop the OA policy of its own.	19 (68%)	5 (18%)	4 (14%)	1.54	5

Fig. 4.18 Ranking of statements about librarians views about OA based on mean



Observation:

Based on the preferences given by the respondents, ranks have been assigned to the 10 statements based on the mean values, which show the importance given by the librarians. These statements are arranged from bottom to top as per the mean value as shown in Fig.4.18. Following are the observations regarding librarian's views about statements related to OA resources based on the ranks given:

1. At first position, there are two statements (M = 1.89) which are as follows:
   i) 92% librarians agree that research library staff should have necessary skills for managing OA resources and providing related services. 4% are not sure and 4% disagree. It indicates that maximum librarians believe that special skills are required for managing OA resources and providing related services.
   ii) 89% librarians agree that RLs should educate the users about OA resources through various activities where as 11% disagree. Those who disagree consider that researchers are already aware about OA resources; in fact, more informed than librarians themselves, hence educating the users is not required. But there are new researchers, Ph.D. students who may not be aware; hence it is important to educate the users through various activities about OA resources.
2. Maximum librarians (89%) agree (M=1.86) that due to exponential growth in open access publications, there is a great need to increase awareness amongst user's community about it whereas 7% disagree and 4% are not sure. This indicates that librarians are aware about the growth in OA publications in recent years and agree to the importance of promotional activities. Those who disagree believe that the users are already aware and more informed hence there is no need.
3. At third rank, there are two statements (M = 1.82) which are as follows:
   i) Maximum librarians (86%) agree that OA resources are very useful from research point of view whereas 10% disagree and 4% are not sure. Discussions with librarians brought out that those who disagree or are not sure about utility of OA resources from research point of view is because of the quality and authenticity issues of the OA resources. It is necessary that like other sources of information, OA resources should be evaluated

based on certain criteria. All OA resources cannot be considered worthless from research point of view as a result.

ii) Maximum librarians (89%) agree (M = 1.82) that RLs should educate researchers about copyright issues of traditional as well as OA resources while 7% are not sure and 4% disagree. Like traditional publications and digital databases where license agreements have to be signed, OA resources also have different types of copyrights considering the rights given to users for various uses. The researchers may be aware about OA resources, but they may or may not be aware about the copyright issues related to OA resources. 'Not sure' and 'disagree' responses indicate that the respondents should be made aware about the importance of it so that they can help in educating the users about copyright aspects of OA resources for their optimum utilization.

4. Maximum librarians (82%) agree (M=1.68) that RLs should encourage the researchers to publish their scholarly content in OA resources as it will benefit other researchers while 14% are not sure and 4% disagree. Those who disagree may be made aware, the importance of OA resources so that they can encourage their users in publishing their research in OA mode.
5. At fifth position, there are two statements (M = 1.54) which are as follows:
   i) Maximum librarians (71%) agree that like traditional journals, impact factor are applicable to OA journals as well. 11% do not agree and 18% are not sure. Impact factor is very important for both library and researchers. Greater impact factor denotes higher quality and relevance of the journal from research point of view. Based on impact factors, the authors publish their research articles and libraries also subscribe to relevant journals in a subject domain.
   ii) Maximum librarians (68%) agree that RLs should develop the OA policy of its own while 18% disagree and 14% are not sure. Considering the exponential growth of OA resource and its importance from research point of view, the research library should develop OA policy based on which library can plan management of OA resources and related services for researchers.
6. Majority of librarians disagree (M=1.14) that OA movement will fail in absence of active participation of all RLs. Those who disagree (36%) have

opined that OA resources can be used by other users from academic community as well for educational purpose. Besides research libraries, authors, publishers, research institutes, government policies etc. also play an important role in OA movement. Those who agree (39%) consider that OA resources are important for research and if they are not promoted by research libraries, it may affect OA movement. 25% are not sure about the statement which indicates that the librarians need to be made aware of OA movement and role of the different stake holders in it. This information is very vital for the success of OA movement.

7. Majority librarians (36%) are not sure about guarantee of quality and accurateness of OA publications available online freely, while percentage of those who agree and do not agree with the statement is same i.e. 32 %. The mean (M= 0.96) suggests that librarians disagree with the statement that OA publications though available online freely does not guarantee quality and accurateness. This suggests that librarians feel that OA publications do have quality and accurateness.

4. In view of budgetary cuts and increasing cost of publications (both journals as well as books) do you think OA resources is the solution?

Table 4.20 OA resources as solution

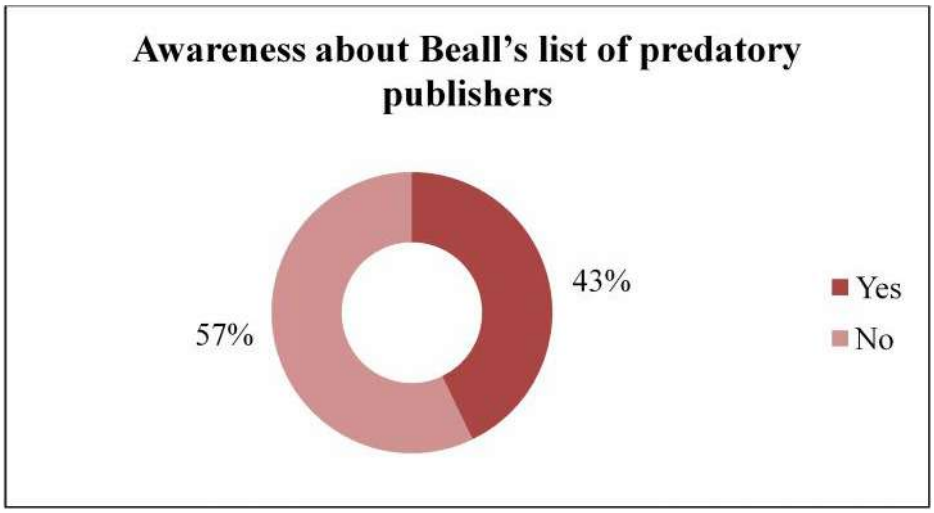
Sr. No.	Response	No. of responses	Percent
1	Yes	21	75
2	No	0	0
3	Not Sure	7	25
	Total	28	100

Observation:

Being free and without restrictions, the OA resources are easy to access through Internet, hence they can be a solution for the main problems of libraries such as budgetary cuts and increasing cost of publications. Maximum librarians (75%) agree with this while 25% are not sure.

5. Are you aware about Beall's list of Predatory Publishers?

Fig. 4.19 Awareness about Beall's list of predatory publishers



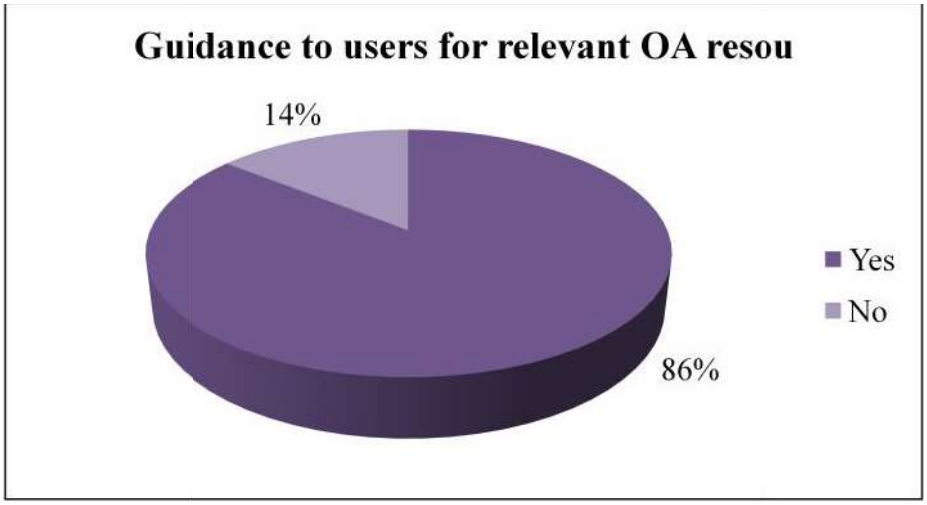
Observation:

Beall's list was a list of predatory open-access publishers that was maintained by University of Colorado librarian Jeffrey Beall who used to update it every year. Analysis of question D3.2 revealed that many librarians expressed concern related to quality and accuracy of OA resources. The knowledge of this list would have been helpful to librarians to know which are authentic and which are predatory publishers, based on which relevant journals could be identified. From Fig. 4.19, it can be seen that more than half of the respondents (16, 57%) are not aware of Beall's list of predatory publishers. This suggests that they may need to be made aware about predatory publishers, an important consideration for the library profession and also for educating the users.

E. OA promotion:

1. Do you guide the users to the important and useful open access resources as per their requirement?

Fig. 4.20 Guidance to users for relevant OA resources



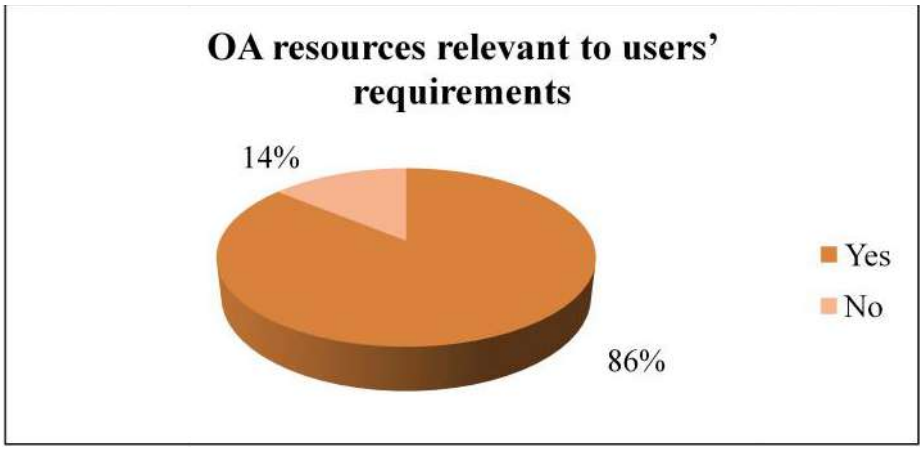
Observation:

As shown in the figure 4.20, it is observed that 24 librarians (86%) are guiding the users to the important and useful OA resources as per their requirements whereas only 4 librarians (14%) are not doing so. Following may be the reasons:

a. Librarians may not know how and where to search relevant OA sources.
b. Librarians may be considering that users are already aware about OA resources, so they know where and how to search on their own.
c. Librarians might be disinterested as regards to OA resources.

2. Have you come across open access resources which are relevant to your users' requirements?

Fig. 4.21 OA resources relevant to users' requirements



Observation:

The data indicates that 24 librarians (86%) have come across OA resources which are relevant to the users while 4 librarians (14%) have responded that they have not came across any OA resources relevant to their user's requirements. While searching on Internet, OA resources are part of search results displayed with links to full text documents. They can be accessed without any restrictions. There are specialised search engines for OA resources. The 14% librarians who are not aware would need training about how to search and how to use specialised search engines for OA resources.

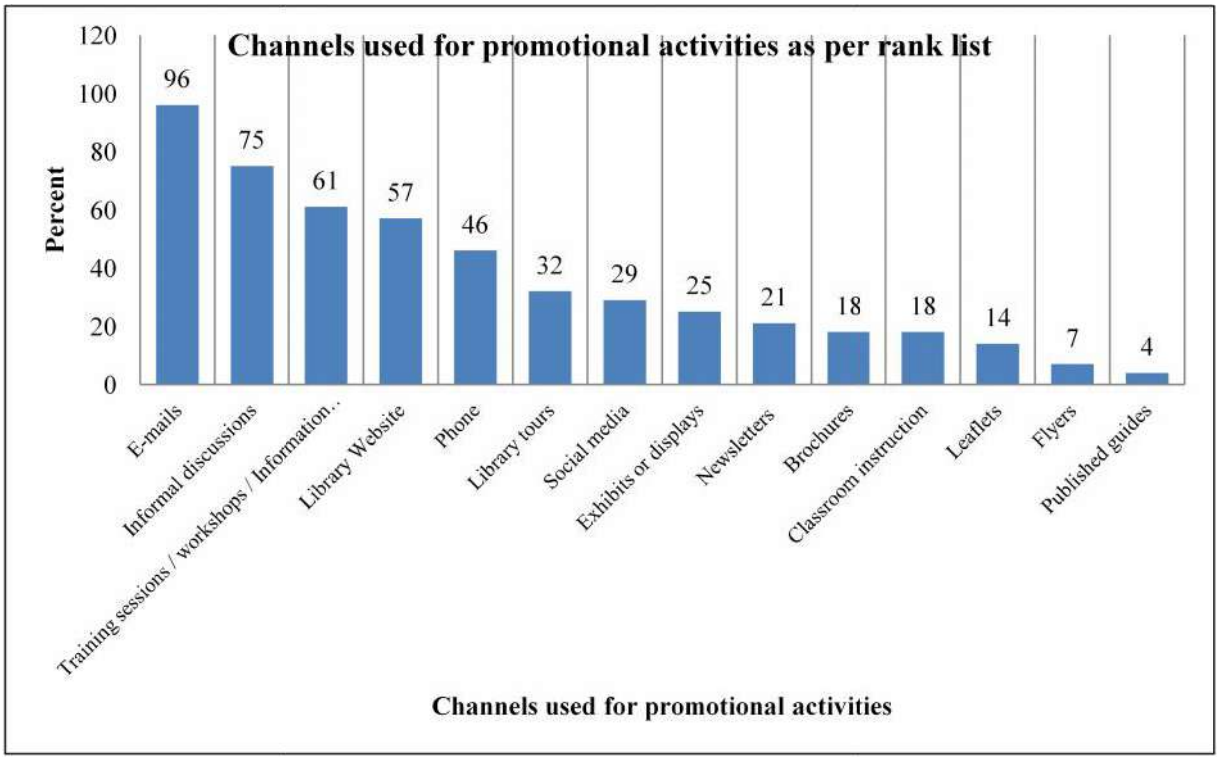
3. Kindly tick mark the channel/s used by you for disseminating information (for promotional purpose) about open access / other information resources to your user

This is a multiple choice question. As per the librarian's preferences for the channels the ranks have been assigned to them as shown in Table 4.21.

Table 4.21 Channels used for promotional activities

Sr. No.	Media	Channels used	No of responses	Percentage	Rank assigned
1	Digital media	E-mails	27	96	1
2		Library Website	16	57	4
3		Social media	8	29	7
4	Print media	Brochures	5	18	11
5		Flyers	2	7	13
6		Leaflets	4	14	12
7		Newsletters	6	21	9
8		Published guides	1	4	14
9	Events	Classroom instruction	5	18	10
10		Exhibits or displays	7	25	8
11		Library tours	9	32	6
12		Training sessions / workshops / Information Literacy programs	17	61	3
13		Informal discussions	21	75	2
14		Phone	13	46	5

Fig. 4.22 Channels used for promotional activities as per rank list



Observation:

It is observed that for promotional activities, librarians are using all media such as digital media, print media and various events. Every medium has some pros and cons. The most common channel (96%) used is email as first choice. The users are informed about new resources / services through email. But once emails are deleted by the users, the important information is lost. It is followed by informal discussions (75%) at second position. This can be done on selective basis hence all users may not be informed at a time. Third is through events such as training sessions / workshops / information literacy programs (61%) where direct contact with multiple users is possible hence their queries can be also sorted out. Fourth option is library website (57%) where library related information is shared with users. It needs regular updation. Through phone (46%) which is at fifth position, users are made aware about library resources / services but being personalised service it has its own limitation. Out of top five channels two are digital media (emails and library website) and remaining three are of event types (informal discussions, Training sessions / workshops / Information Literacy programs and Phone)

The other channels are used comparatively less as shown in Fig. 4.22 as per convenience of librarian depending on the event and as per requirements.

4. Do you have separate budget for promotional activities for your library such as preparing brochures, organizing Information Literacy programs etc.?

Table 4.22 Separate budget for promotional activities

Sr. No.	Response	No. of responses	Percent
1	Yes	5	18
2	No	23	82
	Total	28	100

Observation:

As shown in the Table 4.22, 23 libraries (82%) do not have separate budget for promotional activities while only 5 libraries (18%) have separate budget. This indicates that less importance is given for promotional activities of library which are very important to ensure proper usage of library resources / services and through which researchers are made aware about them.

5. If you do not promote open access resources please tick mark relevant reasons. This was multiple choice question.

Table 4.23 Reasons for not promoting OA resources

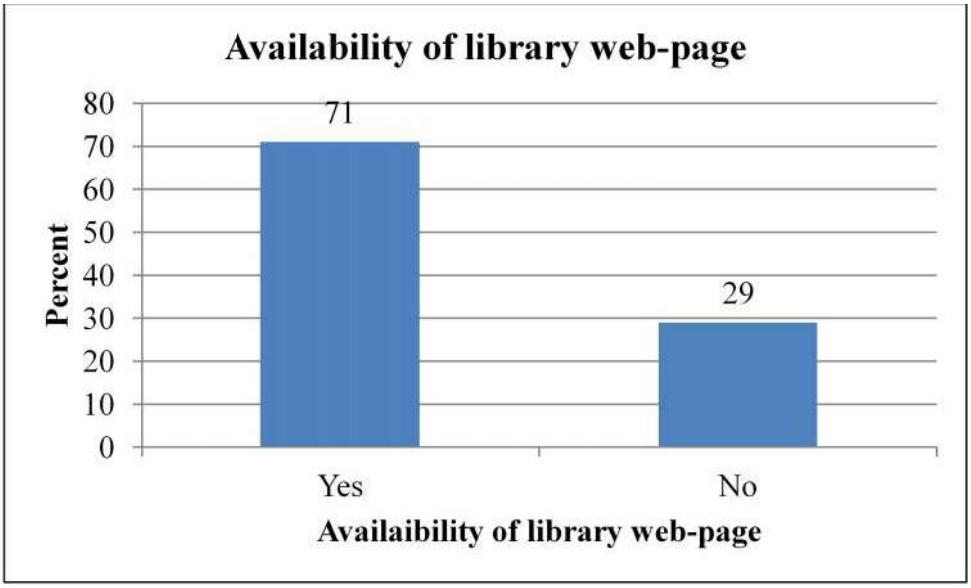
Sr. No	Reasons for not promoting OA resources	No. of responses	Percentage
1.	Not sure about their quality	3	11
2.	Do not consider them important for my users	0	0
3.	Users are not interested in OA resources	0	0
4.	Not sure about how to search and access the relevant OA resources	4	14
5.	Users are already aware about them	6	21
6.	OA resources are not part of library collection development policy	3	11
7.	If other reason, please specify	0	0

Observation:

This question was answered by 6 librarians (21%) out of 28. The table 4.23 reflects that, all 6 librarians (21%) are not promoting OA resources as they believe that users are already aware about it and hence there is no need. The second prominent reason given by 4 librarians (14%) is that they are not sure about how to search and access the relevant OA resources as per users' requirements. At third position, 3 (11%) librarians are not sure about quality of OA resources, while 3 (11%) librarians feel that OA resources are not part of library collection development policy. With technological advancement the libraries have changed their policies to incorporate current trends. As a result, the libraries are now acquiring various types of resources such as online books, online journals, databases etc. Accordingly, necessary changes have been incorporated in the existing library policies. Similarly, OA resources should become a part of library collection development policy and services should be provided accordingly.

6. Do you have library web-page?

Fig. 4.23 Availability of library web-page



Observation:

There are 20 libraries (71%) who have their own library web-page (either on internet or at intranet or at both places) while 8 libraries (29%) do not have their own library web-page.

The analysis of question E.3 reflects that 16 libraries (57%) are using website for library promotional activities. This suggests that though 20 libraries have their own website, 4 libraries (14%) are not using the library website to its full potential for reaching out to researchers through various promotional activities. Remaining 8 (29%) libraries can create their own library web-page by using various free online sites or blog sites to start with.

6.a If yes, please tick mark status of your library webpage (Select appropriate option)

Table 4.24 Library web-page status

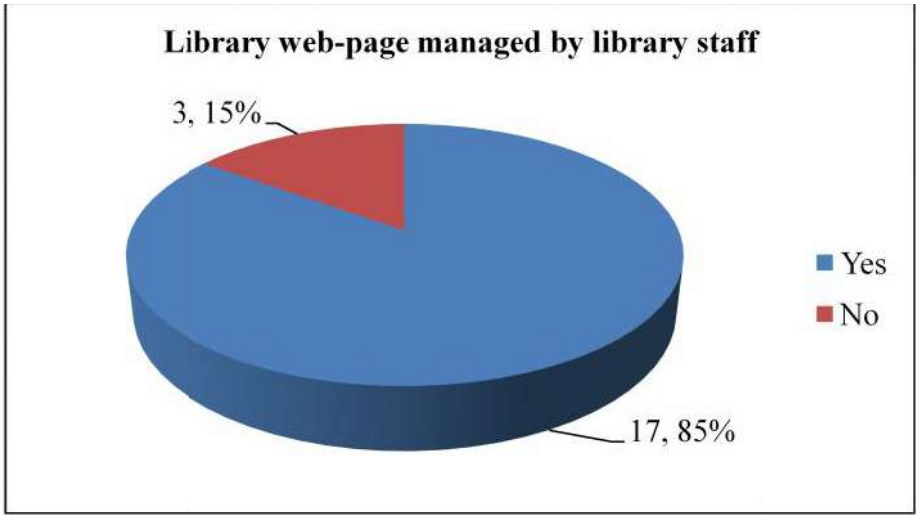
Sr. No.	Library web-page status	No. of responses	Percent
1.	Proposed	2	10
2.	Being developed	5	25
3.	Very well developed	13	65
	Total	20	100

Observation:

Out of 20 libraries, 13 libraries (65%) have very well developed library web-page where as 5 libraries (25%) are developing their web-page and 2 libraries (10%) have proposed creation of the library web-page and the work is at an initial stage.

6.b Does Library staff manages the library web-page

Fig. 4.24 Library web-page managed by library staff



Observation:

Out of 20 libraries, in 17 libraries (85%), library staff manages or updates the library webpage. In remaining 3 libraries (15%) it is managed by other department such as computer centre, IT department etc. If library web-page is managed by library staff then it is updated immediately as and when required against if it is managed by other departments.

7. If no library web-page, then please tick mark the relevant reasons. This is multiple choice question.

Table 4.25 Reasons for no library web-page

Sr. No.	Reasons	No. of responses	Percentage
1.	No network connectivity (No intranet / internet services)	1	13%
2.	This is not library's job	1	12%
3.	No technical trained man-power / knowledge to manage it	6	75%
4.	Other, please specify	0	0
	Total	8	100%

Observation:

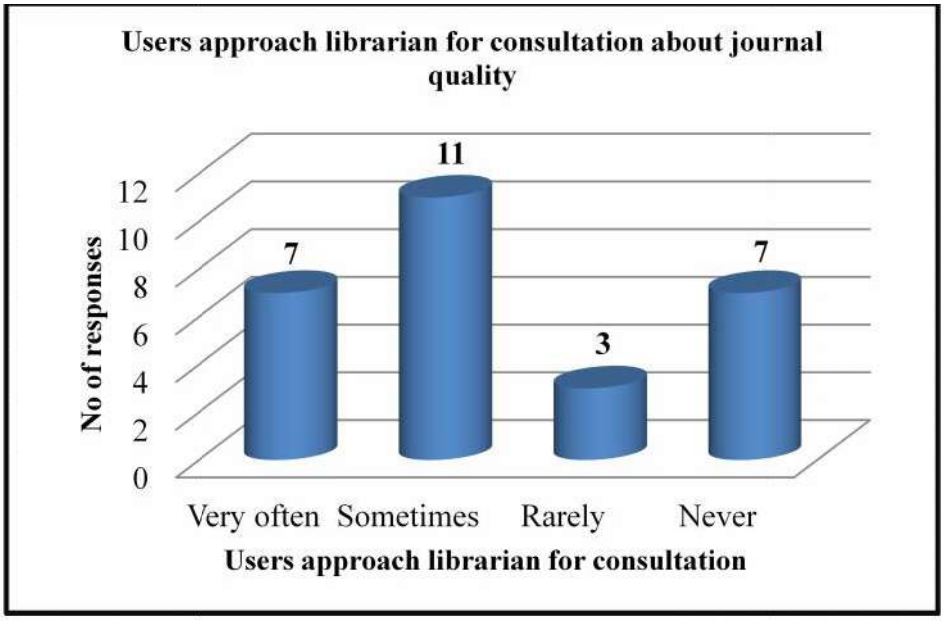
From the data analysis, the main reason (75%) given by 6 librarians for no library web-page is 'No technical trained man-power / knowledge to manage it'. In such a scenario, at least through institutional website, the library details including services and promotional activities can be shared with researchers. Also with the help of free blog / websites, it is easy to build own website without having much technical knowledge. It shows that there is a need for such training workshop for librarians.

8. Do any users approach you for consultation about journal quality when they want to publish their article

Table 4.26 Users approach librarian for consultation about journal quality

Sr. No.	Users approach librarian for consultation about journal quality	No. of responses	Percent
1	Very often	7	25
2	Sometimes	11	39
3	Rarely	3	11
4	Never	7	25
	Total	28	100

Fig. 4.25 Users approach librarian for consultation about journal quality



Observation:

With reference to table 4.26, it is observed that 64% librarians are consulted either very often (7 librarians - 25%) or sometimes (11 librarians - 39%) regarding journal quality by the users before publishing. Hence the librarians are expected to follow certain criteria for evaluation purpose based on which they can decide the quality of the journals. Also they can encourage the researchers for publishing their research in OA resources. This is with reference to the analysis of earlier question D.3.7

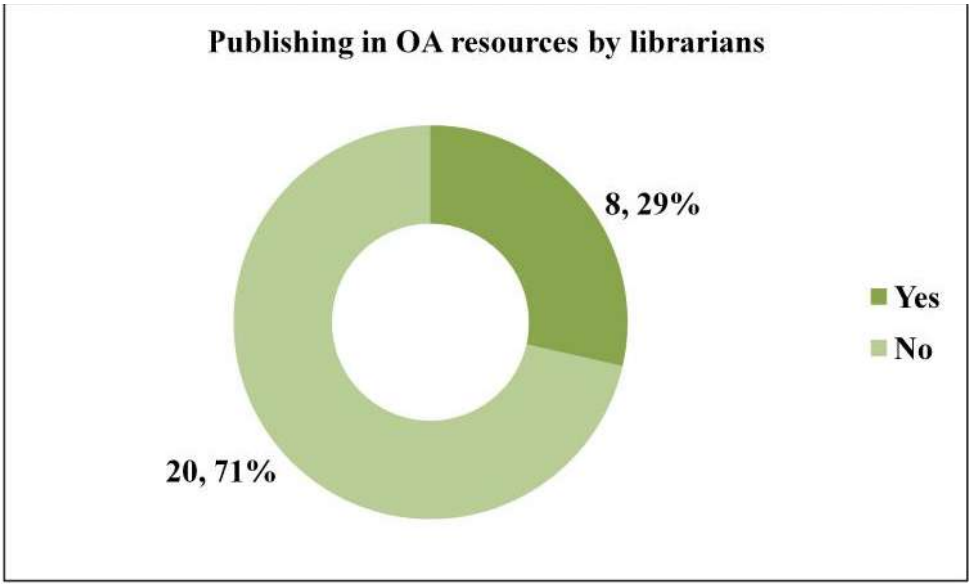
F. OA Publications:

1. Have you published in any open access publications?

Table 4.27 Publishing in OA resources by librarians

Sr. No.	Publishing in OA resources	No. of Responses	Percent
1	Yes	8	29
2	No	20	71
	Total	28	100.0

Fig. 4.26 Publishing in OA resources by librarians



Observation:

It is observed that maximum librarians (71%) have not published in any OA resources while 29% librarians have published in OA resources.

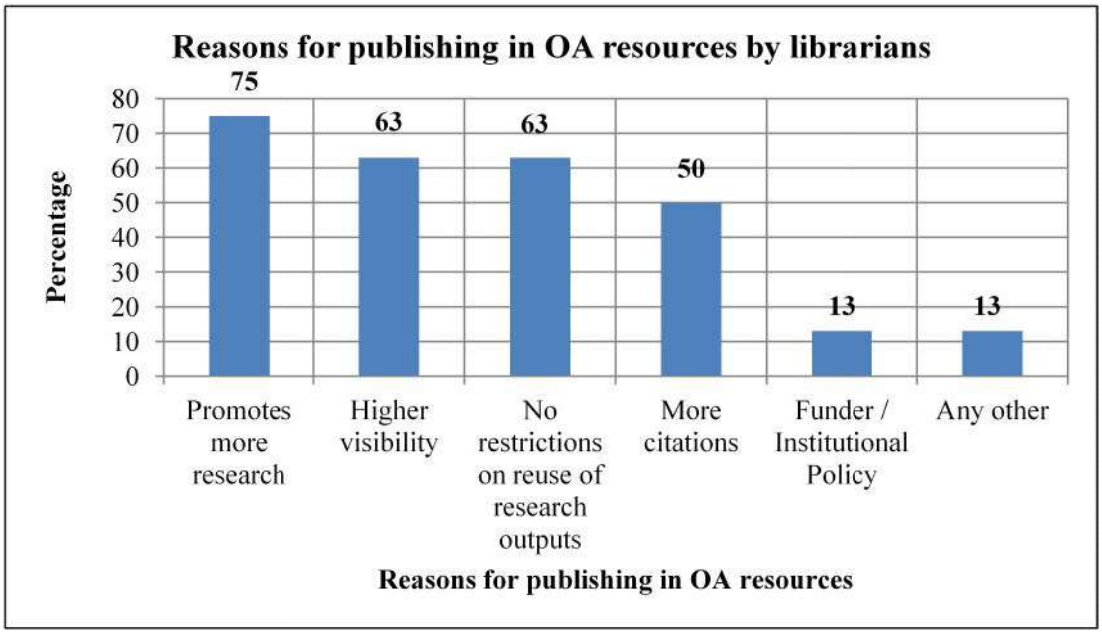
1.A If 'yes', tick mark the applicable reason for it: (This is multiple choice question)

Those who have published in OA resources (8 librarians) were asked to mark the reasons for same. As per the preferences of librarians, the analysed data is tabulated in table 4.28.

Table 4.28 Reasons for publishing in OA resources by librarians

Sr. No	Reason	Number of responses	Percentage
1.	Open access offers higher visibility than subscription based journals.	5	63
2.	Open access journals get more citations than Subscription based journals.	4	50
3.	Open access promotes more research	6	75
4.	There should be no restrictions on reuse of research outputs hence preferred OA mode	5	63
5.	The funder / institutional policy made it mandatory	1	13
6.	Any other, please specify -	1	13

Fig. 4.27 Reasons for publishing in OA resources by librarians



Observation:

The most prominent reason for publishing in OA for librarians is that OA promotes more research, given by 6 librarians (75%). Since OA resources are free and easy to

access for other researchers, it helps not only in reaching more number of users but at the same time give new ideas to other researchers which results in more research.

At second position, 5 librarians (63%) choose two reasons for publishing in OA mode. First one is OA offers higher visibility than subscription based journals. Being free and easy to access, OA resources can reach more number of users at a time increasing its visibility. In case of subscription based resources such as journals, limited users get access which is ready to pay and also have funds for same. So naturally the visibility is less. Being library professionals, this is very important while giving services to users. The second reason is there should be no restrictions on reuse of research output hence OA mode is preferred. Restrictions such as pricing, access barriers or legal barriers result in low visibility of research output. If research is shared with all without any restrictions then the benefits of the research will reach to the society fast and at large scale and will also lead to more research in future.

This shows concern of librarians not only as authors but as library professionals who have to serve their users. Usually research is conducted for improvement of earlier existing practices or innovating new practices for betterment of society in general. Hence if research results are shared with all without any restrictions, then it will be better for entire research community to avoid duplication and saving money and time. It will be more important for the society since many times practical applications of research output is possible.

1.B If 'no', then please tick mark suitable reason mentioned below: (This is multiple choice question)

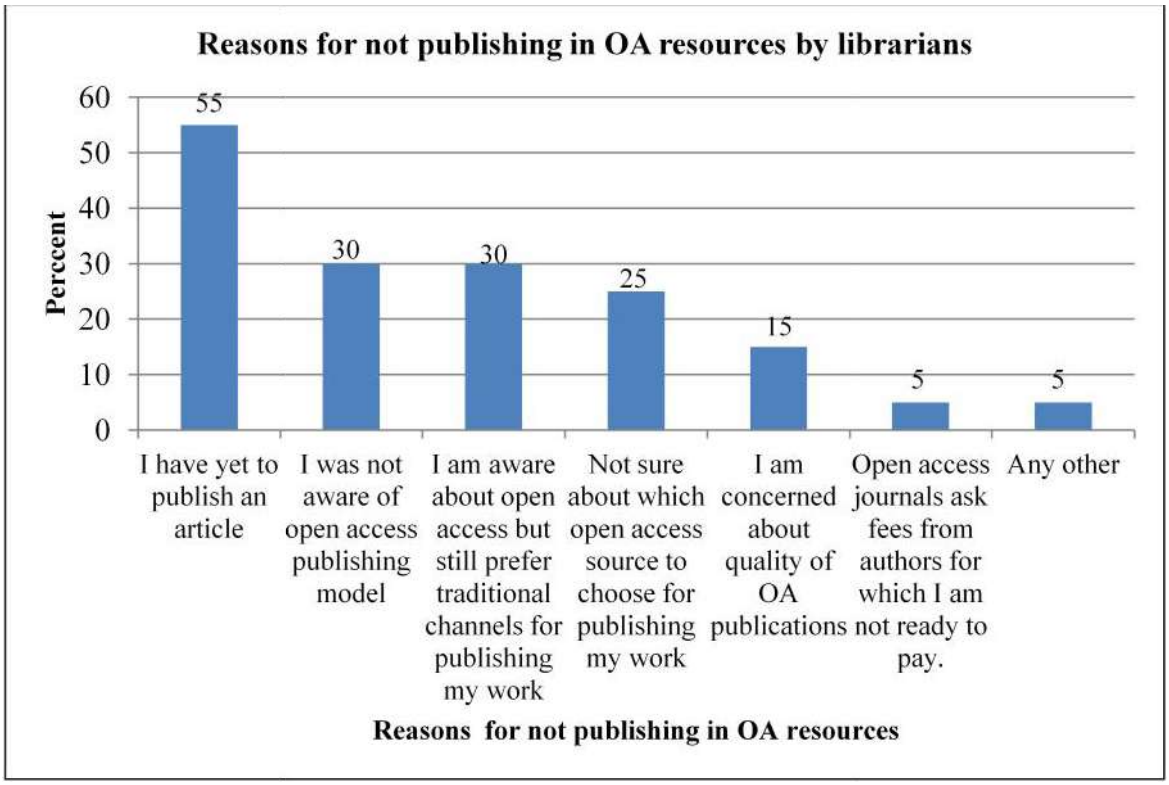
Those who have not published in OA resources (20 librarians) were asked to mark the reasons for the same. As per the preferences of librarians, analysed data is tabulated in Table 4.27.

