CHAPTER I
INTRODUCTION

The communication of information began with the beginning of civilization itself. People recorded their experiences and indigenous knowledge in inscriptions and manuscripts mainly for preservation. The invention of the Printing Press by Gutenberg in mid of 15th century has revolutionized in publishing patterns. The books in printed form has changed the concept of preservation to use. Generally, the progress of any nation is assessed through its research and developmental activity. Research generates new information and knowledge. Research results are disseminated to the target audience through publications in journals, conference proceedings, monographs, dissertations, reports, and now the World Wide Web provides many a new forum for its communication.

The first scholarly journals were started in mid 1600s in the name of *Journal des Scavans* and the *Philosophical Transactions of the Royal Society of London*. Researchers and academicians have been striving to publish and disseminate the results of their research work through the scholarly journals. The scholarly journals provided a platform to the researchers to share their research finding and also acted as a public registry of scientific communication.

1.1 Scholarly Communication

Scholarly communication refers to the process of creation, transformation, evaluation (peer reviewing), dissemination and preservation of knowledge related to research and other scholarly endeavours. It is the most vital component of the research life cycle. The most common method of scholarly communication till the recent past has been through writing up the findings of research into a book, or an article to be published in a scholarly journal. But with the advent of internet and other ICT
(Information Communication Technology) applications there is a major shift in the scholarly communication process from print to electronic.

Scholarly communication can be defined as the system through which research and other scholarly writings are created, evaluated for quality, disseminated to the scholarly community, and preserved for future use. The system includes both formal means of communication, such as publication in peer-reviewed journals, and informal channels, such as electronic listservs (UNESCO, 2015).

According to Ho (2010), “scholarly communication is a cyclical process in which content is generated, reviewed, disseminated, acquired, preserved, discovered, accessed, and assimilated for the advancement of scholarship. The assimilation can potentially lead to generation of new content and thus start a new iteration of the process (or life cycle)”.

1.2 Scholarly Communication and Technology

Publishing articles in peer-reviewed journals is the prime indicator of professional standing for researchers and academicians, and it also fulfills other requirements such as author recognition, quality control, historical record of and the archive for the progress of science. This triggered the unprecedented growth of the scholarly peer journals.

The expansion of R&D activity brought an exponential growth in the number of publications over the years. Research and academic institutions around the world since then have been grappling with the related problems and issues in scientific and technical communication process. The major problems relate to managing information explosion, increasing publishing costs, and delays in publishing and distribution inefficiencies. On the other hand libraries face the problem of spiralling prices of journals, limited physical space for storage and resource crunch.
E-publishing and digital processing of information, their storage and retrieval have made great impact on the scholarly communication process both from the publishing and dissemination point of view. The emergence of e-journals in the 1980s and development of the World Wide Web in the 1990s have revolutionized the scholarly communication landscape.

Although the distribution of scientific information has retained part of its traditional structures, the ways of scholarly communication and research dissemination have been substantially affected with the availability of innovative ICT applications. With the advent of web enabling technologies, innovative publishing models for scientific communication are emerging. This has facilitated self-publishing where the responsibility and ownership of scholarship rests with the creators of information. As it stands today substantial proportion of scholarly publications are controlled by limited number of large publishing houses. It has directly impacted the scholarly communication process and is threatening to defeat the purpose for which the scientific community invented it. Cost of printed materials as well as subscription cost for electronic journals compelled the librarians and professionals to seek alternate form of scholarly communication process like open access.

1.3 Open Access

The term ‘Open’ has become somewhat of a buzz word which currently has positive associations for most people. According to Materu (2004), the present decade can be called the o-decade (open source, open systems, open standards, open archives, open everything) just as the 1990s were called the e-decade. The two most important aspects of openness have to do with free availability over the internet and as few
restrictions as possible on the use of the resource, whether technical, legal or price barriers.

Suber (2012) defines Open Access as “Open Access literature is digital, online, free of charge, and free of most copyright and licensing restrictions”. The concept of open access has emerged in response to the restrictive access to knowledge in scholarly and scientific journals imposed by commercial publishing houses via subscription fees, license fees or pay-per-view fees (Christian, 2008).

Open access in the form of e-prints archives has now expanded to include courseware, backfiles of journals articles, subject specific repositories, conference papers, technical reports, theses and dissertations, and many more institution specific materials.

Educational resources will in most instances involve copyrighted literary, dramatic, musical or artistic works, films or sound recordings. The permission of the copyright owner or a lawful exception such as fair use or a statutory or compulsory license will be needed to authorise re-use the whole or a substantial part of the material, for example, reproduction or communication. In contrast, an open content or source code license represents a convenient method for sharing and re-use of copyright material by providing the necessary permission.

Open access to knowledge is a generic term used for knowledge resources made available in the public domain for public access or public consumption at large scale, without any hindrance of subscription fee or access charges. OA is facilitated in an internet-based online environment.
1.4 Open Access Philosophy

New web based technologies especially Web 2.0 has brought social media in the forefront with its intrinsic features like openness, interactivity, participatory and user-centric activities. This has brought in a radical change in the information behaviour of the researchers and academics. They can now join all kinds of virtual scientific communities and publish their findings in blogs, wikis, and plethora of other platforms.

Open access is a blessing for the scholarly community as it gives them greater freedom to share their ideas as well as their research work. They can now present their work or ideas not only in writing but also through other multimedia channels like audio, broadcast, video, etc. Web 2.0 tools have made knowledge sharing multi-dimensional and participatory providing wider channels for communication.

