OPEN SOURCE SOFTWARE AND OPEN ACCESS RESOURCES FOR ENHANCING LIBRARY SERVICES: AN EXPLORATORY STUDY

BY

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CERTIFICATE

This is to certify that the research titled '**Open Source Software and Open Access Resources for Enhancing Library Services: An Exploratory Study**', incorporates the results of an independent study carried out by Mr. Pawan R. Agrawal under the guidance of Dr. Shyama Rajaram for the degree of Doctor of Philosophy in Library and Information Science. The contents presented herein have not been submitted for the award of any other Degree or Diploma of this or any other university.

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DECLARATION

I hereby declare that the research work presented in this thesis has been prepared and carried out by me. The descriptions and narrations found therein are entirely original. I also declare that such material as has been obtained from other sources has been duly acknowledged.

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Table of Contents

Acknowledgement……...i
Preface……..…….iii
List of Abbreviation…….……...v

CHAPTER I: INTRODUCTION 1
1.1. Background 1
1.2. Genesis of library automation 2
1.3. ARPANET, Internet and Emergence of Online Databases 5
1.4. Evolution of Digital Divide 6
1.5. Development of Open Source Software and Open Access Resources 8
1.6. Statement of the Problem 10
1.7. Research questions 12
1.8. Objectives of the study 13
1.9. Significance of the study 13
1.10. Scope of the Study 14
1.11. Limitation of the Study 15
1.12. Structure of the research report 15
References 17

CHAPTER II: RELATED LITERATURE: AN OVERVIEW 19
2.1. Related literature: Open Source Software 19
2.2. Related literature: Open Access 24
References 27

CHAPTER III: RESEARCH DESIGN AND METHODS USED IN THE STUDY 32
3.1. The universe of this study 32
3.2. The Methodology used in the study 33
3.3. Sources of Information 33
3.4. Operational definitions 35
3.5. Data collection: methods and techniques used 36
3.6. Period of data collection 37
3.7. The steps towards Data analysis 37

CHAPTER IV: OPEN SOURCE SOFTWARE MOVEMENT: AN ANALYSIS 40
4.1. Introduction 40
4.2. Genesis of Open Source Movement 41
4.2.1. Development of UNIX 41
4.2.2. BSD (Berkeley Software Distribution): First Open Source License 44
4.2.3. GNU and FREE SOFTWARE FOUNDATION 45
4.2.4. LINUX 49
4.2.5. Open Source Initiative 50
4.2.6. Success of Open Source Software Movement 55
4.3. Open Source Movement and Libraries 56
4.3.1. Computer application in libraries 56
4.3.2 Beginning of Open Source library systems 58
4.3.3 Advocacy of Daniel Chudnov to open source software in libraries 59
4.3.4 Dissenting voices to open source software in libraries 61
4.3.5 Open source software as an essential aspect for the development of library services 62
4.3.6 OSS4Lib and Code4Lib 64
4.4. Open Source Software Projects for Libraries 65
4.4.1. Open Source Library Management Systems 66
4.4.1.1. Koha (Open Source ILS) 66
4.4.1.2. Avanti (Open Source ILS) 68
4.4.1.3. Evergreen (Open Source ILS) 68
4.4.1.4. NewGenLib (Open Source ILS) 70
4.4.1.5. Others (Open Source ILS) 70
4.4.2. Public Knowledge Project 72
4.4.3. Open Source Digital Library Software 74
4.4.3.1. Greenstone (OSS Digital Library Software) 74
4.4.3.2. Dspace (OSS Digital Library Software) 74
4.4.3.3. Eprints (Open Source Digital Library Software) 75
4.4.3.4. Others (OpenSource Digital Library Software) 75
4.5. Findings and Interpretations 76
4.5.1. Major Findings 76
4.5.2. Interpretations 79
References 82

CHAPTER V: OPEN SOURCE SOFTWARE FOR LIBRARIES 88
5.1. Open Source Library Management Software 88
5.1.1. Koha 89

5.1.1.1. Technical Features 90
5.1.1.2. Koha Modules 91
5.1.2. Evergreen 93
5.1.2.1. Technical features 94
5.1.2.2. Evergreen Modules 95
5.1.3. NewGenLib 97
5.1.3.1. Technical Features 97
5.1.3.2. NewGenLib Modules 98
5.2. Open Source Digital Library Software 101
5.2.1. Dspace: 102
5.2.1.1. Technical Features 103
5.2.1.2. Functional features 105
5.2.2. Greenstone 109
5.2.2.1. Technical features 110
5.2.2.2. Functional Features 111
5.2.3. EPrints 113
5.2.3.1. Technical features 114
5.2.3.2. Functional Features 115
5.3. Other open source software for libraries 117
5.3.1. Open Source Web OPAC (Online Public Access Catalogue) 117
5.3.2. Open Source Content Management System 119
5.3.3. Open Source Journal Management and Conference Management Software 122
5.4. In Summation 123
References 124

CHAPTER VI: OPTIMUM OPEN SOURCE SOFTWARE FOR A LIBRARY: A MODEL 127
6.1. Background 127
6.2. Basic Criteria 128
6.3. Open Source Software for Libraries: an Optimum Model 130
6.3.1. Most Suitable Optimum Open Source ILS: NewGenLib (NGL) 130
6.3.2. Most Suitable Open Source Digital Library Software: DSpace 134
6.3.3. Other Optional Open Source Software 136
6.3.3.1. Open Source Publishing and Review Management Software: Open Journal System 136
6.3.3.2. Open Source Content Management System (CMS) 137
6.4. In Summation 137
References 138

CHAPTER VII: OPEN ACCESS MOVEMENT: AN ANALYSIS OF ITS DEVELOPMENT AND IN FORMATION SERVICES 140
7.1. Background 140
7.2. Scholarly Publishing 142
7.3. Serial Crisis and Journal Pricing 142
7.4. Journey towards Open Access: A Historical Analysis 148
7.4.1. Public Library of Science 152
7.4.2. Budapest Open Access Initiative 153
7.4.3. Bethesda Statement on Open Access Publishing 159
7.4.4. Berlin Declaration on Open Access to Knowledge in the Sciences and Humanities .. 161
7.5. Prominent Open Access Publishers 162
7.5.1. Biomed Central 162
7.5.2 Public Library of Science (PLOS) 163
7.5.3 Hindawi Publishing Corporation 164
7.5.4 Scientific Electronic Library Online (SCIELO) 165
7.5.5 Highwire Press 166
7.5.6 MDPI.COM 166
7.5.7 Others 166
7.6 Open Access and Copyright 167
7.7 Impact of Open Access on Library and Information Services 171
7.8 English language Open Access e-Journals from different subjects 172
7.9 Findings and Interpretations 174
7.9.1 Major Findings 174
7.9.2 Interpretations 176
References 179

CHAPTER VIII: CONCLUSIONS AND SUGGESTIONS 183
8.1. Conclusions: open source software movement 183
8.2. Conclusions: Open access movement 185
8.3. Suggestions 188
8.4. Future avenues for research 191

APPENDIX A 192
BIBLIOGRAPHY 244

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PREFACE

With the introduction of Information and Communication Technology (ICT) library services have changed to a great extent. It has reached far ahead from the traditional circulation services to present information services. Information services are strengthened due to advancement in Internet, e-resources and computer software. Almost all library functions, i.e., acquisition, processing, maintenance and dissemination have been affected by technological changes. In this way one can say that the penetration of ICT in the profession of library and information science is deep rooting. It can be easily seen that the ICT based automated libraries are also growing with traditional libraries. But with this strength several complications and challenges are also arising as the gap between the traditional libraries and modern ICT based libraries is widening giving rise to a new concept, namely, 'digital divide'. This term is widely used in describing the difference between libraries which have and which do not have access to the Info-technologies due to technical expertise or financial resources. Although the latter is the major cause in the present arena, but it is only access to technology that can provide a solution to this problem.

Thus, this research will study Open Source Software and Open Access resources available on the Web. This research will be an effort to change the mind of those who believe that Internet based services can be available only to the affluent libraries. This proposed research work will be an intervention between the modern ICT based libraries and the traditional libraries which are lagging behind due to financial condition

or due to the lack of information about the Open Source Software and Open Access resources.

This research would help the libraries with no finance or with limited finance which are not able to buy expensive commercial library management software, digitization software and scholarly databases. It will help them to be aware about the open source software and open access literature that can be helpful to get their work done in place of commercial software. Additionally, this research will help them to come out of the dilemma of selection of a proper ILS and other open source software from a number of open source software available on the Web. The database of English language scholarly journals, which is presented in the Appendix of this study, will strengthen any type of library in respect of its digital collection.

LIST OF ABBREVIATIONS

AACR2	Anglo American Cataloguing Code 2
ABCD	Automatización de Bibliotecas y Centros de Documentació
ACM	Association for Computing Machinery
ADENET	Adult Education Network
AGLS	Australian Government Locator Service
ARL	American Research Libraries
ARL	Association of Research Libraries
ARPA	Advanced Research Project Agency
ARPANET	Advanced Research Project Agency Network
ASCII	American Standard Code for Information Interchange
AT&T	American Telephone and Telegraph Company
BIREME	Biblioteca Regional de Medicina
BIREME	Latin American and Caribbean Centre on Health Sciences Information
BITNET	Because It's Time Network
BLCMP	Birmingham Libraries Cooperative Mechanisation Project
BOAI	Budapest Open Access Initiative
BSD	Berkeley Software Distribution
BTL	Bell Telephone Lab
C4	Cheap and Cheerful Copy of C
CDS/ISIS	Computerized Documentation System - Integrated Set for Information Systems
CDS-Invenio	CERN Document Server – Invenio
CNPq	Conselho Nacional de Desenvolvimento Científico e Tecnológico
CNRI	Corporation for National Research Initiatives
COMIT	Compilers of MIT
CSNET	Computer and Science Network

CSS	Cascading Style Sheets
DARPA	Defense Advanced Research Projects Agency
DEC	Digital Equipment Corporation
DOAJ	Directory of Open Access Journals
DOAR	Directory of Open Access Repository
DoKS	Document and Knowledge Sharing application
DRA	Data Research Associates
EDUCOM	Educational Communications
ERIC	Educational Research Information Centre
EU	European Commission
FOSS	Free and Open Source Software
FSF	Free Software Foundation
FTP	File Transfer Protocol
GDBM	GNU Database Manager
GE	General Electric Company
GNU	GNU Not Unix
GPL	General Public Licence
GPL	General Public License
GPLS	Georgia Public Library Service
HLT	Horowhenua Library Trust
HTML	Hypertext Markup Language
IBM	International Business Machine
ICT	Information and Communication Technology
IFLA	International Federation of Library Associations and Institutions
ILMS	Integrated Library Management Software
ILS	Integrated Library System
IME	Information Management & Engineering
INSDOC	Indian National Scientific Documentation Center
ISBD	International Standard Bibliographic Description
IT	Information Technology

ITS	Incompatible Timesharing System
JISC	Joint Information Systems Committee
JPEG	Joint Photographic Experts Group
KHK	Katholieke Hogeschool Kempen
KIIKM	Kesavan Institute of Information and Knowledge Management
KWIC	Keyword in Context
LA ILS	Learning Access ILS
LAMP	Linux, Apache, MySQL, and PHP
LARC	Library Automation Research and Consulting
LDAP	Lightweight Directory Access Protocol
MARC	Machine Readable Catalogue
MDPI	Molecular Diversity Preservation International
METS	Metadata Encoding and Transmission
MILNET	Military Network
MIT	Massachusetts Institute of Technology
MULTICS	Multiplexed Information and Computing Service
NDLTD	Networked Digital Library of Thesis and Dissertation
NGL	NewGenLib
NIH	National Institutes of Health
NISO	National Information Standards Organisation
NOTS	Naval Ordnance Test Station
NPL	Nelsonville Public Library
NSF	National Science Foundation
NZLS	New Zealand Govt. Location Service
OAI	Open Access Initiative
OAI-PMH	Open Access Initiative-Protocol for Metadata Harvesting
OCLC	Online Computer Library Centre
OCS	Open Conference System
OJS	Open Journal System
OMP	Open Monograph Press

OPALS	Open Source Automation Library System
OPENDOAR	Open Directory of Open Access Repositories
OpenSRF	Open Scalable Request Framework
OSI	Open Source Initiative
OSS	Open Source Software
PDF	Portable Document Format
PINES	Public Information Network for Electronic Services
PKP	Public Knowledge Project
PLoS	Public Library of Science
PMB	Php My Biblio
RDBMS	Relational Database Management System
RFID	Radio Frequency Identification
RFP	Request For Proposal
RoMEO	Rights MEtadata for Open archiving
RSS	Really Simple Syndication
SaaS	Software as a Service
SciELO	Scientific Electronic Library Online
SFX	Special Effects
SHEPRA	Securing a Hybrid Environment for Research Preservation and Access
SOPS	SciX Open Publishing Services
SOPS	SciX Publishing Services
SPARC	Scholarly Publishing and Academic Research
STM	Science, Technology and Medicine
TCP/IP	Transmission Control Protocol/Internet Protocol
TIFF	Tagged Image File Format
UNESCO	United Nations Educational, Scientific and Cultural Organization.
UNICS	Uniplexed Information and Computer Service
UNIMARC	Universal Machine Readable Catalogue
WINISIS	Windows Integrated Set of Information Systems

WYSWYG	What you see-what you get
XHTML	Extensible Hypertext Markup Language
XML	Extensive Mark-up Language
Y2K	Year 2000

CHAPTER I
INTRODUCTION

1.1. Background

The invention of paper in 105 AD in China by Cai Lun and printing machine in 15th Century in Europe, were the initial factors that changed the status and fate of the libraries worldwide. Since then libraries have seen the technology growth in all their aspects, i.e., collection, process and services. Collection-wise it has grown over the time from clay tablets, to papyrus rolls, to paper, and now to electronic documents. Even the process of preparation of library records have changed from hand written records using ink pen, to type writers and now to computers. Further, services of a librarian have changed from guardian of documents, to circulator of documents, to information provider and now he is regarded as knowledge manager. The technological changes have been affecting almost every type of library including public, academic and special. A computer with the Internet access has become a very basic necessity of any type of library.

The major changes for libraries came in 1876 when several developments took place together. These developments were the publication of 1st edition of Dewey Decimal Classification, creation of Cutter's Rules for Dictionary Catalogue, and formation of American Library Association; since then a series of developments and new innovations were noticed in the field of library and information science. Williams (2002) notices the introduction of technology to automate library functions entered in the libraries with the use of punch cards for the library circulation and acquisition during 1930s extending to 1960s.

1.2. Genesis of library automation

It was World War II that staged the development of libraries throughout the globe. Libraries had huge collection gaps created by World War II (Rayward, 2002). The libraries, after the World War II, were under huge pressure of acquisition and quick technical processing of it. The existing library technologies were proving inadequate and incapable to bear this pressure. During this time library professionals got attracted towards the new emerging technologies that could boost up the work. But the libraries at that time were not able to manage immediate transition towards implementation of new technologies. Rayward observes the situation as;

> When existing library technologies began to break down under economic, social and bibliographical pressures emerging in the late 1950s and early 1960s and library began seeking relief in automation, the introduction of automation involved profound misunderstanding between librarians and early systems developers about the nature of the professional knowledge and tradition of librarianship on one hand and of the capabilities of the new technology and what was required for implementation on the other. (Rayward, 2002, p. 6).

However, various projects on Library automation were initiated around the world. According to a survey carried out by Library Automation Research and Consulting (LARC), there were about 2,000 library automation projects in all types of libraries by 1968 and another 20,000 library automation projects were underway in the world by 1973 (Patrinostro, 1974).

American and British libraries began experiments with computers in 1950s and 1960s that quickly spread to other countries of Europe. No innovation or development, according to Rayward (2002), in the field of library profession, after that, was simple or straight forward. Every development had gone through extensive literature studies and efforts of library and technical professionals.

Bush (1945) may be the first scientist to thing about an Integrated Library Management Software. In his article “As we may think” he talked about a device that can control circulation, cataloguing and indexing of the books of a library. He observed:

> A library of a million volumes could be compressed into one end of a desk. If the human race has produced since the invention of movable type a total record, in the form of magazines, newspapers, books, tracts, advertising blurbs, correspondence, having a volume corresponding to a billion books, the whole affair, assembled and compressed, could be lugged off in a moving van. Mere compression, of course, is not enough; one needs not only to make and store a record but also be able to consult it, and this aspect of the matter comes later. Even the modern great library is not generally consulted; it is nibbled at by a few. (Bush, 1945, p. 2).

And later in the same he suggests:

> Consider a future device for individual use, which is a sort of mechanized private file and library. It needs a name, and, to coin one at random, "memex" will do. A memex is a device in which an individual stores all his books, records, and communications, and which is mechanized so that it may be consulted with exceeding speed and flexibility. It is an enlarged intimate supplement to his memory. (Bush, 1945, p. 6)

His concept of ‘memex’ had straight away shown a way for ‘hypertext research’ of Ted Nelson. Ideas of Bush realized firstly in Massachusetts Institute of Technology (MIT) in the form of COMIT which was developed by Victor Yngve and others in 1957 (Yngve, 1958). COMIT was a programming language to manage linguistic computation that enabled a programmer to retrieve a particular string of information. After this, a series of innovations for the automation were taken place. The librarians moved towards new vision and ideas for the use of technologies for the advancement of library systems. This move led to an explosion of the experiments for computerization of library functions during 1960s and 70s.

It was the third generation of computer applications which marked a significant invention by Jack Kilby of Texas Instruments in 1958. The invention was integrated circuit. It replaced transistors of second generation and it was able to pack a huge number of transistors into a single chip of silicon. By the end of this generation instead of punched cards, librarians and other technical professionals interacted with third generation computer, through keyboards

and monitor and interfaced with operating system (ITL Education Solutions Limited, 2006). The development of computers during 1958 guided Hans Peter Luhn of IBM to generate a computer based keyword index for the articles appearing in Chemical Abstracts. This keyword index known as Keyword in Context (KWIC) was found very comfortable for the computers as it was inexpensive and presented several access points (Cornog, 1983).

In 1960s another instance of computer use for cataloguing appeared when Library of Congress used Machine Readable Catalogue (MARC) for the production of standard computerized cataloguing cards. Technologies in this area flourished rapidly to take the developments from MARC to MARC II by the end of 1968. The MARC was designed with the help of 'fields' and 'tags' consisting of three digit numbers from 001 to 999 for each bibliographic details of the document. Allocating bibliographic details to these tags is called 'tagging', i.e., Title, Author, Publisher, ISBN No. and so on. MARC II became well known among libraries in the US resulting in NISO (National Information Standards Organisation) accepting it as a standard format for bibliographic records in 1973 (Wedgeworth, 1993). 1960s also marked the establishment of Ohio College Library Centre[1] (OCLC) in 1967. With the help of OCLC, University of Ohio became the first university of the world to do online cataloguing as early in 1971 (OCLC, 2010; Jorden, 2006). Membership of OCLC in its initial years was open for only academic libraries especially college libraries but with an amendment in OCLC Articles of Incorporation on May 17, 1972 non-academic libraries were also permitted to join OCLC (Grosch, 1995). This step of OCLC opened the door to widening the new-born OCLC online system towards cooperative agreements with many regional library networks outside Ohio; by 1975, OCLC had grown up with over 500 participating

[1]Now Online Computer Library Center

libraries. The number further extended to above 2000 academic, research, public and special libraries by the end of 1970s.

On the other hand MARC Project boomed up and spread a revolution of computerized library cataloguing in the US followed by the development of national MARC projects by the various national agencies in countries worldwide. UK MARC in the UK and similar projects in several countries mushroomed and by 1986, about 19 countries reported existence of national MARC service and another 25 were in progress (Wedgeworth, 1993). However, it was still not clear that how exchange of bibliographical data could cross the national boundaries. Later initiatives from IFLA (International Federation of Library Associations and Institutions) to develop UNIMARC (Universal Machine Readable Catalogue) made it possible to share standardized bibliographic data globally.

1.3. ARPANET, Internet and Emergence of Online Databases

In 1959 engineers of the US Department of Defence, came together and formed Advanced Research Project Agency (ARPA). The objective of this team was to develop a network that can be used for peer to peer communication in Department of Defence. Department of Defence did not approve the use of this approach, but this research of ARPA provided a strong basis for the Internet. After failing to get its project get approved at Department of Defence, ARPA Connected computers of four Universities of the US, i.e., University of California at Los Angeles, the University of California at Santa Barbara, Stanford Research Institute, and the University of Utah to form ARPANET in 1969. By 1971 the number raised to 13 Nodes with 30 different university sites funded by the ARPA (Cerf, 1993). Within next two years the Global Networks become a reality when University College of London and Royal Radar Establishment, Norway connected to ARPANET (Crocke, 2000; Kirstein, 1988; Zakon, 2010; Baldauf & Stair, 2009). University of California later used this network to

develop an Online Public Access Catalogue named Melvyl[2]. The subsequent development of a number of protocols, i.e., TCP/IP, FTP, Gopher, Telnet, etc. and many other networks such as CSNET[3], MILNET[4], BITNET[5], and EDUCOM led to the birth of the Internet.

Development in networks also realized the dream of Michael Hart to provide books free of cost to the public when he started a project in 1971 known as Project Gutenberg. Project Gutenberg has the credit of being world's '1st virtual library'[6] and online full text database of books. Success of Project Gutenberg, invention of microcomputers and storage devices, and unprecedented growth of the Internet provided a new way of information dissemination through online databases. DIALOG was the most popular commercial database to search reference and bibliographical information for scientific and technical information.

1.4. Evolution of Digital Divide

Research in automation of library functions was marked mainly in four countries, i.e., United States of America, United Kingdom, Australia and Canada. A few universities and institutions played pioneering role in library automation. In the US it was University of

[2]Melvyl was started in University of California as a library automation system for circulation in 1977. It was available online in 1980.

[3]Computer and Science Network, a huge data communication network for institutions doing research network in computer applications.

[4]Military Network, a network came into existence due to split of ARPANET in 1983. This network was used for unclassified military production applications.

[5]Because It's Time Network, managed by Educom. It was mainly spread into universities in many countries. It was invented in 1981.

[6]A comprehensive account of Project Gutenberg is given by Marie Lebert in her article, *Project Gutenberg, from 1971 to 2005,* at http://www.etudes-francaises.net/dossiers/gutenberg_eng.htm

California, Library of Congress, Ohio State University, and Online Computer Library Centre (Tedd, 1994; Rayward, 2002), University of Newcastle and University of Bath in UK(Line, 2006), University of Guelph and University of Waterloo in Canada (Tedd, 1994) and University of Adelaide in Australia (Tedd, 1994). Later similar research extended to few more universities of these countries. The early automation systems include University of California's Melvyl, Geac's ADVANCE, Dynix and BLCMP's BLS, IME's TINlib, Ohio State University's Library Computer System.

The continuous developments in library computerisation led the libraries of developed countries far ahead to that of libraries in Asia, Africa, Latin America and many other developing and under developed countries. The term 'Digital Divide' became prominent in 1990s when the differences between the various fields, i.e., education, commerce and Industry of the countries with IT power and without IT power was clearly visible. The libraries were not exempted from this.

The term digital divide may be "perceived to be the gap between those people who have access to the latest information and communications technologies and those who cannot" (Murelli, 2002). According to Pippa Norris (2001, p. 2) the digital divide is understood to be the difference between "Those who do, and those who do not, use the panoply of digital resources to engage, mobilize, and participate in public life."

The digital divide was observed largely in three aspects; first, availability of technology; second, availability to finance to acquire the technology and third, availability of skills to make use of the technology. After the birth of the Internet, its growth was limited for the first 20 years but as soon as World Wide Web came into existence in 1989 and web browsers were developed, it became a boom and developed rapidly.

On the one side where computerization of libraries was started in developed countries, i.e., USA, UK, Australia, Canada, France, Germany, etc. in 1950s and 60s, the other developing and under developed countries could apply these technologies only after 1980s. India reported use of computers in libraries in 1965 in INSDOC, and Bangladesh in 1996. In Africa, Nigerian special libraries initiated the implementation of technologies and played the pioneering role for computerisation of libraries.

1.5. Development of Open Source Software and Open Access Resources

In 1985 UNESCO developed a software called CDS/ISIS (Computerized Documentation System - Integrated Set for Information Systems) to develop in-house databases of local collection. It was distributed free of cost to the libraries worldwide. Since then libraries in developing and under developed countries started their interest in automating library functions. CDS/ISIS was primarily an information storage and retrieval system used for storing and retrieving bibliographical details of library resources.

In 1985 Richard Stallman established Free Software Foundation (FSF) with an objective to promote universal freedom to create, distribute and modify computer software applications. Additionally it was established to generate and use funds for GNU project (A project that marked the beginning of free software movement), started by Stallman in 1983. The head office of FSF is in Massachusetts, USA.

The philosophy of GNU project and FSF was not only to provide free access to software but to provide software in such a manner in which users can run the software, access the source code, modify the source code for its improvement and redistribute it to others. The authors of the software applied General Public License (GPL) to their software. A major success came to GNU Project in 1991 when it, with the help of Linus Torvalds, could develop completely

free software for operating system known as Linux. Since then a number of initiatives have been taken towards the development of free software. Today we can find free software for any operating system as well as for any purpose. The field of library and information science is no exception.

In 1998, Eric S. Raymond and Bruce Perens formed Open Source Initiative (OSI) with a hope to remove the ambiguity of the individuals who perceived "free software" as anti-commercial. The aim of OSI was to bring software business into open source in which they could get remarkable success. The concept of Open Source Software is explained in details in Chapter 5.

A trend in Open Source Software in librarianship started with the establishment of Open Source Initiative. A series of open source software applications developed in a row. For example, Koha integrated library management system in 1999, Greenstone Digital Library Software and E-prints Digital Library Software in 2000, Dspace Digital Library Software in 2002, Fedora Digital Library Software in 2003, Newgenlib integrated library management software in 2005, and Evergreen integrated library management software in 2006. These software helped library professional a lot in bridging digital divide and automating their libraries in a very cost effective manner. Open Source software empowered library professionals to compete with the growing technological changes.

As far as open access is concerned, free access to literature was all along there even in ancient times when there were no legal restrictions in having access to literature. But with the invention in printing technologies, price factor started to be involved in accessing knowledge. Slowly and gradually, accessibility to available literature, especially research literature, turned costly to costlier. With the establishment of Educational Research Information Centre (ERIC) in 1966 one may see the development of open access movement though the

footmarks of open access were felt so early when a number of inventors did not patent their inventions and kept them under public domain, i.e., open access.

With the growth of the Internet and World Wide Web the distance between the countries across the world became narrower. The concept of resource sharing is realized in true sense. In last few years most of the countries of the world could afford access to computers and other information technology. The cost of the Internet and Computers has reduced to such an extent that any library can easily adopt it with minimum finance. Additionally, increase in ICT education and professional trainings by software vendors have reduced the skills barriers to operate the modern software. However, on the other hand these developments also increased the perception in people that these technologies are going to result in differences in development opportunities to people, and that a gap will be developed between those who can access these technologies and those who cannot. This is due to the financial constraints which is still a concern for libraries to acquire costly software and online databases to provide high-tech services to their users.

1.6. Statement of the Problem

A continuous salient role of ICT in libraries is an indisputable reality. A number of articles over several decennia have emphasized the technological transformation in libraries. Information services are strengthened due to advancement in Internet, e-resources and computer software. Almost all library functions, i.e., acquisition, processing, maintenance and dissemination have been affected by technological changes. In this way one can say that the penetration of ICT in the profession of library and information science is deep rooting. It can be easily seen that the ICT based ‘automated libraries’ are also growing with ‘traditional libraries’. At the same time several problems are also arising due to the widening gap between the traditional libraries and modern ICT based libraries. Once, Florence Nightingale,

pioneer of modern nursing, said that “The progressive world is necessarily divided into two classes — those who take the best of what there is and enjoy it — those who wish for something better and try to create it” (Wikiquote, 2009). In the preview of this quote of Nightingale, the whole universe is divided into two divisions. Earth as Land and Water, human beings as men and women, morals as right and wrong and the society again is divided into two categories, i.e., Capitalist and Non-Capitalist. In this way libraries are also divided into two divisions, i.e., rich and poor, in other words libraries which can afford new technologies and libraries which cannot afford such technologies. This division has given birth to the concepts of ‘Techno-capitalism’ and ‘Digital divide’ which are getting very important and assert a debatable place among library professionals. Earlier every library had been providing almost similar services with the limited available resources. The major difference that could be found between these libraries was regarding their collections only. But in the technological era this difference is touching quality of service also. Organisations with a healthy budget provide attractive services with the help of new emerging library management software, digital library software, e-content management software, client server technologies and online literature/databases to their users in their libraries. All these software and databases are very costly, so the organisations with poor economic condition cannot afford it and still carry on with traditional circulation services that lead to a big gap between these libraries and modern IT based libraries. Use of ICT is directly affecting the popularity of the libraries especially public and academic libraries in developing countries like India. It may not require a great research to evaluate the differences in quality of public libraries between libraries of developing and that of developed nations. Lack of ICT results into insufficient services to the users, hence the library professionals of these libraries feel backward in comparison to the others. This technological difference has given rise to this new concept of ‘Digital divide’. This term is widely used in describing the difference between

libraries which have and which do not have access to the Info-technologies either due to technical expertise or financial resources. However the latter is the major cause in the present arena.

However, it is only present technology that can provide a solution to this problem. In this world where capitalists are leading, there is a small segment that does not believe in the capitalistic view and are following Marxist ideology. They believe that an opportunity to grow should be available to all regardless of their status, caste, creed, colour etc. These groups believe in open access and open source and they are awakening the world about open source and open access.

If we refer the research articles published on these topics we find number of such writings. But most of these deal with one or two software or a few databases which are available in the public domain. However, there is a lack of literature discussing in full the open source movement and open access movement from a librarian's point of view. This study attempts to fill in this information gap.

Thus, this research titled '*Open source software and open access resources for enhancing library services: An exploratory study*' will study open source software and open access resources available on the Web. This research is an effort to change the mind of those who believe that Internet based services can be available only to the affluent libraries This proposed research work will be an intervention between the modern ICT based libraries, and the traditional libraries which are lagging behind due to financial condition or due to the lack of information about the open source software and open access resources.

1.7. Research questions

The present study would attempt to answer the following questions.

- How open source software movement originated, developed and succeeded?
- How many important open source software projects are there for libraries?
- Which open source software would be the best for library automation?
- Which open source software would be the best for development of a digital library?
- How open access movement started and developed and has impacted the library and information services?
- Are there enough English language open access e-Journals from various subjects to enrich a library's collection?

1.8. Objectives of the study

The objectives of this study are:

- To analyse the Open Source Software Movement from its birth to present status from a librarian's point of view.
- To analyse the features of open source software for library automation and development of a digital library.
- To construct a model of optimum open source software for a library
- To analyse the Open Access Movement, its development and its impact on Library and Information Services.
- To identify and collect various English language Open Access e-Journals from different subjects.

1.9. Significance of the study

This research would help the libraries with no finance or with limited financial resources. Libraries that are not able to buy expensive commercial library management software, digitization software and scholarly databases, through this study, would become aware of the

open source software and open access literature that can be helpful to get their work done without huge financial resources. Additionally, this research will help them to come out of the dilemma of selection of a proper Integrated Library Management Software (ILMS) and other open source software out of a number of available open source software. The exemplary database of English language scholarly journals, which is provided in Appendix A of this research report, will strengthen any type of library in respect of its digital collection.

Many libraries in developing countries like India do not have sufficient resources to deliver modern Information Technology (IT) based services as effectively as delivered by those in developed countries. This inequality threatens the fundamental laws of library science. In fact it is not possible to minimise and remove the inequalities and get modern sophisticated technology for all libraries but with the help of open source software and open access resources. The present research addresses this issue head-on.

1.10. Scope of the Study

The scope of this study is delimited to open source software and open access resources. This study is a descriptive study that does not collect the data through any questionnaire or interview. The study carries out descriptive analysis of open access movement and open source movement. Moreover, the software which are freely available on the Internet but are not open source do not come under the purview of this study. In this study, no attempt is made to evaluate any open source software through primary sources of data collection. However, secondary sources of information are used to assess the open source software. The study also aims to draw an optimum model of open source software for libraries that they can use successfully and rely on.

1.11. Limitation of the Study

In the present study the researcher could not touch Web 2.0 tools that are freely available on the Internet due to their volatile nature and complexities. In addition to that, in listing open access journals, researcher has used only English language open access journals, however, open access journals in a number of languages are available.

1.12. Structure of the research report

The present work is planned under 8 chapters, which are briefly discussed below.

Chapter 1: Introduction

This chapter briefly discusses the introduction of computer applications in libraries. The researcher has tried to emboss the level of struggle in implementing technologies into the libraries. Additionally this chapter defines the statement of the problem. Objectives of the study are also stated in this chapter. The significance, scope and limitations of the study has been mentioned and the plan of study report has been formulated.

Chapter 2: Related Literature: An overview

To understand the problem and critical aspect of the subject a number of studies and research literature are needed to be referred. Hence this chapter on related literature is one of the very important chapters of the study. This chapter includes an overview of the work done on open access and open source since the beginning of the concept.

Chapter 3: Research Design and Methods Used in the Study

This chapter describes the research design used in the present study. Moreover, the methods used for the present study has been explained in detail.

Chapter 4: Open Source Movement: An Analysis

This chapter discusses the open source software movement. This movement was started as a general movement and entered in the field of library and information science in late 1990s. It faced many dissenting voices and doubts of its success in library fields as people in library and information science were not computer experts and may not programme the codes for library software. However, the time proved such doubts as wrong. This chapter discusses this story that revolutionised the information services in libraries.

Chapter 5: Open Source Software for Libraries

This chapter deals with the technical features of the prominent open source software for libraries. Researcher has selected software from various categories such as library management software, digital library software, etc. which are used extensively in libraries. This chapter also presents evaluation of software based on the existing studies.

Chapter 6: Optimum Open Source Software for a Library: A Model

This chapter fulfils the last objective of the study. The researcher has identified and explained an optimum open source software model for a library. This model is suggested keeping in mind the libraries of India that are having inadequate finances and technical expertise. The researcher has also given the reasons and justifications for suggesting this particular model.

Chapter 7: Open Access Movement: An Analysis

This chapter deals with the concept of open access in detail from the librarian's point of view. This chapter fulfils the first objective of the study. This chapter enunciates the analytical chronology of the open access movement under various headings. The researcher has found that the open access movement has been put forward as a strong opposition to subscription based scholarly journals and is very helpful to the libraries to deliver excellent information services to the users.

Chapter 8: Conclusions and Suggestions

This chapter presents and highlights the conclusions emerging from the findings derived from the analysis in previous chapters. On the basis of derived conclusions researcher has drawn some suggestions to make the open access movement and open source movement more powerful and effective in the coming years.

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CHAPTER II
RELATED LITERATURE: AN OVERVIEW

Review of literature is a process to identify the research problem and research gaps in a field of study. Overview of related literature in this chapter is synthesis of research that supports open source software and open access literature. This chapter includes an overview of open source software and open access literature. The following overview of related literature is divided into two sections, i.e., open source software and open access literature.

2.1. Related literature: Open Source Software

The literature on the open source software is scattered in a number of ways, i.e., open source, as a movement, open source operating system, open source software in various fields including library and information science. However, the present study is concerned with open source movement and open source software in library and information science. As a general movement a number of studies are available to describe the development of open source movement. History of open source movement in literature is presented from several points of views and standards. For example, Raymond (2001), DiBona, Ockman, & Stone (1999), Soderberg (2008), and Kelty (2008) deal with ethical, moral and ideological view;Daffara and Gongalez-Barahona (2004) study open source movement as a project; Laurent (2004) emphasizes on the licensing of free and open source software and the like. In addition to these specific writings a number of general writings are available such as,Williams (2002) and Evars (2000) who narrate the whole story of the beginning of open source movement; Gay (2002) synthesized the articles of Stallman describing his philosophy towards software and history of free software movement; and Koch (2005) reviewed the research done on free software movement and open source software movement and many more. The open source

software movement initially was part of free software foundation and later on saperated from it and was termed as open source movement. By principle both are same but are different in their values. Raymond (2001) provides a very important account of open source software, reasons behind the starting of open source software and the philosophical difference between the two. He also narrates his experience as a member of free software movement (Williams, 2010).

People from Free Softare Foundation saperated their ways and divided into two movement free software movement and open software movement. However, by and large both are known as open source movement. The first objective of Free Software Foundation was to develop an open source operating system which was achieved with the development of Linux. With success of Linux, a huge number of people started to support open source movement and looked towards open source software not only in operating systems but also in other application software. The movement moved from general to specific through the development of software related to specific field of endeavour, in the case of present study the focus is on open source software related to library operations. Attention of library professionals was drawn with the historical writing of Daniel Chudnov (1999a; 1999b). After these studies a number of writing in support or against the idea of Danier Chunov published rapidly. Tennant (Tennant, 2000) had not seen any ambitious open source project for libraries while Digital Library Federation (Digital Library Federation, 2001) believed that OSS could be economical and potential alternative for libraries.Marshall Breeding (Breeding, 2002), however had not seen early suceess to open source software in the field of libraries due to lack to programming knowledge in librarians and high cost of software development. Muir(Muir, 2005), however tried to analyse open source software in both positive and negetive perspective .

Among these dissenting voices open source software for libraries were developing continuously. However the literature on these was relatively less except the manuals developed by the developers of the software. Clark (2000), and Morgan (2012) also saw the possiblilities of open source software in library and information science. They also listed some websites notifying open source software for libraries.

The above mentioned studies, except a few later ones, discuss open source software for libraries, dealing with open source movement, but none of them discuss open source software movement from the view point of a library professional. However, some studies provide good historical details of library automation, though not with open source software (Grosch, 1995; Line, 2006; Rayward, 2002). These studies are helpful to get the gist of activities that were going on in the field of libraies during the development of open source movement. The history of computer applications in libraries is so scattered that it is very difficult to tie them into a single thread.

Koha is claimed as first open source software for library management. Blake and Rachel (2000) introduced Koha to the world after first release. After this a number of write ups were published on Koha and other open source software. Anctil & Beheshti (2004) provided a brief overview of the open source ILS projects in existence in the initial phase of open source movement in libraries. Engard (2010) listed a number of open source tools for improving library services. She also provided the experiences of users using those tools. Ransom, Cormack, & Black (2009) reminded whole development process and the difficulties faced in bringing out Koha ILS. However these writings were limited to one or some more software, and none of these source could provide full information about open source movement in libraries.

With the passage of time when more alternatives for open source software came into existence several studies evaluating and comparing these software had come into existence. Giri (2012) and Singh (2013) evaluated NewGenLib and recommended it as a very powerful open source ILS. Singh and Sanaman (2012) at the same time compared NGL with Koha and found NGL very competitive to Koha. Ramsay & Chamberlain (2012) and Muller (2011) suggested a number of criteria to evaluate open source ILS. Kökörčený & Bodnárová (2010), Lal & Prasad (2013), Vinit Kumar (2009), and Barve (2008) evaluated open source digital library software following a number of criteria. However these studies were evaluative studies. They either evaluated a single or multiple software. None of the studies could suggest a single software that can be used in any type of library.

The present study is towards filling the gap of these studies. It aims to analyze the open source movement from a librarian's point of view and wish to suggest an optimum model after studying the available open source software for libraries. However, a review of all these studies helped the researcher in his research. Some very important studies on open source are presented below.

i. DiBona, Ockman, & Stone (Eds). (1999).*Open sources: voices from the open source revolution.* Sebastopol: O'Reilly Media Inc.

This book contains a number of essays from the pioneer of open source movement. Some essays of this book are historical and some are conceptual. The editors of this book in the prologue discuss the free software and try to relate it with open source. Eric Raymond in his two essays discusses about the people engaged in the software development. Some essays discuss the concept of open source software licenses. Richard Stallman in his essays narrates his days when he started free software development and reasons behind his bias toward free software. The essays present in this book make it easy to understand

the philosophy of most prominent open source pioneers and the initial open source movement.

ii. Raymond Eric S. (2001). *The cathedral and the bazaar: musing on Linux and open source by an accidental revolutionary*, (revised ed.). Sebastopol: O'Reilly Media Inc.

It is yet another work that must be referred by anyone who is interested about open source. In this book Raymond explains whole open source ideology. He emphasize that open source can produce more competent and economical products than proprietary software. He categorizes closed source software as cathedral where final product is reviewed by a team of small number of members, while bazaar as an open source product which is open socially and can be reviewed by everyone. He briefly points out his views towards Richard Stallman and his Free Software Foundation.

iii. Williams, Sam (2010). *Free as in freedom 2.0: Richard Stallman and the free software revolution,* 2nd ed. Revised by Richard Stallman. Boston: Free Software Foundation.

This is another good book based on Richard Stallman's struggle for free software. It looks like a biographical work on Richard Stallman, however, it includes his philosophy on software. This book is about the youth of Richard Stallman in 1960s and 1070s and his work for making software free. It also keeps the debate on 'free software' and 'open source' alive throughout the book. The revision of the book is done by Richard Stallman himself that makes the book more authentic. The earlier version of the book was carrying the interviews of Richard Stallman, however, this edition also carries his explanation of some interview questions answered by him.

iv. Chudnov, Daniel (1999a). Open source library system: getting started. Retrieved May 09, 2009 from http://oss4lib.org/readings/oss4lib-getting-started.php.

It is a pioneering write-up that introduced open source software to the world of library professionals. Chudnov, in this article gave all the reasons to adopt an open source software and he also criticized proprietary open source software as they did not prove themselves perfect and up to the mark. He justified that the libraries are not for profit organizations and open source are the best option for them. He also requested the library world to get involved in open source production. This write up by Chudnov helped in raising open source voice among library professionals.

v. Engard, Nicole C. (2010). *Practical open source software for libraries.* Oxford: Chandos Publishing.

Engard listed a number of open source software useful for libraries with the practical experience from the organizations which are already using it. She tried to put arguments against those who say that open source is not good or economical for libraries. It includes case studies of open source software of almost all categories of libraries.

2.2. Related literature: Open Access

Open access is an area which is concerned with libraries, scientific publications, and each one who is involved in the process of publication and distribution, i.e., the author, the publisher, the library, and the ultimate user. Open access again is a very new concept born in the final years of the 20th century and initial years of the 21st century. However as a philosophy, open access could have been observed since ancient times. Open access, being a new phenomenon of scientific publication, attracts very few studies on it. Some of those are from the pioneers of open access movement.

Maximum literature in the initial phase of open access movement is found primarily on the rising cost of serials and ways to solve this problem. The contemporary situation is described by Johnson (1990) as "The consequences of the serials crisis are significant. The proportion of library budgets devoted to serials expenditures is increasing at a rate that threatens to consume the entire acquisitions budget". A number of scholars during this time raised their concern towards 'serial crisis' and requirement of a possible solution of it. The subversive proposal by Steven Harnad (1994) is an important writing towards making people aware about open access. Writings from many other advocates of open access not only helped in the growth of the open access movement but also they share large portion of literature written on open access movement. Peter Suber (2012) is one of the advocates who is tracking open access movement from the beginning. He has worked on every aspect of open access such as copyright, pricing, economy, etc. Some important writing on open access are presented below.

i. Okerson, A. S., & O'Donnell, J. J. (Eds.). (1995). *Scholarly Journals at the Crossroads: A Subversive Proposal for Electronic Publishing.* Washington: Association of Research Libraries. Retrieved July 15, 2012, from http://www.arl.org/storage/documents/publications/subversive-proposal-electronic-publishing-jun05.pdf

This work is based on a listserv discussion started by Steven Harnad in 1994 provoking scientists towards publishing their papers online for making it available to other researchers at very low cost. It covers the whole discussion and its critical analysis. In addition it includes some essays on the subject. This book is useful to understand initial views of the researchers on serial publications and their pricing and their concern over constant rise is serial price.

ii. Suber, Peter (2012). *Open access.* Washington: MIT Press

By making this book open access Peter Suber proved that he is a true supporter of open access. This book however is a collection of his numerous articles available freely on the

Web. However, this book presents those writings in a very well managed form that makes the things easy to understand. Through this book he provides clear and concise explanations of various aspects of open access publishing.

iii. Willinsky, J. (2006). *The Access Principle: the Case for Open Access to Research and Scholarship.* Cambridge: The MIT Press.

This was the first collective work on open access and scholarly publishing. Willinsky interprets the rational of open access publishing in this book. This book however differs to that of Peter Suber's who discusses the mechanism of open access.

iv. Jacobs, N. (Ed.). (2006). *Open access: key strategic technical and economic aspects.* Oxford: Chandos Publishing.

It is a collaborative work of all open access advocates. This book includes open access and related concepts. Apart from the basic foundation of open access, it includes relation of open access with researchers, publishers, institutions and the contemporary position of open access literature around the world. This book is a good read to understand the development of open access since its birth to 2005.

No other major work on open access is available. However the writings on open access is available in scattered form from small articles from the pioneers of the open access. None of them carries high importance individually. The majority of works discuss about the various ways of open access publishing propounded by Peter Suber (2008) and Steven Harnad. These two and other advocates led to the open access movement through Budapest Open Access Initiative (2002), Bethesda Statement on Open Access Publishing (Suber, Bethesda Statement on Open Access Publishing, 2003), and Berlin Declaration on Open Access to Knowledge in the Sciences and Humanities (Berlin 9, 2007).

These studies discuss either the philosophy of open access or the framework of open access publishing. These studies do not cover the open access as a movement. The present study is an attempt to fill this research gap.

Though these are not the complete sources of information for this research work, however, these studies played an important role in formulating the concept, understanding and appreciation of open access literature and open source software. This literature was helpful in confirming the facts and clarifying the concepts during the initial stages of the present research work.

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CHAPTER III

RESAERCH DESIGN AND METHODS USED IN THE STUDY

As mentioned in the preceding chapters, ICT plays a major role in the development of libraries today. Modern libraries are able to provide improved information services due to the growing Internet, e-resources and computer software. Although the number of automated libraries is growing every day, yet there are numerous libraries in a developing country such as India which are still traditional. The gap between the traditional libraries and modern ICT based libraries is widening. The preceding chapters have pointed out that the open source software and open access research is of high importance for the library communities. Thus, the present study attempts to address this digital divide by Open Source Software and Open Access resources available on the Web. The libraries with no or minimal financial resources can provide better services to their users through Open Source Software and Open Access resources.

This chapter deals with the design of the research and methodology used in the study. The universe of the study, the operational definitions, the techniques used for data collection, the period covered under the study and steps towards data analysis are also discussed in this chapter.

3.1. The universe of this study

The universe for the present study is open source software and open access literature. The open source software which could be beneficial for a library is covered under this study. The whole sphere of open source movement is also the subject of this study. In addition to open

source software, open access movement is also under the universe of this study. However, free but commercial software and Web 2.0 tools do not come under the purview of this study.

3.2. The Methodology used in the study

This study is an exploratory and descriptive research on open source software and open access resources that are useful to modernize a library and thus also analyses the open source movement and open access movement. To conduct this study, the researcher did a comprehensive literature review of the previous studies in these areas. The present research design builds on research done on open source software and open access literature from the purview of libraries using a descriptive research method.

For this research study a qualitative research design was formed to enrich the understanding of the open source software movement and open access movement in addition to useful software available for a library.

3.3. Sources of Information

Books have been considered great source of information for any study since a long time and it is also not an exemption for this study. A number of books written on open access and open source software were referred by the researcher to get in touch with the subject. However, with the inception of information technology, Internet, and World Wide Web, we get another form of information, i.e., digital or electronic form. This form of information is not only easy to disseminate but also to share in real time. Now an author is not required to collect vast amount of information to publish it. S/he can instantly publish any small piece of information through his or her blog/website. This instant publishing has increased the speed of research

by sharing latest research results. Hence the researcher has also used various resources from the Web to collect information required by him.

Google Scholar: Google Scholar is a free search engine that indexes full text of scholarly literature published by various publishers in different disciplines. It was started in 2004. Google Scholar indexes peer reviewed and scholarly online literature published through online journals both open access and commercial, online books and online repositories of institutions throughout the world. This search engine proved very important due to its nature of open access to search the related literature for this study. A gist of the various online sources used for this study is as following.

Science Direct: Science Direct is a database of full text scholarly journals from several fields including library and information science. This database was useful to understand current trends in open access and open source software.

IEEEXplore: IEEEXplore is a database of scholarly journals from the field of technology and engineering. It covers several journals dealing with library automation and open source software. This database was useful to touch the various aspects of open source software movement and library automation.

Emerald database: Emerald database is a very prominent database of scholarly journals especially from the field of library and information science. The researcher accessed wide number of articles talking about open source software, open access, library automation, etc. from various journals covered under this database. Some prominent journals of this database are Journal of Documentation, Library Hi Tech, Library Management, Library Review, The

Electronic Library, Online Information Review, Program: electronic library and information systems etc.

Springer Link: Springer link is also a database of scholarly journals and books. It offers access to some but important journals in library and information science. The journals proved important for the purpose of this study was International Journal on Digital Libraries.

Other Sources: Literature not covered under the above databases was browsed using various search engines such as Google, Bing, Mamma, Yahoo, etc. These search engines helped the researcher to find information from newspapers and articles and reports not indexed in any of the above database.

3.4. Operational definitions

The term ‘open source software’ in this study refers to the software which are available free of cost, available with source code and do not have any license restriction with respect to their use, modification and redistribution. The user of open source software can exercise all rights of the owner of the software and actually there is no owner of the software but the software is developed by a community of software experts.