Table 4.27 Reasons for not publishing in OA resources by librarians

Sr. No	Reason	Number of responses	Percentage
1	I was not aware of open access publishing model	6	30
2	I have yet to publish an article	11	55

Sr. No	Reason	Number of responses	Percentage
3	Open access journals ask fees from authors for which I am not ready to pay.	1	5
4	Not sure about which open access source to choose for publishing my work	5	25
5	I am aware about open access but still prefer traditional channels for publishing my work	6	30
6	I am concerned about quality of OA publications	3	15
7	Any other	1	5

Fig. 4.28 Reasons for not publishing in OA resources by librarians



Observation:

In Fig. 4.28, the reasons are arranged based on percentages calculated as per the users' selection.

The most prominent reason given by 11 librarians (55%) is 'I have yet to publish an article'. It shows that librarians are lagging behind in authoring papers / publications. At second position, 6 librarians (30%) opted for two reasons as follows:

I. I was not aware of open access publishing model: This shows the lack of knowledge about OA publishing model on the part of librarians of research libraries. With reference to the analysis done earlier for question D.1, 96% librarians are aware about OA resources but 30% do not have information about OA publishing model.

II. I am aware about open access but still prefer traditional channels for publishing my work: Preference towards traditional resources may be due to some issues regarding OA resources like quality or lack of importance in publishing in OA mode.

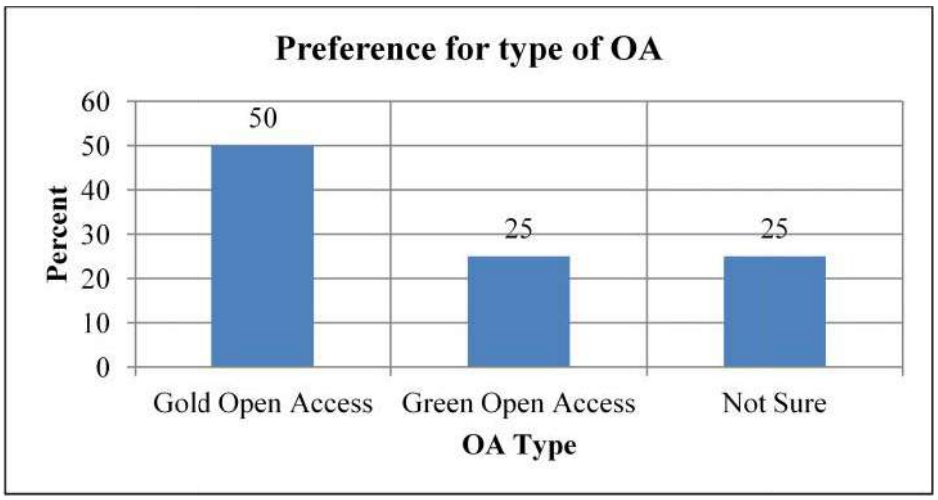
At third position (25%) librarians have selected the reason that 'I am not sure about which open access source to choose for publishing my work'. It is expected that librarians should be aware about latest trends in publishing industry as well as knowledge about norms that can be used for evaluation of resources irrespective of its format such as printed or electronic, paid or OA format etc. in order to know best relevant titles / publications in a particular domain area. With this knowledge they can decide the best source for publishing not only their own research but also help the users whenever required. The librarians can use the same skill sets used to judge traditional media for OA resources as well, with some extra efforts. It is also applied to the reason selected at fourth position by 3 librarians (15%) regarding issues about quality of OA publications.

1 librarian each (5%) cited article processing fees charged by OA journals and institutional policy under 'Any other' category. Some OA journals charge fees (APC) so publishing in OA platform is not free in such case. In some research institutes, there is either committee or policy regarding publishing the articles and everyone has to follow the norms given. If any institutional policy is not recognising the publication in OA resources then it may be due to some misconceptions about OA resources due to lack of information or that research institute does not allow publishing at all, being a commercial venture.

2. Which type of open access resources you would prefer for publishing?

The librarians were asked to give their preference for type of OA for publishing their research.

Fig. 4.29 Preference for type of OA



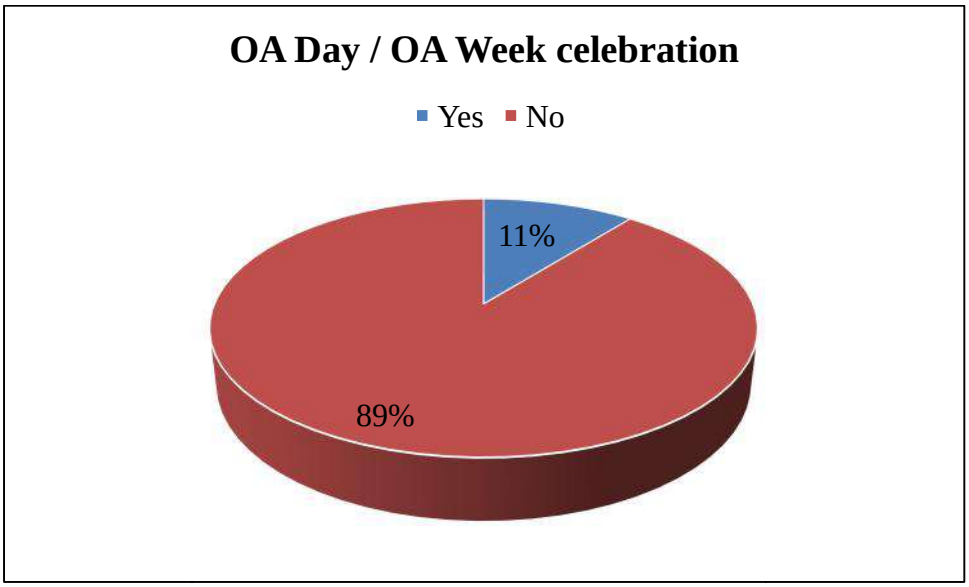
Observation:

As shown in fig. 4.29, it is observed that 14 librarians (50%) out of 28 have given preference to Gold OA while 7 librarians (25%) have selected Green OA and 7 librarians (25%) are not sure about any of the type. This indicates that more in depth awareness is required by them. Gold OA means publishing in OA journal / Hybrid OA journal. Green OA means making research output available through Institutional repository / subject repository / self archiving.

G. Institutional Policy about OA:

1. Does your Library celebrate Open Access Day / Open Access week in October every year by organizing any special events?

Fig. 4.30 OA Day / OA Week celebration



Observation:

OA day / OA week is celebrated all over the world in October since 2008. The librarians were asked whether they celebrate it by organizing any events for increasing the awareness about OA and related issues.

It is observed that only three librarians (11%) responded positively where as majority (89%) do not celebrate it. By planning some events for celebrating such days, the librarians can help and promote in increasing OA awareness among the users.

1.1 If yes, kindly tick mark how frequently you have celebrated OA Day / OA Week (October) since its inception in 2008?

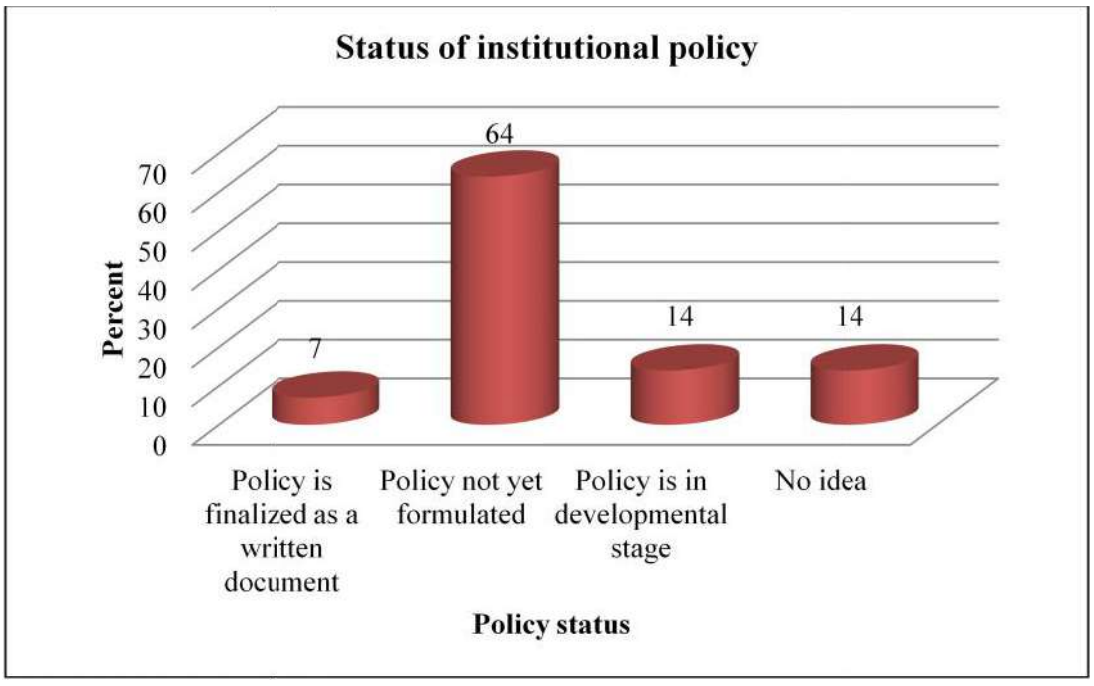
Observation:

In answer to the question about the frequency of celebrations since its inception of OA day / OA week in 2008, one (33%) out of three librarians mentioned every year while two responded (67%) as few times.

This shows that more and regular initiatives are required by librarians in promoting OA as it will increase more awareness in users.

2. What is the status of your Institution's policy /guidelines regarding publishing open access resources?

Fig. 4.31 Status of institutional policy



Observation:

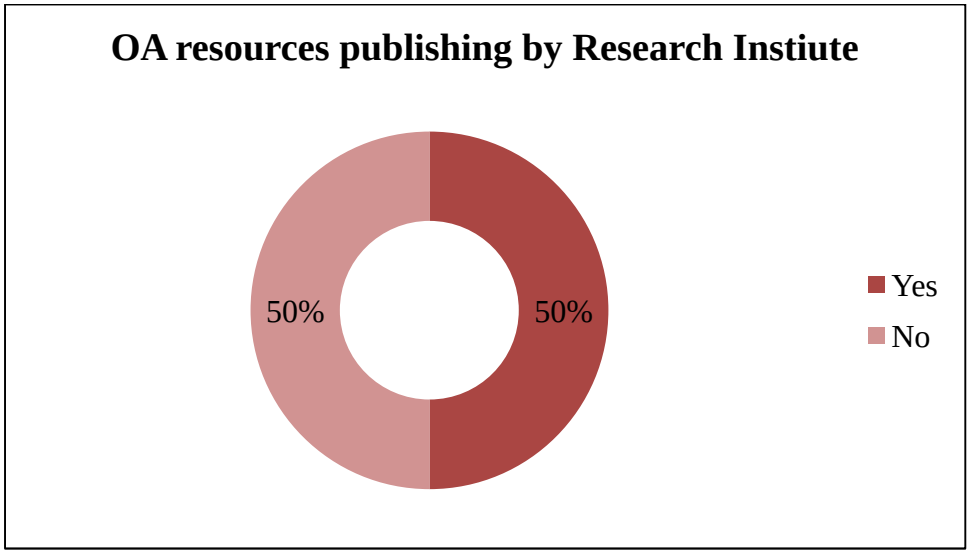
The data indicates that Institutional policy is not developed yet in 18 research institutes (64%). At 4 research institutes (14%) it is in developmental stage, which is a positive sign. Only two research institutes (7%) have well written institutional policy. 4 librarians (14%) have responded that they do not have any idea about the status of their institutional policy indicating that librarians need to be more involved with institutional policies.

Institutional policy is a very useful and vital document as guidelines for the researchers for publishing their research. In many research institutes, there are certain norms followed for publishing the research output, which is also part of their performance appraisal. Hence, publishing research in open access should be given same or more credit. For such norms, institutional policy as written document is essential.

3. Does your institute publish any type of OA resources?

The research institutes may have their own publications, especially research reports, articles, data etc. Hence the question was asked to know the publication status.

Fig. 4.32 OA resources publishing by Research Institute



Observation:

As shown in Fig. 4.32, half of the research institutes publish their research as OA resources whereas other half do not.

3.1. If yes, please tick mark suitable option as per status:

This question was asked to those institutes, which publish some form of OA resources. 14 librarians answered this multiple choice question.

Table 4.30 Publishing of OA resources

Sr. No.	Type of OA Resources	No. of responses	Percentage
1.	Open Journal	4	29
2.	Subject / Institutional repositories	14	100
3.	Open Book	1	7
4.	Open data	0	0
5.	Open Educational Resources	0	0
6.	Open Thesis / Research reports	3	21
7.	Any other	0	0

Observation:

As shown in Table 4.30, it is observed that all 14 institutes (100%) are having their own Institutional repository. Second position is of OA journals published by 4 research institutes (29%). Here, one OA journal is published not directly by the institute but by the Ministry under which it is working, but their researchers are contributing in it.

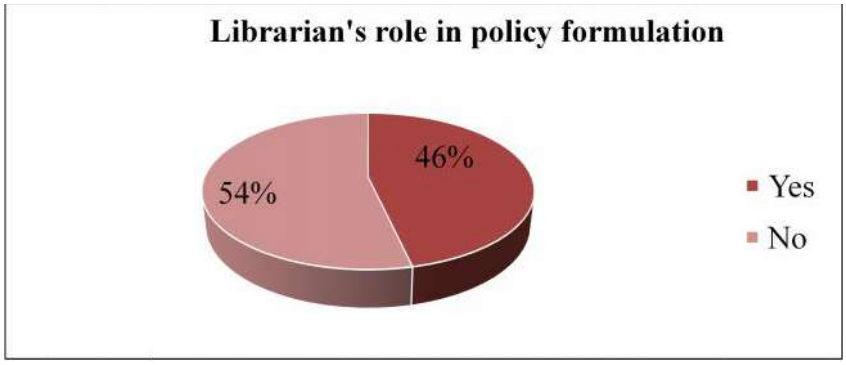
Third category is of Open Thesis / Reports adopted by three research institutes (21%) for their thesis as well as their own research reports collections. Though 22 research institutes are working as PhD research centres as found earlier, only three have made their thesis collection online as OA resources. As per UGC guidelines, theses are to be made available online. Only one research institute (7%) has published open book.

No institute is contributing in open data, open educational resources (OERs) or any other format. Data generated in research, based on which the articles are written, is very vital. Hence if such data is made available to all as Open data, then other researchers can also do lot of research or check the validity of the research conducted based on this data. OERs are useful from student's point of view as these resources can be made available as course study material or text books also. These are generally published by the faculty in academic institutions. Any other format can be open images, open videos, etc. These are useful in research as well as educational purpose and can be used in presentations, info graphics etc. by all.

4. As a Librarian, have you been involved in any policy formulation for your Institute?

Institutional policy formulation about any vital topic is an important activity. Generally, in any organization, policy is formalised through committee with various stake holders. This question was asked specifically to know the role of librarians in policy formulation in the organization.

Fig. 4.33 Librarian's role in policy formulation



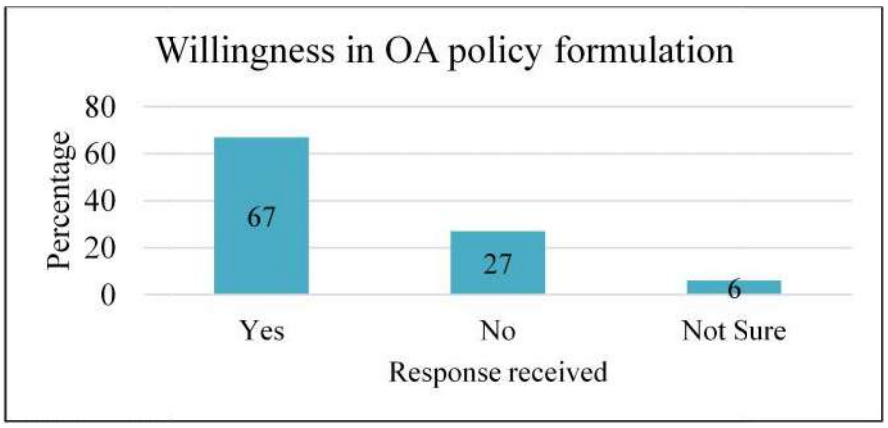
Observation:

It is observed that 13 librarians (46%) are involved in policy formulation process for the Institute especially when it's related to library whereas, 15 libraries (54%) are not involved.

1.1 If no, would you like to get involved in future for OA policy formulation in your Institute?

This question was asked to those librarians who are never involved in any policy formulation for their institute to know whether they are ready for same.

Fig. 4.34 Willingness in OA policy formulation



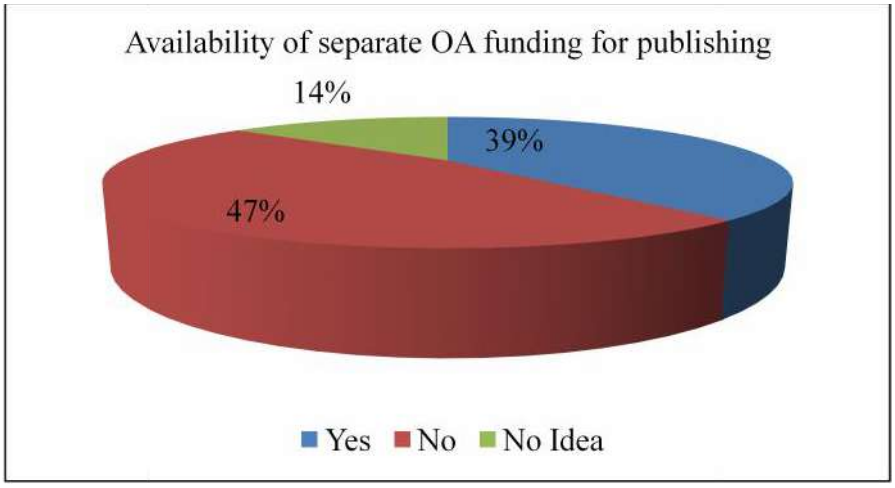
Observation:

It is observed that out of 15 librarians, 10 librarians (67%) are ready to play an active role in future OA policy formulation. 4 librarians (27%) said no and 1 librarian (6%) was not sure. This may be due to the fact that they are not aware about OA related aspects in depth.

It is essential for the research institutes to have a written policy regarding OA resources as guidance for researchers and also on the basis of which the libraries can also plan various services.

5. **Does your Institute have separate OA funding (to pay authors' fees / article processing charges) through which authors / researchers get help to publish their research in OA resources?**

Fig. 4.35 Availability of separate OA funding for publishing



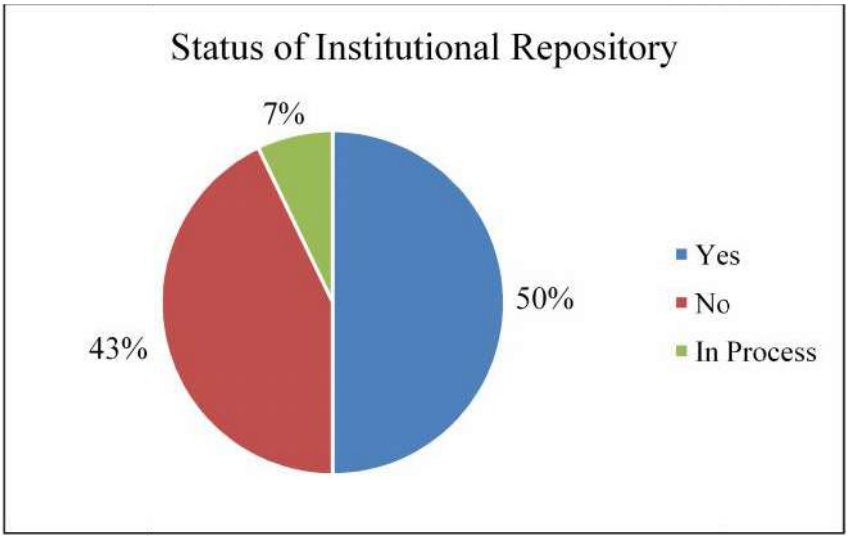
Observation:

It is observed that 13 institutes (47%) do not have separate OA funding (to pay authors' fees / article processing charges) through which authors / researchers get help to publish their research in OA resources. 11 librarians (39%) have responded positively mentioning that they do have such funding available for researchers. Making funds available for publication is definitely a positive sign and encouragement for researchers for publishing in OA resources. In one research institute, Authors research fund is a part of library budget itself where as in other institutes it is separate fund. 4 librarians (14%) have responded that they do not have

any information about this. This indicates that librarians should take more interest, especially in such crucial policy matters at institute level.

6. Do you have Institutional Repository (IR) in your Institute?

Fig. 4.36 Status of Institutional Repository



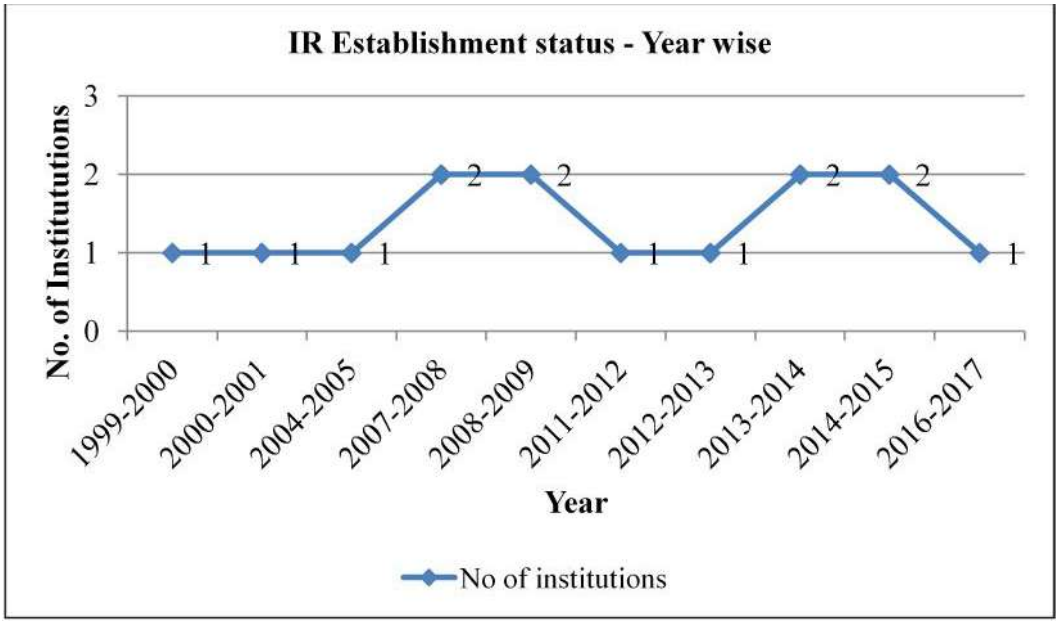
Observation:

Half of the institutes i.e. 14 institutions (50%) have set up their own institutional repositories where as 12 (43%) institutions have not. 2 institutions (7%) have reported that IR is in process. IR is one of the ways of promoting OA resources in the institutions. The above data indicates that more efforts are required for setting up IR in 43% institutions.

6.1 In which year IR was set up?

This question was asked to those librarians (14) who have set up their IR.

Fig. 4.37 IR Establishment status - Year wise



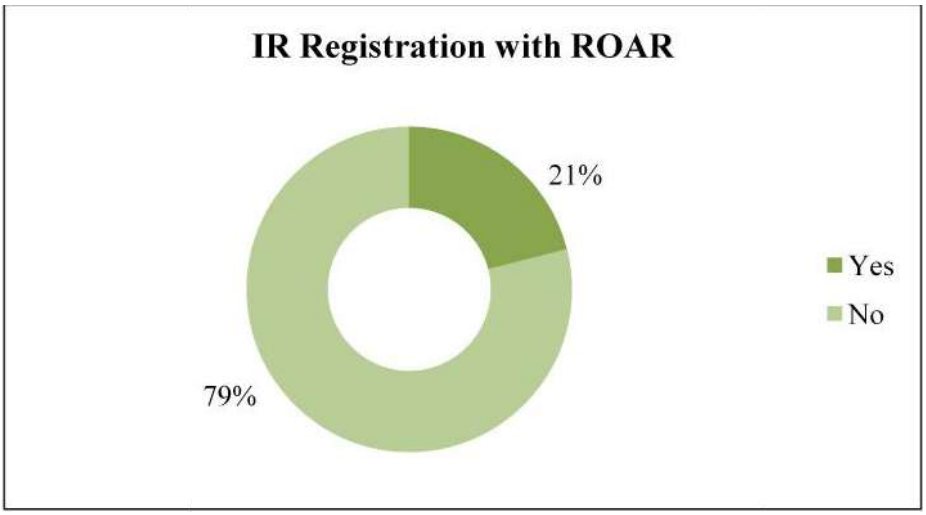
Observation:

The oldest IR was established in 1999 – 2000 and the latest one is established in 2016 – 17. The status of establishment of 14 IR shows that IR set up was done in very slow manner over the period of almost 18 years.

6.2 Is your IR registered with Registry of Open Access Repositories (ROAR)?

This question was also asked to those 14 institutions where IR set up is available.

Fig. 4.38 IR Registration with ROAR



Observation:

From fig. 4.38, it is observed that out of 14 institutions, only 3 institutes (21%) are registered with ROAR which indicates that the data is shared with outside users.

Remaining 11 institutions (79%) have not registered with ROAR. It suggests that their IR is for internal use only. The access is not available to outside users, which is against the OA concept. This may be either due to lack of information about ROAR and its benefits or some other internal reason such as confidentiality.

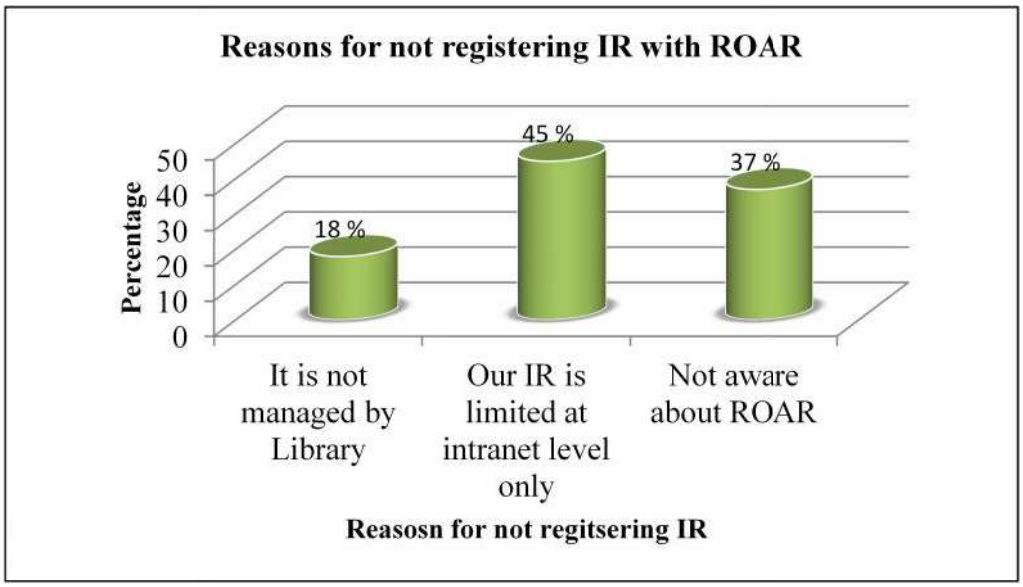
6.3 If not registered in ROAR, please tick marks the appropriate reason for same.

This is multiple choice question asked to the 11 institutes which have not registered their IR with ROAR.

Table 4.31 Reasons for not registering IR with ROAR

Sr. No.	Reason	No. of responses	Percent
1.	It is not managed by Library	2	18
2.	Our IR is limited at intranet level only	5	45
3.	Not aware about ROAR	4	37
	Total	11	100

Fig. 4.39 Reasons for not registering IR with ROAR



Observation:

As shown in fig. 4.39, it is observed that out of 11 librarians, 5 librarians (45%) have given the reason that their IR is limited at intranet only. This may be due to the institutional policy, which suggests either lack of proper policy at institute level or some other valid reason such as confidentiality. 4 librarians (37%) have mentioned that they are not aware about ROAR. For remaining 2 cases (18%), IR is not managed by the library staff.

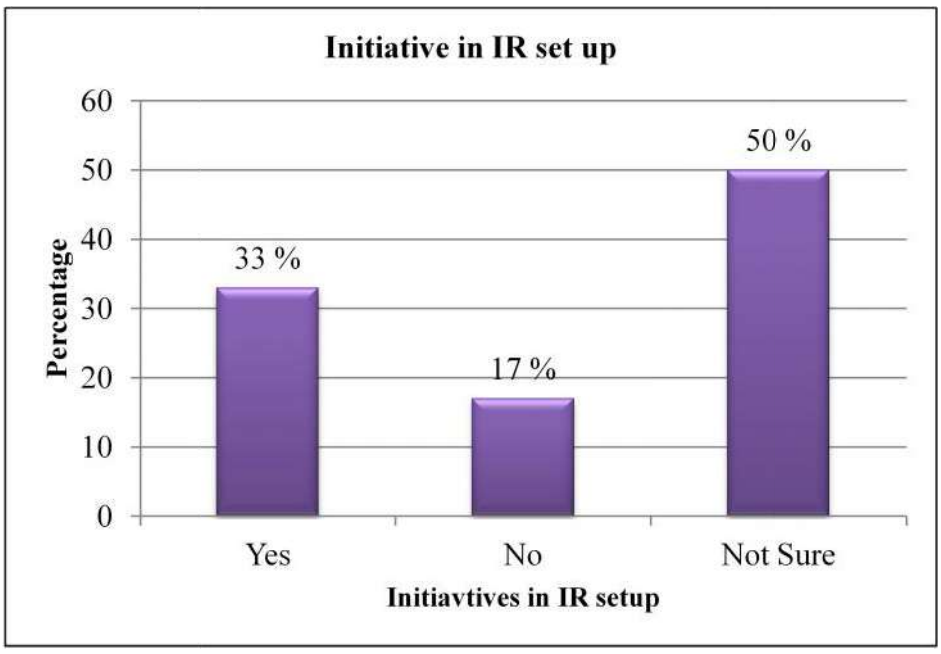
7. If No IR available, then as a librarian would you like to initiate the activity?

This question was asked to those 12 librarians who have not set up IR till now.

Table 4.33 Initiative in IR set up

Sr. No.	Response	No. of responses	Percent
1.	Yes	4	33
2.	No	2	17
3.	Not Sure	6	50
	Total	12	100

Fig. 4.40 Initiative in IR set up



Observation:

The analysis indicates that only 4 librarians (33%) are ready to set up the IR in their institutes where as 2 (17%) have said no and half of the librarians i.e. 6 are not sure about it.

This may be due to variety of reasons such as ignorance about importance of IR, lack of required skills, knowledge about IR set up especially technical knowledge required for installation, administration and its management over the period or man power shortage to carry out extra activity.

Nowadays, various workshops are arranged regularly regarding IR set up using various open source software. Such workshops can be useful for the librarians. Also online user forums are available on Internet for different IR software in case any help is required. Overall, librarians need more training and knowledge to get required confidence in managing IR on day to day basis

H. Services for OA resources

1. **Kindly tick mark the appropriate option with respect to usage of these directories / sources used by you for searching OA resources**

Table 4.33 Directories / sources used for searching OA resources

Sr. No	OA Resources	Number of responses (Percentage)				Mean (M)
		Regularly (4)	Sometimes (3)	Rarely (2)	Never (1)	
1.	Directory of Open Access Journals (DOAJ)	10 (36%)	13 46%	2 (7%)	3 (11%)	3.07
2.	Directory of Open Access Repositories (DOAR)	7 (25%)	10 (36%)	4 (14%)	7 (25%)	2.61
3.	Directory of Open Access Books (DOAB)	3 (11%)	12 (43%)	6 21%	7 (25%)	2.39
4.	Google Scholar	20 (71%)	5 (18%)	0 (0%)	3 (11%)	3.50
5.	Open Access Theses and Dissertations (oatd.org)	3 (11%)	9 (33%)	10 (36%)	6 21%)	2.32
6.	OAIster	2 (7%)	4 (18%)	2 (7%)	20 (68%)	1.57
7.	OA search engine like Jurn.Com, BASE, OAJSE etc	2 (7%)	2 (7%)	3 (11%)	21 (75%)	1.46
8.	Harvard Open Data Dataverse #	2 (7%)	2 (7%)	2 (7%)	22 79%	1.43

The analysed data is tabulated in table 4.33. The mean value of these resources indicates the usage of these sources. Fig. 4.41 shows usage of various sources in searching OA resources in detail.