Social media with tools like blogs, microblogs (Twitter), wikis, cloud computing, podcasts/video-sharing (YouTube), image sharing (Flicker) and community forum/social networks (e.g. MySpace, Facebook) provides a platform for individual users not only to fulfil their basic data storage requirements, but even more also towards their psychological experience requirements of being discovered, appreciated and recognized. With the development of online publication techniques, online writing is becoming a popular style of scholarly communication.

Philosophy of open access is to provide free of charge and unhindered access to researchers and their publications without copyright restrictions. The movement got support from great scientists, educationists, publishers, research institutions, professional associations and library organizations. Its philosophy is research funded by tax payers should be available free of charge to tax payers. Research being a public good should be available to all irrespective of their paying capacity.
The fruits of the freely shared knowledge are benefit to the society as a whole and to the academic community. It makes free access to digital libraries and scientific repositories, and electronic journals. The research scholars, teachers and students can access freely the research materials, latest scientific developments, research literatures, conference presentation and lecturers.

1.5 History and Development of Open Access

The concept of open access has emerged due to the conventional method of dissemination scholarly content through restricted access and against payment system of research and scholarly articles publications. It has been discussed in various forums consisting of educationists, publishers and policy makers. Various conventions held in this connection are presented as follows.

1.5.1. Declarations of Open Access

Three OA declarations which forms the basis for evolution of open access are commonly known as BBB declarations, in the beginning of the 21st century have shaped OA publishing environment in the successive decades. These declarations have also hinted strong philosophical foundations for supporting the ideas and principles of OA.

The Budapest Open Access Initiative (2002) recorded the philosophical understandings as:

An old tradition and a new technology have converged to make possible an unprecedented public good. The old tradition is the willingness of scientists and scholars to publish the fruits of their research in scholarly journals without payment, for the sake of inquiry and knowledge. The new technology is the internet. The public good they make possible is the world-wide electronic distribution of the peer-reviewed journal literature and completely free and
unrestricted access to it by all scientists, scholars, teachers, students, and other curious minds. Removing access barriers to this literature will accelerate research, enrich education, share the learning of the rich with the poor and the poor with the rich, make this literature as useful as it can be, and lay the foundation for uniting humanity in a common intellectual conversation and quest for knowledge.

Berlin Declaration (2003) on open access stated that:

The Internet has fundamentally changed the practical and economic realities of distributing scientific knowledge and cultural heritage. For the first time ever, the Internet now offers the chance to constitute a global and interactive representation of human knowledge, including cultural heritage and the guarantee of worldwide access. We, the undersigned, feel obliged to address the challenges of the Internet as an emerging functional medium for distributing knowledge. Obviously, these developments will be able to significantly modify the nature of scientific publishing as well as the existing system of quality assurance. We have drafted the Berlin Declaration to promote the Internet as a functional instrument for a global scientific knowledge base and human reflection and to specify measures which research policy makers, research institutions, funding agencies, libraries, archives and museums need to consider. Our mission of disseminating knowledge is only half complete if the information is not made widely and readily available to society. New possibilities of knowledge dissemination not only through the classical form but also an increasingly through the open access paradigm via the Internet have to be supported. We define open access as a comprehensive source of human knowledge and cultural heritage that has been approved by
the scientific community. In order to realize the vision of a global and accessible representation of knowledge, the future Web has to be sustainable, interactive, and transparent. Content and software tools must be openly accessible and compatible.

Similar views are also reflected in the Bethesda Statement (2003) as well. The Statement indicates:

*Scientific research is an interdependent process whereby each experiment is informed by the results of others. The scientists who perform research and the professional societies that represent them have a great interest in ensuring that research results are disseminated as immediately, broadly and effectively as possible. Electronic publication of research results offers the opportunity and the obligation to share research results, ideas and discoveries freely with the scientific community and the public.*

These three pioneering declarations got wide supports from the academicians, and renowned global thinkers. The regional, national and similar committees constituted for the purpose follows the BBB declarations, all of them endorse the principles of the OA model for maximizing the access and benefit to scientists, scholars and the public throughout the world. Thereafter, many organizations developed their open access policies.

The International Federation of Library Association and Institutions (IFLA) is committed to the principles of freedom of access to information and the belief that universal and equitable access to information is vital for the social, educational, cultural, democratic, and economic well-being of people, communities and organizations. Open access is a movement and a business model whose goal is to provide free access and re-use of scientific knowledge in the form of research articles,
monographs, data and related materials. The IFLA has signed the Berlin Declarations on open access to knowledge in the Science and Humanities. It also adheres to the definition of open access used in the Berlin declaration and will use it in public communication and contacts with various organizations. They framed the following objectives by including the concept of open access

- Implementing a rigorous system for the control of scientific quality
- Providing long-term preservation of research information.
- Safeguarding freedom from censorship
- Offering efficient and user-friendly services
- Fostering activities that support information literacy
- Expanding bandwidth and other essential infrastructure that underline robust access to information.

1.6 Open Access Policies

Many organizations are in the process of developing their open access policies. These policies are as follows

1. Research funding agencies are at the forefront of open access policy developments. Open access just makes sense for the research funder: it means more research impact more real-world impact and, when taxpayers see the results of funded research, it helps to build support for more funding for the funding agency.

