1

Introduction to
Open Access

UNESCO
United Nations
Educational, Scientific and
Cultural Organization

Introduction to Open Access

Module

1

Introduction to Open Access

CURRICULUM DESIGN COMMITTEE

Anirban Sarma
UNESCO New Delhi, India

Anup Kumar Das
Jawaharlal Nehru University, India

Barnali Roy Choudhury
CEMCA, New Delhi

Bhanu Neupane
UNESCO, Paris, France

Bojan Macan
Ruđer Boškoviƒ Institute Library, Croatia

Dominique Babini
CLACSO, Argentina

Ina Smith
Stellenbosch University, South Africa

Iskra Panevska
UNESCO New Delhi, India

Jayalakshmi Chittoor Parameswaran
Independent Consultant, India

M Madhan
ICRISAT, India

Parthasarathi Mukhopadhyay
Kalyani University, India

Ramesh C Gaur
Jawaharlal Nehru University, India

Sanjaya Mishra
CEMCA, New Delhi, India

Shalini Urs
University of Mysore, India

Sridhar Gutam
Central Institute for Subtropical Horticulture, India

Susan Veldsman
Academy of Science of South Africa, South Africa

Uma Kanjilal
Indira Gandhi National Open University, India

Upali Amarasiri
University of Colombo, Sri Lanka

Žibutė Petrauskiene
Vilnius University Library, Lithuania

MODULE ADVISORS

Ramesh C Gaur
Jawaharlal Nehru University, India

Uma Kanjilal
Indira Gandhi National Open University, India

Project Coordinator

Sanjaya Mishra
CEMCA, New Delhi, India

MODULE PREPARATION TEAM

Writer

Uma Kanjilal (Unit 1)
Indira Gandhi National Open University, India

Anup Kumar Das (Unit 2-5)
Jawaharlal Nehru University, India

Editor
M.P. Satija
UGC Emeritus Fellow
Guru Nanak Dev University
India

Chief Editor
Sanjaya Mishra
CEMCA, New Delhi

.

MODULE INTRODUCTION

Progress of every profession, academic discipline and society at large rides on the back of research and development. Research generates new information and knowledge. It is a standardized process of identifying problem, collecting data or evidence, tabulating data and its analysis, drawing inference and establishing new facts in the form of information. Information has its life cycle: conception, generation, communication, evaluation and validation, use, impact and lastly a fuel for new ideas. Research results are published in journals, conference proceedings, monographs, dissertations, reports, and now the web provides many a new forum for its communication. Since their origin in the 17th century, the journals have remained very popular and important channels for dissemination of new ideas and research. Journals have become inseparable organ of scholarship and research communication, and are a huge and wide industry. Their proliferation (with high mortality rate), high cost of production, cumbersome distribution, waiting time for authors to get published, and then more time in getting listed in indexing services, increasing subscription rates, and lastly archiving of back volumes have led to a serious problem known as "Serials Crisis". The ICT, especially the internet and the WWW, descended from the cyber space to solve all these problems over night in the new avatar of e-journals. Their inherent features and versatility have made them immensely popular. Then in the beginning of the 21st century emerged the Open Access (OA) movement with the Budapest Open Access Initiative (BOAI). Philosophy of open access is to provide free of charge and unhindered access to research and its publications without copyright restrictions. The movement got support from great scientists, educationists, publishers, research institutions, professional associations and library organizations. The other OA declarations at Berlin and Bethesda put it on strong footings. 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 OA has many forms of access and usage varying from total freedom from paying any charges, full permission to copy, download, print, distribute, archive, translate and even change format to its usage with varying restrictions.

In the beginning, OA publications were doubted for their authenticity and quality: established authors and researchers shied away both from contributing to and citing from OA literature. But Committee on Publication Ethics (COPE, 1997) and its code of conduct formulated in collaboration with DOAJ and OASPA, etc. have stemmed the rot. They have defined best practices and compiled principles of transparency for quality control to sift the grain from the chaff; to keep the fraudulent at bay. Now it is accepted that contributors to OA get increased visibility, global presence, increased accessibility, increased collaboration, increased impact both in citations and applications, and lastly instant feedback, comments and critical reflections. This movement has got roots due to its systematic advocacy campaign. Since 2008 every year 21-27 October is celebrated as the OA week throughout the world. There are many organizations which advocate OA through social media and provide guidance for others.

Open Access research literature has not only made new ideas easy and quick to disseminate, but the impact of research can be quantitatively gauged by various bibliometric, scientometric and webometric methods such as h-index, i-10 index, etc. to measure the scientific productivity, its flow, speed and lastly its concrete influence on individuals, and on the progress of a discipline. The OA movement is gaining momentum every day, thanks to technology, organizational efforts for quality control and its measureable impact on productivity and further research. It needs to be strengthened with participation of every researcher, scientist, educationist and librarian. This module covers five units, covering these issues.

At the end of this module, you are expected to be able to:

- Define scholarly communication and open access, and promote and differentiate between the various forms of Open Access;

- Explain issues related to rights management, incl. copyright, copy-left, authors' rights and related intellectual property rights;

- Demonstrate the impact of Open Access within a scholarly communication environment.

UNIT 1   SCHOLARLY COMMUNICATION PROCESS

Structure

1.0   Introduction

1.1   Learning Outcomes

1.2   Research Lifecycle

1.3   History and Evolution of Scholarly Communication

1.4   Status and Trends

1.5   Role of Stakeholders

1.6   Let Us Sum Up

1.0   INTRODUCTION

Scholarly communication refers to the 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 lifecycle. The most common method of scholarly communication till 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 applications there is a major shift in the scholarly communication process. We can see a deviation in the publishing processes wherein a variety of media and formats are being used by the researchers to share and disseminate their work. The networked digital environment has enabled the creation of platforms for publishing by the researchers directly and these are becoming essential tools for scholars conducting research, building scholarly networks, and disseminating their ideas and work. Libraries play a major role in the scholarly communication process. Outreach to scholarly community is one important activity where libraries can bring in positive change that advances the scholarly communication system through new research and dissemination models.

This Unit introduces the concept of research lifecycle and scholarly communication discussing its history and evolution. It further looks in to the changes in the scholarly communication process with advent of web 2.0 tools and other ICT applications, and explores the changing role of the stakeholders in the process.

1.1   LEARNING OUTCOMES

After going through this Unit you are expected to be able to:

- Describe the historical evolution of scholarly communication process;
- Explain the lifecycle of research in socio economic context;
- Understand the roles of different stakeholders, specially the role of librarians.

1.2   RESEARCH LIFECYCLE

The research lifecycle is a representation of the activities that occur throughout a research process. It starts with an idea to pursue, followed by data collection, and data analysis, that continues with interpretation of the analysis in the form of a research publication. Grouped into sequential steps or stages, research lifecycle covers everything from conceptualization to knowledge transfer. Each stage comprises a set of related activities that culminate in a significant outcome that is then carried forward to the next stage. The research output could be shared in the form of a book or article, blog, presentation, or through any other communication channel. These primary research outputs once disseminated provide an opportunity for the scholarly community to engage in discussions, debates, and further study on the topic at hand. The outcome of further study starts the cycle anew. By linking together a series of stages in the research process in a logical sequence, the research lifecycle is represented. Within the research lifecycle, several stages involve the production and management of data and metadata apart from the scholarly publication which is the ultimate outcome.

The research lifecycle diagram by the Joint Information Systems Committee (JISC) represented below shows an interconnected bicycle, the top one showing the research lifecycle, and emanating from the research process stage the data lifecycle interwoven below it.

Figure 1.1: Research Lifecycle[1]

---

[1] http://www.jisc.ac.uk/whatwedo/campaigns/res3/jischelp.aspx

☞ **Activity I**

Visit the Research Lifecycle diagram at JISC website at
http://www.jisc.ac.uk/whatwedo/campaigns/res3/jischelp.aspx and identify the
activities where libraries can play a major role and explain how libraries do it.

……………………………………………………………………………..

……………………………………………………………………………..

……………………………………………………………………………..

……………………………………………………………………………..

……………………………………………………………………………..

……………………………………………………………………………..

……………………………………………………………………………..

……………………………………………………………………………..

The research lifecycle comprises three major processes:

• Research Planning,

• Data Collection and Management, and

• Scholarly Communication.

Data Management Consulting Group (DMConsult) of the University of
Virginia Library representation of the steps in the Research Life Cycle (Fig.
1.2) is quite library centric where library services can be engaged. It focuses
more on the data management aspects including metadata as well.
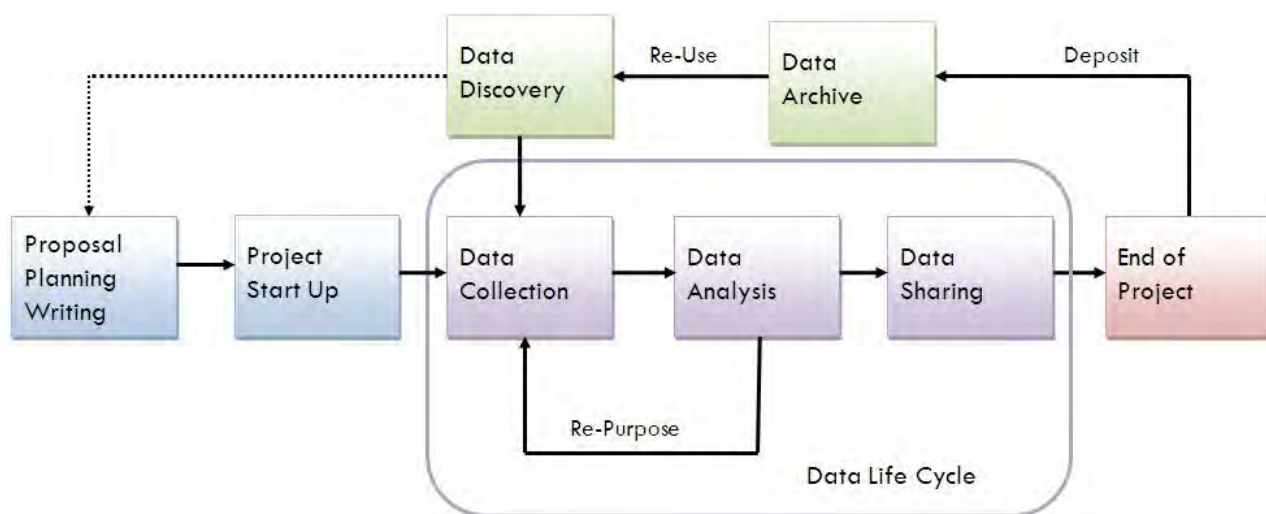
Figure 1.2: Research Lifecycle[2]

---

[2] http://dmconsult.library.virginia.edu/lifecycle

The figure above broadly categorises the research lifecycle into following major components:

- Proposal Planning and Writing – This step includes review of existing data sets, decision on whether to produce a new dataset (or combing existing), investigation of archiving challenges, consent and confidentiality, Identify potential users of data, cost analysis for archiving and consultation with archivists.

- Project Start Up – this step involves preparation of data management plan, take decisions about documentation form and content and conduct pilot test of materials and methods.

- Data Collection – For data collection one needs to look into the best practices. Collected data needs to be properly organized and also one needs to arrange for backups and storage. This step will also require quality assurance mechanism in place for data collection and also decision on access control and security aspects.

- Data Analysis – This step includes managing file versions, document analysis and file manipulations.

- Data Sharing – Depending on the data sharing policy decision on file formats has to be made. Consultation of archivist for advice on data storage may be required and cleaning up of redundant data needs to be looked into.

- End of Project- In the final step one may write paper/ article, submit report on findings and deposit data in a data archive/ repository.

Managing data in a research project is a process that is most crucial and runs throughout the research lifecycle. Good management of data is essential to ensure that data is preserved and remains accessible in the long-term, so that it can be re-used by other researchers. When managed and preserved properly research data can be successfully used for future scientific purposes. Researchers need help to manage their data and this is where libraries can play a major role. One of the most significant changes in the recent years has been the widespread recognition of data as an asset.

Liz Lyon depicts the research life cycle (Research360@Bath) combining the researcher and the library perspectives and adding to that the context of community or stakeholders. The model is based on a partnership approach involving UKOLN-DCC, Library**,** IT services, Research Support Office and Doctoral Training Centres.
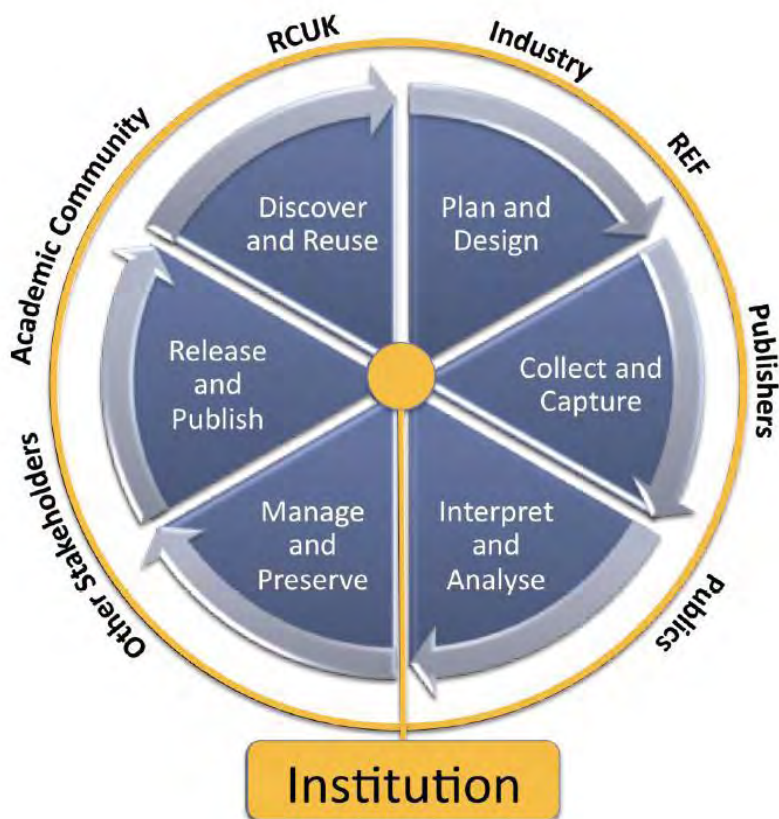
Figure 1.3: Research Life Cycle (Research360@Bath[3])

Data management planning is the starting point in the data life cycle. Data Management Plan needs to take into consideration: i) Information about the data including metadata and their format, ii) policies for access, sharing, and reuse of data, iii) long-term storage and data archiving plan, and iv) budget considerations for data management. After planning, assess what it takes to fulfill in terms of infrastructure, staff skills and resources, and management support. Once data collection or capture (in case of pure research) is done the next step is data analysis. Analysis tools for scientific data generally comprise programming languages, statistics and analysis tools, and workflow tools. For good data management researchers need to engage in Quality assurance mechanism to ensure data quality before its collection and Quality control for monitoring and maintaining data quality during the study. One needs to have mechanisms to check errors of omission and commission at data entry level. Once data is fed next step is managing and preservation of data where library can play a major role. At this stage metadata needs to be added so that the researcher can communicate with other scientists who may like to re-use the data. To bring in interoperability, using metadata standards is important. The next stage is sharing and publishing data. Data sharing basically refers to citing data and for long term preservation a persistent or long-term identifier is an absolute must. It is therefore, important that while publishing data it needs to include the citation data with title, date, authors, abstract, and persistent identifier (DOI, URI etc.) so that they can be easily discovered and reused.

---

[3] http://www.ukoln.ac.uk/ukoln/staff/e.j.lyon/liz-lyon-vala2012-informatics-transform-final.pdf

I2S2 Idealised Scientific Research Activity Lifecycle Model represents the processes and phases of research lifecycle from a typical physical science experiment project perspective. The stages include:

- development of the research proposal;

- peer-reviewing of the proposal;

- carrying out of the experiment;

- processing, analysis and interpretation of the data;

- reporting and publishing in various forms as research outputs;

- appraisal and quality control;

- documentation including metadata and contextual information;

- storage, archive, preservation and curation; and

- IPR, embargo and access control.

This very comprehensive representation of the research lifecycle is given Fig.1.4.
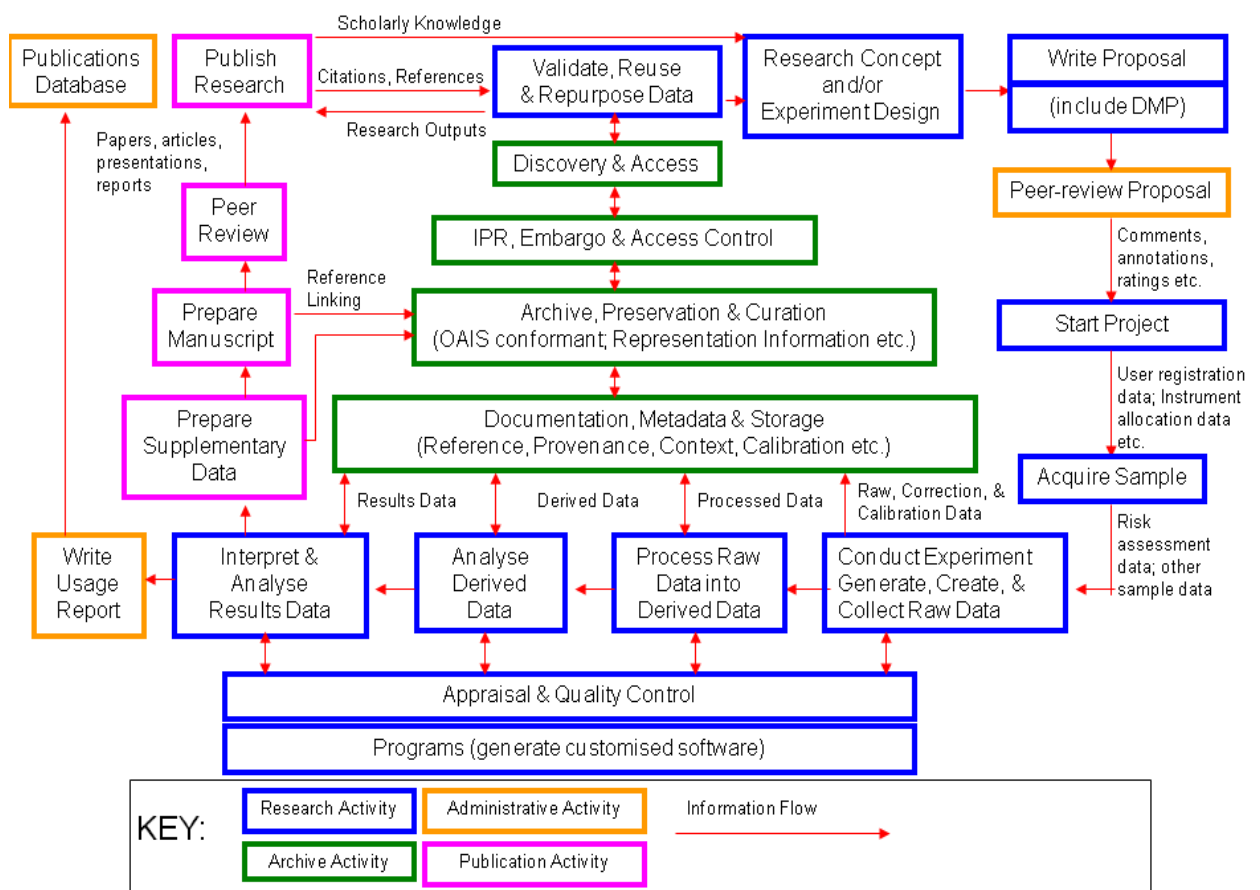

Figure 1.4: I2S2 Idealised Scientific Research Activity Lifecycle Model[4]

---

[4] http://www.ukoln.ac.uk/projects/I2S2/documents/I2S2-ResearchActivityLifecycleModel-110407.pdf

Bo-Christer Björk in 2007 developed a comprehensive model for the scholarly communication life cycle using the formal process-modelling method IDEF02, a standard tool used in business process re-engineering. This was further refined by John Houghton and Bo-Christer Björk in 2008.The model encompasses five basic scholarly communication process activities and each of these comprising numerous sub-processes. The basic components are:

- Fund research and its communication
- Perform research and communicate the results
- Publish research outputs
- Facilitate dissemination, retrieval and preservation
- Study publications and apply the knowledge derived.