Fig. 4.41 Usage of various sources for searching OA resources

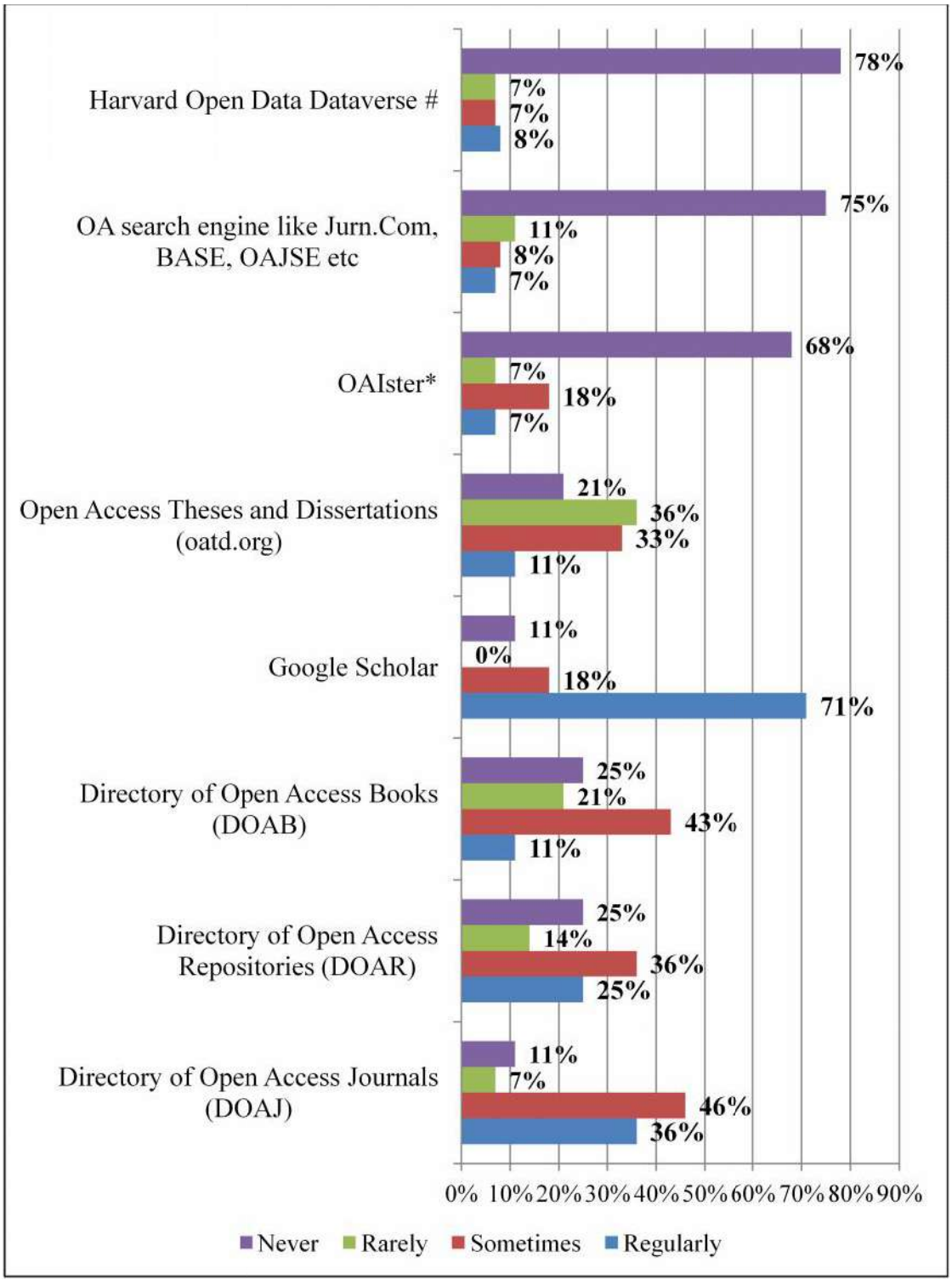
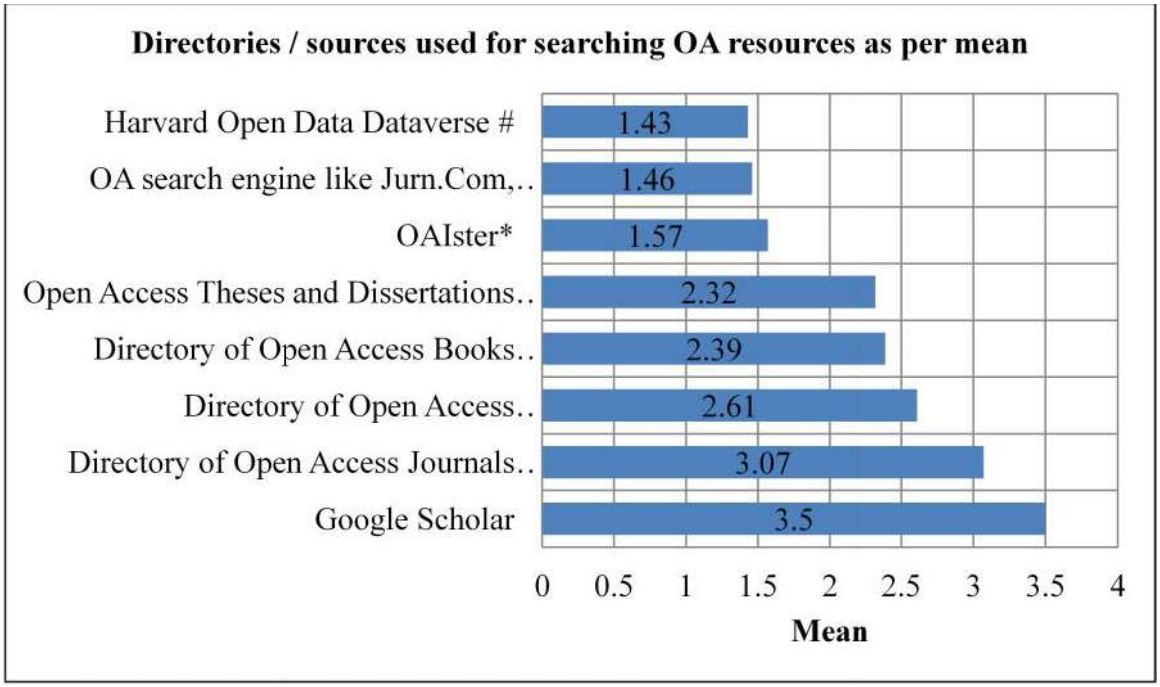


Fig. 4.42 Directories / sources used for searching OA resources as per mean



Observation:

Fig. 4.42 shows the usage of various sources for searching OA resources based on the respective mean values. It is observed that search engine Google scholar is the most used source by librarians with highest mean value (M = 3.50) indicating regular usage for searching OA resources followed by DOAJ (M = 3.07) and DOAR (M = 2.61) showing usage sometimes.

It is observed that DOAB (M = 2.39) and OA Theses and Dissertations (M = 2.32) and OAIster (M=1.57) are rarely used.

OA Theses and Dissertations (oatd.org) is world wide database for OA theses. This may be due to availability of Indian theses database Shodhganga. But from research point of view, knowledge about national level research is not sufficient and hence international level database is also important for researchers.

OAIster is a collection of OA resources worldwide based on Open Archives Initiative Protocol for Metadata Harvesting (OAI-PMH). It is union catalogue.

The least used sources are, OA search engines (M = 1.46) and Harvard open data Dataverse (M = 1.43) as majority of the users opted for never used option. Harvard Dataverse is a repository for research data at global level.

For rest of the sources such as Harvard Open Data Dataverse (79%), OA search engine (75%) and OAIster (68%) the figures for 'Never' used indicate that there is a need of in-depth knowledge about OA resources, their utility in finding relevant OA resources and also its importance for research on part of librarians.

2. Kindly mention directories / other sources of your subject specialization used by you if any, for searching OA resources

Apart from above mentioned directories / sources, librarians were asked other similar databases / directories which they generally use for searching OA resources.

Following are the databases used by librarians for searching OA resources:

I. Pubmed – Four libraries are using this database. PubMed Central (National Center for Biotechnology Information, n. d.) is a free full-text archive of journal literature in the area of life sciences and biomedical. It is managed by U.S. National Institutes of Health's National Library of Medicine (NIH/NLM). It contains around 5.6 million articles.

II. ADS database: One library is using this specialised database. Astrophysics Data System is a digital library in the field of Astronomy and Physics. It is managed by Smithsonian Astrophysical Observatory (SAO) under a NASA grant (ADS, n. d.). It tracks citations and also usage of its records for evaluation purpose and advanced discovery. It has 14.5 million records. But it's not completely open access. All articles and abstracts are copyrighted by the respective publishers and are available free for personal use only.

III. Arxiv.org – This source is cited by one library. This database (Cornell University, n. d.) provides open access to more than 1,575,489 e-prints in the fields of physics, mathematics, computer science, quantitative biology, quantitative finance, statistics, electrical engineering and systems science, etc. It is managed by Cornell University.

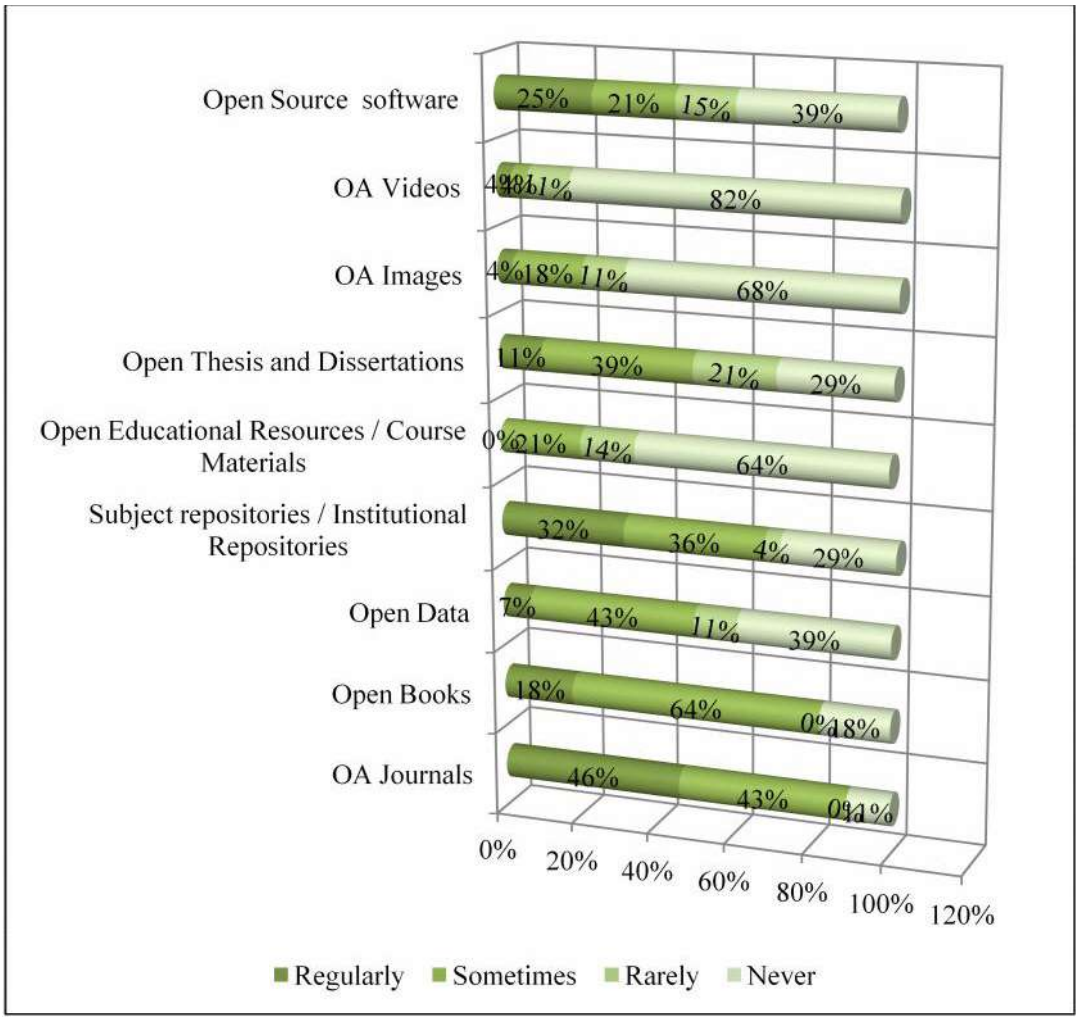
IV. India's census data – Two libraries are using this source for searching authentic data. It is managed by Office of the Registrar General & Census Commissioner, India. (Office of the Registrar General & Census Commissioner, India, Ministry of Home Affairs, n. d.).

3. Please mark the frequency of following OA sources used by your library staff in providing various information services to users

Table 4.34 Use of OA sources in information services

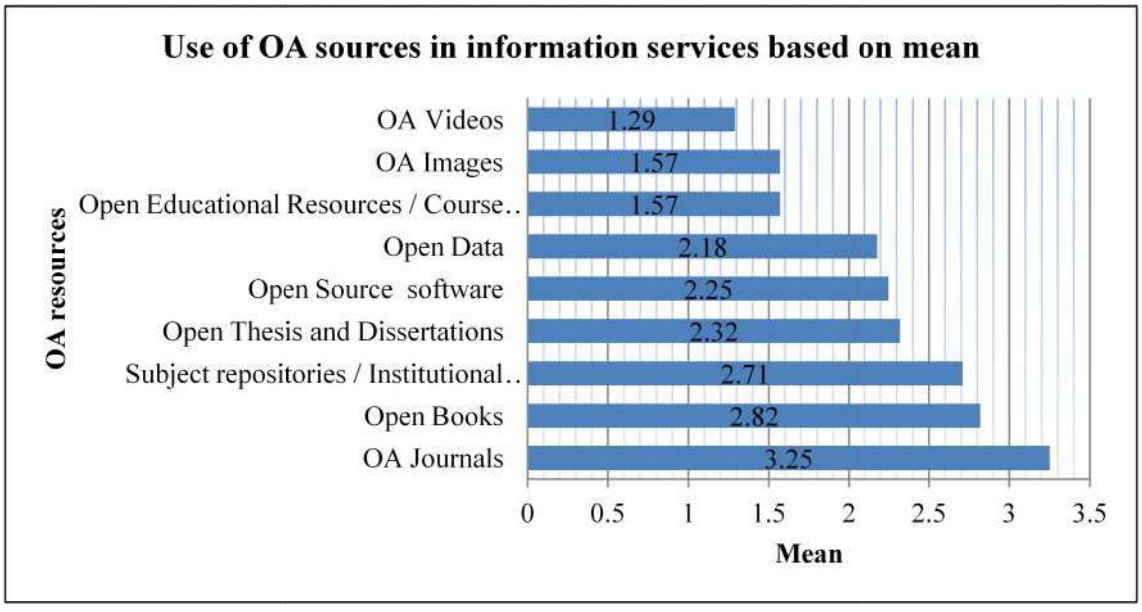
Sr. No.	OA sources	No. of responses (Percentage)				Mean
		Regularly (4)	Sometimes (3)	Rarely (2)	Never (1)	
1.	OA Journals	13 (46%)	12 (43%)	0	3 (11%)	3.25
2.	Open Books	5 (18%)	18 (64%)	0	5 (18%)	2.82
3.	Open Data	2 (7%)	12 (43%)	3 (11%)	11 (39%)	2.18
4.	Subject repositories / Institutional Repositories	9 (32%)	10 (36%)	1 (4%)	8 (28%)	2.71
5.	Open Educational Resources / Course Materials	0	6 (22%)	4 (14%)	18 (64%)	1.57
6.	Open Thesis and Dissertations	3 (11%)	11 (39%)	6 (21%)	8 (29%)	2.32
7.	OA Images	1 (4%)	5 (18%)	3 (10%)	19 (68%)	1.57
8.	OA Videos	1 (4%)	1 (4%)	3 (10%)	23 (82%)	1.29
9.	Open Source software	7 (25%)	6 (21%)	4 (15%)	11 (39%)	2.25

Fig. 4.43 Use of OA sources in information services



The analysed data for usage is tabulated in table 4.34.

Fig. 4.44 Use of OA sources in information services based on mean (M)



Observation:

There are different types of OA resources. This question was asked to know the use of these different types of resources in providing information services to users. These sources are arranged from bottom to top as per the mean value as shown in Fig. 4.44

The mean value of OA resources indicates the usage of these sources in information services by librarians. Following are the observations based on the mean values and actual usage percentage wise as shown in Table 4.34:

1) OA journals are used (M = 3.25) sometimes as most preferred source of OA type. 13 librarians (46%) are using them on regular basis whereas 12 librarians (43%) are using sometimes. Cumulative usage of both categories is 89%.
2) OA books are used sometimes at second position (M = 2.82) with 18 librarians (64%) are using sometimes whereas 5 librarians (18%) are using on regular basis. The cumulative usage of both categories is 82%
3) Subject repositories / Institutional Repositories are at third position (M = 2.71) used sometimes as 10 librarians (36%) are using sometimes whereas 9 librarians (32%) are using on regular basis. The cumulative usage of both categories is 68%
4) Rest of the OA resources such as Open Thesis and Dissertations (M=2.32), Open Source software (M = 2.25), Open Data (M=2.18), Open Educational Resources / Course Materials (M = 1.57) and OA Images (M = 1.57) are rarely used.
5) OA videos are the least used source (M = 1.29) in providing information services as majority of librarians (82%) have never used them.

The analysis indicates especially in case of those OA resources having low usage may require more attention by the library professionals in terms of its importance, sources to find them as per requirement and their utility from research point of view. Every type of OA resource can be useful for research such as OA images and OA videos can be used to know the current status of research with specialised search engines like Google images where statistical data is also available through power point slides or even as figures from published articles. Only one must check the source for authenticity and quality. In case of OER, these are required mostly in academic or educational institutes hence its low usage is justified. It is also observed that not a single OA source is used on regular basis for providing information services.

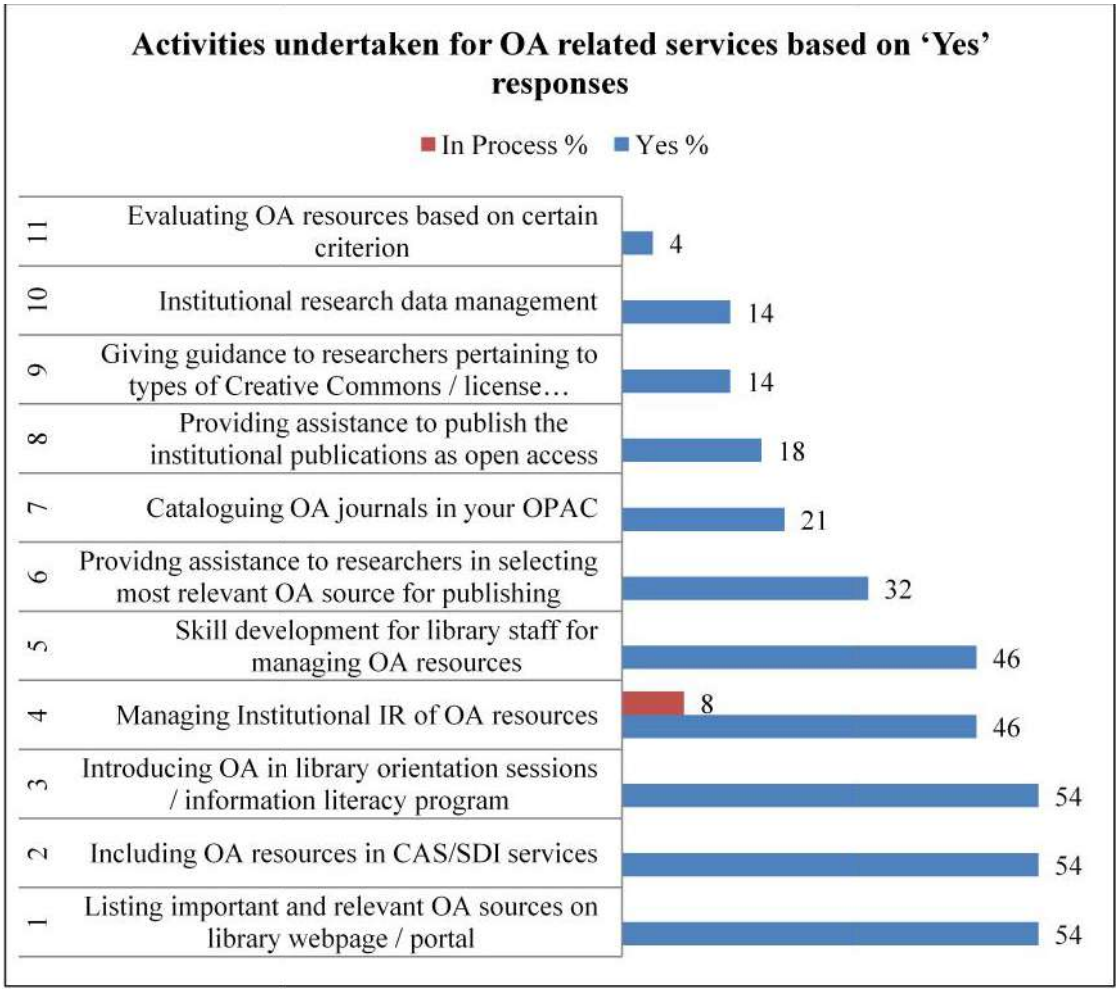
4. Indicate if following activities have been undertaken for giving various services related to OA resources in your library:

Promotion of OA resources is achieved through incorporating them in various services provided to users. Hence librarians were asked to mark the services they are giving related to OA resources. This is a multiple choice question.

Table 4.35 Activities undertaken for OA related services

Sr. No	Activity	Number of responses (Percentage)			Rank assigned
		Yes (1)	No (0)	In Process (2)	
1.	Evaluating OA resources based on certain criterion	7 (4%)	21 (96%)	0	7
2.	Cataloguing OA journals in your OPAC	6 (21%)	22 (79%)	0	4
3.	Listing important and relevant OA sources on library webpage / portal	15 (54%)	13 (46%)	0	1
4.	Managing Institutional IR of OA resources	13 (46%)	13 (46%)	2 (8%)	2
5.	Including OA resources in CAS/SDI services	15 (54%)	13 (46%)	0	1
6.	Providing assistance to researchers in selecting most relevant OA source for publishing	9 (32%)	19 (68%)	0	3
7.	Giving guidance to researchers pertaining to types of Creative Commons / license agreements	4 (14%)	24 (86%)	0	6
8.	Providing assistance to publish the institutional publications as open access	5 (18%)	23 (82%)	0	5
9.	Introducing OA in library orientation sessions / information literacy program	15 (54%)	13 (46%)	0	1
10.	Institutional research data management	4 (14%)	24 (86%)	0	6
11.	Skill development for library staff for managing OA resources	13 (46%)	15 (54%)	0	2
12.	Any other, please specify	0	28 (100%)	0	

Fig. 4.45 Activities undertaken for OA related services based on 'Yes' responses



Observation:

Based on the responses received for 'Yes', ranks have been given to the services offered by the libraries as shown in table 4.35 and Fig. 4.45. From the data analysis, following are the observations:

1. At first position, there are three activities which are mostly followed by the libraries (54%). These are:
   i) Listing important and relevant OA sources on library webpage / portal: This is very common method for promoting OA resources.
   ii) Including OA resources in CAS/SDI services: In research libraries, CAS/SDI services are important for researchers hence if OA resources are also added then it will be value added services.
   iii) Introducing OA in library orientation sessions / information literacy program: New entrants in the organization should be made aware about the

various sources of information available in the library along with services provided which, ensures maximum utilisation of resources and also reduces the burden on library staff. Hence if OA resources are covered in library orientation sessions then it will be very informative and useful for new users.

2. At second position, there are two activities which are mostly followed by the libraries (46%). These are:
   i) Managing Institutional IR: 46% libraries have set up their own subject / Institutional repository through which OA promotion is done. 8% libraries are in process of setting up their own IR.
   ii) Skill development for library staff for managing OA resources: 46% librarians are taking special efforts for skills development of library staff which is vital for managing OA resources as there are different types of OA resources with specific characteristics and features. Library staff must know these in order to provide better information services to users.
3. Providing assistance to researchers in selecting most relevant OA source for publishing: 9 librarians (32%) are helping researchers in selecting most relevant OA source for publishing.
4. Cataloguing OA journals in your OPAC: Only 6 librarians (21%) have responded that they are cataloguing OA journals in Online Public Access Catalogue (OPAC) where as others don't. This is may be as 54% libraries are listing important and relevant OA sources on library webpage / portal. But listing of journals is not sufficient as many times users search OPAC by subject. Then if cataloguing of OA journals is done along with necessary details such as subjects covered, link etc. then it would be very useful for users. It will also help the libraries to show increased collection in full text format. As seen in analysis of question C.8., 68% libraries are fully automated which means they are using the library software. So adding OA journals in journal module with required details will enhance the library catalogue.
5. Providing assistance to publish the institutional publications as open access: 5 librarians (18%) are helping in publishing institutional publications as OA. Research institutes have their own publications but they may not be as OA either due to the administrators and authority people are not aware about OA

resources and their benefits for all or due to commercial reason as being paid subscription or priced publication.

It is important that librarians can make the higher authority aware about the increasing importance of OA resources and their benefits and convince them to make them as OA resources so as to reach maximum audience. In case of commercial journals, the issues may be made available as OA after a certain gap i.e. embargo period so that other researchers will benefit.

6. At last positions, following two activities are listed by 4 (14%) libraries
   i) Giving guidance to researchers pertaining to types of Creative Commons / license agreements: OA resources though free have different copyrights based on which users can use those resources for various purposes. The users may not be aware about this aspect hence librarian should help the users though guidance about these license types and their features.
   ii) Institutional research data management: All research institutes carry various research projects due to which large amount of data is created. This data is very important for future reference and also as intellectual property of the institute. Hence it becomes necessary, that such data is preserved, organised, catalogued, searched as and when require. It is very special activity with different types of skill set required.
7. Evaluating OA resources based on certain criterion: Only 4% librarian is evaluating the OA resources based on some criteria. This is important in view tackling quality issues of OA resources.

Overall, it is observed from the Table 4.36, that the percentage of various activities done by the librarians for promoting the OA resources is poor and needs more efforts from librarians. For that, the librarians should update their knowledge and skills required for such activities so that they can be implemented in the library in a better way for the benefits of users.

5. Are you using set evaluation criterion for evaluating OA resources?

Table 4.36 Use of evaluation criteria for evaluating OA resources

Sr. No.	Use of evaluation criteria	No. of responses	Percent
1.	Yes	1	4
2.	No	27	96
	Total	28	100

Observation:

It is observed that only 1 librarian (4%) is using evaluation criteria and evaluating OA resources based on it. Remaining 27 librarians (96%) are not evaluating the OA resources.

With reference to analysis done regarding question D.3.2, data analysed indicated that many librarians have concerned about quality and accurateness. This emphasises the need for evaluation of OA resources but since only 1 librarian is doing the same, it indicates that librarians should take initiative and start evaluation process.

3. Which following features you consider are important while evaluating OA journals?

OA journals like traditional journals are important for research point of view and used most of the time as articles are easily retrieved with full text when searched online. It is already observed in the analysis of earlier question H.3. Hence question was asked to know the importance of various aspects of OA journals from librarian's view point, based on which evaluation criteria for OA journals can be devised.

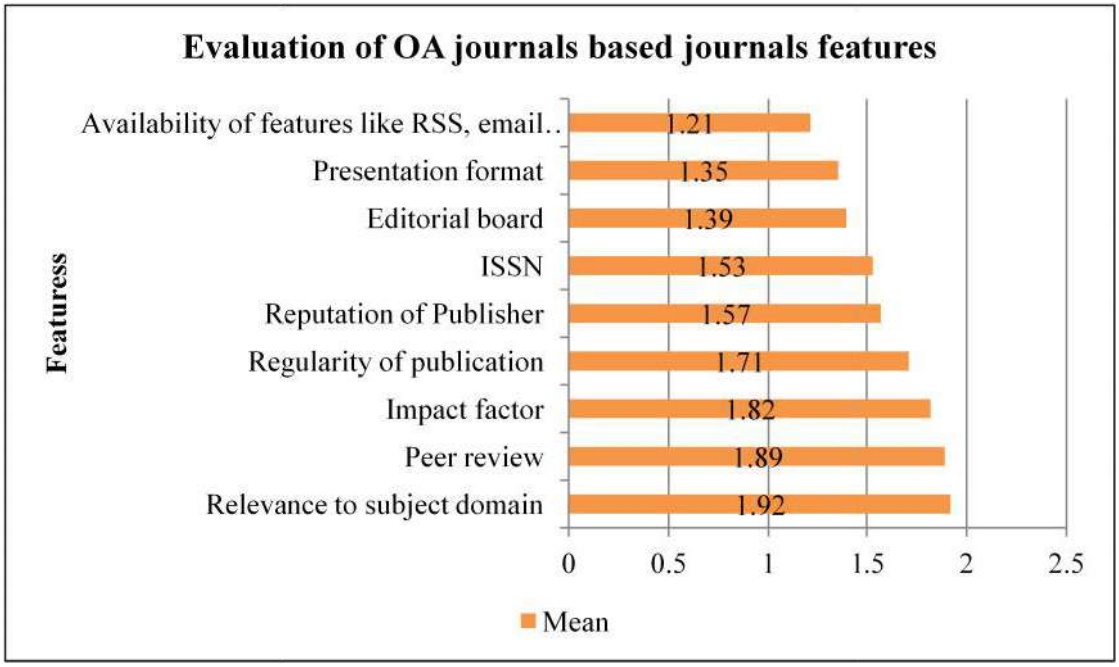
The data analysed and mean is calculated as shown in table 4.37

Table 4.37 Evaluation of OA journals based on features

Sr. No	Aspect	No. of responses (Percentage)			Mean
		Very Important (2)	Moderately Important (1)	Not Important (0)	
1.	Peer review	25 (89%)	3 (11%)	0	1.89
2.	Editorial board	13 (47%)	13 (46%)	2 (7%)	1.39
3.	ISSN	16 (57%)	11 (39%)	1 (4%)	1.53
4.	Regularity of publication	21 (75%)	6 (21%)	1 (4%)	1.71
5.	Relevance to subject domain	26 (93%)	2 (7%)	0	1.92
6.	Presentation format	12 (43%)	14 (50%)	2 (7%)	1.35

Sr. No	Aspect	No. of responses (Percentage)			Mean
		Very Important (2)	Moderately Important (1)	Not Important (0)	
7.	Availability of features like RSS, email alerts, download statistics etc.	10 (36%)	14 (50%)	4 (14%)	1.21
8.	Reputation of Publisher	17 (60%)	10 (36%)	1 (4%)	1.57
9.	Impact factor	23 (82%)	5 (18%)	0	1.82
10.	Other, please specify	0	0	0	NA

Fig. 4.46 Evaluation of OA journals based on features



Observation:

It is observed that librarians gave preferences to the characteristics given by the researcher and there was no other characteristic suggested under 'Any other' option asked. Based on the preferences given, mean is calculated as shown in fig. 4.46. Accordingly, features for OA journals may be considered as an evaluation criteria for evaluating OA journals in given chronological order as shown in fig. 4.46. Considering uniform marks such as 10 may be assigned for each feature, the OA

journal may be given points as per the status. Those with higher marks will be most relevant and useful for users. Such journals may be promoted by the librarians. This is value added service for users.

1) Relevance to subject domain (M = 1.93): 26 librarians (93%) felt that subject is very important and 7% felt that it is moderately important. Highest mean suggests that it is most prominent feature for identifying the relevant and useful title. If the journal is publishing articles in a particular and allied subject areas and matches to users' requirements then it can be considered as relevant to the subject domain. Generally the scope of the journal covers all details which can be checked and verified. Since all articles are relevant hence such journals are important from research point of view.
2) Peer review (M = 1.89): Maximum librarians (89%) have chosen peer review process as very important where as 11 % chosen as moderately important. As per mean value, it is at second place as very important. If journal is following peer review especially blind peer review process then it ensures good quality articles which will be definitely more relevant and useful for users.
3) Impact factor (M = 1.82): 23 Librarians (82%) felt that impact factor for OA journals are very important where as 18% felt that it is moderately important. OA journals having impact factor will be more useful and relevant since articles get more citations which shows more relevance for users.
4) Regularity of publication (M = 1.71): Majority librarians (75%) have given preference to regularity of publication as very important where as 21% felt as moderately important and 4 % not important. Many journals sometimes are not published periodically and on time. Hence regularity is very important.
5) Reputation of Publisher (M = 1.57): Majority librarians (60%) felt the publisher's brand name is very important where as 36% felt as moderately important and 4 % as not importance. Publisher's name gives idea about quality of OA journal. Since many of the OA journals are either published by learned societies, research institutions or by some publishers engaged in publishing OA resources. In case of learned societies or research institutions, their reputation gives the assurance about quality of OA articles. To sustain their publishing model, some charge APCs but that doesn't affect the quality if peer review process is followed by the publisher. Well known commercial publishers have also started publishing OA articles if

authors are ready to pay for same. Most important is that the OA publisher is registered with Open Access Scholarly Publishers Association (OASPA). As a member, the publisher is expected to follow the best practices for OA publishing.

6) ISSN (M = 1.53): Majority librarians (57%) have chosen ISSN (International Standard Serial Number) as very important feature whereas 39% responded as moderately important and 4 % as not important. ISSN is an eight-digit serial number used to identify a serial publication, such as a magazine or journal and it is unique number. Generally most of the journals and magazines do have ISSN but in reality it does not give guarantee for the quality of the concerned publication.
7) Editorial board (M = 1.39): 47% librarians felt that editorial board is very important; 46% librarians felt that it is moderately important and 7% as not important. The editorial board consisting well known names or experts in the concerned subject is a sign indicating that the quality of articles published will be high. Hence an editorial board can play an important role. Even if the names are not familiar, one can search the name of editorial team members online to know their credentials. Only sometimes, there are some predatory journals showing fake names without the consent of the members for publicizing. Even while accepting the position as team member of editorial board, one must check the quality of the publication and other members associated with it.
8) Presentation format (M = 1.35): Half of librarians responded that presentation format is moderately important where as 43% felt that it is very important and 7% felt it is not important. Features like graphical user interface should be more users friendly so that users can navigate easily through all menu options easily. The essential information should be available on the OA journal website such as instructions for authors including any fees required to pay, scope of the journal, editorial board, current and back issues details, table of contents, search facility, type of CC license used, information about journal covered in the databases, indexes, contact details etc. are very much essential.
9) Availability of features (M = 1.21): Half of librarians responded that availability of various features are moderately important where as 36% felt that it is very important and14% felt it is not important. Features like RSS (Rich Site Summary), email alerts for table of contents, download statistics article wise etc. are some of the features available. RSS and email alerts are important and useful as users get alerts whenever new issue / article get published. The download statistics is one of

the parameter like citations indicating number of times the article is downloaded but still it may not give correct picture as downloaded article may or may not be relevant and useful for the user.