2. The Wellcome Trust, the world’s second-largest medical research funding agency, has the strongest open access policy in effect to date. Grantees are required to deposit their manuscripts, for open access, in PubMed Central, within 6 months of publication. This policy applies to all grants awarded since October 2005.
3. The U.S. National Institute of Health, the world’s largest medical research funder, enacted a Public Access Policy in 2005. This policy is widely regarded as flawed, because researchers are requested, but not required, to deposit results of research, and because the permitted delay period (12 months) is seen as too long. As a result of this policy, publications either as in open journals or open access repositories are delayed.

4. A bill introduced in the U.S., the Federal Research Public Access Act of 2006, calls for all US federal funding agencies with extramural research portfolios of $100 million per year or more, to create a public access policy requiring researchers to deposit their peer review manuscripts for open access within 6 months of publication.

5. There are major policy initiatives happening in the U.K., the European Parliament, and many other countries as well. Universities and other organizations are beginning to develop and implement open access policies, too. The European Council for Nuclear Research (CERN) is one of the early leaders in this area; The CERN archive includes over 360,000 full text documents (Morrison, 2006).

In India too, almost all funding agencies such as UGC, ICSSR, ICAR, ICHR and similar agencies directed the principal investigators to publish research articles and reports on their repositories.

1.7 Open Access Terms

According to Schmit (2005) the term open access refers to full-text scholarly articles made completely free and unrestricted to all users to read, copy, download, and distribute over the World Wide Web.
Steven Harnad has coined three terms in developing the concept of open access. They are *Gold OA*, *Green OA* and *Self-archiving*. *Gold OA* for OA delivered by journals, regardless of the journal’s business model, and *Green OA* for OA delivered by repositories. *Self-archiving* is the practice of depositing one’s own work in an OA repository (Harnad, 2001).

*Gratis OA* is the form of OA where access to materials is provided free of charge but not necessarily free of copyright and licensing restrictions. *Libre OA* provides access that is both free of charge (gratis OA) and free of at least some copyright and licensing restrictions. Because there are many possible copyright and licensing restrictions, libre OA is not just one access model but a range of access models. All the degrees of libre OA are alike in permitting uses that exceed fair use (Suber, 2012).

However, when the work is not open access, or that is available only for a price, is called *Toll Access* (TA). While every kind of OA removes price barriers, there are many different permission barriers that can be removed if we wanted to. If we remove price barriers alone, we provide *Gratis OA*, and if we remove at least some permission barriers as well, we provide *Libre OA*. The same is symbolically present in figure 1.1.

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**Figure 1.1: Open Access Terms**

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<td>Green OA (For OA repositories)</td>
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<td>Gratis OA (Remove price barriers)</td>
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<tr>
<td>Libre OA (Remove permission barriers)</td>
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<tr>
<td>Toll Access (Works available only for price)</td>
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<tr>
<td>Not Open Access</td>
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1.8 Models of Open Access Publications

OA publications are predominantly available through gold and green OA channels. Another few models have been introduced very recently by the commercial publishers for featuring some parts of their scholarly contents in OA domain. Those are mainly selective open contents with or without appropriate OA permissions or licenses.

Some of the popular OA models as practiced by the e-journal publishers are:

(i) Hybrid OA,
(ii) Delayed OA,
(iii) Short-term OA,
(iv) Selected OA, and
(v) Partial OA.

Hybrid OA is the one in which the publishers publish articles in toll-access scholarly journals, after receiving certain article processing charges (APC) from the authors.

In the Delayed OA model, publishers offer free access after a specified period, anywhere from 6 months to 2 years.

In the Short-term OA model, publishers offer free access until a specified period, anywhere from 6 months to 1 year. Thereafter, contents are available to subscribers only.

The model in which publishers selectively offer free access to selected contents only is known as selected OA. Other contents are available to subscribers only.
In the Partial OA model, publishers selectively offer free access to contents of particular sections only, e.g., research papers, but not review papers. Other contents are available to subscribers only.

Usually in Gold OA and Hybrid OA models, publishers publish articles with Creative Commons (CC) licenses. These two models belong to Libre OA category. OA contents available with other four models do not explicitly carry CC or similar licenses. These four models mainly belong to Gratis OA category. The different models illustrated in Figure 1.2, it gives a glimpse of different approaches of OA to scholarly literature, where a diversity of content models is recorded.

![Models of Open Access Publications](image)

**Figure 1.2: Models of Open Access Publications**

### 1.9 Open Access Resources

Open access resources are one of the useful resources for the academic community and the research scholars. Open access contributions include original scientific research results, raw data and metadata, source materials, digital representations of pictorial and graphical materials, and scholarly multimedia materials.

Sudhier (2011) defines open access as a generic term which includes open access journals, self archiving, institutions repositories, e-prints, open source software
and open courseware etc. OA journals are scholarly journals published electronically and available freely. They provide access to full text contents of scholarly, peer-reviewed journals.

Open access resources are electronic resources which can be accessed freely online by the users at free of cost without any restrictions. In open access, either the institution or the individual need not to pay for accessing, and downloading scientific publications/articles. Users can read, download, copy, distribute, search, and print full texts of articles or resources.

These resources are not limited only to open access journals but it may be varied in forms such as open e-books, videos, audios, personal websites, discussion forums, open access databases, institutional websites, personal blogs, open access repositories, and institutional repositories and open source softwares.