Houghton and Björk's Activity model of the Scholarly Communication Process substantially developed and extended on the Scholarly Communication Life-Cycle was used for a JISC funded project to: (i) capture all of the activities and related costs throughout the scholarly communication process; and (ii) highlight the differences between alternative publishing models. The Houghton and Björk extended scholarly communication process model provides a foundation for a detailed identification of the actors, activities, objects and functions involved in the entire scholarly communication process that includes more than 50 diagrams and almost 200 activities.

1.3 HISTORY AND EVOLUTION OF SCHOLARLY COMMUNICATION

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."[5]

According to Adrian K. Ho "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 lifecycle)". The scholarly communication lifecycle is represented in Fig. 1.5:

Figure 1.5: **Scholarly Communication Process**[6]

---

[5] http://www.arl.org/focus-areas/scholarly-communication
[6] http://ir.lib.uwo.ca/wlpres/19/

There are different stakeholders involved in the scholarly communication process that includes authors, publishers, libraries, researchers, higher education institutions, and funding agencies. We will discuss the role of these stakeholders especially the libraries in details in section 1.5.

The communication of information began with the beginning of civilization with people recording their experiences in inscriptions and later manuscripts. With the invention of the Printing Press by Gutenberg in mid-15th century it revolutionized publishing in printed book form.

Ever since the first scholarly journals were started in mid 1600s, (*Journal des Sçavans* 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. The scholarly journals provided a platform to share their research finding and also acted as a public registry of scientific communication.

For most scholars the gold standard in the world of scholarly communication is the peer reviewed article. Publishing articles in peer-reviewed journals is the prime indicator of professional standing for researchers and it also fulfils 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.

With the exponential growth of scientific literature since World War II, the need for new ways of organizing, storing and accessing enormous body of information was felt. Invention of Vannevar Bush's microform-based system, Memex (memory expander) to store and retrieve information using a series of navigational links is considered the precursor to the modern hypertext based electronic systems.

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 spiraling prices of journals, limited physical space for storage and resource crunch.

E-publishing and digital processing of information, their storage and retrieval has 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.

The Internet has affected scholarly publication especially from the availability and accessibility point of view. 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 enabling technologies, innovative publishing models for scientific

communication are emerging facilitating self-publishing where the responsibility and ownership of scholarship rests with the creators.

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. Last two decades saw growth in the number of scholarly journals, spiraling prices and falling purchasing power in developing countries. This has resulted in a crisis situation where the academic and research institutions are not able to subscribe to full range of publications and have been forced to cancel subscriptions and resort to other methods to facilitate access to the researcher and academic community. This has paved the way for open access movement which we will cover in detail in the next unit.

☞ **Activity 2**

Identify the major milestones in the scholarly communication process and discuss how libraries have been adapting to these changes.

……………………………………………………………………………...

……………………………………………………………………………...

……………………………………………………………………………...

……………………………………………………………………………...

……………………………………………………………………………...

……………………………………………………………………………...

……………………………………………………………………………...

……………………………………………………………………………...

1.4 STATUS AND TRENDS

Information and Communication Technology (ICT) has revolutionized the way we collect, store, share and communicate information today. This has impacted the scholarly communication process as well, especially from the publishing and dissemination standpoint.

The scholarly publishing system at present is an aggregated one which combines four functions of journal publication i.e. registration, certification (peer review); awareness (communications); and archiving in one package. Internet and other ICT applications provide an opportunity for unlocking the traditional scholarly publishing system and providing new ways to fulfil these four functions.

Technology also provides new models of dissemination with more control on the part of the researchers, academics and the libraries. Due to issues of affordability and with the intension for providing wider access to all readers,

there has been a shift in peer reviewed journals towards open access (OA) in recent years.

New web 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 in 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 towards their psychological experience requirements of being discovered, appreciated and recognized.

With the development of online publication scenario, online writing is becoming a popular style of scholarly communication. Blogs and wikis provide suitable platform to cultivate the habit of online and collective scholarly writing, especially where there is intense collaboration in the research work.

Availability of more online references and multimedia resources through social media is also forcing the scholarly community towards online writing.

1.5   ROLE OF STAKEHOLDERS

There are different stakeholders involved in the scholarly communication process. The major stakeholders can be categorized as:

- researchers/ authors
- publishers
- libraries

Researchers are the primary component of the scholarly communication process. They are not only the creators of the scholarly knowledge base but also act as the consumers and quality controller. As a creator they contribute by sharing their research work in the form of research data, published articles, blogs, discussion forums etc. As a consumer they consult existing publications and data both as testimony of the current state of art or even as direct or indirect input for the establishment of new results. By intervening at each stage of the research lifecycle, where evaluation is required, such as to peer review a submitted paper or to assess the work of a research entity they act as quality controller of the research work.

The publisher's role in the scholarly communication process is not limited to mere dissemination of scholarly work. The elements of quality assurance and filtration, enhancement of presentation, creation of metadata, archiving of validated and authoritative versions of the research publication, meeting market demand, promotion of scholarly publication, outreach services and connecting scholars and scholarship are essential elements of the effective scholarly communication process wherein the publishers are the main drivers.

Librarians play a part in supporting faculty engaged in Research. This has traditionally involved preserving the institution's research output, organising resources, and assisting researchers with locating and accessing information relevant to their needs. Information discovery process is part of the first step in the research lifecycle—the development and exploration of ideas. In recent years however libraries have begun to move beyond this traditional role and to support researchers during other steps in the research lifecycle. The emerging role that libraries are playing includes- data management, creation of metadata for research data and partnering with them in publishing journals. The scholarly publishing landscape itself is also evolving in response to many forces impinging upon the research and academic landscape, including the emergence of public policies mandating open access to publications arising from government-funded research. As a result researchers are seeking an open access publication outlet. Libraries already promoting open access options are getting opportunity to take on the actual publisher role. Hahn (2008) reports on a 2007 survey involving 80 member libraries of the Association of Research Libraries (ARL) which found that 44% of respondents were involved in publishing, with 88% of these libraries involved in journal publishing. A later survey conducted with 43 ARL members in 2010 found that 55% of respondents were publishing or interested to do so (Crow et al., 2012).

In the pre-web age publishers were essential for the scholarly ecosystem. The scholarly community were dependent on the publishers to see their work disseminated. With Web 2.0 tools academia has got empowered both from the access and publishing point of view and the role of the publishers seem to diminish. Rather libraries need to gear up in providing value added services to the scholarly community. With the changing scenario following major areas of interventions are seen for the libraries in the research life cycle:

- support scholarly community by creating institutional repositories as containers for the universe of digital materials produced through research and scholarship, not just the published record;

- help in searching relevant research data and published articles filtering and repackaging the same for better user experience;

- provide platform for self-archiving and self-publishing by scholarly community;

- take up the role of publisher through publication of e-journals and promotion and dissemination of the same;

- designing and maintaining institutional repositories for archiving research output of the institution.

With the advent of state-of-the art technologies there seems to be a major change in the scholarly communication process and the role of the stakeholders in the process is getting redefined.

☞ **Activity 3**

Critically examine how open access initiatives have affected the scholarly publishing scenario.

…………………………………………………………………………………...

…………………………………………………………………………………...

…………………………………………………………………………………...

…………………………………………………………………………………...

…………………………………………………………………………………...

…………………………………………………………………………………...

…………………………………………………………………………………...

…………………………………………………………………………………...

1.6 LET US SUM UP

The research lifecycle starts with an idea to pursue, followed by data collection, and data analysis, that continues with interpretation of the analysis in the form of a research publication. The major components of the research lifecycle comprise, research planning, data management, and scholarly communication.

Ever since the first scholarly journals were started in mid 1600s researchers and academicians have been striving to publish and disseminate their research work through them. The innovative ICT applications have substantially affected the traditional scholarly communication process.

The future of scholarly communication process is uncertain, but it is clear that for at least in the coming years it will be conducted using a variety of media, on an array of platforms. Libraries play a major role in the scholarly communication process and with the changing scholarly publishing landscape their role is getting further enhanced.

UNIT 2 OPEN ACCESS: HISTORY AND DEVELOPMENTS

Structure

2.0 INTRODUCTION

Emerging developments in Internet in the 1990s led to global sharing of knowledge and universal access to information resources. Scholarly communication channels got tremendous impetus, when Internet pushed further their reach, availability and readership. Adaptation of information and communication technologies (ICT) in academic research environment helped in enhancing productivity of research scholars. Borderless or cross-border nature of Internet pushed further global access to knowledge resources and academic databases round the corner in 24X7 timeframe. Many scholarly journals in print format started publishing their electronic edition, which since then are popularly known as electronic journals or e-journals. Scholarly open access (OA) journals are a kind of e-journals available in online environment through Internet, without any access barrier, such as annual subscription fee. In the beginning years of the 21st Century, scholarly communities got engaged with the global OA movements for opening up scholarly resources, more particularly research literature, to worldwide researchers' communities without any access fee or subscription cost. Then researchers' communities availed not only free access to scholarly contents, but also other bundle of rights need to be provided to creators and users of research literature. Freedom of sharing, archiving, reusing and remixing of scholarly contents was not available through normal copyright protection mechanisms. Copyright laws of many countries discouraged public sharing or reusing of scholarly contents. While extending freedom of sharing or reusing to user groups through the alternative to copyright protection pathways, such as Creative Commons (CC) or CopyLeft licenses, users groups happily make use of these community

resources for further production and distribution of knowledge. While protecting creators' rights, CC licenses churn out full potentials of OA research literature.

In this Unit, the genesis of OA publishing is briefly discussed. This Unit also highlights different benefits OA publishing promises, different approaches and business models of OA. Finally, this Unit gives you an overview of long-terms preservation models available for OA and other scholarly electronic contents.

2.1   LEARNING OUTCOMES

After going through this unit, you are expected to be able to:

- Define and explain OA from the perspective of its historical developments;
- Distinguish between Green and Gold OA, and also understand emerging approaches to OA;
- Explain the OA advantages, and argue for promoting OA to scientific information;
- Identify business models for promoting OA; and
- Understand long-term digital preservation models available to OA knowledge resources.

2.2   OPEN ACCESS – DEFINITIONS

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. Thus, OA facilitators as well as users need to establish an online connectivity for knowledge diffusion. Internet services are designed for global as well as local users. User interfaces and languages of scholarly communications are to be suitable for global users for achieving fruits of OA.

Peter Suber (2012) defines OA "Open Access literature is digital, online, free of charge, and free of most copyright and licensing restrictions". He further elaborates terminologies used in popular OA movement, as shown in Figure 2.1.

The OA movement uses the term *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. All three of these terms were coined by Stevan Harnad.

Work that 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 we could remove 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*.
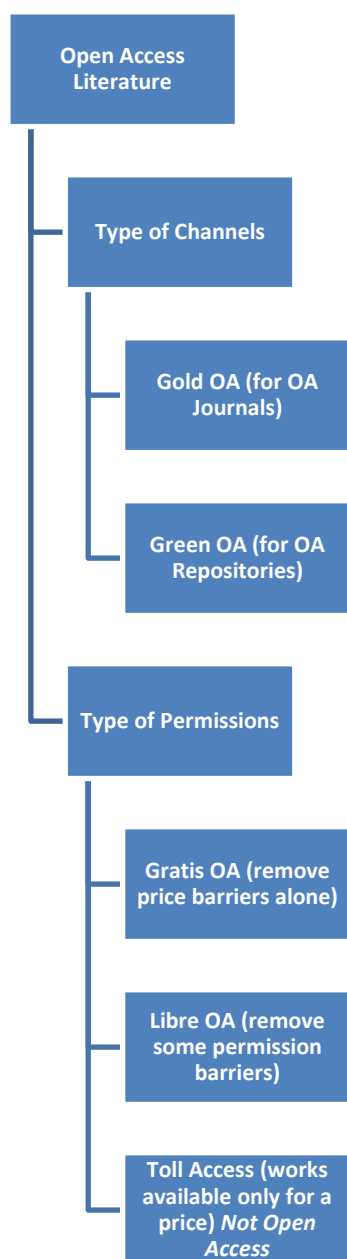
Figure 2.1: Popular OA Terms

2.3   OPEN ACCESS – PHILOSOPHY

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

The Budapest Open Access Initiative (2002) recorded the philosophical understandings of its signatories:

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.

On the other hand, signatories of the Berlin Declaration (2003) believe 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 and 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.

We see the similar sentiments and beliefs are 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 Noble laureates and renowned global thinkers. Similarly, other global, national, regional and institutional OA mandates, introduced after BBB declarations, have recognized and enacted upon philosophical foundations carved in these three pioneering 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.

2.4 OPEN ACCESS – EVOLUTION

OA movement is a worldwide phenomenon to mitigate challenges faced by the global libraries and research institutions related to 'serials crisis' – a spiraling effect of constant increase in subscription cost of many scholarly journals and exponential hike of online access fees of e-journals in 1990s that led to cancellation or reduction of subscriptions of many over-priced serials due to budgetary limits. OA initiatives have tried to provide initially Gratis OA and later Libre OA to scholarly literature. The first ever formal OA repository launched was the arXiv.org in 1991 which helped researchers in self-archiving of their electronic preprints of scientific papers in the fields of physics, mathematics, computer science, quantitative biology, quantitative finance and statistics.

Table 2.1: Indicative Open Access Timeline[7]

1991	2000				2001		2002				2003			2006	2007	2008
arXiv.org Repository Launched	**PubMed Central** Repository Launched	**EPrints** software Released	**PLOS** journals Launched	**BioMed Central** journals Launched	**OJS** (Open Journal Systems) Software Released	**SPARC** Launched	**DSpace** software Released	**Creative Commons** Licenses Released	**Budapest** OA Initiative (Declaration)	OAIster Database Launched	**Berlin, Bethesda Declarations**	**WSIS** Action Lines Launched	**DOAJ** (Directory of Open Access Journals) Launched	**OpenDOAR** (Directory of Open Repositories) Launched	Celebration of **Open Access Week** Started	OA Scholarly Publishers Association (**OASPA**) Launched

As indicated in Table 2.1, there were many events in the first decade of the 21st century that marked the emergence of OA literature as a substantial mode of scholarly communications. Many stakeholders came forward in building institutions and resources for shaping up the global OA movements. Some of

---

[7] http://legacy.earlham.edu/~peters/fos/timeline.htm

the institutions emerged during this decade are namely, Public Library of Science (PLOS), BioMed Central (BMC) – publishers of peer-reviewed OA journals, the Scholarly Publishing and Academic Resources Coalition (SPARC), and Open Access Scholarly Publishers Association (OASPA). Most importantly, the Budapest, Berlin and Bethesda (BBB) OA declarations or statements got signed by the scholarly communities, particularly by the funding agencies, research councils, learned societies, institutions, universities, and scientists for the OA dissemination of public funded research.
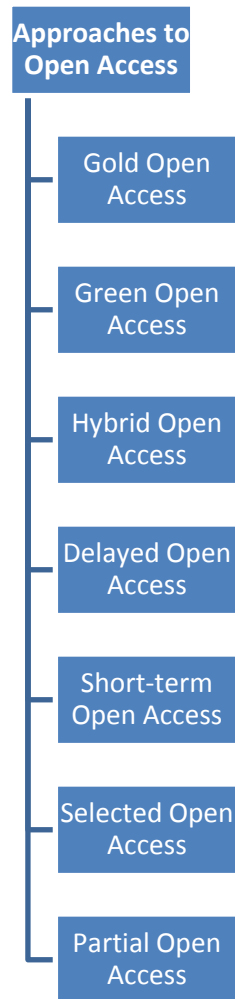
2.5   APPROACHES TO OPEN ACCESS

OA publications are predominantly available through gold and green OA channels, as indicated in earlier sections. 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. In hybrid OA model, publishers publish OA articles in toll-access scholarly journals, after receiving certain article processing charges (APC) from the authors. In Delayed OA model, publishers offer free access after a specified period, anywhere from 6 months to 2 years. In Short-term OA model, publishers offer free access until a specified period, anywhere from 6 months to 1 year. Then after, contents are available to subscribers only. In Selected OA model, publishers selectively offer free access to selected contents only. Other contents are available to subscribers only. In 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 don't explicitly carry CC or similar licenses. These four models mainly belong to Gratis OA category. Figure 2.2 gives a glimpse of different approaches of OA to scholarly literature, where a diversity of content models is recorded.

Figure 2.2: Popular OA Approaches

2.6 BENEFITS OF OPEN ACCESS

The BBB open access statements and associated literature have identified major benefits of OA scholarly publishing. Primary benefit is to provide removal of access barriers, as there is no cost associated with subscriptions or online access. There is no access restriction in OA mode, leading to bridging knowledge divides between global North and global South. Many benefits of OA publishing are related to global nature of Internet. Internet brings every piece of online content to a general or specialized audience, depending on nature of contents. These free contents are outreached globally, accessed and appreciated by global communities. So, OA publishing brings full potentials of the communicated research. To an author these include increased global visibility, increased accessibility in both developed and developing countries, increased possibilities of get cited, and increased article level metrics or altmetrics. Other researchers seeking research collaborations get engaged with the publishing authors for possible international collaborations at the institutional or individual level. The OA contents also offer a window for receiving constructive feedbacks, comments, and opinions. These critical reflections enrich the published OA contents. Both readers and authors can

then be a part in the advancement of knowledge, offered by OA scholarly literature. Figure 2.3 elaborates different benefits of OA scholarly literature, as observed or perceived by the scholarly communities.
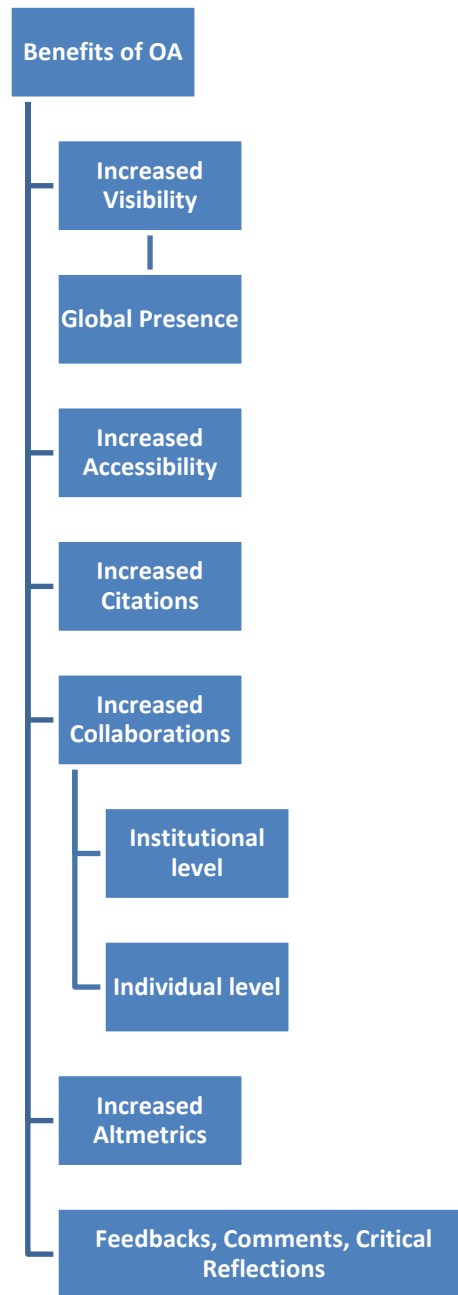
Figure 2.3: Observed Benefits of OA Scholarly Literature

2.7 ARGUMENTS AGAINST OPEN ACCESS AND RESPONSES

In the first two decades of the 21st century, we see high growth rate of the number of OA journal titles. DOAJ has recorded about 9750 scholarly OA journals, whereas OpenDOAR recorded about 2600 OA repositories available across the world as on March 2014. We also have observed that there is also entry of predatory OA journals, promising quick publishing avenue to

researchers – obviously with a price of APC paid by the prospective authors. However, there are various checks and balances to restrict operations of predatory OA journals, such as strict inclusion criteria at DOAJ and OASPA. Beall List (ScholarlyOA.com) also provides regular alerts to scholarly communities about potential, possible, or probable predatory scholarly open-access publishers. Some of them are either not accredited by DOAJ and OASPA, or excluded from these two self-regulatory bodies.

Table 2.2 provides summary of arguments against OA publishing and their suitable responses. The editorial office of a peer-reviewed OA journal should be equipped with supportive editorial advisory board that can scrutinize and peer-review the submitted manuscripts with academic rigour. Table 2.2 argues that OA and non-OA journals would have comparable publishing standards, which can drive OA journals' acceptance, recognition and reputation if they follow self-regulatory industry standards and best practices time to time.