Besides above mentioned criteria, the OA journal if listed in DOAJ then it also indicates quality level and peer review process. Also OA journals are also listed in UlrichsWeb, Global Serials Directory or printed periodical directory.

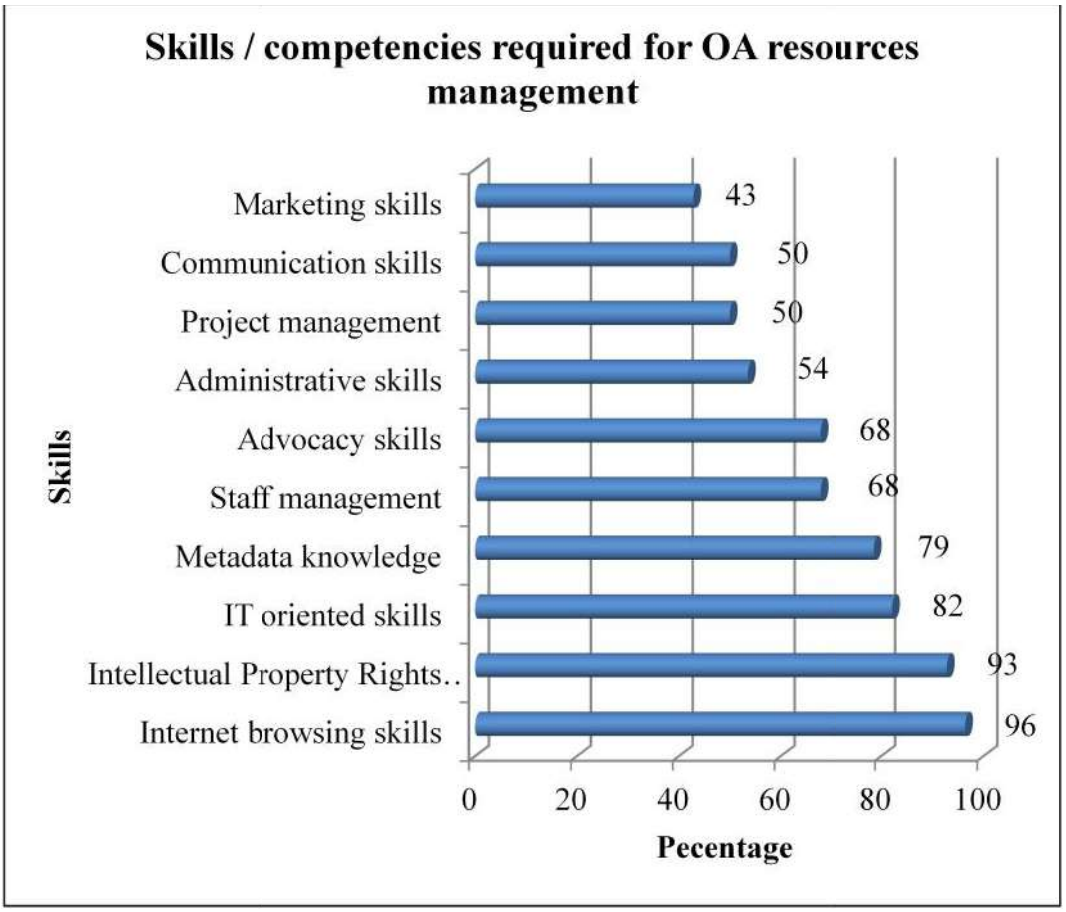
4. Do you feel following skills / competencies are required for OA resources management?

This is multiple choice question. Based on the responses received for 'Yes', the data is compiled and analysed as given in Table 4.38.

Table 4.38 Skills / competencies required for OA resources management

Sr. No.	Skill	No of 'Yes' responses	Percentage	Rank assigned
1	Project management	14	50	7
2	Staff management	19	68	5
3	Communication skills	14	50	7
4	Advocacy skills	19	68	5
5	Administrative skills	15	54	6
6	IT oriented skills	23	82	3
7	Internet browsing skills	27	96	1
8	Metadata knowledge	22	79	4
9	Intellectual Property Rights Knowledge	26	93	2
10	Marketing skills	12	43	8
11	Any other, please specify -	0	0	

Fig. 4.47 Skills / competencies required for OA resources management



Observation:

As observed in fig. 4.47, based on the preferences given by the librarians following are the skills required for management of OA resources in the given order / rank assigned along with its' importance.

1) Internet browsing skills – 27 librarians (96%) have voted for it as most prominent skill required as first choice. Though OA resources are available online free and can be easily searched through any search engine, still internet browsing skills are useful. With proper search strategies, specialised search engines etc. relevant OA resources as per users' requirements can be easily searched and retrieved.
2) Intellectual Property Rights Knowledge – 26 librarians (93%) believe that IPR related knowledge is vital as second choice. Though OA resources are free still author holds some rights. There are different CC license available depicting clear cut information as which rights users have been given. Being library professional, one should be aware about such important aspect and also it's important to guide

the users so as to avoid copyright infringement ensuring maximum utilisation of the OA resources.

3) IT oriented skills – At third position, 23 librarians (82%) have cited IT oriented skills since many open source software are available free of cost for managing OA resources such as IR (e.g. Dspace, e-print etc.), Data repository (Harvard Dataverse, CKAN, DKAN etc.). IT related knwoedge is required from selection of software to its installation, management, preservation till back up level operations.
4) Metadata knowledge – 22 librarians (79%) feel that metadata knowledge is very important at fourth rank. Metadata is often called data about data. It is useful especially in case of IR/SRs, where metadata plays an important role in content discovery for users. It is possible with the help of metadata harvesting by using OAI-PMH (The Open Archives Initiative Protocol for Metadata Harvesting).
5) At fifth position, there are following two skills voted by 19 librarians (68%):
    a. Advocacy skills – Advocacy skills are required to get the attention of users towards various facets of OA resources in terms on its importance, various uses, types available etc. Advocacy programs are required at different levels starting from authority / management till the users and library staff by convincing them in utilising the OA resources so that finally they start using them. It is possible through various ways such as arranging informative sessions, giving important case studies showing its importance and utility etc.
    b. Staff management – Being specialised tasks, proper training is required for staff. The existing staff may or may not be sufficient but one has to plan the activities in addition of regular ones ensuring smooth running of library on timely basis. If suitable or adequate staff is not available then it may become an issue for managing OA resources.
6) Administrative skills – 15 librarians (54%) have cited this skill at sixth rank. In case sufficient staff is not available to provide OA related services and activities then librarian has to convince the administration about recruiting additional staff as per the requirement. This is only possible if the management is convinced about the importance and utility of OA resources from research point of view. Also with administrative skills, librarian can ask for more funding, up-gradation of existing infrastructure if necessary etc.
7) At seventh position, there are following two skills voted by 14 librarians (50%):

a. Communication skills – It's very important to communicate with all the stakeholders in clear and simple but effectively about various aspects related to OA such as benefits of OA resources, having institutional OA policy, publishing own OA resources, setting up and managing IR etc. Only listing of relevant OA resources is not sufficient. Through good communication only, the librarian can convince not only users but also colleagues and management and ask for their participation in OA movement.

b. Project management – Any new activity is like a new project and accordingly one has to do lot of planning from the initial paper work till the project is successfully launched and managed over a period of time. For OA resources also, similarly the librarians need to plan as how to start, its planning in terms on policy at library / institutional level, infrastructure development, funding required, staff and users training, software management, data processing, announcement to users, marketing, promotional activities etc.

8) Marketing skills – 12 librarians (43%) have quoted this skill at eighth spot. In case of printed resources or other online resources subscribed the library do lot of marketing through various ways in order to reach users ensuring the increased usage of those resources. Though OA resources are free, still marketing is required as either user may not be aware about them in depth and considering the efforts taken by the library staff for providing OA related services it should be used by the users. Unless and until they are used, the users may not be able to give their feedback which can help in modifying or improving the existing systems for betterment of users.

The above mentioned skills are listed but they are not exhaustive. Considering the librarians are not familiar with OA resources and allied aspects in depth, they may not be in position also to decide which skills / competencies are essential for the OA resources. Otherwise under 'Any other', there would be additional skills suggested by the librarians. This shows that they still have to understand OA resources in depth so then only they can promote the use of OA resources in research libraries.

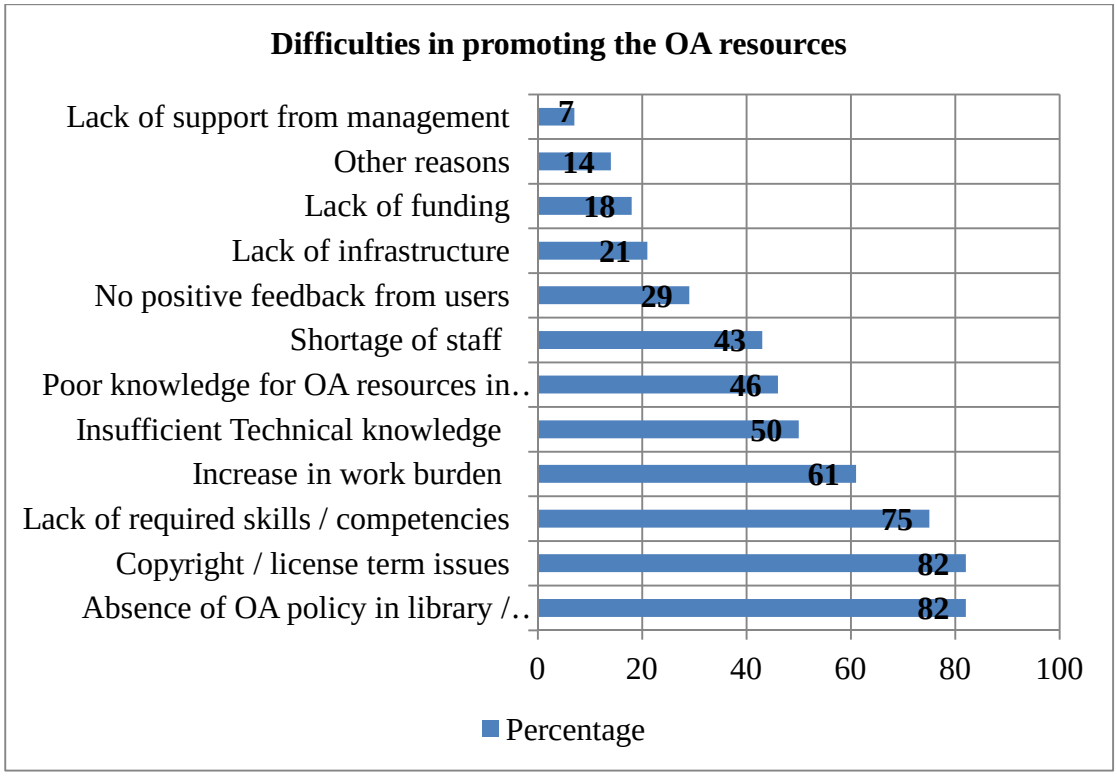
8. Indicate if you feel / face following are the difficulties in promoting the OA resources in your organization.

This is multiple choice question. This question is very important to know the reasons or difficulties faced by the librarians in promoting the OA resources in their organization. Based on the responses received for 'Yes', the data is compiled and analysed as shown in Table 4.39.

Table 4.39 Difficulties in promoting the OA resources

Sr. No.	Difficulty	Number of 'Ýes' responses	Percentage	Rank assigned
1.	Absence of OA policy in library / institutional level	23	82	1
2.	Poor knowledge for OA resources in my domain area	13	46	5
3.	Shortage of staff for providing this type of service	12	43	6
4.	Insufficient Technical knowledge	14	50	4
5.	Lack of support from management	2	7	10
6.	Lack of funding	5	18	9
7.	No positive feedback from users	8	29	7
8.	Lack of infrastructure	6	21	8
9.	Copyright / license term issues	23	82	1
10.	Lack of required skills / competencies	21	75	2
11.	Increase in work burden in view of collection development, providing information and reference services to users	17	61	3
12.	Other please specify	4	14	9

Fig. 4.48 Difficulties in promoting the OA resources



Observation:

As observed in fig. 4.47, librarians have chosen the difficulties they face while promoting OA resources. These difficulties are listed / ranked in a sequence as per the librarians' choice with comments as follows:

1. At first position, there are two prominent reasons listed by 23 (82%) librarians. These are as follows:
   i. Absence of OA policy in library / institutional level: It is observed that OA resources are being neglected as there is no policy at library / institutional level. Otherwise as per the OA policy, the librarian would have given similar weightage to OA resources like other documents in the library and could have plan the services also accordingly. A well-defined policy is helpful in carrying out the necessary activities in a proper systematic way.

      OA policy need not be for only institutional publications but also regarding publishing the research papers of faculty members / scientists in OA resources, about funding issues whenever require, recognising the OA resources in performance evaluation etc., Creating and managing IR for all types of publications related to the concerned institute. From library point of view, recognising OA resources is foremost important and accordingly like other

printed documents and electronic resources such as e-journals or databases, policies could be laid down. Moreover, there are no budgetary requirements also.

ii. Copyright / license term issues: If Copyright / license term issues are hindrance for librarians in promoting the OA resources, then it indicates that librarians themselves are not fully aware about it. As a librarian and user, knowledge about copyright / license terms is must so as to avoid any legal issues or copyright infringement. This also may be due to complicated nature of license terms sometimes which holds back the librarian in using and promoting OA resources

OA resources are free but not completely without restrictions. Author holds the Copyright of OA document. There are different types of licenses assigned to OA resources by the authors. These licenses are known as Creative Commons license. This is covered in detail in chapter 3 Open Access Resources. Based on the assigned license, the user can use the document. Hence knowledge about copyright / licenses of OA resources is must for librarians as well as users. In fact, the users use the OA resources but they may not check the license terms. Hence, librarian can guide the users by orientating them about such important aspects.

2. Lack of required skills / competencies: 21 librarians (75%) have cited lack of required skills / competencies at second rank to manage OA resources which is on higher side. Since OA resources are comparatively less familiar than other types, hence some special efforts and skills are required on part of librarian to manage them such as Internet browsing skills, metadata harvesting, Intellectual Property Rights (Copyright / license issues), advocacy skills, marketing skills etc.

   For OA resource management, technical knowledge like IR installation, management, policy development etc. is also essential if repository is to be maintained. This shows that there is need for some training programs which could help the librarians to develop the required skills / competencies in managing OA resources.

3. Increase in work burden in view of collection development, providing information and reference services to users: 17 librarians (61%) have selected this reason at third position. Like other printed and online resources, if services to be provided related to OA resources which, are also online only but requires different skills

and search strategies from collection development point of view for providing information and reference services to users. The library staff will require some training for searching, organising, cataloguing, managing and retrieving OA resources and accordingly preparing policies / strategies for carry out different activities. It is definitely time consuming activity. In addition to regular routine activities, one has to carry out OA related specialised work also on regular basis means addition of work. This also suggests that 17 librarians are not happy about the existing man-power especially professional staff as OA related activities will increase their work burden.

4. Insufficient Technical knowledge: At fourth rank, 14 librarians (50%) have quoted insufficient technical knowledge. Technical knowledge about OA resources is very much essential for library staff in order to provide necessary services. This suggests that the library professionals need specialised training for technical knowledge which will boost their confidence also. Technical knowledge may include various issues such as different types of OA resources, their features, Institutional policy development for OA resources, how and where to search OA resources, listing or cataloguing of OA resources, providing OA related services, advocacy related to OA resources to users in library orientation sessions etc.
5. Poor knowledge for OA resources in my domain area: 13 librarians (46%) have cited this reason as fifth position. Searching the OA resources relevant to users' requirements is an art. For this, library staff must know the various types of OA resources, their features and sources or Directories in which OA resources are listed, and most important is getting acquainted with specialised search engines available for the purpose. Without proper knowledge one cannot provide effective and efficient service.
6. Shortage of staff for providing this type of service: 12 (43%) librarians have quoted this reason at sixth spot. Earlier with reference to analysis of question C.4, it is observed that 12 libraries (43%) are having manpower less than 3 or 3. One library is managed by single person only. Overall, providing the specialised and value added services depends mainly on permanent library staff as they have sufficient subject knowledge, skills and experience to provide value added services if compared to other type of staff availability. This may create work load especially where man-power is an issue if compared with number of users.

7. No positive feedback from users: 8 librarians (29%) have given this reason at seventh position. Irrespective of all the hurdles, if the librarian and his staff provide specialised services to users then definitely they look forward to good positive feedback from users as encouragement to continue the activities. In absence of such positive feedback from users, the library staff must take special efforts for increasing awareness about new OA services among users through various activities such as quiz, information literacy programes or through informal discussion etc. Once users are aware then feedback may be taken periodically to see if there is any other issue due to which there is no users' feedback and accordingly necessary changes may be implemented.
8. Lack of infrastructure: At 8th rank, 6 librarians (21%) have given this reason. Infrastructure means latest technology such as latest or upgraded configured computers, Internet connection with higher and faster bandwidth for both library staff and users, library / institutional network for sharing resources, institutional / library website for marketing library services and activities, server for storage capacity, backup solutions, UPS connection if electricity supply is an issue, lack of required software for managing OA resources such as IR etc can affect the library services badly hence updated infrastructure is must. This also depends on fund availability.
9. Lack of funding: 5 librarians (18%) have cited the reason at 9th spot. As mentioned above, funding is essential for having up to date infrastructure as it helps to provide better and faster services to users. Though OA resources are free, still funding is required not only for infrastructure development but also for training to staff, marketing library activities, funding for APCs for publishing OA articles whenever required etc. For this management support is very crucial. Librarian can play an important role in convincing the authority for necessary infrastructure with its benefits so that funding is available may be in stages if not in one attempt.
10. Other reasons: Tenth difficulty quoted is by 4 (14%) librarians. Other reasons given are as follows:
    i. Users are searching OA resources on their own.
    ii. Library staff is concerned more about use and organization of available e-resources subscribed by the library.
    iii. Users are already aware of it

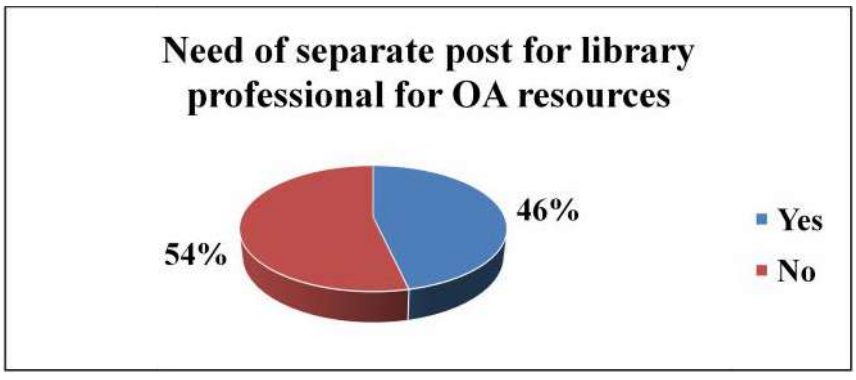
iv. Library has additional responsibility of some committees and also HR hence no time for giving more specialised services. Also use of OA resources is less than expected.

The above statements show that library staff is not concerned about OA resources on giving the pretext that users are already aware and searching on their own. But like in printed resources such as books and journals, though users are aware about such existing material it is the library staff's responsibility to acquire those resources for users. On similar basis, the library staff should also treat OA resources. Also more importance is given to subscribe resources than OA resources. Due to additional administrative responsibilities, the library staff may not be in position to do their expected jobs which is really sad and dangerous as it will hamper the library services. It may result in the duplication of research for the researcher in absence of relevant information. This can be more costly hence proper library services should be planned.

11. Lack of support from management: At last, 2 librarians (7%) have quoted this reason. Support from the management in terms of availability of funding, infrastructure development in the library, availability of required library staff, opportunities for library staff training, involvement of librarian in the institutional policy development, encouragement for work down etc, is very valuable and important. Sometimes in case of less man-power, the staff is expected to carry out the work as per regular practice or needs to give justification for the work load. This may de-motivates staff in carrying out specialised tasks.

9. Do you feel there is a need of separate post for library professional whose main duties should be concerned to open access issues and related projects?

Fig. 4.49 Need of separate post for library professional for OA resources



It is observed that 15 librarians (54%) feel that there is a need for separate post of library professional for providing OA related services where as 13 librarians (46%) doesn't feel the need as existing staff can provide OA related services also. But if analysis done earlier for questions H.1 (usage of OA resources directories used for searching OA resources), H.4 (various services related to OA resources in your library), H.8 (difficulties in promoting the OA resources) then one can easily conclude that the existing staff is not in a position for providing OA related services. If proper training is given to existing staff then only it is possible.

A need may be felt for separate post by maximum librarians due to following reasons:

- ✓ Since OA resources are increasing exponentially hence it is getting difficult to manage them and provide related services by existing staff as it is increasing work burden.
- ✓ It requires special skills and technical knowledge of various software from Installation till back up process (IR, Open data repository etc.), Metadata Harvesting (OAI-PMH), CC license types for copyright aspects, search platforms, creating subject gateways for listing the relevant OA resources, cataloguing, research data management (data acquisition, data curation, data cleaning etc.)
- ✓ The existing staff members are already burdened with other jobs
- ✓ OA resources management requires time allocation in addition of routine work on regular basis for which training, expertise is required and also needs continuous follow up and updating of knowledge of the concerned staff member.

10. Do you think there is need for a short training course for managing OA resources and providing related information services to users?

Table 4.40 Need for a short training course for managing OA resources

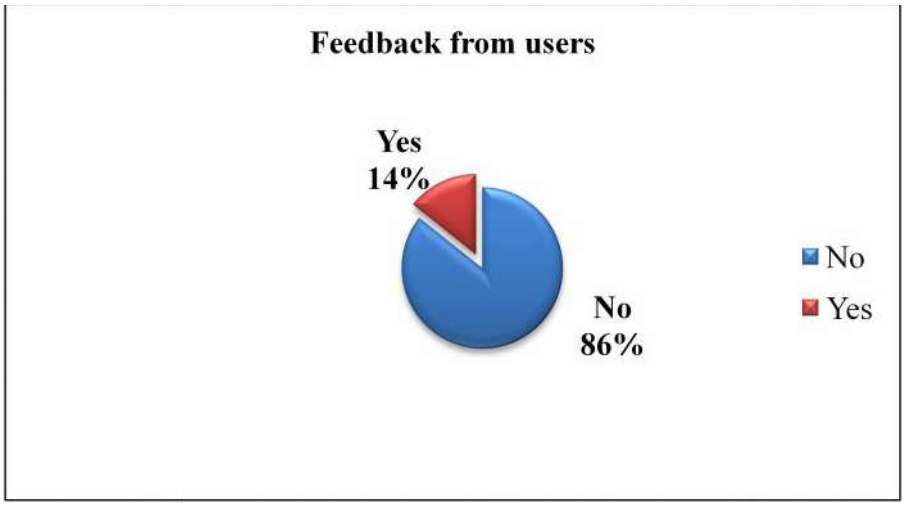
Sr. No.	Answer	No. of responses	Percent
1.	Yes	28	100
2.	No	0	0

It is observed that all 28 librarians (100%) feel that there is a need for short training course for managing OA resources and providing related information services.

This suggests that though librarians are aware about OA resources, they are guiding the users to relevant OA resources still they also agree that additional knowledge is essential considering the importance of OA resources from research point of view.

11. After promoting OA resources in your institute, have you conducted any user survey for their feedback?

Fig. 4.50 Feedback from users



It is observed that out of 28, only 4 (14%) librarians have taken feedback from users through survey after promoting OA resources where as 24 librarians (86%) did not.

11.1 If yes, please share your findings / observations:

Following are the observations shared by the librarians who have taken feedback from users:

- Users appreciated and found information related to OA resources as very useful. Users have expressed satisfaction as it could save their valuable time at some occasions.
- Users appreciated OA related information services and expect more from library with regular updates especially about OA related.
- Users have asked to search OA related sources more often and inform the users about latest developments in the relevant fields.

- Library services are appreciated but some researchers have opined that due to time constraint, they are unable to go through all resources. At the same time, some users approach library on their own for specific queries as and when require.

Summary for librarian's questionnaire:

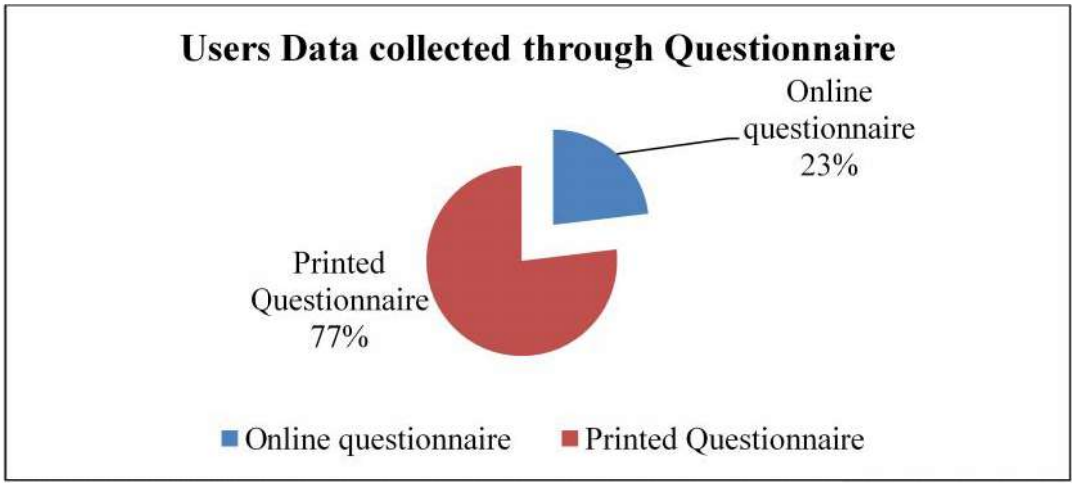
From the data analysis, it is observed that maximum librarians (96%) are aware about OA concept related to scholarly communication, At present, the librarians are doing the OA promotion as per their convenience and not as per users requirements as they felt that the users are already aware about it hence there is no need. Major concern about OA resources is quality related issues and authenticity but it is observed that evaluation of OA resources based on certain criteria is not done. Though librarians accept the role and responsibilities associated with research libraries in promoting OA resources through various activities, there are some difficulties faced by them like lack of knowledge about technical issues, copyright / license term issues, lack of required skills / competencies etc. There is no feedback mechanism in most of the libraries regarding OA related services. There are important areas where librarians can play an important role such as IR, library web-page, institutional policy regarding OA etc. When it comes to OA resources management, there are certain skills the librarians need to develop. Overall, in depth knowledge about various facets of OA resources and ways of promoting them among users through various activities and information services is required. Only then librarians will be in a better position to serve the users and can play an effective part in promoting OA resources which are important from research point of view.

Part B - Response to User's questionnaire

The researcher prepared separate questionnaire to collect the primary data from the users working in the research institutes. Researchers, i.e., library users involved in research activities were approached for data collection. Data was collected from 28 institutes, out of 32 research institutes which were found eligible for the current study. Response was not received from two institutes where as for remaining two institutes, permission was not received to conduct the survey. Total number of users in all 28 research institutes was 4266. The users were classified into three broad groups based on their position in the institute and 5% users from each institute were selected randomly as sample, based on their availability for data collection. As shown in Table 1.8, total number of users as sample was 213 out of which 130 responded, leading to a response rate of 61% .The data collected through the questionnaires is analyzed and presented in this chapter systematically.

Here the users are researchers who are working in various capacities, with emphasis on either research or academics only. To collect the primary data from all types of users, the researcher has personally visited maximum number of Institutes, especially in Pune. In few cases, where users were not available due to their busy schedules or direct contact was not possible, librarians' help was taken. An online questionnaire was also developed with the help of 'Google forms' to get maximum response. Links for online questionnaire was sent to users through emails. 30 researchers (23%) out of 130 researchers responded through an online questionnaire, while 100 researchers (77%) responded through printed questionnaire.

Fig. 4.51 Users data collected through questionnaire



Section I: General information

1. Users profile in research institutes

A. Users as per types of research institutes

Table 4.41 Users as per type of research institutes

Sr. No.	Institute Status	No. of users	Percent
1.	Government	61	47
2.	Autonomous	57	44
3.	Private	12	9
	Total	130	100.0

Observation:

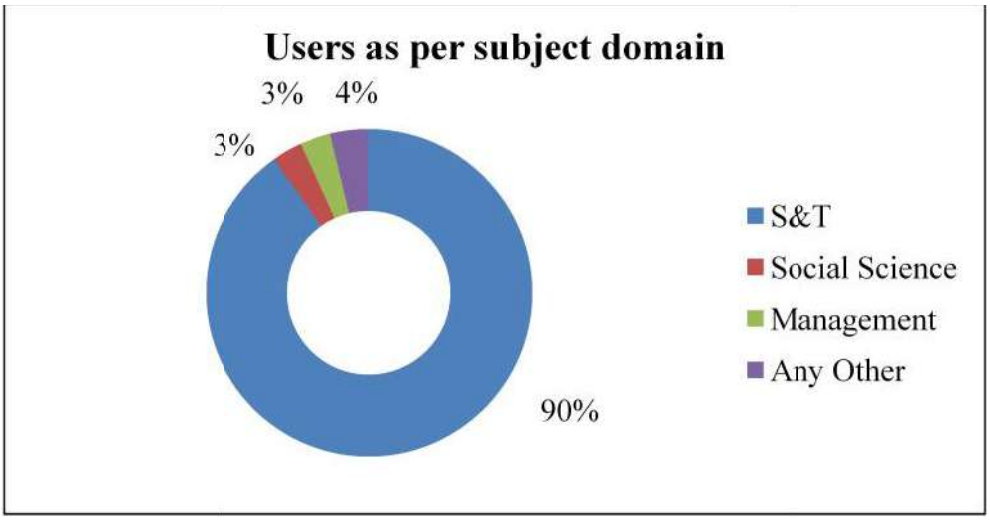
Maximum number of users (47%) is from Government funded research institutes. It is followed by autonomous institutes (44%) and Private research institutes (9%) which are lowest.

B. Users as per subject domain

Table 4.42 Users as per subject domain

Sr. No.	Subject domain	No. of Users	Percent
1.	Science & Technology	117	90
2.	Social Science	4	3
3.	Management	4	3
4.	Any Other	5	4
	Total	130	100

Fig. 4.52 Users as per subject domain



Observation:

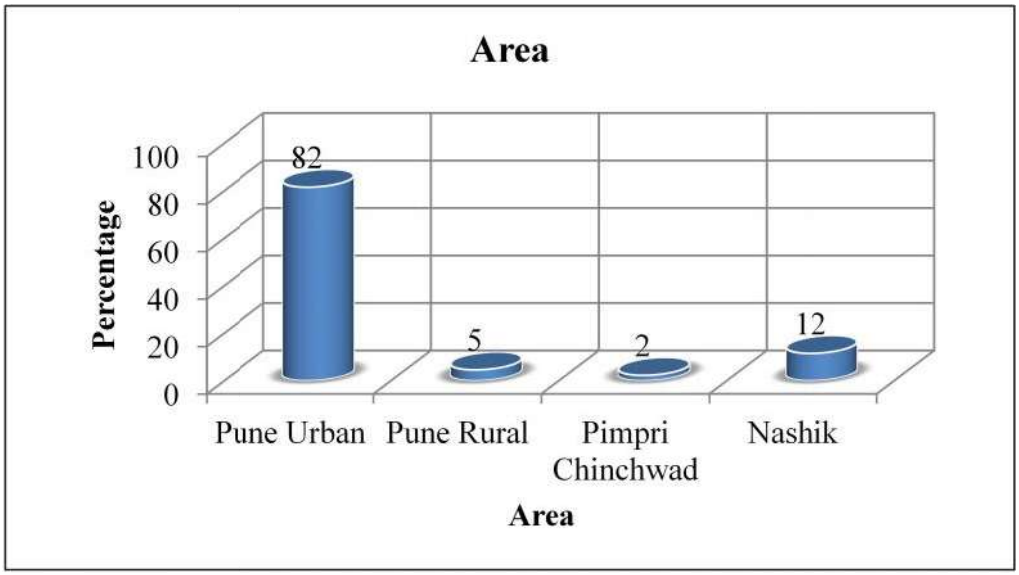
As seen in the fig. 4.52, the percentage of users from Science and Technology domain is highest (90%) followed by other domain areas (4%) which includes Arts, Commerce & Industries, Psychology etc.

C. Users as per area

Table 4.43 Users' area wise

Sr. No.	Area	No. of users	Percent
1.	Pune Urban	106	82
2.	Pune Rural	6	5
3.	Pimpri Chinchwad	3	2
4.	Nashik	15	12
	Total	130	100

Fig. 4.53 Users area wise



Observation:

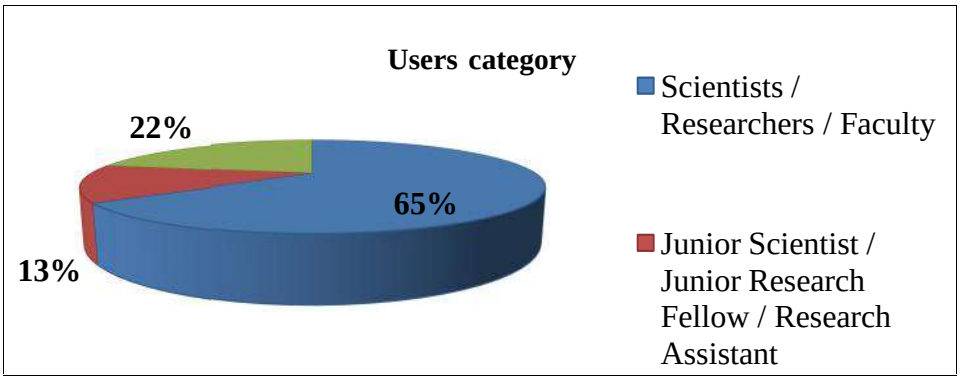
As shown in figure 4.53, the users are primarily from Pune Urban area (82%) followed by Nashik (12), Pune rural (5%) and then Pimpri Chinchwad (2%).