The term open educational resources first came into use at a conference hosted by UNESCO in 2002, defined open educational resources as, the open provision of educational resources, enabled by information and communication technologies, for consultation, use and adaptation by a community of users for non-commercial purposes (Johnstone, 2005). The most commonly definition of Open Educational Resources (OER) now used is Open educational resources are digitised materials offered freely and openly for educators, students and self-learners to use and reuse for teaching, learning and research (Hylen, 2005). To clarify further, OER is said to include:

- **Learning content**: Full courses, courseware, content modules, learning objects, collections and journals.
- **Tools**: Software to support the development, use, reuse and delivery of learning content, including searching and organization of content, content and learning
management systems, content development tools, and online learning communities.

- **Implementation resources**: Intellectual property licenses to promote open publishing of materials, design principles of best practice and localize content.

A closer look at the definition shows that the concept of OER is both broad and vague. OER can be defined as free and open digital publications of high quality materials organized as courses that include lectures, related reading materials, snapshots of discussions, assignments, evaluations, etc used in academic environments such as universities, training institutes, schools and colleges. Access to these resources radically breaks down the barriers to quality education and allows free access to course material that is prepared and evaluated by experts. These are prepared in open standard format and are interactive in nature.

In an academic environment of the higher education system, open access resources and open educational resources are one and the same. In this study too, open access resources and open educational resources are synonymous and represent open educational resources.

1.10 Characteristics of Open Access resources

The characteristics of open access resources are as follows:

1. **Open access resources are free to read, download and print**

   Access to full-text articles is completely free. Open access literature is free of charges and is also free of copyright. Open access campaign focuses on the literature that authors give to the world without the expectation of any payment. There are an extraordinary number of permitted uses for open access materials and users can copy and distribute open access work without constraint.
2. **Open access resources are in digital form**

Open access resources are in digital form. Users can easily access these resources without any physical space limitation, download and copy the full text articles for anyone and from anywhere through internet without restrictions. All are in multiple choices like pdf, html, and word file formats.

3. **Open access removes permission barriers**

Removing price barriers means that the readers are free from payment to the article or to access. Removing permission barriers means that scholars are free to use or reuse literature for scholarly purposes include reading and searching, but also redistributing, translating, text mining, migrating to new media, long term archiving, and innumerable new forms of research, analysis, and processing we have not yet imagined. OA makes work more useful in both ways, by making it available to more people who can put it to use, and by freeing those people to use and reuse it.

4. **Provisions for the researcher to place a copy of each article in an open access archive or repository**

A researcher is free to publish in their choice of journals while providing the broadened access without pay barriers. It seems to be the best of both worlds, while scholars retain their ability to publish in the most prestigious journals in their field they also simultaneously break down barriers to the wide dissemination of their research.

5. **Open access removes legal barriers from copyright laws and license agreement**

In scholarly communication, copyright be a significant access barrier. Permissions are restricted to translate it in to another language, distribute
copies to colleagues, copy the text for mining with sophisticated software, or reformat it for reading with new technology, and so on. Open access gives freedom from to the users from copyright restrictions and licence agreement.

Open Access (OA) contents are not restricted only to peer-reviewed research articles; they can be in any formats from texts and data to software, audio, video, and multi-media. Although the OA movement focuses on peer-reviewed research articles and their preprints, OA can also apply to non-scholarly content, like music, movies, and novels, even if these are not the focus of most OA activists. Thus, Open Access has the following characteristics:

(i) It is free availability of scholarly publication.
(ii) It is free of copyright and licensing restrictions
(iii) Materials are available online or on the internet.
(iv) Material is full text.
(v) Material can be accessed by anybody from anywhere without any discrimination.
(vi) Material can be freely used by anyone.
(vii) Open Access contents can be in any format from texts and data to software, audio, video, and multi-media, scholarly articles and their preprints (Jain, 2012).

1.11 Advantages of Open Access Resources

The open access resources are useful to the academic community for information sharing and exchanging of scholarly content at the global level among the world community. The benefits of using open access resources are listed as follows (Suber, 2010).
1. **Research and publication**

Through open access researchers have wider visibility and usage of their research findings. They have a significantly larger and more diverse audience. Increased exposure to research also increases citation rate. Open access provides an avenue to connect with a global society more easily and researchers can publish without printing costs.

2. **Teaching and Learning**

By putting rich and poor on an equal footing, open access provides free articles for teachers, students and other academic community.

3. **Author**

Open access gives authors a worldwide audience larger than that of any subscription-based journal, no matter how prestigious or popular, and demonstrably increases the visibility and impact of their work.

4. **Readers**

Readers around the globe can have barrier free access to the latest literature and research findings.

5. **Society**

Society as a whole benefits from an expanded and accelerated research cycle in which research can advance more effectively because researchers have immediate access to all the findings they need.

6. **Journals and Publishers**

OA makes their articles more visible, discoverable, retrievable, and useful. If a journal is OA, then it can use this superior visibility to attract submissions and advertising, not to mention readers and citations.
7. **Funding agencies**

Open access increases the return on their investment in research, making the results of the funded research more widely available, more discoverable, more retrievable, and more useful. Thus, OA provides fairness to taxpayers by providing open access to the results of publicly-funded research.

8. **Governments**

Governments benefit from OA as funders of research and OA also promotes democracy by sharing non-classified government information as widely as possible.