This study has also used the term ‘free software’. In this case free does not mean free from price but it is freedom to use, study, and distribute the software. It is freedom to help the others. Both ‘open source software’ and ‘free software’ are not any different in their principles but they are different ethically.

Similarly the term ‘open access’ in this study refers to the authentic scholarly writings which are available through Internet to the users without paying any subscription fees and without

any copyright restriction with respect to their use, reproduction, and redistribution. However, the authors of open access scholarly writings have the right to be cited by the researchers who use these writings in carrying out their research.

3.5. Data collection: methods and techniques used

Being a descriptive research, the data for this study was collected from scholarly literature on open access and open source software. To proceed with the research, researcher studied the vast literature related to the subject. Researcher collected data primarily from books, articles, etc. written since the inception of the concepts till present. To collect the data, researcher has used various sources such as books and journals available in the libraries. Open access literature available through Internet and various proprietary databases were also extensively used.

To retrieve the literature available on Internet in the public domain, researcher used various search engines such as Google Scholar, Google, Bing, Mamma, Yahoo, Search.com, Ask.com, dogpile, etc. In addition to the general Search Engines, the researchers had also used the specific databases that are known to have scholarly writings on the related field. Such databases include Science Direct, Springer Link Service, Emerald database, ieeexplorer, etc. These databases cover major proprietary scholarly journals of library and information science.

All these resources helped the researcher to access comprehensive literature on the subject and on the basis of this literature, the researcher could trace the open source software and open access movement.

3.6. Period of data collection

The duration of data collection was 3 years, i.e., 2010 to 2013.During this period literature from related subject was gathered from every source discussed above. No literature after mid 2013 was retrieved. This point is being stressed here as the world of open source software as well as open access resources keeps growing continuously.

3.7. The steps towards Data analysis

The first step towards data analysis was to unravel the open source software movement and its penetration into the field of library and information science in late 1990s. This is achieved through analysing the previous studies in this area. Chapter IV analyses this story that revolutionised the information services in libraries.

The next step was to analyse the technical features of the prominent open source software for libraries. Researcher has selected software from various categories such as library management software, digital library software, etc. which are used in high percentage among automated libraries. Chapter V reports this analysis and also presents an analysis of the main features of software based on the existing studies.

Further, the attempt was to identify and explain an optimum open source software model for a library. This model is suggested keeping in mind the libraries of India that are having inadequate finances and technical expertise. The researcher has also given the reasons and justifications for suggesting this particular model. This fulfils the third objective of this study.

To fulfil the fourth objective of the study, Chapter VII deals with the concept of open access in detail from a librarian's point of view. It enunciates the analytical chronology of the open access movement under various headings. This is achieved through analysing the previous

studies in this area. As open access is very helpful to the libraries to provide excellent information services to the users the researcher has consulted various open access journals directories such as DOAJ, and other sources where open access journals are listed and compiled a list of more than 5000 open access journals from various fields in English language. This exploration fulfilled the fifth objective of this study. A list of titles of these journals is presented at appendix A.

During the accumulation of the links of open access journal researcher found that an open access journal is available almost for every subject. However, broadly these journals could be categorised under following subjects:

Medical Science: Medical science is dominating open access world by having almost 18% open access journals in the subject. Medical science is a subject which is directly related to every single human being on the earth. Having maximum open access journals in medical science eased the research in medical and health sciences.

Education: Open access journals are also flooded in education. After medical science, education has the large number of open access journals published in several languages.

Life Science: life science is another area where a number of open access journals are available. In life science, user may find journals dealing with biology, zoology, biochemistry, and biotechnology etc.

Chemistry: Chemistry also established as an attractive subject among open access publishers. More than 100 English language open access journals are available in various aspect of chemistry.

Literature and Linguistics: One may find a wide range of open access journals in literature and linguistics. Researchers working in this area may not get affected due to unavailability of subscription based scholarly journals in their libraries as this area is covered hugely by open access publishers.

Others: As discussed earlier, open access journals are available on almost every subject. Subjects not discussed above also have good number of open access journals available online. Computer science, Engineering, Philosophy, History, Economics, Management, Generalia, Agriculture, Library and Information Science are the subjects that have more than 100 open access journals each in English language. Other subjects of social sciences, humanities, science, technology, arts, etc. have 10 to 100 open access journals in English language. However there is a need of open access journals in areas of naval science, nuclear physics, acoustics, environmental engineering, and hydraulic engineering.

Thus, the above research design and methodology helped the researcher to achieve all the objectives of the present study in an efficient way.

CHAPTER IV
OPEN SOURCE SOFTWARE MOVEMENT: AN ANALYSIS

4.1. Introduction

The term ‘software’ was coined by John W. Tukey and he used it for the first time in 1958 in his article published in *The American Mathematical Monthly* (1958). However, the idea of software was devised by Alan Turing (1936) during his presentation on Turing Machine. Earlier, terms like ‘computer program’ and ‘code’ were in use. Ceruzzi (2003, p. 80)defines software as “a single entity, separate from the computer’s hardware, that works with the hardware to solve a problem.” The early software, the so called ‘computer program’ and ‘code’, were installed or programmed in the computer during their configuration and it was a herculean task to change, delete, uninstall, and reinstall software on computer. In fact, initially software were part of computers and were not available separately. Computer manufacturers used to sell computer and software as a single entity. But in 1968, with the intervention of the US government, computer manufacturing companies were forced to sell software as a separate unit (Ceruzzi, 2003, p. 106; Kelty, 2008, p. 119)and thus, emerged the computer software industry. However, the real growth of software industry was observed only after the invention of microcomputers in mid 1970s, which brought the computer on the desk of the people. 1990s observed development of Web and Windows system software that tremendously increased the use of application software with Windows. However, the history of software is very extensive and complex, this chapter would concentrate on the development of open source movement with special reference to the software in use for library and information management.

4.2. Genesis of Open Source Movement

In the beginning, there was no existence of proprietary software or shareware/free software. Software were nothing but codes to perform a particular task on the computer and were available with computers in source code (Daffara & Gonzalez-Barahona, 2004; Chudnov, 2007). These codes were frequently used by educational institutions to study them. Customers were also able to modify them as per their needs as in the case of open source software, hence, there was no difference between the user and the programmer. At the launch of the 701, the first commercial computer by IBM in 1952, there was no difference between hardware and software, all computers had been sold with software of one kind or the other. These software were free software with the code. Richard Stallman (2002)also discussed about a software sharing community which was in existence in 1970s to share and help the users who were facing problems or bugs in using operating system ITS (Incompatible Timesharing System) developed by MIT.

The history of free and open source software is twofold. One is related to the development of UNIX operating system and the other related with Richard Stallman's GNU project.

4.2.1. Development of UNIX

The idea of UNIX was industrialized in 1965 when Massachusetts Institution of Technology (MIT), General Electric Company (GE), and Bell Telephone Lab (BTL) came up with a project MULTICS (Multiplexed Information and Computing Service) with the objective to develop a multi user operating system (Evers, 2000, p. 11).But it did not produce any positive result and in

1969, BTL declared to withdraw its resources and manpower involved in the project as the project was moving towards failure.

However, two BTL researchers Dennis Ritchie and Ken Thompson did not lose their enthusiasm and developed some program and games which they tried on GE645 and PDP-7 computers by altering the codes. Though such a software did not work but they got huge experience from this. Thompson had already developed a file system for an operating system.

In 1969 Ken Thompson spent few weeks on writing *Kernel* (core of any operating system), *shall* (program to read commands) and an *assembler* (to convert codes into software). To work on these, he used DEC's PDP-7 computer and the results were great for him. He named it UNICS (Uniplexed Information and Computer Service), later renamed as UNIX. Initially, he kept this program very small due to less capacity of PDP-7 computer. It was a time when PDP-10 was in market and Thompson and Ritchie made several attempts to convince BTL to acquire it but they did not succeed.

In 1970s Ken developed a programming language known as B which was later improved and completed by Dennis Ritchie and named C in 1972. C has proved itself very powerful and in common use, even after four decades of its development, because of its portable programming language and flexibility to move program from one kind of computers to another. In the same year BTL acquired the latest PDP-11 computer seeing the success of Thompson and Ritchie on UNIX. "With several BTL staff members from outside the research group using the typesetting facilities of the PDP-11, the need to document the operating system grew. The result was the first Unix Programmer's Manual by Thompson and Ritchie, which was dated November 3, 1971" (Salus, 1994).Now BTL was using UNIX for their computers instead of having the operating

system combined with the PDP-11 (Weber, 2004, p. 26). The very next year they rewrote UNIX to add more functionality and released the 2nd version of UNIX. With this release, number of installations in BTL reached to ten (Salus, 1994). Ritchie and Thomson had rewritten the kernel of UNIX in C language instead of an assembly language that made it hardware independent. This third edition or version of UNIX was installed in sixteen sites, in 1973, all within AT&T (Evers, 2000). It was the fourth year of development of UNIX but it was not much known elsewhere except AT&T.

A major landmark came in the development of UNIX when Ritchie and Thompson presented a paper on UNIX at the ACM Symposium on operating systems in October 1973. This symposium proved a big advertisement of UNIX to related audience. After that BTL had a number of requests for copies of UNIX. The publication of their paper on UNIX in conference proceeding in July 1974 caused an explosion in demand of UNIX unanimously.

AT&T was able to sell this product at minimal cost in 'as it is' form without any royalties to AT&T and without any support and bug fixes (Weber, 2004, p. 28; Salus, 1994). At this time it was open in source form and its source code was being studied in the universities.

When there is no system to help one out then people with similar problem get assembled to help each other and the same was in case of UNIX. Users of UNIX came together to share thoughts, information, codes, bug fixes etc. The group gained popularity by their name Usenix Association. Users around the world were working on UNIX like any true open source software where programmers of various universities and organizations were developing UNIX and new developments and improvements were merged with the new release by AT&T.

The developers of UNIX were not able to help or support users due to legal binding but the user groups were working constantly to solve the UNIX error faced by the users all around the world.

A big change came into working of UNIX in its 7th version which was released in 1979. The most influential feature of this version was its portability. This version was successfully run over computers manufactured by DEC, IBM and Interdata (Evers, 2000, p. 13). The earlier version of UNIX was able to run on different computers manufactured by DEC only. The continuous development and popularity of UNIX made its manufacturers serious towards UNIX as a commercial product and they constrained the distribution of source code in new licence. The new licence terms made many universities to drop UNIX from their course of study. But, until 1982, AT&T could not commercialize UNIX in its full capacity due to the consent decree which restricted AT&T to enter into software business. A court decree in 1982 removed the restriction form AT&T to come into software industry. After this, the development of UNIX became more aberrant. A number of derivatives were observed in the market which confused the users. The most prominent of those is BSD. Other derivatives were either based on AT&T's UNIX or BSD. However derivatives from AT&T required licence from AT&T whereas this was not the situation in case of BSD. There were some suits filed on BSD too for breaching the licence restriction of UNIX but could not succeed as the earlier versions of UNIX were released with free source code.

4.2.2. BSD (Berkeley Software Distribution): First Open Source License

UNIX came into the University of California, Berkeley in 1974 after Thompson's and Ritchie's presentation on the Operating System. At the same time, UNIX was included into the courses of study. Computer researchers, studying and working in Berkeley, started to work on the

improvements of UNIX by adding new features and kernels to the existing UNIX. With this they had a full derivative of UNIX which they could distribute to the users. In 1977, a software distribution licence was developed at the University of California known as Berkeley Software Distribution (BSD). This software distribution licence contained almost all the features that an open source licence should have. BSD allowed the users to use, edit the source or its binary codes, and redistribution of the software with or without permission. However, there were some restrictions on it. The licence reads that "[all] advertising materials mentioning features or use of this software must display the following acknowledgement: This product includes software developed by the ‹organisation›" (University of California, 1999).

The development of UNIX and BSD licence was indicating the future revolution towards the free and open source software although the term Open Source was not in existence at that point of time. But people had begun to support the concept of free software. At the same time, when UNIX and BSD were getting momentum, Richard Stallman had started his crusade for free software by establishment of Free Software Foundation.

4.2.3. GNU and FREE SOFTWARE FOUNDATION

Richard Stallman, who had started working with MIT AI Lab (Massachusetts Institute of Technology Artificial Intelligence Lab) in 1971, was the central character of GNU (GNU Not Unix) and FSF (Free Software Foundation). His duty was to improve and enhance the quality of ITS (the Incompatible Timesharing System), an operating system designed and used by MIT AI Lab for its PDP- 10 computers.

In the initial phase, the software was free and MIT AI Lab used to share it with others on demand. Stallman writes:

> “We did not call our software "free software," because that term did not yet exist, but that is what it was. Whenever people from another university or a company wanted to port and use a program, we gladly let them. If you saw someone using an unfamiliar and interesting program, you could always ask to see the source code, so that you could read it, change it, or cannibalise parts of it to make a new program”.(Stallman, 1999, p. 31)

However, the situation radically changed in 1980s with unfortunate discontinuation of Digital PDP-10 series computers. As the ITS was created and designed using machine depended assembler language, it resulted in obsolescence of all program related to ITS.

The new modern computers of 1980s had their own proprietary software where the purchaser of the computers had to sign a non-disclosure agreement. When MIT AI lab purchased new modern computers, all its scientists required to sign a non-disclosure agreement even for getting an executable copy of the operating system. But Richard Stallman was of a different philosophy and supporter of free software. In words of Richard Stallman (1999)“[signing this agreement meant that] if you share with your neighbour you are a pirate. If you want any changes, beg us”. Stallman was not ready to give up his freedom to help others. At this stage, he was left with three options; first, join the proprietary software world by signing non-disclosure agreement and promising not to help others. In words of Stallman (1999)“I could have made money this way, and perhaps amused myself writing code. But I knew that at the end of my career, I would look back on years of building walls to divide people, and feel I had spent my life making the world a worse place.”

The second option he had was to leave the computer software industries and turn his way to some other business where his software developing skills would not be misused. But this could not have been helpful for the others and would have wasted his programming skills. The third option which Stallman opted was to develop software that would be free for users not only to use

but also to modify or redistribute. His choice was to develop an operating system as it is very crucial component of the computer and works like a soul of it. If there is an operating system installed in a computer, one can do many things with it. But if there is no operating system, the computer would be dead.

He chose to develop an operating system that is compatible with UNIX. Hence, he started a project for the same and named it ‘GNU’ which stands for ‘GNU is Not UNIX’. He tagged this future operating system with his pioneering term ‘free software’

He gave up his engagements with MIT in 1984 to focus entirely on GNU. The primary motto behind leaving his job was to make sure that in future MIT may not claim GNU as its own product as Stallman was its employee. In very short time he got a product called GNU Emacs. He distributed the program tape at a cost of $150 which was cost of mailing and of the tape. The software was free. During this process Stallman also felt a need of copyright licence to make sure that all derivatives of the software also remain free and in public domain. Stallman (1999)cites an example of the X Window System which was developed at MIT, and released as free software with a permissive license, and was soon adopted by a number of computer companies. These companies added X to their proprietary UNIX systems, and covered them by the same nondisclosure agreement. To avoid this possible future of software, Stallman decided to write a software distribution licence known as GPL (General Public License). This licence introduced the concept of ‘copyleft’. This license is widely used, even today, by open source software to give freedom to users to use, distribute and modify the licence.

The next step of Richard Stallman’s movement was to bring GNU project under an organisation. In 1985, he established a tax free charity organisation under the name ‘Free Software

Foundation' (FSF). With this organisation he could handle several activities like accepting donation, selling copies of free software or providing other services. Stallman has attempted to formally define the term 'Free Software'. This term refers to the following freedoms which are granted to the user of the software (Free Software Foundation, 1985):

- Freedom to run the program in any place, for any purpose and forever.
- Freedom to study how it works and to modify it as and when required. This guarantees supply of the Source Code of the software.
- Freedom to redistribute copies of the software as it is or in modified form so we can help our friend and neighbour.
- Freedom to improve the program and release the improvements to the public. This also requires the source code.

Stallman made use of the GPL software distribution licence for any software released by FSF to guarantee these freedoms. Through this licence, the author allows the user of the program to exercise these freedoms. In addition to this, FSF also bestowed a freedom to the author to apply any restriction s/he wishes, i.e., to credit the original author even in its redistribution in modified form. However, such restrictions must not offset with the above freedoms.

Richard Stallman's FSF was earning popularity very quickly. Stallman's planning was to write a complete full operating system but even before that the components of the OS was demanded by the computer users. GNU Emacs was used by a number of computer users with UNIX or other system software. It was supporting Stallman to improve GUN Emacs, but on the other hand it

was delaying his work of writing the full operating system. FSF was also getting donation in the form of money, labour and computers to support the noble cause of Richard Stallman.

By 1990's Stallman successfully completed all components of GNU except its Kernel. Without a Kernel, which is heart of any operating system, it was difficult to bring out a complete operating system. Stallman wished to develop its kernel based on Mach. Mach was an operating system microkernel developed at University of Utah. Mach was a commercial Kernel and to make it a component it was required to have Mach as a free Kernel. Using a commercial Kernel for free software may affect its freedom as Mach was bound under copyright licence. Stallman, with help of his technical supporters, could write a Kernel for GNU which was known as GNU HURD. However GNU Kernel was full of errors and was incomplete and unsuitable to be used with GNU. Even today HURD is not completed. But, it was fortunate that there was a man who could do this Job and it was Linus Torvalds.

4.2.4. LINUX

Linus Torvalds, an ambitious but unknown student of Helsinki University, started to build a Kernel in 1991. His aim was to build a free UNIX kernel for Intel- based computers. He initiated to build this keeping Andrew Tanenbaum's Mimix system in mind, which was based on UNIX system and published as a book (Kavanagh, 2004). It was also used as a teaching source in universities. However Linus was unhappy with this Kernel. Linus had created his kernel successfully and as he kept it free, he received a number of feedbacks from other computer experts. In the next year, in 1992, Linux was combined with GNU. It resulted in a complete operating system known as GNU/Linux. Kernel by Linus has made the dream of Richard Stallman true. In his words "It is due to Linux that we can actually run a version of the GNU

system today" (Stallman, 1999). Since then, the combination of GNU and Linux with other free software expanded in popularity and become commonly known by single term 'Linux'. GNU and Linus Torvalds continuously released improved version of GNU/Linux. In 1994 they released Version 1.0, which could compete in terms of reliability and stability with the commercial versions of UNIX. Using Linux, a number of versions were developed. Some of the very prominent models are Debian GNU/Linux developed in 1993, Red Hat GNU/Linux developed in 1994, and Ubuntu GNU/Linux developed in 2004.

4.2.5. Open Source Initiative

After merging with Linux, number of supporter of GNU increased considerably. After 1997, a new philosophy and some disagreement within FSF towards software were growing in FSF and with the passage of time it came out as a new terminology, i.e., Open Source. Eric S. Raymond, wrote a paper 'Cathedral and bazaar' and presented it in GNU/Linux Congress organized by Peter Salus, a member of FSF, under the sponsorship of FSF in 1997. The main concentration of the paper was on the two ways of production of free software. Raymond in this paper supported the open way of producing free software. Cathedral, in his view, was the structure of GNU Emacs that has the source code with it but the access of it was restricted to an exclusive group of software developers while Bazaar model of free software also comprises source codes that are available online to every individual to edit and improve. He credited Linus Torvalds for this model of free software.

Eric S. Raymond was an active member of GNU Emacs in 1980s but he distanced himself from this in 1992 after a dispute with Richard Stallman for making some unauthorised changes in

GNU Emacs. In words of Raymond "It frustrated me so much that I decided I didn't want to work with [Richard Stallman] anymore" (Williams, 2002).Thus he was connected with the philosophy of free software but distanced from FSF and Richard Stallman, however, he continued to work on free software community that enabled him to get invited in GNU/Linux Congress and present his views.

Although most portion of his paper was similar and in practice as free software, but, Raymond provided a new business way through free software. This paper left a very huge influence that it was going to make its place in history. Netscape Communication Corporation, a commercial software company was in the market with its web browser Netscape Navigator, and was involved in a furious struggle, known as 'browser war'[1], to make its browser dominant browser on the desktop. With the release of Internet Explorer 4, Microsoft decided to give away Internet Explorer as inbuilt software with Microsoft Windows operating system (Wikipedia, 2011).This step of Microsoft brought a higher impact on market of Netscape, resulting in a rapid loss in the number of users of Netscape Navigator. The market condition made it easy for Netscape Communication to understand that it is time for some hard decision by changing the rules, and a presentation by Eric Raymond gave them a choice. Influenced by Raymond's presentation, Netscape decided to release the source code of Netscape Navigator to public.

On January 22, 1998, Netscape announced to give the source code of Netscape Navigator free to the public under a project known as Mozzila Project. It boosted the morale of Eric Raymond and some of his colleagues. Netscape Communication, through an email, acknowledged Eric Raymond's paper for their declaration: ''On behalf of everyone at Netscape, I want to thank you

[1] Wikipedia provides a comprehensive detail of the browser ware between Microsoft and Netscape at their page http://en.wikipedia.org/wiki/Browser_wars.

for helping us get to this point in the first place. Your thinking and writings were fundamental inspirations to our decision'' (Raymond, 2001).

Soon after this declaration, a strategy session, on 3rd February 1998 at Palo Alto, California, USA, was held by Eric Raymond with Todd Anderson, Chris Peterson (Foresight Institute), John Hall and Larry Augustin (Linux International), Sam Ockman (of the Silicon Valley Linux User's Group). "The strategy session grew from a realization that the attention around the Netscape announcement had created an opportunity to educate and advocate for the superiority of an open development process" (Open Source Initiative, 2012). Eric Raymond who was already in conflict with Richard Stallman wanted to pave a new way to offer the world free software without any rivalry with commercial software. Chris Peterson of Foresight Institute coined and suggested a term 'Open Source' for it. It is further quoted by Open Source Initiative (2012) on its history page:

> The conferees believed the pragmatic, business-case grounds that had motivated Netscape to release their code illustrated a valuable way to engage with potential software users and developers, and convince them to create and improve source code by participating in an engaged community. The conferees also believed that it would be useful to have a single label that identified this approach and distinguished it from the philosophically- and politically-focused label "free software." Brainstorming for this new label eventually converged on the term "open source", originally suggested by Christine Peterson. (Open Source Initiative, 2012)

Being motivated by this small conference, Eric Raymond spread the word about his philosophy and tried to gather more supporters. He got an approval from Linus Torvalds who was convinced by his philosophy. In addition to that, he got support from many other computer professionals working for Free Software Foundation. Even Richard Stallman seemed convinced by Raymond initially to adopt the term 'open source' but later on rejected it. (Tiemann, 2006; Stallman R. , 2012; Williams, 2002).

Raymond and his friends were making all possible efforts to market the term open source and they were getting success too. But, soon they felt that to market the term ‘open source’ in a better way, they badly required a platform. Hence Raymond decided to form ‘Open Source Initiative’ with the help of Bruce Perens, a colleague of Richard Stallman and member of FSF, and Tim O’Reilly, another supporter of FSF. In February 1998, Raymond formally declared the launch of Open Source Initiative (OSI) to regulate the term ‘open source’ by providing a definition of this term for the people interested to make their program open for the public. His call to support the term ‘open source’ was as following;

> “After the Netscape announcement broke in January I did a lot of thinking about the next phase -- the serious push to get "free software" accepted in the mainstream corporate world. And I realized we have a serious problem with "free software" itself.
>
> Specifically, we have a problem with the *term* "free software", itself, not the concept. I've become convinced that the term has to go.” (Raymond E. , 1998)

Eric Raymond was the first President of OSI and Bruce Perens the first Vice President. OSI, with its initiation, provided its definition of Open Source Software (OSS) and criteria to decide the open source software. According to OSI, "Open source promotes software reliability and quality by supporting independent peer review and rapid evolution of source code. To be certified as open source, the licence of a program must guarantee the right to read, redistribute, modify, and use it freely" (Open Source Initiative, 1998).

In addition to open source definition OSI also identified ten criteria to decide open source software. In other way, these criteria are broader form of definition of open source.

- **Free Redistribution:** The first criteria to decide open source is free redistribution. The licence of software shall not restrict anyone from redistributing or selling the software as

a whole or a constituent of aggregate software. The licence shall not compel to pay any royalty or fee against the software, its redistribution or sale.

- **Source Code:** Source code is a prerequisite for open source. To be identified as 'open source' software, a program must comprise its source and must permit the software in source code as well as in executable form. In case the software is not distributed with source code the developer must have publicized the source code from where it could be downloaded with the help of Internet, without paying any fees.
- **Derived Works:** Open source licence must permit alteration and derived work forms. In addition, the licence should also permit the redistribution of derived work under the same licence of original software.
- **Integrity of Author's Source Code:** The licence of open source software may limit source code from being distributed in modified form if, the licence allows the distribution of 'patch files' with the source code for the purpose of modifying the program at build time. However, the licence must allow distribution of software built from modified source code.
- **No discrimination against person or group:** The open source software licence must not discriminate against any person or a group of persons.
- **No discrimination against field of endeavour:** No group should be restricted by licence to make use of software for any specific field of endeavour. Anyone from any field must be free to use the software as per his/her requirement.
- **Distribution of licence:** The licence of the software must apply to all of them to whom licence is redistributed without adding any additional licence.

- **Licence must not be specific to a product:** The software licence should not depend or be restrictive to a specific software distribution.
- **The licence must not restrict other software:** The licence must not restrict the software distributed under other variety of licence. For example, it should not insist that the other software used with this software should be an open source software.
- **The licence should be technology neutral:** Open source software licence should not be restricted to the use of a particular technology or user interface.

(Open Source Initiative, 1998)

Since this declaration of OSI, the open source movement boomed up and was heard everywhere. However, the internal conflict between two groups, i.e., Free Software Foundation led by Richard Stallman and OSI led by Eric Raymond, on their philosophies continue and is still in existence[2].

4.2.6. Success of Open Source Software Movement

By early 21st Century, open source software movement has observed a number of success stories that include Ubuntu and other versions of GNU/Linux Operating System, MySQL and Postgres SQL for creating databases, Firefox web browser, Apache web server and programming languages such as Perl, PHP, Python and Ruby. According to Web Server Survey 2013, Apache[3] is used by more than 50% hosts while its nearest competitor is Microsoft Web Server which is used by 17.22 sites (Netcraft, 2013).As per Browser Statistics and Trends more than 80% used

[2] To read more about the struggle of two groups please refer Free as in Freedom by William Sam, Introduction to free software by Jesus M. Gonzalez-Barahona et al., and Open Sources: Voices from the Open Source Revolution edited by Chris DiBona, SamOckman and Mark Stone.

[3] http://www.apache.org

Web Browsers are open source, i.e., Firefox and Chrome (W3Schools, 2013). In survey of Statecounter also Firefox and Chrome are beating commercial web browsers (Statcounter, 2013). The latest version of Apache Open Office is 3.4 which was released in May 2012 and in a period of one year it has more than 50 million downloads (Open Office, 2013). These are few examples out of the huge world of open and free software. The use of these software is so wide that every computer of the world must be using one of these by one means or the other. These software are used not only by those who are using these because they cannot afford costly commercial software, but also by the larger organisations which are using these software just because of the quality provided by OSS. Some of the very large examples are Google, Amazon, Facebook etc., which must be in use by every user of Internet.

Since then a number of Free and Open Source Software (FOSS) came into existence from every field such as Banking, Accounting, Medical, etc. One can easily find suitable open source software not only for operating system but also for server, web server, database, data processing and many more. Although we may not be conscious enough about FOSS, but our Internet Service Providers use one or other free and open source software to provide Internet services. Additionally, majority of commercial library management software vendors also use free and open source software to build their product.

4.3. Open Source Movement and Libraries

4.3.1. Computer application in libraries

The development of computer application in libraries has been experienced since late 1950s and early 1960s to automate administrative, user and technical service functions. However the idea of an integrated library system was generated long back by Venn ever Bush (1945) in his paper '*As*

you may think', which later realized in the form of COMIT, a programming language to retrieve a particular string of information, by Dr. Victor Yngve and others at MIT Lab in 1957 (Yngve, 1958). Another presentation by Herley E. Tillitt (1970), entitled "An experiment in information searching with the 701 calculator" at an IBM conference at Endicott, New York in 1954, also evidenced the existence of information retrieval program. Tillitt, a working professional at US Naval Ordnance Test Station (NOTS), applied library computerization that motivated the world to use computerization in libraries. A number of similar smaller projects of computerisation were running, to give the account of all of them here is very difficult, albeit the introductory chapter provides a gist of historical development in library computerisation. However, it is not difficult to understand that library professionals were very much aware and interested in computerisation of library functions since the very beginning.

1960s witnessed the development of MARC (Machine Readable Catalogue) after the several efforts of Library of Congress. MARC is still very prominent cataloguing standard worldwide. After these initial successes a wide number of efforts took place to create various applications to automate library work such as information retrieval, circulation, indexing etc. However these developments and innovation were taking place at institutional levels only. Well-funded institutions of American, Austrian and European continents were increasingly getting involved in automation technologies. Library of Congress, MIT, OCLC, University of California and other were leading organizations in such programming inventions. One thing must be noted here that all the computer programmes developed during 1950s, 1960s were batch processing, they were not as simple as today's integrated systems and librarians and computer programmers of those days had to work very hard to manage those computer programs.

Increasing interest of librarians in computerisation paved the way to establishment of several companies especially dealing with library computerisation, to name a few, Geac, SIRSI, Data Research Associates (DRA), CARS, Ex- Libris, PALS, Gaylord, and Innovative Interface, Inc. Libraries used to enter into a long time contract after buying a library system from these companies as switching the vendor was like starting from the beginning. The costing of the computer program and their management was very expensive and out of reach of libraries and institutions with scant finance. Development of computer programs to automate the library functioning, on the one side, eased the work of libraries, but at the same time a number of libraries of developing and under developed countries were lacking these programs as it was unaffordable for them to acquire costly computers and library automation programs.

With the passage of time, acquisition of computers became affordable and also indispensable for any type of organization or institute and so also for a library. However, having computer applications or library automation software and managing them were still unaffordable. In initial phase computer programs for library functions were not available as free product; libraries interested in computerization needed to hire the programmers or enter into an agreement with library computerisation vendor to design a program as per the need of a library which was still very costly.

4.3.2 Beginning of Open Source library systems

There were some free tools in existence for libraries. Most of them were developed by OCLC and Worldcat which were distributed free to its member libraries but were out of reach to non-member libraries (Clarke, 2000, p. 31). A free cataloguing utility named CDS/ISIS (Computerised Documentation Service / Integrated Set of Information Systems) and later

renamed as WINISIS (Windows Integrated Set of Information Systems) was developed by UNESCO in 1985 and distributed to libraries worldwide for free through their website.

The free software movement or open source movement was already in the lime light in 1980s nonetheless, libraries were still away from the concept of free software. During this decade UNIX was already installed on computers while Linux was about to be born. During late 1980s concept of free software was taking momentum and commercial vendors were looking towards free software as an opportunity to accomplish their commercial goals. This resulted into establishment of Cygnus Solutions[4], the world's first open source software company by Michael Tiemann with the help of David Henkel-Wallace and John Gilmore. Tiemann found business opportunities in open source as he states:

> "Open Source would unify the efforts of programmers around the world, and companies that provided commercial services (customizations, enhancements, bug fixes, support) based on that software could capitalize on the economies of scale and broad appeal of this new kind of software." (Tiemann, 1999)

By late 1980s and early 1990s the whole world had been looking at FOSS as an approach to save their money to be invested on commercial software or FOSS as a business strategy itself. However libraries did not turn towards it before late 1990s; instead, there were some proprietary software which ware using open source software as a component of their ILS.

4.3.3 Advocacy of Daniel Chudnov to open source software in libraries

In most of the possibilities, Daniel Chudnov, the most well-known advocate of the open source software in libraries, drew the attention of library professionals towards open source software through his historical writing 'Open Source library system: getting started' in February 1999 on a

[4] Cygnus Solution is company that has developed 'Red Hat' another open source version of Linux.

website (http://www.oss4lib.org) created by him to provide open source software to library professionals (Morgan, 2012; Clarke, 2000). In August, 1999 he republished it in '*Library Journal'* with modified title 'Open source software: the future of library system', that had done enough to bring the term to the attention of library community (Chudnov, 1999a).

Daniel Chudnov (1999b), in his writing encouraged the library professionals to draw their attention towards open source software by elaborating the benefits of open source software and equalizing the philosophy of librarianship and OSS. He suggested that using open source software the libraries can cut the costs involved in development and management of proprietary software in library as well as the libraries could modify the codes as per the requirement of the library. He says "We are an educational institution, and we are here for people to learn about computers. That should include learning how the software on this computer works.... Libraries should actively discourage the concealment of generally useful knowledge, and that includes proprietary software." (Chudnov, 1999b). This writing by Chudnov became a milestone in the field of OSS in libraries. He was appreciated by a number of library professionals for his efforts in this writing and starting OSS4Lib in early 1999 (Clarke, 2000; Morgan, 2012). However, before Chudnov's writing also there were a few examples of efforts made towards using OSS; some of them were cited by Chudnov in his writing. Some of them, for example are, use of Linux, Apache, MySQL and PHP (LAMP) for managing information about online resources and selected subject-based Internet resources at Yale's Cushing/Whitney Medical Library (Chudnov, 1999b). Further, yet another example is the enunciation of 'Keystone Principles' by ARL (Association of Research Libraries) leaders who acknowledged that "libraries were responsible for creating innovative information systems and advocated for the development of open source

solutions" (Jaffe & Careaga, 2007). According to Chudnov (1999b) the following factors and situations insist libraries to use OSS.

- OSS permits libraries to reduce the costing on library software that can be utilised in other developmental activities in library.
- A library wishing commercial support can also adopt an OSS as there are several organisations which provide technical support for OSS.
- Using OSS, the library does not prohibit itself with a single vendor. A library at any time may change the vendor for technical support.
- Being developed by an open community, there are several online support options available for OSS.
- Library professionals could also build their OSS project and make it open for the library community to improve it.

4.3.4 Dissenting voices to open source software in libraries

This writing of Chudnov led to several reactions towards use of open source software in libraries, some of them supported OSS while a few perceived OSS as "still only a distant possibility"(Breeding, 2002). Marshall Breeding (2002) produced his arguments why OSS in libraries could not be a reality soon:

- A movement of libraries, including Library of Congress, from self-developed ILS to proprietary software ensured that they do not have resources to develop and maintain library automation system. Then how one can expect development of an OSS.

- Proprietary ILS developed by commercial vendors are result of research of more than five years and their software are having program codes of millions line. They have great teams of computer programmers and development of an OSS is a million dollar project. It is hard to see that even a large library would have all these facilities to develop a large scale ILS.

- Technology is developing so fast that even commercial ILS developers with their great teams find it difficult to cope with the demands of libraries. Hence how a team of open source developers with their limited resources could meet the ever rising expectations of library professionals.

- A number of OSS enthusiasts are present but very few library administrators are ready to take risk of strategic reliance on OSS. Libraries lack the ability to fund the programming staff for their commercially-supplied system, and much less towards the development of OSS.

Marshall saw no future of OSS although Koha was already born by the time he was writing this. He did not see any "paradigm shift approaching where commercial companies yield to open source and free software." He observed further, "The opportunity for libraries to develop Open Source applications in the digital library arena is narrow" (Breeding, 2002).

4.3.5 Open source software as an essential aspect for the development of library services

However, Draft Report (Digital Library Federation, 2001) of Digital Library Federation (USA) did observe OSS as an essential aspect for the development of Library services. The report puts their findings as under:

- OSS is an economical alternative to libraries' reliance upon commercially supplied software.
- OSS is essential if libraries are to develop software and systems that meet their patrons' needs.
- OSS ensures that library systems and online services will be more functional for libraries and their patrons and as such be good for library patrons.

Roy Tennant (2000) saw the opportunities in OSS but he felt that "unless the OSS application is a well-developed and stand-alone application such as the Apache web server, use of OSS will mostly occur in large libraries (of all types) that are more likely to have staff who can install and maintain the software". Similarly, Muir (2005) accepted that OSS is beneficial for libraries from the financial point of view and it gives opportunities to the libraries to modify them according to the need of the library but at the same time he raises doubts as to the availability of technical expertise and support in the long run to contain any bug or error. This turns out to be its single most drawback.

However, with the passage of time OSS proved the people who were skeptic regarding the acceptability of open source software in libraries wrong. In a very short period after Chudnov's call to adopt OSS, a number of projects for open source library applications found their way. Additionally libraries started to shift from commercial to open source software. It was enough to change the minds of people who doubted the future of OSS. Roy Tennant (2003), after 3 years of raising doubts about the future of OSS in his publication, accepted that "open source is [going] into mainstream". Similarly Marshall Breeding (2009) who saw open source ILS as a distant possibility agreed that "The open source ILS movement has progressed past the point where its

viability can seriously be questioned. The current momentum of open source ILS adoption makes it almost inevitable that it will represent an increasing portion of the library automation landscape".

There are software which are developed purely on free and open source platform and the users need not spend even a single penny for these. Using free and open source software, one can easily provide high level technical facilities to the users and make the library automated. However, the libraries who find it convenient to obtain commercial support for their ILS may also obtain the same for OSS. Today a number of vendors exist who provide support for OS ILS. Taking commercial support, for those who have enough financial resources and wishing to hire a vendor, for open source ILS again will save the libraries from being blackmailed by the vendors of commercial ILS as source code of open source is always open and changing the vendor may not harm the activities and functionalities of the library in any respect. Availability of commercial vendors for OSS is an answer to the skepticism of Muir as when he said "who officially provides support: after all, there is no vendor to complain to, and this could make it harder to ensure improvements and fixes are made" (Muir, 2005).

4.3.6 OSS4Lib and Code4Lib

Development of OSS in LIS was started for tiny LIS tools by distributed efforts of libraries spread over different corners of the world but today it has integrated as a crusade at International level and approach of the library professionals toward open source software can be considered as a movement in the field of Library and Information Services. Today for almost every function, an open source application exists. OSS4Lib (http://www.oss4lib.org/) and Code4Lib (http://www.code4lib.org/) are two major websites and communities that are dedicated for the

development and distribution of OSS for the use of libraries. OSS4Lib was developed by Daniel Chudnov in 1999 with the mission to "build better and free system for the use of libraries" (Chudnov, 2005). This site maintains the list of the OSS, programming languages, and protocols and standards for libraries and keep tract of the news of OSS in libraries. OSS4Lib has listed over 500 library specific application under more than 15 categories for various functions of libraries. These applications are (as on 23rd May 2013) listed under following categories:

- ADA (1)
- Bibliography (63)
- ILL-DD (19)
- ILS (67)
- Image Processing (15)
- Information Retrieval (47)
- Library Administration (12)
- Metadata (56)
- OPAC (92)
- Readers' Advisory (30)
- Reference (13)
- Repositories (39)
- Reserves (7)
- Resolvers (5)
- Text Processing (19)
- Training (4)
- User Access Management (12)
- Workstation Management (5)

(OSS4Lib, n.d.).

Code4Lib was initiated by a group of library programmers in 2003 with an objective "to providing a harassment-free community experience for everyone regardless of gender, sexual orientation, disability, physical appearance, body size, race, or religion" (Code4Lib, n.d.). Code4Lib also organises annual conferences on OSS since 2006 and continues it till now.

4.4. Open Source Software Projects for Libraries

After the above discussion on the expansion of concept on OSS in libraries, it is necessary to have an in-depth look at prominent open source projects in libraries. The upcoming discussion covers the prominent open source projects, the surrounding environment, and responsible factors for their development. However, it will not cover the technical analysis of the software itself as it

will be covered in Chapter V. Open Source Software projects in the following section primarily covers open source ILS, open source digital library software and open source content management software.

4.4.1. Open Source Library Management Systems

4.4.1.1. Koha (Open Source ILS)

Koha[5], claimed to be the first open source library management system, traces its origin to the 1999 in New Zealand. Koha is a result of the frustration of the library professional with the commercial library management system. A group of public libraries of Horowhenua Library Trust (HLT) in New Zealand felt the need to change their commercial ILS, Catalist, as it was not complement with Y2K[6] issues. The library was not able to do anything with the software as it was a closed source software and they were forced to replace their ILS with a new ILS. The other problem with Catalist was that it depended on modems to maintain their network which was increasing their telephone line cost (Anctil & Beheshti, 2004).Instead of going for another commercial ILS, HLT decided to develop their own ILS suitable to their needs. HLT Librarian Rosalie Blake did all that was required to convince the council to get exceptional circumstances grant for replacing the current ILS and she succeed in it. However, the approved fund was 50% of the actual cost and rest had to be managed by the library itself from their annual budget (Ransom, Cormack, & Blake, 2009).

Being much cost conscious, they sent RFP (Request For Proposal) to several vendors but the proposals were either costly or could not comply to the library needs. They had very limited

[5] To monitor project koha, refer http://koha-community.org/

[6] Y2K (Year 2000) was a problem related to the dates and due to this error computer read every year of 21st century as year of 20th century. For example is somebody types 2001, the machine describe it as 1901 while some computers were reading 2000 as 19100. Actually this was created as a solution to save the disc memory but at the end of the century it become a vulnerable issue.

options left , first, increase the budget which was near to impossible, second, to compromise with their needs which they did not want to do, and third that they write an ILS of their own. Having Katipo communication, an IT firm, in their partner list, increased their motivation to choose the last option. They gave this responsibility to Katipo Communication to program an ILS for HLT. Work of ILS started in September 1999 and was completed by January 2000, however, it was available to the world for download only in July 2000 as the first release (Koha Community, n.d.). Katipo Communication has suggested that the software will release under GNU General Public Licence (GPL) as an open source software so that the project would have longevity. HLT accepted this suggestion and its release was free for all.

Initially, it was named C4 (Cheap and Cheerful Copy of C) but then, after a lot of discussion, they adopted a Maori language term 'Koha' which meant 'gift' or 'donation. (Engard, 2010). "We chose Koha as the name, because it's free and because it's our gift to the world" (Ransom, Cormack, & Blake, 2009). The reaction of developers was that Koha would have a long and bright future as the world's first open source integrated software. Though, the earlier started project on open source ILS was reported as Avanti ILS project begun in 1998 by Peter Schlumpf, it could not be as complete and successful as Koha.

Initial release of Koha was enough for HLT libraries though it did not have several features such as Z39.50 and MARC. After publishing its release on Koha's mailing list, people around the world started showing their interest in it. Some school libraries in Coast Mountains School District of British Columbia in Canada started using Koha with the help of Steve Tonneson, the network engineer of the district. The worldwide interest in Koha rose only after its adoption by Nelsonville Public Library (NPL) in Ohio, USA. NPL also funded to develop Z39.50 and MARC feature in Koha to make it more advanced and viable. Slowly and gradually a number of libraries

moved to Koha from closed source software. The constant move of libraries towards Koha also generated the opportunities for commercial vendors to establish themselves as Koha technical supporter. Some of the commercial vendors are Koha Water Solutions[7], Liblime[8], and Equinox[9]. Presently Koha is running in its 3.10.6 version.

4.4.1.2. Avanti (Open Source ILS)

Avanti[10] is the earliest started project on an open source ILS by Peter Schlumpf in 1998. Nonetheless the project had very small success until the end of 2004. This is what gave chance to Koha to be acclaimed the world's first open source ILS. Avanti is dependent on a single man's effort as it does not have any supporting community of developers. By the end of 2008 it could have only a cataloguing and patron accessible catalogue module. Its capacity is limited and it is configured to catalogue and search up to 16,000 titles and 32,000 items (Schlumpf, 2008).The programming language of the software is java and it is compatible to run on Linux and Windows. However it failed to fascinate library community and no library has reported using Avanti MicroLCS (Anctil & Beheshti, 2004).

4.4.1.3. Evergreen (Open Source ILS)

Evergreen[11], another promising open source ILS project, took its way in 2006 at Georgia, USA. Georgia Public Library Service (GPLS), is a unit established by University System of Georgia with the objective to "empowering libraries to improve the life of Georgians" (Georgia Public Library Service, 2013) through dissemination of information and encouraging reading, learning

[7] http://www.bywatersolutions.com
[8]http://www.liblime.com
[9]http://esilibrary.com
[10] To keep track of the Avanti project visit http://www.avantilibrarysystems.com/microlcs.html
[11] Keep track of http://www.open-ils.org/ to know further developments.

and education with their continuing support and improvement of Georgia's public libraries. They provide excellent information services to people and support the libraries through various programs. One of those is PINES (Public Information Network for Electronic Services). PINES provides automation support to the libraries all over the State. As on 15th January 2013, PINES has been providing its services to 281 public libraries in Georgia. The main feature of PINES is that a user registered at any library may borrow items from any public library in PINES Network (Georgia Public Library Service, 2013).

Initially, PINES library automation installations were built on the Unicorn ILS provided by Sirsi Corporation (now known as Sirsidynix) under a contract started in 1999 and remained in force until 2005. However, GPLS lost its interest in Unicorn only after initial few years and started looking for another alternative and they came up with the idea of developing their own ILS. In an open published letter in 2004, Lamar Veatch, State Librarian of GPLS, announced that they will not renew the contract of Sirsi Corporation beyond 2006 and will encourage an open source software development effort to create ILS for SPINE libraries (Veatch, 2004).The project to develop an ILS was started by a group of programmers of PINES in the year 2004 and they successfully switched to Evergreen by September 2006 (Breeding, 2006, p. 1).The latest version of Evergreen is 2.3.4 released in February 2013. Evergreen is configured to run on Linux only. Like Koha, success of Evergreen has crossed borders of Georgia and sprouted interest worldwide. As per the claims of Evergreen, it is used by more than 1000 libraries worldwide (Evergreen, 2013).Commercial support for Evergreen is available from Equinox Software, a company that developed Evergreen and provided commercial support.

4.4.1.4. NewGenLib (Open Source ILS)

NewGenLib[12], perhaps is the first effort to develop an ILS from a developing nation like India. NewGenLib (New Generation Library) first came into existence in 2005 with the joint efforts of Kesavan Institute of Information and Knowledge Management (KIIKM) and Verus Solutions Pvt. Ltd., both based in Hyderabad. The initial releases of NGL (NewGenLib) was commercial and was not available free of cost until 2008. On 9th January 2008, both the partners decided to make NewGenLib as an open source software under GNU's General Public Licence. KIIKM is the primary source of finance for the development of NGL while Verus Solution took the responsibility to develop and promote it by engaging professional programmers. Verus Solutions provides technical support to install and make the software active at libraries willing to adopt NGL through online community and using desktop sharing systems. If the library wishes to have onsite support, NGL also has a provision for commercial onsite service. A number of libraries in India such as Bangalore University Library, Indira Gandhi Institute of Technology, Birla Institute of Management Technology (BIMTECH) along with several other libraries in Asia and Middle East are using NGL. Verus Solutions is actively working on the development of NGL. The current version of NGL is 3.0.4 R2 that can be downloaded through their website.

4.4.1.5. Others (Open Source ILS)

A number of other open source ILS projects were in existence but many of them either could not be successful or could not be completed at all. Some of these projects are Openbiblio[13], OPALS[14], PhpMyBibli[15](PMB), Emilda[16], Invenio, Learning Access ILS (LA ILS)[17], iVia,

[12] To remain abreast about this project keep track of http://www.verussolutions.biz.
[13] More details of the project available on http://obiblio.sourceforge.net/
[14]http://www.opals-na.org/ is the project sit of OPALS
[15] To keep track of this project, follow http://www.pmbservices.fr

BiblioteQ, and ABCD. Openbiblio originated in 2002 in Spain with efforts of Dave Stevens and it is still under active development. Openbiblio has all modules required in a general ILS such as OPAC, cataloguing, circulation, patron, and reports. It is very much popular in small and rural libraries of Spain, Chile and surrounding areas. Openbiblio is recommended for those libraries which do not have possibilities to reach beyond a collection of 50000 volumes and those which do not require much advanced features. This software can be installed either on Linux or on Windows.

OPALS (Open Source Automation Library System) is another successful software born in USA in early 2000s and was used mainly in School libraries. It is considered to be a perfectly suitable open source ILS for school libraries. It covers all required modules from the point of view of a school library. However, what makes it strange is that though it is an open source ILS, one cannot download it and install it oneself. It is an open source but not free from cost. OPALS is available in SaaS (Software as a Service) model through cloud computing. One has to pay an annual subscription cost towards hosting of the software, although they do not charge for the software. Mediaflex[18] is a vendor involved in installation, hosting and management of OPALS. Due to SaaS model and non-availability of the installation files, the software is hardly installed out of USA. The software claims itself to be an open source software but non-availability of binary and source code to download violates the conditions to be called an open source software.

PhpMyBibli (PMB) is another open source ILS developed in France in 2002 by librarian, François Lemarchand. Currently it is managed by PMB Services. PMB is another cross platform software and can be easily installed on Linux or Windows. This software is also suitable for

[16] Project site of Emilda is http://emilda.org/
[17] Project LA ILS can be tracked from http://www.learningaccess.org/ils-system/
[18]http://www.mediaflex.net

small libraries. It does not have a module to manage serials; hence, it is less popular in academic libraries where serials acquisition is an important and broad process. Initially it was licensed under GNU General Public License but presently it is another similar licence CeCILL (CEA CNRS INRIA Logiciel Libre) born in France.