D. Users as per category

Table 4.44 Users as per category

Sr. No.	Users categories	No. of Responses	Percent
1.	Scientists / Researchers / Faculty	85	65
2.	Junior Scientist / Junior Research Fellow / Research Assistant	17	13
3.	PhD Students	28	22
	Total	130	100.0

Fig. 4.54 Users as per category



Observation:

The users belong to different categories in a hierarchy. In research institutions and other institutions such as management research institute, there is a difference in nomenclature. Accordingly the users groups are created as shown in Table 4.44. Some of these research institutes are also recognised Ph.D. research centres. Hence PhD students as researchers are also included in users' category.

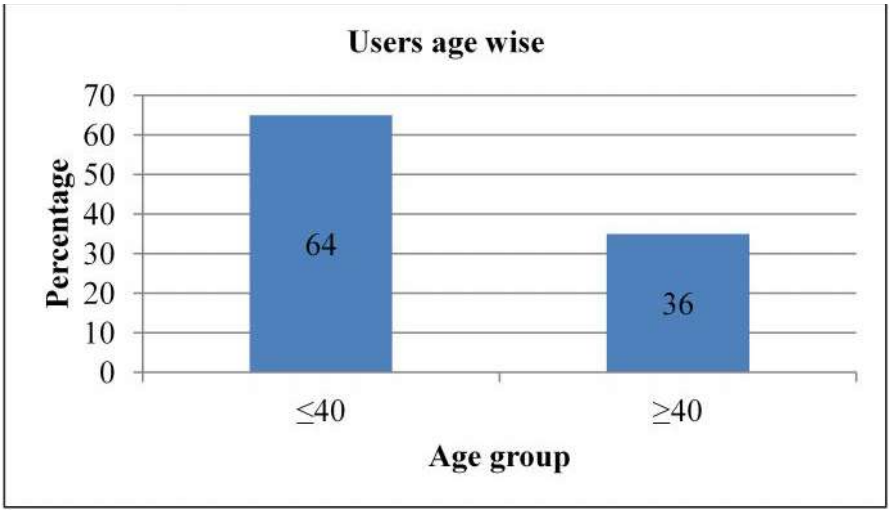
From the table 4.44 it is observed that the largest group of users (65%) who have responded is of Scientists / Researchers / Faculty members working at senior levels. These are mainly associated with research activities in the institute and use scholarly literature including OA resources for various uses. They are actively involved in publishing their research. The second category is of junior level which includes Junior Scientist / Junior Research Fellow / Research Assistant etc. They represent 13% of users. PhD students are 22% at second level. This is due to the fact that they are easily available or approachable. Though comparatively new, they use scholarly material for their research work and are also involved in publishing in journals.

E. Users Age

Table 4.45 Users – Age wise

Sr. No.	Age	No. of Responses	Percent	Cumulative Percent
1.	20-30	38	29	29
2.	31-40	46	35	64
3.	41-50	30	23	87
4.	51-60	15	12	99
5.	61 above	1	1	100.0
	Total	130	100.0	

Fig. 4.55 Users – Age wise



Observation:

The users in the age group 31 – 40 form the largest part (35%) among all users followed by users in age group 20 – 30 (29%). Both these groups consist of mostly PhD students and junior level users. From their cumulative percent, it is observed that 64% users are below 40 years of age while rest 36% are above 40 years.

Section II: OA awareness

1. **Do you know what Open Access (OA) with reference to scholarly communication is?**

Table 4.46 Users' OA Awareness

Sr. No	Users Category	Awareness about OA		Total
		Yes	No	
1.	Scientists / Researchers / Faculty	82 (96%)	3 (4%)	85
2.	Junior Scientist / Junior Research Fellow / Research Assistant	15 (88%)	2 (12%)	17
3.	PhD students	26 (93%)	2 (7%)	28
Total		123 (95%)	7 (5%)	130

It is observed that 123 users (95%) out of 130 are aware of OA concept with reference to scholarly communication as shown in Table 4.46. Only a negligible percent (5%) of users are not aware about OA concept. Creating awareness regarding importance of OA resources at an entry level is advisable.

2. **Would you like to know about Open Access (OA) with reference to scholarly communication?**

Table 4.49 Inclination to know about OA

Sr. No.	Answer	No. of Responses	Percent
1.	Yes	1	14
2.	No	6	86
	Total	7	100

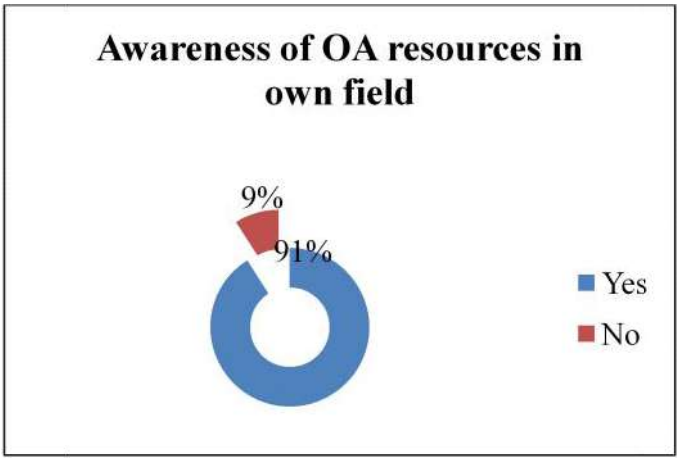
A question was specifically asked to the users who had said 'No' to earlier question II.1 whether they would like to know about OA. It is observed that out of 7 users, only one (14%) was interested to know more about OA.

3. Are you aware of any Open Access resources in your field?

Table 4.48 Awareness of any OA resources in own field

Sr. No.	Response	No. of users	Percent
1.	Yes	118	91
2.	No	12	9
	Total	130	100.0

Fig. 4.56 Awareness of OA resources in own field



Observation:

It is observed that out of 130 users, 118 (91%) know about OA resources in their respective subject domain where as 12 (9%) do not know about it.

Detailed analysis of the 12 users who are not aware about OA resources in their own field was done as shown in Table 4.49. It is found that half of them were in the age group of 31 – 40 and 42% were in age group 20 – 30 as they are new to profession. This underlines the need for librarian to disseminate information about OA resources from specific field.

Table 4.49 Age profile of users who are not aware of OA resources in own field

Sr. No	Age group	No of users	Percentage
1	20-30	5	42
2	31-40	6	50
3	41-50	1	8
	Total	12	100

4. **If yes, indicate the sources which have helped you to become aware about OA resources.**

This multiple choice question was asked to know the useful sources of information for OA resources from users' point of view.

Table 4.50 Sources to know about OA resources

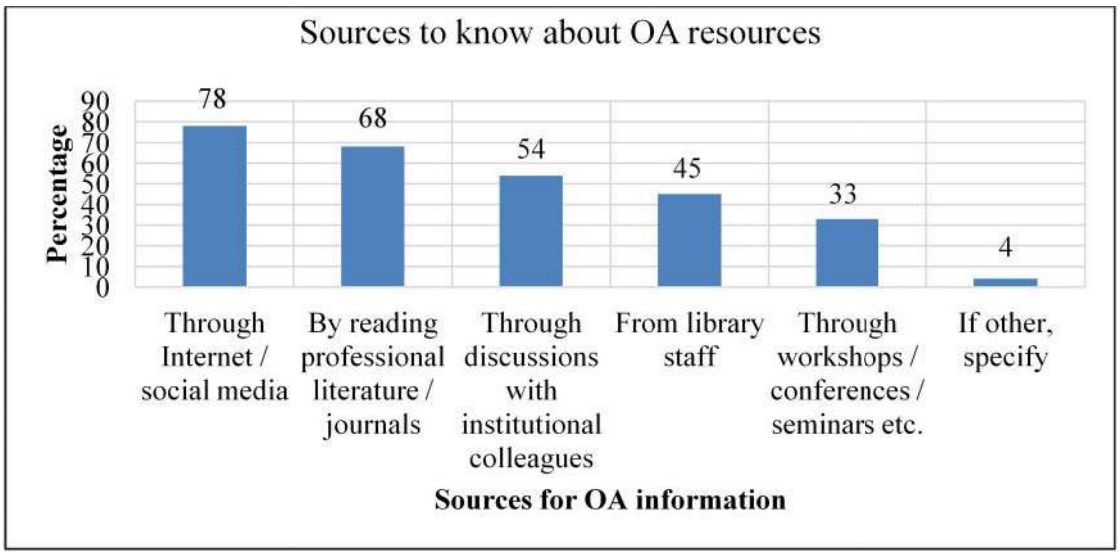
Sr. No.	Sources	Responses received	Percentage	Rank assigned
1.	Through workshops / conferences / seminars etc.	43	33	5
2.	By reading professional literature / journals	88	68	2
3.	From library staff	58	45	4
4.	Through discussions with institutional colleagues	70	54	3
5.	Through Internet / social media	101	78	1
6.	If other, specify	5	4	6

Observation:

From the data analysis, ranks are assigned to various sources that helped the users to become aware about OA resources. As per the preferences given, the ranks have been assigned as shown in table 4.50.

The data indicates that maximum users are getting information from Internet / Social media (78%) as first source of information and by reading professional literature / journals (68%) being second choice. It shows the efforts done by the researchers themselves to know more about OA resources. Third source is through discussions with institutional colleagues (54%) indicates that the researchers help each other to keep them updated regarding OA resources. Library staff contribution in knowing OA resources is at fourth rank (45%) indicating the efforts done by the library staff is not sufficient in comparison with other sources. Fifth source is through workshops / conferences / seminars (33%) and others (4%).

Fig. 4.57 Sources to know about OA resources



Other sources include the following:

1. Being editor and author of several OA publications and non-OA publications, the users get information about OA resources.
2. Users receive email invitations to write for the OA journals.
3. As an institutional policy, latest updates are received for OA resources.

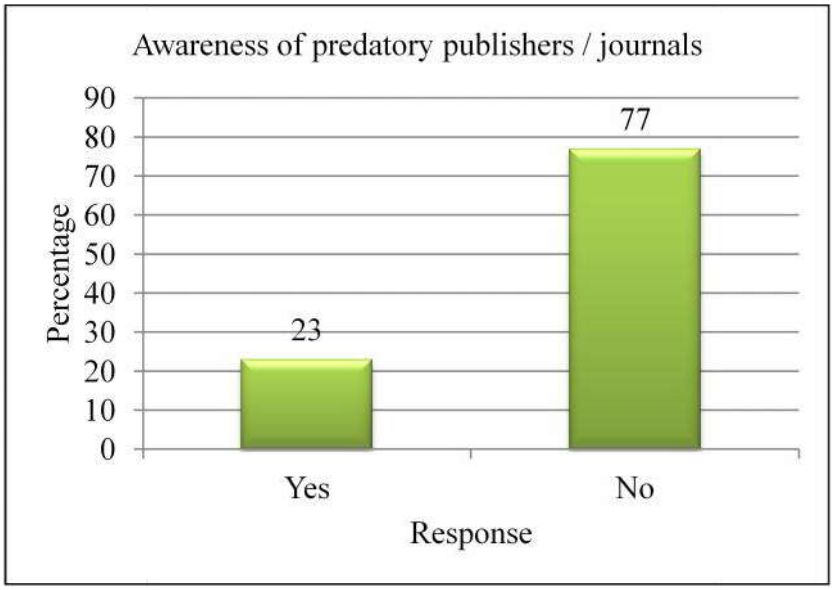
5. Are you aware of Beall's List of Predatory Publishers which lists out questionable, scholarly open-access publishers?

This question was asked to know whether the users are aware about predatory publishers and journals, a phenomenon occurred as a bad practice in publishing industry. Publishing in such journals, paying the fees for publishing the articles in such journals or even accepting the invitation received from the predatory publishers for the position of being editorial member is bad for researcher' image and waste of time. Hence it is important to know the awareness of predatory publishers / journals among researchers.

Table 4.51 Awareness of predatory publishers / journals

Sr. No.	Awareness of predatory publishers / journals	No. of Responses	Percent
1.	Yes	30	23
2.	No	100	77
	Total	130	100.0

Fig. 4.58 Awareness of predatory publishers / journals



Observation:

It is observed that only 30 (23%) researchers are aware about the existence of predatory / publishers / journals. This is a serious issue, as maximum researchers are not aware and they may accept the invitations from predatory publishers to become editorial team member, send articles for publishing with processing fees or publish their article in such journals which will not help them to reach maximum users. Apart from damaging their reputation, their efforts for publishing in good research journal will wafted.

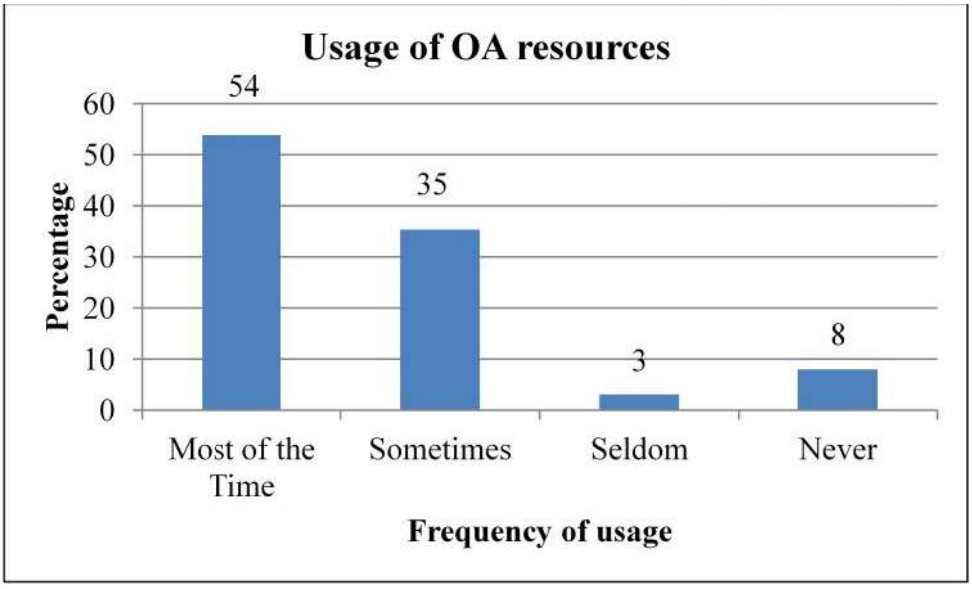
6. **How often do you use Open Access (OA) resources for research and / or educational purposes? Please put tick mark.**

Researchers were asked to give usage of OA resources by them for research and education purpose.

Table 4.52 Usage of OA resources

Sr. No.	Usage of OA resources	No. of responses	Percent	Mean
1.	Most of the Time (4)	70	54	3.35
2.	Sometimes (3)	46	35	
3.	Seldom (2)	4	3	
4.	Never (1)	10	8	
	Total	130	100.0	

Fig. 4.59 Usage of OA resources



Observation:

The data indicates that maximum users (54%) are using the OA resources most of the time, 35% are using sometimes. 3% of users showing seldom and 8% as no usage at all. This indicates denote either unawareness about OA resources or less importance is given by the users. The mean value suggests that overall usage of OA resources is sometimes.

Section III: Publishing in OA resources

This section is about various aspects related to publishing in OA resources by the researchers such as whether they have published in any OA resources or not, reason for same, choice of type of OA resource chosen etc.

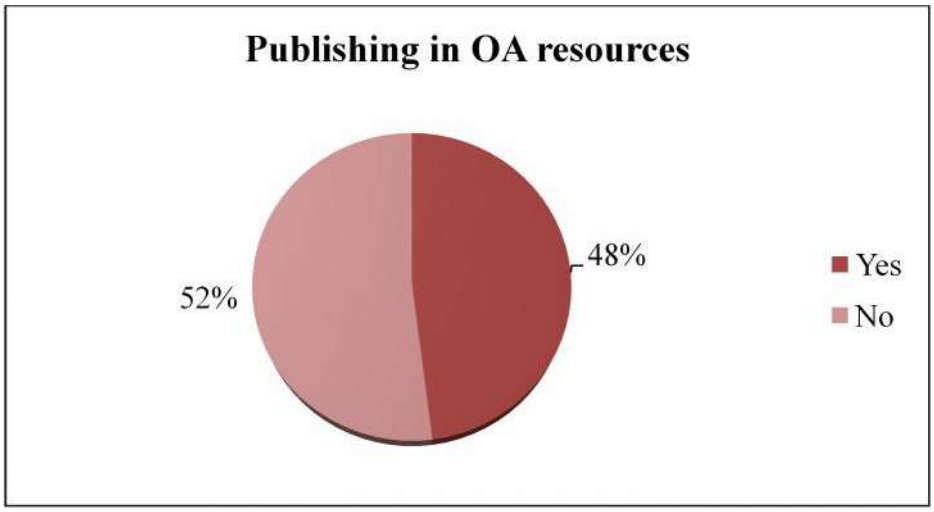
1. **Have you published paper / article / brief note / occasional paper in any open access publications?**

The users were asked whether they have published in any type of OA publication.

Table 4.53 Publishing in OA resources by users

Sr. No.	Publishing in OA resource	Responses	Percent
1.	Yes	62	48
2.	No	68	52
	Total	130	100

Fig. 4.60 Publishing in OA resources



Observation:

It is observed that 62 users (48%) have published in OA resources where as 68 users (52%) have not. Data analysis of question II.6 about 'Usage of OA resources' revealed that 89% users are using OA resources on large scale but comparatively above data reveals that only 48% users have published in OA resources. It indicates users' disinterest / reluctance when it comes to publishing in OA resources.

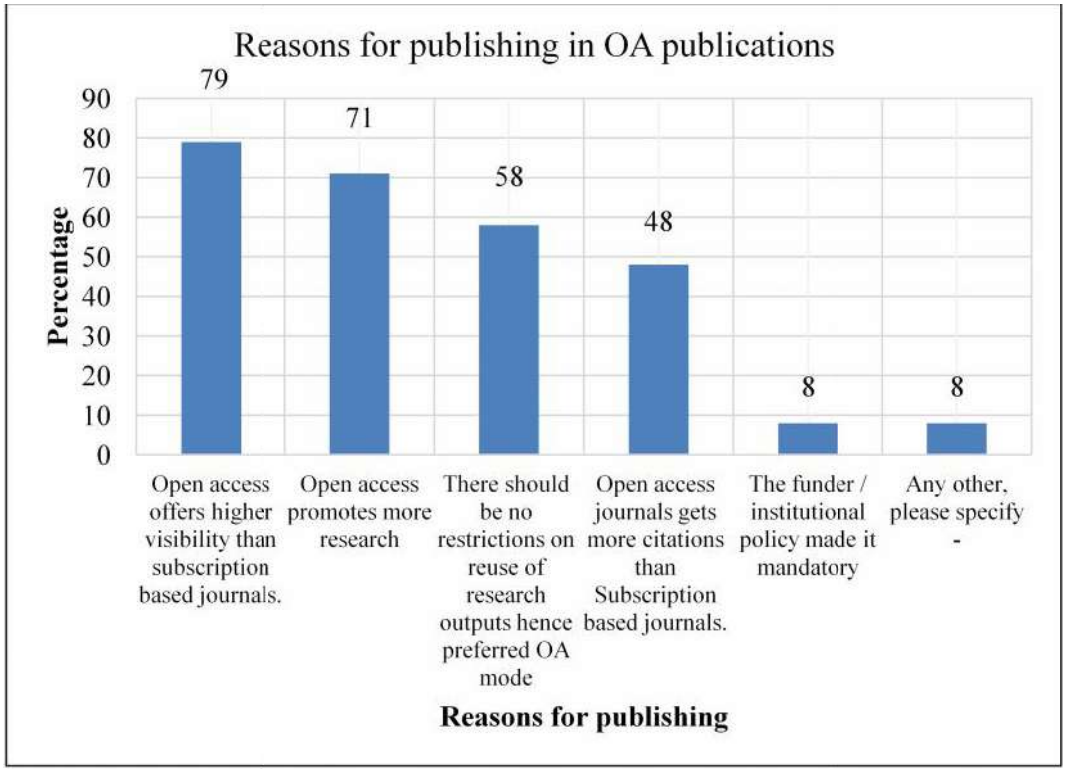
A) If 'yes', tick mark the applicable reason for it: (You may select multiple reasons)

This is a multiple choice question. Out of 130 users, 62 users who had published in any OA publication answered this question.

Table 4.54 Reasons for publishing in OA publications

Sr. No.	Reasons for Publishing	No. of Responses	Percentage
1.	Open access offers higher visibility than subscription based journals.	49	79
2.	Open access journals get more citations than Subscription based journals.	30	48
3.	Open access promotes more research	44	71
4.	There should be no restrictions on reuse of research outputs hence preferred OA mode	36	58
5.	The funder / institutional policy made it mandatory	5	8
6.	Any other, please specify -	5	8

Fig. 4.61 Reasons for publishing in OA publications for users



Observation:

As seen in Fig. 4.61, the reasons based on percentages calculated are arranged as per the users' preferences. It shows the first the topmost reason chosen by 79% users for publishing in OA resource is higher visibility since it reaches wider audience instantly. It is followed by OA promotes more research as cited by 71% users at second position and there should be no restriction on research by 58% users at third spot. At fourth rank, 48% users felt that OA publications get more citations than subscription based journals. Two reasons given at lowest level by 8% users are that they have published in OA resources due to mandating institutional policy and due to other reasons. The others reasons for publishing in OA resources given is as follows:

1. Many OA publications don't charge for publishing.
2. Got the invitation to submit an article hence published in OA journal.
3. Critical research data should be available to all.

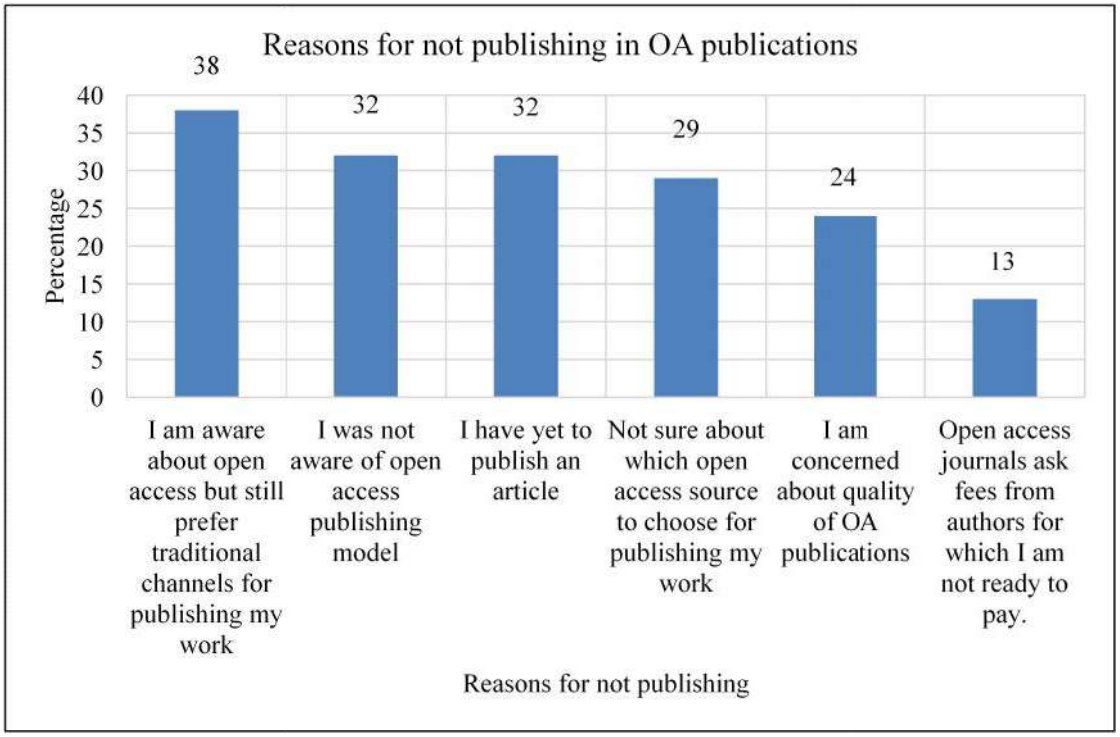
B) If 'no', then please tick mark for suitable reason/s mentioned below: (You may select multiple reasons if applicable)

This is a multiple choice question. Out of 130 users, 68 users who had responded as 'No' for earlier question III.1 were asked to give reasons for same.

Table 4.55 Reasons for not publishing in OA publications for users

Sr. No	Reason	No. of Responses	Percentage
1.	I was not aware of open access publishing model	22	32
2.	I have yet to publish an article	22	32
3.	Open access journals ask fees from authors for which I am not ready to pay.	9	13
4.	Not sure about which open access source to choose for publishing my work	20	29
5.	I am aware about open access but still prefer traditional channels for publishing my work	25	37
6.	I am concerned about quality of OA publications	16	24
7.	Any other, please specify -	1	1

Fig. 4.62 Reasons for not publishing in OA publications



Observation:

In Fig. 4.62, the reasons are arranged based on percentages calculated as per the users' preferences. It is noted that first most common reason given is that the users (38%) prefer traditional channels such as printed journals for publishing though they are aware abut OA mode. At second position, there are two reasons given by the users (33%) for not publishing in OA publications. The first reason is that they were not aware about how to publish in OA publications. The second reason given by the users is they have not published any paper so far. These users may be comparatively new to profession hence still not published any paper like PhD students or working at junior level. At third position, 29% users selected the reason that they are not sure about which OA source to choose for publishing their work. This shows that they may have quality issue related to publication or due to existence of various types of OA publications they are not able to decide about suitable source. The other reasons given are the users have concerned about quality of OA publications (24%), the users are not ready to pay the fees OA journals ask from authors (13%).

The above observations clearly indicate that all users are not aware about benefits of OA resources and OA publishing model due to which they prefer traditional journals only. The users need guidance in recognising relevant good quality OA publications

which can be their source for publishing their research output. To recognise the good quality OA publications, some criteria for evaluation are necessary especially for journals, which are most common format for publishing research outcome. This needs expertise and skills from evaluation point of view. It can be time consumed activity hence the users i.e. researchers cannot do on their own. Here the librarians can play an important role.

2. Which type of open access resources you would prefer for publishing?

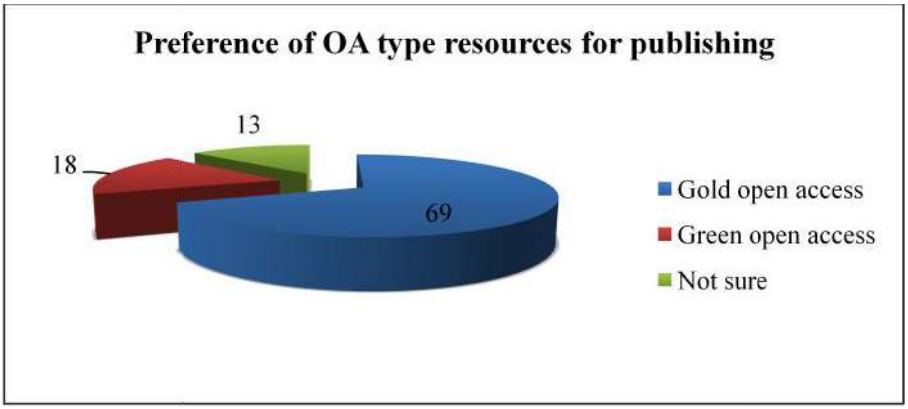
The users were asked to choose any type of OA resource for publishing. There are following basic types:

a. Gold open access: It is publishing through OA journal or hybrid OA journal
b. Green open access: It is publishing through Institutional repository / subject repository / self archiving on personal website.

Table 4.56 Preference of type of OA resources for publishing

Sr. No.	OA Type	No. of responses	Percent
1.	Gold open access	90	69
2.	Green open access	23	18
3.	Not sure	17	13
	Total	130	100.0

Fig. 4.63 Preference of OA type resources for publishing



Observation:

It is observed that 90 users (69%) opted for Gold OA whereas 23 users (18%) have chosen Green OA. 17 users (13%) are not sure about type of OA they would prefer

for publishing. This shows that the users need information about available types of OA resources in which they can publish.

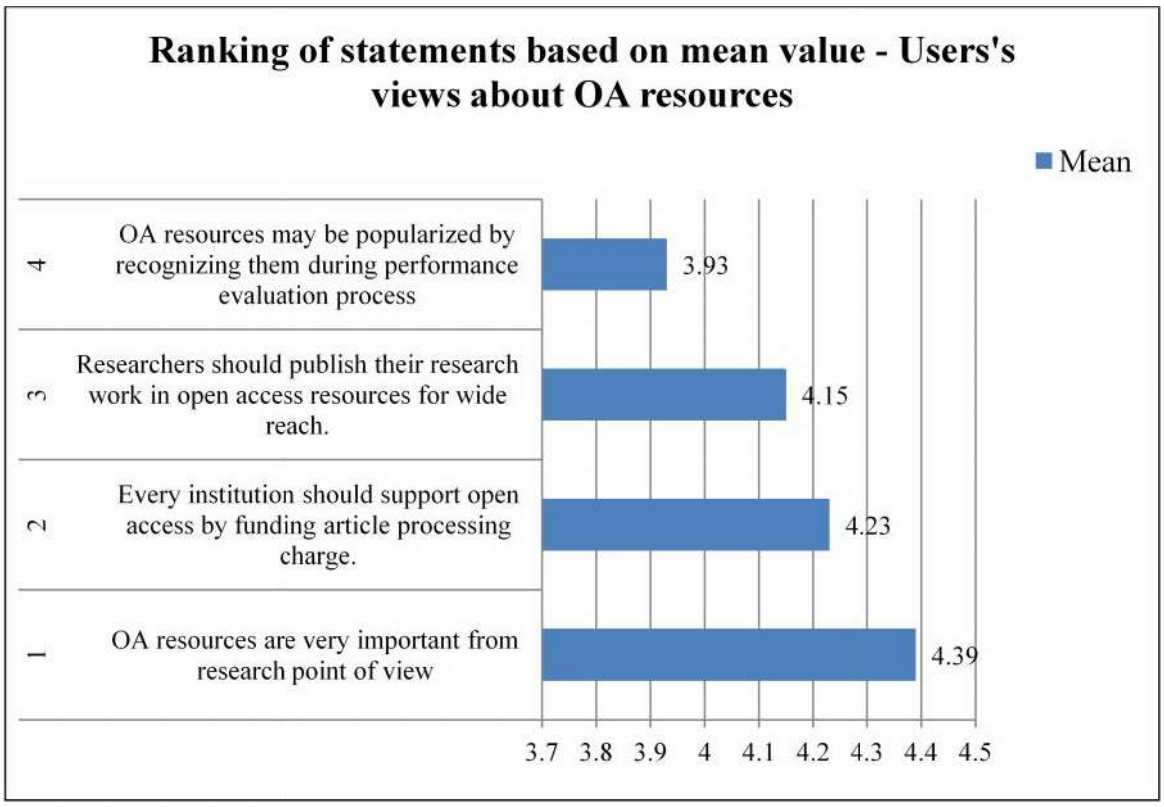
3. State your opinion about open access resources? Kindly tick mark suitable option

The users were asked to give their views about various statements about OA resources. The analysed data is tabulated in table 4.57 with ranks given based on the mean scores.

Table 4.57 Users opinions about OA resources

	Where SA= Strongly Agree; A=Agree; U = Undecided; D = Disagree; SD = Strongly Disagree							
Sr. No.	Statement	SA (5)	A (4)	U (3)	D (2)	SD (1)	Mean	Rank assigned
		No. of Responses (Percentage)						
1	OA resources are very important from research point of view	70 (54%)	48 (37%)	6 (4%)	5 (4%)	1 (1%)	4.39	1
2	Every institution should support open access by funding article processing charge.	58 (45%)	54 (42%)	12 (9%)	3 (2%)	3 (2%)	4.23	2
3	OA resources may be popularized by recognizing them during performance evaluation process	28 (22%)	78 (60%)	14 (11%)	7 (5%)	3 (2%)	3.93	4
4	Researchers should publish their research work in open access resources for wide reach.	45 (35%)	69 (53%)	8 (6%)	7 (5%)	1 (1%)	4.15	3

Fig. 4.64 Ranking of statements based on mean value - Users's views



Observation:

Based on the preferences given by the respondents, ranks have been assigned to the 4 statements based on the mean values. These statements are arranged from bottom to top as per the mean value as shown in Fig. 4.64. Following are the observations regarding users' views and the importance given to these statements related to OA resources

1) Maximum users agree (54% strongly agree and 37% agree) that OA resources are very important from research point of view. This shows that they are aware about OA resources and their benefits. 4% are undecided about it while only few users (4% disagree and 1% strongly disagree) disagree with the statement. The mean value (M = 4.39) suggests that maximum users agree with the statement.
2) Maximum users (45% strongly agree and 42% agree) feel that parent institutions should support OA by providing funds for article processing charges (APC). 9% users are undecided i.e. not sure and only few users (Total 4% from the categories of disagree and strongly disagree) are not in favour of institutional support. The mean value (M = 4.23) suggests that maximum users agree with the statement.

There are different business models based OA publications. Some do accept APC including well known commercial publishers which also publishes some articles in OA mode. If these charges are paid by parent institution, then researchers will be encouraged to publish more in OA mode. For this, institutional policy for OA is a must.