9. **Citizens**

OA gives them access to peer-reviewed research, which is unavailable in public libraries, and gives them access to the research for which they pay taxes. OA accelerates not only research but also the translation of research into new medicines, useful technologies, solved problems, and informed decisions that benefit everyone.

10. **Libraries**

OA solves the pricing and permission crisis for scholarly journals. OA also serves library interests in other indirect ways. Librarians want to help users find the information they need regardless of the budget-enforced limits on the library's own collection. Academic librarians want to help faculties increase their audience and impact, and help the university raise its research profile.
11. *Universities*

Universities benefit from their researchers' increased impact and increase their visibility. OA reduces their journal expenses and advances their mission to share knowledge.

12. *Benefits to Nations*

Open access incorporates local research into all interoperable network of global knowledge; increases impact of local research, providing new contacts and research partnerships for authors; removes professional isolation and strengthens economies through developing a strong and independent national science base.

Thus, open access provides several benefits to researchers, educators, journals, publishers, funding agencies, government and academic institutions around the world. It is an effective vehicle to information exchange between all countries.

1.12 *Open Access Institutional Repositories*

The worldwide development of open access repositories by universities, research institutes and academic disciplines has seen widespread sharing of journal articles and electronic theses. Disillusioned by the increasing costs of journal subscriptions and motivated by the great potential the Internet offered for disseminating knowledge, researchers and their institutions and disciplines have combined to provide greater access to materials.

An institutional repository (IR) is an online archive for collecting, preserving, and disseminating in digital form of the intellectual output of an institution. Usually, it may be a research institution which would include materials such as research journal articles, digital versions of theses and dissertations, digital documents, curriculum, and course materials.
According to Suber (2012), repository is an important source to a library. In the words of open access, a repository is an online database of open access works. Repositories don’t perform their own peer-review, but they may host articles of peer reviewed elsewhere. In addition they frequently host un refereed preprints, electronic theses and dissertation, book or book chapters, datasets, and digitized print works from the institutions library. IRs aim to host the research output of an institution.

Institutional repositories (IRs) are also known as digital repositories, or open access repositories. There are four types of repository publications: the subject-based repository, the research repository, the national repository system and the institutional repository. IRs are widely seen as the fastest route to open access for the widest range of scholarly and research literature, since they allow authors to publish in their choice of journals while providing the broadened access without pay barriers, the hallmark of open access publishing (Grundmann, 2009).

Open Access repositories (or archives) are digital collections that make their contents freely available over the Internet. These digital repositories collect the research output of the members of a university's research community and support the archiving and long-term preservation of the institution's intellectual output. Mostly institutional repositories are hosted within academic libraries around the world to digitally collect and preserve academic papers and documents in order to make them freely accessible to the students, faculty and the public (Swan, 2009).

1.13 Evolution of Open Access in India

The evolution of open access in India was started from Indian Academy of Science founded by Sir C. V. Raman in 1934. During the year 1999, it hosted a meeting on geographical information and virtually every one of the speakers focused on public access to geographical information. The evolution of open access policy in
India began on a two day conference on Advances in Information Access and Science Communication held at M.S. Swaminathan Research Foundation, Chennai, (MSSRF) on 16-17 September 2000, as a tribute to Dr. Eugene Garfield on his 75th birthday. At this conference Prof. Stevan Harnad, open access archivangelist spoke about “Scholarly Skywriting” and the need for every research performing institution to adopt open access self archiving of preprints.

The Indian Academy of Science convened a meeting in April 2001, the second ICSU-UNESCO International conference on electronic publishing in science decided to encourage Indian Science and technology journal publishers to adopt electronic publishing of Indian journals by open access. The open access movement in India is acknowledged worldwide. In India it started modestly from a few institutions and now spread all over. The Indian Institute of Science was the first institution in the country to set up an interoperable institutional repository eprints@IISc, and followed by Indian institute of management, Kozhikode; Indian Statistical Institute, Bangalore; Indian Institute of technology, Delhi; National Institute of technology, Rourkela; National Aerospace Laboratories, Bangalore; National chemical Laboratory, Pune; INFLIBNET, Ahmadabad; National Institute of Oceanography, Goa, and Raman Research Institute, Bangalore. India has launched many new open access journals and also converted some reputed subscribed based journals to open access.

In the scholarly publishing scenario, India has its unique position. India does not have a high percentage of its scientific journals available online. Though it is placed at the 12th position for overall number of journals among the top 25 publishing countries, it position falls down to 18th for journals with online content. Surprisingly its position in the list of open access journals is fifth, well ahead countries such as Netherlands, China, Germany, and Australia. On the other hand, in the registry of Open Access Repositories, India ranks 11th in the list of countries with registered interoperable
archives. Unfortunately out of the 15 listed archives, only 11 were accessible and functional at the time of reporting this study. Eleven of these were institutional archives and only one institutional archive had more than 500 documents (Sahu and Parmar, 2006).