Emilda is another open source ILS having very few modules such as circulation, OPAC, and cataloguing. It can be installed on Windows and Linux. Due to its limited modules and complex installing system it is not adopted in many libraries. Learning Access ILS (LA ILS) was ILS developed in 2000 in the state of Washington, USA. Earlier it was named as Koha West and Openbook. This software is also in use in public and school libraries. This software is declared as an open source software but they yet have to release its source code formally. ABCD (Automatización de Bibliotecas y Centros de Documentació) is a recently launched open source ILS. Its launch was declared by BIREME (Biblioteca Regional de Medicina), a health organisation in Brazil in 2009. ABCD is adopted mainly in libraries of Latin America. To make the software easy, BIREME has started a wiki[19] that provides required documentation on installation and management of ABCD. The most important feature of the software is that it is based on ISIS software model, developed in 1970s by UNESCO that provided the software without licensing cost; however, this model provides only executable files of the software. Presently ABCD is funded by BIREME and Govt. Brazil.

4.4.2. Public Knowledge Project

Public Knowledge Project (PKP) is a non-profit project established by Dr. John Willinsky in 1998 at the Department of Language and Literacy Education, Faculty of Education, University of

[19]http://bvsmodelo.bvsalud.org/php/level .php?lang=en&component=27&item=13

Columbia, Canada with an objective to improve scholarly and public quality of research (Public Knowldege Project, n.d.). Initially PKP was working in area of open access literature by encouraging open access journals. Soon after initiation of his project, he realized that open access journals also required to be managed online with the help of some software and there is no such open source software available and PKP decided to work to develop an open source software to manage online journals. With the efforts of programmers of PKP, they came with an open source online journal management system known as OJS (Open Journal System) in 2001. It turned out to be very successful and famous. Currently it is running its 2.4.2. OJS facilitates all functions required to manage a journal such as submission, author and editor registration, distribution of manuscripts to reviewers, etc. According to PKP website, as of October 2012, OJS has been used for 14, 700 titles around the world (Public Knowledge Project, 2012). On the line of OJS there are some other software developed by project PKP. These are Open Conference System (OCS) developed in 2002 and used to manage a conference online. OHS (Open Harvester System) developed in 2003 allowed to create a searchable index of metadata from OAI compliant archives. Yet another software OMP (Open Monograph Press) is used "for managing the editorial workflow required to see monographs, edited volumes and, scholarly editions through internal and external review, editing, cataloguing, production, and publication. OMP will operate, as well, as a press website with catalogue, distribution, and sales capacities" (Public Knowledge Project, n.d.b). OMP was released on 17th September 2012 and is the newest software released by PKP. There are several conferences held by PKP to increase the awareness about open access literature and scholarly publishing throughout the world to boost the effect of scholarly publishing.

4.4.3. Open Source Digital Library Software

4.4.3.1. Greenstone (OSS Digital Library Software)

Greenstone is world's first open source digital library software developed in New Zealand at University of Waikato. The roots of Greenstone development were traced to the establishment of New Zealand Digital Library Project in 1995 with an initial collection of 50,000 documents. This project was supported and funded by the New Zealand Lotteries Board and operating funding from the New Zealand Foundation for Research, Science and Technology (Witten & Bainbridge, 2007). With New Zealand Digital Library Software, a fully searchable CD ROM Database could be produced. After production of CD ROM database for an NGO, The Zealand Digital Library Project team also produced a CD ROM Database for UNESCO. By the end of 1997, the software was renamed as 'Greenstone' which is valued more highly than gold in Maori language. In addition to that, it was released as an open source software under GNU GPL licence. The initial open source release was distributed in 1998 at greenstone.org (Witten & Bainbridge, 2007).Greenstone is a full-fledged Digital library software with the capacity to create a digital library on Internet, Intranet and produce a CD ROM based database. The development of Greenstone is undertaken by University of Waikato, New Zealand and it is promoted by UNESCO. The current version of Greenstone is version3.0.

4.4.3.2. Dspace (OSS Digital Library Software)

Dspace is another open source digital library project. Dspace is designed to capture, store, index, preserve, and redistribute the digital literature. The idea of Dspace was born in MIT libraries in 1997 when the need for a digital library software was noticed. This need raised conversations among MIT librarians and finally in a meeting with Hewlett Packard Labs in 2000, a contract

was signed for software development plan. The 1st version of Dspace was released after the signing of this contract in 2002. It was released as an open source digital library software under BSD licence. Dspace is a very simple and effective digital library software which even a non-technical person can manage effectively. It follows all major international standards such as OAI-PMH, Dublin Core, and CNRI etc. In less than one decade Dspace became very popular among libraries throughout the world. As on 15th June 2013, 1450 users have been registered on dspace.org (DSpace, 2013) while according to OPENDOAR it is mostly used by open source digital library software in the world (OpenDOAR, 2013). Current version of DSpace is version 3.1.

4.4.3.3. Eprints (Open Source Digital Library Software)

Eprints is another enthusiastic open source digital library project started by Steven Harnad. Eprint came into existence in 2000 as an outcome of Santa Fe meeting in 1999. Eprints is developed by University of Southampton, UK and released under GPL License. Similar to DSpace it also supports OAI-PMH and other international standards. Presently it is ranked among the most widely used open source software.

4.4.3.4. Others (Open Source Digital Library Software)

Besides the above widely used open source digital library software there are several other projects available for digital library creation. These are CDS- Invenio, DoKS, Fedora, MyCoRe, and SOPS (SciX Publishing Services). CDS-Invenio[20] (CERN Document Server - Invenio) earlier known as CDSware is a project of CERN laboratory released under GNU General Public

[20]http://invenio-software.org/

License in 2002 to run CERN Database Server. DoKS[21] (Document and Knowledge Sharing application) is another open source digital library software project initiated by Katholieke Hogeschool Kempen (KHK) with an objective to develop an application to organise electronic thesis and curricula vitae of students of Flemish University Colleges, Belgium. The project took its way in 2002 and funded by Institute for the Promotion of Innovation by Science and Technology in Flanders, private industry partners and non-profit organizations (Baccarne, 2007). The current version of DoKS is 1.4.1. Another project on open source digital library software is Fedora[22] developed at Cornell University with the financial help of DARPA and NSF. The first version of Fedora was released in May 2003. Fedora is repository type digital library software that is capable to store and disseminate several types of electronic documents to the user. Similarly MyCore[23] was released in 2004 at Essen University, Germany and SOPS[24] was also released in 2004 with the financial help of European Commission (EU). However, the open source digital library software which are used comprehensively all over the world are DSpace, Greenstone and Eprints.

4.5. Findings and Interpretations

4.5.1. Major Findings

From the detailed discussion of the open source movement in the earlier sections, the major findings are summarised below.

[21]http://sourceforge.net/projects/doksproject/
[22] http://www.fedora.info
[23]http://www.mycore.de/content/below/index.xml
[24]http://www.scix.net/sops.htm

- In 1952 when IBM launched the 701, first commercial computer there was no difference between hardware and software; all computers were sold with free software of one kind or other with their codes.
- In 1970s there was a software sharing community to share and help the users who were facing problems or bugs in using operating system ITS developed by MIT.
- The history of free and open source software has two aspects, namely, development of UNIX operating system and the development of GNU project of Richard Stallman.
- The presentation of a paper on UNIX at the ACM Symposium on operating systems in October 1973 by Ritchie and Thompson and the subsequent publication of their paper in conference proceeding in July 1974 created a landmark in the development of UNIX as it resulted in generating a number of requests for copies of UNIX.
- UNIX Users around the globe were working on developing and improving UNIX but release of a number of derivatives and versions confused and annoyed the users, leading concern towards an uncertain future of UNIX.
- The first Open Source License, a software distribution license, was developed at University of California known as Berkeley Software Distribution (BSD).
- The voice for free software distribution was raised by Richard Stallman, a scientist at MIT Labs., who went on to develop GNU an operating system that would be free for users not only to use but also to modify or redistribute. He wrote a software distribution licence known as GPL (General Public License) which is widely used even today and he also established Free Software Foundation.

- Linus Torvalds built a free UNIX kernel and in 1992 his kernel was combined with GNU and eventually became popular as LINUX.
- In 1997 Eric S. Raymond wrote the historical paper “Cathedral and bazaar” on production of free software. His paper created such an impact that Netscape decided to release the source code of Netscape Navigator to public.
- Chris Peterson of Foresight Institute coined the term ‘Open Source’ to refer to free software without any rivalry with commercial software.
- In 1998 the Open Source Initiative was formed to market the term ‘Open Source’
- By early 21st Century open source software movement had a number of success stories. Although Computer application in libraries was witnessed from late 1950s, but computer programs for library functions were not available as free product and were very expensive.
- The concept of free software touched the libraries only in late 1990s.
- Daniel Chudnov, an advocate of the open source software in libraries, was responsible for bringing the attention of the library community to this concept.
- There were also some dissenting voices to open source software in libraries.
- Starting with tiny LIS tools like OSS4Lib and Code4Lib the library community is witness to promising and multi module Open Source Library Management Systems like KOHA, Avanti, Evergreen, NewGenLib etc.
- Public Knowledge Project (PKP) of John Willinsky is open source software to manage online journals.

- Greenstone, DSpace, Eprints etc. are Open Source Digital Library Software to manage the digital literature in libraries.

4.5.2. Interpretations

Open source software has become an inevitable reality not just in library but any type of organisation and even in daily lives of people. The widely used open source software is GNU/Linux operating system which is used by almost every individual who uses Internet because all major applications used by people today use Linux as operating system of their servers such as Facebook, Google, Amazon, etc. Apache Web Server has been used by maximum number of websites in the world and has beaten all commercial web servers. Its nearest competitor is Microsoft Web Server. Among Web Browsers also, open source software is leading with Firefox and Chrome. Yet another famous open source software is Apache's Open Office that claims to be very successful and prominent among the computer users throughout the world. These software are being utilised by computer professionals of almost every industry including library and information science.

However, open source software used specifically for libraries and information centres are Koha, Newgenlib, Evergreen, Dspace, Greenstone, Eprints etc. Additionally there are many other types of software that are used in the libraries. The open source software movement and libraries are closely related as philosophy of open source software to distribute free software reflects in the philosophy of libraries to disseminate information freely. That is why once Amarel (2008) rightly asserted that "libraries and the open movement mesh together logically." Free Software Foundation follows the open movement as a philosophy and does not support proprietary software in any way while the Open Source advocates do not loath proprietary software if they

do not have a better open source software to replace the closed one. Even the most prominent open source advocates use proprietary software. Howard County Library, known for most optimum use of open source software, provides access to their OPAC through the computers using Microsoft and Apple's operating system (DeGroff, 2008). But, open source software have secured their place in all types of libraries.

The estimation of usage of open source software and its impact on libraries is difficult. However, there are several literature available about success of open source installation in libraries from every corner of the world. In fact some studies show that open source ILS form a significant portion of automation industry (Breedings, 2013).

Open source software have proved efficient in every aspect such as price and support. Every open source software is supported through more than one community and through their developers as well. Most of the time the participants of the community are users of the software who are experiencing the software, hence, the bug finding and offering solutions are quicker than a commercial vendor. The new users get support from the community and soon get ready to support other new users. However, without good supporting communities it is difficult for open source software to develop. A few examples of such software are Avanti, PhpMyLibrary, Openbiblio, Emilda, etc.

Another benefit of open source software is that it is continuously under development; thus users can avail the latest features. Yet another very important benefit of using open source software is that it does not bind anyone to continuously use it. It gives freedom to migrate to any other software any time which is not an easy task in case of commercial software.

Continuous involvement of library professionals in open source software installation and its use helps them in becoming aware of the complexities of information technology and in comprehending the intricacies of software used in library automation. Some information professionals gain considerable expertise of software by using open source software that they themselves could develop or support the development of an open source software by way of providing programming help, bug finder or through helping other installations. Open source software is a philosophy and it joins the people around the world in a chain where each one is connected and supported by others. Lastly, it could be said that in open source world each one is a user, developer and programmer who supports this movement to the best of his/her capabilities.

OSS in association with open access[25], Web 2.0 and upcoming Web 3.0 shall be beneficial not only today but also in coming future. The most common forms of open access are open access journals and open access repositories that enable the society to access research results without paying any fees. Web tools, on the other hand, are online free tools that can be used to improve the quality of library services and to make the optimum use of Information Technology. Web 2.0 tools are available in various forms such as RSS (Really Simple Syndication), Wiki, Blogs, Social Network, Podcast, etc. Any library with all these tools with open access literature and open source software may provide high quality services to its patrons.

[25] Open access is discussed in more details in chapter no. seven.

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CHAPTER V
OPEN SOURCE SOFTWARE FOR LIBRARIES

As discussed in the preceding chapter, there are many open source software available for libraries. A wide variety of open source library management software, digital library software and other software are available for the libraries to choose from. This chapter attempts to fulfil the second objective of the present study; thus covers the analysis of open source library management software and digital library software. However, as stated earlier in Chapter III, the researcher has not carried out any primary data collection technique through questionnaire or interview to analyse the various software, but has depended on his personal experience of having worked with some of these software, the manuals and websites of these software and the existing studies on them.

In libraries mainly two software are used, first a library management software known by the generic term as Integrated Library System (ILS) and a software used to create a digital library or an institutional repository. The present chapter would first discuss the open source library management software then move to digital library software. Additionally, this chapter would also discuss some other open source software that can be useful to libraries.

5.1. Open Source Library Management Software

There are many open source library management software in existence, i.e., Avanti, Evergreen[1], PhpMyBibli[2], PhpMyLibrary[3], Koha[4], NewGenLib,[5] etc. The researcher has

[1]http://evergreen-ils.org/
[2]http://sourceforge.net/projects/phpmybibli
[3]http://sourceforge.net/projects/phpmylibrary/
[4]http://koha-community.org/
[5] http://www.verussolutions.biz/

discussed them briefly in the earlier chapter. However, out of all these only three software are used by a majority of libraries. These software are Koha, Evergreen and Newgenlib. This current section will discuss only these three software as other software have not made a mark because many of them have either stagnated with a particular version or their development process is very slow or they have unimpressive features. However Koha, Newgenlib and Evergreen could successfully attract the libraries and find enough number of users. A wide number of libraries are using these open source software. Koha and Evergreen are holding about 14 percent market of commercial support ILS services in the world (Breeding, 2013).In addition to this, the number is huge for those who are running open source software on their own without a commercial support. Newgenlib, on the other hand is a developing open source software which originated in India. It is gaining momentum with its excellent features and magnificent support service. Hence it is justifiable to have an analytical and evaluative view on only these three open source ILS which is presented in this section by discussing their technical features and modules.

5.1.1. Koha

Koha, synonymous for the term gift in Maori language, was developed in 1999 to get rid of Y2K problem and on dissatisfactory services from commercial ILS. In Chapter four the investigator has already discussed the historical background of Koha. Koha is written with Perl language and is created on LAMP (Linux, Apache, MySql, PHP) platform. However, a few versions of Koha were also developed for Windows. However, the last version for windows was released in 2009, i.e., 2.2.9 and no further version of Koha was developed for Windows. Koha has won several awards such as 3M Award for Innovation in Libraries in 2000, Interactive NZ Award (The best example of interactive media specifically made for community and not for profit organisations) in 2000, Trophee Du Libre Award in 2003,

Computerworld excellence in IT for non-profit Award in 2004 etc. (Koha, 2013). The current version of Koha is 3.12.4 released on 24th August 2013. The technical specifications and various modules of Koha are discussed below.

5.1.1.1. Technical Features

Besides developed on LAMP platform Koha has several technical features which are as mentioned below in this Section.

Complete open source: Koha is a full-fledged open source software. From basic application of Koha to database application, Web server and installation platform all are open source. Koha does not use any commercial software that may levy any indirect costs to a library that adopts Koha. It is distributed under GNU's General Public Licence while other applications are also distributed under this or other open source licence.

Library Standard compliant: Koha is built using maximum library standards and protocols to ensure interoperability between Koha and other software using these standards. Library standards make it easy to migrate to and from Koha easily. Koha Uses MARC tags, ISBD for cataloguing, Z 39.50 for information exchange and several other similar library standards.

Web based interface: Koha is not only a Web based application but its interfaces such as administrative interface, OPAC, and self-checkout interfaces are completely web based and opens with the help of a browser. Hence it does not require having a separate client application for running the software. Koha's web interface is based on XHTML, CSS and JavaScript Web technologies that make Koha platform independent.

Freedom to use commercial database: Though Koha is basically tested on MySQL to store data, one may also use commercial database software such as Oracle, or Informix.

No vendor lock in: Koha does not impose any restriction in any form for its use. A library can freely use Koha by itself, with in-house expertise or can outsource external technical support. .

Dual database design: Koha uses dual database, i.e., text based and RDBMS to ensure scalable database enough to meet the transaction load of any library, no matter what is the size.

No huge structure required: To have Koha in a library, it does not require to have a huge technical structure. A simple computer is enough to install Koha on it. Koha can work on a standalone computer as well as on a huge intranet and Web structure.

5.1.1.2. Koha Modules

Koha has all essential modules that a complete ILS should have. Koha has acquisition, circulation, cataloguing, OPAC, and serials module. The brief details of the same are as mentioned below in this Section.

Acquisition: Acquisition module of Koha works in two modes. Simple mode and advanced mode. The simple mode provides an interface for adding new holdings to the catalogue. Advanced mode provides options and interface for tracking of acquisition process such as requests, orders, claiming, invoicing, budget control and other processing of the library.

Cataloguing: The cataloguing module of Koha follows worldwide recognized MARC/MARC21 format for creating bibliographic records. Additionally, it can also convert these records to ISBD format. Z39.50 protocol is implemented to retrieve the cataloguing records of other libraries. Cataloguing module of Koha is also compatible with AACR2. Users can create bibliographic record of a document without following acquisition module or

by following acquisition module. Cataloguing module also enables the user to create cataloguing framework for different kinds of material such as monograph, serial, web resources, digital resources etc.

Circulation: Circulation module of Koha provides an easy interface for issuing or returning of books. Moreover patron management is also available in this module. This module calculates fine on overdue materials automatically. There is provision to operate with the institutional email server to provide email notifications to the user regarding checking out and in.

Serials: Serial module of Koha provides interface for registering periodical subscription, to renew them and to track the arrival of them. It also takes care of late received issues, skipped issues and forwards automatic claims to the supplier. Serials module, in short, is a great hand for the library professionals to manage periodicals with more than ten diverse frequencies. It also forwards the information of library holdings to the OPAC and keeps the patrons abreast about the serial issues available in the library.

OPAC: Online Public Access Catalogue of Koha is very interesting. It provides simple Google type search option with an advanced Boolean logic based search. Simple search is for users who are not very familiar with Boolean logic and like to carry a Google like search. It also has ‘did you mean’ feature that lets the user informed about their spelling mistakes or the books available in the database with slight different spellings. Advanced search on the other hand uses Boolean logic to reduce the recall and increase precision. OPAC module also keeps the users informed about the new arrivals in the library. It also enables users to create public and private list of favourite titles. Koha OPAC enables the user to search in various languages. Recently OPAC has integrated with various Web 2.0 features.

Others: In addition to above basic modules, Koha also provides comprehensive report generation facility. Koha can generate a wide range of reports depending upon the requirement of the library. Moreover Koha also helps the library to create barcode labels for books and patrons. It also takes care of Inventory through its inventory management system that helps in stock taking.

Koha, thus, is a complete library management system with all required modules and features. A library can adopt Koha with its own technical human resource or can outsource the maintenance of it with a number of support agencies. The best feature is that the library can change the support agency at any time and it cannot be compelled to take service of a particular agency. Additionally, the libraries that do not wish to take commercial support for Koha may refer a number of manuals available at Koha website, can become a member of the various forums on Koha that extends support to all new Koha users. Moreover, in case of a bug, Koha has created a bug directory that helps to debug any particular problem. Using Koha, a library may get rid of the commercial ILS which often comes loaded with a number of terms and conditions.

5.1.2. Evergreen

Evergreen is yet another prominent open source software which was first released in 2006 and is now adopted by more than 1000 libraries including public libraries, academic libraries, and special libraries all over the world (Evergreen, 2013).It was initiated as a project at Georgia Public Library to take care of more than 200 public libraries of Georgia State. Chapter four of this report has already discussed developmental history of Evergreen in more detail. Evergreen is designed and developed to install at Linux operating system like Koha, however, it is based on client server technology and its client application can be installed on

Windows platform. The current version of Evergreen is 2.4.1 released in July 2013. The technical specification and modules of Evergreen are as below.

5.1.2.1. Technical features

Similar to Koha, Evergreen is also designed using Perl language and uses Apache Web server. However it uses PostgreSQL to store database. The technical features of Evergreen are discussed in this Section.

True open source: Evergreen is a true open source software. It is not only designed to install on open source operating platform but all supporting software that it uses are open source only. Evergreen uses open source Web Server Apache, database PostgreSQL, Perl etc. It is licensed under GNU's GPL licence that offers freedom to users to use, modify and distribute to others.

Client Server Technology: Evergreen is built on Client server technology. The server is Linux while the Client application is platform independent and can be installed even on Windows or Mac.

Library Standards compliant **:** Evergreen follows most of the library standards such as MARC, Dublin Core, Z39.50 etc. to facilitate easy interoperability between other library tools.

OpenSRF: Evergreen also features the Open Scalable Request Framework (OpenSRF) that allows the developers to create applications for evergreen with a minimum knowledge of its structure.

Applicable in any organisational structure: Evergreen is compatible to work in any type of organisational structure such as a single library, multiple libraries in the same campus, multiple libraries in various parts of the city or town, or multiple libraries at various cities, states or countries. Evergreen provides complete structure to work in any of these conditions.

Sufficient for multiple branches: Evergreen can work for a standalone library or a number of libraries of an organisation. Evergreen under this feature allows each library to set up their own rules and policies within their system. Such as circulation period, number of items issued to the patron etc. This functionality allows each member library to maintain their rules, regulations and individual preferences that makes the workflow of each library very simple and smooth.

5.1.2.2. Evergreen Modules

Acquisition: Acquisition module in Evergreen has all features and options required for a library. Evergreen provides platform to users to file their request for an item as the library admin can approve or reject a request, create orders for requested book, allot budget for a financial year, receive invoices from vendors and forward it to the technical section for further processing. Moreover, in acquisition module admin can send reminders for items not received from the vendors and can print any document related to acquisition process.

Cataloguing: Cataloguing in Evergreen supports MARC format for entering bibliographic details of an item. Admin can modify or create templates using MARC tags. In order to import the cataloguing records from other libraries Z39.50 features is available in this module.

Circulation: Through circulation interface admin can issue books to users and can get them checked in back to the library. To specify the period of circulation, admin has to specify the circulation period for various category of users. Moreover, admin can specify the amount of fine for overdue items. Nevertheless, through pre-specified rules admin can select a specific date for any item to any user at the time of checking out of a book. In addition to check in and out, the circulation module provides option to renew the status of an item which is already a

checked out item; option to mark the item as lost or set their status in maintenance in case the book is not available in stacks due to binding or other technical reasons.

OPAC: Evergreen OPAC provides a state-of-the-art web interface (Yang & Hofmann, 2010). It provides a simple and Boolean logic based search option to the users. Evergreen provides an excellent navigation from one search result to another with a specific subject or author. Moreover, evergreen provides an optimum 'did you mean' feature. When a user's search hits no result, then Evergreen provides a list of suggestive alternative spelling. It also has the ability to fetch the book cover from Internet on the basis of its ISBN number. If the book is present in Google Books project, then it also hyperlinks to the web page of that particular item so that the users can read the summary of the item.

Serials: Serial module is one which was added much later than the other modules in Evergreen. It first appeared in Evergreen in 2009 while full-fledged serial module was added in 2011. Hence, serial module of Evergreen is not as matured as the other open source library management software, however, it has all the basic features such as processing request for a new journal, adding a new journal and a journal issue, registering the claim for a not received issue etc.

Others: In addition to the above primary modules, Evergreen has 'Report Builder' feature that allows the admin to create various statistical reports using a number of database tables of Evergreen. Moreover like all ILS, Evergreen also has a common administration module to configure the various parameter of the software. To support the users of Evergreen there are a number of online forums run by the community. In addition to that, some commercial vendors are also available for those who wish to adopt a third party commercial support for Evergreen. Some of these vendors are Equinox, ByWater and Lyrasis.

5.1.3. NewGenLib

NewGenLib is another prominent open source software for libraries. It is born and developed in India by Verus Solution with the help of Kesavan Institute of Information and Knowledge Management, Hyderabad. The developmental history of NewGenLib has already been discussed in Chapter IV. NewGenLib is an ILS which is turned open source from a commercial ILS. It received huge publicity in a very short span of time and is being used in a number of libraries not only in India but also overseas. NewGenLib can be installed on Linux as well as on Windows. It is a web based application and based on Client Server structure, however, it does not require any specific client application to be installed specifically. It installs client application automatically from the server. The current version of NewGenLib is 3.0.4 Release 2 released on 25th June 2013.

5.1.3.1. Technical Features

Unlike Koha and Evergreen, NewGenLib has the ability to work on Windows platform in addition to Linux. It uses Java Tomcat as web server, PostgreSQL database to store data and is programmed with the help of Java. NewGenLib has a number of advanced technical features which are rare in any ILS, open source or proprietary. Some of them are discussed here in this Section.

Complete open source: Similar to Koha and Evergreen, NewGenLib (NGL) is also a complete open source software as it uses all open source software to support the functionality of this software. Besides the main application, NGL uses Apache Tomcat as web server, PostgreSQL database and is programmed in Java. It uses Java Web Start to install client application on other computer.

Platform independent: This feature makes the NGL unique in comparison to Koha and Evergreen. NGL is platform independent and can be installed on Windows too. It does not compel the users to have a Linux platform to install NGL.

Library standard compliant: NGL is complying with international library standards such as MARC, Z39.50, MARC21, and OAI-PMH, Dublin Core. These standards enable interoperability in NGL with other library software or tools.

RFID integration: NGL is compatible to RFID (Radio Frequency Identification) integration. If a library wishes to have RFID then they need not change their ILS. NGL is fully compatible to configure RFID based product with it.

Automated mailing and SMS: NGL has integrated automated mailing and SMS technology through which a user receives an SMS when s/he borrows or returns the book to the library. In addition to circulation, email and SMS can be sent through various modules such as serials, acquisition etc.

Multi lingual: NGL has made it possible to enter data in catalogue in several scripts. Besides English one can enter data in many other languages such as Hindi, Gujarati, Arabic, Urdu, etc.

Android application: NGL has developed a mobile application for android so that the users may access NGL through their android mobile (Verus Solutions, n.d.).All basic features of an OPAC are available through this application such as browsing the collection, checking the availability of the item, checking checkout history, list of new arrival books etc.

5.1.3.2. NewGenLib Modules

NGL has all modules which are generally found in all ILS and there are some modules which are peculiar to it. The details of the modules of NGL are as follows:

Acquisition: acquisition module in NGL provides comprehensive functionality for acquisition. Request made through OPAC are shown here. Additionally the librarian can also add or remove items through this module. The user can create firm order, receive invoices, and assign accession numbers from this module. In addition to the general features of a typical acquisition module this module also manages items received in gift, books bought by the library on approval basis, quotation received by the suppliers etc.

Cataloguing: NGL like Koha and Evergreen follows MARC format for bibliographic entry. However, it has eased the work of library professionals by creating a number of MARC based templates for various category of items such as single volume book, multi volume book, book chapter, non-print material, serials, journal article etc. These templates reduce the users' confusion about numerous tags of MARC records. In addition to the ready templates NGL has created several masters which are preconfigured, i.e., type of material, nature of documents etc. Moreover, NGL has provided the functionality to attach a digital file with a MARC record, hence, a library which is not in a huge requirement of a digital library software can do their work with NGL. For a digital document it also follows international standard Dublin Core. Through this module subject and author authority files are stored in the database that increases the vocabulary control in indexing the items.

Circulation: circulation of NGL is very simple and communicative. The circulation module works on the basis of the parameters set by the admin such as user privileges and overdue charges etc. Issue and return, and renewal function are very rapid in NGL and it also accepts the barcode standards and RFID integration. Moreover, this module also deals with the items lost or damaged, items sent out for binding, inter library loan, Book Bank, and weeding out of the books.

OPAC: Online Public Access Catalogue of NGL is developed with several features of Web 2.0. NGL OPAC provides several search options besides simple and Boolean logic based search. Patron may select the category of items, such from books, serials, book chapters and serial articles etc. Patron by logging onto the OPAC may check books borrowed by them, their privileges and can also request the books for acquisition to the library. In the recently released version a patron may also search the experts in the organisation.

Serials: Like other modules, serial module of NGL is also integrated with all basic functions. All functions of Serial desk such as collecting request, creating orders, receipt of invoices and issues, claims for not received issues and binding of serials can be managed with this module.

NGL Workbench: NewGenLib work bench provides option to the admin to create and print library card and barcode labels. The library card is fully customizable on the requirement of the library. NGL uses another open source application - iReport for creating library cards using the library admin that can modify the format of library card. Moreover this module also helps the library to import the book record and patron record from an xls or csv file. Book records can also be imported from a MARC file.

End of the Day Process (EOD): NewGenLib end of the day process is an application which is bundled in NGL application. The purpose of this application is to relegate the production of time taking outputs, i.e., creating claim letters, emails to users, etc. to a time when the server is comparatively free than the other busier periods of the day.

Others: In addition to all modules elaborated above, NGL has an administration module where all basic configurations are done. Through this module various parameters such as holidays, category of patron, list of vendors, budget head, financial year, user privileges, etc. can be fixed. Moreover, NGL has started using a new application that helps to index full text

of digital attachments so that a user can retrieve any documents from any key word of the document. In addition to the main application, NGL has developed some other applications which can be integrated with the NGL primary application. These are NGL UC and NGL Touch. NGL UC (NewGenLib Union Catalogue) helps to integrate the OPAC of several libraries into one, while NGL Touch is an application that enables the self-check in, check-out and self-renewal of a library material. NGL also supports VuFind that enables the patron of a library to search and browse the library resources by replacing the traditional OPAC to an online OPAC of next generation.

However, presently the users of NewGenLib are limited to many Indian libraries and very few libraries outside India in comparison of Koha and Evergreen. However, the future of NGL is very bright looking at its technical support and development process. NGL has several layers of support to the users of NGL. Firstly, they help the users in real time when they face a problem or get into a trouble. Using remote desktop access tools, an NGL programmer may fix any issue in no time. This layer of their support looks more promising than even technical support of a commercial software. Secondly, like many other software, they also have a forum where any query may be answered by NGL programmers and the other users of NGL. In the third option they have created free lancers who may help the libraries in their area. In addition to all these free support, they may also provide a commercial support if the library wishes to have it. However, till now, no other commercial vendor has been observed providing any commercial support for NGL.

5.2. Open Source Digital Library Software

With the explosion in the number of electronic or digital documents, libraries started to store the electronic copies of theses, dissertations, articles and chapters written by faculty members and many other forms of scholarly content online for instant and easy access by the users of the library. A digital library software played an important role in managing, retrieving and

browsing of the electronic documents kept in the server of the library. Many open source software are available for managing a digital library or institutional repository of an institution. However, out of many, three are used by large number of libraries and these are Dspace[6], Greenstone[7] and Eprints[8]. This section would cover only these three most prominent open source digital library software. However, there are a number of scholarly writings, evaluating the other open source digital library software. For instance, Sunita S. Barve (2008) has done a comprehensive evaluation of open source digital library software in her thesis.

5.2.1. Dspace:

Dspace was developed at MIT, as discussed in the preceding chapter, with the objective to facilitate organisations in managing their digital content. It is a simple and platform independent open source software licensed under BSD Licence (DSpace, n.d.). It is specially designed to support digital preservation for the electronic/digital documents added to the repository in an easy manner (Barve, 2008).The central idea behind the structural model of Dspace is 'communities' that is unit and subunit in an organisation. In case of university, 'communities' can be schools, departments, laboratories, research centres, etc. of the university (Smith, 2003). Communities contain collections by clustering related content. System architecture of DSpace is as shown in Figure 1.0.

[6]http://www.dspace.org/
[7]http://www.greenstone.org/
[8]http://www.eprints.org/

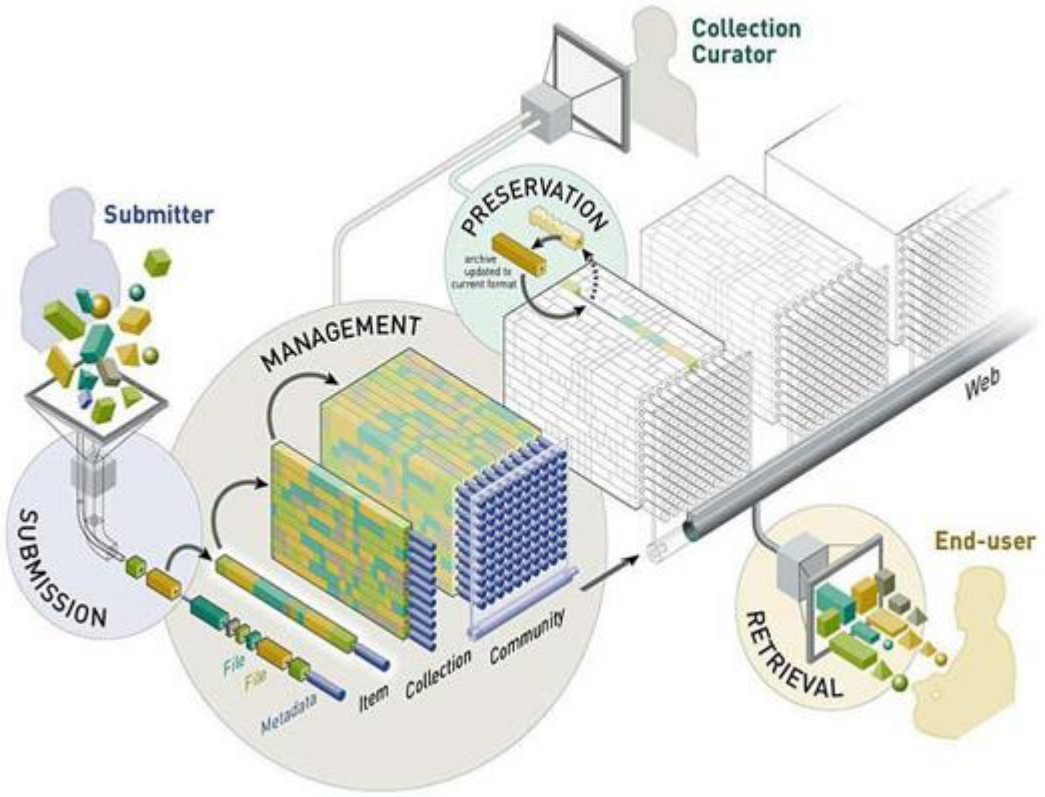

Figure 1.0: DSpace system architecture
(Source: http://www.dspace.org/images/stories/dspace-diagram.pdf)

5.2.1.1. Technical Features

In addition to being an open source software, DSpace uses advanced techniques to make DSpace more advanced in its usability. The technical features of DSpace are as follows:

Complete open source: DSpace is a complete open source software. Besides primary application, it uses all other supporting software such as Java, Apache Ant, Apache Maven, PostgreSQL database and Apache Tomcat; the web server is also an open source. Hence it does not cause any direct or indirect cost on software.

User Interface: DSpace is a complete web based solution. Both interfaces, i.e., user interface and administrative interface, are accessible from any web browser. This helps the

administrator to manage the digital library more effectively. It does not require to access server to manage the collection and changing the preferences and configurations.

Platform independent: DSpace is platform independent. It can be installed on Linux as well as any version of Windows. A user need not learn Linux operating system to get DSpace installed, but, it is easily installable on any version of Windows such as Windows XP, Windows Vista, Windows 7, Windows 8, etc.

Compatible with International Standards: Dspace is compatible with International standards such as OAI-PMH, Dublin Core, OAICat, etc. Open Archive Initiative- Protocol for Metadata Harvesting (OAI-PMH) is an internationally recognized protocol for metadata harvesting. Dublin core is a set of 15 metadata elements to describe the digital resource (Wikipedia, 2013) and OAICat is OCLC's open source framework to conform OAI-PMH (OCLC, 2011). Moreover, Dspace is also compatible and configured to use any crosswalk plug-in to offer additional metadata formats such as METS.

CNRI Handling system: In order to create a tenacious identifier for items uploaded to DSpace, it has used CNRI handling technology. A Handle system is a technological specification for assigning, managing and resolving a persistent identifier for digital objects over the internet (Wikipedia, 2013). Under this specification Handle server runs under a separate process and receives TCP requests from other servers and issues resolution requests to a global server or servers if a Handle entered locally does not correspond to some local content (Handle System, 2012).

Open URL Support: Dspace uses Open URL from SFX. Dspace with the help of SFX server may display an Open URL link on every item page using Dublin Core metadata. Moreover, Dspace can respond to the incoming Open URLs.

5.2.1.2. Functional features

Where use of open source technology makes DSpace a complete open source solution for creating digital library; the use of distinctive specification, protocols, standards and programming makes the workflow and function of DSpace very user friendly and attractive. The functional features provided by DSpace are analysed below in this Section.

Authentication and authorisation: Authentication means verification of users to identify their rights in the repository. Users need to log in to use the repository and their rights over the digital library. Administrator can set the limits to various contributors in respect to access of communities and collections. A user who is not authorised or not logged in can access the documents and serve the rights allotted to an anonymous user. Moreover an anonymous user can register him to the repository and can access the rights allotted to an anonymous user; however, the administrator can upgrade the rights of him.

Similarly, the registered contributors (e-people) are managed through authorisation. The admin can control the registered contributors in regards limiting their rights to access the features, collections and communities in the repositories. The administrator can also limit the number of items received from registered contributors and limit the size of items to be deposited into the repository.

Collection and communities: As discussed earlier, the central idea of development of working module of DSpace is ‘communities’, hence at the configuration point the administration has to create the ‘communities’. ‘Communities’ is referred to the collections and people. Administrator creates communities and under communities several collections are created. Similarly e-groups and e-people may also be created. The items submitted by the

contributors are submitted to the related collection of the community. It helps to provide an efficient browse feature at user's end.

Flawless workflow: The workflow of DSpace is based on the need of the institution; however, typically it is a combination of three flawless steps. Each collection in Dspace may be assigned to e-groups or e-persons. If the collection is not assigned to any e-group or e-person then step 1 is skipped and step 2 and 3 are overruled in the absence of step 1. When a depositor submits a document to the repository, it goes to the e-group of the collection where it has been submitted. The group is notified and the group at step one may accept or reject the submitted document. At step 2, the document is informed to another assigned e-group where it can edit metadata provided by the submitter with the item; however the content of the document cannot be edited. Here also e-group may reject the submission of the item. At step three again item is informed to assigned e-group for verification of metadata and submission to the repository. Submission cannot be rejected at this step; however the metadata can be edited. Figure 2.0 shows the workflow of DSpace (2010).

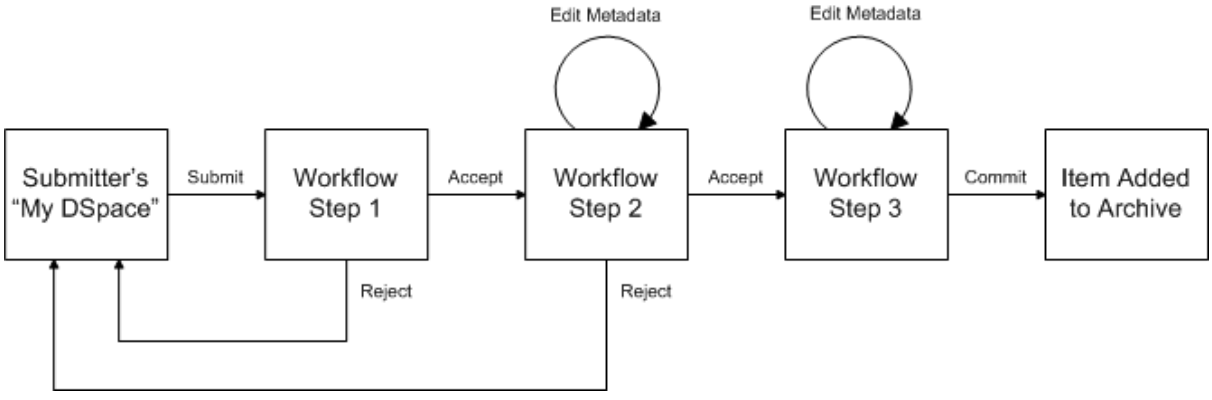

Figure 2.0: Submission workflow in DSpace
Source: http://www.dspace.org/1_6_2Documentation/ch02.html#N103C6

A submitter can submit his document following seven simple steps in submission module. The first three steps are related to the description and metadata of the document. At fourth

step contributor has to upload the document to the repository. Fifth step is verification of submitted information and of document while sixth step deals with the license information. The submission completes at seventh step, from where it is forwarded to the e-group, to which document is related for further process.

Optimized retrieval: the system in DSpace provides two ways retrieval, i.e., search and browse of items available in the repository. In search, it facilitates simple and Boolean logic search. DSpace search retrieves items by searching keywords provided by searcher in the Dublin Core or any other set of metadata used by the repository. On the other hand, through browse, a user can browse the communities created under the repositories and subsequently collection under any community and an item in the collection.

Supports wide variety of documents: DSpace supports a huge range of formats in the repository that helps in creating various types of repositories such as Video, Audio, Picture, Multimedia, Text etc. Moreover, DSpace also allows the customisation to accommodate the formats required as per the need of an organisation.

Import and Export: DSpace includes the batch tools to import and export the whole data or a collection of a community. The data is exported in directory form where the metadata is stored in an XML file.

Statistics: Use and user statistics is an attractive feature of DSpace. Through this feature various reports about the content and user of the system can be generated by the system. The reports include number of items archived, number of bit streams viewed, number of item pages viewed, number of collection pages viewed, number of user logins, number of searches made, most popular search, mostly downloaded item, top country/city views, etc. (DSpace, 2010).

Others: In addition to the above features, DSpace has several other small features that are very helpful for users and make the software very valuable. DSpace supports submission of HTML documents to the repository. DSpace also provides support to the Creative Commons licence to be attached to the repository. A submitter may use this license for the item uploaded by him. When a user uses this option, a text document of the creative commons licence is attached with the document submitted by the submitter. DSpace has the RSS feeds for the communities and the collections. When a user subscribes the RSS feed for a particular community or collection, the user gets information through email on submission of a new document to that community of collection. Moreover, DSpace has inbuilt checksum checker to verify if any document in the repository has not become corrupted or has been tampered with.

DSpace is supported by various online forums. These forums have huge number of members from every corner of the world who are using DSpace. Any new user who wishes to adopt DSpace may get help of these forums. In addition to DSpace software, its website also provides complete manual of the DSpace that covers information from installation to configuration and management. However, if an organisation wishes to have commercial support for DSpace, there are wide number of agencies that provide commercial support for DSpace. A list of registered technical support providers is available on DSpace website (Dspace, n.d.).

DSpace is used by numerous libraries and organisations worldwide. It is upgraded at regular intervals. The current version of DSpace is 3.2 that was released on 24th July 2013.

5.2.2. Greenstone

Greenstone is world's first open source and prominent digital library software. It was developed in New Zeeland at University of Waikato with the funding support of UNESCO and Human Info NGO, Belgium (Greenstone, 2012). The historical details of Greenstone are already discussed in Chapter IV. Greenstone is a suite of software that provides a new way to organize information and publish it on the Internet or on CD ROM (Greenstone, n.d.).The aim of Greenstone is to enable users in libraries and other organisations to build their own digital library. Figure 3.0 explains its data model (Trambu, 2012).

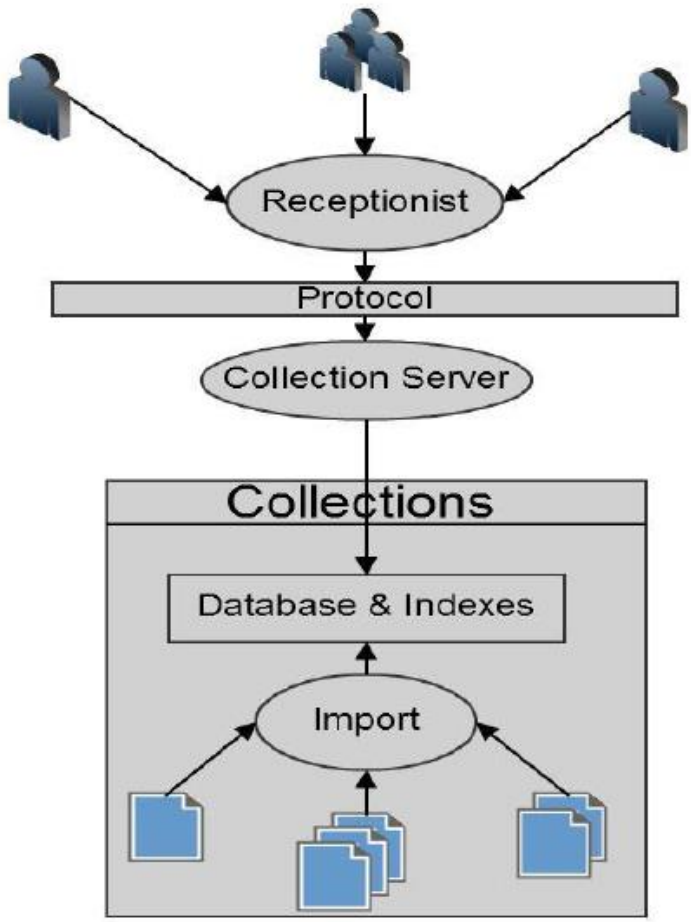

Figure 3.0: Data model of Greenstone
Source: http://arxiv.org/ftp/arxiv/papers/1212/1212.4935.pdf

5.2.2.1. Technical features

Among all open source digital library software, Greenstone makes itself distinguished due to the technology used by it and a host of features it provides. The technical features of Greenstone are discussed in this Section.

Truly open source software: Like many other open source software, Greenstone also follows a complete open source model. It is programmed using Perl programming language. For web server it uses Apache open source server configured on JRE environment. To store data it uses GDBM (GNU Database Manager) database. All these software are open source software, hence do not attract any hidden or indirect costs.

Supports Windows: While many open source software can be installed only on Linux, Greenstone can be installed not only on Linux, but also on Windows platform. One can install it on 32bit Windows system. It supports Windows XP, Vista and Windows 7.

User Interface: Greenstone works on Client Server technology. Clients can be installed on Linux, Mac or Windows. Installation of Client enables to submit the document from a remote computer. It requires Java to install a client. However the public interface is web based and does not require any specific application. Public interface can be accessed via any web browser.

Single click installation: One of its best technical features is its installation. The new version of Greenstone is bundled in a single software and it does not require long manuals for installation of Greenstone. Additionally, downloading various matching version supporting software is also not required as all supporting software are bundled in one. It is a single click software. Greenstone is just a single exe file, one has to click it once and wait to complete its installation.

Multilingual: Greenstone is a multilingual software. It supports Arabic, Chinese, Czech, Dutch, French, Galician, German, Hebrew, Indonesian, Italian, Japanese, Maori, English, Russian, etc. languages. To add any of these languages, one needs to provide a set of language specific text fragments which does not require huge knowledge of Greenstone (Witten, 2003).

Support to International standards: Greenstone is compatible with international standards such as OAI-PMH, Z39.50, Dublin Core and other metadata standards. Z39.50 helps to import the metadata of digital documents from the other digital library.

Large scale database. Greenstone is designed in such a way that it can contain millions of documents of hundreds of gigabyte size. Even if it is having a huge data uploaded in the server the searching of the server does not get affected.

Supports plugins: Greenstone is developed presuming that a number of new formats may be developed in the future and a document may be developed in a format which is not identified by Greenstone. Hence, in Greenstone, plugins can be written to accommodate new types of data.

5.2.2.2. Functional Features

Using above mentioned technologies and supporting facilities, Greenstone provides functional facilities that distinguish it from other digital library software. The functional features of Greenstone are analysed here.

Multimedia: Greenstone supports a wide variety of documents. The Greenstone collection can contain textual documents, pictures, audio files, video files and a combination of all of these. Hence Greenstone can be very useful software to a variety of institutions, for example,

video library, multimedia library, academic library, media library, etc. Greenstone also enables to write plugin to identify other types of documents which are not facilitated by default.

Generates CD-ROM databases: This feature and function of Greenstone separates it from other digital library software. This feature makes it a complete digital library software as one can also create CD-ROM based database. If a library wishes to create subject based collection on CD-ROM, Greenstone provides this facility. The databases created by Greenstone can be installed on any local computer and documents on it could be retrieved from here.

Flexible searching and browsing: Greenstone provides search as well as browse option. In search it provides simple and advanced search. It also provides option to search a field or full text of document. In Browsing one can browse the collection through author, subject, title, uploaded dates, etc. Browsing options can be selected at the time of building collection.

Real time operation: New collection in Greenstone can be installed without bringing the system down. Users who are online may also notice newly installed collection instantly.

Supports various metadata formats: Greenstone supports a number of metadata formats such as Dublin Core, RFC1807, NZLS (New Zealand Govt. Location Service), AGLS (Australian Government Locator Service) and many more. These metadata formats can be used by the organisations as per their needs. Moreover, an organisation also can create their own metadata format by choosing and creating metadata elements. It facilitates the organisation to manage various online databases such as video, audio, patent, newspaper clippings and multimedia effectively.

What you see-what you get (WYSWYG): Greenstone is an open source digital library software, available from the New Zealand Digital Library (ngdl.org) under the terms and

condition of GNU General Public Licence. It includes everything discussed in this section such as web access, capacity to generate CD-ROM based databases, etc. (Witten, Bainbridge, & Boddie, 2001). It also provides an auto install feature for easy installation on Windows and Linux.

Others: In addition to the above mentioned functional features, Greenstone provides various small features such as it can be installed offline also. Being multilingual it is supported by International communities in more than one language. It organises the document in hierarchical form that one may browse the collection in hierarchical way. Greenstone also facilitates distributed collections. Distributed collection means various collections installed on various computers, which may be presented to the users in the same way and through a single web page as a part of a single digital library.