**Table 2.2: Arguments against Open Access Publishing and
Suitable Responses**

| Arguments Against Open Access	Responses
OA journals don't have exhaustive or in-depth peer reviewing process.	COPE and OASPA-accredited OA journals follow very exhaustive and in-depth peer reviewing process, comparable with traditional non-OA scholarly journals.
Peer reviewing is not satisfactory enough to validate scientific findings matching existing standards and methodologies.	Peer reviewing is highly satisfactory in many journals, particularly which are having high rate of citations or altmetrics. These journals have comparable academic rigour while accepting papers.
Academic rigour in OA journals is not proven.	Academic rigour is proven when an OA journal becomes a high ranking journal in a specialized or specific scientific discipline, or, when the journal receives high rate of citations/ altmetric score.
APC (article processing charge) is major hurdle in getting published in OA journals.	Some studies indicate that only a handful of OA journals accept APC from prospective authors. Others don't accept an APC from the authors. Many of them don't consider APC as main source of revenue. On the other hand, toll-access journals charge a print or online subscription fee – unaffordable to many institutions in the developing as well developed nations.

2.8 OPEN ACCESS BUSINESS MODELS

You have learned about different dimensions of OA journals and OA repositories. In addition to OA journals and OA repositories, other products of scholarly communications have started opening up their resources online for free and equitable access. Many of these resources are also available with CC licenses ensuring freedom of sharing, reusing, redistribution, and remixing. These have specific formats and cater to specific audiences. Some OA repositories provide access to a mixed kind of resources, whereas some gateways or portals are available for dissemination of specific kind of resources. Open Educational Resources (OER) have special role to supplement lifelong learning, continuous education, vocational education and distance learning. Massive Online Courses (MOOCs), Open Textbooks and Open Courseware are also associated with global deployment of OER. Some publishers now have been publishing OA books and OA monographs utilizing author's pay model, receiving an APC from authors for publishing such books or monographs. OA books and monographs can be searched from the Directory of Open Access Books[8] (DOAB). An open source software – the PKP Open Conference Systems[9] (OCS) is available from the Public Knowledge Project, helping organizers of scholarly conferences with a free web publishing tool. This software is widely used by the academic institutions, universities and learned societies to create a complete web presence for their conferences. Papers presented in these conferences are freely available in OA mode. Some commercial publishers are also co-publishing OA conference proceedings, in collaborations with scholarly conference organizers. The theses and dissertations are very useful form of scholarly communications, originated from the doctoral, pre-doctoral and post- doctoral research studies undertaken in universities and research institutions. There are certain format-specific OA repositories, which deal with theses and dissertations, also known as ETD (electronic theses and dissertations) repositories. An international organization - the Networked Digital Library of Theses and Dissertations (NDLTD) promotes the adoption, creation, use, dissemination and preservation of electronic theses and dissertations. Many of the ETD and OA repositories are indexed in the OAIster[10] database and are searchable from its portal. Figure 2.4 shows format specific business models in OA publishing, based on nature of contents of full-text documents getting globally disseminated to scholarly audiences.

---

[8] http://www.doabooks.org
[9] http://pkp.sfu.ca/ocs/
[10] http://oaister.worldcat.org
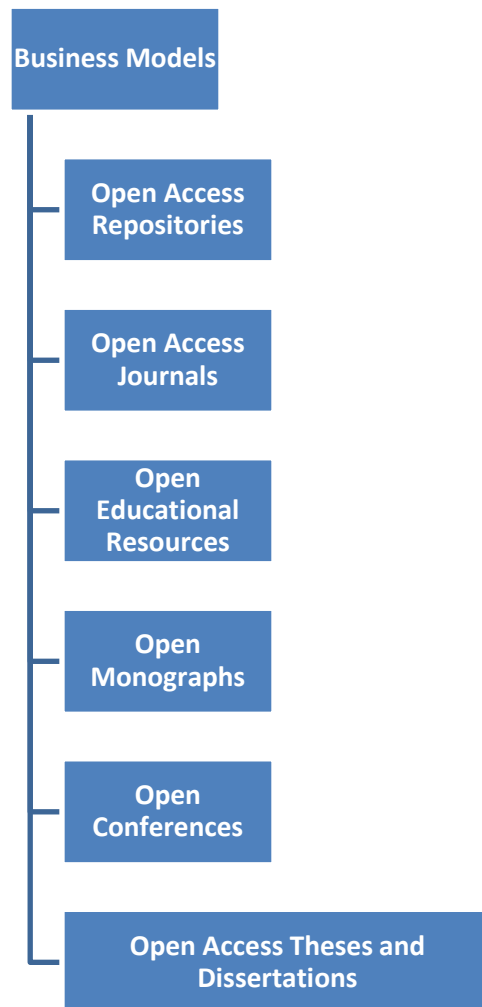
Figure 24: Business Models in Open Access Publishing

2.9   LONG-TERM PRESERVATION MODELS

OA publishing is an online activity that emphasizes on global dissemination of scholarly publications. Gold, hybrid and other kinds of OA publishing channels often create OA contents that are made available through portals of respective publishers. In an online environment, there is always an associated risk of pre-mature closure of a portal, a gateway, an OA publisher or an electronic journal. What we are seeing today in an online environment may not be available tomorrow. Many of the online portals, gateways, e-journals, online repositories or online databases will be unavailable or will be transformed into new entities in tomorrow's online environment. The internet technologies are changing at much faster pace than human civilizations. As more and more contents are created online, there is growing concern that this digital content may not always be available. We can closely observe what happened when many of the Web 1.0 services got transformed into Web 2.0 or later version. Thus, we need to have a very effective long-term preservation plan for easy retrieval of the present born digital contents by the future generations.

Presently, two major long-term preservation programmes are available to academic libraries, researcher institutions and scholarly publishers, namely LOCKSS[11] and CLOCKSS. The LOCKSS Programme, initiated in 1999 at the Stanford University Libraries, is an open-source, library-led digital preservation system built on the principle of "Lots of Copies Keep Stuff Safe". LOCKSS follows a few unique principles that are vital to successful long-term preservation. Those principles are:

- Decentralized and distributed preservation (Lots of Copies Keep Stuff Safe)
- Give libraries local custody and control of their assets
- Preserve the publisher's original authoritative version
- Perpetual access – guaranteed and seamless
- Affordable and Sustainable.

In LOCKSS Program, libraries are building and preserving collections of OA titles and subscribed e-journals and e-books, using the LOCKSS software. The collaborative collections become part of the Global LOCKSS Network. Libraries can also participate in Private LOCKSS Networks to preserve manuscripts and image collections, data sets, and government document collections.

The CLOCKSS[12] (Controlled LOCKSS) initiative, launched in 2005 as a non-profit venture, is a partnership of libraries and publishers committed to ensuring long-term access to scholarly work in digital format. It maintains the CLOCKSS Archive for long-term preservation of scholarly contents archived by its members. CLOCKSS has provision of permanent preservation of abandoned and orphaned contents with a Creative Commons license to ensure these contents remain available forever. CLOCKSS runs on LOCKSS technology. While LOCKSS is an open network, CLOCKSS is a closed system. These two systems are also experimenting with open file formats, which are device independent or software independent for future retrieval of archived contents.

Many OA publishers, e-journal publishers as well as research libraries are actively participating in both the LOCKSS and CLOCKSS programmes. However, some of the OA publishers and research libraries are left out, particularly which are operating outside the North America and Europe. We need to develop a culture of long-term preservation for making our scholarly works permanently available to the future generations, even when the publisher has ceased to exist.

---

[11] http://www.lockss.org
[12] http://www.clockss.org

2.10 LET US SUM UP

In this Unit, you have learned about different dimensions of OA publishing – particularly its genesis, community movements, benefits, approaches, business models and long-term preservation models. Different stakeholders of the knowledge societies, particularly who are involved in production of knowledge, creation, dissemination and consumption of scholarly contents, have supported global and local OA movements for making public funded research literature available through OA modes. Now we need to develop a culture of openness for long-term sustainability of community knowledge being recorded and disseminated through OA channels.

2.11 CHECK YOUR PROGRESS

a) Which is the oldest disciplinary digital repository?

    …………………………………………………………………………...

    …………………………………………………………………………...

    …………………………………………………………………………...

b) What is green open access?

    …………………………………………………………………………...

    …………………………………………………………………………...

    …………………………………………………………………………...

c) What is gold open access?

    …………………………………………………………………………...

    …………………………………………………………………………...

    …………………………………………………………………………...

d) Which is the online database available for identifying OA books on a
    particular subject?

    …………………………………………………………………………...

    …………………………………………………………………………...

    …………………………………………………………………………...

e) Who is the founder of LOCKSS initiative?
    i)   Yale University Libraries
    ii) Stanford University Libraries
    iii) University of Michigan Libraries.
    iv) MIT Press

f) Which is not an OA Directory?

   i) DOAJ

   ii) OpenDOAR

   iii) DOAB

   iv) OAIster

g) Which is a metadata search service for repositories?

   i) DOAJ

   ii) WorldCat

   iii) OAIster

   iv) DOAB

h) Who was the founder of OAIster initiative?

   i) Yale University

   ii) University of Michigan

   iii) Stanford University

   iv) Royal Society of London

i) What is the usual delay period in Delayed OA?

   i) About 6 months to 2 years

   ii) About 1 to 6 months

   iii) About 2 years to 3 years

   iv) None of the above.

ONLINE VIDEOS FOR SELF-LEARNING

There are a number of video tutorials available on topics discussed in this Unit. Some of the tutorials were developed by the reputed institutions, libraries and scientists. Now, you can learn more about OA models, approaches and OA movements around the world.

- *CLOCKSS and Portico: United on Preservation* **Video**[13]
- *Digital Preservation and LOCKSS* **Video**[14]
- *Evolution of Science: Open Science and the Future of Publishing* **Video**[15]
- *Open Access – Towards New Peer-Review Models* **Video**[16]
- *Open Access: Green, Gold, Gratis, Libre, North, South How To Get There* **Video**[17]
- *Promising Business Models for Open Access Monographs* **Video**[18]
- *Why Libraries Should Care About LOCKSS* **Video**[19]

---

[13] http://www.youtube.com/watch?v=4PGPkL7rce4
[14] http://www.youtube.com/watch?v=TOE_Jw23cVg
[15] http://www.youtube.com/watch?v=yELZ3kbFj1w
[16] http://www.youtube.com/watch?v=RmmLqsVtgCY
[17] http://vimeo.com/42384098
[18] http://www.youtube.com/watch?v=5bz6U7r7lxw
[19] http://www.youtube.com/watch?v=POJf38RzihA

UNIT 3 RIGHTS AND LICENSES

Structure

3.0   INTRODUCTION

In the beginning of this millennium, three open access declarations namely Berlin, Budapest and Bethesda (BBB), have transformed the whole scholarly communications environment. The electronic journals had already arrived by then. But scholars still used to browse through print version of journals as a matter of habit. Electronic journals brought out the concept of open access journals, where people will get free access to published journal contents. However, copyright regime existing that time did not have adequate provisions to deal with open access to scholarly communications. Then the Creative Commons (CC) licenses got introduced in 2001 by a non-profit organization with the same name, that facilitate making open access knowledge resources globally accessible without the hassles of copyright restrictions. Open content licenses help researchers to make public funded research findings communicated through open access channels. There are two prominent open access channels available to researcher communities, namely Gold Open Access and Green Open Access. Gold open access channel usually caters to open access journals and open access contents in hybrid electronic journals. Green open access channel caters to institutional and disciplinary knowledge repositories. Scholarly authors are also made aware of author rights and some rights they can retain while signing a copyright transfer agreement or a license to publish agreement.

In this Unit, various author rights, licenses and rights assessment tools are discussed in details to help the librarians in strengthening their efforts in enhancing researchers' level of awareness.

3.1 LEARNING OUTCOMES

After going through the unit, you are expected to be able to:

- Understand the legal basis of copyrights and intellectual property;

- Explain the meaning of rights and restrictions associated with copyright;

- Understand the bases of open licensing;

- Analyse the different types of Creative Commons licensing; and

- Identify different support services available to understand adoption of OA.

3.2 INTELLECTUAL PROPERTY RIGHTS

Creative and innovative minds of human beings are the main force behind the technological changes for societal needs and comforts. Intellects and ingenious marvels are churning out in innovative solutions to societal problems. In scientific research, researchers deal with many real life problems as well as hypothetical or theoretical problems. The results of research are reported in research literature including journal articles, conference papers, book chapters, monographs, dissertations and research reports. In scientific and technological areas, research results often lead to scientific discovery or invention of new machines, formulae, designs and processes. Thus, scientific research turns into intellectual activities or intellectual exercises undertaken by a broad spectrum of researchers, who later become the knowledge creators, innovators, and finally legitimate holders of intellectual property rights.

WIPO (2008) defines "Intellectual property, very broadly, means the legal rights which result from intellectual activity in the industrial, scientific, literary and artistic fields. Countries have laws to protect intellectual property for two main reasons. One is to give statutory expression to the moral and economic rights of creators in their creations and the rights of the public in access to those creations. The second is to promote, as a deliberate act of Government policy, creativity and the dissemination and application of its results and to encourage fair trading which would contribute to economic and social development."

There are many forms of intellectual properties for defending rights of knowledge creators, inventors, or authors. Most prominent ones are Patent, Copyright, Trademarks, Industrial Designs and Integrated Circuits (IC), and Geographical Indications (GI).

WIPO (2008) defines 'Patent' – a major instrument for protecting intellectual property as, "a document, issued, upon application, by a government office (or a regional office acting for several countries), which describes an invention and creates a legal situation in which the patented invention can normally only be exploited (manufactured, used, sold, imported) with the authorization of the owner of the patent." The patents are vehicle of protection of intellectual property rights emanated from scientific projects or scientific discoveries. A

new product or process or technique derived from a scientific research work, which has certain applications for the betterment of human life, is patentable and inventors can claim it as their intellectual property by registering it with patenting authorities by following certain legal procedures.

WIPO (2008) defines 'Copyright' as "a legal term used to describe the rights that creators have over their literary and artistic works. Works covered by copyright range from books, music, paintings, sculpture and films, to computer programs, databases, advertisements, maps and technical drawings."

The copyright is a primary instrument for protecting intellectual properties of scientific and researchers' communities, as they communicate research findings through publishing papers in scholarly journals, conferences, monographs, theses and other research literature. The Patent is another tool for protecting intellectual property, although prudently used by scientific communities. The Copyright law is country specific and it varies country to country. The author, who is solely responsible for knowledge creation and authoring scholarly works, is the principal owner of copyright. However, many commercial publishers insist transfer of copyright from the creators to the publishers for getting research papers published in their publishing channels such as scholarly journals, monographs, books, conference proceedings, and case studies. While transferring copyright of a scholarly work to a publisher, an author actually transfers a bundle of exclusive rights such as reproduction, reuse, distribution, public performance, translation, public display, and modification of the original work. Most of the author's exclusive rights get curtailed. The SPARC (2006) highlights some of the rights an author should retain while publishing with for-profit publishers. Text Box 3.1 makes you understand your rights as an author. The SPARC (2006) has developed a model Addendum to Publication Agreement for retaining some author's rights while an author is signing the Copyright Transfer Agreement (CTA) or Licence to Publish (LTP).

While commercial or for-profit publishers have intensified commodification of scholarly works published by them, there are instances of researchers' communities adopting alternative pathways so that authors and users of scholarly literature retain some of the exclusive rights for fair use and continuation of the knowledge creation process. Table 3.1 shows various author rights regime. Copyright is the conventional method of protecting intellectual properties of authors and creators. Copyleft is a liberal method of protecting author's rights, while relaxing some rights for fair use and reuse of published literature. Creative Commons is another liberal form of protecting author's rights, which is most accepted in open access publishing environment.

Text Box 3.1: Know Your Rights as an Author

- The author is the copyright holder. As the author of a work you are the copyright holder unless and until you transfer the copyright to someone else in a signed agreement.

- Assigning your rights matters. Normally, the copyright holder possesses

the exclusive rights of reproduction, distribution, public performance, translation, public display, and modification of the original work. An author who has transferred copyright without retaining these rights must ask permission unless the use is one of the statutory exemptions in copyright law.

- The copyright holder controls the work. Decisions concerning use of the work, such as distribution, access, pricing, updates, and any use restrictions belong to the copyright holder. Authors who have transferred their copyright without retaining any rights may not be able to place the work on course websites, copy it for students or colleagues, deposit the work in a public online archive, or reuse portions in a subsequent work. That's why it is important to retain the rights you need.

- Transferring copyright doesn't have to be all or nothing. The law allows you to transfer copyright while holding back rights for yourself and others. This is the compromise that the SPARC Author Addendum helps you to achieve.

Source: http://www.sparc.arl.org/resources/authors/addendum

Table 3.1: Various Author Rights Regime

	Symbol	Rights Statement
Copyright	Ⓒ	All rights reserved.
Copyleft	Ↄ	All wrongs reserved.
Creative Commons	cc	Some rights reserved.

3.3   OPEN LICENSES

As seen in Table 3.1, there are two major alternatives to Copyright regime for protecting author's rights as well as users' freedom of use, reuse, share, distribution and modification of the original work. Copyleft and Creative Commons licenses become very helpful to the knowledge communities which are intended to guarantee your freedom to share, use, reuse, and change. Some popular forms of open licences are briefly introduced in the following paragraphs.

Copyleft

Copyleft is a general method for marking a creative work as freely available to be modified, and requiring all modified and extended versions of the creative work to be free as well. The believers of Copyleft movement are concerned over well-funded corporate strategies to privatize and commodification of all human knowledge, creativity, and meaning. This movement strives to build an

alternative to the current restrictive regime of intellectual property controls. The movement sarcastically kept its slogan "All wrongs reserved." GNU General Public License of the GNU Project, supported by the Free Software Foundation, follows the principles of Copyleft. Copyleft is a feature of most open source software (OSS) licenses.

GNU General Public License

The GNU General Public License (GNU-GPL or GPL) was originally written by Richard Stallman of the Free Software Foundation (FSF) for the GNU project. It was formally launched in 1989 as GPL version 1.0. It is the most widely used free software license, which guarantees end users (individuals, organizations, companies) the freedom to use, study, share (copy), and modify the computer software. Computer software that ensures that these rights are retained is called free software.

Open Content License

OpenContent Licensing (OCL) is another form of open license launched in 1998. It is mostly used in technical documentation, software manual and other related projects. The Wiki Books project also has adopted OPL for online distribution. Its derivative version Open Publication License (OPL) was released in 1999 as OPL version 1.0.

The Copyleft, GNU-GPL and OPL have been the collective and community efforts to produce shareable and modifiable computer software, technical literature and creative contents. These licences are also aimed at reducing overdependence from the multinational and large corporations, trying to hold community knowledge for their profits.