The National Knowledge Commissions (NKC) working group on open access recommended that public-funded research literature is made available to public through open courseware repositories for countrywide dissemination of quality courseware to many cross-sections of people. The scholarly literature and lifelong learning materials produced by state-sponsored institutions would then be made accessible through open access channels such as national and institutional repositories. It also recommended that research papers resulting from public-funded research should be peer-reviewed before it is made available through open access channels. NKC also recommended creating national knowledge portals for basic needs on key sectors such as water, energy, environment, education, food, health, agriculture, employment and citizen rights. Based on the recommendations, national portals on water (www.indiawaterportal.org), energy (www.indiaenergyportal.org), and education (www.sakshat.ac.in) are established to provide open access to information, knowledge and learning resources on the relevant areas. In 2005, the University Grants Commission of India (UGC) drafted a national policy framework entitled “UGC (Submission of Metadata and Full-text of Doctoral Theses in Electronic format) Regulations, 2005”. These regulations proposed two sets of planned actions, such as:

a) Creation of Indian National Theses and Database and

b) Submission of Ph.D Theses in electronic form;

Consequently, the UGC has established Shodhganga, an e-thesis database.
1.14 Open Access Publishers and Educational Repositories in India

A large number of the journals are published from India belong to learned societies and associations, and published by the association or the editor themselves without the involvement of any commercial publisher. The members of these learned societies receive the print copies of the journals without paying an annual or recurring fee. For continuing their publication activities the associations depends on non member subscriptions, which are limited in number and restricted by and large to the Indian universities and colleges. Most of the Indian journals suffer from low circulation, low visibility, and low impact syndrome. With many fewer paid regional or international subscriptions, these journals have limited visibility and restricted mainly to the members of the association. The Indian open access journals will be able to reach to a wider audience. At the same time, loss, if any of paid non-member subscription is less likely to have a major effect on the economics of these journals. Impact of Open access publishing has certainly helped the Indian journals to reach an international audience, as could be seen by the number of distribution of article downloads.

1. **Indian Academy of Science**

Indian Academy of Science encourages Indian Science and Technology journal publishers to adopt electronic publishing of Indian journals by open access. Indian Academy of Science published with basic philosophy journals and Current science. The entire back volumes are available online in PDF format. Many other OA journals include *Journal of Bioscience, Sadhana, Mathematical Science, Chemical Science, Earth Science, Astrophysics and Astronomy, Genetics, Science Education, Material Science* and the *Pramana journal*. A total of 11 journals are now available through open access.

2. **Medknow Publishing**

Medknow publication is founded by Dr. D.K. Sahu, a pediatrician. Medknow is the largest open access publisher in the world which does not charge authors or authors’ institution for submission, processing or publication of articles. Medknow has shown that open access does not adversely affect print subscriptions. Medknow pioneered the fee-less-fee model of open access publishing and provides immediate free access to the electronic editions of the journals.

3. **Open J Gate**

Open access movement was in its formative stage when Informatics initiated the development of J-Gate in 2000. Informatics made a provision in its e-journal directory, which is a back-end component of its J-Gate to indicate if a journal was available for free access. By 2005, it was found that the number of open access journals in J-Gate had grown to a respectable level of over 10 per cent. J-Gate being a subscription based service, Informatics realized that to access the open access content indexed in J-Gate, users will have to subscribe to J-Gate. As a mark of its commitment to open access movement, Informatics decided to spin off a separate free for all service for open access only journals to facilitate seamless and unrestricted discovery of and access to open access content. Now open J-Gate is not functioning.
4. **Indian Institute of Science**

   Indian Institute of Science plays a major role in strengthening open access initiative in India. Eprints @ IISc repository collects, preserves and disseminates in digital format the research output created by the IISc research community. It can be accessed by anybody, but the submission of documents is limited to the IISc research community. EPrint @ IISc is the first Indian institutional repository. The archive has more than 3000 documents with over 90% having full text.

5. **Indian National Science Academy**

   The Indian National Science Academy (INSA) was established in 1935. The INSA published journals in Science and Technology and the Proceedings of INSA. It contains three open source journals.

6. **Indian open access journals in Bioline International**

   It is a non-profit electronic publishing service committed to providing open access to quality Bioscience research journals and Medical journals.

7. **Indian Medlars center**

   Indian Medlars center was initiated by the National Informatics Center (NIC) and Indian Council of Medical Research (ICMR). IndMed center publishes full text peer reviewed Indian biomedical journals.

8. **NISCAIR Journals**

   NISCAIR (National Institute of Science Communication And Information Resource) is the publication wing of CSIR (Council of Scientific and Industrial Research). NISCAIR publishes Science and Technology research journals and Library Science research journals. A total of 18 journals are now available through open access.
9. **Sankhya**

The Indian Statistical Association and Indian Statistical Institute provide full text access to its journal Sankhya.

10. **Vidnyidhi**

Vidyanidhi is one of the Indian Electronic Theses and Dissertation of digital library initiative of the University of Mysore. Vidynidhi is envisioned to evolve as a national repository and a consortium for e-theses through participation and partnership with universities, academic institutions and other stakeholders. It is one of the largest repositories with nearly 12,000 full text and more than 1,30,000 metadata records of Indian theses.

11. **Indian Agricultural Research Institute**

Indian Agricultural Research Institute was the premier multi-disciplinary research and education institute in India launched its Institutional repository and published two professional societies in agricultural science have made their journals in open access. In a related development, a group of Computer Science Department of IIT Kanpur built a new platform hosting agricultural research publications called the Open Agri.

12. **Indian Journals.Com**

Indian journals.com is an open source journal platform. It includes 200 research journals in 16 subjects are available in open access platform.