Greenstone is supported by large community to provide technical assistance to its users worldwide. It has forums, Wikis, mailing lists, FAQs, user manuals, to support the users. Additionally, there are also a number of online training programmes organised by its developers and the community to inform users the features of Greenstone. Moreover, a number of conferences are also held to discuss Greenstone and workshops are conducted to provide practical hands on training to it. In addition to all, commercial support for Greenstone is also provided by a number of vendors worldwide. Greenstone is used by a huge number of organisations worldwide. The current version of Greenstone is 2.86.

5.2.3. EPrints

EPrints is another digital library software on the lines of DSpace and Greenstone. It is yet another highly used open source software for creating digital library after the above two. Eprints took its way at Southampton University in 2000. The historical background of EPrints

is discussed in Chapter IV. Originally the development of EPrints was supported by Cogprints, and presently it is supported by Joint Information Systems Committee (JISC) as a part of Open Citation Project. The technical features of EPrints are as below:

5.2.3.1. Technical features

Like many other open source software, EPrints is also an open source application and is distributed through the web without any cost and with liberty to modify, redistribute and adapt as per the need. However there are several features that differentiate EPrints from other open source digital library software. The technical features of EPrints are as follows.

True Open source based on LAMP technology: EPrints is developed on the LAMP architecture, however it is written on Perl instead of PHP (EPrints, 2013). All software used for EPrints are fully open source software and thus they do not attract any hidden or indirect costs to adopt it. It is licensed under GNU's General Public Licence which is a prominent licence for open source software.

Platform Independent: With a release in 2010 for Windows, EPrints has become a platform independent software. Now it can be installed on Linux, Mac or Windows. Linux is not a must operating system for using EPrints. A user of Windows operating system can also adopt EPrints.

User Interface: Unlike Greenstone, EPrints provides web based interface not only for user but also for the administrator that makes it easy for the administrator to manage the software from any computer on LAN or on WAN.

Supports Plugins: Being written in Perl, it is very easy to write Plug-ins for EPrints. It also supports third party plug-ins to get compatible with unknown formats.

Complies with International Standards: EPrints complies with international standards such as OAI-PMH and various Metadata standards. Use of these International standards makes EPrints compatible with other software and increase the interoperability of the software.

Multilingual: EPrints has used Unicode thoroughly; hence it may allow use of any language consistently.

Export and import: EPrints facilitates bulk import and export of record in several formats such as ASCII, BibTex, XML, etc. that helps to create large collection easily.

5.2.3.2. Functional Features

EPrints has a different working structure than that of DSpace and Greenstone. The functional overview of EPrints is as follows:

Three user role: EPrints has its work flow around three major roles, i.e., author, editor and administrator (Beazley, 2010). Author has to submit his/her documents or papers, editor's role is to review the submission before publication through the repository and administrator controls all back-end functions of the software that includes technical and functional structure.

Supports wide variety of media: EPrints supports a variety of formats such as PDF, JPEG, TIFF, HTML, etc. Those formats which are not supported by default can be recognized by using plug-ins.

Extended search option: EPrints provides extended search option that includes simple search, field search, and full text search. A search in EPrints scans through each metadata type entered in the database. In addition to the search option, EPrints also provides browsing

facility through which one can browse the collection on the basis of author, title, subject or date of submission.

Customisable metadata: EPrints supports a number of metadata schemas such as Dublin Core, METS, etc. In addition to this it also supports the customisation of the metadata that facilitates the creation of a metadata by defining the elements as per the requirement of the organisation.

SHEPRA/RoMEO Integration: EPrints provides integration with SHEPRA/RoMEO for quickly checking the publisher's policies and author's rights over the content submitted by them (Beazley, 2010).

Others: In addition to the above functional features, EPrints has many small features that attracted the large community to use it. EPrints provides RSS feeds for entire collection based on the specific criteria decided by the administrator such as author, subject, etc. Having a web interface has eased the end user submission to the repository. It supports Library of Congress Subject Heading for indexing and browsing of the collection.

At present EPrints has been reported in more than 270 organisations including British Library, Harvard College, Australia National University, etc. Like other open source software discussed above, EPrints also has a similar support. One may use the ready documents on EPrints web site, EPrints forums available on the web or can use the option of commercial support. A very active community is working behind the EPrints for its consistent development. The current version of EPrints is version 3.3.12 released on 24th July 2013 (EPrints, 2013a).

5.3. Other open source software for libraries

In addition to open source library management software and open source digital library software, there are a number of software available that can be used by a library. These software include Content management software, Journal management software, etc. Engard (2010) has listed a wide range of open source software in her book on practical open source software. She has also listed the experience of some libraries using those open source software. Some categories of open source software not discussed in the earlier sections that may be very useful in libraries are discussed in this Section.

5.3.1. Open Source Web OPAC (Online Public Access Catalogue)

When we say Web OPAC, an OPAC bundled in library management software reflects in our mind. However, here the concern is not about the default Web OPACs of library management software; open source web OPAC are the applications, integrated with Web 2.0 features, designed especially for converting the OPAC into a next generation Web OPAC without modifying the existing or default Web OPAC application of the library management software. These applications provide an additional interface for the users to retrieve the library resources with the help of a third party application known as catalogue overlay system or Catalogue 2.0. Some of the very prominent such OPACs are Acquabrowser, Scriblio, Vufind, SOPAC, Backlight, LibraryFind, Extensible catalogue, ObiblioOPAC for Joomla, OPACIAL, Drupac etc. An extensive comparison of many of these is done by Yangand Wagner (2010).These applications, however, are designed by using diverse structure and means, but the objective is to provide a next generation catalogue. Few of these are solely cataloguing applications while others provides catalogue integration as a feature of their main application, however the main application is not a library integrated system. Some of these applications are used frequently by the libraries such as VuFind, LibraryFind, and Scriblio.

VuFind is a solely web catalogue application integrated with a number of Web 2.0 features and was developed in Villanova University Library in 2007; however, it could detect only four users by July 2009. Using VuFind with any ILS needs bit of programming if it is not already supported by the ILS. The information on technical requirement for implementing VuFind and information about the various features is available on project website of VuFind[9].

VuFind, like other open source software, is released under GNU General Public Licence and available for download from its website. NewGenLib is programmed to adopt VuFind that makes integration of VuFind with NewGenLib very simple. Koha can also be integrated with it with little modification (Adara, 2011). Using VuFind will make the catalogue of library more advanced and dynamic.

LibraryFind[10] is another open source application to make the library catalogue more technical and attractive. It was developed by Oregon State University Library, United States in 2007. LibrayFind also provides various Web 2.0 features for information retrieval. Project site of LibraryFind provides all required information for the installation of this application on any computer. However, there is lack of documents providing information on integration of LibraryFind with Koha, NewGenLib or any other library ILS.

Scriblio[11], earlier known as WPopac, is the oldest open source OPAC with Web 2.0 application developed in 2006 by Host Plymouth State University, United States. Scriblio is fully based on Wordpress, the online content management application. Scriblio not only provides the library an opportunity to create a free website but also to integrate its OPAC with this website. The detailed technical notes on installation and working of Sriblio are available on its project Website.

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[9] http://www.vufind.org
[10] http://www.libraryfind.org
[11] http://scriblio.net

ObiblioOPAC for Joomla and Drupac are OPAC modules that can be integrated with Joomla or Drupal to configure a web OPAC on a website designed on Joomla or Drupal. These applications are rather simple than other applications as they are created in the form of a module. However, precondition for these applications is having Joomla or Drupal based website.

Although above applications are just an add-in for the ILS, they require tedious procedures to install and configure them with the ILS. This tedious procedures is one of the reasons for not attracting a huge number of users worldwide.

5.3.2. Open Source Content Management System

A content management system (CMS) is a software providing ability to create a website with dynamic features of Web 2.0 such as blog, RSS feed, discussion forum, surveys, wikies, podcasts, etc. Content management system is of two types: web based and an offline application. The Web based content management system lets the users not only to create website but also hosts them at the real time while an offline application enables users to create a website offline which the user can upload online by choosing host and registering domain name of his/her choice. Both types of options are available through proprietary and open source. However, free web hosting and domain name is not guaranteed in online content management system. Hence, it is always favourable to create a website using offline applications where users have the freedom to select the web hosting and domain name vendors. In offline CMS, a huge number of open source applications are available, however, very few are used by majority of sites. Wordpress[12], Joomla[13] and Drupal[14] are mostly used and highly referred CMS applications. Out of these three applications Wordpress covers

[12] http://www.wordpress.org
[13] http://www.joomla.org
[14] Http://www.drupal.org

maximum market than Joomla and Drupal due to its simplicity and ease. Joomla is on second place while Drupal is on third as it is difficult than other two, although it is very high-tech than others.

Joomla, Drupal and Wordpress, all three being open source, are developed on PHP and MySQL. However, they dynamically differ in terms of their capabilities and features.

Wordpress is the simplest CMS of the three listed above. It was released in 2003 under GNU's GPL license making it complete open source software. One can design a blog or a website using Wordpress easily. However, those who wish to create more dynamic website may prefer Joomla or Drupal. The project page of Wordpress has enough number of document to assist in its installation and using its modules. Wordpress enables users to handle it from multiple points hence it is a multi-author CMS tool. It is a user friendly tool having a plugin library to add various features in the website. A beginner may easily opt for it for creation of a library blog or a simple library website. There is also a service, i.e., Wordpress.com, where users not only can create websites but also host it free and get a free domain name. The drawback of Wordpress is its limitations. It has limited designs, limited plug-ins and limited content management capabilities that make Wordpress a good blog creation tool but very basic CMS for the newbies. However, in terms of use, Wordpress is at the top of all three CMS. Some featured websites created with Wordpress are metro.co.uk (Metro, Newspaper, UK), tv.msnbc.com, blogs.loc.gov/loc/ (Library of Congress, blog), library.plymouth.edu (Playmouth University, Library, lis.uncg.edu (University of North Caroline, Library), etc. A comprehensive list of many other sites using Wordpress is given on the project page of Wordpress.

Joomla is another open source CMS and winner of several awards for its wonderful features. It was released in 2005 and is licensed under GNU's GPL, the open source license. The great

advantage of using Joomla is its strong developer community[15] that is always ready to support the users of Joomla. Like Wordpress it is a user-friendly CMS tool that requires no technical or programing knowledge to handle it. However, having a technical knowledge is always a benefit in creation of any website or blog. Joomla is a more powerful tool than Wordpress, having many extension tools that include plug-ins, components, templates, modules and languages. Joomla is also supported with a large number of manuals for its installation and modular handling. The weakness of the CMS is that one cannot start working straight forward with Joomla, one needs to learn crunch of it before working on it. However, it helps one to develop a site which has more structural stability and content than Wordpress. Some featured websites created with Joomla aregsas.harvard.edu (Harvard University), statelibrary.sc.gov (South Carolina State Library), www.librarynext.com (LibraryNext, India), etc.osu.okstate.edu (Oklahoma State University) and many more can be explored on Joomla project website.

Drupal is another prominent open source CMS that came into existence in 2001 with its distribution under GNU's GPL license. Drupal is exceptionally powerful and developer friendly CMS. It is very flexible to develop powerful blogs or a dominant website. It has more features and possibilities than Joomla or Wordpress. Project page of Drupal provides a number of manuals to help in installation and working on Drupal. However, it requires more expertise in using a CMS than Joomla and Wordpress. Drupal with a large number of modules and themes makes itself very useful for making websites with great features. The current version of Drupal is 7.23 released on 7th August 2013. Some featured websites that developed using Drupal are thewhitehouse.gov (White House, USA), data.gov.uk (Govt. of UK), science.mit.edu (MIT School of Science), library.unt.edu (University of North Texas Libraries), and college.du.ac.in (Acharya NarendraDev College, India), etc.

[15]http://community.joomla.org/

Although there are a number of open source CMS available, but the three discussed above are the most important and prominent of all. Using any one of these three may be useful in all respects, i.e., security, documentation and support.

5.3.3. Open Source Journal Management and Conference Management Software

Public Knowledge Project[16] is the developer of Open Journal System (OJS), Open Conference System (OCS) and few other software. OJS is an open source software developed with the objective to provide a solution to host and manage all aspects of publishing a journals online such as call for paper, receiving manuscripts, forward them to editors, resending to author for correction, peer review, publication of an issue, and retrieving the current or older issues and journals. OJS made each of these works very easy and convenient. Any organisation publishing a periodical can easily manage all operation related to Journal with OJS. It is an open source software released under GNU's SGPL license.

Open Conference System on the other hand, is another important software that is used widely. A conference, symposium, workshop, etc. can be managed and handled with the help of OCS. OCS is compatible to handle every operation of a conference management including publication of conference paper. Like OJS, OCS is also released under GNU's GPL licence that makes OCS an open source software. In addition to these two software, Public Knowledge Project has developed Open Monograph Press (OMP) and Open Harvester Software (OHS) designed on the basis of OJS and OCS.

All these software are user friendly and can be installed on any platform. Installation of these software is easy. The manuals of working on software are available on its project website.

[16] http://pkp.sfu.ca

5.4. In Summation

The open source software has given the libraries a chance to provide the users the services comparable to the libraries with huge economic and technological resources. Open source software could be adopted at a very low cost without any vendor lock in and with the source code. Then one can increase the innovation and adaptation of the software by modifying the source code of the software. Open source software are imperative for any type of library, i.e., academic, public or research. The philosophy of open source software revolves around two principles, viz., sharing and collaboration. These principles are very much acceptable and adaptable in libraries too. Hence, the open source software and libraries are natural fit, as both promote learning and understanding by dissemination of information (Poynder, 2001). Open source software come to libraries as exciting opportunities to fulfil the expectations, roles and process which are critical to the library's community of patrons. These open source software are available in many categories as discussed in this chapter and hundreds of other categories which are important to an individual or organisation at any level. OSS in libraries are available for every function that can embrace the quality of service provided by the libraries. A library having a single computer with internet connection can easily adopt and implement these open source software. Open source software does not require high license fee or high configuration fee for the software implementation in the library. Moreover, open source software also has the possibility to get the commercial services of the vendors, if the library is willing to have it.

Open source software with these opportunities also pose some challenges forward. If an organisation is not having techno savvy staff to implement these software then it may attract a cost by hiring a vendor to implement it. Another challenge is that generally open source does not offer the same kind of support as a proprietary software does. At the time of any error or bug libraries with proprietary software may easily call the vendor and get the

problem solved, but the case is not the same in case of open source software. Here the person dealing with the software has to solve the problem himself or herself. S/he has to rely fully on the community forum of the particular open source software which may take time to solve the bug or error. Open source software can be a daunting game for those who are not having programming knowledge and confidence or are not techno savvy.

However, these challenges are no reason to not choose open source software, but just are the challenges that need to be taken care of. These challenges can be faced even when a library has commercial software. A library must select the software keeping these challenges in mind. There are a number of excellent open source software as discussed in this chapter which are available and are endowed with tremendous features but a library need to keep in mind the resources available with it while choosing the software. If one chooses an open source software keeping in mind these challenges and the available resources (technical expertise) then there can be no better alternative than open source software. The next chapter deals with the optimum software model that a library can adopt.

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CHAPTER VI
OPTIMUM OPEN SOURCE SOFTWARE FOR A LIBRARY: A MODEL

6.1. Background

Preceding chapters of this work dealt with the concept of open source software and available open source software in general and with reference to libraries in particular. The analysis revealed the availability of a number of open source software for libraries. However, a library cannot not use all the software together; it has to select an appropriate and optimum product suitable to the needs of that particular library. Selection of the software for a library has always been seen as a challenge. There are several research publications available that deal with the criteria to keep in mind while selecting an open source ILS or digital library software for library. Ramsay and Chamberlain (2012) have developed a comprehensive guide that focuses on the decision process in selecting an ILS for a library. They listed a huge list of features that should be taken into consideration while choosing an ILS for a library. Nabi Hasan (2009) discussed several challenges in choosing an optimum ILS or digital library software such as, operating system used in the organisation, capability of software to run over LAN or WAN, total cost of implementation (direct or indirect), etc. Tristan Muller (2011) did analysis of 20 free and open source ILS for the library and came up with two software as his recommendations. However, this analysis is based on standard ILS features only and did not consider the technical skills and resources available with the library.

None of the studies, discussed above or available in literature, proposes an appropriate model of open source software or any single software that could be accepted by any type of library. Actually, choosing and implementing an open source software is a very crucial step in library automation. An organisation invests a lot of time, if not money, in making it live, and if it is

done without a proper homework it may prove very expensive. The available studies just explain a number of criteria to be considered while going for an open source software or evaluate the available open source software by one way or other, but none of them suggests any particular software out of a number of software available on the Web. Moreover these studies completely miss out one most important criterion, i.e., resources available with the library adopting any open source software. This chapter puts forward open source software model for a new library that wishes to have its system automated. This model is created considering the criteria of open source software selection and the presuming minimum financial and technical resources are available with the library. This model would be very helpful for the libraries of Indian and other countries that are willing to move to open source software but do not have the financial resources and technical resources for evaluating and selecting an optimum software. Additionally those libraries which have enough financial resources would also be able to adopt this model to make the library services more dynamic.

6.2. Basic Criteria

The financial and human resource situation of the library should be the single most criterion while selecting any open source software. Generally any study for selection of open source software misses out this criterion and concentrates on the features provided by the software. But the model given here gives primary consideration to this criterion before considering the features of the software because the features of software are useless if the library adopting the software is not able to use these feature for one or the other reason. The following conditions are considered as the basic criteria for adopting the model suggested.

- The minimum requirement for this model to become operative is merely a computer with a decent internet connection. It is understandable that a library will think for automation only if it is having these two things. The present model is suggested with

the presumption that the library that wishes to move for an open source software is having only the minimum hardware package and does not have anything else.

- The second consideration is the operating system used on the computer available in the library. Although Linux is an open source software and available without any charge; but Windows is used by more number of users in home and office computers including libraries. Hence, it is presumed that the library that wishes to adopt an open source software is having a Windows operating system on its computer.
- The third consideration is availability of technical expertise with the library. Here it is presumed that the library does not have expert personnel in computer software and the library staff is just computer literate to use the computer to get their work done on computer without having much of technical expertise. It is further presumed that even the parent organisation of the library does not have IT experts in the organisation.
- The forth consideration is regarding the availability of financial resources. It is presumed that the organisation is not in a condition to spend huge funds on library to purchase an expensive software or to pay annual maintenance cost (AMC) to maintain an open source software.

After considering the above conditions, which actually are the ground realities in our country for most of the libraries, the features of suggested open source software are considered. The library open source software model presented here mainly consists of two software one of which is ILS and another is institutional repository software/digital library software. However this model also suggests other open source software for managing online journals and other electronic content but such software are useful for the libraries having more than the minimum conditions discussed above as these software definitely require more funds and expertise to make optimum use of them.

6.3. Open Source Software for Libraries: an Optimum Model

This model as discussed above includes the basic software for a library, i.e., an ILS and a digital library/institutional repository software. However the basic need for a library is an ILS but a digital library software is also important to host the scholarly articles by the staff of the institution and dissertations and theses by the students. In addition to these two software presented, this model also includes some other additional software that may be helpful for the library such as a content management software and a software to host a journal or a conference.

6.3.1. Most Suitable Optimum Open Source ILS: NewGenLib (NGL)

Under the category of open source integrated library systems, NGL is most optimum and adoptable in every type of library. There are a number of reasons to justify NGL as the most optimum software for any type of library. Firstly if we consider the evaluation criteria most of the studies prefer Koha and Evergreen while the studies done in the last two years have increased the option by including NGL. The reason behind this is that in the last two years NGL has emerged as a strong competitor of Koha and Evergreen. A number of studies from India has recommended NGL (Giri, 2012; Singh K. , 2013; Singh & Sanaman, 2012).NGL more or less has all features and modules provided by Koha and Evergreen. The details of the modules of these software are already given in Chapter V, hence that will not be repeated here. A perusal of these features reveal that its features are no less than Koha's although Koha is recommended by more studies than NGL. The reason of it is that Koha was released long before NGL. However, the present model recommends adoption of NGL.

The major reason to give weightage to NGL over Koha is the first basic criteria mentioned above, i.e., it is fully applicable in any type of library with or without finance, with one or

more computers and with minimum technical expertise. The details of the reason to recommend NGL are as following.

Platform independent: NGL is a platform independent software, i.e., it can be installed not only on Linux but also on Windows or any other platform. Koha, which is recommended by majority of studies, is based on Linux only and cannot be installed on Windows. However, a version of Koha was developed for Windows but it could not grow well and stagnated with its last version 2.2.9 released in 2009. In fast growing technological era it is not recommended to go with a product which is not developing in real sense of the term. Also version 2.2.9 is good for circulation and cataloguing only. Other version which is still developing is Linux based and is difficult for those who are not familiar with Linux operating system. It is a well-known fact that most of the computer users prefer and are comfortable only with Windows platform. Although installation of Koha is eased with the help for live CD but still it needs enough knowledge of Linux to work on it. NGL is preferable due to its compatibility with Windows platform too.

Free live support from developers: NGL is the only software that provides free live support to the libraries opting for NGL or who wish to adopt it. The NGL team has started a NGL adaptation program under which they help the libraries to install the software. Moreover, they provide an online training through which users can get informed about the practical use of NGL. As a general practice NGL provides live support to the libraries using NGL, in case they face any problem or bug. Any issue of the library can be resolved by NGL team using desktop sharing tools such as Team Viewer and/or Ami Admin. Thus, NGL is recommended to the libraries looking for a suitable software or want to move from their present software. Although like NGL, Koha also has several sources to provide the help to install and learn the software, but there are no live help available from the developer or any agency free of cost.

Users of Koha need to depend on available forums and documentations or they have to opt for commercial option for live support. Hence NGL is more effective and reliable for this reason also.

Free Data Conversion: Another major reason to recommend NGL is its free data conversion service. It not only helps the libraries that want to adopt NGL as their first library automation software, but it also helps the libraries to migrate from on library automation software to another library automation software. If a library is already running on a library management software and wants to migrate to NGL, the NGL team will help the library to migrate their existing data in NGL. There are no charges for it. If a library has maintained their catalogue in Microsoft Access or Excel, then also NGL team will convert the data into needed format to make NGL running in the library. Such support will save huge time to enter data in software and in no time whole catalogue can be automated. In case of Koha there is no such free service. The library has only one way, i.e., to hire a commercial vendor to convert the data into Koha format; as this would incur additional cost there is a possibility that the parent organization may not allow this.

User Friendly: Another reason to recommend NGL is its simple user interface. Using NGL is very user-friendly and does not require very special skills. Even MARC format of cataloguing is simplified in such a manner that it does not pose any confusion in the mind of a cataloguer. A number of templates are preconfigured to save time and efforts of the cataloguer. If it is compared with Koha, NGL cataloguing module is much more simplified than Koha where a cataloguer needs to have full knowledge of MARC tags for cataloguing of books. Moreover, in Koha, a wide number of configurations are required while NGL is fully preconfigured and just requires filling basic configurations which varies from library to library.

Continuous development: Yet another essential reason to recommend NGL is its continuous development. NGL Team is continuously working on the features of the software. They come with a new version in every 45 days. The continuous development is recommended for any Software. This consistent advancement makes the debugging of errors of last version faster and easier.

Features: Koha is very well known open source software and has very advanced features in comparison to Evergreen. However, NGL has grown over the time with continuous development and competes well with Koha. . Features in both Koha and NGL are advanced. The users of NGL may not find any deficiency when it is compared with Koha. It has maximum features of Koha and many other advanced features which are not available even in Koha. Some of these are, Web 2.0 enabled catalogue, SMS service to users on book issue and return and digital library capacity. In addition to these, there are a number of functionality which makes NGL more powerful software in comparison to Koha. Hence features of NGL compete well with Koha and also have an edge over it owing to the reasons mentioned above and can be accepted in any library.

When we consider the above criteria, it becomes very easy to understand that NGL is more compatible for an average library functioning under the presumptions made above. Not only those libraries which are technologically or financial weak but the libraries with strong financial and technical support can also adopt NGL as their library management system. Thus, in library management system NGL is recommended over Koha. NGL can be adopted by the libraries without any fear and trouble.

6.3.2. Most Suitable Open Source Digital Library Software: DSpace

Under the category of open source digital library software three software are prominent they are DSpace, Greenstone and EPrints. If we consider the features as discussed in the preceding chapter, none of these is complete or can satisfy every need of every user. All these software have their own specifications and features that cannot be substituted by other digital library software. However, according to Registry of Open Access Registries (n.d.), DSpace is dominating all other digital library software with 1383 registered repositories out of 2893 total registered repositories. Majority of the experts also suggests DSpace as their first preference (Kumar, 2009; Trambu, 2012; Lal & Prasad, 2013; Kökörčený & Bodnárová, 2010). For the purpose of this model also DSpace is suggested as the most suitable software over greenstone and EPrints. Greenstone, on the other hand provides a single click installation and has the ability to enable users to create CD ROM based database for their libraries. However, in overall evaluation of digital library software DSpace is found more suitable.

The major reason to consider DSpace is its simple workflow and platform independency. DSpace can be installed on any platform whether Windows or Linux, 32bit or 64bit. It also provides a very simple workflow that does not take much time to understand. It provides step by step workflow which a user can follow easily. The details of the features dominating Greenstone and Eprints are discussed below.

User Interface: DSpace provides a very simple single web interface for admin and user. Admin, after login to the account, can access all of his rights while other user may enjoy the rights of a user. From this interface user can search and browse the collection while admin can add communities and collections.

Platform Independent: DSpace is platform independent and can be installed on any platform while Greenstone cannot be installed on 64 bit Windows system and EPrints is primarily made for Linux though it has started development on Windows too.

Simple workflow: The workflow of DSpace is one which is most competitive among all digital library software. It provides very simple workflow which does not require very rigours training to understand. The functionalities of DSpace is very simple to work on and applicable in any library.

Simple object management: DSpace provides an easy and simple object management system. The object display is decided during the workflow only. Greenstone on the other hand requires programming to manage the object information display. To display information in a proper way administrator requires creating a tag using programming skills.

Access Control: Access control feature of DSpace is unique in all digital library software. DSpace has a concept of people and group which are created by administrator and assigned powers to upload the documents into the collection. The access is provided through password X509 certificates and LDAP. Greenstone is limited to two predefined groups, i.e., administrator and collection builder. In EPrints registered users can create and edit objects.

DSpace is a suitable digital library management software that may fulfil all general needs of an institution such as collecting and preserving the articles of the staff, dissertations of the students and other documents. However, there are also some challenges. First the installation of DSpace is not as simple as Greenstone. Greenstone provides a single click installation whereas DSpace requires installation of a series of programs to make DSpace operable on the computer. Secondly, to install DSpace an internet connection is required. During installation of DSpace some components are required to be downloaded from the Internet as installation

process. Third, DSpace cannot create offline CD ROM based databases that Greenstone can do. And lastly if an organisation needs to deal with various kind of documents such as patent, newspaper cuttings, diverse category of videos where different metadata format is required one many choose Greenstone. However, overall DSpace is the best option for those libraries which do not have specific objectives.

6.3.3. Other Optional Open Source Software

However a library having minimum resources requires only an ILS to run in the library. Only when the librarian is more active the library may go for a digital library software. The combination of these two software, i.e., NGL and DSpace may be called a complete model for a library. However, in this digital age libraries have to go beyond the traditional concepts of library and have to get involved in a number of activities which demands additional tools rather than just ILS and DLS. The libraries today are hosting and managing online journals and run their own CMS to provide information to users. Many librarians, to have a proper management and updating, wish to make a website themselves and many others who are hosting online journals wish to do the same. Those who wish to do this may opt for the following software for satisfying their needs.

6.3.3.1. Open Source Publishing and Review Management Software: Open Journal System

Open Journal System (OJS) is the best open source journal management software. It provides a complete solution for publishing an electronic journals as well as carrying peer review process. The installation of OJS is very simple and does not pose any difficulties to the users of the software. The software and relevant documents on working of OJS are available on its project site, i.e.,www.pkp.sfu.ca.

6.3.3.2. Open Source Content Management System (CMS)

In this category, it is difficult to suggest and single CMS that may fulfil all requirement of the user. CMS may be used as a process of learning. Those who are at initial stage may use Wordpress which is most simple and able to do all to make a website with blog. But as the need raises one can move from Wordpress to Joomla and from Joomla to Drupal. Drupal is most sophisticated CMS software having a number of modules. If a librarian has some technical expertise and courage to handle some levels of difficulties may opt for Joomla or Drupal directly. One who opts for Drupal will be able to do all the jobs with Drupal and a number of free modules are available for it. Installation of all three is simple. Installation and other manuals are available on their respective project sites. More details of these can be found in Chapter V of this research report.

6.4. In Summation

Open source software are of great benefit to the libraries and the individuals. The need is of just identifying and selecting the correct one out of a number of OSS available. At the time of selection of software, besides considering its features, one must take care of the available resources to adopt the OSS. This model, i.e., NGL for ILS and DSpace for DLS is presented keeping in mind the minimum requirements, minimum availability of resources and use of Operating Systems. However, it does not mean that those who have enough finance may not go for this model or the model is having less features. The OSS model suggested here carries almost all features which are generally found in a commercial software. For example, DSpace which is a suggestion of this model is used widely by the libraries to build their digital libraries. In ILS, Koha is used by wide number of organisation worldwide while the suggestion of this model is NewGenLib. Such a suggestion is being made because although Koha is the oldest library management software and popular worldwide, but its Windows

version has stagnated with its last version 2.2.9 released in 2009. Whereas, NGL is new software developed in India itself. NewGenLib is now attracting the libraries worldwide and feature wise it is very competitive to Koha, with the additional benefit of its platform independency.

These two software have the ability to manage a library as well as to create a digital library. However, those who wish to go beyond this by creating a website and launching an online journal may opt for OJS and Wordpress to fulfil their objectives.

This chapter on optimum model of open source software fulfils the third objective of the present study. It is hoped that this model will help the libraries not only in selecting open source Integrated Library Software and Digital Library Software but also in going much beyond.

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CHAPTER VII
OPEN ACCESS MOVEMENT: AN ANALYSIS OF ITS DEVELOPMENT AND IMPACT ON LIBRARY AND INFORMATION SERVICES

7.1. Background

Invention of printing press in 1440 by Johannes Gutenberg must have given relief to billions of people who have been aware of the destruction of knowledge in the form of handwritten manuscripts in various conflicts. Some of these unforgettable events are Burning of Nalanda University library and burning handwritten manuscripts during Hussite crisis. "Dharm Ganga" in 1193 by Muslim invaders. This library was very huge and contained thousands of volumes of precious handwritten manuscripts in three buildings. The Persian historian, Minhaj-i-Sirajin, in his chronicle the Tabaquat-I-Nasiri reported that "the burning of the library continued for several months and smoke from the burning manuscripts hung for days like a dark pall over the low hills" (Nair, 1987). Similarly, in early 1400s during Hussite crisis, about 200 manuscripts were burned with the order of authorities of the kingdom (Butler, 1997). It is definitely impossible to bring those manuscripts back which were destroyed in such events, but invention of printing press gave humanity a chance to create multiple copies of a single work and so that the work may be available for humanity forever. However, invention of printing press proved a major relief as it made it possible to create multiple copy of a single work and to keep it long lasting. The most immediate effect of this invention was the production of greater number of books at a more reasonable price to the common man.

However, this free flow of book production could not go for long as a series of Copyright Acts started throughout the world. By 1886 these laws were implemented at international level through Berne Convention. TRIPS (Trade Related aspects of Intellectual Property Rights) of 1995 and WCT (WIPO Copyright Treaties) of 1996 were extended forms of copyright laws providing more protection to the creator of intellectual property. Though, there are some relaxations in these laws for academic purposes, but no provision for free or open access. A very important notice in the development of copyright is that before India singed the WTO treaty, we had a patent law which did not permit application of a patent for medicine and food, but, after signing these treaties, India was compelled to change its Patent Act and made medicine and food patentable just to comply with the provisions of the WTO treaty.

Science and technology also developed after renaissance and the inventions were protected by Patent laws; at the same time the writings on such research were also protected by copyright laws. The research results were published in the form of scholarly journals since 1665 with Journal de Sçavans (5 January, 1665) and Philosophical Transactions of Royal Society (6 March, 1665). Since then four things have kept increasing day by day, first research results, second publication of scientific journals containing research papers, third copyright protection to these journals, fourth and most importantly cost of journals. Increasing cost not only compelled the institutions to reduce the number of subscribed journals to cope with the available budget, but also narrowed down the circulation of results of research done in various fields. This, in addition to the invention of Internet and WWW, made people to think about open access.

7.2. Scholarly Publishing

Scholarly publications in the form of periodicals started with the initiation of scientific journals, 'Journal de Sçavans' and 'Philosophical Transactions of Royal Society' in the 17thcentury. Since then, these have become the first choice of researchers and scientists for publishing their research results. In next 340 years, a number of organizations throughout the globe were prompted to run thousands of quality scholarly journals. But an explosion of scholarly publication was seen only by 19th century prompted by increasing specialisation and diversification of scientific and academic research and also low-cost publication using cheap wood pulp based paper (Valauskas, 1997). Some of the publishers emerged as typhoons of the scholarly publication industry that covered a big part of global scholarly publications. Today, around 2000 periodical publishers are a part of journal publishing industry, but the top three journal publishers, viz. Elsevier, Springer-Kluwer and Willy-Blackwell, account for approximately 42% of all published journal articles and no other publisher accounts for more than 3% share of journal publication market (McGuigan & Russell, 2008).

The concern here is not the holding of journal publishing market by few journal publishers, but the consistently increasing cost of journal subscription resulting into serial crisis. This serial crisis has compelled almost every organization of the world either to cut in the number of journal subscription or to increase the budget involved in the journal subscription.

7.3. Serial Crisis and Journal Pricing

The unfailing increase in journal subscription cost led to the coining of a new term, 'Serial crises'. The journal subscription cost has constantly escalated during last 30-40 years. Statistics from some of the reputed organizations in the world are very shocking and surprising. The statistics from ARL (Association of Research Libraries) show that during 1986-2006 the ARL members managed to increase their budget by 321% while increase in serial number subscribed during this period was slightly ahead than what they had in 1986, i.e., 51%, whereas the growth in the unit cost of a periodical was observed 180% (Kyrillidou & Young, 2008, p. 13).

Not only this, but in 2003, well reached universities such as Harvard, Cornell, California, Duke, MIT, and several others cancelled their Elsevier subscriptions or dropped their subscriptions to hundreds of journals (Willinsky, 2006). Elsevier is considered as the costliest journal publisher in the publishing industry. In 2002, it accounted for 50% of the University of California's online serial budget, although its titles accounted for only 25% of total subscription (Willinsky, 2006). Willinsky has given detailed account of journal subscription in his book *The Access principle*. In a recent newspaper article by Ian Sample, published in the Guardian, he reported that the Harvard University also cracked to sustain the subscriptions of paid journals (Sample, 2012). The article reported;

> A memo from Harvard Library to the university's 2,100 teaching and research staff called for action after warning it could no longer afford the price hikes imposed by many large journal publishers, which bill the library around $3.5m a year.
>
> The extraordinary move thrusts one of the world's wealthiest and most prestigious institutions into the centre of an increasingly fraught debate over access to the results of academic research, much of which is funded by the taxpayer.
>
> The outcome of Harvard's decision to take on the publishers will be watched closely by major universities around the world and is likely to prompt others to follow suit.
>
> The memo from Harvard's faculty advisory council said major publishers had created an "untenable situation" at the university by making scholarly interaction "fiscally

> unsustainable" and "academically restrictive", while drawing profits of 35% or more. Prices for online access to articles from two major publishers have increased 145% over the past six years, with some journals costing as much as $40,000, the memo said.
>
> More than 10,000 academics have already joined a boycott of Elsevier, the huge Dutch publisher, in protest at its journal pricing and access policies. Many university libraries pay more than half of their journal budgets to the publishers Elsevier, Springer and Wiley.
>
> Robert Darnton, director of Harvard Library told the Guardian: "I hope that other universities will take similar action. We all face the same paradox. We faculty do the research, write the papers, referee papers by other researchers, serve on editorial boards, all of it for free … and then we buy back the results of our labour at outrageous prices.
>
> "The system is absurd, and it is inflicting terrible damage on libraries. One year's subscription to *The Journal of Comparative Neurology* costs the same as 300 monographs. We simply cannot go on paying the increase in subscription prices. In the long run, the answer will be open-access journal publishing, but we need concerted effort to reach that goal."
>
> In traditional journal publishing, researchers submit articles to editors who send them out for peer review, a task that is usually unpaid. The final versions of the articles are then formatted and sold back to university libraries. Open access comes in various guises, but one model requires authors to pay to have their articles published and made freely available to anyone.
>
> According to the Harvard memo, journal subscriptions are now so high that to continue them "would seriously erode collection efforts in many other areas, already compromised". The memo asks faculty members to encourage their professional organisations to take control of scholarly publishing, and to consider submitting their work to open access journals and resigning from editorial boards of journals that are not open access.
>
> It adds that the library must insist on transparent contracts that prevent universities from discussing in public the fees they pay certain publishers." (Sample, 2012)

"The answer will be open access publishing" the hope of the Harvard University researcher is the hope of the whole world. The libraries throughout the world face a similar situation. Smaller libraries somehow manage to subscribe minimum journals. However the amount invested by them may be very useful for providing other facilities to their users. Commercial journals must be substituted with open access journals but this requires unity of research scholars worldwide.

So such voices from affluent libraries like Harvard Library do make an impact on the thinking of other libraries and information professionals. Further, it was hoped that the transformation from print to online will reduce the subscription cost to a considerable level. Moreover, Steven Harnad after launching his free online journal '*Psychoquy*' with the sponsorship of American Psychological Association in 1989, observed the difference of costing in print publication and online publication (Okerson & O'Donnell, 1995):

> "If we charged PSYCOLOQUY's readership (now estimated at 40,000) their share of the true costs, they would have to pay 25 cents per year (down from 50 cents a couple of years ago, as the readership grew and costs actually shrank; and thanks in part also to centralized subscriber-list handling at EARN, much of it automatized, as well as to developments such as gopher and world-wide web, which are rapidly replacing the subscriber model by the browser model altogether in electronic publication)."
>
> (Okerson & O'Donnell, 1995)

And he claimed

> "My claim that the true per-page cost of electronic publication will be 25% of current per-page paper costs rather than the 75% that has been quoted over and over, has been challenged and I have attempted to support my estimate above."
>
> (Okerson & O'Donnell, 1995)

But online publishing did not make real differences even in online models, rather it put forward other purchase models also, such as pay per view and bundled subscription licensing. Pay per view is generally meant for the researchers who wish to purchase or download a particular journal article. The costing of this option is too high for an individual purchaser. A newspaper article by George Monbiot (2011) published in *The Guardian*, stated the following in this concern:

> Reading a single article published by one of Elsevier's journals will cost you $31.50. Springer charges €34.95, Wiley-Blackwell, $42. Read 10 and you pay 10 times. And the journals retain perpetual copyright. You want to read a letter printed in 1981? That'll be $31.50.

> Of course, you could go into the library (if it still exists). But they too have been hit by cosmic fees. The average cost of an annual subscription to a chemistry journal is $3,792. Some journals cost $10,000 a year or more to stock. The most expensive I've seen, Elsevier's Biochimicaet Biophysica Acta, is $20,930. Though academic libraries have been frantically cutting subscriptions to make ends meet, journals now consume 65% of their budgets, which means they have had to reduce the number of books they buy. Journal fees account for a significant component of universities' costs, which are being passed to their students. (Monbiot, 2011)

Hence, it is very difficult for an individual to pay such a huge amount for reading a single journal article. At the same time, libraries also find it challenging to subscribe scholarly journals especially in the field of Science, Technology and Medical Sciences, when the costs are rising steadily. Increasing cost of journal is resulting in constant decrease in the number of journal titles subscribed by the libraries. This situation is mounting the problem of serial crisis all over the world. Some of the Journal publishers quote the increase in peer review process of the articles as a reason for this rise. But the article reports the profit of journal publishers and publishing norms:

> The returns are astronomical: in the past financial year, for example, Elsevier's operating profit margin was 36% (£724m on revenues of £2bn). They result from a stranglehold on the market. Elsevier, Springer and Wiley, who have bought up many of their competitors, now publish 42% of journal articles.

> More importantly, universities are locked into buying their products. Academic papers are published in only one place, and they have to be read by researchers trying to keep up with their subject. Demand is inelastic and competition non-existent, because different journals can't publish the same material. In many cases the publishers oblige the libraries to buy a large package of journals, whether or not they want them all. Perhaps it's not surprising that one of the biggest crooks ever to have preyed upon the people of this country – Robert Maxwell – made much of his money through academic publishing. (Monbiot, 2011)

Moreover, in most of the cases peer review is a process where authors submit their article to the editors, who review the article, it is a job which is mostly unpaid. But many a time, authors are required to pay a publishing fee to get their article published in the journals.

Subscribing scholarly journals is an unavoidable requirement for academic and research institutions to disseminate the result of research done throughout the world. The profit of the publishing industries seems very high in an environment where the whole world is passing through inflation crisis. Sonya White and Claire Creaser (2007) in their report, regarding increasing price of journals, put forward some eye opening facts through their research which are as follows:

- A median price of Elsevier biomedical journals was £859 in 2006 while the same of Oxford University Press was £198.
- In this period a price rise for biomedical journal was observed to the extent of 104%. Per page price rise increase was £1.06 which is about 75%.
- A median price rise in social science journal was observed to 120% for the period of six years, i.e., 2000-2006. And the price rise for per page was 91%.

This report was supported by Oxford University Press and included the period of only six years. Being supported by a journal publisher, the research may have carried out from the publisher's perspective but still the statistics of price rise are unbearable for an academic library which has a very limited budget.

This price rise during the last four decades drew the attention of a number of scholars which resulted in production of several articles related to price hike in scholarly publishing. Lloyd Davidson (1989), Life Science librarian of North Western University, finds that "the cost of journals these days has risen much faster than the cost-of-living index. This has forced many institutions, including mine, to begin cancelling all those journals which are at all peripheral to the major research areas we serve."

The crisis in scholarly publication not only has devastating effects on academic and other libraries, but also has made it more difficult for researchers to carry out their research. Open

access is now the only way to fight the monopolies of scholarly publishing industries and to provide bondless access to research result, which is mostly carried out using public funds.

7.4. Journey towards Open Access: A Historical Analysis

A movement does not start at a jerk but takes ages and ages to be formed. A movement is the result of an idea that comes into the mind of a person. The idea spreads and collects supporters and oppositions. If the idea is based on 'Public good' then it may get huge popularity. If this popularity of idea inspires the world to form organisations to carry on this idea, then it may be termed as a movement. The history is full of such movements like the Independence movement of India, Dalit Movement, Feminist Movement and many more. Open access movement is one of such movements which is based on 'public good' and is in its initial phase.

Though open access movement traces its formal history to Budapest Declaration in 2002, it has a long informal base, which took open access to a worldwide movement. Some of the reasons have been discussed above, i.e., exorbitant increase in journal price and monopolies of journal publishers. Other includes the aspiration of people to make the knowledge of the world within the reach of every individual of the globe. And these wishes could come true when Internet and World Wide Web have come into existence.

The pioneering effort to make full text in open access was made by Michael Hart, the founder of Project Gutenberg. He was credited to create the first e-book in 1971 through his 'Project Gutenberg'. Its mission was "to break down the bars of ignorance and illiteracy" (Hart &

Newby, 2004). Michael Hart invested his life time earnings, i.e., around $100 million in making e-books available on Internet through Project Gutenberg, which now has a collection of more than 30,000 e-books in 60 languages available for people without any restrictions. Although the collection was of copyright free books, but it was an effort to make books within the access of people without charging any download or reading fee which is the main objective of open access movement.

During late 80s, researchers and library professionals had already started to talk alternative ways of scholarly journals. They were worried about the constantly increasing price of scholarly journals. Peggy Johnson (1990) discussed about price rise of serials and some solutions to avoid it. The suggestions include self-publication or journal by institutions and to avoid submitting articles to high cost journals (Johnson, 1990). During these days, in 1979, George Soros founded Open Society Foundation to pursue his ambitions of establishing open societies in place of authoritarian forms of government (Open Society Foundation, 2010).

In 1987, first free peer reviewed journal was observed when research students of Nova South-eastern University, Florida, launched '*New Horizons in Adult Education'* through their network Adult Education Network (ADENET) (Nova Southeastern University, 1987). Presently this journal is managed by Florida International University. The journal is renamed '*New Horizons in Adult Education and Human Resource Development'* (Florida International University, 2006). *Psycologuy* was another free journal published in 1989 and started peer review process in 1990. *Psycoloquy* as mentioned earlier was sponsored by American Psychological Society and launched by Steven Harnad (Okerson & O'Donnell, 1995). In the same Year, University of Houston launched another free journal named *The Public-Access Computer Systems Review* under the editorship of Charles W. Bailey (Wikipedia, 2012). The year 1989 also observed the launch of Newsletter of Serial Pricing Issues which fire the talk

on serial crisis and issues of price increase in scholarly journals. After 1989, every year observed inauguration of at-least one free electronic journal.

A big milestone in Open Access came in 1991, when Paul Ginsparg started an online archive for *Physicist,* i.e., XXX.lanl.gov. It was an institutional repository of Los Alamos National Laboratory developed with an objective to save the articles submitted by the scientists of the organisation to a common place instead of mailing to individuals. In 1998, it was renamed to arXiv.org. The access to the archive is totally free and is accessible to every individual, who wishes to access it. The arXiv.org received a huge success and appreciation from scientists in every corner of the world. This success caused the expansion of arXiv to many other scientific subjects such as mathematics, astronomy, computer science, statistics and many more. Presently it has a huge collection of approximately 100000 articles. In 1993, George Soros, Founder of Open Society Foundation, established Open Society Institute under his foundation Open Society Foundation.

The year 1997 made the concept of free distribution of information more strong with the establishment of CogPrint by Stevan Harnad and Research Papers in Economics (RePEc). This year also marks the establishment of PubMed, which made Medline free with its amalgamation with PubMed. Around the same time Scientific Electronic Library Online (Silo) was launched by Sao Paulo Science Foundation to strengthen free distribution of health information and research.

The next was the launch of Scholarly Publishing and Academic Research Coalition (SPARC) programme by American Research Libraries (ARL) in 1998. SPARC claims itself to be "correcting the imbalance in the scholarly publishing system" (SPARC, 2007). It is an alliance of 222 academic and research libraries to set the imbalance correct which has resulted in escalating the prices of

scholarly journals and making it difficult to the scholarly community to access and use it. According to this program "At the core of SPARC's mission is the belief that these imbalances inhibit the advancement of scholarship and are at odds with fundamental needs of scholars and the academic enterprise" (SPARC, 2007). Presently SPARC is running several blogs, newsletter and organising other programmes such as access conferences, international meets, etc. on open access.

By 1999, a number of Institutional and subject repositories had emerged. At the same time a project to develop open source digital repository software was being carried out at Massachusetts Institute of Technology (MIT) with the help of Hewlett-Packard (HP). The existed repositories were facing a number of problems with e-print servers, diversity in formats of archives and requirement of cross platform searching for articles in various repositories. Most prominent repositories at this time were, arXiv.org providing access to physics, mathematics, computer science, etc.; cogPrints for psychology, linguistics and neuroscience; RePEc providing access to literature in the field of economics and Networked Digital Library of Thesis and Dissertation (NDLTD) a repository of electronic thesis and dissertations authored by the students of member institutions. The problems faced by the archives turned them up for a meeting in Mexico's Santa Fe, where they discussed all difficulties faced by them and end users. Here, Ginsperg of arXiv and Van de Sompel of Ghant University proposed creation of a universal service for author's self-archived scholarly literature named Universal Preprint Service later renamed as Open Archive Initiative (OAI). OAI provided a universal format for data harvesting known as Open Access Initiative-Protocol for Metadata Harvesting (OAI-PMH). OAI was a big achievement in the area of open access. It was used in digital library software such as Dspace and Greenstone. Moreover, it has given a momentum to open access institutional repositories.

It is very difficult and will make things very complex to put the details of every new launch relating to free and open access. However, a timeline of events supporting open access is given by Peter Suber (2009) and the same of open access declaration (2012) are given on Open Access Directory. The following figure shows development of open access movement on the basis of data provided at open access timeline (Suber, 2013) and open access declaration timeline.