3) Maximum number of users (53% agree and 35% strongly agree) supported that researchers should publish their research work in OA resources for wide reach. 6 % users are undecided whereas few users (5% disagree and 1% strongly disagree) are not in favour of this idea. It shows that majority users have recognised the potential of OA resources in getting wider audience as compared to traditional channels like journals. It also underlines that the researchers feel that research work should be open to all. The mean value (M = 4.15) suggests that maximum users agree with the statement.
4) Maximum number of users (60% agree and 22% strongly agree) have opined that OA resources may be popularized by recognizing them during performance evaluation process. 11 % are undecided whereas few users (5% are disagree and 2% strongly disagree) are not supportive to this idea. The mean value (M = 3.93) suggests that maximum users agree with the statement.

   Since majority of users have opined earlier that OA resources are very important from research point of view hence it is expected that more and more researchers publish in OA publications. During performance evaluation, if such contribution gets more significance, then it will definitely help and motivate the researchers for further contribution there by increasing the popularity of OA resources.

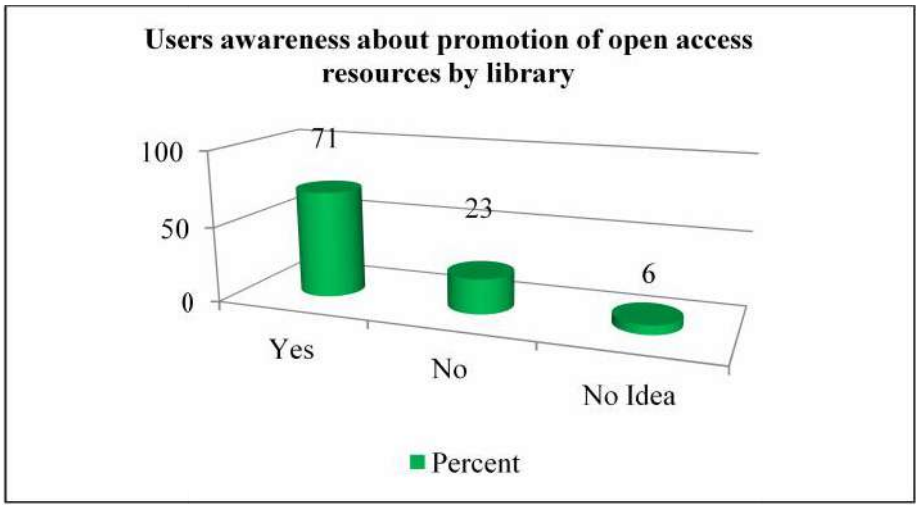
Section IV: Library OA promotion and Institutional policy for OA resources

1. **Does your library promote open access resources in your organization?**

Table 4.58 Users awareness about promotion of OA resources by library

Sr. No.	Users awareness of promotion of OA resources by library	No. of Responses	Percent
1.	Yes	92	71
2.	No	30	23
3.	No Idea	8	6
	Total	130	100.0

Fig. 4.65 Users awareness about promotion of OA resources by library



Observation:

Maximum users (71%) acknowledged that their libraries are promoting OA resources in their organization. 23% users mentioned that their libraries are not promoting OA resources while 6% have not idea about the status of OA promotion by their libraries. Though library promote OA resources, still the efforts by library are not sufficient as being most prominent source for knowing about OA resources. This is with reference to earlier analysis, where users were asked to give 'Sources which have helped them to become aware about OA resources', it is observed that only 45% users acknowledged the library for getting information about OA resources though 71% users mentioned that their libraries are promoting OA resources.

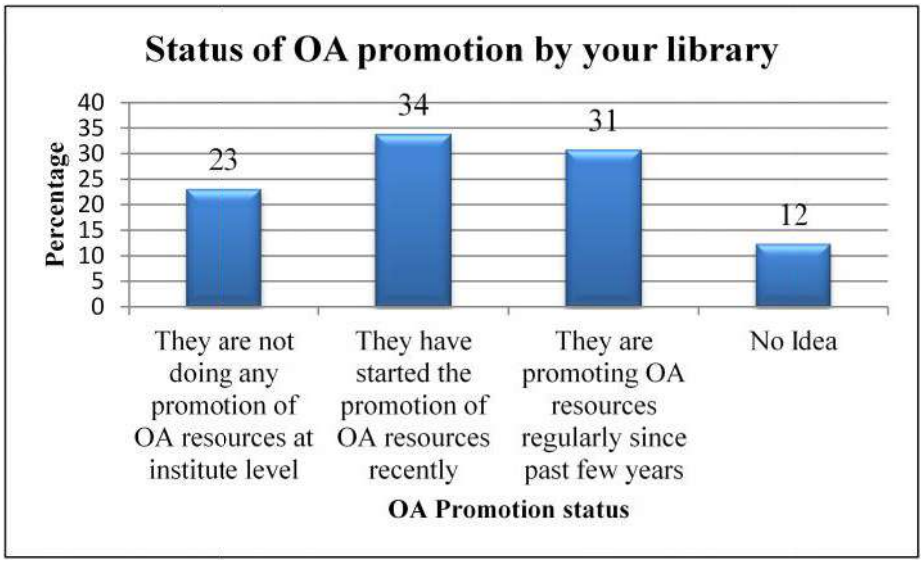
Hence it is essential that library should update all users about library services, including promotion of OA resources. It also indicates that the library needs to take more and continuous efforts to reach out to all users through orientation, training etc.

2. What according to you is the current status of OA promotion by your library?

Table 4.59 Status of OA promotion by your library

Sr. No.	Current status of OA promotion	No. of Responses	Percent
1.	They are not doing any promotion of OA resources at institute level	30	23
2.	They have started the promotion of OA resources recently	44	34
3.	They are promoting OA resources regularly since past few years	40	31
4.	No Idea	16	12
	Total	130	100.0

Fig. 4.66 Status of OA promotion by your library



Observation:

From figure 4.66, it is observed that maximum users (34%) expressed that the library have started the promotion of OA resources recently and 31% users mentioned that it is done since past few years. From cumulative percentage (45%) of other two categories it is observed that users feel that there is no OA promotion or they have no

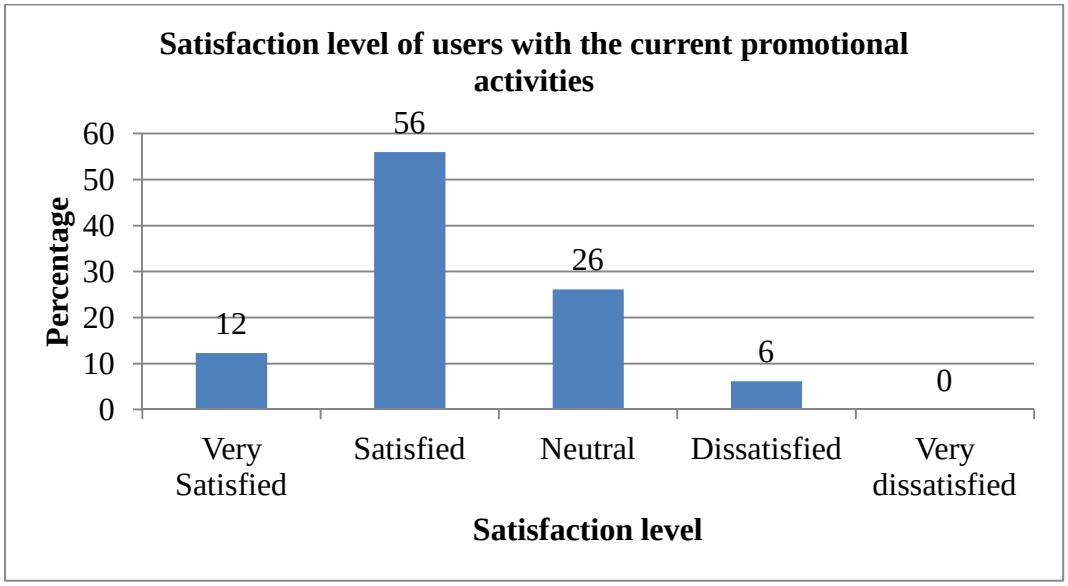
idea about it. Hence librarians need to put in more efforts on a regular basis in this aspect.

3. **What is the overall satisfaction level with the current promotional activities done by your Librarian? Kindly tick mark.**

Table 4.60 Satisfaction level with the current promotional activities of library

Sr. No.	Satisfaction level	No. of responses	Percent	Mean
1.	Very Satisfied	16	12	3.74
2.	Satisfied	72	56	
3.	Neutral	34	26	
4.	Dissatisfied	8	6	
5.	Very dissatisfied	0	0	
	Total	130	100.0	

Fig. 4.67 Satisfaction level of users with the current promotional activities



Observation:

As shown in table 4.60, maximum users (56%) are satisfied and 12% are very satisfied regarding current promotional activities by their librarians. 26 % remain

neutral while 6% are dissatisfied. The mean 3.74 suggests majority of users are satisfied.

The cumulative % of neutral and dissatisfied categories is 32% which is quite high. It shows that libraries should concentrate more on promotional aspects of library services including OA resources.

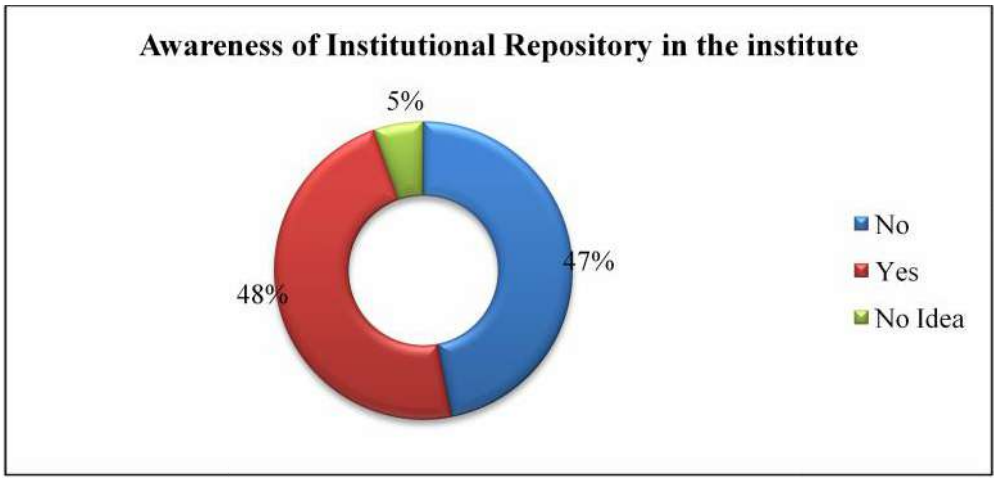
4. Do you have Institutional Repository in your institute?

The users were asked whether they have institutional repository in their institute. Here the IR is considered in digital form only.

Table 4.61 Awareness of Institutional Repository in the institute

Sr. No.	Response	No. of Responses	Percent
1.	Yes	62	48
2.	No	61	47
3.	No Idea	7	5
	Total	130	100.0

Fig. 4.68 Awareness of Institutional Repository in the institute



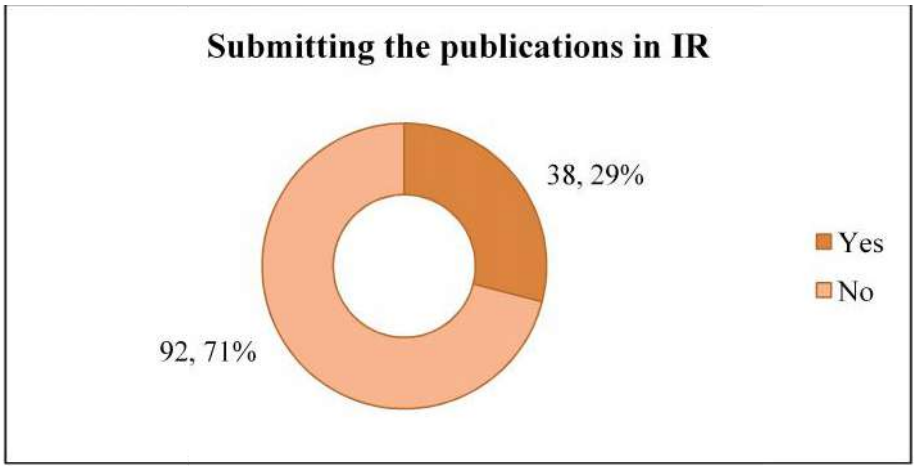
Observation:

As shown in Table 4.61, 48% users acknowledged that they have IR in their institute whereas 47% users don't have. 5% users are not aware about the status. Those users are who do not have idea about IR status (5%) need to be given library orientation.

5. **If you have Institutional Repository ready, are you submitting / providing your publications to include in it?**

The users were asked whether they submit their publications in IR if available. The data analysed is shown in Fig. 4.69.

Fig. 4.69 submitting the publications in IR



Observation:

Only 29% users are submitting in IR whereas maximum users (71%) do not submit. It indicates that users are not giving importance to IR, are ignorant of the benefits, or there is a lack of institutional policy which otherwise makes it mandatory for users to submit. The library staff can guide the users in this activity by arranging proper training and demonstration.

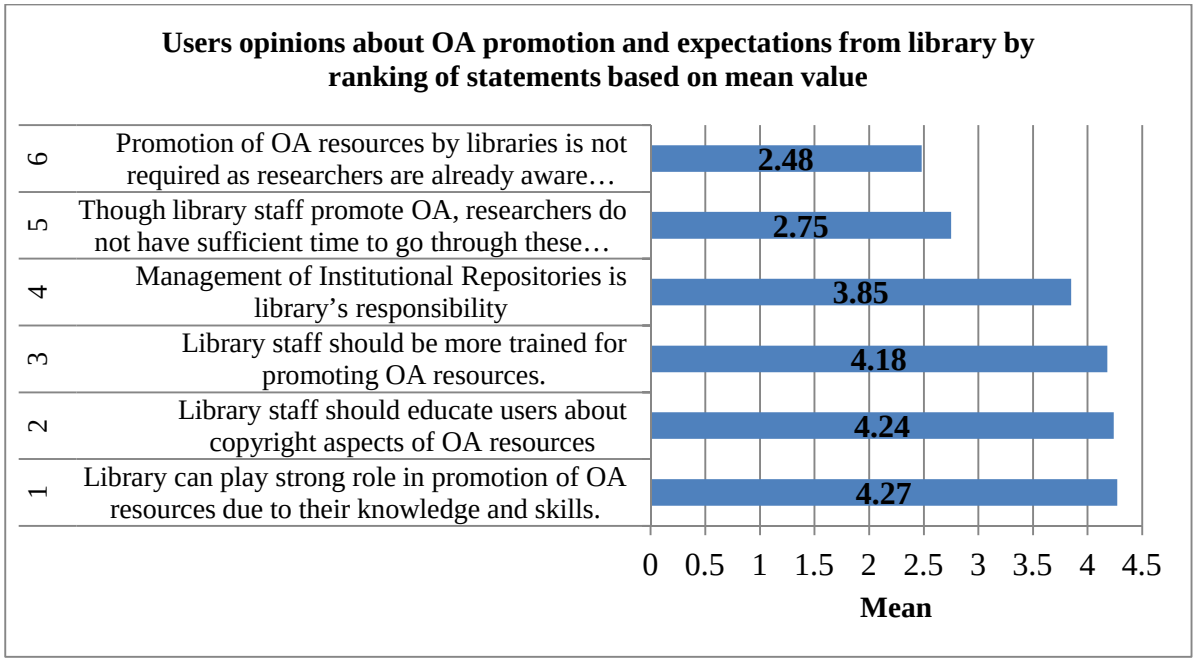
6. **State your opinion about promotion of OA resources and expectations from library staff. Kindly tick mark suitable option**

The users were asked their opinions about various statements related to promotion of OA resources and expectations from library staff. The analysed data is tabulated in table 4.62 with ranks given based on the mean scores.

Table 4.62 Users opinions about OA promotion and expectations from library

	Where SA= Strongly Agree; A=Agree; U = Undecided; D = Disagree; SD = Strongly Disagree							
Sr. No.	Statement	SA (5)	A (4)	U (3)	D (2)	SD (1)	Mean	Rank assigned
		No. of Responses (Percentage)						
1	No promotion of OA resources by libraries is required as researchers are already aware about it.	2 (2%)	35 (27%)	3 (2%)	63 (48%)	27 (21%)	2.48	6
2	Library can play strong role in promotion of OA resources due to their knowledge and skills.	48 (37%)	71 (54%)	9 (7%)	2 (2%)	0 (0%)	4.27	1
3	Management of Institutional Repositories is library's responsibility	25 (19%)	69 (53%)	30 (23%)	6 (5%)	0 (0%)	3.85	4
4	Library staff should educate users about copyright aspects of OA resources	46 (35%)	75 (58%)	3 (2%)	6 (5%)	0 (0%)	4.24	2
5	Though library staff promote OA, researchers do not have sufficient time to go through these resources	8 (6%)	45 (35%)	4 (3%)	48 (37%)	25 (19%)	2.75	5
6	Library staff should be more trained for promoting OA resources.	50 (38%)	66 (51%)	4 (3%)	8 (6%)	2 (2%)	4.18	3

Fig. 4.70 Users opinions about OA promotion and expectations from library



Observation:

Based on the preferences given by the respondents, ranks have been assigned to the six statements based on the mean values. These statements are arranged from bottom to top as per the mean value as shown in Fig. 4.70. Following are the observations regarding users' views and the importance given to these statements related to OA resources

1. Maximum users (37% strongly agree and 54% agree) believe that library can play a strong role in promotion of OA resources. 7% are undecided about it while only few users (2%) disagree with the statement. The mean value (M = 4.27) suggests that maximum users agree with the statement. This indicates that users are expecting more services related to OA resources from library because of their specialised skills and knowledge.
2. Maximum users (35% strongly agree and 58% agree) feel that library staff should educate users about copyright aspects of OA resources while 2 % are not sure. Only 5% users disagree. The mean value 4.24 suggests that maximum users agree with the statement. Librarians can arrange a workshop on this specific aspect to educate users.
3. Maximum users (38% strongly agree and 51% agree) feel that library staff should be more trained for promoting OA resources while 3 % users are not sure. The mean value 4.18 suggests that maximum users agree that library staff should be more trained for promoting OA resources. This shows that they are expecting more relevant OA related services and promotional activities from libraries which will save their time and also help them in keeping them updated with latest developments in their field of research.
4. Maximum users (19% strongly agree and 53% agree) believes that management of Institutional Repositories is library's responsibility while 23 % are not sure. Only 5% users disagree as they feel that it should be according to institute's policy or with other department like IT staff who have necessary skills. Those who are not sure are a sign that these users may not be aware about IRs and its functioning and importance. The mean value 3.85 suggests that maximum users agree with the statement.
5. Maximum users (37% disagree while 19 % strongly disagree) do not agree whereas sizable number of users (35% agree and 6% strongly agree) with the

statement that through library staff promote OA, researchers do not have sufficient time to go through these resources. 3% are not sure. The mean value 2.75 suggests that users are neutral to the statement.

It indicates that some of the users spend time to know the latest shared OA resources while some do not as they may be very busy or due to some other reasons. As library staff has to spend lot of time on new services from its planning till its managing stage, it is expected that users should use these resources and give their feedback. For this, those who are busy should be informed about relevant OA sources through Selective Dissemination of Service (SDI) so that they can make use of these sources.

6. Maximum number of users (48% disagree and 21 % strongly disagree) do not go with the statement that no promotion of OA resources by libraries is required as researchers are already aware about it. Only few users (27% agree and 2% strongly agree) support the statement and 2 % are not sure. The mean value 2.48 suggests that maximum users disagree with the statement.

   This indicates that users want libraries to promote the OA resources due to which users will come to know more about new developments about OA resources. This will also save time of users.

7. Please offer your suggestions, if any, regarding promotion of OA resources by your library staff:

The users were asked to offer suggestions regarding promotion of OA resources by library staff. The researchers gave following suggestions regarding promotion of OA resources by library staff:

1. Depending on the quality of OA resources, their importance for research can be determined. Library staff may evaluate OA resources and inform users about relevant resources.
2. Training of library staff on OA resources & its relevance in research will be useful to provide value added services to users.
3. Training of users on OA importance and its limitations will be useful.
4. Subject wise alerts may be provided by library staff to concerned faculty for OA resources.

5. Intranet and blogs can be utilised for information sharing like other services.
6. A session giving an overview of library services and new OAR could be offered once in a year.
7. All library promotions must be done through institutional website. Separate library site may not be too useful.
8. There is a need to conduct workshops, seminars more often related to OA resources for increasing awareness especially for new researchers.
9. Library staff can educate researchers about copyright acts of OA resources.
10. Library can create own blog / website for promotion of OA resources and other services.
11. Librarian should check the services of similar organizations and provide same
12. Library staff can understand issues related to copyrights of OA resources and hence will be able to educate the young researchers in the field. Also it will help the institutional management to frame policy especially related to IR which will help in publishing green OA resources.
13. While promoting OA, we need to consider monetary resources also, which may not be available with all researchers. Hence alternate funding or waiver option may be also made available for eligible researchers
14. Most of the researchers in my field publish in arxiv.org before sending it to peer reviewed journal (May not be open access). This model is desirable.
15. Libraries should keep a repository of lectures and seminars that happen in the institute, provide a web platform to publicise certain research outputs. Most of OA resources used by me, other than arxiv, are maintained by individuals (other researchers)
16. Open access should be promoted by library staff as it saves money. It is very much necessary that they should upgrade their skills and provide innovative and qualitative services which will save users time also.
17. As a scientific research library, promotion of OA resources will be beneficial for scientists, research scholars as well as for all.
18. Library in any institute can play a pivotal role in promoting research. OA resources are important to spread the research activity in scientific community. Library staff can understand the issues related to copyrights of OAR and hence will be able to educate the young researchers in the field. Also it will help the

institute management to frame policy especially related to IR which will help in publishing green OA resources.

19. OA resources should be made available by all except classified research documents.
20. Good quality of standard material is not available from libraries. Majority material is irrelevant hence librarians should check the authenticity and utility of resources for users before disseminating.
21. For promoting OA, library staff first should be trained to search and manage OA resources.
22. OA resources are very important for researchers as it helps them and society also to get access to others research work.
23. OA resources are important for research but based on quality publications. If impact factor is good then after internal assessment institutions should support OA by funding APC. Only good quality OA journals should be preferred for publishing.

Summary for users' questionnaire:

In this chapter, responses received from 130 users were analysed and presented systematically. Descriptive statistics is used for analysis purpose using excel. It is mainly observed that most of the researchers are aware about OA resources, get updates on their own through various channels, use OA resources most of the time. But when it comes to publishing their own work, they have limitations. They also expect more OA related promotional activities from library and at the same time are satisfied with the current promotional activities for overall all library services and types of publications also. They feel that library staff should be more trained for promoting OA services and educate users about latest developments taking place related to OA resources. Many have also suggested that library should promote the services through own blog / site. Maximum users have expressed that library can play strong role in promotion of OA resources due to their knowledge and skills. This shows the confidence of users and also expectations from library in promoting OA resources as they are found very useful and important from research point of view.

The next chapter is covering the findings based on the analysis done in the current chapter, suggestions and conclusion.

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Chapter 5: Findings, Suggestions and Conclusion

After the analysis and interpretation of data collected from the librarians as well as researchers / users of libraries and through the literature review done the researcher has reached to the final outcome i.e. findings. Being the last chapter, it covers the findings, suggestions and conclusions.

5.1 Findings: Based on librarian's data analysis

A. Institute's profile

1. The oldest research institute is Deccan Muslim Education and Research Institute, Pune which is established in 1915 while Lupin Research Park, a private pharmaceutical company Nande, Tal. Mulshi is the youngest research institute founded in 2001.
2. 50% of the research institutes are autonomous while 29% institutes are private research institutes. Government funded research institutes are 21% which is lowest.
3. 57% research institutes are from Science & technology area which is highest and 18% are from Management side followed by other domain areas (14%). The research institutes belonging to social science area are least (11%).
4. Majority of research institutes belong to Pune Urban area (75%) whereas from Pune rural area is 11%. Percentage of Pimpri Chinchwad and Nashik institutes are same i.e. 7%.
5. 79% research institutes are recognised as Ph.D. research centres also.

B. Profile of Librarian / Library Head

1. Majority of librarians / library heads belongs to age group 41 to 60 years. 82% libraries have library head on permanent basis. Library head on contract / temporary basis is available in 18% libraries.
2. 54% librarians are having experience of more than 20 years. Percentage of librarians having more than 10 years of experience is 86%
3. Most of these libraries are managed by well qualified professional staff. 39% librarians have post graduate degree (M. Lib. I. Sc.) whereas 21% librarians have Ph.D. and those having NET/SET along with Ph.D. are 11%. Librarians having NET/SET qualifications are 11% while librarians managing the library with graduation in library science are 18%.

C. Library profile

1. Libraries having regular timings similar to institute timings are 71 % while the percentage of libraries having extended timings beyond the normal office hours is 29%. Only 18% libraries are open on Sundays and other Holidays also.
2. Library budget varies from institute to institute with a huge difference in the range of Rs. 30,000/- to Rs 3 crore per year. The available budget was just sufficient was felt by 47% librarians whereas insufficient to meet the users' requirements by 21% librarians. 32% librarians answered that available budget is more than sufficient.
3. All libraries have special subject collection and allied areas relevant to subject domain of parent organization. As expected all libraries have printed book collection whereas printed journals are available in 89% libraries. 75% libraries have e-journals and 43% libraries have subscribed to various kinds of databases. Digitised collection is available in only 39% libraries. Other types of collection such as manuscripts, patents and circulars are available in 7% libraries. The collection size varies from 1600 to 1,62,000+. Only printed collection is available in two libraries.
4. The available manpower of research institutes is in the range of 1 to 20. 43% libraries have manpower up to 3. In one institute, librarian is working single handed where as in others institutes more than 1 are working in the library. 7% libraries are having maximum manpower i.e 10 or more. Library staff belongs to different categories such as library professionals and non-professionals (clerical or administrative staff, helpers etc.). They are appointed either on permanent basis or temporary / contract basis. 86% libraries are having library professionals as permanent staff members whereas 43% libraries also have non-professional staff on permanent basis. On contract basis, 36% libraries are having qualified library staff whereas 29% have non-professional staff on contract basis. 4% libraries also have library trainees for limited period.
5. Majority of libraries (89%) are automated and using various software such as commercial / open source software / local companies / in-house software. 7% libraries are still using excel for managing the library catalogue and one library (4%) is still managed manually.

6. Library facilities made available to users differ institute to institute. It is observed that all librarians have Internet facility in the library for staff and 93% for users. For checking, accessing and searching OA resources, internet connection is a must for all.
7. Different library services are given to the researchers by their respective research libraries. As expected the most common service in all libraries (100%) found is circulation of documents. Other types of services are special services as per users' requirements such as reference services (96%), News/ Resource Alerts (79%), CAS / SDI services (71%), bibliographic services (82%) etc. From research point of view, all these services are important but only selective libraries are giving particular services.
8. Half of the research libraries are members of consortia, due to which resource sharing is possible and also cost effective.
9. Journals are important for researchers, but due to high pricing and increase in subscription every year, the libraries have to discontinue some subscriptions. 11 libraries (39%) reported that they have discontinued the journals in last 3 years. On further analysis of these 11 libraries, it is found that 36% libraries had discontinued 1 to 5 journals while more than 15 journals are discontinued by 27% libraries. It would affect the research activities of the institute.

D. Open Access (OA) resources awareness and views

1. Regarding awareness about "OA" concept with reference to scholarly communication, 96% librarians have responded positively.
2. It is observed that through various sources librarians became aware about OA resources in which Internet / social media (86%) played most prominent role as lot of material is freely available on web. It is followed by followed by workshops / conferences / seminars (75%) as nowadays one of the themes is dedicated to various aspects of OA in such programs. 71% librarians have chosen reading professional literature / journals as 3rd preference. It indicates that efforts are being taken by the librarians for updating their knowledge.
3. While checking the views of the librarians about OA resources where 10 different statements were given, it is observed that out of 10 statements majority of librarians were agreed on 8 statements. These statements are

related to various aspects of OA resources and role of Research Libraries (RLs) associated with these resources. It shows that librarians are agreeing with eight statements

i. 92% librarians agree (M = 1.89) that research library staff should have necessary skills for managing OA resources and providing related services.

ii. 89% librarians agree (M = 1.89) that Research Libraries (RLs) should educate the users about OA resources through various activities.

iii. 89% librarians agree (M=1.86) that due to exponential growth in OA publications, there is a great need to increase awareness amongst users' community about it.

iv. 86% librarians agree (M = 1.82) that OA resources are very useful from research point of view.

v. 89% librarians approved (M = 1.82) that RLs should educate researchers about copyright issues of traditional as well as OA resources.

vi. 82% librarians agree (M=1.68) that RLs should encourage the researchers to publish their scholarly content in OA resources as it will benefit other researchers.

vii. 71% librarians agree (M=1.54) that like traditional journals, impact factor are applicable to OA journals as well.

viii. 68% librarians agree (M=1.54) that RLs should develop the OA policy of its own.

For following two statements, librarians are disagreeing with given statements:

ix. Based on mean value (M=1.14) it is observed that majority of librarians disagree that OA movement will fail in absence of active participation of all RLs.

x. The mean (M= 0.96) suggests that librarians disagree with the statement that OA publications though available online freely does not guarantee quality and accurateness. Majority librarians (36%) while percentage of those who agree and do not agree with the statement is same i.e. 32 %.

4. In view of free, online and without restrictions availability of OA resources on internet, 75% librarians opined that they can act as a solution for libraries in the situation of budgetary cuts and increasing cost of publications. This may be again related to quality and authenticity issues of OA resources.

5. Predatory / fake publishers and journals is one of the bad effects of publishing industry. It is observed that quality and accuracy of OA resources are librarian's concern. 57% respondents are not aware of Beall's list of predatory publishers. This suggests that librarians should update their knowledge about trends in publishing industry as well as it is important and also could be useful in educating users as well.

E. OA promotion

1. Directing the users to the important and useful OA resources as per their requirements is done by 86% librarians only.
2. While searching on Internet, through any search engine or specialised OA search engines, generally full text OA resources are also retrieved. 86% librarians have responded positively that they have come across OA resources relevant to the users while 14 % librarians have not. Specialised training about searching OA resources by using specialised search engines would prove useful for librarians.
3. For promotional activities, librarians are using various mediums such as print, online or events. The most preferred channel used by 96% librarians is email as it is easy and cheaper followed by informal discussions by 75% librarians. 61% librarians prefer special training sessions / workshops / information literacy programs are at third position. It is followed by library website by 57% librarians and phone by 46%). The other channels are used as per convenience of librarian depending on the event and as per requirements.
4. For library promotional work, allotted budget is helpful but it is found that 82% libraries do not it whereas only 18% libraries have allotted budget for library promotion. This suggests that more importance should be given to library promotional activities which will help in ensuring optimum utilization of library services / resources. This helps in increasing awareness among users about library's activities.
5. 21% librarians reported that they are not promoting OA resources. It is observed that:
    a. 100% librarians felt that there is no need for OA promotion as users are already aware about it

b. 14 librarians face difficulties in searching and accessing the relevant OA resources as per users' requirements.
c. 3% librarians are not convinced about quality of OA resources
d. 3% librarians felt that OA resources are not included in library collection development policy hence it is not required.

8. 71% libraries have their own library web-page whereas 29% libraries do not have. However only 57% libraries are using their website for promotional activities of library. The web-pages are in different stages. Very well developed library web-page is available in 65% libraries, 25 % libraries are having their web-page in developing stage and 10% libraries have proposed construction of the library web-page and it is at an initial stage.
9. Library staff manages or updates the library webpage in 85% libraries. For remaining librarians, training for library web-page using free websites will be helpful especially for promotional activities of OA resources in various ways. At present, other departments are managing the library web-pages.
10. No technical trained man-power / knowledge to manage the library web-page is most common reason cited by 75% librarians who don't have library web-page. Training for developing library website using free blog sites / webs-sites will be useful for librarians.
11. Users are consulting overall 64% librarians (39% sometimes or 25% very often) before publishing in any journal to know the quality. Therefore, it is necessary that librarians should evaluate the journals based on certain criteria to decide quality journals in a particular domain. They can promote publishing in OA resources among users.

F. OA Publications

1. 29% librarians have published in OA resources while 71% librarians have not published yet.
2. Reasons were asked to 29% librarians for publishing in OA resources. The most common reason cited by 75% librarians is OA promotes more research. It was followed by 63% librarians who picked up two reasons. First one is higher visibility since they are free and easy to access online, and second one is no constraints on reuse of research.

3. Similarly, 71% librarians were asked reasons for not publishing in OA resources. The most common reason given by 55% librarians is that they have yet to publish an article. It indicates that professionally librarians are lagging behind in publications. There are two reasons given by 30% librarians at second position. First is that unawareness about OA publishing model and though aware but still prefer traditional channels. This indicates that there are certain doubts or issues regarding OA resources due to which such low publication rate is observed.
4. When preference for OA type was asked for publishing their research, it is observed that 50% librarians opted for Gold OA (publishing through OA journal or hybrid OA journal) whereas Green OA (publishing through Institutional repository / subject repository / self archiving on personal website) was selected by 25% librarians. Rest 25% librarians are not sure about any of the OA type. Thus it shows that more in-depth knowledge about OA resources is required for librarians.

G. Institutional Policy about OA

1. 89% librarians do not celebrate OA Day / OA Week which is a major occasion when various activities are organised at institute levels throughout the world for increasing OA awareness among society. 11% librarians mentioned that they are celebrating. Few are celebrating few times from its inception time since 2008 whereas other institute has celebrated it every year.
2. Institutional OA policy is finalised in 7% research institutes whereas it is in developmental stage at 14% research institutes, which is a positive sign. In 64% research institutes, institutional OA policy is not developed whereas 14% librarians have responded that they do not have any idea about the status of their institutional policy. It shows that more efforts are required in formulating Institutional OA policy as it helps the researchers as guidance for publishing their research and also as basis for libraries to plan and provide information services related to OA resources.
3. 50% research institutes are publishing their research as OA resources. All 14 institutes are having their own subject / Institutional repository for OA resources. One OA journal is published by the Ministry under which the Institute is functioning and their researchers are contributing in it. Though

there are many research institutes which have also got recognition as PhD research centre, but only 21% research institutes having recognition as PhD research centres have made their theses collection and research reports collections online open. Open book is published by 7% research institute.