Creative Commons

While the Copyleft, GNU-GPL and OPL licenses mainly cater to the purposes of computer software and technical documentations, the Creative Commons (CC) licenses are preferred in scholarly communications as well as in creative audio-visual communications. Creative Commons, launched in 2001 as a non-profit organization, is an outcome of larger community movements, embracing the notions of freedom of sharing, reusing and modifying scholarly or artistic contents for knowledge re-creation and optimal utilization. Creative Commons in scholarly communications environment becomes the Science Commons that ensures open access to research literature and research data. As shown in Figure 3.1, there are six types of CC licenses, namely CC BY, CC BY-SA, CC BY-NC, CC BY-ND, CC BY-NC-SA, and CC BY-ND. Here ND stands for no derivative works, SA stands for share-alike, and NC stands for non-commercial. The most liberal term is CC BY, where users can copy, distribute, display, perform and remix an author's work if they credit author's name as requested by the author. The most restrictive term is CC BY-NC-ND, where users can copy, distribute, display, and perform verbatim copies of an author's work but for non-commercial purposes only.
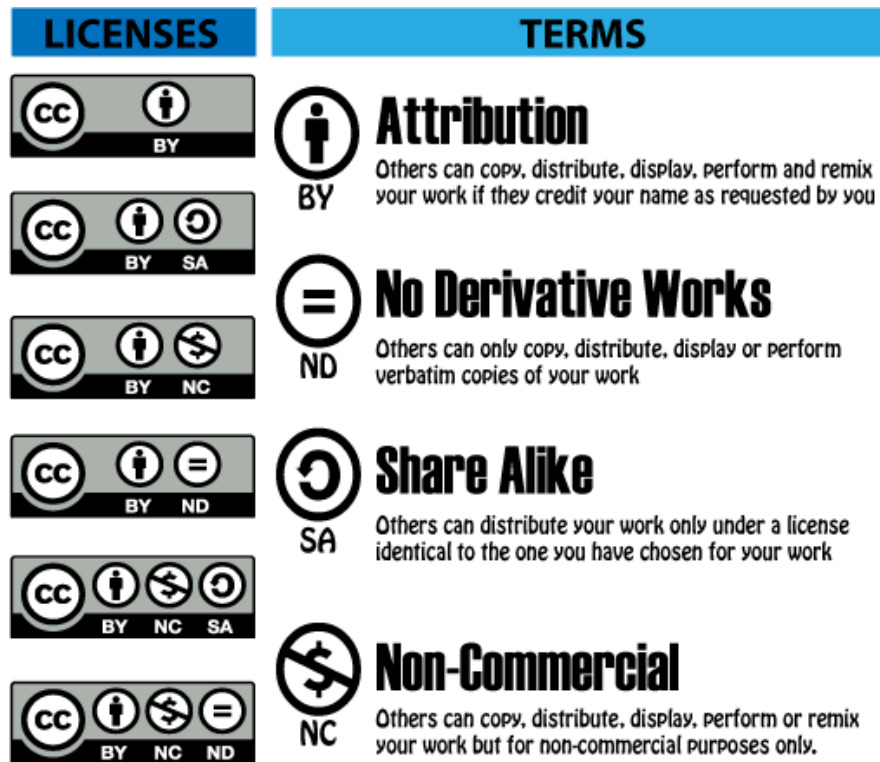
Figure 3.1: Understanding Creative Commons Licenses[20]

Open Access Spectrum: Table 3.2 shows a tabular representation of different rights available to a creator or author who opts to publish an open access publication. Such rights and attributes are the Reader Rights, Reuse Rights, Copyrights, Author Posting Rights, Automatic Posting, and Machine Readability. Some of these rights are also extended to users' community, in case of open access publications, allowing them to use, reuse, remix or share. This Table is drawn from an advocacy toolkit "HowOpenIsIt?™ Open Access Spectrum", jointly published by the SPARC (Scholarly Publishing and Academic Resources Coalition), PLOS (Public Library Of Science) and OASPA in 2014 and licensed under CC BY. The top most row indicates most generous rights available to an open access publication, with a CC BY license, where authors as well as users have rights related to reusing, sharing, archiving, self-archiving, copying, distributing, translating, machine reading and all other fair use. Whereas bottom most row indicates most restrictive rights for a closed access publication, where neither creators nor users have rights related to reusing, sharing, archiving, self-archiving, copying, distributing, translating, or machine reading. This tabular spectrum also gives a glimpse of broader view of an open access publication vis-à-vis narrower view a publication in copyright regime. The publications licensed under CC BY-ND offer more restrictive rights than the publications licensed under CC BY-SA or CC BY-NC. Similarly, the publications licensed under CC BY offer more liberal rights than the publications licensed under CC BY-SA or CC BY-NC.

Since the last decade we have observed the exponential growth of open access publishers as well as joining of toll-access publishers in open access scholarly

---

[20] http://education-copyright.org/creative-commons/

publishing domain. The Open Access Scholarly Publishers Association (OASPA), founded in 2008, has become an industry association representing open access publishers for sustenance of gold OA publishing model. OASPA recommends implementation of CC BY license by their member publishers so that OA contents can be reused and distributed through commercial and non-commercial channels. However, OASPA usually opposes implementation of CC BY-SA or CC BY-NC-ND licenses by their member publishers, as discussed in Text Box 3.2, as these licenses are more restrictive and non-beneficial to them. The publishers receiving article processing charge (APC) from the authors of accepted papers in their OA journals or OA articles in hybrid journals usually grant CC BY license to their contents. Whenever authors insist to have more restrictive ones such as CC BY-SA or CC BY-NC-ND licenses, they need pay premium APC – higher than regular APC for granting CC BY license.

Major OA publishers, such as, PLOS, BioMed Central and eLife, have been publishing papers with appropriate CC licenses, as suggested or approved by authors' respective research funders. Other OA publishers, particularly, which are from the developing countries, need to implement standardized OA licenses suitable for global researchers and research funders.

Text Box 3.2: Why doesn't OASPA allow CC BY-SA or CC BY-NC-ND licenses?

Each type of restriction has its uses, for certain types of content and certain types of sharing. But the emerging consensus on the adoption of CC-BY reflects the fact that any of these restrictions needlessly limits the possible reuse of published research.

CC-BY-SA: Share-Alike. Material distributed under a share-alike license can be used to create and distribute derivative works, but only if those works are shared under the same Share-Alike license. Such licenses are sometime referred to as Viral licenses, as "the licenses spread a continuing use of the licenses in its derivatives". However, while such licenses can be extremely helpful in building up a collection of content, they also have downsides in terms of the limitations they place on reuse. For example, material distributed within a Share-Alike article could only be combined and redistributed with other share-alike content. In contrast, CC-BY content can be combined with any content, and redistributed according to the terms of that other content, as long as CC-BY's own attribution requirement is respected. This makes CC-BY something like a Universal Donor blood-type in that it has maximal compatibility.

CC-BY-NC-ND: No Derivatives. Derived use is fundamental to the way in which scholarly research builds on what has gone before. One of the many benefits of open access publishing is that elements such as figures from a published research article can be reused, with attribution, as part of teaching material, or in other published works, without needing to request permission of the publisher. Similarly, article translations, image libraries, case report databases, text-mining enhancements and data visualizations are all examples of how additional value can be created by allowing derivative use.

Source: http://oaspa.org/information-resources/frequently-asked-questions/

Table 3.2: Understanding Fully Open Access Resources from the "Open Access Spectrum"

	Reader Rights	Reuse Rights	Copyrights	Author Posting Rights	Automatic Posting	Machine Readability
	Free readership rights to all articles immediately upon publication	Generous reuse & remixing rights (e.g., CC BY license)	Author holds copyright with no restrictions	Author may post any version to any repository or website	Journals make copies of articles automatically available in trusted third-party repositories (e.g., PubMed Central) immediately upon publication	Article full text, metadata, citations, & data, including supplementary data, provided in community machine readable standard formats through a community standard API or protocol
	Free readership rights to all articles after an embargo of no more than 6 months	Reuse, remixing, & further building upon the work subject to certain restrictions & conditions (e.g., CC BY-NC & CC BY-SA licenses)	Author holds copyright, with some restrictions on author reuse of published version	Author may post final version of the peer-reviewed manuscript ("postprint") to any repository or website	Journals make copies of articles automatically available in trusted third-party repositories (e.g., PubMed Central) within 6 months	Article full text, metadata, citations, & data, including supplementary data, may be crawled or accessed through a community standard API or protocol
	Free readership rights to all articles after an embargo greater than 6 months	Reuse (no remixing or further building upon the work) subject to certain restrictions and conditions (e.g., CC BY-ND license)	Publisher holds copyright, with some allowances for author and reader reuse of published version	Author may post final version of the peer-reviewed manuscript ("postprint") to certain repositories or websites	Journals make copies of articles automatically available in trusted third-party repositories (e.g., PubMed Central) within 12 months	Article full text, metadata, & citations may be crawled or accessed without special permission or registration
	Free and immediate readership rights to some, but not all, articles (including "hybrid" models)		Publisher holds copyright, with some allowances for author reuse of published version	Author may post submitted version/draft of final work ("preprint") to certain repositories or websites		Article full text, metadata, & citations may be crawled or accessed with permission
	Subscription, membership, pay-per-view, or other fees required to read all articles	No reuse rights beyond fair use/limitations & exceptions to copyright (all rights reserved copyright) to read	Publisher holds copyright, with no author reuse of published version beyond fair use	Author may not deposit any versions to repositories or websites	No automatic posting in third-party repositories	Article full text & metadata not available in machine-readable format

3.4   SUPPORT TOOLS AND SERVICES

Scholarly communications require clear understanding related to author rights and users' rights in order to maximize benefits of publishing and knowledge diffusion. Particularly when authors are young researchers, they need regular institutional supports for rights management. In many universities and research institutions, librarians provide advisory service and guidance to budding authors while they deal with copyright and related rights during the course of their academic publishing.

Some organizations associated with open access advocacy and awareness raising have developed certain ready-to-use tools for authors helping them to deal with rights management, particularly while they deal with copyright transfer before publishing in scholarly journals or conference proceedings, and self-archiving after publishing in journals or conferences.

SPARC Author's Addendum

In earlier section you came to know that an author requires signing a Copyright Transfer Agreement (CTA) for transferring a bundle of rights to publisher for publishing a paper in a scholarly journal or conference volume. This way, publisher also obtains a Licence to Publish (LTP) from the author, before publishing a paper in a scholarly journal. However, the author can retain some rights (e.g. rights to access, reuse, modify, share, etc.) and transfer only LTP to the publisher. This would facilitate publishers in accepting contents for publishing, while authors would have freedom to reuse. The SPARC has developed a model agreement and a tool known as *SPARC Author's Addendum* for facilitating authors to negotiate with publishers of scholarly journals. Author can carefully assess CTA given by a publisher and opt out some provisions in it restricting in exercising his/her academic freedom.

SHERPA/RoMEO[21]

As Green Open Access model gives researchers avenues for self-archiving of their papers in institutional repositories, disciplinary repositories and personal research profiles, there is confusion in what form an author should self-archive a particular paper written by him/her. S/He needs to check whether in pre-print, post-print or publisher's version s/he can self-archive. RoMEO is a necessary tool for a researcher for making a self-archiving decision. The RoMEO is a searchable database of publisher's copyright policies regarding the self-archiving of journal articles on the web and in open access repositories. This is a web-based database of about 22,000 peer-reviewed scholarly journals, covering many print, electronic and open access journals available worldwide. This project is part of the SHERPA Services based at the University of Nottingham. This project is presently funded by JISC. It also received seed funding from the Wellcome Trust, UK. You can use RoMEO website for different purposes, such as:

---

[21] http://www.sherpa.ac.uk/romeo/

- Use RoMEO to assist you when depositing articles to your institutional repository.

- Use RoMEO to find out if your publishers' copyright rules allow you to deposit in your institutional repository.

- RoMEO summarizes publishers' conditions and categorizes publishers by colours, indicating level of author rights.

- RoMEO shows which publishers' comply with funding agencies' conditions on open access.

SHERPA/JULIET[22]

The SHERPA/JULIET is an excellent tool for helping global authors in identifying Research Funders' Open Access Policies. JULIET is searchable by funders' name or country keywords. The search results indicate whether researchers are required or not required to have open access publishing, open access archiving of publications and data archiving, while carrying out sponsored research projects. JULIET helps in comparing details of policies between different countries or different funding agencies, research councils and research bodies across the world. It also helps in determining open access mandates and publishing conditions of funding agencies. It also helps in identifying funders having provisions to pay APC for publishing open access scholarly articles. JULIET project is a part of the SHERPA Services based at the University of Nottingham. This project was initially funded by JISC and Research Libraries in the UK and Ireland (RLUK). You can use JULIET website for different purposes, such as:

- Use JULIET to find out if your research funder requires you to deposit your article in a repository.

- Use JULIET to assist you when depositing articles to your institutional repository.

- JULIET provides summaries of funding agencies' grant conditions on self-archiving on research publications and data.

3.5   LET US SUM UP

In this Unit, you have learnt about various provisions of protection of intellectual property rights during the processes of knowledge creation, publishing and dissemination. Electronic publishing environment helps in sharing ones' scholarly works with global communities. However, copyright of a scholarly work, if transferred to its publishers, may restrict an author to share his/her own works through a global network. On the other hand, authors may obtain some exemptions in using, reusing or sharing their respective works. Research papers published in toll access journals or conference proceedings may be made freely available through self-archiving in institutional or

---

[22] http://www.sherpa.ac.uk/juliet

disciplinary repositories. The author needs to know the journal's self-archiving policy, i.e., whether allowing pre-print or post-print or publishers' version to be self-archived. Author should also know whether a journal is having an embargo period restricting self-archiving for a certain period after publishing.

Of late, Creative Commons (CC) licenses facilitate authors to enjoy certain liberty in sharing, using, reusing, distribution and modification. When an author shares his/her 'just published' research paper in social media, personalized researcher's profile and online forums, it comes with much higher possibilities of getting read or noticed by co-researchers working in the same or allied research areas. All six types of CC licenses give rights to share and fair use. Open licenses help the researchers in global dissemination of public funded research results for effective delivery of public goods and services.

The publishing and academic databases industries have strengthened their digital rights management (DRM) tools for detecting copyright violations and plagiarisms in the vicinity of academic publishing. The fair use culture needs to inculcate in academic researcher communities in order to bring transparent publications ethics in the process of scholarly communications, particularly in the electronic environment.

3.6 CHECK YOUR PROGRESS

a) Identify four open licenses suitable for scholarly publishing.

b) Identify four organizations involved in awareness raising of author rights.

c) Identify four rights that can be exempted through SPARC Author Addendum.

d) Where can you find out whether your publishers' copyright rules allow you to self-archive?

e) Where can you find out whether your research funder requires you to deposit your article in a repository?

f) Which license does not permit commercial redistribution of a published work?

   i)   CC BY

   ii) CC BY-NC

   iii) CC BY-ND

   iv) CC BY-SA

g) Which license does not permit users to modify and republish a work already published?

   i)   CC BY

   ii) CC BY-NC

   iii) CC BY-ND

   iv) CC BY-SA

h) Which license does not permit users to produce derivative works of a work already published?

   i)   CC BY

   ii)   CC BY-NC

   iii)   CC BY-ND

   iv)   CC BY-SA

i) Which license is most liberal?

   i)   CC BY

   ii)   CC BY-ND

   iii)   CC BY-NC-SA

   iv)   CC BY-SA

j) Which license is most restrictive?

   i)   CC BY

   ii)   CC BY-ND

   iii)   CC BY-SA

   iv)   CC BY-NC-SA

ONLINE VIDEOS FOR SELF-LEARNING

There are a number of video tutorials available on topics discussed in this Unit. Some of the tutorials were developed by the organizations responsible for the advocacy and awareness raising, while some others were developed by reputed scientists and libraries. Now, you can learn more about different dimensions of copyright and author rights in real life academic research environment.

- Author rights, your rights **Video**[23]

- Author Rights: Working with Publishers to Keep Your Rights **Video**[24]

- Copyright vs Copyleft **Video**[25]

- Creative Commons & Copyright Info **Video**[26]

- Fair Use & Copyrights **Video**[27]

- Using copyrighted content licensed under Creative Commons or from the Public Domain **Video**[28]

- Science Commons **Video**[29]

---

[23] http://www.youtube.com/watch?v=hWZ_ZYbAIyg
[24] http://www.youtube.com/watch?v=dYXwqsFmK44
[25] http://www.youtube.com/watch?v=Ry5bVQ3y2FU
[26] http://www.youtube.com/watch?v=8YkbeycRa2A
[27] http://www.youtube.com/watch?v=GidwzOYiPl0
[28] http://www.youtube.com/watch?v=as5QsoRYyBk
[29] http://www.youtube.com/watch?v=hZAcTNFzF-s

UNIT 4   ADVOCACY FOR OPEN ACCESS

Structure

4.0   INTRODUCTION

In the scholarly communications world, the concept of open access publishing has proliferated at faster pace since the global open access declarations such as the Budapest Open Access Initiative (BOAI) in February 2002 and the Berlin Declaration on Open Access to Knowledge in the Sciences and Humanities in October 2003. After one decade of these two epoch-making declarations, we see growing instances of open access resources due to collective efforts put by the advocacy organizations, advocacy groups and individual advocates for open access. As a library and information professional, all you need to do is to promote creation, deployment, mobilization and utilization of OA resources to your users groups, particularly to young researchers, academics and students communities. Some countries also have started social movements with appropriate national legislations promoting students' access to research, as well as taxpayers' access to public funded research. There are also advocacy groups in different geographical regions, who are trying hard to influence their respective national legislators and policymakers in making open access a national mandate for achieving universal access to research literature. Recent two European projects aim at engaging academic researchers in creating and contributing OA literature out of their public-funded research projects.

In this Unit, various global advocacy initiatives are briefly discussed to help the library and information professionals in strengthening their efforts in sensitizing, awareness raising and promoting the concept of open access to knowledge at the local and national level.

4.1   LEARNING OUTCOMES

After going through the unit, you are expected to be able to:

- Identify key advocacy organizations and their initiatives to promote open access to various stakeholders;

- Identify key stakeholders to promote Open Access, and identify their needs; and

- Prepare appropriate advocacy campaign and training programmes for the stakeholders.

4.2 OPEN ACCESS ADVOCACY

Open Access Advocacy is considered as one of the significant strategies to promote open access. Other two strategies, as given by Swan (2012), are policy-oriented and infrastructure development. These three strategies are pursued at institutional, national, regional and international level. Text Box 4.1 gives you an understanding how open access advocacy can be planned, designed and implemented for promoting OA in your respective institution, country and region.

Text Box 4.1: Open Access Advocacy-based Strategies

Strategies based on advocacy have focused on two main things – creating an evidence base for the benefits of Open Access, and making the case to policymakers, funders and research managers.

The BOAI was an early, formal advocacy initiative. Published in 2002, it set the direction for Open Access advocacy for the rest of the decade. Funded in its conceptualisation by the Open Society Institute (now called Open Society Foundations), the BOAI provided in a few, clear, unambiguous paragraphs a description and set of aims that advocates could coalesce around and use to promote the ideas about opening up science. The Initiative can be signed by institutions and foundations that commit to its aims and remains an influential advocacy tool for Open Access alongside the Berlin Declaration (which also collects signatures of commitment from institutions).

Since 2002, there has been increasing intensity in advocacy activity. Organisations specifically established to promote Open Access have emerged, some with an international remit, some operating within national or regional boundaries. The evidence base for the benefits of Open Access has been growing, demonstrating the value of access to scientific information not just for scientists but for other constituencies, too.

Advocacy targets are policymakers, researchers and, increasingly, students who are receptive to the notion of openness, are open to the development of better ways of communicating science and are the scientists of the future. Culture change is taking root in the young scientists of today. The student 'Free Culture' movement and the 'Right To Research Coalition' are examples of student activism with respect to opening up science. The research library community has a strong voice in Open Access advocacy, as would be expected. SPARC (and its European and Japanese counterparts) is a highly effective advocacy organisation that has effected change at many levels. The European research library network, LIBER, and EIFL (Electronic Information for Libraries). There are also actors that have arisen from the research community itself, including from the ranks of senior management: Enabling Open Scholarship, an international organisation of university managers promoting the principles and practices of open scholarship, is one such.

Advocacy is not limited to dedicated organisations, though. It takes place on the ground, locally across the world. The launch of Open Access Day in 2008 by the Public Library of Science was so successful that the next year the event lasted a week and has done so ever since. In 2010, Open Access Week involved thousands of events in 90 countries and the movement is growing even bigger.