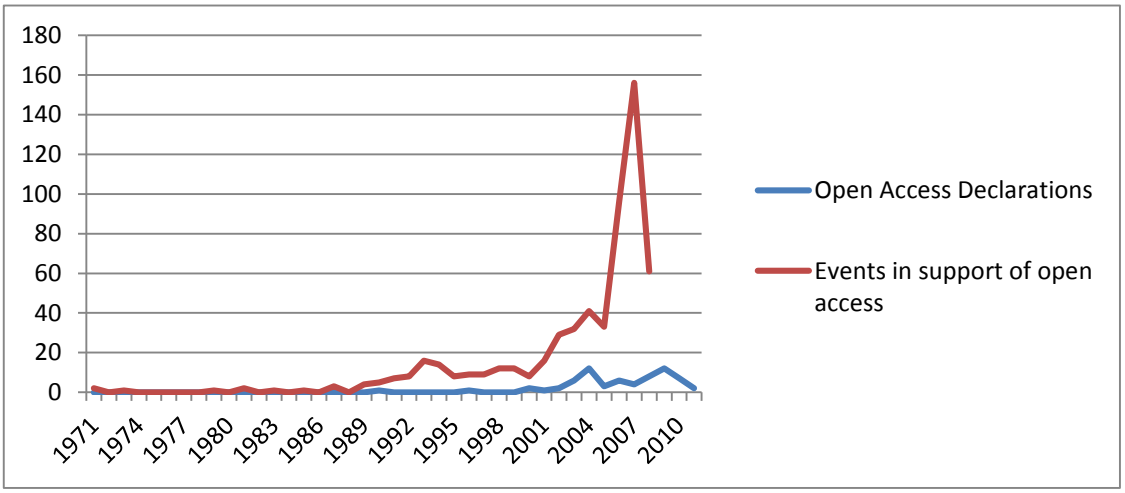

Figure 2: Development of Open access movement

7.4.1. Public Library of Science

By this time the cost of journals was rising invariably and the increased cost was restricting access to research articles to thousands of the researchers. Sometimes, the authors, who submitted their articles to the commercial publishers were not able to access their own article as their organisation could not subscribe to those journals. This condition invoked not only the consumers, but also the producers of such articles, to do something to bring those articles to free access. Hence, an initiative took place through an open letter to the journal publisher stating that "we pledge that, beginning in September 2001, we will publish in, edit or review for, and personally subscribe to only those scholarly and scientific journals that have agreed to grant unrestricted free distribution rights to any and all original research reports that they

have published, through PubMed Central and similar online public resources, within 6 months of their initial publication date" (Public Library of Science, 2001).

This letter was initiated by "Harold Varmus, Director, National Cancer Institute; Patrick Brown, Professor, Department of Biochemistry, Stanford University School of Medicine, and Howard Hughes Medical Institute in California, Investigator; and Michael Eisen, Associate Professor of Genetics, Genomics, and Development in the Department of Molecular and Cell Biology at the University of California, Berkeley" (Public Library of Science, 2001) in later 2000 and soon was popular among the scientists and researchers globally. This letter also attracted the media and media played a great role in popularising the letter and its content over the world. The open letter was loved by the scientists worldwide and got signed by more than 37000 scientists from 180 countries.

This was an attempt to change the publishing module within the commercial module itself. But it was not successful as the policies of journal publishers were intact even after the enormous support received by open letter. By the end of 2002, Gordon and Betty Moore Foundation offered PLoS a huge grant of $9 Million to launch free biomedical journals. Finally, PLoS, with this grant, made it possible to start two open access journals namely 'PLoS Biology' and 'PLoS Medicine'.

Today, PLoS has grown to the biggest open access publisher publishing for science and medicine. Open access was getting boost with launch of such journals and Budapest Open Access Initiative converted this journey towards free access into an 'open access movement'

7.4.2. Budapest Open Access Initiative

Open Society Institute organised a small meeting in Budapest on 1-2 December, 2001 with the objective to accelerate process in International effort to make research article in all the academic disciplines freely available on Internet or the Web (Open Society Institute, 2002a). This meet received a number of views from the participants from various disciplines and different nations to make up the Open Access Movement. This meeting ended with a decision to start an initiative known as Open Access Initiative for the same. In less than 2 months after its formation, OAI released its initiative called Budapest Open Access Initiative (BOAI).

It was a historical day of 14th February, 2002 when Open Society Institute released Budapest Open Access Initiative at Budapest, Hungary and for the first time the term 'open access' was assigned to free and unrestricted access to research articles online. OSI on this occasion promised funding of 1 million US dollars per year for three years to support open access projects (Open Society Institute, 2002b). The initiative reads as below:

> 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.(Open Society Institute, 2002a)

The introduction of the initiative shows its concerns towards free literature. It talks about traditional way to publish research journal in periodicals which are paid and does not reach to every individual due to pricing issue. But advent of Internet and development of World Wide Web provides a way and an opportunity to the scientists and researchers to spread their research result to more people without any restriction. This will help the education system to grow and will create a global collaborative community sharing their knowledge. It was BOAI

which had coined the term ‘Open Access’ as a meaning of unrestricted online availability of research articles. Further this initiative calls the institutions and individuals worldwide involved in the process of knowledge generation to come together to share their research and work without any price and other barriers. The call was to make efforts to bring all scholarly literature in public domain. It was a formal beginning of Open Access Movement. The initiative explained the benefits of open access which may also result in making the peer reviewed literature barrier free.

Moreover, this initiative very importantly talks about the category of literature which should be available freely or in the open access; the literature which are developed by the researchers and distributed ‘without expectation of payment’ should be in the open access. Hence it is not the call to the people who generate their livelihood by their writings. Such category may include novelists, dramatists, generators of music, etc. as they generate their livelihood by their work. They write with expectation of selling their work to have meal on their table. But this is not the case with a professor of a university or a researcher in a research institute. They get their food by teaching and by doing other activities for their organisation. So it is a very important feature of this initiative. The initiative provides an elaborated definition of open access as follows:

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

The definition of open access provides full freedom to the readers to access the article without any barrier. It just expects from the readers or the researchers to cite and

acknowledge the source properly in their writings. It does not lay down any other condition for the distribution of such work. This definition gives opportunity to the world to use, distribute, download, print or to include in any database without any financial, legal or technical barrier.

The BOAI does not avoid the financial needs to develop or produce a journal. Hence it discusses the requirements of funds to support the open access to research article online. This statement shows concern about financial aspects to achieve open access, however, it costs very low to provide open access to peer reviewed journals through web in comparison to print publication which is a traditional model for the same. Steven Harnad also states that distributing literature online reduces costs to 25% of what it costs in print distribution (Okerson & O'Donnell, 1995). Moreover, other models for financial support to open access journal have also been developed, such as publication fees, dual mode of distribution where print version is paid and electronic version is open access, open access journals sponsored by various organisations, funds from the government, support from the promoters of open access, etc.

To start open access, BOAI suggested two ways, i.e., self-archiving and open access journals. Self-archiving was already in existence for 10 years when this declaration was made. However BOAI supported the archives created following the protocols created by Open Archives Initiative for easy searching and browsing of articles submitted in the archives.

Open Access Journals was the second suggestion by BOAI to boost open access. The declaration appeals individuals and organisations to move towards publishing open access journals to publish research results of their scholars and scientists. The open access journals, by nature, would not be following any copyright laws to restrict the reader in any way and

will be disseminated widely. The open access journals would not imply any subscription charges to the readers but may find out other ways, as discussed earlier, to meet their cost. The initiatives clearly state their objective and future expectations from the world of research and scholarly writings.

> Open access to peer-reviewed journal literature is the goal. **Self-archiving (I.)**and a new generation of **open-access journals (II.)** are the ways to attain this goal. They are not only direct and effective means to this end, they are within the reach of scholars themselves, immediately, and need not wait on changes brought about by markets or legislation. While we endorse the two strategies just outlined, we also encourage experimentation with further ways to make the transition from the present methods of dissemination to open access. Flexibility, experimentation, and adaptation to local circumstances are the best ways to assure that progress in diverse settings will be rapid, secure, and long-lived. (Budapest Open Access Initiative, 2002)

Budapest Open Access Initiative suggested above two ways to enhance open access to peer reviewed articles and journals and expected more to explore. It also talked about the idea of copy left instead of copyright. BOAI not just released their initiative but made it a concrete effort towards open access by providing all types of help, i.e., financial, technical, etc. to the efforts towards open access. The Open Society Institute uses its resources and influence in encouraging and developing institutional self-archiving. It also extends support to launch new open-access journals. It also guides such initiatives to become economically self-sustaining. Although Open Society Institute has substantial resources and enormous commitment towards open access initiative, at the same time it feels that other organisations should also extend their resources to accelerate this movement forward. Thus this Institute invites all the stake holders like "governments, universities, libraries, journal editors, publishers, foundations, learned societies, professional associations, and individual scholars" (Open Society Institute, 2002a) to join this movement so that research and education can flourish in this world.

Initially this initiative was adopted by 13 signatories including Bioline International, Open Society Institute, Public Library of Science (PLoS), Scholarly Publishing and Academic Research Coalition (SPARC), Peter Suber, Biomed Central, etc. As on 12th September 2012, it has 5673 individual and 637 organisations who have signed BOAI declaration.

This number of signatories seems very little if we compare it with the number of Internet users worldwide. As per the latest statistics of 'Internet World Stats' more than 2260 million people worldwide are users of Internet. Surely, most of the users come from the community of consumers of information, but if we presume that, one per cent of the Internet users belong to the category of the researchers, scientists and university teachers, then the number of such users would be more than 226 lakh. Moreover, if we look at the number of blogs of individual authors we find this number very high. So, if BOAI is getting only 5673 individuals in the last ten year, then a number of doubts may arise. Whether, the scholars who were expressing concern for price hike of journals published by commercial publishers really want open access to grow? However, this study has yet to explore many things which may give answer to this question.

After this declaration, a number of open access archives and journals were started. In addition to that, various efforts to boost the open access movement were observed. In less than one year of BOAI declaration, Creative Commons, a non-profit organisation established by Lawrence Lessig and his friends in 2001, released their first set of copyright licence for free to the public (Creative Commons, 2002). The objective was to make the information within access to all with minimum restrictions.

Lunds University of Sweden launched a major project called 'Directory of Open Access Resources (DOAJ)' in 2003 with financial help from Open Society Institute and SPARC

listing around 300 initial open access journals (Bjornshauge, 2011). DOAJ is basically a list of open access journals to provide easy access to the researchers, students, teachers, etc. around the world.

7.4.3. Bethesda Statement on Open Access Publishing

Within a few months another statement on open access was released that is known as 'Bethesda Statement on Open Access Publishing' with the objective to come up with some concrete steps to foster open access publishing and rapid and efficient dissemination of scholarly peer reviewed articles among all the related parties. The aim was to make e-publishers, scientists, organisations, libraries, etc. related to or dependent on scientific publication to agree to a common solution, i.e., open access (Suber, 2003).

This statement also came up with their definition of open access publication stating "Open access is one that meets following two conditions:

- The author(s) and copyright holder(s) grant(s) to all users a free, irrevocable, worldwide, perpetual right of access to, and a license to copy, use, distribute, transmit and display the work publicly and to make and distribute derivative works, in any digital medium for any responsible purpose, subject to proper attribution of authorship, as well as the right to make small numbers of printed copies for their personal use.
- A complete version of the work and all supplemental materials, including a copy of the permission as stated above, in a suitable standard electronic format is deposited immediately upon initial publication in at least one online repository that is supported by an academic institution, scholarly society, government agency, or other well-established organization that seeks to enable open access, unrestricted distribution, interoperability, and long-term archiving (for the biomedical sciences, PubMed Central is such a repository) (Suber, 2003).

This definition mainly exhibits two points. First, that an open access publication is the property of the author and it grants public the rights to access, copy, distribute transmit, display and to make use of it in any derivative work. The only expectation of these publications is to be cited and properly acknowledged. Second, the article with the above

rights must be submitted in electronic format and in full to any open access repository immediately after its publication. Hence, it refuses to grant open access label to any article accessible after three, six or twelve months of its publication so called delayed open access.

Bethesda statement is released in three parts or can say three separate statements from funding agencies and Institutions, libraries and publishers and scientists and scientific societies proposing duties on their ends.

Institutions, including academic and research institutes and funding agencies, propose and agree to encourage their researchers and staff to publish their research results in open access journal; to offer financial help to publish their research results in peer reviewed open access journals; to consider the merit of work instead of title of journal at the time of appointment, promotion, grant or award and to consider the open access publications as service to the community and will give merits of the same at the time of appointment, promotion, etc. This statement is an effort to bring the institutions, which insist the scientists and researchers to have great publications, in favour of open access. Out of their proposals, their agreement to consider the merit of work and not the title of journal is more interesting. The intention behind this statement is to bring the open access publication in equality of commercially published journals and to encourage scientists and researchers to publish their articles in open access journals.

In statement of libraries and publishers, libraries propose to give priority to open access journals and make users of the library aware about these journals. Additionally, they will list the open access journals in their catalogue to be retrieved by the users. At the same time, publishers propose to provide an open access option for any research article published by them, work with publishers providing open access to develop tools for authors and publishers

for manuscript transition and publication and to develop open access module with low barriers.

The statements seem quite promising to promote open access. The Bethesda statement included all the factors included in a scholarly publication. On one side, where it includes a promise on the part of libraries to encourage the literature published in open access to be used by the users, it is also trying to bring commercial publishers under the umbrella of open access with the proposal from publishers to provide open access option to every article they publish and to help the publisher providing open access to develop tools for easy publication.

The statement on the part of scientists says that they would take the rights to publish their article in an open access too through their own website or through an institutional repository. Moreover, they also propose to publishing, reviewing and editing for open access journals.

This statement was made in the presence of 24 participants. The participants were the advocates of open access and publishers providing open access journals. After this declaration no information is available on the official page of the declaration about whether any other participants signed the statement or not. Moreover, there is no information of the development on the basis of this statement. However, it is difficult to say that the statement has no impact on communities involved in the scholarly publication without analysing further development in the field.

7.4.4. Berlin Declaration on Open Access to Knowledge in the Sciences and Humanities

In next few months of Bethesda statement, an international conference on open access was organised at Berlin by Max Plank Society. This conference and meeting of various international open access advocates resulted in Berlin Declaration on Open Access to Knowledge in Sciences and Humanities (Berlin 9, 2007).This declaration accepted most of

the principles of Budapest Open Access Initiative (BOAI) and included them in the declaration. Berlin Declaration accepted the conditions of open access publication proposed by Bethesda Statement of Open Access Publishing and defined that "We define open access as a comprehensive source of human knowledge and cultural heritage that has been approved by the scientific community" (Gruss, 2003).

The Berlin declaration has been signed by 394 signatories as on September 2012 that covers a number of universities and research centres. The declaration was very much similar to that of Budapest Declaration and had similar objectives.

These three declarations BBB (Budapest, Bethesda and Berlin) are the major declarations towards open access movement and the whole movement is spread on the basis of these declarations. Signatories of Budapest and Berlin declaration are increasing constantly and these declarations, being done with the support of Open Society Institute and Max Plank Society, are still very much active.

Now, almost 10 years have passed since these declarations. During these years, a number of initiatives towards open access have taken place. It is very much required to analyse the development of such initiatives to mark the success of open access movement in the last decade.

7.5. Prominent Open Access Publishers

7.5.1. Biomed Central

BioMed Central is a commercial publisher, but focused in publishing open access journals in the field of Science, Technology and Medicine (STM). It was developed in 1998 and launched in 2000 by VitekTracz. He was a person involved in commercial publication who

developed medicine and science journals and once they became popular, he sold them to big commercial publishers like Elsevier. But during 1990s situation around the world experienced a drastic change with a huge opposition of commercial publishers by open access advocates due to unaffordable price rise. Moreover, emergence of Internet and Web also paved a way to remove the costs of publishing. Vitek Tracz was also convinced that such an emergence of Internet and Web will make it difficult for the commercial publisher to charge high price for their journals.

Evaluating the situation, Vitek Tracz started a commercial but open access publication BioMed Central (BMC). In 2001 BMC announced launch of initial list of journals. BMC did not charge readers to read an article of any of its journal but it charged the author to publish their articles as publication fees or article processing fees that was $500. The BioMed Central experienced many ups and downs due to changes in its publication fees and some times editors of BioMed Journals rebelled against its price increase (Poynder, 2005). In 2008 BioMed Central with approximately 180 journals was acquired by Springer, one of the major commercial publishers. It posed a threat to millions of scholars to lose the open access to BioMed Central, but, Springer promised to provide open access to its journals. Since then the number of open access journals published by Biomed Central has constantly increased. As on September 2012, it was providing 220 open access journals that included journal published by Springer Open and Chemistry Central.

7.5.2 Public Library of Science (PLOS)

Public Library of Science (PLoS) was established as a result of the open letter to the publisher, as discussed earlier, in 2000. The goal of PLoS is to “provide ways to overcome unnecessary barriers to immediate availability, access, and use of research, pursue a

publishing strategy that optimizes the openness, quality, and integrity of the publication process, and develop innovative approaches to the assessment, organization, and reuse of ideas and data" (Public Library of Science, 2004). With the help of a Grant of $9 million it could start two initial online journals, i.e., PLoS Biology and PLoS Medicine in 2003 and 2004 respectively. PLoS is a non-profit organisation unlike BioMed Central, though it also charges publication fees from the authors to recover editing and publication cost of the journals. Though PLoS was receiving grants from several foundations spread globally but in 2011 for first time it declared that it does not bank on any foundation and is producing its cost itself (Jerram, 2011). It follows the copyright model of Creative Commons where any article published on PLoS expects only proper citation and acknowledgment in the later research that come out referring it. As of September 2012, they are running seven peer reviewed journals in medical and biomedical fields. These journals are most important open access journals in medicine and may equalize to commercial journals of Elsevier.

7.5.3 Hindawi Publishing Corporation

Hindawi Publishing Corporation is the brain child of Ahmed Hindawi and Nagwa Abdel Mottalab and Egypt based commercial publisher of scientific, technical and medical (STM) journals. It was established in 1997 and launched its first commercial and subscription based journal in 1999. It was quite successful in its initial 5 years but 'serial crisis' and price negotiation made it difficult for smaller publishers to launch new journals and get the subscriptions. With the view that "Subscription publishing does not encourage innovation and will not reward the smaller players" (Harris, 2007) they tried a new model of publishing, i.e., Hybrid mode, where they launched a journal in 2003 with subscription based print and open access electronic mode and converted two subscription based journals to open access. By 2005 they experienced remarkable success in open access and started some more totally open

access journals and also converted their early subscription based journals to open access (Peters, 2007). As of September 2012, Hindawi Publishing Corporation had been publishing 438 fully open access journals. Out of these, around 75% journals are carrying impact factor (Harris, 2007). To fund the open access publication they charge per page publication fees from the authors and are running several dual mode publication where print mode is subscription based while electronic mode is open access.

7.5.4 Scientific Electronic Library Online (SCIELO)

SciELO is a multi-country project initiated in Brazil by FAPESP (Fundação de Amparo à Pesquisa do Estado de São Paulo), in partnership with BIREME (the Latin American and Caribbean Centre on Health Sciences Information) in 1997 (Scientific Electronic Library Online, 2009). Once it began in Brazil, a number of countries have kept joining this project to provide open access "free to access and free to publish" (Scientific Electronic Library Online, 2009). The countries joining this project includes Brazil, Argentina, Bolivia, Chile, Colombia, Costa Rica, Cuba, Mexico, Paraguay, Peru, Uruguay, Venezuela and South Africa. South Africa is recent joiner to this project and was working with SciELO in 2009. SciELO project is a very strong project of 977 peer reviewed journals (as on September 2012) spread over 15 nations and various languages of the world. Besides this, it has a solid database of Bibliometric and Scientometric indicators that are compatible to Thomson ISI too. Since 2002 it has been getting financial help from CNPq (Conselho Nacional de Desenvolvimento Científico e Tecnológico). This huge network of open access journals is rapidly proceeding towards its goal to "envisage the development of a common methodology for the preparation, storage, dissemination and evaluation of scientific literature in electronic format" (Scientific Electronic Library Online Chile, 2009) using a special software that establishes an

electronic library accessible through a number of route, e.g., titles in alphabetic and subject list, subject and author indexes and an integrated search engine.

7.5.5 Highwire Press

HighWire Press, established in 1995, is a division of Stanford University Libraries producing more than 2500 online peer reviewed journals including subscription based, open access and delayed open access journals. Out of these journals, 61 journals are fully open access while 279 are providing delayed open access.

7.5.6 MDPI.COM

MDPI (Molecular Diversity Preservation International) established in 1996 is a Switzerland based organization aiming to deposit and exchange molecular and Biomolecular samples. In 2008, another institute was established with same abbreviation MDPI (Multidisciplinary Diversity Publishing Institute) with the objective to publish open access journals in various scientific and medical fields. The articles published by MDPI are fully open access. They cover the publication cost through article processing fees collected from the authors. MDPI was established in 1996 and as on September 2012, it has been running 89 open access journals. It is observed that number of MDPI publication increased only after the launch of MDPI.com in 2008 as before 2008 they were running only 8 journals (MDPI, 2012). Various journals published by MDPI.com have good impact factor.

7.5.7 Others

There are a number of small organisations, institutes and publishers who publish and provide open access to their publication which would be too long to mention here. However, these mainly include various research organisations and institutions, i.e., American Association of

Pharmaceutics, American Clinical and Climatological Association, American Institute of Physics, American Medical Informatics Association, and many more, and commercial publishers like Wolters Kluwer Health/Medknow Publication (223 journals), Bentham Science Publishers(237 journals), Wiley-Blackwell Publishing(11 journals), Co-Action Publishing(27 journals), Dove press(126 Journals), German Medical Science(16 journals), Frontier Media SA(14 journals), Karger Publishers(5 journals), Nature Publishing Group(16 journals), Oxford University Press(11 journals), Sage Publication (4 journals)Copernicus Publication (30 journals), and others. They provide a number of open access journals and are strengthening open access movement. In addition to fully open access, these publishers also give option to authors to keep their article in open access by paying a publication fees.

Directory of Open Access Journals (DOAJ) listed 9709 open access journal as of April 2014 in various languages and field of knowledge. DOAJ was established in 2003 with listing of less than 500 open access journals. If we look at the statistics, it is easy to analyse that since then DOAJ has added approximately 3 journals per day to the golden road to open access.

Directory of Open Access Repository (DOAR) on the other hand, lists over 2000 open access repositories including institutional repositories and subject repositories providing access to their contents. Open access through institutional repositories, or subject repositories is known as green road to open access.

7.6 Open Access and Copyright

Discussion on open access will always be incomplete without a discussion on copyright issue. Whenever there is a debate on copyright, people presume that copyright is something which prevents the open access and levies a price restriction over the access of scholarly content

(Jeffery, 2006). But, if we analyse or study copyright carefully, we may easily understand that copyright is not a barrier but a set of rules that preserves the right of an author of an intellectual property towards its ownership and distribution. It is the intention of copyright holder which prohibits the open access of scholarly content and makes them available on a price. Copyright law just fixes the duration, in which the holder of the copyright clutches the rights and ownership of scholarly contents. The basic aim of copyright is to preserve the interest of those who earn their living and bread and butter through their creative works. It includes musicians, artists, writers of fictions, painters, industrial trademarks, etc. At the same time it is also being used for the scholarly articles where the authors have no financial interest in writing an article; they write only to gain greater visibility and they publish it with commercial publisher and transfer copyrights of the article for nothing. The publisher makes use of those articles to earn huge profits.

No copyright Act in the world fixes a price on which scholarly content can be distributed or made available. The holders of the copyright solely carry all right over the content and can distribute without any cost by their choice without violating Copyright Act. However, these laws do not explicitly offer open access of the intellectual property to the public.

Authors of scholarly articles during submission of their write-ups to the journal publishers hand over all the copyrights through a copyright transfer agreement. One hardly cares or considers keeping copyrights of the articles with them or not transferring the copyrights to the publishers. However, some institutions have their own copyright policies when they fund the publisher for publishing articles of their scientists. Peter Suber (2012, p. 80) discusses about such right retention policies of NIH (National Institutes of Health) and Harvard University. They made it compulsory for their scientists and faculty members to deposit their articles to institutional repositories as soon as they are accepted for the publication, thus, a pre-print of

the article is available through open access institutional repositories without any barrier. In addition to this, many publishers now permit authors to submit pre-print of articles to institutional repositories or upload at author's website for free accessibility. Hence, it is not copyright that prohibits the access of scholarly content but the intention of publishers and authors or the lack of commitment towards open access from the authors who do not try to get permission of uploading a pre-print to institutional repositories or their own websites.

However, these Copyright Acts certainly strengthen the hands of those who, definitely are not the authors, desires to make money by selling such scholarly content at high price. Lawrence Lessig and James Boyle tried to create a new copyright that expressly makes the literature within public domain, through 'creative commons' in 2005, a copyright that does not levy any restriction in anyways to use the literature and make it in open access. Creative commons appeared as a copyright licence for open access journals. Both commercial publisher and open access publisher ask the author for transferring copyrights to the publisher but their aims are different. A commercial publisher, when receives the copyright of an article from an author, becomes the sole authority of the article and even the author needs permission of the publisher to upload the same article into an archive. Open access journals also ask for copyright from the authors but their aim is not to sell those articles or to earn from them. They just distribute it freely and at the same time, the author also retains the rights to upload the article in a repository or on their own website without any infringement of copyrights.

However, the entire discussion lastly depends upon the human intention. If there is no intention to support open access, then even creative commons cannot do anything as it cannot be forced. Interest of publishers and many research institutes strongly supports Copyright Acts. Not only this, they want the governments throughout the world to make such Acts more strong to satisfy their financial greed. The recent global copyright treaties and copyright

amendments affected the individual Copyright Acts, Patent Acts, etc. Patent Act is very much related with the public good and copyright. Right to open access silently offers the users to use the literature and convert the knowledge into a product which many a time is protected with a patent law. The most elegant example of these developments is Patent Amendment 2005 of the Indian Patent Act 1970. This Act introduced food, pharmaceutical and chemical invention that were not patentable in India before 2005. This amendment was not done with earning intention by Indian government but was a step to just comply with TRIPS agreement. This amendment not only made medicines costly in India and many other developing countries but also threatened the right to life of a number of patients in these countries who could not afford the lifesaving drugs and died without medicine. Our late Prime Minister of India Smt. Indira Gandhi had stated at the World Health Assembly in 1982: "The idea of a better ordered world is one in which medical discoveries will be free of patents and there will be no profiteering from life and death." (Lanjouw, 1998). But today it seems we are moving towards the business of 'profiteering from life and death' just to fulfil obligations of a treaty. All these are directly indicating to knowledge capitalism where one section of society wishes to keep the other section deprived of knowledge. The entire deal just shows profit making intention of the people. Research work in India, whether in a government granted institution or a fully private institution, is fully borne by the government, i.e., public funds, but the results of these researches are not available to the people themselves. People associated with this so called business of knowledge generation do not want to share it for free. Not only this, but they also want to generate very high profit from this business. However, there are plenty of examples where the inventors had left their invention unpatented for the welfare of public and people throughout the globe are using those products. Some of these products are Polio Vaccine, Internet, World Wide Web, ATM Machine, Stove's Burner and many more. These inventions carry the potential to earn billions of dollars for their inventors but they just left it

for the community throughout the world. And we know that, these inventions have changed the world. Thus, the use of copyright solely depends upon the human intention. It is almost a decade to the open access movement but still this movement is struggling to gain ascendance over commercial publishing industry.

7.7 Impact of Open Access on Library and Information Services

The development of open access has made a wide impact on various aspects of libraries such as economic, technological, collection development, reference services, information literacy, etc. However the major impacts are on economic aspects, technological aspects and collection development policy of the libraries.

Open access has made a wide impact on economic aspects of the libraries. The libraries, acquiring the scholarly literature from the sources which provide under the open access philosophy, are not required to pay for accessing the literature. They are free to access and distribute the literature; can print number of copies as per their wish and are not bound by any copyright law.

Open access has also been encouraging the libraries to set up an institutional repository or start open access journals. Initiating an open access journal or institutional repository poses a number of technological challenges, software issues and requires expertise to overcome those. The gaining of technological expertise slowly reflects in the services of the library. The libraries try to provide access to their open access literature following various ways such as Google search engine, permanent URL such as DOAJ, etc. Use of technology benefits the libraries not only to disseminate open access literature but also helps in sharpening the skills of library professionals.

Open access has also a wide impact on collection development policy. As soon as they start looking to open access journals, libraries realize that open access literature has everything they require. They can create their own databases of URL's of the open access journals and open access institutional repositories available on the World Wide Web dealing with the subject of their concern. Many of the journal articles published in subscription based journals are available free through the institutional repository of their institutions. This availability not only eases the financial pressure from their shoulders but also makes them more conscience while subscribing to a journal. They may also use the budget for something else than just on journal subscription.

7.8 English language Open Access e-Journals from different subjects

The fifth objective of this study is to identify and collect various English language Open Access e-Journals from different subjects. Instead of subscribing to a number of journals, the library may provide access to open access journals available on the Web. So, the researcher has collected more than five thousand open access journals in English language from various subject fields. To gather these journals the researcher has referred a number of directories of open access journals such as DOAJ, Open-J-Gate, and Public Library of Science etc. The researcher has found that at-least a few open access journals are available in almost all subjects. To be precise, the researcher identified 103 subjects for this list. The subjects identified are shown in the table below.

English language Open Access e-Journals from different subjects

Sr. No.	Subjects	Number of Journals
1	Acoustics	4
2	Agriculture	88
3	Allergy and Immunology	35
4	Analytical Chemistry	16
5	Anatomy	6
6	Anesthesiology	14
7	Animal Sciences	65
8	Anthropology	30

9	Aquaculture and Fisheries	13
10	Archaeology	9
11	Architecture	13
12	Arts in general	27
13	Astronomy	15
14	Biochemistry	36
15	Biology	193
16	Biotechnology	41
17	Botany	48
18	Business and Management	156
19	Cardiovascular	59
20	Chemical Engineering	12
21	Chemical Technology	25
22	Chemistry In General	82
23	Computer Science	272
24	Construction	14
25	Cytology	13
26	Dentistry	55
27	Dermatology	20
28	Earth Sciences (Geology)	52
29	Ecology	31
30	Economics	83
31	Education	241
32	Electrical and Nuclear Engineering	49
33	Electricity	7
34	Environmental Engineering	8
35	Environmental Sciences	66
36	Environmental Technology	8
37	Ethnology	6
38	Forestry	14
39	Gastroenterology	34
40	Gender Studies	16
41	General and Civil Engineering	111
42	Genetics	52
43	Geology	29
44	Geophysics and Geomagnetism	9
45	Gynecology and Obstetrics	27
46	Heat	5
47	History of arts	43
48	Hydraulic Engineering	3
49	Industrial Engineering	13

50	Inorganic Chemistry	5
51	Internal medicine	243
52	Languages and Literatures	67
53	Law	60
54	Library and Information Science	58
55	Linguistics	36
56	Manufactures	4
57	Mathematics	173
58	Mechanical Engineering	35
59	Media and communication	33
60	Medicine In General	346
61	Meteorology and Climatology	21
62	Microbiology	46
63	Migration	3
64	Military Science	5
65	Mining and Metallurgy	11
66	Multidisciplinary	100
67	Music	21
68	Neurology	90
69	Nuclear Physics	3
70	Nursing	15
71	Nutrition and Food Sciences	17
72	Oceanography	15
73	Oncology	76
74	Ophthalmology	28
75	Optics and Lights	18
76	Organic Chemistry	13
77	Otorhinolaryngology	15
78	Pathology	31
79	Pediatrics	32
80	Performing Arts	15
81	Pharmacy and Pharmacology	98
82	Philosophy	51
83	Physics In General	58
84	Physiology	32
85	Plant Sciences	29
86	Political Science	72
87	Psychiatry	32
88	Psychology	55
89	Public Health	136
90	Religion	34

91	Science In General	98
92	Social and Public Welfare	21
93	Social Sciences	96
94	Sociology	45
95	Sports Science	29
96	Statistics	32
97	Surgery	73

98	Technology In General	68
99	Therapeutics	86
100	Transportation	20
101	Urology	23
102	Visual Arts	8
103	Zoology	53

7.9 Findings and Interpretations

7.9.1 Major Findings

From the detailed discussion about the open access movement in the earlier sections, the major findings are summarised below.

- Free flow of print publication was facilitated with the invention of printing machine; it could survive due to enactment of a series of copyright laws and by 1886, these laws were implemented globally.
- The research results had begun to be published in the form of scholarly journals since 1665 with *Journal de Sçavans* (5 January, 1665) and *Philosophical Transactions of Royal Society* (6 March, 1665). Since then, the prices of scholarly journals have been escalating.
- Increasing cost is not only compelling the institutions to reduce the number of subscribed journals to cope with available budget, but also narrowing the circulation of the result of research done in various fields.
- Today, around 2000 periodical publishers are associated with journal publishing industry, but, top three journal publishers, viz., Elsevier, Springer-Kluwer and Willy-Blackwell, account for approximately 42% of all published journal articles and no other publisher accounts for more than 3% share of journal publication market.

- The unfailing increase in journal subscription cost led to the coining of a new term, i.e., ‘serial crises.
- The statistics from ARL (Association of Research Libraries) shows that during 1986-2006 the ARL members managed to increase their budget by 321% while increase in serial number subscribed during this period was not remarkable.
- Michael Hart invested his life time earnings, i.e., around $100 million in making e-books available on Internet through Project Gutenberg, which is now has a collection of more than 30,000 e-books in 60 languages available for the people without any restrictions.
- During these days, in 1979, George Soros founded Open Society Foundation to pursue his ambitions of establishing open societies in place of authoritarian forms of government.
- In 1987, the first free peer reviewed journal was observed when Research students of Nova South-eastern University, Florida launched ‘New Horizons in Adult Education’ through their network Adult Education Network.
- A big milestone in Open Access came in 1991, when Paul Ginsparg started an online archive for *Physicist, i.e.*, XXX.lanl.gov.
- OAI provided a universal format for data harvesting known as Open Access Initiative-Protocol for Metadata Harvesting (OAI-PMH).
- In 2001 an initiative took place through an open letter to the journal publisher showing their decision to write, review and edit for those journals which makes the access free instantly or within 6 months of initial publication. This letter got sanctioned by 37000 scientists from 180 countries.
- By the end of 2002, Gordon and Betty Moore Foundation offered PLoS a huge grant of $9 Million to launch free biomedical journals.

- On 14th February, 2002, Open Society Institute released Budapest Open Access Initiative at Budapest of Hungary and for the first time the term 'open access' was assigned to free and unrestricted access to research articles online.
- In 2003 another statement on open access known as 'Bethesda Statement on Open Access Publishing' was released with the objective to boost open access publishing.
- Year 2007 marked for one more declaration known as 'Berlin Declaration on Open Access to Knowledge in the Sciences and Humanities'.
- Lawrence Lessig and James Boyle tried to create a new copyright that expressly makes the literature within public domain, through 'creative commons' in 2005, a copyright that does not levy any restriction in anyways to use the literature and make it in open access.
- Today more than 10,000 open access journals of various subjects in a number of languages are available. In addition to this there are various encyclopaedias and books available without any restriction.

7.9.2 Interpretations

Open access came into existence because of three major factors. Firstly, the constant rise in the price of scholarly journals in the field of science, technology and medicine. As noted earlier, the first scholarly journal began only in the third quarter of the 17th century, grew in 20th century and captured the whole market by the end of the 20th century. In the last two quarters of the 20th century, a huge price hike was observed that worried not only the institutions subscribing these journals, but also the authors of the articles publishing in these journals. It brought the scholars around the world together against serial pricing or serial crisis. This anger and worry among scholars and scientists marked the launch of 'newsletter on serial pricing issues' in 1989 to discuss the issue and raise their voice against price rise.

Several editors of commercial journals left the editorship of their journals; they also wrote an open letter to the publisher to make their articles freely available but nothing could change the mind and policies of commercial publishers.

This phase also marked major technological changes around the world with the advent of computers, Internet and World Wide Web. These inventions gave an opportunity to launch online journals to cut print and paper cost to a considerable level. But, it has made no changes in commercial publishing industry and price rising remained intact. However, some open access pioneers such as Steven Harnad and Charles W. Bailey launched their own open access journals and observed that online publishing cuts publishing costs to 25% of the print publication. Steven Harnad posed these debates forward to the public by his 'subversive proposal' (Okerson & O'Donnell, 1995) on a list serve in 1994 which was later published as an online book. His arguments in this mailing list, "the scientific journal and the scholarly monograph are threatened by rising costs, rising output, and constrained academic budgets. The most painful paradox is that in the interests of science, the law of the market cannot be allowed to function. An item with a very small market may yet be the indispensable link in a chain of research that leads to a result of high social value" and suggestion to create self-repositories became guiding principles of open access movement.

Secondly, double pay debate was also a leading factor towards open access movement. The debate was raised on use of public funds to carry out the researches by the research institutions over the world and to subscribe the journals publishing those research results. This gave birth to double pay debate for doing the research and again for accessing the research results. The commercial publishers get the benefit of the entire cycle. Additionally, there are cases where journal also levy publication fees which is paid again by those institutions where researchers work. This multiple pay paradox, has spread disappointment

and anger among scholars and institutions. Open access publishing was seen as a solution to this unfair, immoral and uncourageous double payment irony.

Thirdly and last, as researchers noted earlier no movement starts at a single point. It is something which converts from the thinking of people that gets support from more peers and lead to a movement. Pioneering efforts from open access advocates, such as Peter Suber, Steven Harnad, Charles W. Bailey, Harold Varmus, Alma Swan, Lawrence Lessig and many more have resulted in consciousness towards open access and opposition towards commercial publication.

Started with golden road to open access, now a number of ways are discovered to provide open access to scholarly articles. As of today, open access is possible through gold open access, green open access, gratis open access, libre open access, delayed open access, etc.

In terms of impact, open access has been coming as a strong competitor of commercial publication that has compelled many of them to offer open access in one way or the other. But still there is a lot to improve. As a recent study in 2010 showed that around 20% of total published peer reviewed article in 2009 could be found in open access (Bjork et al, 2010). Now question arises whether to take it in a positive or negative sense. Whatever, one thing is clear that open access is yet to undergo a lot to find its way. Still libraries are finding it difficult to subscribe journals due to high price and low budget. Many a times it seems that we are standing at the same turn where we were a decade back. Subscription of paid journals and databases is made compulsory for educational institutions by the accrediting authorities. Use and distribution of open access journals in libraries is still not flourishing. Though for individuals it has become easier to find information available in public domain.

It is true that open access has significantly changed the scholarly publishing but it's the turn of the universities, research institutions, and funding agencies to push open access by encouraging publication in open access journals. Additionally, Scientists also should go for publication in open access journals instead of commercial journals. One must leave this misconception that publication in a commercial journal will only be able to assign them good impact factor and reputation. At last it can be said that it is not the journals which provide a reputation to an author but it is an author who gives reputation by submitting their high quality articles to journals.

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CHAPTER VIII

CONCLUSIONS AND SUGGESTIONS

In the course of the present research study and the interpretations made in the preceding chapters, many interesting facts and features about open source software movement and open access movement have come to the fore. These facts and features not only reveal the development of open source software movement and open access movement as a whole, but also lay down the foundation for further research in these areas in future.

8.1. Conclusions: open source software movement

1. Open Source like open access is distribution of software with the source code and with the liberty to modify or redistribute the same to anyone.
2. Libraries are in high need of computer software to meet the expectations of the users. Open source provide them a variety of software developed by a number of organisations and individuals worldwide.
3. The philosophy of library and open source software is the same, i.e., to serve the community. Use of open source in libraries supports this philosophy largely.
4. Open source does not mean that it should be free of cost, one may charge for an open source software, however, he cannot restrict the purchase to distribute it freely to others or to modify it.
5. Open source operating systems and web servers have already captured the most of the servers in the world.
6. From the perspective of a library professional, open source software is playing the role of life saving medicine especially in developing countries.

7. Open source software is a successful alternative for any type of library and available for a wide range of operations applicable for a library from general, operating system (Linux), data processing software (Open Office) to specifics, i.e., library management system, digital library creation, web designing, e-learning, content management system, managing online serial or conference, etc.
8. Even when a library adopts open source software it may need Annual Maintenance Contract to maintain the system. Unlike proprietary software where only the developer manages it, here the advantage is that, the library has the option to choose from a number of vendors who offer to management various open source software. Some prominent vendors are Liblime, Equinox, ByWater, Lyrasis, etc.
9. In open source software user libraries have a number of choices to adopt or migrate to at any point of time. Good choices for library management software are Koha and Newgenlib; for Digital library software, DSpace, Greenstone and Eprints; for content management software Joomla, Drupal and Wordpress. These alternatives provide a huge range of choice from which libraries can select most prominent and promising software as per their needs. These alternatives also give them choice to migrate from one to another at a later point of time.
10. Open source software release their new upgraded version more frequently than proprietary software; also these upgraded versions of open source software are freely available to the users while in case of proprietary software users are required to pay even for the new versions of the software.
11. Open source operating systems have been proving themselves very safe in comparison to proprietary operating systems. We all know that the Linux versions of operating systems are more secure than Windows in terms of virus and malware attack.

12. Open source makes source code available to the world; the people around the world not only can use it, but modify it and improve the software to make it more competitive. It has already been accepted that all types of open source software are presenting very strong competition to commercial software.
13. Among available open source software, NewGenLib is found more suitable for library automation; while DSpace is good for creating digital libraries. These software are easy helpful and available with enough technical support to library professionals.
14. The open source software have very bright future as the market base of open source software is increasing very fast. Open source operating system and web servers are already in high use in comparison to proprietary systems. Open source SQL database is posing tough competition to proprietary software. Libraries are increasingly using one or the other open source software.

8.2. Conclusions: Open access movement

1. Information Technology has become an unavoidable element of today's libraries and information centres. Open source software and open access resources are the tools and resources that provide a helping hand to the libraries having limited or no financial resources to use modern information technology.
2. The open access is associated with the scholarly publishing in the form of journal articles. The advocates of open access expect the free distribution of digital copies of these scholarly publications.
3. Since the publication of first scholarly journal, the prices of scholarly publications continue to increase sharply. Many of the publications become unaffordable even for big libraries.

4. Open access movement offered three fold solutions in the form of open access journals, self-archiving and institutional repositories. Researchers can opt for any of these ways to publish their scholarly writings.
5. The Open access movement was supported by a number of individuals, institutions and associations which reflected in the beginning of a number of open access journals.
6. Open access in not just a movement to encourage the barrier free access to scholarly publishing, but also to accelerate the research with easy access to research results. Such an effort thus avoids duplication of research that leads to saving and conserving the collective resources of humanity.
7. Open access provides nationally and globally a way to generate and encourage further research, education and training prospects.
8. If we see this movement from a different perspective, we can easily understand that open access movement has expanded the definition of 'right to life'. The maximum journals available in open access are of health science. Hence, now people associated with health sciences can easily access research results in their subject area without any economic liability; something that was possible earlier only when their institutions subscribed to the same. They, now, not only can access that research result but also apply it to enhance their profession and render service to society.
9. The open access movement has given birth to the concept of cyber democracy where scholarly publishing is available for all and anyone can use it without prior permission of the author of the same just by fulfilling moral duty of acknowledging the author.
10. Open access movement has also been very supportive in the growth of knowledge economy by making knowledge and information available to wide number of people.

11. Open access does not violate the right of the author to be acknowledged. The researcher using earlier work has moral obligation to acknowledge the author whose research has been used in the study.
12. One of the major impacts of open access is that it omits or removes the barriers between university and society or research organisations and societies. Research work which earlier was accessible only to universities and research institutions that subscribed to it is now accessible through open access to anyone even outside these institutions.
13. Open access has made the scholarly writings available to a wide range of people such as entrepreneurs, consultants, social workers, journalists, policy makers, teachers in schools, people in business & industry and the public as a whole. Earlier maximum scholarly writings were available to only academicians and researcher who were able to access it through the subscription by their parent organisation. Use of scholarly writing by general public will surely enhance their understanding and social learning.
14. For the government funded research, open access is a way to get maximum utilisation and maximum return on the government funds by way of making it widely available, easily discoverable, accessible, retrievable and much more useful.
15. At this juncture, the notion of developed nation has changed. Now the country having maximum financial resources is not called developed nation but a country having maximum information is considered a developed nation. Open access is a wonderful way to increase the 'knowledge capital' of any country.
16. The open access advocates do not expect the authors who write for a living to allow open access to their work. However it expects a university researcher to allow to access his/her work through open access.

17. Open access and open source movement have been proving very successful in bridging the digital divide and the gap between the haves & the have nots, the developed & the developing and the rich & the poor; be it individuals or libraries.
18. Open access movement has forced the commercial publishers to respond positively to it by either turning few of their journals to open access instantly or after few months. Many publishers are running a number of open access journals along with their commercial journals. Moreover, many of them allow authors to submit the pre-print or post-print of their articles to the institutional repositories of their institutions.
19. The open access movement is showing its wide impact over scholarly publishing. A number of open access repositories and more than 10,000 journals in various languages are available to the world. A library is in a very good position to help in the growth of open access movement via open source software.

8.3. Suggestions

In the light of the findings, interpretations and conclusions of the present study, the researcher would like to present the following suggestions.

1. Libraries with no library management software in their libraries should automate their libraries using open source software. Open source software is not a challenge, it is a help that we can use, improve and forward to someone else. It has numerous benefits; it offers a very smooth library system without having to pay for the software. This would help not only in modernising the library and the information professional's skills but would also help in the development of the software that is being used. NewGenLib is a very suitable open source library management software while DSpace is a considerably good open source digital

library software. However, if one does not wish to use these for any reason, they may opt for other open source software. The open source world has good alternatives to choose from.

2. Libraries that are already using library management software but due to some functional difficulties wish to migrate to something better, may also consider migrating to NewGenLib for library management and DSpace for managing their digital library. They can even modify and customize these to suit their needs.
3. More than 10,000 open access journals in various languages (about 5000 of them in English) are available covering all fields of human endeavour. Such open access scholarly publishing is a very good source for libraries to provide their users right information at the right time. A list of 5000 English journals categorised according to different subjects is presented in Appendix A of this report. All libraries must provide access to these journals to their users through library's OPAC or website. More use of open access literature will lead to more research results being put up on open access and that will boost open access movement.
4. The libraries should encourage and start institutional repositories to make the research work of their institution available to the world. It would not only boost the open access movement but would also make the access to their research output easy to the world.
5. The funding organisations including government should make it compulsory for researchers to publish their research in open access journals only. It will not only make their research widely available, but will also save the funds which is used in subscribing to the journals again to access the research work of their researchers.

6. Authors of research papers should also understand that the research done by them is funded by public and they should have access to it easily without again paying for it.
7. If the institution is having enough research to publish a journal of any periodicity they must start an open access journal. There are a number of open source software to maintain such a journal online.
8. Today's library services are influenced very much by information technology and a library professional must have sufficient knowledge of it. Use of open source software needs fairly good IT skills and it may prove very good for working closely with information technology. Many a time librarian needs to debug the problem himself that needs good understanding of technology.
9. Growth of open source software for libraries depends upon the response of library professionals. When libraries use open source software it helps in the growth of the open source movement in the library field. It requires collaborative efforts from all those who have the abilities to make this movement more effective.
10. Moreover library professionals should also help in the development of new open source software and improvement of the existing open source software. Although it is the software professionals who develop the codes, the library professionals by constantly using it can identify the bugs found in the software and find the ways to smoothen the workflow of the software and inform the same to the developers. This would help and guide the software professionals to come out with new and improved versions of the software.

11. The library professionals should follow and encourage the use of open source and open access licensing by providing their research in open access and submitting their software to the open source community, if they succeed in creating one.
12. In summation, open source and open access are two separate movements but for the libraries the combination of two can do a magic that perhaps even proprietary software cannot do for them. A library professional must make the optimum use of the both.

8.4. Future avenues for research

Although library professionals are slowly becoming aware of open source software but still there is a lot of scope for research in open source software and open access literature. Research in open access needs more efforts to make is practically applicable in small libraries; presently open access literature is understood only in big libraries. The possible research areas related to open access and open source software in the field of library and information science is enumerated below.

- Comparative study of open source and commercial software to make Open Source Software more effective.
- Practical implementation of open source software in libraries and laying out the resources required, problems faces both technical and human, expected minimum budget for automating a library, etc.
- Use of open source software to make the use of open access literature more effective in libraries.
- Best practices with open source software and open access literature.