4. In policy development for the Institute, especially related to library, 46% librarians are involved whereas 54% librarians are not. From these 54% librarians, 67% librarians have showed their willingness to play an active role in OA policy formulation, which is a positive sign.
5. Some OA journals ask for fees from authors known as Article Processing Charges (APCs). This is also true in case of commercial publishers in case author wants to publish article in OA mode. If these fees are paid by the Institute where researcher is working then it would be great encouragement for researchers for publishing in OA resources. It is observed that OA funding is not available separately in 47% institutes whereas 39% librarians have acknowledged its availability. Authors' research fund is a part of library budget in one research institute, while it is separate fund in other institutes. 14% librarians do not have any information about this.

   Lara (2015) has observed during her study through survey that 23% of libraries help in financing OA from their materials budget, and one-third of these had established criteria for funding.
6. Promotion of OA resources in the institution is also carried out by managing institutional repository. Institutional repositories are available in 50 % institutions whereas it is in process in 7% institutes.
7. In 1999 – 2000, the first IR was established while in 2016 – 17 latest IR was set up. IR set up is done very slowly over the period of 18 years.
8. 21% institutes out of 50% have registered their IR with Registry of Open Access Repositories (ROAR). This shows that they are sharing the data with outside users. 79% institutions have not registered with ROAR. It suggests that their IR is for internal use only. This indicates that librarians should be made aware about the benefits of IRs and their registration with ROAR. They should promote them at institute level for increasing awareness so that it can be shared with outside users also.
9. 33% librarians have shown willingness in setting up IR in their institutes whereas 17% are not ready and 50% are not sure about it. This indicates that

librarians need IR related training to develop necessary skills and technical knowledge from its installation till overall management. It will enable them to perform better and confidently.

H. Services for OA resources

1. For OA resources searching, Google scholar is the most used source by librarians on regular basis. Directory of Open Access Journals (DOAJ) and Directory of Open Access Repositories (DOAR) are used sometimes while Directory of Open Access Books (DOAB), OA Theses and Dissertations and OAIster are rarely used. OA search engines and Harvard open data Dataverse are least used sources for searching. This indicates that all librarians may not be aware about availability of these options for searching.
2. Other than given sources, it is noticed that librarians are using some other resources for searching OA resources such as Pubmed (biomedical and life sciences journal literature), ADS database (Astronomy and Physics), Arxiv.org (Multidisciplinary subjects) and India's census data.
3. Regarding use of OA resources in giving various information services, it is observed that OA journals are used (M = 3.25) sometimes as most preferred source of OA type followed by OA books (M = 2.82) and Subject repositories / Institutional Repositories (M = 2.71). Rest of the OA resources such as Open Thesis and Dissertations (M=2.32), Open Source software (M = 2.25), Open Data (M=2.18), Open Educational Resources / Course Materials (M = 1.57) and OA Images (M = 1.57) are rarely used. OA videos (M = 1.29) are the least used source in providing information. Not a single OA source is used on regular basis for providing information services. It shows that librarians should be updated about these resources, their features, characteristics and sources so as to give relevant services.
4. 54% librarians are doing three major activities for promoting use of OA resources. These activities are: Listing important sources on library webpage / portal, inclusion of relevant OA resources in CAS/SDI services and through library orientation sessions / information literacy program for users. At second position, 46% librarians are doing two prominent activities for managing OA resources such as IR management and skill development for library staff. It is followed by assisting users in selecting most relevant OA source for

publishing (32% librarians), cataloguing of OA journals in their OPAC (21% librarians), and assisting in publishing the institutional publications in OA mode (18% librarians). Two activities are carried out by 14% librarians such as guiding the researchers for different types of Creative Commons / license agreements and management of institutional research data. Evaluation of OA resources by using certain criterion is done by 4% librarian. This shows that librarians may be given training about carrying out such variety of activities which will help them in promoting OA resources and also their usage.

5. Evaluation criteria for OA resources are used by 4% librarian. Evaluation of OA resources is not done by 96% librarians. Many librarians are apprehensive about quality and accuracy of OA resources as observed in the analysis of D.3.2 question. This indicates that librarians need some guidance regarding importance of evaluation so as to provide quality based services.
6. For OA journals, the librarians have given preferences to various characteristics of journals which can be used for evaluating the OA journals. Their order as per mean value obtained is relevance to subject domain (M = 1.93), peer review (M = 1.89), impact factor (M = 1.82), regularity of publication (M = 1.71), reputation of publisher (M = 1.57), ISSN (M = 1.53), presentation format (M = 1.35) and availability of features (M = 1.21). Inclusion of OA journal in DOAJ also indicates that journal is peer reviewed and having good quality. If included in global serials directory / UlrichsWeb, or printed periodical directory, it gives more value addition for OA journals in terms of quality.
7. Librarians were asked about their views regarding the skills / competencies required for OA resources management. The order of importance is: Internet browsing skills is the most preferred skills for 96% librarians' as OA resources are available online. It is followed by Intellectual Property Rights (93%), IT oriented skills (82%), metadata knowledge (79%). Other two skills preferred by 68% librarians are staff management and advocacy skills followed by Administrative skills (54%) whereas 50% librarians have selected two skills such as project management and communication Skills. The lowest preferred skills is marketing skills (43% librarians).
8. The two most prominent difficulties faced by the librarians (82%) are absence of OA policy in library / institutional level and copyright / license term issues.

Followed by lack of required skills / competencies (75%), increase in work burden in view of collection development (61%), providing information and reference services to users (61%), insufficient technical knowledge (50%), limited knowledge for OA resources in one's subject (46%), unavailability of sufficient staff for OA related services (43%) , no optimistic response from users (29%), deficiency of required infrastructure (21%), insufficient funding (18%), other reasons (14%) and dearth in management support (7%).

9. For giving services related to OA, 54% librarians opined that separate position is required for library professional having necessary skills.
10. 100% librarians acknowledged requirement for training course of short duration for OA resource management and associated information services. Despite the fact that librarians know about OA resources and referring the users to relevant OA resources, still they have aspiration for in depth knowledge about various aspects of OA resources so as to enhance their efforts in promoting OA resources.
11. After promotion of OA resources, users' feedback is taken by 14% librarians through survey while others have not. Users' feedback is vital in any promotional activity as it assists in improving next promotional activity.
12. Through users' feedback, it is observed that users appreciated and found OA information services very helpful. They expressed satisfaction as it saved their valuable time. At the same time, users anticipate more updates from library on regular basis. Users want librarians to inform them about important OA sources along with most recent development in the related areas. Some users appreciated the value added services but also opined that it is difficult to check all resources because of time constraints. Sometimes, library staff is approached by the users for specific queries as per requirement.

5.2 Findings: Based on users' data analysis

Section I: General information

1. Total 130 users responded to the questionnaire. 47% users are from Government funded research institutes followed by 44% users from autonomous institutes and 9% users are from private research institutes.

2. 90% users are from Science and Technology area which is highest. 4% users are from other domain areas while 3% users are from management and social science area each which is the smallest category.
3. 82% users are from Pune Urban area, followed by 12% users from Nashik area. Pune rural area has 5% users while Pimpri Chinchwad have 2% users which is lowest.
4. The users i.e. researchers have different nomenclature institute wise and are working in various categories. 79% institutes are having recognition as Ph.D. research centres. As PhD students are also available in these institutes hence they are also included in users' category. Maximum users i.e. 65% belong to Scientists / Researchers / Faculty category. They are working at senior levels. 22 % users are PhD students. The least number of users i.e. 13% belong to the category of Junior Scientist / Junior Research Fellow / Research Assistant etc.
5. Percentage of users having age 40 years or less is 64% while rest of the 36% users are above 40 years.

Section II: OA awareness

1. 95% users have OA awareness with reference to scholarly communication. Only 5% percent users are not aware about it. Awareness about significance of OA resources for new researchers is suggested.
2. Out of 7 users who had said that they are not aware, only one has shown interest in knowing about OA.
3. 91% users are aware about OA resources in their own subject area whereas 9% are not aware. Further analysis of these 9% users revealed that half of these users belong to age group 31 – 40 while 42% users are from age group 20 – 30 being new entrants to the profession. This shows the importance of information dissemination by the librarian about OA resources.
4. 78% users are getting information about OA resources from Internet / Social media followed by 68% users by reading professional literature / journals. 54% users have opted for discussions with institutional colleagues at third position and 45% have selected through Library staff. 33% users have picked workshops / conferences / seminars as many times one theme is dedicated to OA while 4% have selected other sources. Library's position at ^{4th} rank

indicates that more efforts are required by the library staffs in promoting OA resources.

5. 23% researchers are aware about Beall's List of Predatory Publishers. Users should be educated and warned about such bad practices in publishing industry, which can have serious impacts on their professional life.
6. 54% users are using the OA resources most of the time while 35% users are using sometimes. Seldom or no usage is marked by 11% users which denote either no knowledge about OA resources or ignorance. The mean value suggests that usage is sometimes.

Section III: Publishing in OA resources

1. 48% users have published in OA resources whereas 52% users have not. Earlier question about 'Usage of OA resources' (II.6) shown that OA resources are being used by 89% users but in comparison only 48% users have published in OA resources. It indicates users should be made aware about OA publishing.
2. 48% users who have published in OA resources were asked reasons for same. 79% users have given preference to higher visibility as most prominent reason. It is followed by 71% users who feel that OA promotes more research. 58% users responded to no restriction on research and 48% users selected more citations for OA publications than subscription based journals. 8% users opted for two reasons at lowest level which are mandating institutional policy and due to other reasons.
3. 52% users who have not published in OA resources were asked reasons for same. First most common reason given by 38% users is preference towards traditional publishing channels even after having OA awareness. Two reasons given by the 33% users at second position are unawareness about OA publishing and they have yet to publish any paper. 29% users are not sure about how to select good OA source for publishing purpose. 24% users are concerned about quality of OA publications while 13% users are against paying the author's fees.
4. 69% users opted for Gold OA whereas 18% users have chosen Green OA type for publishing their research. 13% users are not convinced about any OA type.

This suggests that users should be educated about available OA types along with their features so that they can decide the OA type for publishing.

5. It was observed that majority of users agreed about various statements given about OA resources. It shows that users are accepting the facts mentioned in these statements which are as follows:
    i. Maximum users agree (54% strongly agree and 37% agree) that OA resources are very important from research point of view. This shows that they are aware about OA resources and their benefits.
    ii. Majority of users (45% strongly agree and 42% agree) feel that parent institutions should support OA by providing funds for article processing charges (APC).
    iii. Majority of users (53% agree and 35% strongly agree) supported that researchers should publish their research work in OA resources for wide reach.
    iv. Majority of users (60% agree and 22% strongly agree) have opined that OA resources may be popularized by recognizing them during performance evaluation process.

Section IV: Library OA promotion and Institutional policy for OA resources

1. Promotion of OA resources is being done by their libraries is acknowledged by 71% users while 23% users have not acknowledged it. 6% users are clueless.
2. 34% users expressed that the library has started OA promotion recently, while 31% users revealed that it is being carried out since past few years. 23% users opined that there is no promotion of OA resources and 12% have no idea. Hence librarians should try to reach all users through various promotional programs on regular basis.
3. 56% users are satisfied with current promotional activities by librarians; whereas 12% are very satisfied. 26 % users are impartial and 6% users expressed dissatisfaction. These cumulative 32% users from last two categories suggests that more work is required by libraries in promotional aspects of OA resources.

4. Availability of IR in their institute is acknowledged by 48% users whereas 47% users said they do not have. 5% users do not have any idea about it.
5. Submission of resources in IR is done by 29% users while 71% users do not submit. This picture suggests that users are ignorant about IR benefits or there is no mandatory institutional policy for it. Librarians can guide the users through various training programs about it along with demonstration.
6. Majority of users agreed about various statements given about promotion of OA resources and expectations from library staff. It shows that users are accepting the facts mentioned in these statements which are as follows:

- Majority of users (37% strongly agree and 54% agree) believe that library can play a strong role in promotion of OA resources. This indicates that because of librarian's specialised skills and knowledge, users are expecting more services from library related to OA resources.
- Majority of users (35% strongly agree and 58% agree) feel that library staff should educate users about copyright aspects of OA resources. A workshop on this specific aspect can be arranged by librarians to educate users.
- Majority of users (38% strongly agree and 51% agree) feel that library staff should be more trained for promoting OA resources. This shows that users are expecting more relevant OA related services and promotional activities from libraries which will save their time and also help them in keeping them updated with latest developments in their field of research.
- Majority of users (19% strongly agree and 53% agree) believes that management of Institutional Repositories is library's responsibility. Thus, the libraries are expected to promote IRs in their institute.

For two statements, the findings differ as follows:

- Majority of users (37% disagree while 19 % strongly disagree) do not agree whereas sizable number of users (35% agree and 6% strongly agree) agree with the statement that through library staff promote OA, researchers do not have sufficient time to go through these resources. 3% are not sure. The mean value (M= 2.75) suggests that users are neutral to the statement. It indicates that some of the users spend time to know the latest shared OA resources while some do not as they may be very busy or due to some other reasons.

- Majority of users (48% disagree and 21 % strongly disagree) do not go with the statement that no promotion of OA resources by libraries is required as researchers are already aware about it. This indicates that users want libraries to promote the OA resources due to which users will come to know more about new developments about OA resources. This will also save time of users.

7. List of suggestions given by the users regarding promotion of OA resources is given in Chapter 4, P. 244 (Under Section IV.7)

   Based on these suggestions, and own experience of this research, following suggestions are given.

5.3 Fulfilment of objectives and hypothesis:

The objectives selected in the beginning were covered by the researcher in the present study. The objectives are completely fulfilled as per details given below.

Objectives:

1. To study the types of available open access resources and ascertain their importance in scholarly communication. This is achieved in Chapter 3 where different types of OA resources are listed along with their features and importance in scholarly communication.
2. To study librarian's awareness about 'Open Access' phenomenon. This is discussed in the Chapter 4, analysis of questions D.1; D.2 and views from question D.3 of librarian's questionnaire.
3. To study the institutional policy with respect to open access for their own publications. This objective is discussed in Chapter 4, analysis of questions G.2 , G.3 and G.3.1 of librarian's questionnaire
4. To know end users viewpoints about role of libraries in promotion of open access resources. This objective is covered in Chapter 4. Role of librarian / library in promoting use of OA resources is discussed in the analysis of question Section II.4.3, questions of Section IV. 1, 2, 3, 6 and 7 of user's questionnaire.
5. To explore librarians' role in promoting use of open access resources in their organizations and to ascertain the difficulties faced by the librarians in promoting OA resources. Librarian's role in promoting use of open access

resources is discussed in Chapter 4, under the analysis of questions D.3.3, D.3.6,- D.3.10 (Views of librarians' about OA resources related aspects), E.1, E.3, G.1, H.1, H.3, H.4, H.11. All these questions deal with librarian's role in promoting use of OA resources directly / indirectly.

The difficulties faced by the librarians in promoting OA resources is elaborated in Chapter 4, under analysis of question H.8 of librarian's questionnaire

6. To find out status of publishing in OA resources by librarian as well as users. Both the aspects are covered in Chapter 4. For librarians, it is covered in the analysis of question F.1 - A & B and F.2 of librarian's questionnaire. For users it is covered in the analysis of question III.1 – A & B, III.2 of user's questionnaire.
7. To suggest actions to be taken by librarians to promote the use/dissemination of OA resources – This is discussed in the current chapter 5, point number 5.3 and 5.4

Hypotheses Testing:

Hypothesis-I

H01(null): "Majority of librarians from research institutes are promoting use of open access resources in their own organizations"

(Majority is taken as 90% or more)

HA1 (alternate): "Majority of librarians from research institutes are not promoting use of open access resources in their own organizations"

(Proportion of librarians from research institutes promoting use of open access resources in their own organizations is significantly smaller than 90%)

Test applied: Test for Proportion at 0.05 significance level

Questions used: Librarian Questionnaire (E1) and User Questionnaire (Section IV.1)

(E1) Do you guide the users to the important and useful open access resources as per their requirement?

Table 5.1 Guidance to users for relevant OA resources

Sr. No	Response	Number of responses	Proportion
1.	Yes	24	0.857
2.	No	4	0.143
	Total	28	

Proportion Test was run. Analysis was done by keeping 5% level of significance. The p value obtained is 0.305, which is greater than significance level 0.05. Hence, null hypothesis cannot be rejected.

(Section IV.1) Does your library promote open access resources in your organization?

Table 5.2 Users awareness of promotion of OA resources by library

Sr. No.	Response	No. of responses	Proportion
1.	Yes	92	0.708
2.	No	30	0.231
3.	No Idea	8	0.061
	Total	130	

Proportion Test was run. Analysis was done by keeping 5% level of significance. The p value obtained is 0.000. Since it is smaller than significance level of 0.05, data supports rejection of null hypothesis. The proportion of respondents who feel librarian is promoting use of open access resources in their own organizations is significantly smaller than 90%.

Interpretation: - From the descriptive statistics, librarian's role in promotion of OA resources amongst the user was observed using both the questionnaires. From the frequency it has been observed that 86% of librarians replied that they guide the users for OA resources as per their requirement. When users were asked a similar question, 71% users agreed that librarians guide and promote the use of OA resources. Hence, it can be inferred that librarians promote the open access resources in their organization and guide the users with respect to OA resources as per their requirement.

However, since data shows that 30 users (23%) have responded that the library does not promote OA resources, this indicates that either the OA promotion done by the librarians is not reaching all users or that they still need to take more efforts in promoting Open Access Resources.

Result: HA1 (alternate) is accepted.

Proportion of librarians from research institutes promoting use of open access resources in their own organizations is significantly smaller than 90%

Hypothesis-II

H0: "Majority of organizations are adopting open access policies for their own publications."

(Majority is taken as 90% or more)

H1: "Majority of organizations are not adopting open access policies for their own publications."

(Proportion of organizations adopting open access policies for their own publications is significantly smaller than 90%)

Questions used: - Librarian Questionnaire G2 & G3

Test Applied: Test for Proportion at 0.05 significance level

Table 5.3 Status of institutional policy

Sr. No.	G2.00 : What is the status of your Institution's policy /guidelines regarding publishing open access resources:		
	Policy Status	**No. of responses**	**Percent**
1.	Policy is finalized as a written document	2	7
2.	Policy not yet formulated	18	64
3.	Policy is in developmental stage	4	14
4.	No idea	4	14
	Total	28	100

Based on the above table, total positive and negative responses to the question are considered and proportion is calculated:

Table 5.4 No. of responses for status of Institutional policy

Responses	No. of responses	Proportion
Total number of positive responses (Policy is finalized as a written document + Policy is in developmental stage)	6 (2+4)	0.214
Total number of negative responses (Policy not yet formulated+ No Idea)	22 (18+4)	0.786

Proportion Test was run. Analysis was done by keeping 5% level of significance. The p value obtained is 0.000. Since it is smaller than significance level of 0.05, data supports rejection of null hypothesis. The proportion of organizations adopting open access policies for their own publications is significantly smaller than 90%.

Table 5.5 OA resources publishing by Research Institute

G3.00: Does your institute publish any type of OA resources?		
Response	**No. of responses**	**Proportion**
Yes	14	0.500
No	14	0.500
Total	28	

Proportion Test was run. Analysis was done by keeping 5% level of significance. The p value obtained is 0.000. Since it is smaller than significance level of 0.05, data supports rejection of null hypothesis. The proportion of institutes publishing any type of open access resources is significantly smaller than 90%.

Interpretation: - Librarians were asked about status of their Institution's policy /guidelines regarding publishing open access resources, and responses were collected using four options. Out of 28 librarians, 2 librarians (7%) replied that Policy is finalized as a written document and 4 librarians (14%) replied that policy is in developmental stage, both of which are positive responses, giving a total of 6 (21%). 18 respondents (64%) said that policy is not yet formulated, and 4 librarians (14%) responded that they don't have any idea about it, both of which are negative responses, giving a total of 22 (78%).

Librarians were also asked whether their institutes publish any type of OA resources. 21 (75%) librarians replied that their institute does not publish any OA resources and only 7 (25%) of the librarians replied that they publish OA type resources.

Both the responses through descriptive statistics and test for proportion clearly show that research institutes are not adopting open access policies for their own publications. Data supports rejection of Null Hypothesis. Hence, majority of organizations are not adopting open access policies for their own publications.

Result: HA2 (alternate) is accepted.

Proportion of organizations adopting open access policies for their own publications is significantly smaller than 90%

Hypothesis-III

H0: "Majority of users are satisfied with the OA Promotional activities done by library staff."

(Majority is taken as 75% or more)

H1: "Majority of users are not satisfied with the OA Promotional activities done by library staff."

(Proportion of users that are satisfied with OA promotional activities done by library staff is significantly smaller than 75%)

Test: - Test for Proportion at significance level 0.05

Question used: Section IV.3 from User's Questionnaire

Table 5.6 Overall Satisfaction level of users towards promotional activities of librarians

Overall Satisfaction of Users towards Promotional Activities done by Librarians						**Total**
Response	**Very Satisfied**	**Satisfied**	**Neither Satisfied Nor Dissatisfied**	**Dissatisfied**	**Very Dissatisfied**	
Number of responses	16	72	34	8	0	130

Table 5.7 No. of responses for satisfaction of users towards promotional activities of librarians

Responses	No. of responses	Proportion
Total number of positive responses (Satisfied + Very satisfied)	88 (72+16)	0.677
Total number of negative responses (Very dissatisfied + Dissatisfied + Neither satisfied nor dissatisfied)	42 (0+8+34)	0.323

Proportion Test was run. Analysis was done by keeping 5% level of significance. The p value obtained is 0.037. Since it is smaller than significance level of 0.05, data supports rejection of null hypothesis. The proportion of users that are satisfied with OA promotional activities done by library staff is significantly smaller than 75%.

Interpretation: - Users' satisfaction with respect to promotion done by librarians for OA sources is tested. Descriptive statistics used to observe the frequencies. From the descriptive statistics it has been observed that 16 respondents said they were 'very satisfied' and 72 respondents said they were 'Satisfied', both of which are positive responses, giving a total of 88 (72+16). 34 respondents selected 'neither satisfied nor dissatisfied', 8 respondents selected 'dissatisfied', and 0 respondents chose 'very dissatisfied', leading to the total of negative responses to be 42 (34+8+0).

Though the responses through descriptive statistics show positive response (68%) to be more than negative response (32%), it is still significantly smaller than 75%, which has been taken as 'majority'. Hence, majority of users are not satisfied with the OA promotional activities done by library staff.

Result: HA3 (alternate) is accepted.

The proportion of users that are satisfied with OA promotional activities done by library staff is significantly smaller than 75%.

5.4 Suggestions:

1. **Appointment of professional librarian on permanent and full time basis:**
   Librarian is essential for providing professional library services as the quality of library services depends on it. For research libraries, appointment of full time professional librarian is highly recommended as there cannot be substitute for

same. Having a full time librarian but on contract / temporary basis also may affect the services as the person appointed may look for better options.

2. **Institutional mandate for OA policy:**

   It is recommended that all research institutes should consider adopting OA policy at institute level especially those having funding from government. Though in current research, only 50% institutes are government funded, still others may adopt the policy in view of benefits associated with OA and latest OA trends at global level. ROARMAP is a collection of such polices at various levels such as government, organizational, funder etc. which can be referred while drafting own institutional OA policy. Generally OA mandate should include various aspects such as permission for publishing in OA sources, copyright, access, license, IR activities, OA Day / Week celebrations, Funding for publishing in OA / APCs, own publications etc.

   It is observed that many of these institutes have their own priced publications. If these are not possible to make it available through OA on immediate basis still, through embargo it may be considered. And even if it is not possible due to commercial or other reason, then at least institutional policy for OA should be framed as OA policy also deals with guidelines for publishing the research papers in OA resources, funds availability as per requirement, recognition of OA publications during performance evaluation, Management of IR for institutes' publications etc.. In case of libraries, inclusion of OA resources in collection development policy is very essential so that related activities and services can be planned. Most important is that financial support is not required.

   The librarians should initiate the activity by convincing the management and researchers by educating them the global OA trends and benefits associated with it through various actions.

3. **Availability of sufficient library staff:**

   Research library being a special library, specialised services are also expected from library professionals in addition to routine activities and services. For this, sufficient professional library staff in comparison to available users is required with necessary skill sets. Other administrative work will increase the burden on Library staff which will affect their routine work. As a result, library services will get hamper. In absence of up-to-date and relevant information duplication of

research may take place which is most risky and costly hence planning of library services properly is vital.

If possible, separate library staff with necessary skills may be given the sole responsibility of OA related activities which may include planning, evaluating, managing, retrieving different types of OA resources as and when required along with promotion of OA resources. Also installation, management of required software may be done with the help of technical assistant. Training of users and also library staff on regular basis can be assigned. This is in view that there is tremendous growth is observed in OA resources hence day to day management and providing associated services by existing staff is challenging and also work burden is increasing. It requires various skills and technical understanding of different software from its installation stage till back up. (Open data repository, IR, etc.), search platforms, cataloguing (Dublin core), Metadata harvesting (OAI-PMH), copyright issues and different CC licenses, subject gateways for listing OA resources relevant to users requirements, research data management. Also it is important that one must have updated knowledge about latest OA activities at global level.

4. **Inclusion of OA resources in collection development policy of library:**

   Collection Development policy is an essential guide for librarians to develop their library collection and provide information services based on it. It is highly recommended that OA resources should be included along with other resources. Only then quality services can be provided to users. Librarians cannot neglect the OA resources as it may affect the research activities of the institute.

5. **Review of library services:**

   Once OA resources are included in collection development, then review of existing library activities and services is necessary. Accordingly, changes must be brought about to include OA resources, and roles and responsibilities of library staff may be redefined with necessary training as and when required.

6. **Skills / Competencies development:**

   Librarians need training for developing the skills / competencies for managing various OA resources. There is a need to increase more awareness about various aspects of OA resources among librarians including their searching techniques, management, organization techniques, retrieval etc. which will help them. Special training programs, workshops having hands on training session would be more

useful. At international level, there are many such training programs, workshops being organised. Even in India, efforts are made by discussing the topic in various conferences / seminars along with some workshops. More regional and local level workshops can be planned with hands on training session for library professionals, not only from research libraries, but also from other streams. The library associations at various levels may take initiative for same. List of skills / competencies mentioned in this thesis are not exhaustive, and requires more in depth study.

Cassella and Morando (2012) have suggested skills set for repository managers and staff. The main skill is to promote IR within the institution. Other skills recommended are management and communication skills, project management, collection development and metadata technical skills to deal with interoperability standards and protocols, and expertise with regard to access rights and preservation of digital content.

Schmidt, Calarco, Kuchma, and Shearer (2016) have identified essential technical skills and competencies include e.g. data visualization, text mining, metadata standards and schema, text markup and encoding, semantic web technologies important from scholarly communication and data management.

Apart from library professionals, skill development is also recommended for researchers. This is because librarians can help them in finding the relevant resources but ultimately the researchers should know how to use these OA resources to optimum utilisation for their research. Like Borrell-Damian et al. (2017) have recommended skills such as OA publishing; data management and open data; enabling professional research conduct etc. This is important since it impacts on research integrity, enabling researchers to avoid plagiarism, data manipulation, and data falsification. For Open Science, more technical skills such as data stewardship, data protection, scholarly communication and dissemination etc. are important and hence there is need for skills development for various types of information professionals such as librarians, data scientists and data stewards.

7. **Budget for library promotion:**

It is recommended that small part of library budget or institutional budget may be allocated for promotional aspects of library resources. For organising events like workshops, information literacy program, expert's lecture, quiz program, essay

writing competitions, library brochures, posters etc. especially during OA Day / Week celebration every year. Budget may be allocated for library website separately so as to provide various OA related services. In absence of separate budget, it is recommended that librarians must think other options such as free sites / blogs for creating library website, use of social media in reaching out to users, including emails, as and when required.

8. **Support from management:**

   The management support is vital for various activities such as funding for updating the IT infrastructure, promotion activities of library, training of library staff for OA related activities as and when required, availability of sufficient professional staff etc. Developing institutional OA policy for researchers as encouragement for publishing in OA resources, recognising them in performance appraisal, along with funding for Article Processing Charges is very much essential. Publishing institutional publications in OA mode will be greatest contribution from any research institute.

9. **By advocating users:**

   Through advocacy skills, librarians should educate the users to utilize OA resources for research, teaching, training and education purpose.

10. **Inclusion and wide coverage for OA resources in M.Lib.I.Sc. syllabus**:

    It is suggested that as part of M.Lib.I.Sc. syllabus, more weightage may be given to OA resources, their importance, types, CC Licences, management, related services, promotional aspects, software for managing OA resources etc. This will benefit new entrants in the library profession.

11. **Updating knowledge for OA:**

    Library staff should always keep themselves updated with latest and future predictions related to OA so that they can plan their services, change their OA promotional strategies as and when require and also keep the users updated with interesting facts and figures about benefits of OA due to which users will be interested in it.

12. **Infrastructure Development:**

    It is necessary that library infrastructure should be a state of the art infrastructure. Latest upgraded computers, server with higher storage capacity, backup solutions, increased bandwidth, faster Internet connection for all users and library staff is must. For resource sharing, library / institutional network is important.

Institutional / library website is necessary for promoting library services and activities. UPS connection is required if electricity supply is an issue. Suitable software is necessary OA resources management like for IR or managing open data etc.

13. **Use of library website for OA promotion:**

    Planning and creating a library web-page / web-site with a separate menu for listing relevant OA resources can be planned. To attract users on regular basis, some interesting news / data pertaining to OA may be shared on regular basis. Intranet site is having limitations since users can not access it outside campus. New announcements for promotion can be shared easily with users and also feedback from users is possible through library website.

14. **Use of Open Source tools / software**:

    For OA promotion, use of available open source tools / software is recommended. For single operation, multiple options are available so one must study their features, software updates over a period of time, installation and preservation requirements, availability of user groups in case of difficulty etc. Based on the institutional requirement one can opt for suitable software. For e.g. IR (Dspace, Greenstone, Fedora, Eprints etc.), Open Source Journal for publishing OA journal (Open Journal System (OJS), Libero, Journal Management System (JMS), Journal of Open Source Software (JOSS)) etc., Research data management (CKAN, DKAC, Dataverse, Swirrl etc.) This requires technical knowledge hence support form IT staff would be helpful.

15. **Digital Preservation:**

    The librarians should ensure the long term access for digital content for users in view of constant evolving ICT technologies. This may result into data loss because of digital dependencies and obsolescence related issues, which should be checked and tackled as and when new or upgraded software are available. The only solution is data migration to new platforms, provided access to file formats is available. For this, from beginning of the use of any application, the librarian must check and verify the standards followed in particular application. According to Prasad and Madalli (2007) the categories of standards that directly have a bearing on OA are - file formats, digital Preservation Standards, Metadata and data standards, Technical and Information Architecture standards, Interoperability standards , Encoding Standards and Network Protocols and standards

16. **Removing unwanted OA resources**:

OA resources which are out dated or no longer available due to inactive hyperlinks or technical difficulties should be removed by the librarians like weeding out process used for other resources.

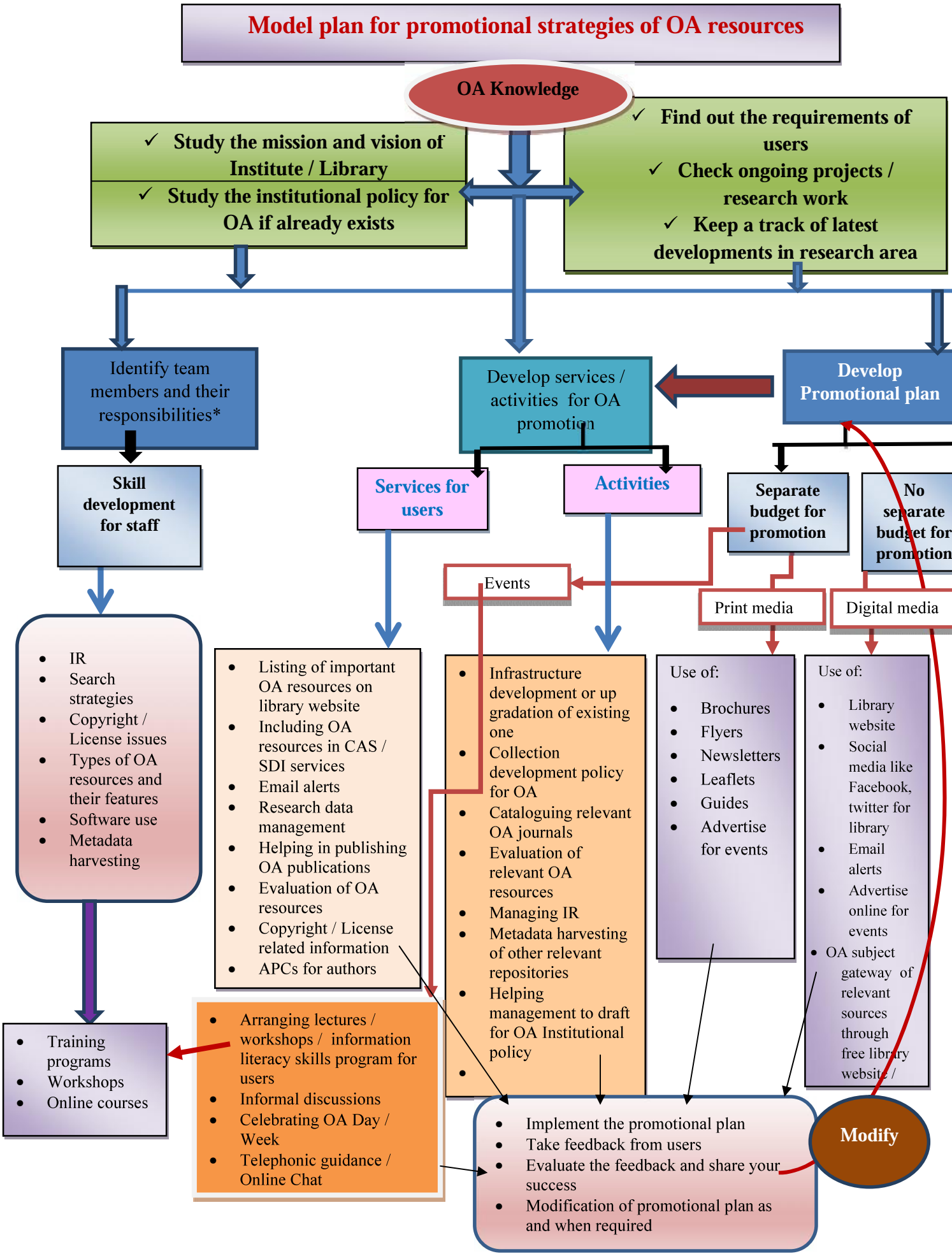
17. Inclusion of Specific programs for Research Libraries at association level:

In India at present there is no separate association for research libraries. But since research libraries are special libraries, it is proposed that separate section for research libraries may be created by Indian Association of Special Libraries and Information Centres (IASLIC). In IASCLIC, at present four types of libraries are covered under sections (Indian Association of Special Libraries and Information Centres (n. d.) such as Academic Library, Public Library, Government Library or Corporate library. As found in the current study, there is a vast difference in the status of research libraries in terms of facilities, automation, services offered, budget, staff , collection etc.. Considering the importance of research libraries, their development in proper systematic way is essential for which standardised practices should be followed irrespective of the nature of their parent organization i.e. Government, private or autonomous. Thus at association level, there is a need for discussing various issues related to research libraries for ensuring development of best practices, standards etc to tackle upcoming challenges.