Source: Swan, Alma (2012). Policy Guidelines for the Development and Promotion of Open Access. Paris: UNESCO.
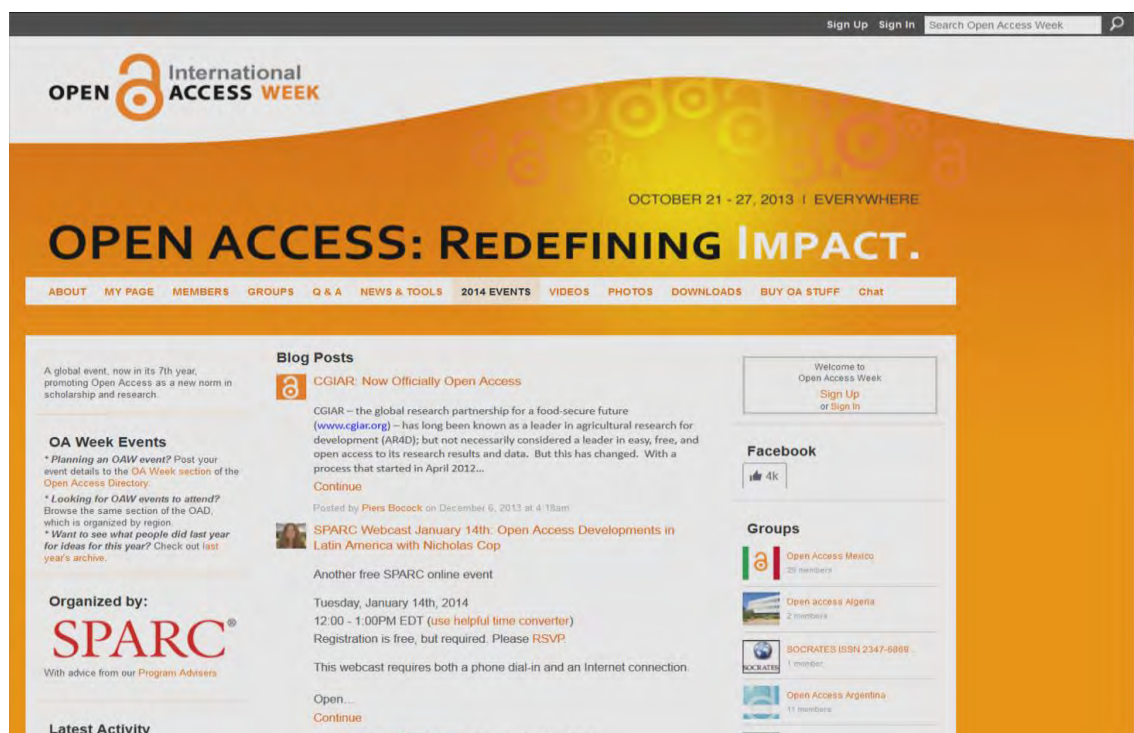
Figure 4.1: Website of the International Open Access Week

4.2.1 International Open Access Week – Global Celebration

The International Open Access Week, initiated in 2008 by the Public Library of Science (PLoS), is celebrated worldwide every year in the month of October for advocacy, policy campaign, promotion and awareness raising on issues related to open access to scholarly literature, open science data and self-archiving. There are instances of stakeholders' participation in events around the OA Week and their interactions help them in clearing doubts of the audiences and prospective OA contributors. This Week also helps in engaging students, young learners, young scholars and early career researchers for attracting them in creation and utilization of open access literature. Many intergovernmental agencies such as United Nations, UNESCO, World Bank, Food and Agriculture Organization (FAO) and several international civil society organizations have been celebrating OA Week globally as well as locally for actively promoting OA knowledge resources produced by them and their partner organizations.

Figure 4.1 shows website of the International Open Access Week available at OpenAccessWeek.org. This website is being supported by the SPARC (Scholarly Publishing and Academic Resources Coalition) and few other OA advocacy organizations. This website aggregates list of OA Week events organized around the world, videos, photos, promotional pamphlets and brochures, e-groups, social media posts, blog posts, news, tools, merchandises and other resources helpful to OA stakeholders and practitioners. This website has also created promotional materials for outreaching to different target audiences. Some popular titles of international handouts are namely:

- A Very Brief Introduction to Open Access

- What Faculty can do to promote Open Access
- What Librarians can do to promote Open Access
- What Research Funders can do to promote Open Access
- What Universities and Administrators can do to promote Open Access.

Text Boxes 4.2 and 4.3 elaborate international handouts on what you can do to promote open access, particularly for the librarians and university administrators. These lists were initially prepared by OA thinkers and think tanks, namely Peter Suber, Stevan Harnad and Budapest Open Access Initiative (BOAI). Later conveners of International OA Week have created adapted versions of these handouts to suit their regional and national purposes. These Text Boxes only provide some bullet points. You can get further details on each point from the respective handout.

<div align="center">

Text Box 4.2: Open Access Week Discusses *What you can do to promote open access*

</div>

What Librarians Can Do to Promote Open Access

- Launch an open-access, OAI-compliant institutional e-print archive, for both texts and data.
- Help faculty deposit their research articles in the institutional archive.
- Consider publishing an open-access journal.
- Consider rejecting the big deal, or cancelling journals that cannot justify their high prices, and issue a public statement explaining why.
- Help OA journals launched at the university become known to other libraries, indexing services, potential funders, potential authors, and potential readers.
- Include OA journals in the library catalogue.
- Offer to assure the long-term preservation of some specific body of OA content.
- Undertake digitization, access, and preservation projects not only for faculty, but for local groups, e.g. non-profits, community organizations, museums, galleries, libraries. Show the benefits of OA to the non-academic community surrounding the university, especially the non-profit community.
- Negotiate with vendors of priced electronic content (journals and databases) for full access by walk-in patrons.
- Annotate OA articles and books with their metadata.
- Help design impact measurements (like e.g. citation correlator) that take advantage of the many new kinds of usage data available for OA sources.
- Inform faculty in biomedicine at your institution about the NIH public-access policy.
- Join SPARC [www.arl.org/sparc/], a consortium of academic libraries actively promoting OA.
- Join the Alliance for Taxpayer Access (ATA) [Taxpayeraccess.org], a coalition of U.S.-based non-profit organizations working for OA to publicly-funded research. If you can persuade your university as a whole to join the ATA, then do that as well.

<div align="center">

***Source:** What Librarians Can Do to Promote Open Access[30]*

</div>

---

[30] http://legacy.earlham.edu/~peters/fos/do.htm#librarians

What Universities and Administrators Can Do to Promote Open Access

- Adopt a policy: in hiring, promotion, and tenure, the university will give due weight to all peer-reviewed publications, regardless of price or medium.

- Adopt a policy: faculty who publish articles must either (1) retain copyright, and transfer only the right of first print and electronic publication, or (2) transfer copyright but retain the right of postprint archiving.

- Adopt a policy: when faculty cannot get the funds to pay the processing fee charged by an OA journal from their research grant, then the university will pay the fee.

- See to it that the university launches an open-access, OAI-compliant archive.

- Adopt policies encouraging or requiring faculty to fill the institutional archive with their research articles and preprints.

- Adopt a policy: all theses and dissertations, upon acceptance, must be made openly accessible, for example, through the institutional repository or one of the multi-institutional OA archives for theses and dissertations.

- Adopt a policy: all conferences hosted at your university will provide open access to their presentations or proceedings, even if the conference also chooses to publish them in a priced journal or book. This is compatible with charging a registration fee for the conference.

- Adopt a policy: all journals hosted or published by your university will either be OA or take steps to be friendlier to OA. For example, see the list of what journals can do.

- Support, even reward, faculty who launch OA journals.

- Consider buying an institutional membership in BioMed Central, or an institutional membership or sponsorship in the Public Library of Science.

- If your university uses DSpace, then consider joining the DSpace Federation.

- Sign the Budapest Open Access Initiative and/or sign the Berlin Declaration on Open Access to Knowledge.

Source: What Universities and Administrators Can Do to Promote Open Access[31]

4.2.2 OA Blogs for OA Advocacy

Several open access blogs are being created and maintained globally by OA thinkers, campaigners and practitioners. These blogs serve the purposes of advocacy, public policy campaigns and sharing news of current affairs related to open access movement. Some of the most visible and creditable blogs are namely:

- Peter Suber's Blog[32]

- Open Access News: News from the open access movement (Peter Suber's former blog, May 2002 – April 2010)[33]

---

[31] http://www.openaccessweek.org/page/englishhigh-resolution-1
[32] https://plus.google.com/+PeterSuber
[33] http://www.earlham.edu/~peters/fos/fosblog.html

- Open Access Archivangelism by Stevan Harnad[34]

- SPARC Blog[35]

- Scholarly Open Access: Critical Analysis of Scholarly Open Access Publishing, by Jeffrey Beall[36]

- OASPA (Open Access Scholarly Publishers Association) Blog[37]

- Open Access Week Blog[38]

- ACD Blog, by IFLA Acquisition & Collection Development (ACD) Section[39]

- BioMed Central Blog[40]

- PLOS Blogs[41]

- SciELO (Scientific Electronic Library Online) Blog[42]

- Open Access India: Advocating Open Access in India[43]

In addition to blogs, there are several microblog sites spreading awareness on OA research literature and strengthening OA advocacy efforts. Examples of microblogs related to OA advocacy can be discovered in Twitter.com using hashtags #OpenAccess, #OA, #OAWeek, #OpenScience, #OApublishing, #OAAdvocacy, etc. You can find several individuals and organizations are involved in OA advocacy in blogospheres and other social media spaces for reaching out to millions of researchers and academics.

4.2.3   OA Advocacy Organizations and Initiatives

Open Access Directory[44] has prepared an online directory of Advocacy Organizations for OA. These organizations make OA advocacy a significant part of their mission. Their advocacy efforts go beyond providing OA or promoting OA. Some of the globally significant advocacy organizations and initiatives are briefly described below.

Scholarly Publishing and Academic Resources Coalition (SPARC): The SPARC, launched in 1998, is an international alliance of academic and research libraries working to create a more open system of scholarly communication. It supports the immediate, barrier-free online availability of scholarly and scientific research articles, coupled with the rights to reuse these articles fully in the digital environment, and supports practices and policies that enable this. The SPARC is involved in many transnational OA public policymaking and acting as pressure group for achieving open access to

---

[34] http://openaccess.eprints.org
[35] http://www.sparc.arl.org/blog
[36] http://scholarlyoa.com
[37] http://oaspa.org/blog/
[38] http://www.openaccessweek.org/profiles/blog/list
[39] http://blogs.ifla.org/acd/
[40] http://blogs.biomedcentral.com/bmcblog/
[41] http://blogs.plos.org/
[42] http://blog.scielo.org/
[43] http://oaindia2013.wordpress.com
[44] http://oad.simmons.edu/oadwiki/Advocacy_organizations_for_OA

scholarly communication. The SPARC supports a robust advocacy program supporting policy changes at the local, state, national, regional and international levels. It publishes *SPARC Open Access Newsletter*, which is a monthly newsletter authored by Peter Suber and offers news and analysis of the global open access movement. Peter Suber has been promoting global open access movement since May 2002 through his Open Access News Blog, later he migrated to Google+ platform (http://plus.google.com/u/0/+PeterSuber/). SPARC also maintains an email-based global OA discussion forum called SPARC Open Access Forum for dissemination of information related to SPARC activities and campaigns. SPARC now has three distinct geographical presences, namely, SPARC North America, SPARC Europe (launched in 2001) and SPARC Japan (launched in 2006). The SPARC spearheads many alliances, coalitions and public campaigns for promoting open access. Some of their OA leadership initiatives and campaigns include:

- Coalition for Open Access Policy Institutions (COAPI) [Sparc.arl.org/COAPI/], launched in 2011, is focused on the implementation of university OA policies in North America;

- Alliance for Taxpayer Access (ATA) [TaxPayerAccess.org], launched in 2011 with its motto "We Support Taxpayer Access to Publicly Funded Research", is focused on OA for publicly-funded research in the United States of America;

- Right to Research Coalition [RightToResearch.org], launched in 2009 with its motto "Access to Research is a Student Right", is focused on OA to research literature to student communities in the United States, and

- Support the FASTR Act 2013 (Fair Access to Science and Technology Research) – a public campaign in the United States.

Electronic Information for Libraries (EIFL.net): The EIFL, launched in 1999, is focused on OA in developing and transition countries. It has a dedicated OA Programme titled "EIFL-OA: Open Access". Some of the overarching action lines of EIFL-OA include:

- Building capacity to launch open access repositories and to ensure their long-term sustainability;

- Offering training, supporting knowledge sharing, and providing expertise on open access policies and practices (open access journals, open access repositories, open access books, open data and open educational resources);

- Empowering librarians and library professionals, scholars, educators and students to become open access advocates; and

- Advocating nationally and internationally for the adoption of open access policies and mandates.

The EIFL has recently introduced EIFL-OA Advocacy Campaign grants for encouraging and supporting the national and institutional open access advocacy campaigns and to support publishing initiatives. The grantees of this grant are chosen from open access practitioners located in developing countries. In addition to OA advocacy, EIFL-OA has been able to strengthen

capacity and capability of information professionals in developing countries for their lifelong association with OA initiatives in their respective countries.

International Network for the Availability of Scientific Publications (INASP) [www.inasp.info]: INASP, launched in 1992, is a focused on improving availability in developing countries, including through OA. Similar to EIFL, INASP has made significant contributions in capacity building of library, information and publishing professionals in developing countries, enabling them in building OA institutional repositories and OA journals in their respective countries.

Enabling Open Scholarship (EOS) [www.openscholarship.org]: EOS is a major advocacy organization for university OA policies. It was launched as EurOpenScholar in October 2007, later it was re-launched as EOS in September 2009. It is an organisation for universities and research institutions worldwide. It promotes the principles of open scholarship and open science amongst the university managers and policymakers.

Some other global portals for promoting OA, endorsed by several OA advocates, include:

- Open Access Scholarly Information Sourcebook [www.openoasis.org]

- ROARMAP (Registry of Open Access Repositories Mandatory Archiving Policies) [Roarmap.eprints.org]

4.3   TRAINING AND DEVELOPMENT

In earlier section, you have learned that various organizations are engaged in promoting open access to knowledge. Infrastructure development is one of the key strategies in promotion of open access. Capacity building of library, information and publishing professionals through various training programmes helps in infrastructure development in their respective institution or country. Training is essential for strategic planning and maintaining open access infrastructure in the institution or country concerned.

Nowadays, a number of open source software (OSS) are frequently used for establishing open access institutional repositories, OA journals and OA conferences. Examples of most popular OSS are namely, DSpace (DSpace.org), EPrints (EPrints.org), Open Journal Systems (OJS). While DSpace and Eprints are used in building OA institutional repositories, OJS is used for establishing OA journal portals.

Open Journal Systems (OJS) is a journal management and publishing system, developed and launched by the Public Knowledge Project (PKP) in 2001 to expand and improve access to research. PKP also have developed two more useful OSS for OA practitioners, namely, Open Conference Systems (OCS) and Open Harvester Systems (OHS). OCS is a web publishing tool for scholarly conferences. OHS is a free metadata indexing system that helps in indexing the metadata from Open Archives Initiative (OAI)-compliant OA

digital archives or institutional repositories. A few other related software are also available for maintaining open access knowledge repositories and OA digital archives.

DSpace, EPrints and OJS have been already included in the graduate curricula of many library schools and information schools around the world. However, senior library and information professionals need to develop competencies and technical skills in handling these software on day-to-day basis while maintaining OA infrastructure in their respective institutions. Various institutions, organizations and professional associations have introduced continuous education or lifelong learning or professional training programmes on use of these OSS in maintaining OA infrastructure. Recently, international organizations such as INASP, EIFL.net, SPARC and UNESCO, have supported organizing training workshops for capacity building of information professionals and journal editorial staff members, around the world more particularly in developing countries.

There are also instances of launching MOOCs (massive online courses), e-learning courses, distance learning (ODL) courses, open courseware (OCW), and open educational resources (OER) in the relevant areas for skills development in open access and open science. Some courses are also planned targeting academic researchers in improving their understanding on open access to scholarly literature.

4.3.1 FOSTER – Facilitate Open Science Training for European Research

Recently, the European Union (EU)'s Seventh Framework Programme for Research and Development (FP7) funded project FOSTER was launched in 2014, which aims to set in place sustainable mechanisms for EU researchers to foster open science in their daily workflow. It is aligned with another FP7 funded project PASTEUR4OA "Open Access Policy Alignment Strategies for European Union Research" [Pasteur4OA.eu]. Two overarching objectives of FOSTER are to (i) Integrate open access principles and practice in the current research workflow by targeting the young researcher training environment, and (ii) Strengthen the institutional training capacity to foster compliance with the open access policies of the European Research Area (ERA) and Horizon 2020 (beyond the FOSTER project). Several OA practicing organizations, e.g., SPARC Europe, eIFL.net and LIBER (Association of European Research Libraries) are associated with both FOSTER and PASTEUR4OA projects.

While FOSTER is facilitating the adoption, reinforcement and implementation of OA policies in the European region, other regions across the world need to have similar initiatives for engaging and nurturing young researchers towards a larger global OA ecology.

4.4   LET US SUM UP

In this Unit, you have learnt about different advocacy initiatives across the world for engaging different stakeholders in open access ecology and promoting open access publishing initiatives in their respective institution, country and region. Open access requires active participation of library, information and publishing professionals. They hold key portfolios in OA infrastructure development. Thus, successful deployment of OA infrastructure requires fulfilment of training needs of key portfolio holders. On the other hand, young researchers and academics are primary contributors in OA knowledge creation. Some of them are adequately aware of gold and green OA publishing models, whereas many others – particularly who are newcomers in academic research arena – need to be sensitized. Young researchers should be made aware of open access mandates of their funders and institutions. How to get published in OA publishing channels needs to be demonstrated to young researchers as well.

4.5   CHECK YOUR PROGRESS

a) Identify five Open Access promotional events in your country or region, using OpenAccessWeek.org website.

    …………………………………………………………………………...

    …………………………………………………………………………...

    …………………………………………………………………………...

    …………………………………………………………………………...

b) Identify five key Open Access advocacy organizations in country or region, using OpenAccessWeek.org website or other website.

    …………………………………………………………………………...

    …………………………………………………………………………...

    …………………………………………………………………………...

    …………………………………………………………………………...

c) Find out five promotional handouts available in OpenAccessWeek.org website.

    …………………………………………………………………………...

    …………………………………………………………………………...

    …………………………………………………………………………...

    …………………………………………………………………………...

d) Identify two popular open source software used for establishing open access institutional repositories.

…………………………………………………………………………...

…………………………………………………………………………...

…………………………………………………………………………...

…………………………………………………………………………...

e) Where can you find online learning resources on open access to knowledge?
    i)   Open Training Platform (OTP)
    ii) Curriki.org
    iii) Global Open Access Portal (GOAP)
    iv) All of the above

f) Which coalition/ alliance does promote students' access to research?

    i)   Alliance for Taxpayer Access
    ii) Right to Research Coalition
    iii) Coalition for Open Access Policy Institutions
    iv) None of the above

g) Which coalition/ alliance does promote taxpayers' access to research?

    i)   Right to Research Coalition
    ii) Alliance for Taxpayer Access
    iii) Coalition for Open Access Policy Institutions
    iv) None of the above

h) Which organization did initiate the Alliance for Taxpayer Access?

    i)   SPARC North America
    ii) SPARC Europe
    iii) SPARC Japan
    iv) SPARC Australia

i) Which organization did initiate the public campaign for the FASTR (Fair Access to Science and Technology Research) Act 2013?

    i)   SPARC Europe
    ii) SPARC North America
    iii) SPARC Japan
    iv) Biomed Central

j) Which learning channels are introduced for open access training for library, information and publishing professionals?

    i) Massive Online Courses (MOOC)

    ii) Distance Learning Courses (ODL)

    iii) Open Educational Resources (OER)

    iv) All of the above

ONLINE VIDEOS FOR SELF-LEARNING

There are a number of video tutorials available on topics discussed in this Unit. Some of the tutorials were developed by the organizations responsible for the respective OA advocacy, while some others were developed by reputed individuals championing open access best practices.

- *Budapest Open Access Initiative at 10 – Recommendations for the Next Ten Years,* by Alma Swan **Video**[45]

- *Key Open Access Policy Initiatives in the US, Europe, and Australia* **Video**[46]

- *Open Access and the Impact of Open on Research*, by the Right to Research Coalition **Video**[47]

- *PubMed Central Celebrates its 20th Anniversary!* **Video**[48]

---

[45] http://www.youtube.com/watch?v=zqlnyXuYGoQ
[46] http://vimeo.com/62555757
[47] http://vimeo.com/33610691
[48] http://blip.tv/sparc-north-america/pubmed-central-20th-anniversary-5261942

UNIT 5 OPEN ACCESS RESEARCH IMPACTS

Structure

5.0 INTRODUCTION

In an open access (OA) world, much importance has been given to using open source tools, open access resources and open solutions to engage authors and researchers in collaborative research, peer-to-peer sharing of scholarly information and collaborative evaluation of scholars' works.

On the other hand, exponential growth of scientific literature also has led to rapid disappearance of nascent literature before it actually gets noticed by the scientific communities. No single database can capture this over-growing scientific literature. Several data mining tools are probably required to keep abreast with quantum of emerging literature.

In this Unit, various tools and techniques have been discussed in details to help the library and information professionals in strengthening their efforts in enhancing scientific productivity, visibility, reputation, and impact of research works of their affiliated scientific researchers. This Unit briefly discusses various conventional citation-based indicators available for assessing scientific productivity of authors, journals and institutions. This Unit also identifies emerging indicators such as h-index, i10-index, Eigenfactor score, article influence score and source normalized impact per paper.

The social webs, available to the researchers' communities in addition to any other groups of citizens, help the researchers in disseminating their produced or contributed knowledge to global communities. Much you are active in social media, more you have chances to get noticed by fellow researchers and possible research collaborators. Many personalized web-based services are now increasingly made available targeting global researchers' communities, helping them to enhance their social media presence and visibility. These factors influence the development of new metrics called article level metrics or altmetrics. Finally, this Unit also briefly discusses the emergence of the open citation databases for text mining and data mining of open access literature.