APPENDIX A

Subject wise list of Open Access Journals

Acoustics

- EURASIP Journal on Audio, Speech, and Music Processing
- Open Journal of Acoustics
- Advances in Acoustics and Vibration
- Open Acoustics Journal

Agriculture

- African Journal of Agricultural Research
- Agricultural and Food Science
- Agricultural Sciences
- Agriculture (Basel)
- AGRIS on-line Papers in Economics and Informatics
- Agronomy (Basel)
- Albanian Journal of Agricultural Sciences
- American Journal of Experimental Agriculture
- Analele Universitatii din Craiova : Seria Agricultura, Montanologie, Cadastru
- Asian Journal of Agricultural Sciences
- Australian Journal of Agricultural Engineering
- Chilean Journal of Agricultural Research
- Food and Energy Security
- International Agrophysics
- International Journal of Agricultural and Biological Engineering
- International Journal of Agricultural Research, Innovation and Technology : IJARIT
- International Journal of Agriculture and Crop Sciences
- International Journal of AgriScience
- International Journal of Agronomy & Plant Production
- ISRN Soil Science
- Journal of Agricultural Extension
- Journal of Agricultural Science and Technology (JAST)
- Journal of Agricultural Sciences
- Journal of Agronomy
- Journal of Livestock Science
- Journal of SAT Agricultural Research
- Facultatea de Management Agricol
- Natural Product Radiance
- Pertanika Journal of Tropical Agricultural Science
- Research & Reviews : Journal of Agriculture and Allied Sciences
- RURALS : Review of Undergraduate Research in Agricultural and Life Sciences
- Scientific Journal of Crop Science
- Soil & Environment
- Spanish Journal of Agricultural Research
- Sustainable Agriculture Research
- Vegetable Crops Research Bulletin
- Academia Journal of Agricultural Research
- African Journal of Food, Agriculture, Nutrition and Development
- Agricultural Engineering International : The CIGR e-journal
- Agriculture
- Agriculture and Biology Journal of North America
- Agrivita : Journal of Agricultural Science
- Agronomy Research
- American Journal of Agricultural and Biological Science
- American-Eurasian Journal of Sustainable Agriculture
- Applied and Environmental Soil Science
- Asian Journal of Agriculture and Rural Development
- Cercetari Agronomice in Moldova
- Electronic Journal of Polish Agricultural Universities
- Hacquetia
- International Food and Agribusiness Management Review
- International Journal of Agricultural Management and Development
- International Journal of Agriculture : Research and Review
- International Journal of Agriculture Sciences
- International Journal of Agronomy
- ISRN Agronomy
- Journal of Agricultural Engineering
- Journal of Agricultural Science
- Journal of Agricultural Sciences
- Journal of Agrobiology
- Journal of Animal and Plant Sciences
- Journal of Organic Systems
- Journal of Tropical Agriculture
- Madras Agricultural Journal
- Open Agriculture Journal
- Plant, Soil and Environment
- Research Journal of Agriculture and Biological Sciences
- Scientific Journal of Agriculture
- Scientific Papers Series : Management, Economic Engineering in Agriculture and Rural Development
- Soil Forming Factors and Processes from the Temperate Zone
- Studies in Agricultural Economics
- Turkish Journal of Field Crops
- Banatâ's Journal of Biotechnology
- International Journal of Agriculture and Biology
- Trends in Agricultural Economics
- Annals of Agricultural and Environmental Medicine

- Journal of Environmental Issues and Agriculture in Developing Countries
- Living Reviews in Landscape Research
- Conservation & Society
- Journal of Rural and Community Development
- World Journal of Agricultural Sciences
- Turkish Journal of Agriculture and Forestry Sciences
- Life Sciences and Medicine Research
- Agriculture & Food Security
- Journal of Soil Science and Plant Nutrition
- Electronic Journal of Plant Breeding
- Journal of Agriculture and Social Sciences
- European Countryside

Allergy and Immunology

- Allergology International
- American Journal of Clinical and Experimental Immunology
- Asia Pacific Allergy
- Case Reports in Immunology
- Clinical and Molecular Allergy
- Frontiers in Immunology
- Iranian Journal Of Allergy, Asthma and Immunology
- Iranian Journal of Immunology
- ISRN Allergy
- Journal of Allergy
- Journal of Asthma and Allergy
- Journal of Investigational Allergology and Clinical Immunology
- Open Allergy Journal
- Open Immunology Journal
- Research Journal of Immunology
- World Journal of AIDS
- AIDS Research and Treatment
- Allergy, Asthma & Clinical Immunology
- Antibodies
- BMC Immunology
- Clinical and Developmental Immunology
- Clinical and Translational Allergy
- Immunology and Immunogenetics Insights
- Iranian Journal of Arthropod-Borne Diseases
- ISRN AIDS
- ISRN Immunology
- Journal of Arthropod-Borne Diseases
- Journal of Immune Based Therapies and Vaccines
- Open AIDS Journal
- Open Autoimmunity Journal
- Open Journal of Immunology
- World Allergy Organization Journal
- HIV/AIDS - Research and Palliative Care
- AIDS Research and Therapy
- Immunome Research

Analytical Chemistry

- American Journal of Analytical Chemistry
- Analytical Sciences
- Eurasian Journal of Analytical Chemistry
- International Journal of Analytical Chemistry
- ISRN Chromatography
- Mass Spectrometry Letters
- Open Analytical Chemistry Journal
- Pakistan Journal of Analytical and Environmental Chemistry
- Analytical Chemistry Insights
- Chromatography Research International
- International Journal of Analytical and Bioanalytical Chemistry
- ISRN Analytical Chemistry
- Journal of Automated Methods and Management in Chemistry
- Microarrays
- Open Crystallography Journal
- Metal-Based Drugs

Anatomy

- Anatomy Research International
- Frontiers in Human Neuroscience
- International Journal of Anatomical Variations
- Bangladesh Journal of Anatomy
- Frontiers in Neuroanatomy
- Open Anatomy Journal

Anesthesiology

- Anaesthesia, Pain & Intensive Care
- Case Reports in Anesthesiology
- Indian Journal of Anaesthesia
- ISRN Anesthesiology
- Local and Regional Anesthesia
- Open Journal of Anesthesiology
- Saudi Journal of Anaesthesia
- Anesthesiology Research and Practice
- Indian Anaesthetists' Forum
- The Internet Journal of Anesthesiology
- Journal of Anaesthesiology Clinical Pharmacology
- Open Anesthesiology Journal
- Pain Physician
- Sri Lankan Journal of Anaesthesiology

Animal Sciences

- Acta Veterinaria
- Acta Veterinaria Scandinavica
- Animal Biology & Animal Husbandry
- Archiva Zootehnica
- Bangladesh Veterinarian
- Biotechnology in Animal Husbandry
- Case Reports in Veterinary Medicine
- Extreme Life, Biospeology & Astrobiology
- International Journal of Animal and Veterinary Advances
- The Internet Journal of Veterinary Medicine
- Irish Veterinary Journal
- Italian Journal of Animal Science
- Journal of Animal Production Advances
- Journal of Animal Science and Biotechnology
- Journal of Equine Science
- Journal of Reproduction and Development
- Journal of the South African Veterinary Association
- Journal of Veterinary Medical Science
- Lucrari Stiintifice : Zootehnie si Biotehnologii
- Onderstepoort Journal of Veterinary Research
- Open Access Animal Physiology
- Open Veterinary Journal
- Pakistan Veterinary Journal
- Research Journal of Animal and Veterinary Sciences
- Scientific Journal of Animal Science
- Scientific papers : Series D, Animal Science
- Sokoto Journal of Veterinary Sciences

- Vet Scan
- Veterinary Medicine : Research and Reports
- Veterinary Research
- Veterinary Science Development
- Wayamba Journal of Animal Science
- Acta Veterinaria Brno
- American Journal of Animal and Veterinary Sciences
- Animal Science Papers and Reports
- Bangladesh Journal of Veterinary Medicine
- Basic and Applied Myology
- BMC Veterinary Research
- Experimental Animals
- Global Veterinaria
- International Journal of Poultry Science
- Iranian Journal of Applied Animal Science
- ISRN Veterinary Science
- Journal of Animal and Veterinary Advances
- Journal of Animal Science Advances
- The Journal of Applied Research in Veterinary Medicine
- The Journal of Poultry Science
- Journal of the Indonesian Tropical Animal Agriculture
- Journal of Veterinary Advances
- Journal of Veterinary Science
- Lucrari Stiintifice. Seria Zootehnie
- Online Journal of Animal and Feed Research
- Open Journal of Animal Sciences
- Open Veterinary Science Journal
- Pastoralism
- Research Opinions in Animal & Veterinary Sciences
- Scientific Journal of Veterinary Advances
- Slovenian Veterinary Research
- South African Journal of Animal Science
- VeterinÃ¡rnÃ- MedicÃ-na
- Veterinary Medicine International
- Veterinary Research Forum
- Veterinary World
- Human & Veterinary Medicine
- Animal Reproduction

Anthropology

- Anthropoetics : the Journal of Generative Anthropology
- Anthropological Review
- Anthropologist
- Asian Ethnology
- Durham Anthropological Journal
- Explorations: a Graduate Student Journal of Southeast Asian Studies
- HAU : Journal of Ethnographic Theory
- Indian Folklife
- The Internet Journal of Biological Anthropology
- Journal of Physiological Anthropology
- Locale : the Australian-Pacific Journal of Regional Food Studies
- Studies of Tribes and Tribals
- Vis-Ã -vis : Explorations in Anthropology
- Advances in Anthropology
- Anthropological Notebooks
- Anthropological Science
- Anthropology Matters Journal
- Bulletin of the International Association for Paleodontology
- Eurasian Journal of Anthropology
- Folklore : Electronic Journal of Folklore
- Human Biology Review
- International Journal of Modern Anthropology
- Journal of Anthropology
- Journal of the Anthropological Society of Oxford
- Open Anthropology Journal
- Totem : the University of Western Ontario Journal of Anthropology
- Journal of Business Anthropology
- Asian folklore studies
- Oral Tradition
- Cultural Analysis

Aquaculture and Fisheries

- Aquaculture, Aquarium, Conservation & Legislation
- Egyptian Journal of Aquatic Biology and Fisheries
- Fishery Bulletin
- International Aquatic Research
- Marine and Coastal Fisheries : Dynamics, Management, and Ecosystem Science
- Turkish Journal of Fisheries and Aquatic Sciences
- Acta Ichthyologica et Piscatoria
- Archives of Polish Fisheries
- Fisheries and Aquaculture Journal
- Fishery Technology
- Journal of Northwest Atlantic Fishery Science
- Open Fish Science Journal
- Scientia Marina

Archaeology

- Bulletin of the History of Archaeology
- HAEMUS Journal
- Journal of Caribbean Archaeology
- Chronika
- Journal of Archaeology in the Low Countries
- Papers from the Institute of Archaeology
- British Museum Studies in Ancient Egypt and Sudan
- E-Keltoi : Journal of Interdisciplinary Celtic Studies
- Rosetta

Architecture

- Archnet-IJAR : International Journal of Architectural Research
- City & Time
- Footprint
- Landscape Review
- Open Urban Studies Journal
- Spatium
- A+BE : Architecture and the Built Environment
- A|Z ITU Journal of the Faculty of Architecture
- Field : a Free Journal for Architecture
- Italian Journal of Planning Practice
- Multi : The RIT Journal of Plurality and Diversity in Design
- Places : Forum of Design for the Public Realm
- Buildings

Arts

- Animation Studies
- Body, Space and Technology
- E-conservation Magazine
- Inflexions : a Journal for Research Creation
- International Journal of Conservation Science
- Kritikos. Journal of postmodern cultural sound, text and image
- Nineteenth-Century Art Worldwide
- Online Journal of Art and Design
- Working Papers in Art & Design
- Art and Research : A Journal of Ideas, Contexts and Methods
- The Brock Review
- Forum
- Intensions
- Journal of Science and Technology of the Arts
- Liminalities : a Journal of Performance Studies
- Nonsite.org
- Tate Papers
- Journal of Art Historiography
- Acta Graphica : Journal for Printing Science and Graphic Communications
- International Journal of Education and the Arts
- Rupkatha Journal on Interdisciplinary Studies in Humanities
- 19 : Interdisciplinary Studies in the Long Nineteenth Century
- Philament : An Online Journal of the Arts and Culture
- The Bonefolder : an e-Journal for the Bookbinder and Book Artist
- The International Journal of The Creative Arts in Interdisciplinary Practice
- Journal of Transnational American Studies
- Journal of Graphic Engineering and Design

Astronomy

- Apeiron (Montreal) : Studies in Infinite Nature
- Communicating Astronomy with the Public Journal
- International Journal of Astronomy and Astrophysics
- Journal of Astronomy and Space Sciences
- Living Reviews in Solar Physics
- Open Astronomy Journal
- Serbian Astronomical Journal
- Advances in Astronomy
- Bulletin Astronomique de Belgrade
- Information Bulletin on Variable Stars
- ISRN Astronomy and Astrophysics
- Journal of Astrophysics and Astronomy
- MARS : the International Journal of Mars Science and Exploration
- Revista Mexicana de Astronomia y AstrofÃ-sica : Universidad Nacional AutÃ³noma de Maxico. Instituto de AstronomÃ-a
- Advances in Geosciences

Biochemistry

- Acta Biochimica Polonica
- African Journal of Biochemistry Research
- Biochemistry Research International
- BMC Biochemistry
- Chem-Bio Informatics Journal
- FEBS Open Bio
- International Journal of Biochemistry and Molecular Biology
- International Journal of Peptides
- ISRN Biochemistry
- Journal of Natural Products
- Journal of Tissue Engineering
- Molecular Biology International
- Nuclear Receptor Signaling
- Open Proteomics Journal
- World Journal of Biological Chemistry
- Advances in Biological Chemistry
- Biochemistry Insights
- Biokemistri
- BMC Chemical Biology
- Clinical Proteomics
- Indian Journal of Biochemistry & Biophysics
- International Journal of Biochemistry Research & Review
- International Journal of Proteomics
- Journal of Amino Acids
- Journal of Nucleic Acids Investigation
- Metabolites
- Natural Products and Bioprospecting
- Open Biochemistry Journal
- Proteomics Insights
- Advances and Applications in Bioinformatics and Chemistry
- American Journal of Biochemistry and Biotechnology
- General and Applied Plant Physiology
- Bulgarian Journal of Plant physiology
- Nucleic Acids Research
- DNA Research
- Molecular Medicine

Biology

- Acta Agrobotanica
- Acta Histochemica et Cytochemica
- Advanced Studies in Biology
- Advances in BioResearch
- Advances in Environmental Biology
- African Journal of Biotechnology
- American Journal of Molecular Biology
- Annual Review & Research in Biology
- Arthropods
- Atlas Journal of Biology
- Biodiversity : Research and Conservation
- Bioinformatics and Biology Insights
- BioInvasions Records
- Biological Procedures Online
- Biology Direct
- Biology Open
- Biomedical Engineering and Computational Biology
- Biomolecules
- Bioscience Research
- BMC Bioinformatics
- BMC Biophysics
- BMC Developmental Biology
- BMC Molecular Biology
- BMC Systems Biology
- Cambodian Journal of Natural History
- Cell & Bioscience

- Cell Structure and Function
- Current Biomarker Findings
- Ecology and Evolution
- eJournal of Biological Sciences
- Environmental and Experimental Biology
- European Journal of Histochemistry
- Evolutionary Bioinformatics
- Folia Histochemica et Cytobiologica
- Frontiers of Biogeography
- Genetic Engineering and Biotechnology Journal
- GERF Bulletin of Biosciences
- Glycobiology Insights
- Indian Journal of Experimental Biology
- International Journal of Biomaterials
- International Journal of BioSciences, Alternative and Holistic Medicine
- International Journal of Life Sciences
- International Journal of Pharma and Bio Sciences
- International Journal of Systems Biology
- ISRN Biomathematics
- ISRN Molecular Biology
- Journal of Advanced Laboratory Research in Biology
- Journal of Biological Sciences
- Journal of Biology and Earth Sciences
- Journal of Biosciences
- Journal of Cell Death
- Journal of Epithelial Biology & Pharmacology
- Journal of Life Sciences
- Journal of Radiation Research
- Journal of Tropical Life Science
- Lifesciences Leaflets
- Mires and Peat
- Molecular Vision
- Nature Conservation
- Notulae Scientia Biologicae
- OnLine Journal of Biological Sciences
- Open Bioactive Compounds Journal
- Open Biology
- Open Biomarkers Journal
- Open Conservation Biology Journal
- Open Marine Biology Journal
- Open Structural Biology Journal
- Pakistan Journal of Biological Sciences
- PLoS Computational Biology
- Proenvironment Promediu
- Research and Reports in Biology
- Research Journal of Biological Sciences
- Scientific Journal of Biological Sciences
- Subterranean Biology
- Toxins
- Turkish Journal of Biology
- Acta Biologica Malaysiana
- Acta Limnologica Brasiliensia
- Advances in Bioinformatics
- Advances in Bioscience and Biotechnology
- Advances in Environmental Sciences
- Algae
- Analele Universitatii din Oradea, Fascicula Biologie
- Archives of Biological Sciences
- Asian Journal of Experimental Biological Sciences
- BIO Web of Conferences
- Biodiversity Informatics
- Bioinformation
- Biological Letters
- Biology
- Biology of Sex Differences
- Biomarker Insights
- Biomirror
- Bioscience Reports
- BIOTROPIA : the Southeast Asian Journal of Tropical Biology
- BMC Biology
- BMC Cell Biology
- BMC Evolutionary Biology
- BMC Structural Biology
- Brazilian Journal of Biology
- Casopis Slezskeho Zemskeho Muzea (A)
- Cell Reports
- Check List
- Current Research Journal of Biological Sciences
- Egyptian Journal of Biology
- Electronic Journal of Biology
- EurAsian Journal of Biosciences
- EvoDevo
- Experimental and Molecular Medicine EMM
- Free Radicals and Antioxidants
- Gene Regulation and Systems Biology
- Genome Integrity
- GigaScience
- IIOAB Letters
- International Journal of Bioinformatics Research
- International Journal of Biosciences
- International Journal of Integrative Biology
- International Journal of Life Sciences and Technology
- International Journal of Pharmaceutical and Biological Archive
- ISRN Bioinformatics
- ISRN Biophysics
- Jordan Journal of Biological Sciences
- Journal of Biological Research
- Journal of Biology
- Journal of Biophysics
- Journal of Biotech Research
- Journal of Clinical Bioinformatics
- Journal of Extracellular Vesicles
- Journal of Molecular Biology Research
- Journal of Signal Transduction
- Life
- Limnological Review
- Molecular Systems Biology
- Mycosphere
- NeoBiota
- Nusantara Bioscience
- Open Access Bioinformatics
- Open Bioinformatics Journal
- Open Biology Journal
- Open Biomaterials Journal
- Open Evolution Journal

- Open Reproductive Science Journal
- Open Tissue Engineering and Regenerative Medicine Journal
- PLoS Biology
- Proceedings of the International Academy of Ecology and Environmental Sciences
- Reproductive Biology Insights
- Research in Plant Biology
- Scientific Annals of Alexandru Ioan Cuza University of Iasi. New Series, Section 2. Vegetal Biology
- Speleobiology Notes
- Theoretical Biology and Medical Modelling
- Trends in Evolutionary Biology
- Annual Review of Biomedical Sciences
- Enzyme Research
- EXCLI Journal
- European Cells and Materials (ECM)
- Research Letters in Biochemistry
- Computational Ecology and Software
- BMC Ecology
- Smithiana Bulletin
- Arquipelago : Life and Marine Sciences
- CBE-Life Sciences Education
- Journal of Environmental Biology
- BC Journal of Ecosystems and Management
- Evolutionary Applications
- The Internet Journal of Genomics and Proteomics
- Proceedings of the Latvian Academy of Sciences. Section B : Natural, Exact and Applied Sciences
- International Journal of Biometric and Bioinformatics
- BioImpacts
- Biological and Biomedical Reports
- BMC Proceedings
- Interdisciplinary Bio Central
- International Journal of Biomedical Science
- Prilozi : Oddelenie za Bioloski i Medicinski Nauki
- Systematic Reviews
- Yale Journal of Biology and Medicine
- African Journal of Biomedical Research
- Biointerphases
- Biology and Medicine
- Brazilian Journal of Medical and Biological Research
- International Journal of Biological and Medical Research
- Iranian Biomedical Journal
- Scientifica
- Thyroid Research
- International Journal Bioautomation
- Journal of Molecular and Genetic Medicine
- Journal of Marine Biology
- Asian Journal of Pharmaceutical and Biological Research
- Journal of Circadian Rhythms
- Marine Drugs
- Journal of Insect Science
- International Journal of Biology
- Wildlife Biology in Practice
- Koedoe : African Protected Area Conservation and Science

Biotechnology

- Academia Journal of Biotechnology
- AgBioforum
- BioMed Research International
- Biotechnology and Molecular Biology Reviews
- Biotechnology Research International
- British Biotechnology Journal
- Current Trends in Biotechnology and Chemical Research
- Fluoride
- Indian Journal of Biotechnology
- International Journal of Advanced Biotechnology and Research
- International Journal of BioEngineering and Technology
- International Journal of Biotechnology Applications
- Journal of Biochemical Technology
- Journal of Biomedicine and Biotechnology
- Journal of Ecobiotechnology
- Nanotechnology, Science and Applications
- Open Food Science Journal
- Scholars' Research Journal
- Trends in Biomaterials & Artificial Organs
- 3 Biotech
- Advanced Biotech
- AMB Express
- Biotechnology
- Biotechnology for Biofuels
- BMC Biotechnology
- Computational and Structural Biotechnology Journal
- Electronic Journal of Biotechnology
- Food Technology and Biotechnology
- Indonesian Journal of Biotechnology
- International Journal of Bio-Science and Bio-Technology
- International Journal of BioSciences and Technology
- International Journal of Life Sciences Biotechnology and Pharma Research
- Journal of Biomaterials and Nanobiotechnology
- Journal of BioScience and Biotechnology
- Journal of Nanobiotechnology
- Open Biotechnology Journal
- Research in Biotechnology
- Scientific Bulletin Biotechnology : Series F
- International Journal of Biological Sciences
- Tropical Journal of Pharmaceutical Research
- Journal of Microbiology, Biotechnology and Food Sciences

Botany

- Acta Biologica Cracoviensia Series Botanica
- Acta Palaeobotanica
- American Journal of Plant Physiology
- AoB Plants
- Bangladesh Journal of Plant Taxonomy
- BMC Plant Biology
- Botanical Bulletin of Academia Sinica
- Current Botany

- Egyptian Academic Journal of Biological Sciences : Botany
- Global Journal of Research on Medicinal Plants & Indigenous Medicine
- International Journal of Plant Biology
- Journal of Phytology
- Lindbergia
- North American Fungi
- Nuytsia
- Open Mycology Journal
- Pacific Northwest Fungi
- PhytoKeys
- Plant Science Feed
- Research and Reviews : Journal of Botanical Sciences
- Vulpia
- Acta Botanica Croatica
- Acta Societatis Botanicorum Poloniae
- Annali di Botanica
- The Arabidopsis Book
- Bioscience Horizons
- Botanica Serbica
- Botanical Studies
- Dendrobiology
- Folia Cryptogamica Estonica
- IMA Fungus
- Journal of Botany
- Journal of Pollination Ecology
- MycoKeys
- Notulae Botanicae Horti Agrobotanici Cluj-Napoca
- Oklahoma Native Plant Record
- Open Plant Science Journal
- Pakistan Journal of Botany
- Plant Omics
- Polish Botanical Journal
- Turkish Journal of Botany
- Advances in Agriculture & Botanics
- Studies in Mycology
- Plant Biotechnology
- International Journal of Plant Genomics
- International Journal of Wine Research
- Geneconserve
- International Journal of Botany

Business and Management

- Accounting and Finance Research
- Advances in Business-Related Scientific Research Journal
- African Journal of Business Management
- American Journal of Industrial and Business Management
- Arabian Journal of Business and Management Review
- Asian Journal of Business and Management Sciences
- Asian Journal of Finance & Accounting
- Australasian Accounting Business and Finance Journal
- B Quest
- BuR : Business Research
- Business and Management Review
- Business Management Dynamics
- Case Studies in Business, Industry and Government Statistics
- Contemporary Marketing Review
- e-Finanse
- Economic Insights - Trends and Challenges
- Economics and Business Letters
- Economics and Organization of Enterprise
- Electronic Journal of Business Research Methods
- European Journal of Business and Economics
- Far East Journal of Psychology and Business
- Folia Oeconomica Stetinensia
- Global Journal of Enterprise Information System
- Indian Journal of Commerce & Management Studies
- Interdisciplinary Journal of Contemporary Research in Business (IJCRB)
- International Business and Management
- International Journal of Academic Research in Business and Social Sciences
- International Journal of Business Administration
- International Journal of Business and Management Studies
- International Journal of Business Science and Applied Management
- International Journal of eBusiness and eGovernment Studies
- International Journal of Financial Research
- International Journal of Leadership Studies
- International Journal of Management and Business Studies
- International Journal of Management, Knowledge and Learning
- International Journal of Marketing Studies
- International Research Journal of Applied Finance
- Investment Analysts Journal
- Journal of Applied Finance and Banking
- Journal of Behavioral Studies in Business
- Journal of Business Studies Quarterly
- Journal of Case Research in Business and Economics
- Journal of E-Government Studies and Best Practices
- Journal of Emerging Knowledge on Emerging Markets
- Journal of Entrepreneurship, Management and Innovation
- Journal of Intelligence Studies in Business
- Journal of International Research Publications : Economy & Business
- Journal of Internet Business
- Journal of Knowledge Management, Economics and Information Technology
- Journal of Management and Marketing Research
- Journal of Management and Strategy
- Journal of Mathematical Finance
- Journal of Project, Program & Portfolio Management
- Journal of Service Science and Management
- KCA Journal of Business Management
- Management : Journal of Contemporary Management Issues

- Manager
- MIBES Transactions
- Open Business Journal
- Organizacija
- Petroleum-Gas University of Ploiesti Bulletin : Economic Sciences Series
- Public Administration and Management
- Research and Practice in Human Resource Management
- Research Journal of Commerce & Behavioural Science
- Review of Finance and Banking
- SERIEs : Journal of the Spanish Economic Association
- South East European Journal of Economics and Business
- Strategic Leadership Review
- Studia Universitatis Babes-Bolyai Negotia
- Technology and Investment
- TMC Academic Journal
- Administrative Sciences
- AESTIMATIO : the IEB International Journal of Finance
- American Journal of Economics and Business Administration
- Annals of Innovation & Entrepreneurship
- Asian Academy of Management Journal
- Asian Journal of Business Management
- Asian Journal of Management Research
- Australian Journal of Business and Management Research
- BAR : Brazilian Administration Review
- Business and Economics Journal
- Business Intelligence Journal
- Business Systems Research
- Central European Business Review
- Dalhousie Journal of Interdisciplinary Management
- Economic Analysis and Policy
- Economic Review : Journal of Economics and Business
- Economics and Management Research Projects : An International Journal
- EEO Insight
- Emerging Leadership Journeys
- Far East Journal of Marketing and Management
- Financial Counseling and Planning
- Global Advances in Business Communication
- The IMP Journal
- Information Management and Business Review
- Interdisciplinary Journal of Research in Business
- International Business Research
- International Journal of Advances in Management and Economics
- International Journal of Business and Management
- International Journal of Business Research and Management
- International Journal of Contemporary Business Studies
- International Journal of Electronic Business Management
- International Journal of Knowledge and Research in Management and E-Commerce
- International Journal of Management and Business Research
- International Journal of Management and Strategy
- International Journal of Managing Value and Supply Chains
- International Journal of Research Studies in Management
- International Review of Management and Marketing
- Iranian Journal of Management Studies
- Journal of Behavioral and Applied Management
- Journal of Business and Economic Management
- Journal of Business Systems, Governance and Ethics
- Journal of Commerce
- Journal of Electronic Commerce Research
- Journal of Empirical Generalisations in Marketing Science
- Journal of Finance and Accountancy
- Journal of International Business and Cultural Studies
- Journal of Internet Banking and Commerce
- Journal of Knowledge Management Practice
- Journal of Management & Public Policy
- Journal of Management and Science
- Journal of Management Research
- Journal of Organization Design
- Journal of Research for Consumers
- KASBIT Business Journal
- Management & Marketing
- Management Science Letters
- Managing Global Transitions
- Michigan Journal of Business
- Open Textile Journal
- Organizations and Markets in Emerging Economies
- Product : Management & Development
- Rationality, Markets and Morals
- Research in Business and Economics Journal
- Research Journal of Science and IT Management
- Serbian Journal of Management
- Social Technologies
- Southern African Business Review
- Studia Commercialia Bratislavensia
- Studies in Business and Economics
- Terengganu International Management and Business Journal
- UTMS Journal of Economics
- Anale : Seria tieine Economice. Timisoara
- Journal of Systems Integration
- International Journal of Digital Accounting Research
- Journal of Theoretical and Applied Electronic Commerce Research
- Business, Management and Education
- Journal of Academic and Business Ethics
- Journal of Women's Entrepreneurship and Education

- Engineering Economics
- Journal of Interactive Advertising
- Electronic Journal of Business Ethics and Organization Studies
- Trade, Law and Development
- Pakistan Journal of Commerce and Social Sciences
- European Journal of Business and Social Sciences
- Technology Innovation Management Review

Cardiovascular

- American Journal of Cardiovascular Disease
- ARYA Atherosclerosis Journal
- Cardiogenetics
- Cardiology Research
- Cardiovascular Diabetology
- Cardiovascular Ultrasound
- Case Reports in Vascular Medicine
- Clinical Medicine : Cardiology
- Current Controlled Trials in Cardiovascular Medicine
- Heart International
- The Indian Journal of Chest Diseases and Allied Sciences
- International Journal of Hypertension
- Iranian Cardiovascular Research Journal
- ISRN Vascular Medicine
- Journal of Atherosclerosis and Thrombosis
- Journal of Cardiovascular Disease Research
- Journal of Geriatric Cardiology
- Journal of Tehran Heart Center
- Journal of the American Heart Association : Cardiovascular and Cerebrovascular Disease
- Open Atherosclerosis & Thrombosis Journal
- Open Cardiovascular Medicine Journal
- Open Heart Failure Journal
- Research Reports in Clinical Cardiology
- Thrombosis
- Trials
- Vascular Disease Prevention
- World Journal of Cardiology
- Annals of Cardiac Anaesthesia
- BMC Cardiovascular Disorders
- The Cardiology
- Cardiology Research and Practice
- Cardiovascular Journal
- Case Reports in Cardiology
- Circulation Journal
- Clinical Medicine Insights : Cardiology
- European Journal of Cardiovascular Medicine
- Heart Views
- International Cardiovascular Research Journal
- International Journal of Vascular Medicine
- ISRN Cardiology
- Japanese Heart Journal
- Journal of Cardiovascular and Thoracic Research
- Journal of Cardiovascular Magnetic Resonance
- Journal of Phlebology and Lymphology
- Journal of Tehran University Heart Center
- Mechanical Circulatory Support
- Open Cardiovascular Imaging Journal
- Open Circulation & Vascular Journal
- PVRI Review
- SA Heart Journal
- Thrombosis Journal
- Vascular Cell
- Vascular Health and Risk Management
- World Journal of Cardiovascular Diseases
- Journal of Angiogenesis Research
- Pediatric Cardiology Today
- Indian Pacing and Electrophysiology Journal
- Journal of Cardiothoracic Surgery
- The Internet Journal of Thoracic and Cardiovascular Surgery

Chemical Engineering

- Brazilian Journal of Chemical Engineering
- E-polymers
- International Journal of Chemical Engineering
- International Journal of Science and Engineering
- Journal of Advanced Chemical Engineering
- Open Chemical Engineering Journal
- Advances in Chemical Engineering and Science
- Chemical and Biochemical Engineering Quarterly
- International Journal of Chemical and Environmental Engineering
- International Journal of Industrial Chemistry
- ISRN Chemical Engineering
- KONA : Powder and Particle Journal
- American Journal of Food Technology
- Carpathian Journal of Food Science and Technology
- Coatings
- Indian Journal of Chemical Technology
- International Journal of Food Studies
- Ion Exchange Letters
- ISRN Polymer Science
- Journal of Petroleum Engineering
- New Journal of Glass and Ceramics
- Open Energy and Fuels Journal
- Processing and Application of Ceramics
- Advances in Petroleum Exploration and Development
- Bioceramics Development and Applications
- Chemical Engineering Research Bulletin
- Energies
- International Journal of ChemTech Research
- International Journal of Polymer Science
- ISRN Ceramics
- Journal of Excipients and Food Chemicals
- Journal of Textiles
- Open Electrochemistry Journal
- Open Fuels and Energy Science Journal
- Czech Journal of Food Sciences
- International Journal of Electrochemical Science
- Journal of Petroleum Exploration and Production Technologies

Chemistry in General

- Acta Chimica Slovenica
- Advanced Materials Letters
- American Chemical Science Journal
- Biointerface Research in Applied Chemistry
- Bulletin of the Chemical Society of Ethiopia

- Catalysts
- Der Chemica Sinica
- Chemical Sciences Journal
- Chemistry Education. Research and Practice in Europe
- ChemistryOpen
- Crystals
- Current Chemistry Letters
- European Journal of Chemistry
- Green and Sustainable Chemistry
- Indian Journal of Chemistry : A
- International Journal of Chemical Sciences
- International Journal of Chemistry
- International Journal of Electrochemistry
- International Journal of Photoenergy
- International Research Journal of Pure and Applied Chemistry
- Journal of Analytical Methods in Chemistry
- Journal of Business Chemistry
- Journal of Chemical Sciences
- Journal of Chemistry
- Journal of Crystallization Process and Technology
- Journal of Nuclear and Radiochemical Sciences
- Journal of the Serbian Chemical Society
- Macedonian Journal of Chemistry and Chemical Engineering
- Nanoscale Research Letters
- Open Chemical and Biomedical Methods Journal
- Open Glycoscience
- Open Macromolecules Journal
- Open Physical Chemistry Journal
- Oriental Journal of Chemistry
- Polish Journal of Chemical Technology
- Rasayan Journal of Chemistry
- Research Letters in Physical Chemistry
- Turkish Journal of Chemistry
- Acta Crystallographica Section E
- Advances in Physical Chemistry
- Applied Petrochemical Research
- BioResources
- Bulletin of the Korean Chemical Society
- Ceramics-SilikÃ¡ty
- Chemical Science Transactions
- Chemistry Central Journal
- Chemistry Journal
- Croatica Chemica Acta - izd. Tromjese no Hrvatsko kemijsko drustvo
- Current Chemical Genomics
- E-Journal of Chemistry
- Functional Materials
- Heterocyclic Letters
- International Journal of Chemical Research
- International Journal of Chemical Sciences and Research
- International Journal of Chemistry Research
- International Journal of Molecular Sciences
- International Journal of Research in Chemistry and Environment
- ISRN Physical Chemistry
- Journal of Biophysical Chemistry
- Journal of Chemical and Pharmaceutical Research
- Journal of Cheminformatics
- Journal of Cosmetics, Dermatological Sciences and Applications
- Journal of Electrophoresis
- Journal of the Iranian Chemical Society
- Laser Chemistry
- Molbank
- Open Catalysis Journal
- Open Colloid Science Journal
- Open Journal of Physical Chemistry
- Open Natural Products Journal
- Organic and Medicinal Chemistry Letters
- Pakistan Journal of Chemistry
- Proceedings of the Indian Academy of Sciences : Chemical Sciences
- Research and Reviews : Journal of Chemistry
- Science of Sintering
- Internet Electronic Journal of Molecular Design
- Journal of Electrochemical Science and Engineering
- Journal of Systems Chemistry
- Current Science
- Diffusion Fundamentals
- Atmospheric Chemistry and Physics Discussions
- Particle and Fibre Toxicology

Computer Science

- Advanced Computing : an International Journal
- Advances in Computational Research
- Advances in Electrical and Computer Engineering
- Advances in Information Mining
- Advances in Multimedia
- The African Journal of Information Systems
- Ajis : Australasian Journal of Information Systems
- BVICAM's International Journal of Information Technology
- Communications and Network
- Computer Engineering and Applications Journal
- Computer Science Journal
- Computer Science Master Research
- Cybernetics and Information Technologies
- Database Systems Journal
- eJOV : Electronic Journal of Organizational Virtualness
- Electronic Proceedings in Theoretical Computer Science
- eMinds : International Journal on Human-Computer Interaction
- EURASIP Journal on Information Security
- Future Internet
- IAENG International Journal of Computer Science
- ICGST International Journal on Graphics, Vision and Image Processing
- Image Processing On Line
- Informatica
- Information and Knowledge Management
- Information Technology Journal

- Intelligent Information Management
- The International Arab Journal of Information Technology
- International Journal of Ad Hoc, Sensor & Ubiquitous Computing
- International Journal of Advanced Computer Research
- International Journal of Advanced Information Technology
- International Journal of Advanced Research in Computer Engineering & Technology (IJARCET)
- International Journal of Advanced Research in Computer Science and Electronics Engineering
- International Journal of Advanced Robotic Systems
- International Journal of Artificial Intelligence & Applications
- International Journal of Artificial Intelligence and Expert Systems
- International Journal of Combinatorial Optimization Problems and Informatics
- International Journal of Communications, Network and System Sciences
- International Journal of Computational Intelligence and Information Security
- International Journal of Computer and Distributed System
- International Journal of Computer Information Systems and Industrial Management Applications
- International Journal of Computer Networks
- International Journal of Computer Science & Applications
- International Journal of Computer Science & Technology
- International Journal of Computer Science and Engineering Survey
- International Journal of Computer Science and Information Technologies
- International Journal of Computer Science and Mobile Computing
- International Journal of Computer Science and Network Security
- International Journal of Computer Science Issues
- International Journal of Computer Science, Engineering and Applications (IJCSEA)
- International Journal of Computer Technology and Electronics Engineering
- International Journal of Computers & Technology
- International Journal of Computing and Business Research
- International Journal of Database Management Systems
- International Journal of Distributed Sensor Networks
- International Journal of Electronics Communication and Computer Technology
- International Journal of Future Generation Communication and Networking
- International Journal of Grid Computing & Applications
- International Journal of Image, Graphics and Signal Processing
- International Journal of Information and Communication Technology Research
- International Journal of Information Engineering and Electronic Business
- International Journal of Information Systems and Telecommunication Engineering
- International Journal of Information Technology Convergence and Services (IJITCS)
- International Journal of Interactive Mobile Technologies (iJIM)
- International Journal of Interoperability in Business Information Systems
- International Journal of Managing Information Technology
- International Journal of Multimedia & Its Applications
- International Journal of Network Security & Its Applications
- International Journal of Next-Generation Networks
- International Journal of Reconfigurable Computing
- International Journal of Research In Computer Science
- International Journal of Security
- International Journal of Signal Processing, Image Processing and Pattern Recognition
- International Journal of Smart Home
- International Journal of Soft Computing and Software Engineering
- International Journal of Software Engineering & Applications
- International Journal of Spatial Data Infrastructures Research
- International Journal of UbiComp
- International Journal of VLSI and Signal Processing Applications
- International Journal of Web & Semantic Technology
- International Journal on Applications of Graph Theory in Wireless ad hoc Networks and Sensor Networks
- International Journal on Electrical Engineering and Informatics
- International Journal on Smart Sensing and Intelligent Systems
- International Magazine on Advances in Computer Science and Telecommunications
- ISRN Communications and Networking
- ISRN Machine Vision
- ISRN Software Engineering
- ITB Journal of Information and Communication Technology
- Journal of Advances in Information Technology
- Journal of Applied Computing and Information Technology
- The Journal of Artificial Intelligence Research
- Journal of Communications and Computer Engineering
- Journal of Computer Networks and Communications

- Journal of Computer Science and Control Systems
- Journal of Computers
- Journal of Computing and Information Technology
- Journal of Emerging Trends in Computing and Information Sciences
- Journal of Information and Communication Technology
- The Journal of Instruction-Level Parallelism
- Journal of Machine Learning Research
- Journal of Modelling and Simulation of Systems
- Journal of Networks
- Journal of Pattern Recognition Research
- Journal of Research and Practice in Information Technology
- Journal of Sensor and Actuator Networks
- Journal of Software Engineering and Applications
- Journal of Theoretical and Applied Information Technology
- Journal of Virtual Reality and Broadcasting
- Lecture Notes in Engineering and Computer Science
- Logical Methods in Computer Science (LMCS)
- OASIcs : OpenAccess Series in Informatics
- Open Artificial Intelligence Journal
- Open Software Engineering Journal
- Oriental Journal of Computer Science and Technology
- The Python Papers
- The Python Papers Source Codes
- Research Letters in Communications
- Scientific Annals of Computer Science
- Signal Processing : An International Journal
- Studia Universitatis Babes-Bolyai : Series Informatica
- Theoretical and Applied Informatics
- Transactions of the Japanese Society for Artificial Intelligence
- Universal Journal of Computer Science and Engineering Technology
- World Applied Programming
- Advances in Artificial Intelligence
- Advances in Computer Science : an International Journal
- Advances in Human-Computer Interaction
- Advances in Internet of Things
- Advances in Software Engineering
- Ajis : Australian Journal of Information Systems
- ARPN Journal of Systems and Software
- CLEI Electronic Journal
- Computer and Information Science
- Computer Science and Information Systems
- Computer Science Journal of Moldova
- Crosstalk : Journal of Defense Software Engineering
- Data Science Journal
- e-Informatica Software Engineering Journal
- ELCVIA Electronic Letters on Computer Vision and Image Analysis
- Electronics (Basel)
- Engineering Letters
- First Monday
- Human-Centric Computing and Information Sciences
- IAES International Journal of Artificial Intelligence (IJ-AI)
- Identity in the Information Society
- Indian Journal of Computer Science and Engineering
- Information
- Information Engineering Letters
- Intelligent Control and Automation
- International Arab Journal of e-Technology
- International Journal of ACM Jordan
- International Journal of Advanced Computer and Mathematical Sciences
- International Journal of Advanced Computer Sciences and Applications
- International Journal of Advanced Networking and Applications
- International Journal of Advanced Research in Computer Science
- International Journal of Advanced Research In Computer Science and Software Engineering
- International Journal of Advances in Soft Computing and Its Applications
- International Journal of Artificial Intelligence & Knowledge Discovery
- International Journal of Cloud Computing and Services Science (IJ-CLOSER)
- International Journal of Communication Networks and Information Security
- International Journal of Computational Cognition
- International Journal of Computer & Electronics Research
- International Journal of Computer Games Technology
- International Journal of Computer Network and Information Security
- International Journal of Computer Networks & Communications
- International Journal of Computer Science & Information Technology
- International Journal of Computer Science and Communication Networks
- International Journal of Computer Science and Information Security
- International Journal of Computer Science and Management Studies
- International Journal of Computer Science and Network
- International Journal of Computer Science and Security
- International Journal of Computer Science Research and Application
- International Journal of Computer Technology and Applications
- International Journal of Computer Trends and Technology
- International Journal of Computers and Communications
- International Journal of Data Mining & Knowledge Management Process

- International Journal of Distributed and Parallel Systems
- International Journal of Electronics and Computer Science Engineering
- International Journal of Engineering and Computer Science
- International Journal of Grid and Distributed Computing
- International Journal of Hybrid Information Technology
- International Journal of Informatics and Communication Technology
- International Journal of Information and Network Security (IJINS)
- International Journal of Information Sciences and Computer Engineering
- International Journal of Information Technology and Computer Science
- International Journal of Intelligent Systems and Applications
- International Journal of Interactive Multimedia and Artificial Intelligence
- International Journal of Machine Intelligence
- International Journal of Modern Education and Computer Science
- International Journal of Network Security
- International Journal of Networking and Computing
- International Journal of Reconfigurable and Embedded Systems (IJRES)
- International Journal of Research and Innovation in Computer Engineering
- International Journal of Reviews in Computing
- International Journal of Signal and Image Processing
- International Journal of Simulation : Systems, Science and Technology
- International Journal of Soft Computing & Engineering
- International Journal of Software Engineering
- International Journal of Software Engineering and Its Applications
- International Journal of u- and e- Service, Science and Technology
- International Journal of Universal Computer Sciences
- International Journal of VLSI Design & Communication Systems
- International Journal of Wireless & Mobile Networks
- International Journal on Computer Science and Engineering
- International Journal on Internet and Distributed Computing Systems
- International Journal on Soft Computing
- ISRN Artificial Intelligence
- ISRN Computer Graphics
- ISRN Sensor Networks
- Issues in Information Systems
- Journal of Advanced Computer Science & Technology
- Journal of Applied Collaborative Systems
- Journal of Artificial Intelligence
- Journal of Automatic Control
- Journal of Computations & Modelling
- Journal of Computer Science
- Journal of Computer Systems, Networks, and Communications
- Journal of Computing
- Journal of Electrical and Computer Engineering
- Journal of Global Research in Computer Science
- Journal of Information Security
- Journal of Internet Services and Information Security
- Journal of Mobile, Embedded and Distributed Systems
- Journal of Multimedia
- Journal of Object Technology
- Journal of Physical Agents
- Journal of Security Engineering
- Journal of Software
- Journal of Systemics, Cybernetics and Informatics
- Journal of Universal Computer Science
- Journal of Wireless Mobile Networks, Ubiquitous Computing, and Dependable Applications
- LIPIcs : Leibniz International Proceedings in Informatics
- Network Protocols and Algorithms
- Open Applied Informatics Journal
- Open Information Systems Journal
- Open Source Science Journal
- Proceeding of the Central European Conference on Information and Intelligent Systems
- The Python Papers Monograph
- Research Journal of Information Technology
- Scalable Computing : Practice and Experience
- Signal & Image Processing
- Software Engineering : an International Journal
- Telektronikk
- Theory of Computing
- Transactions on Data Privacy
- Wireless Sensor Network
- World of Computer Science and Information Technology Journal
- Database : the Journal of Biological Databases and Curation
- International Journal of Enterprise Computing and Business Systems
- Electronic Journal of Information Systems Evaluation
- Economy Informatics
- Information Technology, Learning, and Performance Journal
- Turkish Journal of Electrical Engineering and Computer Sciences
- Microwave Review
- Journal of Control Science and Engineering
- Digital Medievalist
- Journal of International Commercial Law and Technology
- Interdisciplinary Journal of Information, Knowledge, and Management
- Journal of Information Architecture

- Issues in Informing Science and Information Technology
- Journal on Satisfiability, Boolean Modeling and Computation
- Discrete Mathematics & Theoretical Computer Science
- Electronic Journal of Information Systems in Developing Countries
- Telfor Journal
- African Journal of Information and Communication Technology
- Human Technology
- Information & Security : An International Journal
- Computational Intelligence and Neuroscience
- URISA Journal
- Eludamos : Journal for Computer Game Culture
- Game Studies
- Journal of Computer Science and Technology
- International Journal of Engineering Science and Technology

Construction

- Australasian Journal of Construction Economics and Building
- Concrete Research Letters
- Electronic Journal of Structural Engineering
- International Journal of Advanced Structural Engineering
- Journal of Construction in Developing Countries
- Lean Construction Journal
- Structural Engineering / Earthquake Engineering
- Built & Human Environment Reivew
- Electronic Journal of Information Technology in Construction
- Heron
- International Journal of Sustainable Construction Engineering and Technology
- Journal of Information Technology in Construction
- Open Construction & Building Technology Journal
- Sustainable Construction & Design

Cytology

- Biocell
- Cell Regeneration
- Cilia
- International Journal of Cell Biology
- Journal of Cell and Molecular Biology
- Oxidative Medicine and Cellular Longevity
- Cell Division
- Cells
- CytoJournal
- ISRN Cell Biology
- Journal of Cytology
- Endocytobiosis and Cell Research
- Journal of Applied Biomedicine

Dentistry

- Annali di Stomatologia
- Archives of Orofacial Sciences
- Brazilian Dental Journal
- Brazilian Oral Research
- Central India Journal of Dental Sciences
- Contemporary Clinical Dentistry
- Dental Hypotheses
- e-Journal of Dentistry
- Indian Journal of Dental Research
- Indian Journal of Stomatology
- International Journal of Clinical Dental Science
- International Journal of Dental Clinics
- International Journal of Oral & Maxillofacial Pathology
- The Internet Journal of Dental Science
- ISRN Dentistry
- Journal of Conservative Dentistry
- Journal of Dental Research, Dental Clinics, Dental Prospects
- Journal of Dentistry of Tehran University of Medical Sciences
- Journal of International Dental and Medical Research
- Journal of Oral Science
- Journal of Periodontology & Implant Dentistry
- Journal of the Indian Society of Pedodontics and Preventive Dentistry
- The New York State Dental Journal
- Open Journal of Stomatology
- Oral & Maxillofacial Pathology Journal
- Saudi Dental Journal
- STREAMDENT
- Angle Orthodontist
- Annals and Essences of Dentistry
- BMC Oral Health
- Brazilian Journal of Oral Sciences
- Case Reports in Dentistry
- Clinical, Cosmetic and Investigational Dentistry
- Dental Follicle : the E Journal Of Dentistry
- Dental Research Journal
- Indian Journal of Dental Advancements
- Indian Journal of Dental Sciences
- International Dental and Medical Disorder
- International Journal of Contemporary Dentistry
- International Journal of Dentistry
- International Journal of Prosthetic Dentistry
- Iranian Endodontic Journal
- Journal of Clinical and Experimental Dentistry
- Journal of Dental Biomechanics
- Journal of Dental Sciences and Research
- Journal of Forensic Dental Sciences
- Journal of Oral & Maxillofacial Research
- Journal of Orofacial Sciences
- Journal of the California Dental Association
- Journal of the Indian Society of Periodontology
- Open Dentistry Journal
- Oral & Implantology
- Research & Reviews : Journal of Dental Sciences
- Smile Dental Journal
- Journal of Oral and Maxillofacial Pathology

Dermatology

- Acta Dermato-Venereologica
- Case Reports in Dermatological Medicine
- Clinical Medicine Insights : Dermatology
- Dermatology and Therapy

- Dermatology Practical & Conceptual
- Dermatology Research and Practice
- Indian Dermatology Online Journal
- Indian Journal of Dermatology, Venereology and Leprology
- ISRN Dermatology
- Open Dermatology Journal
- BMC Dermatology
- Case Reports in Dermatology
- Clinical, Cosmetic and Investigational Dermatology
- Dermatology Online Journal
- Dermatology Reports
- Egyptian Dermatology Online Journal
- Indian Journal of Dermatology
- The Internet Journal of Dermatology
- Journal of the Egyptian Women's Dermatologic Society
- Psoriasis : Targets and Therapy

Earth Science (Geology)

- Acta Geologica Polonica
- Bulletin of Geosciences
- Current Research in Earth Sciences
- Earth Science Research
- Earth System Science Data
- Estonian Journal of Earth Sciences
- Geologia Croatica
- Geologos
- Geoscientific Model Development Discussions
- International Journal of Geomatics and Geosciences
- Iranian Journal of Earth Sciences
- Journal of Geological Research
- Mineralogia
- Open Geology Journal
- Open Journal of Modern Hydrology
- Proceedings of the Estonian Academy of Sciences. Geology = Teaduste Akadeemia toimetised.
- Proceedings of the Ocean Drilling Program Initial Reports
- Scripta Geologica
- Solid Earth
- Stephan Mueller Special Publication Series
- Turkish Journal of Earth Sciences
- Acta Palaeontologica Polonica
- Bulletin of the Geological Society of Finland
- Earth Science India
- Earth Sciences Research Journal
- Earth System Science Data Discussions
- Geochemical Transactions
- Geologica Acta
- Geoscientific Model Development
- History of Geo- and Space Sciences
- International Journal of Geosciences
- Journal of Earth System Science
- Journal of Geosciences
- Norwegian Journal of Geology
- Open Journal of Geology
- Open Mineralogy Journal
- Proceedings of the Integrated Ocean Drilling Program
- Proceedings of the Ocean Drilling Program Scientific Results
- The Sedimentary Record
- Solid Earth Discussions
- Studia Universitatis Babes-Bolyai : Geologia
- Biogeosciences Discussions
- Biogeosciences
- Earth System Dynamics Discussions
- Papers on Global Change IGBP
- Earth System Dynamics
- Mineralogia Polonica
- Speleogenesis and Evolution of Karst Aquifers
- Journal of Spatial Hydrology
- Geological Survey of Denmark and Greenland Bulletin
- GeoScience Engineering
- Polish Polar Research