18. Promotional plan for OA resources:

Based on the findings of current study and literature review, the researcher has devised a model plan for promotional strategies of OA resources as shown in Fig. 5.1

Fig. 5.1 Model plan for promotional strategies of OA resources



5.5 Model plan for promoting OA resources for librarians

The researcher has suggested the model plan for library promotion especially for OA resources as shown in fig. 5.1.

Suggestions

1. Following suggestions are made to improve the quality of promotional activities of libraries for OA resources. Before starting the OA resources promotion, initial preparation is also important for the success later on. These activities are recommended accordingly for both librarian as well as library staff.
2. It is important that one must know the following at initial stage:
   I. The vision and mission of parent organization and also library.
   II. If already institutional OA policy is developed then library staff should be aware of it and know their role and responsibilities which will help from planning stage till delivering information services related to OA resources.
   III. It is also important that library staff should be aware of users' requirements which can be found out through informal discussions or through feedback.
   IV. By keeping an eye on current projects, new announcements, annual reports, other institutional publications etc. to know current status as well as future requirements can be identified.
3. OA Knowledge development:
   I. At initial stage, learning about OA phenomenon with respect to scholarly communication, OA Movement, their benefits, different types of OA resources and their importance and features, sources on internet, search engines for OA resources, CC licenses etc. is recommended. This can be done through literature review at personal level, internet searching or through attending various training programs / workshops / conferences.
   II. Self practice / hands on training are recommended for librarian, which will help in developing necessary understanding and skills.
   III. Important OA sources relevant to users' requirements may be compiled and shared through library blog / website.
   IV. Listing important websites which are related to OA related activities, such as, Organizations involved in increasing OA awareness (e.g. SPARC), OA publishers (e.g. Open Access Scholarly Publishers Association), OA

Directories (e.g. DOAJ, DOAB), Institutional Repositories of similar organizations in same subject domain, Subject repositories (e.g. Arxiv.org), finding important and relevant sites for OA resources such as OA journals, OA books, OERs, Open Thesis, etc. This will be helpful to know latest developments and future trends through announcements made / news shared on these websites.

4. In case, institutional OA policy is not in place, then through some expert's lecture or presentations users as well as management may be informed about the requirement, importance and benefits of Institutional OA policy.
5. As per library staff availability, it is important that everyone is associated with OA promotion work. Roles and responsibilities may be assigned accordingly.
6. Based on the job profile and responsibilities, necessary training for skill development may be arranged from time to time through training programs / workshops / online courses.
7. Various library services and activities can be planned as shown in the model and these can be improved over a period of time as per feedback received from users.
8. As per situation requirement and budget availability, OA promotional plan may be designed.
9. In case budget is available, print media such as brochures, guides, newsletters may be used for sharing any latest OA related updates / services or events such as training programs / workshops / information literacy program may be arranged. In absence of separate budget, use of digital media i.e. use of library website / social media can be planned effectively as nowadays users are tech savvy and can be reached individually, in no time.
10. After implementing the promotional plan, it is very important to take users feedback, its evaluation, its success points and sharing them with users. The drawbacks may be studied and modifications can be planned as and when required.
11. More important is that similar cycle of activities can be planned for other services also in addition to OA promotions. The success will depend on the activities based on which various services may be planned as these are vital. Hence listing them separately with importance is essential.

5.6 Suggestions for further research

The current study is about the views of librarians and researchers along with their usage and publishing preference for OA resources from research institutes in Pune. Similarly following studies if undertaken will be useful to know various aspects related to OA resources:

1) Status of OA Awareness and usage of OA resources by users in educational institutes with special emphasis on Open Educational Resources / free course materials
2) Study of publication policies of commercial publishers vs. leaned societies at national and international level
3) Study of OA Institutional policy of well known national level institutes with emphasis on OA publishing of their own publications
4) Study of skills / competencies required for library professionals for OA resource management.

5.7 Conclusion

The aim of the study was to find out librarian's role in promoting OA resources in research institutes recognised by University of Pune. In order to understand how far libraries have succeeded in this role, data was also collected from a sample of researchers/users from these institutes. They were asked to give their views about OA resources and OA promotion done by their library, and their expectations. Accordingly data collected from 28 librarians and 130 users were analysed and studied.

OA Movement is catching up at global level with involvement of various stake holders. As a result, it is definitely going to impact the libraries and librarians from collection development stage to providing various information services to users. It is essential that librarians develop various skills / competencies required for OA resources management, also in view of technological advancement. They should pro-actively take part in various OA promotional activities in libraries using various channels as per requirement depending on budget availability to increase OA awareness among users especially new researchers. Librarians must ensure that library infrastructure is updated. Knowledge of library staff must be updated with

latest happenings pertaining to technology, publishing and OA in general. Management support is also crucial for librarians in a variety of ways and especially in developing institutional OA mandate as guidance for both, researchers and librarians.

Users are also expecting various services from research libraries due to their skills in information searching and management. They expect the librarians to educate the users about various aspects such as OA, its importance, copyright issues, limitations, etc., They should also provide relevant OA resources updates after evaluating for their quality and authenticity. Users also suggest that librarians must get training and update their skills to provide innovative services, which will save user's time as well.

The outcome of the current study is helpful for library professionals not only from research libraries, but also other libraries for developing their library collection by inclusion of various types of OA resources, by introducing OA related activities, using various promotional methods for OA resources, etc. This study has also highlighted that there is a need for evaluating OA resources by librarians so as to include only good quality OA resources.

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Appendix 1

List of eligible institutes from where data was collected

Sr. No.	Pune Urban	Institute Code
1.	Central Water and Power Research Station	CWPRS
2.	Deccan Muslim Education and Research Institute, Pune - 1	Deccan
3.	Dnyana Prabodhini's Institute of Psychology, Pune -30	IPD
4.	General Observatories (Climatology and Geophysics), Shivajinagar, Pune 5	GO
5.	High Energy Materials Research Laboratory	HEMRL
6.	Hirabai Kowasji Jehangir Medical Research Institute, Old Bldg., Ground Floor, Jehangir Hospitl, 31-A, Sassoon Road, Pune - 2	HKJMRI
7.	Indian Institute of Education's Centre for Educational Studies, Kothrud Pune -29	IIE
8.	Indian Institute of Tropical Meteorology, Pashan Pune - 8	IITM
9.	Inter-University Centre for Astronomy and Astrophysics (IUCAA), Pune -7	IUCAA
10.	MAEER's MIT School of Management	MIT
11.	Maharashtra Association for the Cultivation of Science, Agharkar Research Institute Pune -4	ARI
12.	Maratha Chamber of Commerce & Industries	MCCIA
13.	MES' Institute of Management and Career Courses (IMCC), Kothrud Pune 411029	IMCC
14.	National Centre for Cell Science	NCCS
15.	National Centre for Radio Astrophysics (NCRA) - TIFR, Pune -7	NCRA
16.	National Chemical Laboratory, Pashan, Pune 8	NCL
17.	National Institute of Bank Management	NIBM
18.	National Institute of Virology, Pune - 1	NIV
19.	National Insurance Academy, Balewadi, Pune - 45	NIA
20.	Serum Institute of Indian Research Foundation, Hadapsar, Pune -28	SIIRF
21.	Vaikunth Mehta National Institute of Co-operative Management Pune 7	VAMNICOM

Sr. No.	Pimpri - Chinchwad	Institute Code
22.	National Aids Research Institute, Bosari, Pune - 26	NARI
23.	P. E. Society Institute of Management, Nigdi, Pune	PEIM
Sr. No.	**Pune Rural**	**Institute Code**
24.	Kaivalyadham Shriman Madhava Yoga Mandir Samiti, Lonavala - 410403	KSMYM
25.	Lupin Research Park, Nande, Tal. Mulshi	LRP
26.	Vasantdada Sugar Institute, Manjari (Bk.) - 412307	VSI
Sr. No.	**Nashik District**	**Institute Code**
27.	K.K. Wagh Institute of Engineering Education and Research, Panchavati, Nashik	KKWAGH
28.	MVPS Institute of Management, Research and Technology, Nashik	MIMRT

Appendix 2

List of ineligible research institutes

Part A	**Reason - No professional full time librarian / Vacant post**	
Sr. No.	Area	Research Institute
1.	Ahmednagar	Ahmednagar District Comprehensive Rural Development Foundation, Ahmednagar
2.		Watershed Organization Trust's Paryavaran, Ahmednagar
3.	Nashik	G.E.S. Hindi Research Centre, Nashik
4.	Pimpri-Chinchwad	Bahujan Improvement Trust's Indian Institute of Buddhist Studies, Thergaon, Pune -33
5.	Pune Rural	Dr Shri Balaji Tambe Health Foundation Atma Santulan Village, Karla 410405
6.		Lonavala Yoga Institute, Lonavala
7.		Vidya Pratishthan's School of Biotechnology, Baramati
8.	Pune Urban	Adivasi Research and Education Institute, Pune - 1
9.		Aikya Bharati Research Institute, Ghole Road, Pune - 4
10.		APT Research Foundation, Vadgaon (Kh) Pune41
11.		Armament Central Training Institute (CQA), Kirkee, Pune - 3
12.		Botanical Survey of India Pune - 1
13.		Central Bee Research & Training Institute
14.		Centre for Materials for Electronic Technology, Pashan Pune - 8
15.		Centre for Rheumatic Diseases, Camp, Pune -1
16.		Chest Research Foundation, Vadgoan Sheri, Marie Gold, Kalyaninagar, Pune 14
17.		College of Military Engineering, Dapodi, Pune -31
18.		Indian Drugs Research Association and Laboratory, Pune -5
19.		Janseva Foundation, Indulal Complex, Lal Banahadur Shastri Marg, Pune - 30
20.		Kamayani Prashikshan & Research Centre
21.		Maharshi Karve Stree Shikshan Santha's Women Study Centre, Karvenagar Pune 52
22.		Regional Research Institute, Pune 38
23.		Research Institute for Orthopaedics, Hardikar Hospital, Pune -5
24.		Sant Dyaneshwar Medical Education Research Centre, Pune 30
25.		Shram Seva Nyas, Pune

Part B	Reason - Institutions closed now	
Sr. No.	**Area**	**Institute**
26.	Pimpri-Chinchwad	Hope Foundation & Research Centre, Hinjewadi Pune -33
27.	Pune Urban	M.E.R.D.O. Mechanical Engineering Research and Development Organization, Pune -8
28.		Institute of Insurance and Financial Services, Education Research and Training, Karve Road, Pune - 45
29.		Toxicology Research Foundation, Pune 13
Part C	**Reason - No Affiliation as Research Institute**	
Sr. No.	**Area**	**Institute**
30.	Ahmednagar	Rahuri Rural Womens Institute Of Education
31.	Nashik	Gokhale Education Society J.D.C. Bytco Institute Of Management Studies and Research
32.		Yoga Vidya Gurukul, Talwade, Tal. Tryambak, 422005
33.		Yoga Vidyadham, Kaivalyanagar, Nashik 422005
34.	Pimpri-Chinchwad	Centre for Research in Health Sciences & I.D.S., Nigdi-Pradhikaran, Pune 44
35.	Pune Urban	Armament R & D Establishment Centre, Pashan
36.		Bhaskaracharya Pratisthan, Erandwane, Pune - 4
37.		Centre for Development Studies & Activities, Bavdhan (Kh.), Pune -8
38.		Dr Ramzini Research Institute of Occupational Health Science, Wanawadi, Pune 40
39.		K.E.M. Hospital and Research Institute, Pune -11
40.		Maharashtra State Education Research and Training Institute, Pune -30
41.		Sanmati Teerth Institute of Research in Prakrit Languages & Jainology, Shivajinagar Pune -4

Appendix III

Questionnaire for Librarians

Study of Librarian's Role in Promoting Open Access Resources With Special Reference To Libraries of Research Institutes Recognized By University Of Pune.

About open access resources:

Open access resources are available online in digital format free of charge and free of most copyright and licensing restrictions as per the consent of the author or copyright-holder.

Date:

(A) General Information: Institute

Institute Name: _____

Year of establishment: _____

Status of Institute: Government / Autonomous / Private (Tick mark correct answer)

Address: _____

_____

Area of specialization of the Institute / Library: (Select suitable answer)

Science & Technology ☐ Social Science ☐

Management ☐ Any other, please specify subject _____

(B) General Information: Librarian / Library Head

Name of the Library Head_____

Designation_____Qualification_____

Working as Library Head / Incharge Library since: (Please mention Year) _____

Contact No. (O) _____ Mobile _____

Email: _____

Kindly tick mark for the suitable answer:

1. Your Age (Years):

20 – 30 ☐ 31 – 40 ☐ 41– 50 ☐ 51 – 60 ☐

Above 60 ☐

2. Professional Experience (Years):

1 – 5 ☐ 6 – 10 ☐ 11 – 15 ☐ 15 – 20 ☐

More than 20 ☐

(C) About Library:

1. Working Hours

Days	Opens At	Closes At
Monday to Friday/Saturday		
Sundays / Holidays		

2. What is the current annual budget of your library? (Excluding salary of library staff)

_____

2.1 How would you rate the available budget in view of users' requirements (Tick mark suitable option)

More than sufficient	Just sufficient	Insufficient

3. Collection details: Kindly mention the collection size

Document types	Number		Document types	Number
Books			Journals (Excluding magazines)	
E-books if any			E-journals if any	
DVDs/CDs			Ph.D Thesis	
Digitized Documents			Bound Volumes	
Working Papers/ Monographs/ occasional Papers			Committee/ Research reports	
			Databases	
If other please specify				

4. Number of library staff (Kindly mention only number)

	Library Science Professionals (With Ph.D., M.Phil., NET/SET, M.Lib.I.Sc., B.Lib.I.Sc. degrees)	Non Library professionals (Including sub-staff)
Permanent		

Temporary / Contract		
Library Trainees		NA

5. Is Library Head appointed on permanent basis?

   Yes ☐ No ☐

6. Is your Institute recognized as PhD research centre by SPPU?

   Yes ☐ No ☐

7. Name of the Library software used:_____

8. Answer following questions by selecting suitable answer for the facilities available.

Sr. No.	Question	Yes	No
I)	Has your library a separate building?		
II)	Do you have reading room facility?		
III)	Do you have Internet facility for library staff?		
IV)	Do you have Internet facility for your users?		
V)	Whether library is fully automated? (Are all modules of your software used?)		
VI)	Do you have research cubicles for researchers?		

9. Indicate services provided by your library?

Sr. No	Question	Yes	No
I)	Circulation of documents		
II)	Reference Service		
III)	Bibliographic service		
IV)	CAS / SDI Services		
V)	News/ Resource Alerts		
VI)	Photocopying Service		
VII)	Printing Service (For users)		
VIII)	Multimedia machines		
IX)	Scanning		
X)	Inter-Library Loan		
XI)	Any other, please specify		

10. Is your library a member of any consortia?

Yes ☐ No ☐

10.1 If yes, please mention the consortia name: _____

11. Indicate the approximate users in below categories as per current status:

Sr. No	Type of Users	Number
a.	Scientists / Researchers / Faculty	
b.	Research Assistants / Junior Research Fellows	
c.	Ph.D. Students	

12. In recent years, have you discontinued any journal subscription in view of high costs?

Yes ☐ No ☐

12.1 If yes, how many journals have been discontinued in last 3 years? (Please tick mark appropriate option)

Sr. No	No of journals discontinued	Tick mark	Sr. No	No of journals discontinued	Tick mark
a.	1-5		c.	11-15	
b.	6-10		d.	More than 15	

(D) Open Access (OA) resources awareness and views:

1. Are you aware of the concept of "OA" resources with reference to scholarly communication?

   Yes ☐ No ☐

2. If yes, indicate the sources which have helped you to become aware about OA resource.

No.	Sources	Tick mark if applicable
1.	Through workshops / conferences / seminars etc.	
2.	By reading professional literature / journals	

No.	Sources	Tick mark if applicable
3.	Through discussions with fellow librarians / online library discussion forums	
4.	Through discussions with institutional colleagues	
5.	Through Internet / social media	
6.	If other, please specify -	

3. Please give your views regarding following statements? Please Tick mark for suitable answer

Sr. No	Question / Statement	Answers		
		Agree	Disagree	Not sure
1.	Open access resources are very useful from research point of view.			
2.	Open access publications though available online freely does not guarantee quality and accurateness.			
3.	Due to exponential growth in open access publications, there is a great need to increase awareness amongst user's community about it.			
4.	Open access movement will fail in absence of active participation of all research libraries.			
5.	Like traditional journals, impact factor are applicable to open access journals.			
6.	Research Libraries should educate the users about OA resources through various activities			
7.	Research libraries should encourage the researchers to publish their scholarly content in OA resources			
8.	Research Libraries should educate researchers about copyright issues of traditional as well as OA resources.			

Sr. No	Question / Statement	Answers		
9.	Research Library staff should have necessary skills for managing OA resources and providing related services			
10.	Research library should develop the OA policy of its own.			

4. In view of budgetary cuts and increasing cost of publications (both journals as well as books) do you think OA resources is the solution?

   Yes ☐ No ☐ Not Sure ☐

5. Are you aware about Beall's list of Predatory Publishers?

   (This was a list of questionable, scholarly open-access publishers. The term "predatory open access" was coined by University of Colorado Denver librarian and researcher Jeffrey Beall.)

   Yes ☐ No ☐

(E) OA promotion:

1. Do you guide the users to the important and useful open access resources as per their requirement?

   Yes ☐ No ☐

2. Have you come across open access resources which are relevant to your users' requirements?

   Yes ☐ No ☐

3. Kindly tick mark the channel/s used by you for the disseminating information (for promotional purpose) about open access / other information resources to your users:

Sr. No	Channel	Tick Mark
1.	E-mails	
2.	Library Website	
3.	Social media	
4.	Brochures	
5.	Flyers	
6.	Leaflets	
7.	Newsletters	
8.	Published guides	
9.	Classroom instruction	
10.	Exhibits or displays	
11.	Library tours	
12.	Training sessions / workshops / Information Literacy programs	
13.	Informal discussions	
14.	Phone	
15.	Any other, please specify	

4. Do you have separate budget for promotional activities for your library such as preparing brochures, organizing Information Literacy programs etc.?

   Yes ☐ No ☐

5. If you do not promote open access resources please tick mark relevant reasons You may choose multiple options.

Sr. No	Reasons for not promoting OA resources	Tick mark if applicable
1.	Not sure about their quality	
2.	Do not consider them important for my users	
3.	Users are not interested in OA resources	
4.	Not sure about how to search and access the relevant OA resources	
5.	Users are already aware about them	
6.	OA resources are not part of library collection development policy	
7.	If other reason, please specify	

6. Do you have library web-page?

   Yes ☐ No ☐

a) If yes, please tick mark status of your library webpage: (Select appropriate option)

   a. Proposed
   b. Being developed
   c. Very well developed

b) Does Library staff manages the library web-page:

Yes ☐ No ☐

7. If No library web-page, then please tick mark the relevant reasons (You may select multiple applicable options)

Sr. No.	Reasons	Tick mark if applicable
1.	No network connectivity (No intranet / internet services)	
2.	This is not library's job	
3.	No technical trained man-power / knowledge to manage it	
4.	Other, please specify	

8. Do any users approach you for consultation about journal quality when they want to publish their article

Very Often ☐ Sometimes ☐ Rarely ☐ Never ☐

(F) OA Publications:

1. Have you published in any open access publications?

Yes ☐ No ☐

A) If 'yes', tick mark the applicable reason for it: (You may select multiple reasons)

Sr. No	Reason	Tick mark
1.	Open access offers higher visibility than subscription based journals.	
2.	Open access journals gets more citations than Subscription based journals.	
3.	Open access promotes more research	

4.	There should be no restrictions on reuse of research outputs hence preferred OA mode	
5.	The funder / institutional policy made it mandatory	
6.	Any other, please specify -	

B) If 'no', then please tick mark suitable reason mentioned below: (You may select multiple reasons if applicable)

Sr. No	Reason	Tick mark
1.	I was not aware of open access publishing model	
2.	I have yet to publish an article	
3.	Open access journals ask fees from authors for which I am not ready to pay.	
4.	Not sure about which open access source to choose for publishing my work	
5.	I am aware about open access but still prefer traditional channels for publishing my work	
6.	I am concerned about quality of OA publications	
7.	Any other, please specify -	

2. Which type of open access resources you would prefer for publishing?

   a. Gold open access (Through OA journal / Hybrid OA journal)
   b. Green open access (Through Institutional repository / subject repository / self archiving)
   c. Not sure

(G) Institutional Policy about OA:

Kindly tick mark the appropriate answer -

1. Does your Library celebrate Open Access Day / Open Access week in October every year by organizing any special events?

   Yes ☐ No ☐

1.1 If yes, kindly tick mark how frequently you have celebrated OA Day / Week (October) since its inception in 2008?

Sr. No	Frequency	Tick mark suitable option
I.	Every year from 2008	
II.	Celebrated few times only since 2008	

2. What is the status of your Institution's policy /guidelines regarding publishing open access resources:

Sr. No	Status	Tick mark suitable option
1.	Policy is finalized as a written document	
2.	Policy not yet formulated	
3.	Policy is in developmental stage	
4.	No idea	

3. Does your institute publish any type of OA resources?

Yes ☐ No ☐

3.1. If yes, please tick mark suitable option as per status:

Sr. No	OA Resource	Tick Mark	Sr. No	OA Resource	Tick Mark
1	Open Journal		2	Subject / Institutional repositories	
3	Open Book		4	Open data	
5	Open Educational Resources		6	Open Thesis / Research reports	
7	Any other, Please specify:				

4. As a Librarian, have you been involved in any policy formulation for your Institute?

Yes ☐ No ☐

4.1 If no, would you like to get involved in future for OA policy formulation in your Institute?

Yes ☐ No ☐ Not Sure ☐

5. Does your Institute have separate OA funding (to pay authors' fees / article processing charges) through which authors / researchers get help to publish their research in OA resources?

Yes ☐ No ☐ No idea ☐

6. Do you have Institutional Repository (IR) in your Institute?

(Institutional Repository is an online archive of an institution's scholarly papers, deposited by their authors. Institutional Repositories may include a variety of research output of an organization such as datasets, administrative documents, course notes, learning objects, or conference proceedings.)

Yes ☐ No ☐

6.1 In which year IR was set up? - _____

6.2 Is your IR is registered with Registry of Open Access Repositories (ROAR)?

Yes ☐ No ☐

6.3 If not registered in ROAR, please tick mark the appropriate reason for same:

Sr. No	Reason	Tick mark suitable option
1.	Not aware about ROAR	
2.	Our IR is limited at intranet level only	
3.	It is not managed by Library	
4.	Other, please specify	

7. If No IR available, then as a librarian would you like to initiate the activity?

Yes ☐ No ☐ Not sure ☐

(H) Services for OA resources

1. Kindly tick mark the appropriate option with respect to usage of these directories / sources used by you for searching OA resources:

Sr. No	OA Resources	Usage			
		Regularly	Sometimes	Rarely	Never
1.	Directory of Open Access Journals (DOAJ)				
2.	Directory of Open Access Repositories (DOAR)				
3.	Directory of Open Access Books (DOAB)				
4.	Google Scholar				
5.	Open Access Theses and Dissertations (oatd.org)				
6.	OAIster*				
7.	OA search engine like Jurn.Com, BASE, OAJSE etc				
8.	Harvard Open Data Dataverse #				

* - Available at http://oaister.worldcat.org/. Contains records of digital resources from open-archive collections worldwide.

- The Institute for Quantitative Social Science (IQSS) collaborates with the Harvard University Library and Harvard University Information Technology organization to make the installation of the Harvard Dataverse openly available to researchers and data collectors worldwide from all disciplines, to deposit data. Dataverse is an open source web application to share, preserve, cite, explore, and analyze research data. It facilitates making data available to others, and allows you to replicate others' work more easily. Researchers, data authors, publishers, data distributors, and affiliated institutions all receive academic credit and web visibility.

2. Kindly mention directories / other sources of your subject specialization used by you if any, for searching OA resources

1. _____
2. _____
3. _____
4. _____

3. Please mark the frequency of following OA sources used by your library staff in providing various information services to users

Sr. No.	OA sources	Regularly	Sometimes	Rarely	Never
1.	OA Journals				
2.	Open Books				
3.	Open Data				
4.	Subject repositories / Institutional Repositories				
5.	Open Educational Resources / Course Materials				
6.	Open Thesis and Dissertations				
7.	OA Images				
8.	OA Videos				
9.	Open Source software				

4. Indicate if following activities have been undertaken for giving various services related to OA resources in your library:

Sr. No	Activity	Yes	No	In Process
1.	Evaluating OA resources based on certain criterion			
2.	Cataloguing OA journals in your OPAC			
3.	Listing important and relevant OA sources on library webpage / portal			
4.	Managing Institutional IR			
5.	Including OA resources in CAS/SDI services			
6.	Proving assistance to researchers in selecting most relevant OA source for publishing			
7.	Giving guidance to researchers pertaining to types of Creative Commons / license agreements			
8.	Providing assistance to publish the institutional publications as open access			
9.	Introducing OA in library orientation sessions / information literacy program			
10.	Institutional research data management			
11.	Skill development for library staff for managing OA resources			
12.	Any other, please specify			

5. Are you using set evaluation criterion for evaluating OA resources?

   Yes ☐ No ☐

6. Which following features you consider are important while evaluating OA journals? (Select appropriate option)

Sr. No	Feature	Very Important	Moderately Important	Not Important
1.	Peer review			
2.	Editorial board			
3.	ISSN			
4.	Regularity of publication			
5.	Relevance to subject domain			
6.	Presentation format			
7.	Availability of features like RSS, email alerts, download statistics etc.			
8.	Reputation of Publisher			
9.	Impact factor			
10.	Other, please specify			

7. Do you feel following skills / competencies are required for OA resources management?

Sr. No.	Skills / competencies	Yes	No
1.	Project management		
2.	Staff management		
3.	Communication skills		
4.	Advocacy skills		
5.	Administrative skills		
6.	IT oriented skills		
7.	Internet browsing skills		
8.	Metadata knowledge		

9.	Intellectual Property Rights Knowledge		
10.	Marketing skills		
11.	Any other, please specify -		

8. Indicate if you feel / face following are the difficulties in promoting the OA resources in your organization.

Sr. No.	Reason	Yes	No
1.	Absence of OA policy in library / institutional level		
2.	Poor knowledge for OA resources in my domain area		
3.	Shortage of staff for providing this type of service		
4.	Insufficient Technical knowledge		
5.	Lack of support from management		
6.	Lack of funding		
7.	No positive feedback from users		
8.	Lack of infrastructure		
9.	Copyright / license term issues		
10.	Lack of required skills / competencies		
11.	Increase in work burden in view of collection development, providing information and reference services to users		
12.	Other please specify		

9. Do you feel there is a need of separate post for library professional whose main duties should be concerned to open access issues and related projects?

Yes ☐ No ☐

10. Do you think there is need for a short training course for managing OA resources and providing related information services to users?

Yes ☐ No ☐

11. After promoting OA resources in your institute, have you conducted any user survey for their feedback?

Yes ☐ No ☐

11.1 If yes, please share your findings / observations:

- _____
- _____
- _____
- _____
- _____

Appendix IV

Questionnaire for Users

Study of Librarian's Role in Promoting Open Access Resources with Special Reference to Libraries of Research Institutes Recognized by Savitribai Phule Pune University

About open access resources:

Open access resources are available online in digital format free of charge and free of most copyright and licensing restrictions as per the consent of the author or the copyright-holder.

Section I: General information:

Date:

Name: _____Designation: _____

Institute Name: _____

Address: _____

_____

Contact No. (O) _____ Mobile _____

Email: _____

1. Please tick mark the relevant option –

   I. What is your current status?

      a. Scientists / Researchers / Faculty
      b. Junior Scientist / Junior Research Fellow / Research Assistant
      c. PhD Student

   II. Age (Years)

   a. 21-30
   b. 31-40
   c. 41-50
   d. 51-60
   e. 60+

Section II: About open access awareness:

1. Do you know what Open Access (OA) with reference to scholarly communication is?

   a. Yes (Go to question 3)
   b. No (Go to question 2)

2. Would you like to know about Open Access (OA) with reference to scholarly communication?

   Yes ☐ No ☐

3. Are you aware of any Open Access resources in your field?

   Yes ☐ No ☐

4. If yes, indicate the sources which have helped you to become aware about OA resources.

Sr. No.	Sources	Tick mark if applicable
1.	Through workshops / conferences / seminars etc.	
2.	By reading professional literature / journals	
3.	From library staff	
4.	Through discussions with institutional colleagues	
5.	Through Internet / social media	
6.	If other, please specify -	

5. Are you aware of Beall's List of Predatory Publishers which lists out questionable, scholarly open-access publishers?

   (This is a list of questionable, scholarly open-access publishers. The term "predatory open access" was coined by University of Colorado Denver librarian and researcher Jeffrey Beall.)

   Yes ☐ No ☐

6. How often do you use Open Access (OA) resources for research and / or educational purposes? Please put tick mark.

Most of the time	Sometimes	Seldom	Never

Section III: About Publishing in OA resources:

1. Have you published paper / article / brief note / occasional paper in any open access publications?

   Yes ☐ No ☐

A) If ‘yes’, tick mark the applicable reason for it: (You may select multiple reasons)

Sr. No	Reason	Tick mark
1.	Open access offers higher visibility than subscription based journals.	
2.	Open access journals get more citations than Subscription based journals.	
3.	Open access promotes more research	
4.	There should be no restrictions on reuse of research outputs hence preferred OA mode	
5.	The funder / institutional policy made it mandatory	
6.	Any other, please specify -	

B) If ‘no’, then please tick mark for suitable reason/s mentioned below: (You may select multiple reasons if applicable)

Sr. No	Reason	Tick mark
1.	I was not aware of open access publishing model	
2.	I have yet to publish an article	
3.	Open access journals ask fees from authors for which I am not ready to pay.	
4.	Not sure about which open access source to choose for publishing my work	
5.	I am aware about open access but still prefer traditional channels for publishing my work	
6.	I am concerned about quality of OA publications	
7.	Any other, please specify -	

2. Which type of open access resources you would prefer for publishing?

    a. Gold open access (Through OA journal / Hybrid OA journal)
    b. Green open access (Through Institutional repository / subject repository / self archiving)
    c. Not sure

3. State your opinion about open access resources? Kindly tick mark suitable option

Sr. No.	Statements	Strongly Agree (5)	Agree (4)	Neutral (3)	Disagree (2)	Strongly Disagree (1)
1.	OA resources are very important from research point of view					
2.	Every institution should support open access by funding article processing charge					
3.	OA resources may be popularized by recognizing them during performance evaluation process					
4.	Researchers should publish their research work in open access resources for wide reach.					

Section IV: About Library OA promotion and Institutional policy for OA resources

1. Does your library promote open access resources in your organization?

Yes ☐ No ☐ No Idea ☐

2. What according to you is the current status of OA promotion by your library?

   a. They are promoting OA resources regularly since past few years.
   b. They have started the promotion of OA resources recently.
   c. They are not doing any promotion of OA resources at institute level.
   d. No Idea

3. What is the satisfaction level with the promotional activities done by your librarian? Kindly tick mark.

Very satisfied	Satisfied	Neutral	Dissatisfied	Very dissatisfied

4. Do you have Institutional Repository in your institute?

Yes ☐ No ☐ No Idea ☐

5. If you have Institutional Repository ready, are you submitting / providing your publications to include in it?

Yes ☐ No ☐

6. State your opinion about promotion of OA resources and expectations from library staff. Kindly tick mark suitable option

Sr. No.	Statements	Strongly Agree (5)	Agree (4)	Undecided (3)	Disagree (2)	Strongly Disagree (1)
1.	No promotion of OA resources by libraries is required as researchers are already aware about it.					
2.	Library can play strong role in promotion of OA resources due to their knowledge and skills.					
3.	Management of Institutional Repositories is library's responsibility					
4.	Library staff should educate users about copyright aspects of OA resources					

5.	Though library staff promote OA, researchers do not have sufficient time to go through these resources					
6.	Library staff should be more trained for promoting OA resources.					

7. Please offer your suggestions, if any, regarding promotion of OA resources by your library staff:

_____

_____

_____

_____

_____