5.1 LEARNING OUTCOMES

After going through the unit, you are expected to be able to:

- Describe the process of evaluation of research in national and international contexts;
- Identify the tools used for evaluation of research;
- Explain the advantages and disadvantages of different evaluation metrics; and
- Use emerging evaluation metrics to explain OA research impact.

5.2 METRICS

The scientific communication systematically enhances existing knowledge base and records new developments in ones field of research. New knowledge is created and communicated through primary literature such as journal articles, conference papers, monographs, theses, dissertations, book chapters and research reports. While communicating results of a research work, scientists often acknowledge existing research works in the form of citations as given in the list of references. Here comes the role of bibliographic databases and also citation databases in aiding researchers to identify literature through the extensive process of literature search. Bibliographic databases are usually subject-specific, and sometimes country specific, to help their users in identifying most relevant research literature – based on search term a user used. On the other hand, citation databases help in identifying most cited papers, authors and journals in addition to helping literature search similar to bibliographic databases. Thus, citation databases help in measuring effectiveness, scientific productivity and impact of research literature. There are certain bibliometric indicators often derived from the citation databases. Because bibliometric indicators are based on evidence of usability of published literature – while cited literature are better used by the fellow researchers or successors, uncited literature is often unnoticed by the researchers. Thus, bibliometric indicators help in ranking scholarly journals, or identifying core journals, and making other similar productivity measurements.

Research evaluation metrics of an individual researcher or a research institution or a research group looks into detailed analysis of many aspects of this entity. Figure 5.1 depicts four important dimensions of research evaluation. These aspects are extremely interrelated and interdependent. Weakness in one aspect will lead to lowering value to other aspect. Research evaluation should be carried out to determine strengths and weaknesses in productivity, visibility, reputation, and impact of scientific researchers or institutions.

Figure 5.1: Dimensions of Research Evaluation

5.2.1 Concepts of Bibliometrics, Scientometrics and Webometrics

A number of terms are commonly used in defining different approaches of research evaluation and measurement of scientific productivity. Many of the terms are correlated as each one addresses a typical aspect of scholarly communications. Table 5.1 shows an illustrative list of terms frequently used as research evaluation metrics. Each term defines a set of methods for a particular type of resources or applications. Some of the terms are used interchangeably to broadening or narrowing scope of research evaluation.

Table 5.1: Commonly Used Terms for Assessing Research Impacts

| Term	Short Definition
Bibliometrics	Bibliometrics is a set of methods to quantitatively analyse academic literature and scholarly communications.
Informetrics	Informetrics is the study of quantitative aspects of information. This includes the production, dissemination, and use of all forms of information, regardless of its form or origin.
Scientometrics	Scientometrics is the study of quantitative features and characteristics of science, scientific research and scholarly communications.
Webometrics	Webometrics is the study of quantitative features, characteristics, structure and usage patterns of the worldwide web, its hyperlinks and internet resources.
Cybermetrics	Cybermetrics is an alternative term for Webometrics to measure the World Wide Web, cyber media, web resources and hyperlinks.
Librametrics	Librametrics is a set of methods to quantitatively analyse availability of documents in libraries, their usage and impact of library services to its user community.
Patentometrics	Patentometrics is a set of methods to quantitatively analyse patent databases, patent citations and their usage patterns.
Altmetrics	Altmetrics is a new metrics proposed as an alternative to the widely used journal impact factor and personal citation indices like the h-index. The term altmetrics was proposed in 2010, as a generalization of article level metrics, and has its roots in the twitter #altmetrics hashtag.
Article Level Metrics (ALM)	Article level metrics is an alternative term for Altmetrics.

5.2.2 Applications of Scientometrics and Bibliometrics in Research Assessment

In the last sixty years, evaluation of public funded research has been carried out globally on a regular basis for performance measurement of different actors of scientific research. Most of the citation databases and citation analysis tools available in today's world have functionalities to instantly generate reports and scientometric profile of a scientist, an institution, a collaborative research group, a country, or a journal. Some of the popular applications of scientometrics and bibliometrics listed below can use report generator tools available with citation-based products and services.

- **For Institution/ Collaborative Research Group**: mapping of collaborations, top collaborating institutions, top collaborating countries, collaborating with public vs. private institutions, highly cited papers, highly cited authors, top contributing scientists, top publishing journals, scientists with top h-index, top subject categories or research domains, percentage of cited vs. uncited papers, percentage of self-citations, publishing in OA vs. subscription-based journals, comparative study of two or more institutions in a region/ country.

- **For a scientist**: mapping of collaborations, collaborating institutions, collaborating countries, mapping of co-authors, highly cited papers, top publishing journals, percentage of cited vs. uncited papers, percentage of self-citations, author-level indicators such as h-index, i10-index, etc.

- **For a country**: top contributing institutions, top contributing cities, top contributing states, top funding agencies supporting research, top affiliating apex bodies, mapping of collaborations, top collaborating countries, top collaborating institutions, top contributing scientists, top publishing journals, top subject categories or research domains, percentage of cited vs. uncited papers, percentage of self-citations, highly cited papers, highly cited authors, top scientists with h-index, publishing by public vs. private institutions, publishing in OA vs. subscription-based journals, comparative study of two or more countries in a region or globally.

- **For a journal**: highly cited papers, highly cited authors, percentage of cited vs. uncited papers, percentage of self-citations, top research domains, cited half-life vs. citing half-life, top contributing institutions, top contributing cities, top contributing countries, most downloaded papers, most shared papers, and highly ranked journals based on citation-based indicators.

5.2.3 Classical Bibliometric Laws

Three classical bibliometric laws are widely accepted by the bibliometricians and information scientists in establishing theoretical framework and understanding growth of universe of knowledge or formation of emerging subject areas, as recorded in citation databases. Figure 5.2 visually depicts these three classical bibliometric laws. These laws are discussed in details with suitable examples in literature listed in Further Readings at the end of this Unit.
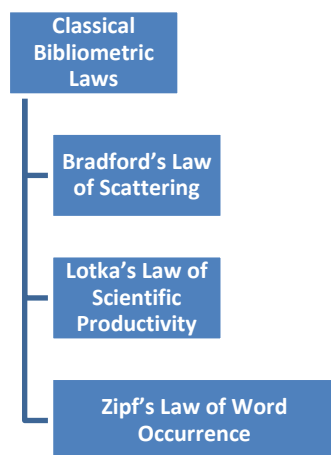
Figure 5.2: Classical Bibliometric Laws

Bradford's Law of Scattering: Samuel C. Bradford in 1934 found that a few core journals provide $1/3^{rd}$ of the articles on a given subject, a moderate number of less-than-core journals provide a further $1/3^{rd}$ of the articles on the subject, and a large number peripheral journals provide the remaining $1/3^{rd}$ of the articles. He proposed the formula 1:n:n² to describe the phenomenon share of the significant research results on a given subject. However, this distribution is not statistically accurate and it may vary subject-to-subject. But it is still commonly used as a general rule of thumb.

Lotka's Law of Scientific Productivity: Alfred J. Lotka in 1926 in his paper "the Frequency Distribution of Scientific Productivity" found that " … the number (of authors) making n contributions is about $1/n^2$ of those making one; and the proportion of all contributors, that make a single contribution, is about 60 percent". This means that out of all the authors in a given field, 60 percent will produce just one publication, and 15 percent will produce two publications, 7 percent of authors will produce three publications, and so on. According to Lotka's Law of scientific productivity, only six percent of the authors in a field will produce more than 10 articles. However, this distribution is not statistically accurate and it may vary subject-to-subject. But it is still commonly used as a general rule of thumb.

Zipf's Law of Word Occurrence: Harvard linguist George Kingsley Zipf suggested an equation popularly known as Zipf's Law that is often used to predict the frequency of words within a relatively lengthy text. Zipf found that the rank of the word multiplied by the frequency of the word equals a constant. Zipf's Law, again, is not statistically accurate, but it is very useful for indexers and indexing databases even during the internet era.

Applications of these bibliometric laws are very often found in the early period of scientometric literature and bibliometric studies. However, their applications in web 2.0 or social media-enabled scholarly communications have not been tested adequately, as scientometric research has now moved into different domains and in different directions.

5.2.4 Common Bibliometric Indicators

There are a number of bibliometric indicators used for research evaluation and performance measurement of journals, institutions, countries and collaborative research groups, but rarely individual authors. These bibliometric indicators are mostly citation-based indicators, traditionally drawn from the citation databases such as Science Citation Index (SCI), Social Science Citation Index (SSCI) and Journal Citation Reports (JCR). Later, from the beginning of the twenty first century, web-based citation databases such as Scopus and Web of Science, and citation search engines such as Google Scholar, Microsoft Academic Search and CiteSeer[X] are frequently used for deriving citation-based indicators. Figure 5.3 depicts various citation-based indicators, mostly derived from the Journal Citation Reports, citation databases and citation search engines. Some of the indicators help in analysing collaborative authorship, collaborative institutions and collaborative countries commonly found from affiliation search in any citation database.
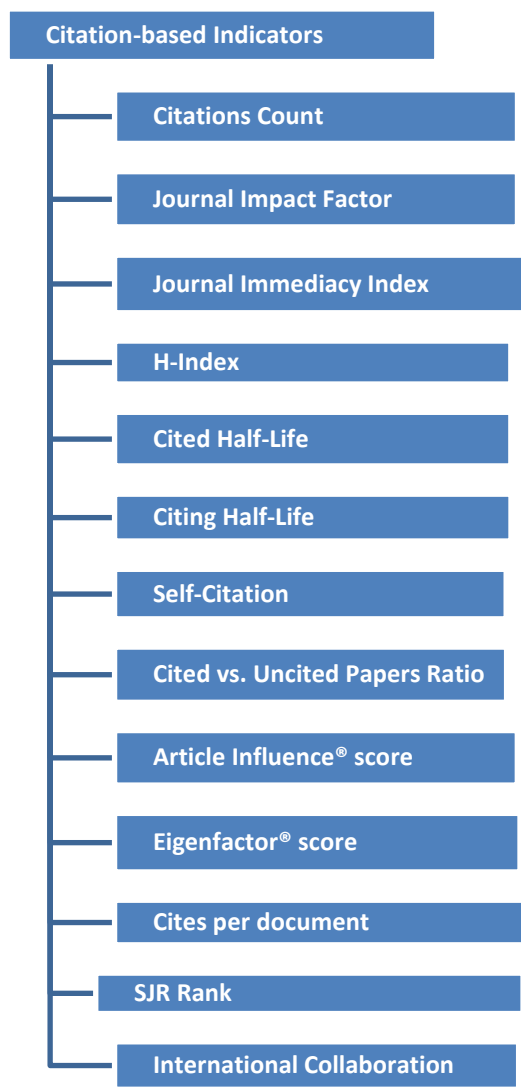
Figure 5.3: Most Useful Citation-based Indicators, derived from Citation Databases

5.2.5   Webometric Ranking of Institutional Repositories

The "Ranking Web of World Repositories"[49] is a global ranking initiative by the CSIC Cybermetrics Lab in Spain for OA institutional or disciplinary repositories available across the world. This web ranking effort helps in promoting the OA initiatives, which are distributing the research outputs of the universities and research centers by depositing scientific papers and related materials at OA repositories. Its website provides world ranking of repositories. It further provides region-wise rankings, such as for the North America, Latin America, Europe, Asia, Africa, Arab World, and Oceania. It also derives ranked list of top institutional repositories and top portals of disciplinary repositories. Text Box 5.1 shows ranking methodology that includes four ranking parameters, viz., size, visibility, number of rich files and number of scholars. Figure 5.4 shows a ranked list of OA repositories from the group of emerging economies, popularly known as BRICS countries, covering 124 repositories from Brazil, Russia, India, China and South Africa.

Text Box 5.1: Methodology[50] in the Ranking Web of Repositories

---

Methodology

The Ranking Web (Webometrics) provides a list of mainly research-oriented repositories arranged according a composite index derived from their web presence and the web impact (link visibility) of their contents, data obtained from the major commercial search engines. For being accepted in the Directory the following conditions are needed:

- Only repositories with an autonomous web domain or subdomain are included:

  - repository.xxx.zz (YES)

  - www.xxx.zz/repository (NO)

- The contents should be mainly scientific papers

With the aim to improve visibility of repositories and good practices in their web publication we have extracted the following quantitative web indicators from the most important search engines. The methodology is similar, but not exactly the same, to those use in our other Rankings:

- Size (S). Number of web pages extracted from Google.

- Visibility (V). The total number of external links received (backlinks) by the number of referring domains for such links obtained from MajesticSEO.com and Ahrefs.com databases.

- Rich Files (R). Files in formats like Adobe Acrobat (.pdf), MS Word (doc, docx), MS PowerPoint (ppt, pptx) and PostScript (.ps & .eps) extracted from Google.

- Scholar (Sc). Using Google Scholar database we calculate the normalised number of papers between 2007 and 2011.

The four ranks were combined according to a formula where each one has a different weight but maintain the ratio 1:1 between activity (size in the broad sense) and impact (visibility).

---

[49] http://repositories.webometrics.info
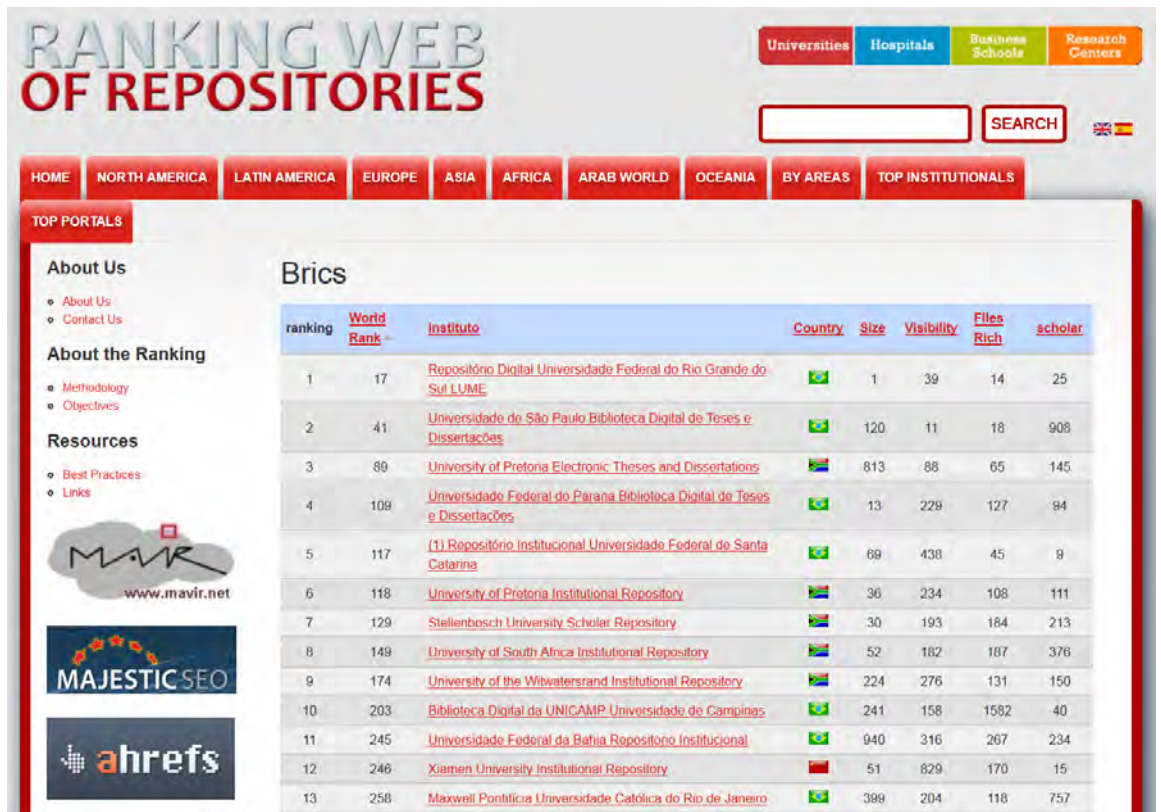[50] http://repositories.webometrics.info/en/Methodology

Figure 5.4: Ranking of OA Repositories from the BRICS Countries

5.2.6 Article Level Metrics (Altmetrics)

Outputs or impacts of scientific research are periodically measured worldwide with different parameters, where a variant number of different tools and techniques are used. The Journal Impact Factor (JIF), Hirsch's H-Index and a number of variations of these two citation-based metrics are used commonly for evaluating impacts of journals and their contributing authors and institutions. However, many funders, research administrators, scientific communities and other stakeholders felt these indicators as inadequate, inappropriate and skewed due to various reasons. The San Francisco Declaration on Research Assessment (DORA) publicly declared a statement on 16th December 2012 supporting altmetrics or alternative metrics also widely known as article level metrics), which is a clear transition from the citation-based indicators such as JIF and h-index to measuring impacts beyond citations of a particular piece of research work. DORA got considerable support from the funding bodies, publishers, research institutions, and scientific communities as altmetrics is focused on capturing the increasing variety of online references to a scholar's work. Altmetrics offers a different view of the influence of that work. In the editorial of the Bulletin of the American Society for Information Science and Technology, April-May 2013 issue in a special section on altmetrics, the Guest Editor identifies: "Altmetrics offer four potential advantages:

- A more nuanced understanding of impact, showing us which scholarly products are read, discussed, saved and recommended as well as cited.

- Often more timely data, showing evidence of impact in days instead of years.

- A window on the impact of web-native scholarly products like datasets, software, blog posts, videos and more.

- Indications of impacts on diverse audiences including scholars but also practitioners, clinicians, educators and the general public." (Piwowar, 2013)

Thus, an altmetric score of a scholar's work encompasses not only citation count but also number of times it is viewed, saved, shared, discussed, tagged, highlighted in news, and other such counts in academic social media and online networks. It also involves normalization of some counts based on subject area of an article. Figure 5.5 elaborates enumeration of an altmetric score from different sources. Figure 5.6 shows altmetric score of one of the highest rating articles, which is amongst top 1% in generating global attention of researchers, practitioners, journalists and bloggers communities. This paper ranks second in *Science* magazine, compared to all papers published therein. Figure 5.6 also shows detail counts of social media that talked about this paper. This way an almetric score can help in measuring impact of a scholarly work to researchers' communities. Figure 5.6 also shows a multicolour emblem, which is popularly known as Altmetric Badge. Journal publishers can integrate and provide a fuller picture of online impact by integrating visually-appealing Altmetric badges into their article level metrics pages.