Ecology

- Biodiversity Journal
- Ecology and Society
- Herpetological Conservation and Biology
- ISRN Ecology
- Journal of Ecology and Environment
- Journal of Limnology
- Marine Turtle Newsletter
- Open Journal of Ecology
- Transitional Waters Bulletin
- Tropical Conservation Science
- Urban Habitats
- Wetlands (Australia)
- Ecological Processes
- Ethnobiology Letters
- International Journal of Ecology
- Journal of Biodiversity and Ecological Sciences
- Journal of Ecology and Field Biology
- Lakes reservoirs and ponds
- Open Ecology Journal
- Research Letters in Ecology
- Transitional Waters Monographs
- Trumpeter
- Web Ecology
- Applied Ecology and Environmental Research
- Conservation Evidence
- Rangifer
- Ethnobotany Research and Applications
- Acta Geographica Debrecina. Landscape and Environment Series
- Studies on Ethno-Medicine
- Acta Protozoologica
- Studies on Home and Community Science

Economics

- Annals of the University of Petrosani : Economics
- AUCO Czech Economic Review
- BRAND : Broad Research in Accounting, Negotiation, and Distribution
- Business and Economic History On-Line
- Contemporary Economics
- Econ Journal Watch
- Economics Bulletin
- Economy Transdisciplinarity Cognition
- Financial Assets and Investing
- Hyperion International Journal of Econophysics & New Economy

- International Journal of Applied Econometrics and Quantitative Studies
- International Journal of Contemporary Economics and Administrative Sciences
- International Journal of Economic Sciences and Applied Research
- International Journal of Economics and Finance Studies
- International Journal of Energy Economics and Policy
- International Real Estate Review
- Japan Social Innovation Journal
- Journal of Economics and Behavioral Studies
- Journal of the Australasian Tax Teachers Association
- Latin American Journal of Economics
- Modern Economy
- Open Economics Journal
- PSL Quarterly Review
- Quantitative Economics
- Research in World Economy
- Review of Economic Analysis
- Review of Economics & Finance
- Risk in Contemporary Economy
- South-Eastern Europe Journal of Economics (SEEJE)
- Theoretical Economics Letters
- African Technology Development Forum Journal
- Asian Economic and Financial Review
- BOFIT Discussion Papers
- Bulletin of the Transilvania University of Brasov. Series V : Economic Sciences
- Consilience : The Journal of Sustainable Development
- Current Research Journal of Economic Theory
- Economics : the Open-Access, Open-Assessment e-Journal
- Economics Research International
- EuroEconomica
- GeoJournal of Tourism and Geosites
- The Industrial Geographer
- The International Journal of Applied Economics and Finance
- International Journal of Economic Development Research and Investment
- International Journal of Economics and Finance
- International Journal of Economics and Research
- International Journal of Population Research
- ISRN Economics
- Journal of Applied Economics and Business Research
- Journal of Regional Analysis and Policy
- Kasarinlan : Philippine Journal of Third World Studies
- Market Forces
- Nurture
- Ovidius University Annals : Economic Sciences Series
- Quantitative and Qualitative Analysis in Social Sciences
- Research in Applied Economics
- Research Journal of Economics, Business and ICT
- Review of Economic Perspectives
- Review of Economics and Institutions
- Romanian Journal of Fiscal Policy
- Theoretical Economics
- Valahian Journal of Economic Studies
- Advances in Management and Applied Economics
- CESifo Forum
- Eurasian Journal of Business and Economics
- International Journal of Economics and Financial Issues
- Journal of Emerging Trends in Economics and Management Sciences
- Romanian Economic and Business Review
- Business and Economic Horizons
- Economics and Finance Review
- The European Journal of Comparative Economics
- International Journal of Economics Business and Management Studies
- Review of Economic and Business Studies (REBS)
- South African Journal of Economic and Management Sciences
- Annals of Dunarea de Jos University. Fascicle I : Economics and Applied Informatics
- Oeconomics of Knowledge
- Information Technologies and International Development
- Erasmus Law and Economics Review
- Games
- Journal of Economic and Social Policy
- Monthly Labor Review
- Romanian Journal of Regional Science
- Economic Sociology : the European Electronic Newsletter
- Electronic International Journal of Time Use Research

Education

- AASA Journal of Scholarship and Practice
- Academia Journal of Educational Research
- Acta Didactica Napocensia
- Asia-Pacific Journal of Cooperative Education
- Atlas Journal of Science Education
- Australasian Journal of Peer Learning
- Bioscience Education Electronic Journal
- Canadian Journal of Educational Administration and Policy
- Complicity : An International Journal of Complexity and Education
- Contemporary Educational Technology
- Critical Education
- Current Issues in Education
- e-Journal of Business Education & Scholarship of Teaching
- Educate~
- Education Inquiry
- Education Research International
- Educational Research eJournal
- Educause Quarterly
- eLearning Papers
- Electronic Journal of Literacy through Science

- English Teaching : Practice and Critique
- Essays in Education
- Eurasian Journal of Physics and Chemistry Education
- European Journal of Educational Studies
- European Journal of Physics Education
- Higher Education Studies
- IARTEM e-journal
- Indonesian Journal of Applied Linguistics
- Innovate : Journal of Online Education
- Inter-American Journal of Education for Democracy
- Interdisciplinary Journal of Problem-based Learning
- International Electronic Journal for Leadership in Learning
- International Journal about Parents in Education
- International Journal for the Scholarship of Teaching and Learning
- International Journal of Critical Pedagogy
- International Journal of Education
- International Journal of Educational and Psychological Assessment
- International Journal of Educational Sciences
- International Journal of Evaluation and Research in Education
- International Journal of Instruction
- International Journal of Multicultural Education
- International Journal of Social Pedagogy
- International Journal of Teacher Leadership
- International Journal of the First Year in Higher Education
- International Review of Research in Open and Distance Learning
- ISRN Education
- ITALICS
- JEP : eJournal of Education Policy
- Journal of Case Studies in Accreditation and Assessment
- Journal of Curriculum Theorizing
- Journal of Education for International Development
- Journal of Educational Enquiry
- Journal of Educational Sciences & Psychology
- Journal of Elementary Education
- Journal of Extension
- Journal of Higher Education Outreach and Engagement
- Journal of Institutional Research (South-East Asia)
- Journal of Interactive Media in Education
- Journal of Language Teaching and Learning
- Journal of Learning Design
- Journal of Learning Spaces
- Journal of Mathematics Education at Teachers College
- Journal of Online Learning and Teaching
- Journal of Physics Teacher Education Online
- Journal of Research in Rural Education
- Journal of Southeast Asian American Education and Advancement
- Journal of Teaching and Learning
- Journal of Technical Education and Training
- Journal of the NUS Teaching Academy
- Journal of University Teaching and Learning Practice
- Journal on Efficiency and Responsibility in Education and Science
- Kentucky Journal of Higher Education Policy and Practice
- The Knowledge Tree: an e-Journal of Learning Innovation
- Learning and Teaching in Higher Education : Gulf Perspectives
- LEARNing Landscapes
- Literacy and Numeracy Studies
- Medical Education Development
- Meridian (Raleigh): a middle school computer technologies journal
- Modern Journal of Language Teaching Methods
- The New Educator
- Nonpartisan Education Review
- Online Journal of Counselling and Education
- Open Education Journal
- Physical Review Special Topics. Physics Education Research
- Practical Assessment, Research & Evaluation
- Profile Issues in Teachers' Professional Development
- Reconceptualizing Educational Research Methodology
- Research and Issues in Music Education
- Research in Learning Technology
- Review of International Geographical Education Online
- Science Education International
- Simon Fraser University Educational Review
- South African Journal of Education
- Studies in Learning, Evaluation, Innovation and Development
- Talent Development and Excellence
- The Turkish Online Journal of Distance Education
- Workplace : A Journal for Academic Labor
- World Journal on Educational Technology
- AAUP Journal of Academic Freedom
- Across the Disciplines
- Annual Review of Education, Communication and Language Sciences
- Asian Journal of Distance Education
- Australasian Journal of Educational Technology
- Australian Journal of Teacher Education
- Brazilian English Language Teaching Journal
- The College Quarterly
- Concept : The Journal of Contemporary Community Education Practice Theory
- Creative Education
- Current Issues in Comparative Education
- Democracy & Education
- E-Journal of Organizational Learning and Leadership
- Education and Health
- Education Next
- Education Sciences

- Educational Technology Letters
- Educause Review
- Electronic Journal of e-Learning
- Electronic Magazine of Multicultural Education
- Enhancing Learning in the Social Sciences
- Ethiopian Journal of Education and Sciences
- European Journal for Research on the Education and Learning of Adults
- European Journal of Open, Distance and e-Learning
- Higher Education in Review
- Humanising Language Teaching
- in education
- INFORMS Transactions on Education
- InSight : A Journal of Scholarly Teaching
- Interactive Educational Multimedia
- International Education Studies
- International Electronic Journal of Elementary Education
- International Journal for Educational Integrity
- International Journal of Advanced Corporate Learning (iJAC)
- International Journal of Designs for Learning
- International Journal of Education Policy and Leadership
- International Journal of Educational Research and Technology
- International Journal of ePortfolio
- International Journal of Higher Education
- International Journal of Medical Education
- International Journal of Research Studies in Education
- International Journal of Special Education
- International Journal of Teaching and Learning in Higher Education
- International Journal of Whole Schooling
- The Internet Journal of Medical Education
- Issues in educational research
- Je-LKS : Journal of e-Learning and Knowledge Society
- Journal for Critical Education Policy Studies
- Journal of Curriculum and Instruction
- Journal of Education and Vocational Research
- Journal of Education Policy, Planning and Administration
- Journal of Educational Research
- Journal of Educators Online
- Journal of Emerging Trends in Educational Research and Policy Studies
- Journal of Free Software and Free Knowledge
- Journal of Information Technology Education : Research
- Journal of Instructional Pedagogies
- The Journal of Interactive Online Learning
- Journal of Leadership Education
- Journal of Learning Development in Higher Education
- Journal of Learning Through the Arts
- Journal of Nursing Education and Practice
- Journal of Pedagogic Development
- Journal of Praxis in Multicultural Education
- The Journal of Scholarship of Teaching and Learning
- Journal of Studies in Education
- Journal of Teaching and Learning with Technology
- The Journal of Technology, Learning, and Assessment
- Journal of the Research Center for Educational Technology
- Journal of Unschooling and Alternative Learning
- Kairos : Journal of Rhetoric, Technology, and Pedagogy
- Knowledge Management & E-Learning : an International Journal
- Learning and teaching in higher education (LATHE)
- Learning Exchange
- Learning Technology
- LLI Review : the Annual Journal of the Osher Lifelong Learning Institute
- The Mentor: An Academic Advising Journal
- Mevlana International Journal of Education
- MountainRise
- New Waves : Educational Research & Development
- NZ Journal of Teachers' Work
- Online Journal of Distance Learning Administration
- Per Linguam : A Journal of Language Learning
- Policy & Practice : A Development Education Review
- Practice and Evidence of the Scholarship of Teaching and Learning in Higher Education
- Radical Pedagogy
- Reflecting Education
- Research in Higher Education Journal
- Research in Middle Level Education Online
- School Community Journal
- Seminar.net
- Social Studies Research and Practice
- Spreadsheets in Education
- Studies in Self-Access Learning Journal
- Teaching Exceptional Children Plus...
- Work Based Learning e-Journal
- World Journal of Education
- CEBE Transactions
- Astronomy Education Review
- Informatics in Education
- Journal of Information Technology Education : Innovations in Practice
- Bulletin of Applied Computing and Information Technology
- International Journal of Education and Development using Information and Communication Technology
- Journal of Intelligent Learning Systems and Applications
- International Review of Economics Education
- International Journal of Environmental and Science Education
- International Electronic Journal of Environmental Education
- International Journal of Engineering Pedagogy
- Journal of Technology and Science Education
- Engineering Education

- Journal of Pre-College Engineering Education Research
- Journal of Chiropractic Education
- Arab World English Journal
- Critical Literacy : Theories and Practices
- Journal of Language and Literacy Education
- SANE Journal
- This Rough Magic
- CORELL : Computer Resources for Language Learning
- International Journal of English and Education
- Language Learning and Technology
- Theory and Practice in Language Studies
- Heritage Language Journal
- English Language Teaching
- International Journal for Mathematics Teaching and Learning
- The Montana Mathematics Enthusiast
- Pythagoras
- International Electronic Journal of Mathematics Education
- Journal of Urban Mathematics Education
- Numeracy
- Journal of Educational Evaluation for Health Professions
- Open Medical Education Journal
- The International Electronic Journal of Health Education
- Medical Education Online
- Journal of Music History Pedagogy
- Paideusis
- International Journal of Evidence Based Coaching and Mentoring
- Christian Perspectives in Education
- The Electronic Journal of Science Education
- InterActions : UCLA Journal of Education and Information Studies
- International Journal of Social Sciences and Education
- Contemporary Issues in Technology and Teacher Education
- Design and Technology Education: An International Journal
- Eurasia Journal of Mathematics, Science & Technology Education

Electrical and Nuclear Engineering

- Advances in Power Electronics
- Buletin Teknik Elektro dan Informatika
- Electronics
- Energy and Power Engineering
- EURASIP Journal on Advances in Signal Processing
- International Journal of Antennas and Propagation
- International Journal of Design, Analysis and Tools for Integrated Circuits and Systems
- International Journal of Power Electronics and Drive Systems
- International Journal of Vehicular Technology
- ISRN Signal Processing
- Journal of Electrical Engineering : Theory and Application
- Journal of Electronic Science and Technology
- Journal of Microwaves, Optoelectronics and Electromagnetic Applications
- Journal of Sensor Technology
- Micromachines
- Open Electrical & Electronic Engineering Journal
- Radioengineering
- Research Letters in Electronics
- Science and Technology of Nuclear Installations
- TELKOMNIKA : Indonesian Journal of Electrical Engineering
- VLSI Design
- Advances in Fuzzy Systems
- Archives of Electrical Engineering
- Circuits and Systems
- Elektrika : Journal of Electrical Engineering
- ETRI Journal
- EURASIP Journal on Embedded Systems
- International Journal of Applied Power Engineering
- International Journal of Electrical and Computer Engineering
- International Journal of Power Management Electronics
- ISRN Electronics
- Journal of Electrical and Electronics Engineering
- Journal of Electrical Systems
- Journal of Low Power Electronics and Applications
- Journal of Power Technologies
- Journal of Signal and Information Processing
- Nuclear Technology and Radiation Protection
- Open Signal Processing Journal
- Recent Patents on Signal Processing
- Research Letters in Signal Processing
- Serbian Journal of Electrical Engineering
- Transactions on Electrical and Electronic Materials
- Wireless Engineering and Technology
- EURASIP Journal on Bioinformatics and Systems Biology
- Annals of Dunarea de Jos
- Scientific Bulletin of the Politehnica University of Timisoara : Transactions on Electronics and Communications
- Acta Electrotechnica et Informatica
- International Journal of Electronics, Computer and Communications Technologies
- Energy Science and Technology

Electricity

- Journal of Electromagnetic Analysis and Applications
- Progress In Electromagnetics Research
- Progress In Electromagnetics Research C
- Progress In Electromagnetics Research M
- Magnetic Resonance in Solids
- Progress In Electromagnetics Research B
- Progress In Electromagnetics Research Letters

Environmental Engineering

- International Journal of Energy and Environment

- International Journal of Renewable Energy Development (IJRED)
- Journal of Urban and Environmental Engineering
- Open Journal of Soil Science
- Annals of Warsaw University of Life Sciences - SGGW : Land Reclamation
- International Journal of Energy and Environmental Engineering
- Journal of Applied Phytotechnology in Environmental Sanitation
- Open Environmental Engineering Journal

Environmental Science

- Air, Soil and Water Research
- Annals of Environmental Science
- BioRisk
- Cities and the Environment
- Climate of the Past Discussions
- Energy and Environment Research
- Environment and Natural Resources Research
- Environmental Evidence
- Environmental Research, Engineering and Management
- Environmental Sciences Europe
- EnvironmentAsia
- Holistic Approach to Environment
- International Journal of Environmental Sciences
- IOP Conference Series : Earth and Environmental Science
- Journal of Environmental Protection
- Journal of Management and Sustainability
- Journal of Sustainability Science and Management
- Journal of Sustainable Energy
- Journal of Vietnamese Environment
- Journal of Water and Land Development
- Low Carbon Economy
- Open Environmental & Biological Monitoring Journal
- Open Environmental Sciences
- Park Science
- San Francisco Estuary and Watershed Science
- Solutions Journal
- Universal Journal of Environmental Research and Technology
- Academia Journal of Environmental Sciences
- American Journal of Environmental Sciences
- Aquatic Biosystems
- British Journal of Environment and Climate Change
- Climate of the Past
- Electronic Green Journal
- Energy, Sustainability and Society
- Environment and Pollution
- Environmental Research Letters
- Environmental Sciences
- Environmental Skeptics and Critics
- European Journal of Sustainable Development
- International Journal of Development and Sustainability
- International Journal of Soil, Sediment and Water
- Iranica Journal of Energy and Environment (IJEE)
- Journal of Environmental Science and Technology
- Journal of Natural Resources and Development
- Journal of Sustainable Development
- The Journal of Transdisciplinary Environmental Studies
- Journal of Waste Management
- Landscape Online
- Natural Resources and Environmental Issues
- Open Environmental Pollution & Toxicology Journal
- PAGES News
- Research Journal of Environmental and Earth Sciences
- Smart Grid and Renewable Energy
- Sustainability
- Water S.A.
- Journal of Human Ecology
- Our Nature
- Boreal Environment Research
- Journal of Tropical Forestry and Environment
- Hydrology and Earth System Sciences
- The Cryosphere
- Baltica : an International Yearbook for Quaternary Geology and Palaeogeography, Coastal Morphology and Shore Processes, Marine Geology and Recent Tectonics of the Baltic Sea Area
- EARSeL eProceedings
- Environmental Health Perspectives
- Journal of Applied Sciences and Environmental Management
- Interdisciplinary Description of Complex Systems

Environmental Technology

- Journal of Applied Sciences in Environmental Sanitation
- Journal of Water and Environment Technology
- Open Waste Management Journal
- Applied Water Science
- Journal of Applied Technology in Environmental Sanitation
- Journal of Water Resource and Protection
- Water
- Sustainability : Science, Practice and Policy

Ethnology

- International Journal of Intangible Heritage
- Journal of Ethnology and Folkloristics
- Indian Journal of Traditional Knowledge
- Journal of Ethnobiology and Ethnomedicine
- Folklore Studies
- Nordic Notes

Forestry

- Casopis Beskydy
- Forest Systems
- iForest : Biogeosciences and Forestry
- International Journal of Forestry Research
- Mathematical and Computational Forestry & Natural-Resource Sciences
- Open Forest Science Journal
- Annals of Forest Research
- Croatian Journal of Forest Engineering

- Forests
- International Journal of Forest, Soil and Erosion
- ISRN Forestry
- New Zealand Journal of Forestry Science
- Open Journal of Forestry
- Silva Fennica

Gastroenterology

- BMC Gastroenterology
- Case Reports in Gastrointestinal Medicine
- Clinical and Molecular Hepatology
- Clinical Medicine : Gastroenterology
- Comparative Hepatology
- Gastroenterology Research
- Gut Pathogens
- Hepatitis B Annual
- Hepatitis Research and Treatment
- ISRN Gastroenterology
- Journal of Coloproctology
- Open Gastroenterology Journal
- Saudi Journal of Gastroenterology
- World Journal of Gastrointestinal Pathophysiology
- Annals of Gastroenterology
- Case Reports in Gastroenterology
- Case Reports in Hepatology
- Clinical and Translational Gastroenterology
- Clinical Medicine Insights : Gastroenterology
- Gastroenterology Insights
- Gastroenterology Research and Practice
- Hepatic Medicine : Evidence and Research
- Hepatitis Monthly
- International Journal of Hepatology
- JOP Journal of the Pancreas
- Middle East Journal of Digestive Diseases
- Open Journal of Gastroenterology
- World Journal of Gastroenterology
- World Journal of Hepatology
- World Journal of Gastrointestinal Oncology
- World Journal of Gastrointestinal Endoscopy
- HPB Surgery
- World Journal of Gastrointestinal Surgery
- World Journal of Gastrointestinal Pharmacology and Therapeutics

Gender Studies

- Canadian Online Journal of Queer Studies in Education
- International Family Planning Perspectives
- Journal of International Women's Studies
- Religion and Gender
- Thirdspace : a Journal of Feminist Theory & Culture
- Advancing Women in Leadership
- Gender Forum
- Intersections : Gender and Sexuality in Asia and the Pacific
- Outskirts: Feminisms along the Edge
- The Scholar & Feminist Online
- Wagadu : a Journal of Transnational Women's & Gender Studies
- International Journal of Gender, Science and Technology
- Nineteenth-Century Gender Studies
- Gay and Lesbian Issues and Psychology Review
- Electronic Journal of Human Sexuality
- Women in Judaism : a Multidisciplinary Journal

General and Civil Engineering

- Advances in Civil Engineering
- Analele Universităţii "Eftimie Murgu
- Archives of Civil Engineering
- CFD Letters
- Contemporary Engineering Sciences
- Engineering Journal
- EURASIP Journal on Image and Video Processing
- Ganpat University Journal of Engineering & Technology
- Indian Journal of Engineering & Materials Sciences
- International Journal for Service Learning in Engineering
- International Journal of Applied Engineering Research
- International Journal of Engineering
- International Journal of Engineering and Advanced Technology
- International Journal of Engineering Research and Applications
- International Journal of Image Processing
- International Journal of Prognostics and Health Management
- International Journal of Rotating Machinery
- International Journal of Thermodynamics
- IOP Conference Series : Materials Science and Engineering
- ITB Journal of Engineering Science
- Journal of Emerging Trends in Engineering and Applied Sciences
- Journal of Engineering Science and Technology
- Journal of Engineering Studies and Research
- Journal of the South African Institution of Civil Engineering
- Modelling and Simulation in Engineering
- Open Ocean Engineering Journal
- Open Transport Phenomena Journal
- Reviews on Advanced Materials Science
- Scientific Drilling
- Slovak Journal of Civil Engineering
- Acta Technica Corviniensis
- American Journal of Engineering and Applied Sciences
- Annals of the Faculty of Engineering Hunedoara
- Bulletin of Materials Science
- Computational Methods in Civil Engineering
- Engineering
- Engineering, Technology & Applied Science Research
- Facta Universitatis Series : Architecture and Civil Engineering
- IETE Technical Review
- Industrial Engineering Letters
- International Journal of Advances in Engineering Sciences

- International Journal of Engineering
- International Journal of Engineering & Technology
- International Journal of Engineering Research
- International Journal of Engineering Trends and Technology
- International Journal of Latest Trends in Engineering and Technology
- International Journal of Research and Reviews in Applied Sciences
- International Journal of Scientific Research Engineering & Technology (IJSRET)
- International Transaction Journal of Engineering, Management, & Applied Sciences & Technologies
- ISRN Civil Engineering
- JIDEG : Journal of Industrial Design and Engineering Graphics
- Journal of Engineering and Applied Sciences
- Journal of Engineering Science and Technology Review
- Journal of the Institute of Engineering
- Latvian Journal of Physics and Technical Sciences
- Open Civil Engineering Journal
- Open Petroleum Engineering Journal
- Polish Maritime Research
- Sadhana
- Scientific Herald of the Voronezh State University of Architecture and Civil Engineering
- Technology Interface Journal
- Journal of Biological Engineering
- International Journal of Engineering Business Management
- International Journal of Computer Applications in Engineering Sciences
- International Journal of Intelligent Control and Systems
- International Journal of Civil and Structural Engineering
- Electronic Journal of Geotechnical Engineering
- Journal of Environmental Sciences, Computer Science and Engineering & Technology
- Archives of Computational Materials Science and Surface Engineering
- Archives of Materials Science and Engineering
- Indian Journal of Fibre & Textile Research
- International Journal of Nano Dimension
- ISRN Materials Science
- Journal of Achievements in Materials and Manufacturing Engineering
- Journal of Nanomaterials
- Materials
- Materials Research
- Materials Sciences and Applications
- Nanomaterials
- Open Journal of Composite Materials
- Recent Patents on Corrosion Science
- Science and Technology of Advanced Materials
- World Journal of Mechanics
- Advances in Materials Physics and Chemistry
- Archives of Foundry Engineering
- Chalcogenide Letters
- International Journal of Corrosion
- ISRN Corrosion
- ISRN Nanomaterials
- Journal of Materials Science Research
- MATEC Web of Conferences
- Materials Engineering
- Materials Science
- Materials Today
- Open Corrosion Journal
- Open Materials Science Journal
- Research Letters in Materials Science
- Smart Materials Research
- eXPRESS Polymer Letters
- Carbon : Science and Technology
- Journal of Applied Fluid Mechanics
- Archives of Metallurgy and Materials
- Differential Equations and Nonlinear Mechanics
- Applied Computational Intelligence and Soft Computing
- Advances in OptoElectronics
- Journal of Applied Sciences Research
- International Journal of Quality, Statistics, and Reliability
- International Journal of Engineering and Technology
- Research Letters in Nanotechnology
- Research Journal of Applied Sciences, Engineering and Technology
- Management Science and Engineering

Genetics

- Advances in Genomics and Genetics
- The Application of Clinical Genetics
- BMC Genetics
- BMC Medical Genomics
- Case Reports in Genetics
- Comparative and Functional Genomics
- Current Research in Bacteriology
- Frontiers in Genetics
- Genes
- Genetic Vaccines and Therapy
- Genetics and Molecular Biology
- Genetics Research International
- Genome Biology and Evolution
- Human Genomics
- Indian Journal of Human Genetics
- International Journal of Genetics
- International Journal of Human Genetics
- Investigative Genetics
- Journal of Genetics
- Journal of RNAi and Gene Silencing
- Molecular Cytogenetics
- Open Journal of Genetics
- Silence
- Stem Cell Discovery
- American Journal of Stem Cells
- Balkan Journal of Medical Genetics
- BMC Genomics
- Brazilian Journal of Genetics
- Clinical Epigenetics
- Comparative Cytogenetics
- Epigenetics & Chromatin

- G3 : Genes, Genomes, Genetics
- Genes & Genetic Systems
- Genetics and Epigenetics
- Genetics and Molecular Research
- Genetika
- Genomics and Quantitative Genetics
- Human Genomics and Proteomics
- International Journal of Evolutionary Biology
- International Journal of Genomics
- International Journal of Molecular Epidemiology and Genetics
- Journal of Genetic Genealogy
- Journal of Genomics
- Mobile DNA
- Open Genomics Journal
- PLoS Genetics
- Standards in Genomic Sciences
- Stem Cell Studies
- Journal of Nucleic Acids
- Algorithms for Molecular Biology
- Hereditas
- Genomics, Society and Policy

Geography

- Annals of the University of Craiova
- Bulletin of Geography. Physical Geography Series
- Enlightening Tourism : a Pathmaking Journal
- European Journal of Remote Sensing
- Fennia : International Journal of Geography
- Human Geographies : Journal of Studies and Research in Human Geography
- International Journal of Navigation and Observation
- Italian Journal of Remote Sensing
- Journal of Geography and Geology
- Mountain Research and Development
- Positioning
- Revista Romana de Geografie Politica
- Shima : the International Journal of Research into Island Cultures
- Applied GIS
- Bulletin of Geography. Socio-Economic Series
- European Journal of Geography
- European Journal of Tourism, Hospitality and Recreation
- GeoScape
- International Journal of Disaster Risk Science
- ISPRS International Journal of Geo-Information
- Journal of Geographic Information System
- Journal of Spatial Information Science
- Open Geography Journal
- Remote Sensing
- Romanian Review of Regional Studies
- Hydrology and Earth System Sciences Discussions
- JURA : Journal of Urban and Regional Analysis
- Palaeontologia Electronica
- Open Paleontology Journal

Geophysics and Geomagnetism

- Annales Geophysicae
- International Journal of Geophysics
- Journal of Space Weather and Space Climate
- Abraham Zelmanov Journal
- Geofisica Internacional
- ISRN Geophysics
- eEarth Discussions
- eEarth
- Nonlinear Processes in Geophysics

Gynecology and Obstetrics

- Anatolian Journal of Obstetrics & Gynecology
- Case Reports in Obstetrics and Gynecology
- International Journal of Reproductive Medicine
- The Internet Journal of Gynecology and Obstetrics
- ISRN Obstetrics and Gynecology
- Journal of Experimental and Clinical Assisted Reproduction (JECAR)
- Journal of Gynecological Endoscopy and Surgery
- Journal of Pregnancy
- Nepal Journal of Obstetrics and Gynaecology
- Open Access Journal of Contraception
- Open Women's Health Journal
- Sri Lanka Journal of Obstetrics and Gynaecology
- BMC Pregnancy and Childbirth
- Facts, Views & Vision in ObGyn
- International Journal of Women's Health
- Iranian Journal of Reproductive Medicine
- Journal of Clinical Gynecology and Obstetrics
- Journal of Family and Reproductive Health
- Journal of Human Reproductive Sciences
- Journal of Prenatal Medicine
- Obstetrics and Gynecology International
- Open Journal of Obstetrics and Gynecology
- Research Journal of Obstetrics and Gynecology
- Infectious Diseases in Obstetrics & Gynecology
- Osteopathic Medicine and Primary Care
- Southern African Journal of Gynaecological Oncology
- International Breastfeeding Journal

Heat

- Frontiers in Heat and Mass Transfer
- Journal of Combustion
- Archives of Thermodynamics
- ISRN Thermodynamics
- Open Thermodynamics Journal

History

- 49th Parallel : an Interdisciplinary Journal of North America
- Culture & History Digital Journal
- E-Journal of Portuguese History
- Fragments : Interdisciplinary Approaches to the Study of Ancient and Medieval Pasts
- Greek, Roman, and Byzantine Studies
- Journal for Late Antique Religion and Culture
- Journal of World-Historical Information
- Law, Crime & History
- Mamluk Studies Review
- New Jersey History : Studies in State and Regional History
- Quest : Issues in Contemporary Jewish History.
- Settler Colonial Studies
- Studies on Asia
- Yesterday and Today

- Annals of Genealogical Research
- Dubrovnik Annals
- Eras
- Graduate History Review
- International Journal of Naval History
- Journal of Historical Biography
- Kronos (Bellville)
- Leeds International Classical Studies
- The Middle Ground Journal
- Public History Review
- Reviews in History
- Southern Spaces
- Sydney Journal
- Bryn Mawr Classical Review
- Electronic Journal of Africana Bibliography
- E-Preservation Science
- Journal of African American Males in Education
- World History Connected : The e-Journal of Teaching and Learning
- Australian Studies
- The Heroic Age : a Journal of Early Medieval Northwestern Europe
- Asian Culture and History
- Asia-Pacific Journal : Japan Focus
- Revista RomÃ¢na de Studii Baltice si Nordice
- African Journal on Conflict Resolution
- Journal on Ethnopolitics and Minority Issues in Europe
- Globality Studies Journal : Global History, Society, Civilization
- African Journal of Criminology and Justice Studies
- Journal of Historians of Netherlandish Art
- EMAJ : Electronic Melbourne Art Journal

Hydraulic Engineering

- Drinking Water Engineering and Science Discussions
- Drinking Water Engineering and Science
- Open Hydrology Journal

Industrial Engineering

- American Journal of Operations Research
- International Journal of Industrial Engineering Computations
- Journal of Automation, Mobile Robotics & Intelligent Systems
- Journal of Industrial Engineering International
- Open Automation and Control Systems Journal
- Open Operational Research Journal
- International Journal of Industrial Engineering & Production Research
- International Scientific Journal of Management Information Systems
- Journal of Engineering, Project, and Production Management
- Journal of Remanufacturing
- Open Industrial & Manufacturing Engineering Journal
- South African Journal of Industrial Engineering
- Journal of Industrial Engineering and Management

Inorganic Chemistry

- International Journal of Inorganic Chemistry
- Open Journal of Inorganic Chemistry
- Bioinorganic Chemistry and Applications
- Open Inorganic Chemistry Journal
- Research Letters in Inorganic Chemistry

Internal Medicine

- Acta Endocrinologica (Bucharest)
- Ageing Research
- American Journal of Blood Research
- American Journal of Nuclear Medicine and Molecular Imaging
- Annals of Family Medicine online
- Annals of Thoracic Medicine
- Archives of Trauma Research
- Asian Journal of Transfusion Science
- Blood and Lymphatic Cancer : Targets and Therapy
- BMC Blood Disorders
- BMC Endocrine Disorders
- BMC Geriatrics
- BMC Medical Physics
- BMC Nuclear Medicine
- Bone Marrow Research
- Case Reports in Critical Care
- Case Reports in Endocrinology
- Case Reports in Infectious Diseases
- Case Reports in Radiology
- Chest Disease Reports
- Chiropractic and Osteopathy
- Cleveland Clinic Journal of Medicine
- Clinical and Experimental Vaccine Research
- Clinical Geriatrics
- Clinical Medicine : Blood Disorders
- Clinical Medicine : Endocrinology and Diabetes
- Clinical Medicine Insights : Arthritis and Musculoskeletal Disorders
- Clinical Medicine Insights : Endocrinology and Diabetes
- Clinical Medicine Insights: Circulatory, Respiratory and Pulmonary Medicine
- Current Gerontology and Geriatrics Research
- Diabetic Hypoglycemia
- Diabetology & Metabolic Syndrome
- Diagnostic and Therapeutic Endoscopy
- EJNMMI Research
- Emerging Infectious Diseases
- Endocrinology Studies
- European Respiratory Review
- Experimental Diabetes Research
- Fibrogenesis & Tissue Repair
- Germs
- Hematology Reports
- Hong Kong Journal of Emergency Medicine
- Indian Journal of Endocrinology and Metabolism
- Indian Journal of Physical Medicine and Rehabilitation
- Indian Journal of Sexually Transmitted Diseases
- Infection and Drug Resistance
- Infectious Disease Reports
- Influenza Research and Treatment
- Integrated Blood Pressure Control
- Internal Medicine

- International Journal of Burns and Trauma
- International Journal of Emergency Medicine
- International Journal of Hematology-Oncology and Stem Cell Research
- International Journal of Parasitology Research
- The Internet Journal of Emergency and Intensive Care Medicine
- The Internet Journal of Endocrinology
- The Internet Journal of Hematology
- The Internet Journal of Internal Medicine
- The Internet Journal of Perfusionists
- The Internet Journal of Radiology
- The Internet Journal of Rheumatology
- Iranian Journal of Clinical Infectious Diseases
- Iranian Journal of Parasitology
- ISRN Emergency Medicine
- ISRN Hematology
- ISRN Pulmonology
- Japanese Journal of Infectious Diseases
- Journal of Association of Chest Physicians
- Journal of Blood Medicine
- Journal of Coagulation Disorders
- Journal of Diabetes & Metabolic Disorders
- Journal of Diabetes Research
- Journal of Emergencies, Trauma and Shock
- Journal of Foot and Ankle Research
- Journal of Global Infectious Diseases
- Journal of Hematology
- Journal of Lasers in Medical Sciences
- Journal of Medicine
- The Journal of Musculoskeletal and Neuronal Interactions
- Journal of Occupational Health
- Journal of Parasitology Research
- Journal of Thyroid Research
- Leprosy Review
- Lung India
- Malaria Research and Treatment
- Molecular Autism
- Nutrition & Diabetes
- Open Access Emergency Medicine
- Open Arthritis Journal
- Open Diabetes Journal
- Open Endocrinology Journal
- Open Hematology Journal
- Open Journal of Hematology
- Open Journal of Radiology
- Open Longevity Science
- Open Neuroendocrinology Journal
- Open Nutrition Journal
- Open Parasitology Journal
- Open Rheumatology Journal
- Open Tropical Medicine Journal
- Polish Archives of Internal Medicine
- Pulmonary Medicine
- Research and Reports in Endocrine Disorders
- Respiratory Research
- Rheumatology Reports
- South African Journal of Radiology
- Sri Lanka Journal of Critical Care
- Tanaffos : Journal of Respiratory Disease, Thoracic Surgery, Intensive Care and Tuberculosis
- Turkish Journal of Endocrinology and Metabolism
- Turkish Journal of Rheumatology
- World Journal of Diabetes
- World Journal of Radiology
- Advances in Hematology
- Aging and Disease
- American Journal of Infectious Diseases
- Anemia
- Annals of Intensive Care
- Annals of Tropical Medicine and Public Health
- Arthritis
- Autoimmune Diseases
- Blood Transfusion
- BMC Emergency Medicine
- BMC Family Practice
- BMC Infectious Diseases
- BMC Musculoskeletal Disorders
- BMC Pulmonary Medicine
- Brazilian Journal of Infectious Diseases
- Case Reports in Emergency Medicine
- Case Reports in Hematology
- Case Reports in Pulmonology
- Case Reports in Rheumatology
- Chiropractic and Manual Therapies
- Chronic Diseases in Canada
- Clinical and Experimental Gastroenterology
- Clinical Epidemiology
- Clinical Medicine : Arthritis and Musculoskeletal Disorders
- Clinical Medicine : Circulatory, Respiratory and Pulmonary Medicine
- Clinical Medicine : Geriatrics
- Clinical Medicine Insights : Blood Disorders
- Clinical Medicine Insights : Geriatrics
- Critical Care Research and Practice
- Diabetes Therapy
- Diabetologia Croatica
- Diagnostic and Interventional Radiology
- Drugs and Cell Therapies in Hematology
- Emergency Medicine International
- Endocrine Journal
- Ergonomics Open Journal
- Experimental & Translational Stroke Medicine
- Family Medicine
- Frontiers in Endocrinology
- Hematology online (ASH)
- Hematology Reviews
- Indian Journal of Critical Care Medicine
- Indian Journal of Occupational and Environmental Medicine
- Indian Journal of Radiology and Imaging
- Industrial Health
- Infection Ecology & Epidemiology
- Infectious Diseases : Research and Treatment
- Insights into Imaging
- Interdisciplinary Perspectives on Infectious Diseases
- International Diabetes Monitor
- International Journal of COPD
- International Journal of Endocrinology
- International Journal of Occupational Hygiene
- International Journal of Rheumatology

- The Internet Journal of Emergency Medicine
- The Internet Journal of Geriatrics and Gerontology
- The Internet Journal of Infectious Diseases
- The Internet Journal of Orthopedic Surgery
- The Internet Journal of Pulmonary Medicine
- The Internet Journal of Rescue and Disaster Medicine
- The Internet Journal of Tropical Medicine
- Iranian Journal of Nuclear Medicine
- Iranian Journal of Radiology
- ISRN Endocrinology
- ISRN Obesity
- ISRN Rheumatology
- Journal of Aging Research
- Journal of Atrial Fibrillation
- Journal of Clinical and Experimental Hematopathology
- Journal of Contemporary Brachytherapy
- Journal of Diabetes Mellitus
- Journal of Diabetology : Official Journal of Diabetes in Asia Study Group
- Journal of Endocrinology and Metabolism
- Journal of Gambling Issues
- Journal of Hematological Malignancies
- Journal of Injury and Violence Research
- Journal of Medical Physics
- Journal of Mid-Life Health
- Journal of Obesity
- Journal of Occupational Medicine and Toxicology
- Journal of the Indian Academy of Geriatrics
- Journal of Tropical Medicine
- Leukemia Research and Treatment
- Malaria Journal
- Mediterranean Journal of Hematology and Infectious Diseases
- Multidisciplinary Respiratory Medicine
- Nutrition and Metabolic Insights
- Open Aging Journal
- Open Critical Care Medicine Journal
- Open Emergency Medicine Journal
- Open Geriatric Medicine Journal
- Open Infectious Diseases Journal
- Open Journal of Internal Medicine
- Open Leukemia Journal
- Open Medical Imaging Journal
- Open Nuclear Medicine Journal
- Open Obesity Journal
- Open Respiratory Medicine Journal
- Open Stem Cell Journal
- PLoS Neglected Tropical Diseases
- Primary Care Respiratory Journal
- Radiology Research and Practice
- Research and Reports in Tropical Medicine
- Reviews in Infection
- Scandinavian Journal of Trauma, Resuscitation and Emergency Medicine
- Southwest Journal of Pulmonary and Critical Care
- Stem Cells International
- Texas Heart Institute Journal
- Turkish Journal of Hematology
- Western Journal of Emergency Medicine
- World Journal of Nephrology and Urology
- The Internet Journal of Asthma, Allergy and Immunology
- Immunity & Ageing
- Applied Cardiopulmonary Pathophysiology
- The Internet Journal of Cardiology
- Proceedings of the American Thoracic Society online
- The Internet Journal of Cardiovascular Research
- The Internet Journal of Gastroenterology
- Journal of Pathogens
- Tuberculosis Research and Treatment
- Pathogens
- Journal of Neuroparasitology
- International Journal of Alzheimer's Disease
- Haematologica
- Experimental Hematology & Oncology
- Journal of Hematology & Oncology
- International Journal of Pediatric Endocrinology
- Pediatric Rheumatology
- PPAR Research
- Tobacco Induced Diseases
- Journal of Venomous Animals and Toxins including Tropical Diseases

Language and Literature

- The Albatross
- Aphra Behn Online : Interactive Journal for Women in the Arts 1640-1830
- Brno Studies in English
- Cardiff Corvey : Reading the Romantic Text
- The Criterion : an International Journal in English
- Cuneiform Digital Library Journal
- Digital Defoe : Studies in Defoe & His Contemporaries
- Early Modern Literary Studies
- English for Specific Purposes World
- European Journal of Life Writing
- ImageTexT : Interdisciplinary Comics Studies
- Inquire : Journal of Comparative Literature
- Journal of Dutch Literature
- Journal of Literature, Culture and Media Studies
- KB Journal
- Language in India
- Looking Glass : New Perspectives on Children's Literature
- Orbit : Writing Around Pynchon
- Papers : Explorations into Children's Literature
- The Poetess Archive Journal
- Postcolonial Text
- Romanticism and Victorianism on the Net
- Studies in Gothic Fiction
- Transnational Literature
- Working Papers in Language Pedagogy
- 3L Language, Linguistics and Literature : the Southeast Asian Journal of English Language Studies
- Americana : E-Journal of American Studies in Hungary
- Australian Humanities Review

- Bryn Mawr Review of Comparative Literature
- Composition Forum
- Cuneiform Digital Library Bulletin
- The Dawn Journal
- Early Modern Culture Online
- Electronic Book Review
- Erfurt Electronic Studies in English
- Glossator : Practice and Theory of the Commentary
- Indian Review of World Literature in English
- International Journal of Research Studies in Language Learning
- Journal of Language Teaching and Research
- K@ta : a Biannual Publication on the Study of Language and Literature
- Kritika Kultura
- Lapis Lazuli : an International Literary Journal
- NJES : Nordic Journal of English studies
- Ovid, Myth and (Literary) Exile
- Persuasions : the Jane Austen Journal On-Line
- Pores : an Avant-gardist Journal of Poetics Research
- Romantic Textualities : Literature and Print Culture, 1780-1840
- Romanticism On the Net
- Studies in Literature and Language
- Victorian Network
- Writing Technologies
- Asian American Literature : Discourses & Pedagogies
- Language and Literacy : A Canadian Educational e-journal
- ELTWorldOnline.com
- Teaching American Literature : A Journal of Theory and Practice
- Teaching English with Technology
- Journal of the Association for the Study of Australian Literature
- American Studies Journal
- English Language and Literature Studies
- Acta Linguistica Asiatica
- TESL - EJ
- Transformative Works and Cultures
- The Irish Journal of Gothic and Horror Studies
- Colloquy
- S : Journal of the Jan van Eyck Circle for Lacanian Ideology Critique
- Epiphany
- Neo-Victorian Studies

Law

- AGORA International Journal of Juridical Sciences
- Asian-Pacific Law & Policy Journal
- Comparative Law Review
- Duke Environmental Law & Policy
- Duke Journal of Gender Law & Policy
- E Law - Murdoch University Electronic Journal of Law
- European Journal of Law and Technology
- feminists@law
- International Free and Open Source Software Law Review
- International Journal of Criminal Investigation
- JIPITEC : Journal of Intellectual Property, Information Technology and E-Commerce Law
- Journal of Intellectual Property Rights
- Journal of Legal Analysis
- Law and Contemporary Problems : a Quarterly Published by the Duke University, School of Law
- Law, Democracy & Development
- Merkourios : Utrecht Journal of International and European Law
- Mizan Law Review
- Open Forensic Science Journal
- Pittsburgh Journal of Environmental and Public Health
- Public Space : the Journal of Law and Social Justice
- Roman Legal Tradition
- Stanford Technology Law Review
- University of Pittsburgh Law Review
- Utrecht Law Review
- William & Mary Bill of Rights Journal
- William and Mary Journal of Women and the Law
- Wroclaw Review of Law, Administration and Economics
- Amsterdam Law Forum
- Beijing Law Review
- Connecticut Public Interest Law Journal
- Duke Journal of Comparative and International Law
- Duke Law Journal
- ELSA Malta Law Review
- Federal Courts Law Review
- Gottingen Journal of International Law
- International Journal for Court Administration
- International Journal of Not-for-Profit Law
- Journal of Information, Law and Technology
- Journal of Law & Family Studies
- The Jury Expert
- Law Review
- Law, Social Justice & Global Development
- Michigan Telecommunications and Technology Law Review
- No Foundations : An Interdisciplinary Journal of Law and Justice
- Open Law Journal
- Pittsburgh Journal of Technology Law and Policy
- Richmond Journal of Law and Technology
- Sea Grant Law & Policy Journal
- Unbound : Harvard Journal of the Legal Left
- Utah Law Review
- Web Journal of Current Legal Issues
- William & Mary Environmental Law and Policy Review
- William and Mary Law Review
- International Journal of Legal Information
- The Internet Journal of Law, Healthcare and Ethics
- Harvard Human Rights Journal
- Baltic Journal of Law & Politics
- Bulletin of the Transilvania University of Brasov. Series VII : Social Sciences and Law
- Socio-Legal Review

- Northwestern Journal of Technology and Intellectual Property

Library & Information Studies

- Annals of Library & Information Studies
- B Sides
- Chinese Librarianship: an International Electronic Journal
- Collaborative Librarianship
- Cybermetrics : International Journal of Scientometrics, Informetrics and Bibliometrics
- DESIDOC Journal of Library & Information Technology
- Evidence Based Library and Information Practice
- Information Technology and Libraries
- International Journal of Digital Curation
- International Research: Journal of Library and Information Science
- Journal of Digital Information
- Journal of eLiteracy
- Journal of Information and Organizational Sciences
- Journal of Librarianship and Scholarly Communication
- Journal of southern academic and special librarianship
- Kansas Library Association College and University Libraries Section Proceedings
- Library and Information Research : Research into Practice for Information & Library Services
- Library Student Journal
- New Knowledge Environments
- Pakistan Journal of Library and Information Science
- School Library Media Research
- Trends in Information Management
- Virginia Libraries
- Ariadne
- Bulletin of the American Society for Information Science and Technology
- Code4Lib Journal
- Communications in Information Literacy
- D-Lib Magazine
- E-JASL: The Electronic Journal of Academic and Special Librarianship
- Information Research: an international electronic journal
- Interdisciplinary Journal of e-Learning and Learning Objects
- International Journal of Digital Library Services
- Issues in Science and Technology Librarianship : a quarterly publication of the Science and Technology Section, Association of College and Research Libraries
- Journal of Electronic Publishing
- Journal of eScience Librarianship
- Journal of Information Literacy
- Journal of Library Innovation
- The journal of the Rutgers University Library.
- Liber Quarterly : The Journal of European Research Libraries
- Library Philosophy and Practice
- Libres: Library and Information Science Research Electronic Journal
- North Carolina Libraries
- Practical Academic Librarianship
- Singapore Journal of Library & Information Management
- Urban Library Journal
- Webology
- Electronic Journal of Knowledge Management
- International Journal of Information Dissemination and Technology
- International Journal of Doctoral Studies
- Journal of Information, Information Technology, and Organizations
- Information Technology and Disabilities
- South African Journal of Information Management
- Journal of the Association for History and Computing
- Journal of Medical Internet Research
- Journal of the Medical Library Association
- Journal of Health Informatics in Developing Countries
- Journal of the European Association for Health Information and Libraries
- European Journal of ePractice