13. **Shodhganga @ INFLIBNET**

Information and Library Network (INFLIBNET) Centre is an autonomous Inter-University Centre of the University Grants Commission (UGC) of India. It is a major National programme initiated by the UGC in March 1991 with its head quarter
at Gujarat, University campus, Ahmedabad. INFLIBNET is involved in modernizing university libraries in India and connecting them as well as information centres in the country through a nationwide high speed data network using the state of art technologies for the optimum utilisation of information. INFLIBNET provides link to open access service to online profile of academic community of Indian Universities and Shodhganga Theses data base.

14. **DRTC**

The DRTC (Documentation Research and Training Centre) digital library contains the collection of Library and Information science resources and it publishes DRTC conference and proceedings to an open platform.

15. **DOAJ**

The Directory of Open Access Journals (DOAJ) was initially started in 2003 with a financial support from the open society institute and since then has been developed and maintained by Lund University Libraries. It is one of the largest open access directories. The prime concern of the DOAJ is to provide the users with a quality controlled peer-reviewed scientific open access journals in full text. The DOAJ is defining OA journals as journals that are using financial model that doesn’t charge readers or their institutions for access. DOAJ is taking the right of users to read, download, copy, distribute, print, search, or links to the full text of these articles. Currently they have 10439 journals covering all fields.

16. **HighWire Press**

Highwire press is a division of Stanford University libraries. Highwire press is a pioneer e-publisher in the area of scientific and medical journals. It contains 62,164,930 free full-text articles.
17. **DOAR and ROAR**

Directory of Open Access Repository (DOAR) is an authoritative directory of academic open access repositories. The aim of Registry of Open Access Repository (ROAR) is to promote the development of open access by providing timely information about the growth and status of repositories throughout the world.

18. **DESIDOC**

DESIDOC Journal of Library and Information Technology is an open source journal under the publication of DRDO (Defence Research and Development Organization). It is one of the research journal in the field of library and information Science.

19. **NPTEL**

NPTEL (National Programme on Technology Enhanced Learning) which is an initiative by IITs and IISc and funded by MHRD India. In NPTEL, video lecture courses and web courses are available. Both the web and video courses mostly cover major engineering disciplines and the core science curriculum. The video contents are freely available through you tube, flash player, real media players in the system.

20. **IETE Journals**

IETE (Institution of Electronics and Telecommunication Engineers) publishes three journals in open access system.

21. **Bio Med Central**

Bio Med Central publishes 242 peer-reviewed open access journals in the field of medicine.
22. **MDPI Journal**

Journals published by MDPI are fully open access research articles, reviews or any other content on this platform is available to everyone free of charge.

23. **Public Library of Science (PLoS)**

PLoS publishes peer-reviewed open access journals. The journals vary in their selectivity and contain differing amounts of commentary articles from opinion leaders in a variety of scientific disciplines.

24. **Trial Journals**

Trial is an open access, peer-reviewed, online journal that encompasses all aspects of the performance and findings of randomized controlled trials.

25. **Kamla Raj Enterprises**

Kamla-Raj Enterprises published 21 online open access journals in Science and Technology.

26. **Open Library.Org**

Open Library.Org is an open source platform. More number of e-books and e-journals in all fields are available online. Users can freely download and printout in their academic needs.

27. **NDLTD. Org**

Networked Digital Library of Theses and Dissertations (NDLTD), an international organization dedicated to promoting the adoption, creation, use, dissemination, and preservation of Electronic Theses and Dissertations (ETD). It support electronic publishing and open access to scholarship in order to enhance the sharing of knowledge worldwide.
28. **Open Access Library**

Open access library is an open source online database. It includes a large number of open access journals and books are freely available on various subjects.

29. **Book ZZ.org**

Book ZZ.org is the world largest e-book library. It includes 2,567,702 books are available freely on various subjects.

1.15 **Problems in Promoting Open Access in India**

The efforts towards the adoption of open access have already been started. But, there are some hurdles, misconceptions and misunderstandings about open access among the Indian research community. In 2006, Hirwade and Rajalekshmi pointed out some of the problems faced by the Indian academic community on open access are as follows:

(i) Lack of expertise in every organization to promote and creation of institutional archives.

(ii) Lack of infrastructural facilities like hardware connectivity of high bandwidth

and

(iii) Scientists are under the impression that the editors of renowned journals may not accept the archived papers.

1.16 **Need and Significance of the Study**

Open access resources are one of the latest innovations to access scholarly content in the higher education systems. With the advancement of Information Communication Technology (ICT), most of the traditional sources are being changed into electronic resources such as e-journals, e-books, e-databases, e-newspapers, open
source softwares, online database and CD-ROM databases. Access to open resources has emerged as the latest phenomenon in the process of making scholarly information free to all. Parallel to electronic resources on payment mode, the open access resources have emerged and the intellectuals are contributing their qualitative research articles through open access platform such as open access journals, open access repositories, institutional and personal websites and it has been more frequently cited by experts in their respective area of interest at global level. Academic community in the higher education system consist of students, research scholars and the faculty members of various capacities such as Assistant Professors, Associate Professors, Research Fellows, Professors and so on. Moreover, the open access educational resources are very useful to the students, to the research scholars, and to the teachers of higher educational institutions like Arts and Science Colleges, Engineering Colleges, Education Colleges and Universities for the creation of new and innovative knowledge in arts, humanities and science.