The DORA as well as *Altmetrics Manifesto* indicate two major providers of altmetric score, namely Altmetric.com and ImpactStory.org. Many others are now under development stage, whereas some are in experimental or testing stages. Other important ones are namely PlumAnalytics.com, ScienceCard.org, PeerEvaluation.org, ResearchScorecard.com, and ReaderMeter.org. Many individual journal publishers also engaged in development of in-house article level metrics (ALM) tools, which they will integrate into their online journals in near future. A leading online journal publisher – PLOS (Public Library of Science) has widely publicized its interests in article level metrics. Article level measurement can be carried out using online tools from Altmetric.com and ImpactStory.org. ALM can also be integrated to publishers' websites for generating article level metrics for each published article, subject to having a DOI-linked webpage.
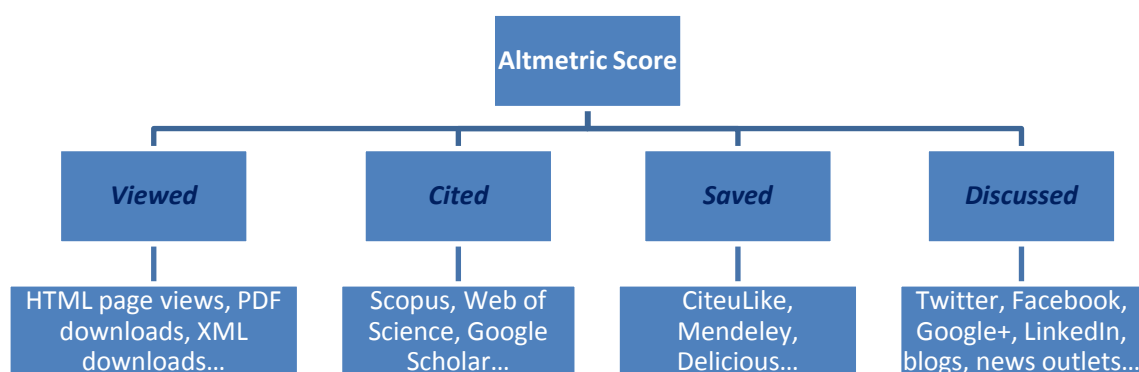
Figure 5.5: Deriving an Altmetric Score
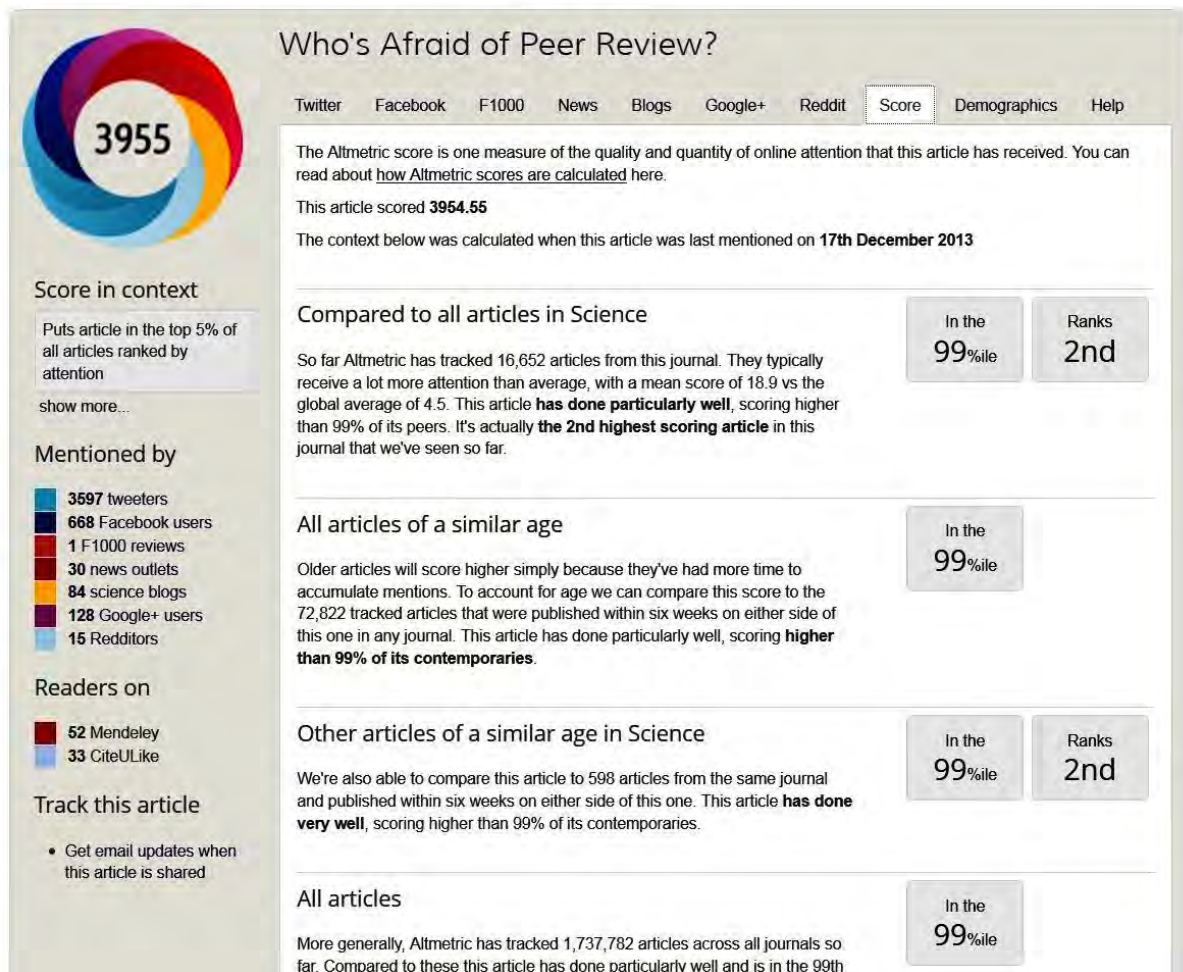
Figure 5.6: Altmetric Score of one of the Highest Rating Articles (amongst top 1%)

## 5.3 EMERGING INDICATORS (H-INDEX AND DERIVATIVES)

The Journal Citation Reports (JCR) derived from the Web of Science, combining the Science Citation Index Expanded (SCI-E) and Social Science Citation Index (SSCI), can only provide evaluation metrics based on overall journals' performance, but JCR failed to measure performance of individual papers and individual authors. There has been emergent necessity of measuring scholarly impact of individual researchers. At this juncture, physicist Jorge E. Hirsch proposed a new indicator named H-Index. H-Index measures scholarly impact of individual researchers, and is the largest number h such that h publications have at least h citations. For example an H-Index value 6 denotes 6 publications have at least 6 citations each. In addition to an author, H-Index can also be obtained for a journal, an affiliating institution, a research group.

Other derivatives of h-index are:

- i10-index (number of publications with at least 10 citations),

- h5-index (the h-index for articles published in the last 5 complete years),

- h5-median (the median number of citations for the articles that make up its h5-index),

- g-index (an index to quantify an individual's scientific research output, proposed by Leo Egghe).

Google Scholar Citations[51] (GSC) helps in creating an author's profile that auto-generates several indicators based on an author's research impact and citations history. GSC is a personalized source of information for authors to keep track of citations to their published articles. As an author, you can check who is citing your publications, graph citations over time, and compute several citation metrics. You can also make your profile public, so that it will appear in Google Scholar results when people search for your name, e.g., Richard Feynman.

In a public profile, information displayed include: name of the scholar, current affiliation, broad areas of research interests, bibliographic details of all papers, number of citations received by each paper, names of co-authors, number of followers of this profile, etc. This profile also includes a few performance indicators and citation metrics, such as overall total citations, h-index, i-10 index; and total citations, h-index, i-10 index for last five years, as shown in Figure 5.7. When you register with GSC as an author, these citation metrics are computed and updated automatically as Google Scholar finds new citations to your work on the web. You can choose to have your list of articles updated automatically or review the updates yourself, or to manually update your articles at any time.
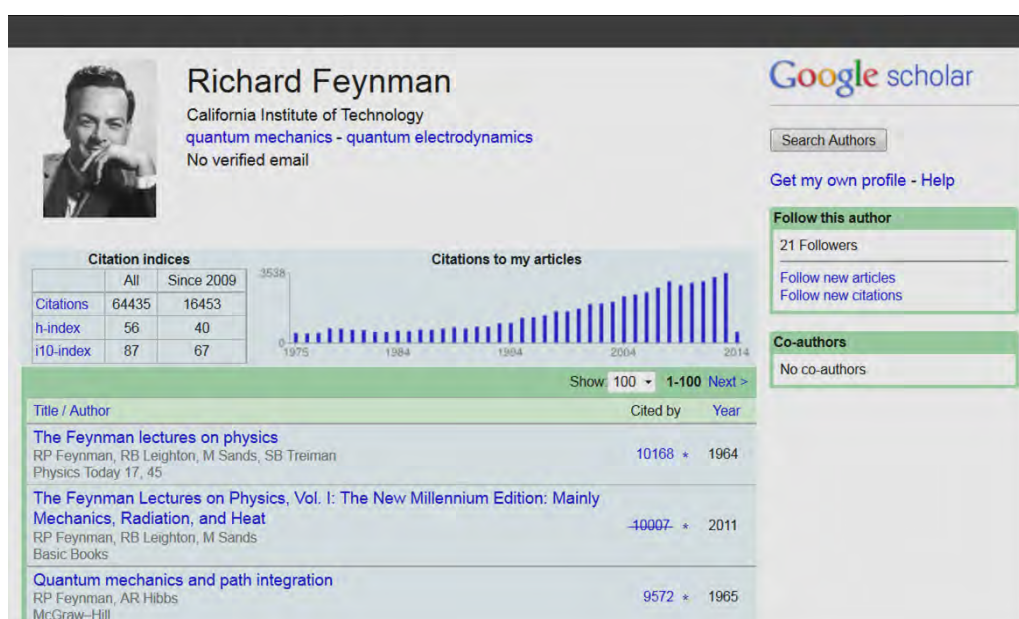
Figure 5.7: Display of Public Profile of Prof. Richard Feynman in Google Scholar Citations

---

[51] http://scholar.google.com/citations

The Publish or Perish[52] (POP) software, developed by Australian Professor Anne-Wil Harzing in 2006, is a freely downloadable software for personal non-profit use. This software can be used for author impact analysis. The software fetches bibliographic information of papers written by specified author from the Google Scholar search engine and presents different author citations metrics such as h-index, g-index, cites per paper, hc-index (the contemporary h-index), citations count for each paper, cumulative citations count, publishing years (i.e., productive years of a scientist), etc. Similarly, this software can also be used for journal impact analysis with similar citation metrics.

Several other freely available online portals are available that derive different indicators for comparative impact analysis of authors, journals, institutions, and countries. Some examples are:

- eigenFACTOR.org – for article influence score, eigenfactor score and cost effectiveness score of journals.
- JournalMetrics.com – for SNIP (Source Normalized Impact per Paper), SJR (SCImago Journal Rank) values.
- JournalPrices.com – for cost effectiveness of journals.
- ScimagoIR.com – SCImago institutions rankings.
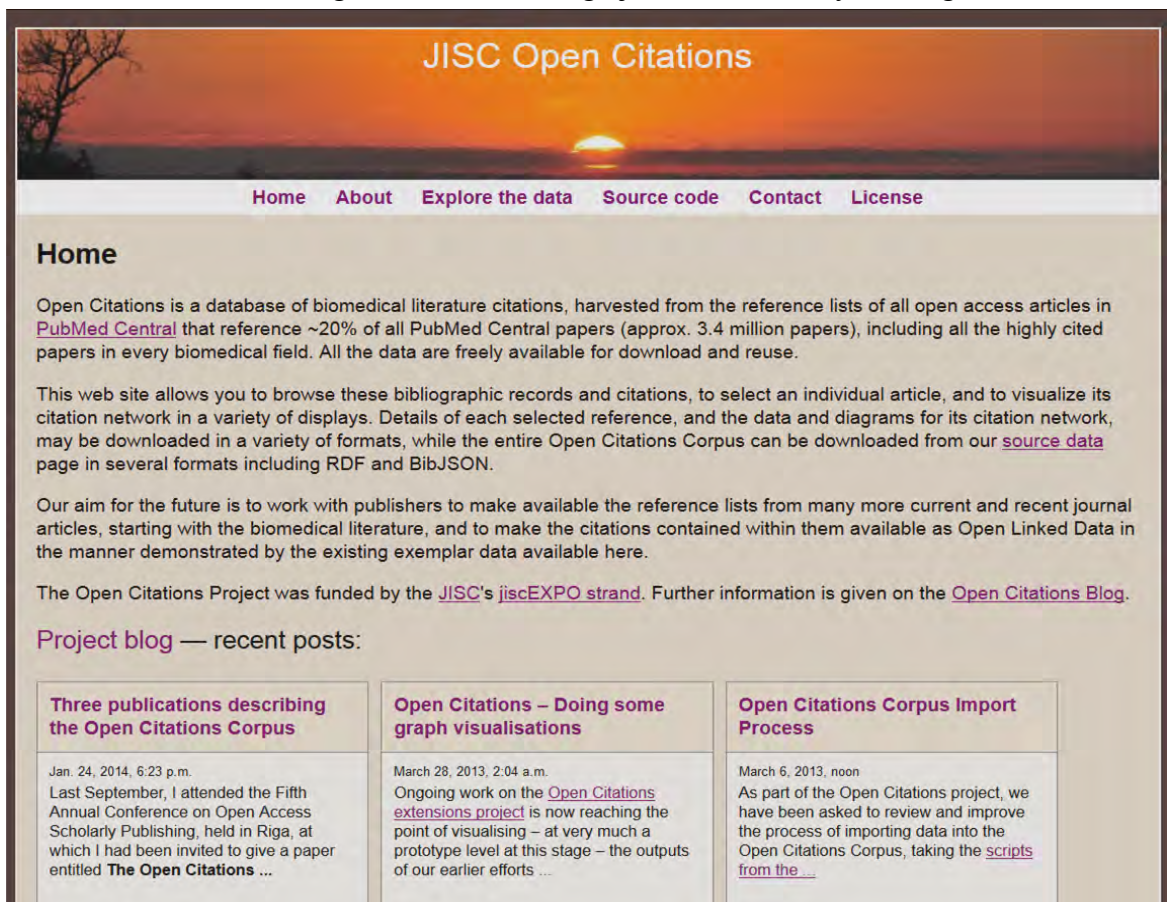- ScimagoJR.com – SCImago journal & country ranking.

Figure 5.8: Homepage of JISC Open Citations Project[53]

---

[52] http://www.harzing.com/pop.htm
[53] http://opencitations.net

5.4   OPEN CITATION DATABASES

OA literature gets cited by successive research publications, that makes a sustainable life cycle of open science endeavours. Open citations projects, being planned and implemented in different scales, help in assessing impact and reach of OA resources. Global OA movement and particularly the concept of Green OA proliferate number of Open Archives Initiative (OAI)-compliant OA digital archives, institutional repositories and disciplinary repositories across the world. OAI-compliant repositories or archives can be harvested using metadata harvesting software such as Open Harvester Systems (OHS) developed by the Public Knowledge Project (PKP).

The Open Citations project (OpCit), initially funded by the Joint NSF-JISC International Digital Libraries Research Programme, is a conceptual framework for publishing bibliographic and data citations as linked open data within Open Citations Corpus (OCC). OpCit gathers citation data from OAI-compliant open archives such as arXiv.org and PubMed Central for "reference linking and citation analysis for open archives". Its citation-based linked open data are gathered in a central database called 'Citebase' for citation analysis and data mining.

5.5   LET US SUM UP

In this Unit, you have learnt about different methods and techniques used in evaluating research, particularly the measurement of science, scientific communities and scientific communications. Some of them are commonly described as research evaluation metrics. Historically, main tools used for research evaluation are citation analysis and citation indexes. Emergence of interactive social network and social media marks arrival of personalized web-based indicators for measuring social impact and outreach of every piece of scholarly work, and its producers – authors and institutions.

When an author shares his 'just published' research paper in social media, personalized researcher's profile and online forums, it comes with much higher possibilities of getting read or noticed or cited by co-researchers working in the same or allied research areas. Thus, author-level metrics and article-level metrics are built upon counting social 'share', 'saved', 'discussed' and 'cited' data sources available through different social webs.

 Unlike toll-access research literature, OA literatures have higher chance of getting cited as well as shared, saved and discussed due to their worldwide availability and visibility. Thus, OA literatures have possibility of considerably higher research impact. Altmetrics and other new indicators will help in judging or determining the productivity, visibility, reputation and impact of OA literature to scientific communities.

5.6   CHECK YOUR PROGRESS

a) Identify five key citation-based indicators for journals.

…………………………………………………………………………..

…………………………………………………………………………..

…………………………………………………………………………..

b) Identify five key author-level indicators for evaluating author's
    productivity.

…………………………………………………………………………..

…………………………………………………………………………..

…………………………………………………………………………..

c) Identify names of three common bibliometric laws.

…………………………………………………………………………..

…………………………………………………………………………..

…………………………………………………………………………..

d) Where can you find H-Index of an author?

…………………………………………………………………………..

…………………………………………………………………………..

…………………………………………………………………………..

e) Where can you find G-Index of an author?

…………………………………………………………………………..

…………………………………………………………………………..

…………………………………………………………………………..

f) Which Citation Index was introduced first?

   i)   Science Citation Index
   ii)   Social Science Citation Index
   iii) Arts & Humanities Citation Index
   iv)   Data Citation Index

g) Which altmetrics tool generates an altmetric badge?

   i)   ImpactStory.org
   ii)   Altmetric.com
   iii) SSRN
   iv)   Scopus

h) Which company did introduce Science Citation Index?

    i)   Thomson Reuters
    ii)   Institute for Scientific Information
    iii)   Elsevier
    iv)   Springer

i) Which journal publishers did first introduce article level metrics?

    i)   JoVE
    ii)   eLIFE
    iii)   PLOS
    iv)   Biomed Central

j) Where can you find i10-Index of an author?

    i)   Google Scholar
    ii)   ResearchGate
    iii)   Scopus
    iv)   Google Scholar Citations

ONLINE VIDEOS FOR SELF-LEARNING

There are a number of video tutorials available on topics discussed in this Unit. Some of the tutorials were developed by the organizations responsible for the respective products or services, while some others were developed by reputed scientists and libraries. Now, you learn more about how these products can be used for measurement of articles and contributors.

- *Academic Visibility and the Webometric Future* **Video**[54]

- *Alternate Routes: Journal Metrics Revisited* **Video**[55]

- *Altmetric for Librarians* **Video**[56]

- *Article level metrics for publishers by Altmetric* **Video**[57]

- *Citation Indexing* **Video**[58]

- *eigenFACTOR* **Video**[59]

- *Eugene Garfield on H-indexes and Impact Factors* **Video**[60]

- *Eugene Garfield on Impact Factors* **Video**[61]

- *Getting Started with Harzing's Publish or Perish* **Video1**[62]**, Video2**[63]

- *H-Index: A Measure of a Scientist's Impact* **Video**[64]

- *Impact Factor and other Bibliometric Indicators* **Video**[65]

---

[54] http://www.youtube.com/watch?v=IRLo_VyBMIo
[55] http://www.youtube.com/watch?v=B7WRbybStps
[56] http://www.youtube.com/watch?v=RzVxoUx9tfc
[57] http://www.youtube.com/watch?v=XE8hDetxEt0
[58] http://www.youtube.com/watch?v=uYTZouNlxWo
[59] http://vimeo.com/20498839
[60] http://www.webofstories.com/play/eugene.garfield/71
[61] http://www.webofstories.com/play/eugene.garfield/38
[62] http://www.youtube.com/watch?v=pZpyo7X5YIc
[63] http://www.youtube.com/watch?v=w06iw9NPKaw
[64] http://www.youtube.com/watch?v=P47yAH8yz9U
[65] http://www.youtube.com/watch?v=Pmw9KKpuqFU

SELF-LEARNING ACTIVITIES

1. Determine various metric indicators (e.g. Journal Impact Factor, SJR, SNIP, Eigenfactor Score, Article Influence Score) of the following journal title - PLoS ONE - by visiting the following databases:

   a) SCImago at http://www.scimagojr.com/

   b) Eigenfactor.org at: http://www.eigenfactor.org/

   c) Journal Citation Reports or Scopus via your library database subscriptions.

2. Create a researcher profile for yourself or a researcher at your institution using the following:

   a) Google Scholar Citations at http://scholar.google.com/citations

   b) ORCID at http://orcid.org

   c) ResearcherID at http://www.researcherid.com

   d) ResearchGate at http://www.researchgate.net/

   e) LinkedIn at http://www.linkedin.com/

   f) Academia.edu at http://www.academia.edu/

   g) ImpactStory at http://impactstory.org/

3. Determine the altmetrics of a paper/author by using http://altmetrics.org/tools/

4. Determine different metrics of a scientific paper written by a senior researcher in your university/ institution PoP (Publish or Perish) Software.

5. Calculate h-index of five authors on any given area by using PoP Software.

ANSWERS TO CHECK YOUR PROGRESS

Unit 2

    Q-(e) ii,

    Q-(f) iv,

    Q-(g) iii,

    Q-(h) ii,

    Q-(i) i.

Unit 3

    Q- (f) ii,

    Q- (g) iv,

    Q- (h) iii,

    Q- (i) i,

    Q- (j) iv.

Unit 4

    Q-(e) iv,

    Q-(f) ii,

    Q-(g) ii,

    Q-(h) i,

    Q-(i) ii,

    Q-(j) iv.

Unit 5

    Q-(f) i,

    Q-(g) ii,

    Q-(h) ii,

    Q-(i) iii,

    Q-(j) iv.

GLOSSARY OF TERMS

Advocacy   It is a political process by an individual or group which aims to influence public opinion, public-policy and resource allocation decisions within political, economic, and social systems and institutions. It can include many activities that a person or organization undertakes including media campaigns, public speaking, commissioning and publishing research.

Altmetrics   Altmetrics is a new metrics proposed as an alternative to the widely used journal impact factor and personal citation indices such as h-index. The term altmetrics was proposed in 2010, as a generalization of article level metrics, and has its roots in the twitter #altmetrics hashtag.