Several attempts have been made by the researchers and research organizations to analyse the various aspects of open access resources both in India and abroad. Some of the representative studies are conducted by Sandhu and Daviet (2012) on use of open access electronic resources among the engineering college students, on awareness of open access resources by Jomy Jose (2014) and use of open access repository by Obaje and Amkpa (2013). But a closer analysis of available studies shows that no systematic study have been conducted on usage and user perceptions about open access resources among the academic community in the higher education system are scanty. Hence the present investigator has been motivated to fill this gap by conducting a study on user perceptions and usage of open access resources by the academic community in the higher education system in Kanyakumari district.
1.17 Statement of the Problem

The present study intends to analyse the usage of open access resources and to determine the perceptions of the user towards open access resources among the academic communities. It also intends to determine the awareness, attitude and satisfaction of the users towards open access resources among the academic communities in the higher education system. Hence, the problem for the present study is entitled as “User Perceptions and Usage of Open Access Resources by the Academic Community in the Higher Education System”.

1.18 Definition of Terms

The operational definition of major terms used in the title is presented as follows:

a. User Perception

User perception is the ability of the user to see, hear, access and become aware of something what we experience through the senses.

User perception here refers to the opinion, perceived experience, and attitude of users in the higher educational institutions namely post-graduate students, research scholars and faculty members towards open educational resources.

b. Open Access Resources

Open access resources are electronic resources which are freely available in online access to the users at free of cost without any restrictions. Users can read, download, copy, distribute, search and print full text articles.

Here, open access resources and open educational resources represent one and the same.
c. **Usage of Open Access Resources**

Usage refers to the way in which the resources are being utilized by the users for their information requirements.

Usage here refers to the use of open access resources by the academic community consisting of post-graduate students, research scholars and faculty members of higher educational institutions.

d. **Academic Community**

Academic community refers to the community gathered together to pursue education. It is made up of students and teachers gathered together for the common purpose of information sharing and knowledge exchange.

Academic community here refers to students of undergraduate students, post-graduate students, research scholars and faculty members in the higher education system consisting of Arts and Science Colleges, Engineering Colleges, Education Colleges and University.

e. **Higher Education System**

Higher education system is the system of education beyond the secondary level, especially education provided by a college or university. Higher education is often delivered at Universities, Academies, Colleges, Seminaries, and Institute of Technology. Higher education is also available through certain college-level institutions, including vocational schools, trade schools and other colleges that award academic degrees or professional certificates.

Higher education system here refers to the higher educational institutions namely Arts and Science Colleges, Engineering Colleges, Education Colleges and University.
1.19 Objectives of the Study

The following objectives are framed for the study:

1. To determine the level of awareness towards open access resources among the academic community in the higher education system.
2. To identify the frequency and purpose of using open access resources.
3. To determine the extent of usage of open access resources by the academic community.
4. To analyse the information literacy among the academic community in the higher education system.
5. To analyse the user perception and attitude towards open access resources.
6. To identify the relationship between the demographic variables with respect to use of open access resources, awareness, information literacy, perception and attitude towards open access resources and
7. To analyse the major problems faced by the academic community while using open access resources.

1.20 Hypotheses of the Study

The hypotheses framed for the study are as follows:

1. Utilization of open access resources are more among the academic community in the higher education system.
2. Awareness towards open access resources is poor among the academic community in the higher education system.
3. Information literacy is more among the academic community in the higher education system.
4. Users in higher education system have favorable attitude towards open access system.
5. There is no significant difference in awareness, use of open access resources, time spent, information literacy, user perception and attitude towards open access resources with respect to (i) gender (ii) locale (iii) age (iv) category of institution (v) category of user and (vi) familiarity of computer.

6. There is no significant correlation between the selected demographic variables with information literacy, perception and attitude towards open access resources.

1.21 Delimitations of the Study

The delimitations of the present study are given as follows:

1. The present study is limited only to the users of Arts and Science Colleges, Engineering Colleges, Education Colleges and the University of Kanyakumari district.

2. Undergraduate students from Arts and Science Colleges, Engineering Colleges, and Education Colleges and the University of Kanyakumari district are excluded from the study.

3. Users from Polytechnic Colleges, Nursing Colleges and Medical colleges are excluded from the study.

4. The present study is conducted during the academic year 2013-14 alone.

1.22 Organizations of the Report

The study is reported in six chapters. They are as follows:

1. Chapter –I : Introduction

Chapter one explains the concepts, advantages and evolution of open access resources, history and development of open access, declaration of open access conventions, evolution of open access in India, type of open access resources, open
access repositories, need and significance of the study, definition of terms, objectives and hypothesis of the study, delimitations of the study and organization of the report.

2. Chapter – II : Review of Related Literature

The related studies and literature pertaining to open access resources, usage of open access resources, user perceptions and attitude towards open access resources are reviewed and presented in this chapter.

3. Chapter– III : Area Profile and Higher Education System in Kanyakumari District

This chapter deals with the geographical and higher educational profile of Kanyakumari district.

4. Chapter – IV : Methodology

The chapter four deals with the research design, method adopted for the study, sampling design, samples for the study, tools used for the study and statistical tools used for the study.

5. Chapter – V: Analysis and Interpretation of Data

The fifth chapter contains the analysis and interpretation of data.

6. Chapter – VI : Findings, Suggestions and Conclusion

Findings of the study, suggestions of the study and conclusion are provided in the sixth chapter.

The sixth chapter is followed by an exhaustive references and a series of annexure pertaining to the study.

The American Psychological Association (APA) style manual is used for reference and citations.