Article   The article influence determines the average influence of a

Influence® score	journal's articles over the first five years after publication. It is calculated by dividing a journal's EFS by the number of articles in the journal, normalized as a fraction of all articles in all publications.
Arts & Humanities Citation Index	It is the third commercially available citation index, launched in 1978 by the ISI. Now it is available with the WoS/ WoK platform.
Author Addendum	A legal instrument that modifies the publisher's agreement and allows you to keep key rights to your articles.
Author Rights	A bundle of rights which are part of copyright law, such as right to share, use, reuse, modify, perform and remix.
Capacity Building	It is a conceptual approach to development that focuses on understanding the obstacles that inhibit people, governments, international organizations and non-governmental organizations from realizing their developmental goals while enhancing the abilities that will allow them to achieve measurable and sustainable results. It is also referred to as capacity development.
Citation	It is a reference to a text or part of a text identifying the document in which it may be found.
Citation analysis	It is the examination of the frequency, patterns, and graphs of citations in articles and books. It uses citations in scholarly works to establish links to other works or other researchers. It is one of the most widely used methods of bibliometrics.
Citation Index	It is a bibliographic tool in print or electronic format that lists all referenced or cited source items published in a given time span.
Cited Half-Life	It is a measurement used to estimate the impact of a journal. It is the number of years, going back from the current year, that account for 50% of the total citations received by the cited journal in the current year. ISI developed this calculation to provide an indicator as to the long-term value of source items in a single journal publication.
Citing Half-Life	The number of journal publication years, going back from the current year that account for 50% of the total citations given by the citing journal in the current year. ISI developed this calculation to provide an indicator of the subtle changes in scope of a publication over the course of time.
Coalition	It is a pact or treaty among individuals or groups, during which they cooperate in joint action, each in their own self-interest, joining forces together for a common cause. This alliance may be temporary or a matter of convenience.
Copyleft	An arrangement whereby software or artistic work may be used, modified, and distributed freely on condition that anything derived from it is bound by the same conditions.

Copyright	The exclusive and assignable legal right, given to the originator or creator or author for a fixed number of years, to print, publish, perform, film, or record literary, artistic, or musical material.
Copyright Transfer Agreement	An agreement between authors and publishers, where authors transfer some exclusive rights to publishers.
Delayed OA	It offers free access after a specified period. A journal will make its articles freely available after a period of time, anywhere from 6 months to 2 years.
Digital Preservation	In library and archival science context, it is a formal endeavour to ensure that digital information of continuing value remains accessible and usable.
Eigenfactor® score	It is based on the number of times articles from the journal published in the past five years have been cited in the JCR year, but it also considers which journals have contributed these citations so that highly cited journals will influence the network more than lesser cited journals. References from one article in a journal to another article from the same journal are removed, so that Eigenfactor Scores are not influenced by journal self-citation.
Gratis OA	It removes price barriers alone. It is free of charge, but not free of copyright, or licensing restrictions.
H-Index	It refers to Hirsch's H-Index, suggested by physicist Jorge E. Hirsch. It is the largest number h such that h publications have at least h citations.
Hybrid OA	It offers free availability of certain articles written by authors who choose to pay a publication charge or APC to make their articles OA immediately on publication, while the rest of the articles requires a subscription to access.
i10 Index	It, introduced in 2011 by Google Scholar, indicates the number of academic publications an author has written that have at least ten citations from others.
Institutional Repository	It is an online archive for collecting, preserving, and disseminating digital copies of the intellectual output of an institution, particularly a research institution. Usually it is in OA.
Journal Citation Reports	It is a tool, launched in 1975 by the ISI, for ranking academic journals analysing citations count, journal impact factor and journal immediacy index. Presently it has two annual editions for science and social sciences, based on SCI-E and SSCI.
Journal Immediacy Index	It is the average number of times that an article published in a specific year within a specific journal is cited over the course of that same year.
Journal	It is the number of current citations to articles published in a

Impact Factor	specific journal in a two year period divided by the total number of articles published in the same journal in the corresponding two year period.
Libre OA	It removes price barriers and at least some permission barriers as well. It is free of charge and expressly permits uses beyond fair use.
Licence to Publish	An exclusive right authors grant to publishers.
License	A permission or authorization that ensures licensors get the credit for their work.
Open Source Software	It is computer software with its source code made available and licensed with a license in which the copyright holder provides the rights to study change and distribute the software to anyone and for any purpose.
Partial OA	It offers free availability of the journal's primary research articles, but access to other value-added content such as editorials and review articles requires a subscription.
Scholarly Journal	It is a peer-reviewed periodical publication in which scholarship relating to a particular academic discipline is published. Academic journals serve as forums for the introduction and presentation for scrutiny of new research, and the critique of existing research.
Science Citation Index	It is the first commercially available citation index, launched in 1964 by the ISI. Now it is available with the WoS/ WoK platform.
SCImago Journal Rank	It is a prestige metric based on the idea that 'all citations are not created equal'.
Scopus	It is the world's largest abstracting and citation database of peer-reviewed literature.
Selected OA	It offers free availability of selected articles of a journal issue, while the rest of the issue requires a subscription to access.
Self-Citation	It is a reference an author provide in a document to other documents written by himself/ herself.
Serials Crisis	A common phenomenon to describe the constant increase in subscription cost increases of many scholarly journals.
Short-term OA	It provides free access to articles for a short period after publication, after which they are only available to paid subscribers.
SNIP	It measures contextual citation impact by weighting citations based on the total number of citations in a subject field.
Social Science Citation Index	It is the second commercially available citation index, launched in 1972 by the ISI. Now it is available with the WoS/ WoK platform.

LIST OF ABBREVIATIONS

ACD	IFLA Acquisition & Collection Development
A&HCI	Arts & Humanities Citation Index
AIS	Article Influence® score
ALM	Article Level Metrics
Altmetrics	Article Level Metrics
APC	Article Processing Charge
ATA	Alliance for Taxpayer Access
BBB	Budapest, Berlin and Bethesda OA declarations
BMC	BioMed Central
BOAI	Budapest Open Access Initiative
CC	Creative Commons
CC BY	Creative Commons Attribution
CC BY-NC	Creative Commons Attribution- Non-Commercial
CC BY-NC-ND	Creative Commons Attribution- Non-Commercial- No Derivatives
CC BY-NC-SA	Creative Commons Attribution- Non-Commercial- Share Alike
CC BY-ND	Creative Commons Attribution- No Derivatives
CC BY-SA	Creative Commons Attribution- Share Alike
CLOCKSS	Controlled LOCKSS
COAPI	Coalition for Open Access Policy Institutions
COPE	Committee on Publication Ethics
CTA	Copyright Transfer Agreement
DCC	Digital Curation Centre
DOAJ	Directory of Open Access Journals
DOI	Digital Object Identifier
DOI	Digital Object Identifier
DORA	San Francisco Declaration on Research Assessment
DRM	Digital Rights Management
EFS	Eigenfactor® score
EIFL	Electronic Information for Libraries
EOS	Enabling Open Scholarship
ERA	European Research Area
ETD	Electronic Theses and Dissertations
EU	European Union
FAO	Food and Agriculture Organization
FASTR	Fair Access to Science and Technology Research

FOSTER	Facilitate Open Science Training for European Research
FP7	Seventh Framework Programme for Research and Development
FSF	Free Software Foundation
GPL	GNU General Public License
GSC	Google Scholar Citations
HC-Index	Contemporary H-Index
H-Index	Hirsch Index
HTML	Hypertext Markup Language
I2S2	Infrastructure for Integration in Structural Sciences Project, U.K.
INASP	International Network for the Availability of Scientific Publications
IPR	Intellectual Property Rights
ISI	Institute for Scientific Information, USA
JCR	Journal Citation Reports
JIF	Journal Impact Factor
JII	Journal Impact Factor
JISC	Joint Information Systems Committee, United Kingdom
LIBER	Association of European Research Libraries
LOCKSS	Lots of Copies Keep Stuff Safe
LTP	Licence to Publish
MOOC	Massive Online Courses
NDLTD	Networked Digital Library of Theses and Dissertations
OA	Open Access
OAI	Open Archives Initiative
OASPA	Open Access Scholarly Publishers Association
OCC	Open Citations Corpus
OCS	Open Conference Systems
OCW	Open Courseware
ODL	Open and Distance Learning
OER	Open Educational Resources
OHS	Open Harvester Systems
OJS	Open Journal Systems
OpenDOAR	Directory of Open Repositories
OPL	Open Content License
OSS	Open Source Software
PKP	Public Knowledge Project
PLOS	Public Library of Science
PLOS ALM	PLOS Article Level Metrics.
PMC	PubMed Central

POP	Publish or Perish software
R&D	Research and Development
RLUK	Research Libraries in the UK and Ireland
ROARMAP	Registry of Open Access Repositories Mandatory Archiving Policies
RoMEO	Rights Metadata for Open Archiving
SCI-E	Science Citation Index Expanded
SciELO	Scientific Electronic Library Online
SJR	SCImago Journal Rank
SNIP	Source Normalized Impact per Paper
SPARC	Scholarly Publishing and Academic Resources Coalition
SSCI	Social Science Citation Index
SSRN	Social Science Research Network
UKOLN	United Kingdom Office for Library and Information Networking
UNESCO	United Nations Educational, Scientific and Cultural Organization
URI	Uniform Resource Identifier
WIPO	World Intellectual Property Organization
WoK	Web of Knowledge
WoS	Web of Science
WSIS	World Summit on the Information Society

REFERENCES AND FURTHER READINGS

Bailón-Moreno, R., Jurado-Alameda, E., Ruiz-Baños, R., & Courtial, J. P. (2005). Bibliometric laws: Empirical flaws of fit. *Scientometrics*, *63*(2), 209-229. Retrieved from http://eprints.rclis.org/12847/1/Bailon-Moreno,_R_.pdf

Berlin Declaration on Open Access to Knowledge in the Sciences and Humanities (2003). Retrieved from http://openaccess.mpg.de/286432/Berlin-Declaration

Bethesda Statement on Open Access Publishing (2003). Retrieved from http://legacy.earlham.edu/~peters/fos/bethesda.htm

Budapest Open Access Initiative (2002). Retrieved from http://www.budapestopenaccessinitiative.org/read

Correia, A.M.R. and Teixeira, J.C. (2005). Reforming scholarly publishing and knowledge communication: From the advent of the scholarly journal to the challenges of open access. *Information Services & Use*, 29(4), 349-364. DOI: 10.1108/14684520510617802

DORA (2012). *The San Francisco Declaration on Research Assessment (DORA)*. USA: American Society for Cell Biology (ASCB). Retrieved from http://www.ascb.org/dora/files/SFDeclarationFINAL.pdf

Drott, M. C. (1981). Bradford's Law: Theory, Empiricism and the Gaps Between. *Library Trends*, *30*(1), 41-52. Retrieved from www.ideals.illinois.edu/bitstream/handle/2142/7189/librarytrendsv30i1_opt.pdf

Garfield, Eugene (1994). Expected Citation Rates, Half-Life, and Impact Ratios: Comparing Apples to Apples in Evaluation Research. *Current Contents*, Retrieved from http://wokinfo.com/essays/expected-citation-rates/

Garfield, Eugene (1994). The Concept of Citation Indexing: A Unique and Innovative Tool for Navigating the Research Literature. *Current Contents*, Retrieved from http://wokinfo.com/essays/concept-of-citation-indexing/

Garfield, Eugene (2010). The Evolution of the Science Citation Index. *International Microbiology*, 10(1): 65-69. doi:10.2436/20.1501.01.10. Retrieved from: http://garfield.library.upenn.edu/papers/barcelona2007a.pdf

Gu, Feng & Widén-Wulff, Gunilla (2011). Scholarly communication and possible changes in the context of social media: A Finnish case study. *The Electronic Library*, 29(6), 762-776.

Hahn, K. L. (2008). Research library publishing services: New options for university *publishing*. Washington, D.C.: Association of Research Libraries http://www.arl.org/storage/documents/publications/research-library-publishing-services-mar08.pdf

Houghton, J.W., Rasmussen, B., Sheehan, P.J., Oppenheim, C., Morris, A., Creaser, C., Greenwood, H., Summers, M. and Gourlay, A. (2009). *Economic Implications of Alternative Scholarly Publishing Models: Exploring the Costs and Benefits*, Report to The Joint Information Systems Committee (JISC) by Victoria University & Loughborough University.

Hubbard, Bill (2008). *Green, Blue, Yellow, White & Gold: A Brief Guide to the Open Access Rainbow*. Retrieved from www.sherpa.ac.uk/documents/sherpaplusdocs/Nottingham-colour-guide.pdf

I2S2 Partners (2011). *Idealised Scientific Research Activity Lifecycle Model*. http://www.ukoln.ac.uk/projects/I2S2/documents/I2S2-ResearchActivityLifecycleModel-110407.pdf

Iribarren-Maestro, I.; Lascurain-Sánchez, M.L. & Sanz-Casado, E. (2009). The Use of Bibliometric Techniques in Evaluating Social Sciences and Humanities. In: *Celebrating Scholarly Communication Studies: A Festschrift for Olle Persson at his 60th Birthday*. Retrieved from http://www8.umu.se/inforsk/Bibexcel/ollepersson60.pdf

Joseph, Heather (2013). The Open Access Movement Grows Up: Taking Stock of a Revolution. *PLoS Biololgy*, 11(10): e1001686. doi:10.1371/journal.pbio.1001686

Katz, J. Sylvan (1999). *Bibliometric Indicators and the Social Sciences*. UK: ESRC/ SPRU, University of Sussex. Retrieved from http://www.sussex.ac.uk/Users/sylvank/pubs/ESRC.pdf.

LSE Public Policy Group (2011). Maximizing the Impacts of Your Research: A Handbook for Social Scientists. London: London School of Economics. Retrieved from http://www.lse.ac.uk/government/research/resgroups/LSEPublicPolicy/Docs/LSE_Impact_Handbook_April_2011.pdf.

Lyon, Liz (2012). *The Informatics Transform: Re-engineering Libraries for the Data Decade*. Retrieved from http://www.ukoln.ac.uk/ukoln/staff/e.j.lyon/liz-lyon-vala2012-informatics-transform-final.pdf

Malenfant, Kara (2012). Integrating Scholarly Communication into Your Library. Retrieved from http://scholcomm.acrl.ala.org/node/21

McIntyre, G., Chan, J. and Gross, J. (2013). Library as Scholarly Publishing Partner: Keys to Success. *Journal of Librarianship and Scholarly Communication* 2(1):eP1091. http://dx.doi.org/10.7710/2162-3309.1091 (Licensed under CC-By)

Moed, Henk F. (2005). *Citation Analysis in Research Evaluation*. Dordrecht, the Netherlands: Springer.

Mullins, J. L., [et al] (2012). Library Publishing Services: Strategies for Success: Final Research Report. Washington, DC: SPARC. Retrieved from http://docs.lib.purdue.edu/purduepress_ebooks/24/

Neylon, C.; Willmers, M. & King, T. (2014). Impact beyond Citation: An Introduction to Altmetrics. Retrieved from http://openuct.uct.ac.za/sites/default/files/media/SCAP_Brief_2_Neylon_et_al_Impact_Beyond_Citation.pdf

Park, E.G. & Oh, S. (2012). Examining Attributes of Open Standard File Formats for Long-term Preservation and Open Access. *Information Technology and Libraries*, 31(4). Retrieved from http://ejournals.bc.edu/ojs/index.php/ital/article/view/1946/pdf_1

Pendlebury, David A. (2008). *Using Bibliometrics in Evaluating Research*. Retrieved from http://wokinfo.com/media/mtrp/UsingBibliometricsinEval_WP.pdf

Poiter, W. G. (1981). Lotka's Law Revisited. *Library Trends*, *30*(1), 21-39. Retrieved from www.ideals.illinois.edu/bitstream/handle/2142/7189/librarytrendsv30i1_opt.pdf

Smith, K.L. & Hansen, D.R. (2008). *Copyright and Authors' Rights: A Briefing Paper*. Retrieved from http://www.openoasis.org/images/stories/file/Copyright%20and%20authors%27%20rights.pdf

Smith, L.C. (1981). *Citation Analysis*. *Library Trends*, *30*(1), 83-106. Retrieved from http://www.ideals.illinois.edu/bitstream/handle/2142/7189/librarytrendsv30i1_opt.pdf

SPARC (2006). *Addendum to Publication Agreement*. Retrieved from http://www.sparc.arl.org/sites/default/files/Access-Reuse_Addendum.pdf

SPARC (2006). Author Rights: Using the SPARC Author Addendum to Secure Your Rights as the Author of a Journal Article. Retrieved from http://www.sparc.arl.org/sites/default/files/SPARC_AuthorRights2006_0.pdf

SPARC, PLOS & OASPA (2014). *HowOpenIsIt?™ Open Access Spectrum.* Retrieved from http://www.sparc.arl.org/sites/default/files/hoii_guide_rev4_web.pdf

Starr, Joan (2012). What is the research life cycle? http://www.slideshare.net/joanstarr/the-research-data-life-cycle

Suber, Peter (2009). *Timeline of the Open Access Movement*. Retrieved from http://legacy.earlham.edu/~peters/fos/timeline.htm

Suber, Peter (2012). *Open Access*. Cambridge, Massachusetts, USA: MIT Press. Retrieved from http://mitpress.mit.edu/sites/default/files/titles/content/9780262517638_Open_Access_PDF_Version.pdf

Swan, Alma (2008). *New Metrics for Research Outputs: An Overview and the Main Issues*. Retrieved from http://eprints.soton.ac.uk/266986/1/New_metrics_for_research_outputs_-_overview.pdf

Swan, Alma (2008). *What is Open Access?: A Briefing Paper*. Retrieved from http://www.openoasis.org/images/stories/briefing_papers/Open_Access.pdf

Swan, Alma (2009). *Open Access Advocacy: A Checklist for Research Libraries*. Retrieved from http://www.sparc.arl.org/sites/default/files/presentation_files/17swan_paper.pdf

Swan, Alma (2010). *Open Access Impact: A Briefing Paper for Researchers, Universities and Funders*. Retrieved from http://www.openscholarship.org/upload/docs/application/pdf/2010-10/open_access_impact.pdf

Swan, Alma (2012). *Policy Guidelines for the Development and Promotion of Open Access*. Paris: UNESCO. http://unesdoc.unesco.org/images/0021/002158/215863e.pdf

Tananbaum, Greg (2013). *Article Level Metrics: A SPARC Primer*. Retrieved from http://sparc.arl.org/sites/default/files/sparc-alm-primer.pdf

Thelwall, Mike (2013). *Webometrics and Social Web Research Methods*. UK: University of Wolverhampton. Retrieved from http://www.scit.wlv.ac.uk/~cm1993/papers/IntroductionToWebometrics AndSocialWebAnalysis.pdf

University of Minnesota Libraries (2010). Approaches to Open Access. Retrieved from http://www.lib.umn.edu/scholcom/approaches-open-access.

Van den Eynden, V., Corti, L., Woollard, M. & Bishop, L. (2009). Managing and Sharing Data: A Best Practice Guide for Researchers, http://www.data-archive.ac.uk/media/2894/managingsharing.pdf

Weimer, Katherine H. and Andrew, Paige G. (2013) How We Participate in the Scholarly Communication Life Cycle. *Journal of Map and Geography Libraries*, 9:217–219.

Wellcome Trust, U.K. (2012). Open Access: CC-BY licence required for all articles which incur an open access publication fee – FAQ. Retrieved from http://www.wellcome.ac.uk/stellent/groups/corporatesite/@policy_commun ications/documents/web_document/WTVM055715.pdf

WIPO (2008). *WIPO Intellectual Property Handbook: Policy, Law and Use. Geneva: World Intellectual Property Organization*. Retrieved from http://www.wipo.int/about-ip/en/iprm/

Withey, lynne [et al] (2011). Sustaining Scholarly Publishing: New Business Models for University Presses a report of the AAUP task force on economic models for scholarly publishing. *Journal of Scholarly Publishing*, http://www.library.cornell.edu/scholarlycomm/

Wouters, P., & Costas, R. (2012). *Users, Narcissism and Control: Tracking the Impact of Scholarly Publications in the 21st Century*. Utrecht, the Netherlands: SURF Foundation.

Wyllys, R.E. (1981). Empirical and Theoretical Bases of Zipf's Law. *Library Trends*, *30*(1), 53-64. Retrieved from http://www.ideals.illinois.edu/bitstream/handle/2142/7189/librarytrendsv 30i1_opt.pdf