Linguistics

- Biolinguistics
- Colorado Research in Linguistics
- Computational Linguistics
- International Journal of English Studies (IJES)
- Language at Work : Bridging Theory and Practice
- Language@internet
- Linguistic Discovery
- Linguistics Journal
- Northwest Journal of Linguistics
- Open Applied Linguistics Journal
- Oslo Studies in Language
- The Reading Matrix : an International Online Journal
- Signs : International Journal of Semiotics
- Snippets
- Taiwan Journal of Linguistics
- Translation and Interpreting : the International Journal of Translation and Interpreting Research
- Catalan Journal of Linguistics
- Communication & Language at Work
- International Journal of English Linguistics
- Issues in Applied Linguistics
- Language Documentation & Conservation
- Lingua Posnaniensis
- Linguistics in Amsterdam
- Modern Journal of Applied Linguistics
- Novitas-ROYAL
- Open Journal of Modern Linguistics
- Reading in a Foreign Language
- Semantics and Pragmatics
- SKASE Journal of Theoretical Linguistics
- Studies in Polish Linguistics
- TEFLIN Journal
- Working Papers in Functional Grammar
- Rasenna

- TESL Canada Journal
- L1 Educational Studies in Language and Literature
- Journal of Intercultural Communication

Manufactures

- Annals of the University of Oradea. Fascicle of Textiles, Leatherwork
- China Foundry
- Brazilian Journal of Operations & Production Management
- Journal of Studies on Manufacturing

Mathematics

- Abstract and Applied Analysis
- Acta Mathematica Academiae Paedagogicae Nyiregyhaziensis
- Advanced Modeling and Optimization
- Advances in Difference Equations
- Advances in Numerical Analysis
- Algorithms
- Annales Academiae Scientiarum Fennicae. Mathematica
- Applicable Analysis and Discrete Mathematics
- Applied Mathematics E - Notes
- Arabian Journal of Mathematics
- Armenian Journal of Mathematics
- Asian Journal of Mathematics & Statistics
- Azerbaijan Journal of Mathematics : An International Journal
- Banach Journal of Mathematical Analysis
- Buletinul Academiei de stiinte a Republicii Moldova : Matematica
- Bulletin of Mathematical Analysis and Applications
- Bulletin of the Iranian Mathematical Society
- Bulletin, Classes des Sciences Mathematiques et Naturelles, Sciences
- Communications in Applied and Industrial Mathematics
- Computational and Applied Mathematics
- Contributions to Discrete Mathematics
- Differential Geometry - Dynamical Systems
- Dynamics of Partial Differential Equations (DPDE)
- Electronic Journal of Differential Equations
- Electronic Journal of Qualitative Theory of Differential Equations
- Electronic Research Announcements of the American Mathematical Society
- ESAIM : Proceedings
- Fixed Point Theory and Applications
- Forum Geometricorum : a Journal on Classical Euclidean Geometry
- Hiroshima Mathematical Journal
- IAENG International Journal of Applied Mathematics
- Interdisciplinary Information Sciences
- International Journal of Applied Mathematical Research
- International Journal of Applied Operational Research
- International Journal of Difference Equations
- International Journal of Group Theory
- International Journal of Mathematical Sciences & Applications
- International Journal of Mathematics and Soft Computing
- International Journal of Optimization and Control : Theories & Applications
- ISRN Algebra
- ISRN Computational Mathematics
- ISRN Geometry
- ITB Journal of Science
- Journal of Applied Mathematics
- Journal of Applied Mathematics and Decision Sciences
- Journal of Complex Analysis
- Journal of Fractional Calculus and Applications
- Journal of Generalized Lie Theory and Applications
- Journal of Humanistic Mathematics
- Journal of Inequalities and Applications
- Journal of Integer Sequences
- Journal of Mathematical Analysis
- Journal of Mathematics
- Journal of Mathematics in Industry
- Journal of Modern Methods in Numerical Mathematics
- Journal of Nonlinear Analysis and Optimization : Theory & Applications
- Journal of Numerical Mathematics and Stochastics
- Journal of Singularities
- Kyushu Journal of Mathematics
- Mathematica Aeterna
- Mathematical Journal of Okayama University.
- Mathematics and its Applications : Annals of the Academy of Romanian Scientists
- Miskolc Mathematical Notes
- New York Journal of Mathematics
- Nonlinear Analysis : Modelling and Control
- Notices of the American Mathematical Society.
- Open Journal of Discrete Mathematics
- Open Numerical Methods Journal
- Osaka Journal of Mathematics
- Progress in Applied Mathematics
- Publications de l'Institut MathÃ©matique.
- Research Journal of Pure Algebra
- Selcuk Journal of Applied Mathematics
- Siauliai Mathematical Seminar
- Studies in Mathematical Sciences
- Symmetry, Integrability and Geometry : Methods and Applications
- Theory and Applications of Categories
- Turkish Journal of Mathematics
- Uniform Distribution Theory
- Acta et Commentationes Universitatis Tartuensis de Mathematica
- Acta Mathematica Universitatis Comenianae
- Advances in Decision Sciences
- Advances in Fixed Point Theory
- Albanian Journal of Mathematics
- American Journal of Computational Mathematics
- Annals of Functional Analysis
- Applied Mathematics
- Applied Sciences (Bucuresti)
- Archivum Mathematicum

- Asian Journal of Algebra
- Axioms
- Balkan Journal of Geometry and Its Applications
- Boundary Value Problems
- Bulletin (new series) of the American Mathematical Society
- Bulletin of Mathematical Sciences
- Bulletin of TICMI
- CODEE Journal
- Communications in Numerical Analysis
- Computational Methods in Applied Mathematics
- Cubo : A Mathematical Journal
- Dolomites Research Notes on Approximation
- The Electronic Journal of Combinatorics
- Electronic Journal of Linear Algebra
- Electronic Research Announcements in Mathematical Sciences
- Electronic Transactions on Numerical Analysis
- Filomat
- Formalized Mathematics
- GeoGebra : The New Language for the Third Millennium
- Homology, Homotopy and Applications (HHA)
- Integers : Electronic Journal of Combinatorial Number Theory
- International Journal of Analysis
- International Journal of Applied Mathematics and Computation
- International Journal of Combinatorics
- International Journal of Differential Equations
- International Journal of Mathematical Combinatorics
- International Journal of Mathematics and Mathematical Sciences
- International Journal of Nonlinear Analysis and Applications
- International Journal of Stochastic Analysis
- ISRN Applied Mathematics
- ISRN Discrete Mathematics
- ISRN Mathematical Analysis
- Journal of Advanced Studies in Topology
- Journal of Applied Mathematics and Bioinformatics
- Journal of Applied Mathematics and Stochastic Analysis
- Journal of Computational Geometry
- Journal of Fuzzy Set Valued Analysis
- Journal of Graph Algorithms and Applications
- Journal of Hyperstructures
- Journal of Inequalities and Special Functions
- Journal of Logic and Analysis
- Journal of Mathematical Modelling and Application
- Journal of Mathematics and Statistics
- Journal of Mathematics Research
- Journal of Nonlinear Analysis and Application
- The Journal of Nonlinear Sciences and its Applications
- Journal of Physical Mathematics
- Kyungpook Mathematical Journal
- Matematica Contemporanea
- Mathematical Communications
- Mathematical Sciences Quarterly Journal
- Measurement Science Review
- Missouri Journal of Mathematical Sciences
- New Zealand Journal of Mathematics
- Nonlinear Analysis and Differential Equations
- Open Applied Mathematics Journal
- Open Mathematics Journal
- Opuscula Mathematica
- Proceedings of the Indian Academy of Sciences. Mathematical sciences
- Proyecciones : Revista de MatemÃ¡tica
- Pure Mathematical Sciences
- ROMAI Journal
- Seminaire Lotharingien de Combinatoire
- Stochastic Systems
- Surveys in Approximation Theory
- Tamkang Journal of Mathematics
- Transactions on Combinatorics
- TWMS Journal of Applied and Engineering Mathematics
- Yugoslav Journal of Operations Research
- British Journal of Mathematics & Computer Science
- International Journal of Computers, Communications & Control
- Journal of Applied Computer Science & Mathematics
- Modeling, Identification and Control
- InterJournal
- International Journal of Open Problems in Computer Science and Mathematics
- Journal of Formalized Reasoning
- Theory and Applications of Mathematics & Computer Science
- Mathematics Educator
- Mathematical Problems in Engineering
- International Journal of Systems Signal Control and Engineering Application
- Solstice : Electronic Journal of Geography and Mathematics
- Advances in Mathematical Physics
- ISRN Mathematical Physics
- ALEA : Latin American Journal of Probability and Mathematical Statistics

Mechanical Engineering

- Advances in Mechanical Engineering (IERI)
- Advances in Tribology
- Electronic Journal of Boundary Elements (EJBE)
- IAES International Journal of Robotics and Automation (IJRA)
- International Journal of Renewable Energy Research
- ISRN Renewable Energy
- Journal of Advanced Research in Mechanical Engineering
- Journal of Computational and Applied Research in Mechanical Engineering (JCARME)
- Journal of Machine Engineering
- Journal of Naval Architecture and Marine Engineering

- Journal of the Brazilian Society of Mechanical Sciences
- Machine Design
- Mechanical Sciences
- Open Mechanical Engineering Journal
- R&D Journal
- Thermal Science
- Advances in Mechanical Engineering
- Advances in Theoretical and Applied Mechanics
- Archive of Mechanical Engineering
- Frontiers in Heat Pipes
- International Journal of Automotive and Mechanical Engineering
- ISRN Mechanical Engineering
- Jordan Journal of Mechanical and Industrial Engineering
- Journal of Computational and Applied Mechanics
- Journal of Fundamentals of Renewable Energy and Applications
- Journal of Mechanical Engineering and Technology
- Journal of Robotics
- Journal of the Brazilian Society of Mechanical Sciences and Engineering
- Mechanical Engineering Research
- Modern Mechanical Engineering
- Open Mechanics Journal
- Theoretical and Applied Mechanics
- International Journal of Systems Control
- Buletinul Institutului Politehnic din Iaşi
- Journal of Theoretical and Applied Mechanics

Media and Communication

- Case Studies in Strategic Communication
- DHQ
- Global Media Journal : African Edition
- Global Media Journal : Pakistan Edition
- Innovation Journalism
- International Journal of Digital Multimedia Broadcasting
- Journal of e-Media Studies
- Journal of Media Studies
- Journal of Virtual Worlds Research
- Nordicom Review
- Online Journal of Space Communication
- Public Relations Journal
- Continent.
- Ejournalist : a Refereed Media Journal
- Global Media Journal : Australian Edition
- InMedia : the French Journal of Media and Media Representations in the English-Speaking World
- International Journal of Communication
- Journal of Communications
- Journal of Information Policy
- Journal of Telematics and Informatics
- Media History Monographs
- Online Journal of Communication and Media Technologies
- PLATFORM : Journal of Media and Communication
- Rocky Mountain Communication Review
- International Journal of Multimedia and Ubiquitous Engineering
- Systems, Signs & Actions
- Informing Science The International Journal of an Emerging Transdiscipline
- MediaTropes
- Westminster Papers in Communication and Culture
- Cyberpsychology : Journal of Psychosocial Research on Cyberpspace
- PRism Online PR Journal
- M/C Journal
- Fibreculture Journal

Medicine in General

- Acta Medica
- Acta Medica Martiniana
- Advanced Biomedical Research
- Advances in Medical Sciences
- Advances in Pharmacological Sciences
- African Journal of Laboratory Medicine
- Al Ameen Journal of Medical Sciences
- Ancient Science of Life
- Annals of King Edward Medical University Lahore Pakistan
- Applied Medical Informatics
- Asia Pacific Family Medicine
- Asian Journal of Epidemiology
- Asian Journal of Medical Research
- Asian Journal of Medical Sciences
- Avicenna Journal of Medical Biotechnology
- Baylor University Medical Center Proceedings
- BioMedical Engineering OnLine
- Biomedical Informatics Insights
- Biomedicine International
- Biosensors
- BMC Medical Imaging
- BMC Medical Research Methodology
- BMC Palliative Care
- Bosnian Journal of Basic Medical Sciences
- British Journal of Medical Practitioners
- Brunei International Medical Journal
- Case Reports in Medicine
- Cell Health and Cytoskeleton
- Chang Gung Medical Journal
- Chinese Medicine
- Cholesterol
- Clinical and Translational Medicine
- Clinical Medicine & Research
- Clinical Medicine Insights : Case Reports
- Clinics
- CME
- Computational and Mathematical Methods in Medicine
- Croatian Medical Journal
- Dar Es Salaam Medical Students' Journal
- Diabetes, Metabolic Syndrome and Obesity : Targets and Therapy
- Drug, Healthcare and Patient Safety
- Einstein
- Eurasian Journal of Medicine
- European Journal of Medical Research
- European Medical, Health and Pharmaceutical Journal
- Folia Medica

- Global Journal of Health Science
- Grand Rounds
- Health
- Hospital Chronicles
- Ibnosina Journal of Medicine and Biomedical Sciences
- Indian Journal of Medical Sciences
- Indian Journal of Palliative Care
- International Archives of Medicine
- International Journal of Ayurveda Research
- International Journal of Behavioral Nutrition and Physical Activity
- International Journal of Biomedical Imaging
- International Journal of BioMedicine
- International Journal of Circumpolar Health
- International Journal of Clinical Medicine
- International Journal of Fertility & Sterility
- International Journal of High Dilution Research
- International Journal of Medical and Health Sciences
- International Journal of Medical Sciences
- International Journal of Medicine and Biosciences
- International Journal of Molecular Imaging
- International Journal of Occupational and Environmental Medicine
- International Journal of Qualitative Studies on Health & Well-Being
- International Journal of Telemedicine and Applications
- International Medical Journal Malaysia
- The Internet Journal of Alternative Medicine
- The Internet Journal of Health
- The Internet Journal of Medical Informatics
- Internet Journal of Medical Update
- The Internet Journal of Nuclear Medicine
- The Internet Journal of Third World Medicine
- Iranian Journal of Basic Medical Sciences
- Iranian Red Crescent Medical Journal
- Israel Journal of Medical Sciences
- JK Science : Journal of Medical Education & Research
- Journal of American Physicians and Surgeons
- Journal of Armed Forces Medical College, Bangladesh
- Journal of Ayub Medical College
- Journal of Basic and Clinical Pharmacy
- Journal of Biomedical Science and Engineering
- Journal of Case Reports
- Journal of Clinical and Scientific Research
- Journal of Clinical Medicine Research
- Journal of Cutaneous and Aesthetic Surgery
- Journal of Electrical Bioimpedance
- Journal of Family and Community Medicine
- Journal of Health Sciences
- Journal of IMAB : Annual Proceeding (Scientific Papers)
- Journal of Integrative Medicine (JIM)
- Journal of International Medical Research
- Journal of Krishna Institute of Medical Sciences University
- Journal of Medical and Allied Sciences
- Journal of Medical Case Reports
- Journal of Medical Investigation
- Journal of Medical Sciences
- Journal of Medical Sciences Research
- Journal of Negative Results in Biomedicine
- Journal of Pain Research
- Journal of Paramedical Sciences
- Journal of Postgraduate Medicine
- Journal of Receptor, Ligand and Channel Research
- Journal of Stem Cells and Regenerative Medicine
- Journal of the American Board of Family Practice
- Journal of the Islamic Medical Association of North America
- Journal of Traditional and Complementary Medicine
- Journal of Trauma Management & Outcomes
- JRSM Short Reports
- Kobe Journal of Medical Sciences
- Kust Medical Journal
- Macedonian Journal of Medical Sciences
- Malaysian Family Physician
- Malta Medical Journal
- Medica Innovatica
- Medical Devices : Evidence and Research
- Medical Journal of the Islamic Republic of Iran
- MMWR CDC Surveillance Summaries
- Nagoya Journal of Medical Science
- Nephron Extra
- Nonlinear Biomedical Physics
- North Carolina Medical Journal
- Online Journal of Health & Allied Sciences
- Open Access Journal of Clinical Trials
- Open Biomedical Engineering Journal
- Open Complementary Medicine Journal
- Open General & Internal Medicine Journal
- Open Journal of Medical Imaging
- Open Medical Devices Journal
- Open Medicine
- Open Nitric Oxide Journal
- Pain Research and Treatment
- Palliative Care : Research and Treatment
- The Permanente Journal
- Physicians Academy
- Polish Journal of Surgery
- Pravara Medical Review
- Professionalization of Exercise Physiology online
- Radiology and Oncology
- Rambam Maimonides Medical Journal
- Reports in Medical Imaging
- Research & Reviews : Journal of Medical and Health Sciences
- Retrovirology
- Romanian Medical Reviews & Research
- Scientific Journal of Medical Science
- Shiraz E Medical Journal
- Singapore Medical Journal
- South African Medical Journal
- Stem Cells and Cloning : Advances and Applications
- Sultan Qaboos University Medical Journal : SQUMJ

- Theranostics
- Trauma Monthly
- Ulster Medical Journal
- Upsala Journal of Medical Sciences
- West London Medical Journal
- Yonsei Medical Journal
- Acta Facultatis Medicae Naissensis
- Acta Medica Academica
- Acta Medica Nagasakiensia
- Advanced Studies in Medical Sciences
- Advances in Molecular Imaging
- African Health Sciences
- Alternative Medicine Studies
- American Journal of Translational Research
- Annals of African Medicine
- Annals of Saudi Medicine
- Archives of Medical Science
- Asian Journal of Clinical Nutrition
- Asian Journal of Medical and Clinical Sciences (AJMCS)
- Asian Journal of Medical Sciences
- Australasian Medical Journal
- Bangladesh Journal of Medical Science
- Biologics : Targets & Therapy
- Biomedical Imaging and Intervention Journal
- Biomedical Journal
- BioPsychoSocial Medicine
- BMC Complementary and Alternative Medicine
- BMC Medical Informatics and Decision Making
- BMC Medicine
- BMJ Open
- British Columbia Medical Journal
- British Journal of Medicine and Medical Research
- Calicut Medical Journal
- Cell Death and Disease
- Cerebrovascular Diseases Extra
- Chinese Medical Journal
- Chinese Medicine
- Clinical and Experimental Medical Sciences
- Clinical Interventions in Aging
- Clinical Medicine : Case Reports
- Clinical Medicine Insights : Women's Health
- Clinics and Practice
- Communicable Diseases Intelligence
- Critical Ultrasound Journal
- Danish Medical Bulletin
- Deutsches Arzteblatt International
- Diagnostics
- Egyptian Journal of Hospital Medicine
- Electronic Physician
- European Journal of General Medicine
- European Journal of Psychotraumatology
- Evidence-Based Complementary and Alternative Medicine
- Galle Medical Journal
- GMS German Medical Science
- Head & Face Medicine
- Hong Kong Medical Journal
- IBMS BoneKEy
- Indian Journal of Medical Research
- Indian Journal of Medical Specialities
- Integrative Medicine Insights
- International Journal of Advanced Ayurveda, Yoga, Unani, Siddha and Homeopathy
- International Journal of Ayurvedic Medicine
- International Journal of Biomedical and Advance Research
- International Journal of Biomedical Research
- International Journal of Caring Sciences
- International Journal of Clinical and Experimental Medicine
- International Journal of Family Medicine
- International Journal of General Medicine
- International Journal of Hospital Research
- International Journal of Medical Science and Public Health
- International Journal of Medical Sciences and Technology
- International Journal of Medicine and Public Health
- International Journal of Nanomedicine
- International Journal of Phytomedicine
- International Journal of Students' Research
- International Medical Case Reports Journal
- The Internet Journal of Academic Physician Assistants
- The Internet Journal of Family Practice
- The Internet Journal of Laboratory Medicine
- The Internet Journal of Medical Technology
- The Internet Journal of Nanotechnology
- The Internet Journal of Pain, Symptom Control and Palliative Care
- The Internet Journal of World Health and Societal Politics
- Iranian Journal of Medical Sciences
- Irish Medical Journal : Journal of the Irish Medical Association
- Japanese Clinical Medicine
- JLUMHS
- Journal of Applied Clinical Medical Physics
- Journal of Athletic Training
- Journal of Ayurveda and Integrative Medicine
- Journal of Biomedical Physics and Engineering
- Journal of Biomedical Sciences and Research
- Journal of Clinical and Diagnostic Research
- Journal of Clinical Imaging Science
- Journal of Community Hospital Internal Medicine Perspectives
- Journal of Dhaka Medical College
- Journal of Experimental and Integrative Medicine
- Journal of Functional Biomaterials
- Journal of Hospital Administration
- Journal of Infection in Developing Countries
- Journal of Interdisciplinary Histopathology
- Journal of Korean Medical Science
- Journal of Laboratory Physicians
- Journal of Medical and Biomedical Sciences
- Journal of Medical Cases
- Journal of Medical Research and Practice
- Journal of Medical Sciences
- Journal of Multidisciplinary Healthcare
- Journal of Osteoporosis
- Journal of Pakistan Medical Students

- Journal of Personalized Medicine
- Journal of Radiology Case Reports
- Journal of Research in Medical Sciences
- Journal of the American Board of Family Medicine
- Journal of the Association of Physicians of India
- Journal of the Royal College of Physicians of Edinburgh
- Journal of Translational Medicine
- JPMI
- Kansas Journal of Medicine
- Korean Journal of Radiology
- Libyan Journal of Medicine
- Magnetic Resonance Insights
- Malaysian Journal of Medical Sciences
- McGill Journal of Medicine
- Medical Channel
- Medical Journal of Shree Birendra Hospital
- Medicine & Health
- Molecular Pain
- National Journal of Medical Research
- Nigerian Medical Journal
- North American Journal of Medical Sciences
- Oman Medical Journal
- Online Journal of Health Ethics
- Open Access Rheumatology : Research and Reviews
- Open Bone Journal
- Open Ethics Journal
- Open Journal of Clinical Diagnostics
- Open Magnetic Resonance Journal
- Open Medical Informatics Journal
- Open Nanomedicine Journal
- Open Pain Journal
- Pakistan Journal of Medical Sciences Online
- People's Journal of Scientific Research
- Philosophy, Ethics, and Humanities in Medicine
- PLoS Medicine
- Pragmatic and Observational Research
- The Professional Medical Journal
- Public Health Reviews
- Radiology Case Reports
- Rehabilitation Research and Practice
- Reproductive Health
- Research Journal of Medicine and Medical Sciences
- Revista do Hospital das ClÃ-nicas
- Russian Open Medical Journal
- Scottish Universities Medical Journal
- Sierra Leone Journal of Biomedical Research
- South African Family Practice
- Sri Ramachandra Journal of Medicine
- Studia Universitatis Vasile Goldis : Seria Stiintele Vietii (Life Sciences Series)
- Swiss Medical Weekly
- Translational Medicine @ UniSa
- Turkish Journal of Medical Sciences
- University of Toronto Medical Journal
- West Indian Medical Journal
- Wisconsin Medical Journal
- New Zealand Journal of Medical Laboratory Science
- Nutrition & Metabolism
- Biomedical Research
- Cell Communication and Signaling
- Source Code for Biology and Medicine
- Biological Research
- BMC Research Notes
- Journal of Biomedical Science
- Bioautomation
- World Journal of Stem Cells
- African Journal of Health Professions Education
- Advances in Medical Education and Practice
- BMC Medical Education
- BMC Medical Genetics
- Electronic Journal of Health Informatics
- Bulletin of the Medical Library Association
- Image Analysis and Stereology
- Journal of Neuroinflammation
- Pathology and Laboratory Medicine International
- BMC Medical Ethics
- Eubios Journal of Asian and International Bioethics
- Primary Care Companion to the Journal Clinical Psychiatry
- PLoS ONE
- Journal of Biomedical Semantics
- Health Statistics Quarterly
- Core Evidence
- Journal of Applied Research in Clinical and Experimental Therapeutics
- Drug Design, Development and Therapy

Meteorology and Climatology

- Atmosphere
- Atmospheric Measurement Techniques
- Atmospheric Pollution Research
- E-Journal of Severe Storms Meteorology
- ISRN Meteorology
- Journal of Lightning Research
- Open Atmospheric Science Journal
- Tellus A
- Tellus B
- Advances in Meteorology
- Atmospheric and Climate Sciences
- Atmospheric Measurement Techniques Discussions
- Carbon Balance and Management
- International Journal of Atmospheric Sciences
- Journal of Advances in Modeling Earth Systems
- Journal of the Meteorological Society of Japan
- SOLA : Scientific Online Letters on the Atmosphere
- Tellus B
- Natural Hazards and Earth System Sciences
- Atmosfera
- The Cryosphere Discussions
- **Microbiology**
- Advances in Virology
- Annals of Clinical Microbiology and Antimicrobials
- BMC Microbiology

- Current Issues in Molecular Biology
- Frontiers in Microbiology
- Indian Journal of Medical Microbiology
- International Journal of Microbiology Research
- The Internet Journal of Microbiology
- Journal of Culture Collections
- Journal of Microbiology & Biology Education
- Jundishapur Journal of Microbiology
- mBio
- Microbial Ecology in Health and Disease
- Microbiology Indonesia
- Microbiology Research
- Open Antimicrobial Agents Journal
- Open Virology Journal
- Retrovirology : Research and Treatment
- Saline Systems
- Virology : Research and Treatment
- Viruses
- American Journal of Immunology
- Archaea
- British Microbiology Research Journal
- Egyptian Academic Journal of Biological Sciences : Microbiology
- Herpesviridae
- International Journal of Microbiology
- International Microbiology
- ISRN Microbiology
- Journal of Medical Bacteriology
- Journal of Oral Microbiology
- Malaysian Journal of Microbiology
- Microbial Cell Factories
- Microbial Informatics and Experimentation
- Microbiology Insights
- MicrobiologyOpen
- Open Microbiology Journal
- Research & Reviews : Journal of Microbiology and Biotechnology
- Revista de Microbiologia
- Scientific Journal of Microbiology
- Virus Adaptation and Treatment
- Micologia Aplicada Internacional
- Journal of Microbiology and Infectious Diseases
- PLoS Pathogens
- Parasites & Vectors
- Virology Journal

Migration

- Irish Migration Studies in Latin America
- Translocations : Irish Migration, Race and Social Transformation Review
- Journal of Post-Colonial Cultures & Societies

Military Science

- Journal of Defense Resources Management
- Scientia Militaria : South African Journal of Military Studies
- Defence Science Journal
- Journal of Strategic Security
- Strategic Assessment

Mining and Metallurgy

- Geomaterials
- ISRN Metallurgy
- Journal of Mining and Metallurgy, Section B : Metallurgy
- Metals
- Open Journal of Metal
- Platinum Metals Review
- Gold bulletin : a quarterly review of research on gold and its applications in industry
- Journal of Metallurgy
- Metallurgical and Mining Industry
- Minerals
- Open Mineral Processing Journal

Multidisciplinary

- Aceh International Journal of Science and Technology
- African Nebula
- Altitude : An e-Journal of Emerging Humanities Work
- Arbutus Review
- British Journal of Applied Science & Technology
- Challenges
- College of the Bahamas Research Journal
- Critical Approaches to Discoures Analysis across Disciplines
- Culture Unbound : Journal of Current Cultural Research
- E-International Scientific Research Journal
- Eastern Journal of European Studies
- Enculturation: a Journal of Rhetoric, Writing, and Culture
- Ethiopian e-Journal for Research and Innovation Foresight
- European Journal of Humour Research
- European Psychomotricity Journal
- Expositions : Interdisciplinary Studies in the Humanities
- Graduate Journal of Asia-Pacific Studies
- Inkanyiso : Journal of Humanities and Social Sciences
- International Journal of Bahamian Studies
- International Journal of Bioassays
- International Journal of Management, Economics and Social Sciences (IJMESS)
- International Journal of Science, Environment and Technology
- Israeli Journal of Humor Research
- Journal of Aesthetics & Culture
- Journal of Cave and Karst Studies
- Journal of Florida Studies
- Journal of International and Global Studies
- Journal of Scientific Review
- Journal of the European Association for Studies on Australia
- JPUR : Journal of Purdue Undergraduate Research
- McNair Scholars Research Journal
- Natural Resources
- Nebula
- NeoAmericanist
- New West Indian Guide
- Open Area Studies Journal
- Opticon1826
- The Pantaneto Forum
- PORTAL : Journal of Multidisciplinary International Studies
- Review of European Studies
- Scan : Journal of Media Arts Culture

- Science China Life Sciences
- Scientific Journal of Review
- Skepsi
- Spaces for Difference : an Interdisciplinary Journal
- Surveys and Perspectives Integrating Environment & Society
- ThirdFront : Journal of Humanities and Social Science
- Transforming Cultures
- University Museums and Collections Journal
- Academic Research International
- Ad Alta : Journal of Interdisciplinary Research
- Akademeia
- American Journal of Applied Sciences
- Asia-Pacific Science and Culture Journal
- Caribbean Journal of Science
- College Forum
- Coolabah
- Cultural Studies Review
- Diversity
- Early Modern Japan : an Interdisciplinary Journal
- Ecclectica
- Environmental Humanities
- European Journal of American Studies
- European Journal of Interdisciplinary Studies
- Excursions
- Field Actions Science Reports
- Humanities
- International Journal of Asia-Pacific studies
- International Journal of Basics and Applied Science
- International Journal of Current Research
- International Journal of Science and Technology
- International Journal of Transdisciplinary Research
- Journal of Academic and Applied Studies
- Journal of Applied Sciences
- Journal of Conservation and Museum Studies
- Journal of Information Engineering and Applications
- Journal of Multidisciplinary Research
- Journal of the Chicago Colloquium on Digital Humanities and Computer Science
- Journal of the International AIDS Society
- Junctures : The Journal for Thematic Dialogue
- Museum and Society
- Natural Science
- NECSUS : European Journal of Media Studies
- New Voices : A Journal for Emerging Scholars of Japanese Studies in Australia and New Zealand
- Nordicum-Mediterraneum
- Open Conference Proceedings Journal
- Pakistaniaat : A Journal of Pakistan Studies
- Philica
- Researchers World - Journal of Arts Science & Commerce
- Rutherford Journal
- School of Doctoral Studies Journal
- Scientia Magna
- Singidunum Journal of Applied Sciences
- South African Journal of Science
- SpringerPlus
- Tamara Journal for Critical Organization Inquiry
- Transcultural Studies
- Turkish Online Journal of Qualitative Inquiry
- Vanderbilt Undergraduate Research Journal
- Journal of Research Practice

Music

- British Postgraduate Musicology
- Dancecult : Journal of Electronic Dance Music Culture
- Empirical Musicology Review
- Journal of Interdisciplinary Music Studies (JIMS)
- Journal of Music and Meaning
- Music & Anthropology
- Music Performance Research
- Nota Bene : Canadian Undergraduate Journal of Musicology
- Popular Musicology Online
- Voices: A World Forum for Music Therapy
- Action, Criticism and Theory for Music Education
- Current Research in Jazz
- Electronic Musicological Review
- Ethnomusicology Review
- Journal of Jazz studies
- Journal of the Society for Musicology in Ireland
- Music and Arts in Action
- Music Theory Online
- Pacific Review of Ethnomusicology
- South Central Music Bulletin
- Music & Politics

Neurology

- American Journal of Neurodegenerative Disease
- Annals of Neurosciences
- Basic and Clinical Neuroscience
- BMC Neurology
- Brain and Behavior
- Case Reports in Neurological Medicine
- Cerebrospinal Fluid Research
- Degenerative Neurological and Neuromuscular Disease
- Epilepsy Currents
- Fluids and Barriers of the CNS
- Frontiers in Aging Neuroscience
- Frontiers in Cellular Neuroscience
- Frontiers in Evolutionary Neuroscience
- Frontiers in Molecular Neuroscience
- Frontiers in Neuroenergetics
- Frontiers in Neurology
- Frontiers in Synaptic Neuroscience
- Functional Neurology
- Indian Journal of Neurotrauma
- The Internet Journal of Neurology
- Iranian Journal of Neurology
- Journal of Behavioral and Brain Science
- Journal of Central Nervous System Disease
- Journal of Mathematical Neuroscience
- Journal of Neurology Research

- Journal of Undergraduate Neuroscience Education
- Molecular Brain
- Multiple Sclerosis International
- Neural Systems & Circuits
- Neurobehavioral HIV Medicine
- Neurology Asia
- Neurology International
- Neuropsychiatric Disease and Treatment
- Neuroscience & Medicine
- Open Neurology Journal
- Open Neuroscience Journal
- Pathobiology of Aging & Age-related Diseases
- Socioaffective Neuroscience & Psychology
- Translational Neurodegeneration
- Annals of Indian Academy of Neurology
- Autism Insights
- Behavioral and Brain Functions
- BMC Neuroscience
- Brain Sciences
- Case Reports in Neurology
- Clincal Neuropsychiatry
- Dementia and Geriatric Cognitive Disorders Extra
- Epilepsy Research and Treatment
- Folia Neuropathologica
- Frontiers in Behavioral Neuroscience
- Frontiers in Computational Neuroscience
- Frontiers in Integrative Neuroscience
- Frontiers in Neural Circuits
- Frontiers in Neuroengineering
- Frontiers in Neuroscience
- Frontiers in Systems Neuroscience
- Impulse : an Undergraduate Journal for Neuroscience
- International Journal of Intelligence Science
- The Internet Journal of Neuromonitoring
- ISRN Neurology
- Journal of Brachial Plexus and Peripheral Nerve Injury
- Journal of Experimental Stroke & Translational Medicine
- Journal of Neurodevelopmental Disorders
- Journal of Neurosciences in Rural Practice
- Medical Gas Research
- Molecular Neurodegeneration
- Neural Plasticity
- Neuroanatomy
- Neurological Journal of South East Asia
- Neurology India
- Neurology Research International
- Neuropsychological Trends
- Open Neuroimaging Journal
- Open Neuropsychopharmacology Journal
- Parkinson's Disease
- Psychology Research and Behavior Management
- Stroke Research and Treatment
- World Journal of Neuroscience
- Acta Neurobiologiae Experimentalis
- Cardiovascular Psychiatry and Neurology
- Advances in Artificial Neural Systems
- Brain. Broad Research in Artificial Intelligence and Neuroscience
- Journal of NeuroEngineering and Rehabilitation (JNER)
- Consciousness, Literature and the Arts
- Iranian Journal of Child Neurology
- Translational Psychiatry
- Annual Review of Cybertherapy and Telemedicine
- Behavioral Sciences
- Neurologia Medico-Chirurgica
- Romanian Neurosurgery

Nuclear Physics

- Journal of Nuclear and Radiation Physics
- World Journal of Nuclear Science and Technology
- Physical Review Special Topics. Accelerators and Beams

Nursing

- Clinical Nursing Studies
- International Journal of Advanced Nursing Studies
- The Internet Journal of Advanced Nursing Practice
- Nursing : Research and Reviews
- Nursing Research and Practice
- Online Journal of Nursing Informatics
- Open Nursing Journal
- BMC Nursing
- Curationis
- International Practice Development Journal
- ISRN Nursing
- Nursing Reports
- Online Journal of Issues in Nursing
- Open Journal of Nursing
- Online Journal of Rural Nursing and Health Care

Nutrition and Food Sciences

- Advance Journal of Food Science and Technology
- Annals of the University Dunarea de Jos of Galati. Fascicle VI : Food Technology
- Emirates Journal of Food and Agriculture
- Flavour
- Food and Nutrition Sciences
- Journal of Food Research
- Nutrients
- Open Nutraceuticals Journal
- Annals : Food Science and Technology
- EFSA Journal
- European Journal of Food Research & Review
- Food & Nutrition Research
- Functional Foods in Health and Disease
- Journal of Nutrition and Metabolism
- Nutrition Journal
- Pakistan Journal of Nutrition
- Innovative Romanian Food Biotechnology

Oceanography

- Indian Journal of Marine Sciences
- Journal of Coastal Development
- Ocean Science (OS)
- Oceanography
- Oceanus.
- Open Oceanography Journal

- Acta Adriatica
- International Journal of Oceanography
- Mediterranean Marine Science
- Ocean Science Discussions (OSD)
- Oceanologia
- Open Journal of Marine Science
- Science of Tsunami Hazards
- Journal of Marine Animals and Their Ecology
- Aquatic Invasions
- **Oncology**
- American Journal of Cancer Research
- Asian Pacific Journal of Cancer Prevention
- Blood Cancer Journal
- Breast Cancer : Basic and Clinical Research
- Cancer and Clinical Oncology
- Cancer Control: Journal of the Moffitt Cancer Center
- Cancer Immunity
- Cancer Management and Research
- Cancers
- Case Reports in Oncology
- Clinical Cancer Investigation Journal
- Clinical Medicine Insights : Oncology
- Current Oncology
- European Journal of Oncology Pharmacy
- Frontiers in Oncology
- Indian Journal of Cancer
- International Journal of Breast Cancer
- The Internet Journal of Oncology
- Iranian Journal of Pediatric Hematology Oncology
- Journal of Cancer
- Journal of Cancer Molecules
- Journal of Cancer Therapeutics & Research
- Journal of Carcinogenesis
- Journal of Gastrointestinal Oncology
- Journal of Ovarian Research
- Journal of Solid Tumors
- Lung Cancer International
- Molecular Cancer
- Oncology Reviews
- Open Breast Cancer Journal
- Open Cancer Journal
- Open Colorectal Cancer Journal
- Open Surgical Oncology Journal
- Rare Tumors
- Translational Oncogenomics
- World Journal of Oncology
- Archive of Oncology
- Biomarkers in Cancer
- BMC Cancer
- Breast Cancer : Targets and Therapy
- Cancer Cell International
- Cancer Growth and Metastasis
- Cancer Informatics
- Cancer Medicine
- Case Reports in Oncological Medicine
- Chinese Journal of Cancer
- Clinical Medicine : Oncology
- Clinical Sarcoma Research
- Ecancermedicalscience
- Forum of Clinical Oncology : Quarterly Official Publication of the Hellenic Society of Medical Oncology
- Hereditary Cancer in Clinical Practice
- Infectious Agents and Cancer
- International Journal of Surgical Oncology
- Iranian Journal of Cancer Prevention
- ISRN Oncology
- Journal of Cancer Epidemiology
- Journal of Cancer Research and Therapeutics
- Journal of Cancer Therapy
- Journal of Experimental & Clinical Cancer Research
- Journal of Oncology
- Journal of Skin Cancer
- Lung Cancer : Target and Therapy
- Middle East Journal of Cancer
- Neoplasia : An International Journal for Oncology Research
- OncoTargets and Therapy
- Open Cancer Immunology Journal
- Open Clinical Cancer Journal
- Open Prostate Cancer Journal
- Radiation Oncology
- Sarcoma
- World Journal of Clinical Oncology
- World Journal of Surgical Oncology
- Gastrointestinal Cancer : Targets and Therapy
- European Association of NeuroOncology Magazine
- Indian Journal of Medical and Paediatric Oncology
- Prostate Cancer

Ophthalmology

- BMC Ophthalmology
- Case Reports in Ophthalmology
- Clinical Optometry
- Digital Journal of Ophthalmology
- Eye Reports
- Indian Journal of Ophthalmology
- The Internet Journal of Ophthalmology and Visual Science
- Journal of Ophthalmic & Vision Research
- Journal of Ophthalmology
- Journal of Vision
- Middle East African Journal of Ophthalmology
- Oman Journal of Ophthalmology
- Ophthalmology and Eye Diseases
- Optometry & Vision Development
- Case Reports in Ophthalmological Medicine
- Clinical Ophthalmology
- Community Eye Health Journal
- Eye and Brain
- GMS Ophthalmology Cases
- International Journal of Ophthalmology
- ISRN Ophthalmology
- Journal of Ophthalmic Inflammation and Infection
- Journal of Optometry
- Medical Hypothesis, Discovery & Innovation Ophthalmology Journal
- Nepalese Journal of Ophthalmology
- Open Ophthalmology Journal
- Optometric Education

- Pakistan Journal of Ophthalmology

Optics and Light

- Advances in Optical Technologies
- International Journal of Optics
- Journal of the European Optical Society â€“ Rapid Publications
- Open Spectroscopy Journal
- Optical Materials Express
- Optics and Photonics Letters
- Photonics Letters of Poland
- Ukrainian Journal of Physical Optics
- Biomedical Optics Express
- ISRN Optics
- Open Optics Journal
- Optica Applicata
- Optics and Photonics Journal
- Optics Express
- Research Letters in Optics
- X-Ray Optics and Instrumentation
- International Journal of Spectroscopy
- Journal of Light & Visual Environment

Organic Chemistry

- ARKIVOC - Online Journal of Organic Chemistry
- Indian Journal of Chemistry : Section B
- International Journal of Organic Chemistry
- Lipid Insights
- Open Organic Chemistry Journal
- Organic Communications
- Beilstein Journal of Organic Chemistry
- International Journal of Carbohydrate Chemistry
- ISRN Organic Chemistry
- Molecules
- Organic Chemistry International
- Research Letters in Organic Chemistry
- Records of Natural Products

Otorhinolaryngology

- Bangladesh Journal of Otorhinolaryngology
- Case Reports in Otolaryngology
- Clinical Medicine Insights : Ear, Nose and Throat
- International Archives of Otorhinolaryngology
- The Internet Journal of Otorhinolaryngology
- Journal of Hearing Science
- Otolaryngology Online Journal
- Audiology Research
- BMC Ear, Nose and Throat Disorders
- Clinical and Experimental Otorhinolaryngology
- Indian Journal of Otology
- International Journal of Otolaryngology
- ISRN Otolaryngology
- Open Otorhinolaryngology Journal
- World Articles in Ear, Nose and Throat

Pathology

- Anil Aggrawala's Internet Journal of Forensic Medicine and Toxicology
- Case Reports in Pathology
- Clinical Medicine Insights : Pathology
- Diagnostic Pathology
- EMBO Molecular Medicine
- International Journal of Inflammation
- The Internet Journal of Forensic Science
- Iranian Journal of Pathology
- ISRN Pathology
- Journal of Inflammation
- Journal of Pathology Informatics
- Open Clinical Chemistry Journal
- Open Inflammation Journal
- Pathology Research International
- Ulcers
- BMC Clinical Pathology
- Clinical Medicine : Pathology
- Diabetic Foot & Ankle
- Disease Models & Mechanisms
- International Journal of Clinical and Experimental Pathology
- International Journal of Interferon, Cytokine and Mediator Research
- The Internet Journal of Pathology
- ISRN Inflammation
- Journal of Headache and Pain
- Journal of Inflammation Research
- Mediators of Inflammation
- Open Gene Therapy Journal
- Open Pathology Journal
- Sri Lanka Journal of Forensic Medicine, Science & Law
- Indian Journal of Pathology and Microbiology
- Journal of Speech and Language Pathology and Applied Behavior Analysis

Pediatrics

- Annals of Pediatric Cardiology
- Case Reports in Pediatrics
- Clinical Medicine Insights : Pediatrics
- Hong Kong Journal of Paediatrics
- International Journal of Clinical Pediatrics
- The Internet Journal of Pediatrics and Neonatology
- ISRN Pediatrics
- Journal of Nepal Paediatric Society
- Jurnalul Pediatrului
- Open Pediatric Medicine Journal
- Pediatric Health, Medicine and Therapeutics
- Research and Reports in Neonatology
- Adolescent Health, Medicine and Therapeutics
- BMC Pediatrics
- Clinical Medicine : Pediatrics
- Clinical Pediatric Endocrinology
- Indian Pediatrics
- International Journal of Pediatrics
- Iranian Journal of Pediatrics
- Journal of Neonatal Surgery
- Journal of Pediatric Sciences
- Open Journal of Pediatrics
- Paediatrics Today
- Pediatric Reports
- South African Journal of Child Health
- Congenital Cardiology Today
- Pediatric Dental Journal
- Signa Vitae
- Journal of Pediatric Neurosciences
- Child and Adolescent Psychiatry and Mental Health
- Journal of Early and Intensive Behavior Intervention

- African Journal of Paediatric Surgery

Performing Arts

- Bright Lights Film Journal
- International Journal of Scottish Theatre and Screen
- Movie: a Journal of Film Criticism
- Platform : Postgraduate e-Journal of Theatre and Performing Arts
- Wide Screen
- Alphaville : Journal of Film and Screen Media
- Didaskalia : Ancient Theatre Today
- Kino : the Western Undergraduate Journal of Film Studies
- Participations
- Scope : an Online Journal of Film Studies
- Papers of Surrealism
- New Voices in Classical Reception Studies
- Genders
- Cinema : Journal of Philosophy and the Moving Image
- Performance and Spirituality

Pharmacy and Pharmacology

- International Journal of Chemical and Pharmaceutical Sciences
- Acta Facultatis Pharmaceuticae Universitatis Comenianae
- Advanced Pharmaceutical Bulletin
- American Journal of Pharmaceutical Education
- Archives of Pharmacy Practice
- Asian Journal of Pharmaceutical and Clinical Research
- Asian Journal of Pharmaceutical Research and Health Care
- Drug Invention Today
- Generics and Biosimilars Initiative Journal
- Indian Journal of Pharmaceutical Sciences
- Indo Global Journal of Pharmaceutical Sciences
- International Bulletin of Drug Research
- International Journal of Advances in Pharmaceutical Sciences
- International Journal of Basic Medical Sciences and Pharmacy
- International Journal of Drug Development & Research
- International Journal of Drug Formulation and Research
- International Journal of Pharma Sciences and Research
- International Journal of Pharmaceutical Frontier Research
- International Journal of Pharmaceutical Sciences : Review and Research
- International Journal of Pharmaceuticals Analysis
- International Journal of Pharmacy and Biomedical Sciences
- International Journal of PharmTech Research
- International Journal of Research in Ayurveda and Pharmacy
- International Journal of Research in Pharmacy and Chemistry
- International Research Journal of Pharmacy
- ISRN Pharmaceutics
- Journal of Advanced Pharmaceutical Technology & Research
- Journal of Biomedical and Pharmaceutical Research
- Journal of Global Pharma Technology
- Journal of Pharmaceutical and Biomedical Sciences
- Journal of Pharmaceutical Care
- Journal of Pharmaceutical Research and Health Care
- Journal of Pharmaceutical Sciences and Research
- Journal of Pharmacy and Pharmaceutical Sciences
- Mintage Journal of Pharmaceutical and Medical Sciences
- Open Drug Delivery Journal
- Der Pharma Chemica
- Pharma Science Monitor : An International Journal of Pharmaceutical Sciences
- Pharmaceuticals
- Pharmacia
- Der Pharmacia Sinica
- Pharmacogenomics and Personalized Medicine
- Pharmacognosy Research
- Research and Reviews : Journal of Pharmacy and Pharmaceutical Sciences
- Research in Pharmacy
- Southern Med Review
- Therapeutics and Clinical Risk Management
- Academia Journal of Medicinal Plants
- Acta Pharmaceutica
- African Journal of Pharmacy and Pharmacology
- American Journal of PharmTech Research
- Asian Journal of Biomedical and Pharmaceutical Sciences
- Asian Journal of Pharmaceutical and Health Sciences
- Asian Journal of Pharmacy and Life Science
- Drugs in R&D
- Hygeia : Journal for Drugs and Medicines
- Indo American Journal of Pharmaceutical Research
- INNOVATIONS in Pharmacy
- International Journal of Advances in Pharmaceutical Research
- International Journal of Applied Research in Natural Products
- International Journal of Drug Delivery
- International Journal of Drug Discovery
- International Journal of High Throughput Screening
- International Journal of Pharmaceutical and Phytopharmacological Research
- International Journal of Pharmaceutical Research and Allied Sciences
- International Journal of Pharmaceutical Sciences and Research
- International Journal of Pharmacy and Biological Sciences
- International Journal of Pharmacy and Pharmaceutical Sciences

- International Journal of Research and Development in Pharmacy and Life Sciences
- International Journal of Research in Pharmaceutical Sciences
- International Journal of Research in Pharmacy and Science
- Iranian Journal of Pharmaceutical Research
- Journal of Advanced Pharmaceutical Research
- Journal of Applied Pharmaceutical Science
- Journal of Drug Delivery
- Journal of Global Trends in Pharmaceutical Sciences
- Journal of Pharmaceutical and Scientific Innovation
- Journal of Pharmaceutical Education and Research
- Journal of Pharmaceutical Science and Technology
- Journal of Pharmacy and Bioallied Sciences
- Journal of Young Pharmacists
- Open Access Journal of Medicinal and Aromatic Plants
- Open Medicinal Chemistry Journal
- Pharma Research
- Pharmaceutical Reviews
- Pharmaceutics
- Der Pharmacia Lettre
- Pharmacie Globale : International Journal of Comprehensive Pharmacy
- Pharmacognosy Magazine
- Pharmacy Practice
- Research in Pharmaceutical Sciences
- RGUHS Journal of Pharmaceutical Sciences
- Stamford Journal of Pharmaceutical Sciences
- U.S. Pharmacist
- International Journal of Pharmaceutical and Biological Research
- ClinicoEconomics and Outcomes Research
- International Journal of Pharmaceutical and Biomedical Research (IJPBR)
- International Journal of Pharmacy and Technology

Philosophy

- American Society for Aesthetics Graduate E-Journal
- Analytic Teaching and Philosophical Praxis
- Annales Philosophici
- The Baltic International Yearbook of Cognition, Logic and Communication
- Comparative Philosophy
- Emergent Australasian Philosophers
- Essays in Philosophy
- Florida Philosophical Review
- Informal Logic
- Journal of Evolution and Technology
- Journal of Philosophy of Life
- Kritike : an Online Journal of Philosophy
- Minerva : an Internet Journal of Philosophy
- Perspectives : International Postgraduate Journal of Philosophy
- Philosophers' Imprint
- Philosophy Pathways : Electronic Journal
- Public Reason
- Reason Papers : A Journal of Interdisciplinary Normative Studies
- Stanford Encyclopedia of Philosophy
- Thought and Practice : a Journal of the Philosophical Association of Kenya
- William James Studies
- Analecta Hermeneutica
- Animus : a Philosophical Journal for our Time
- Australasian Journal of Logic
- Bangladesh Journal of Bioethics
- Cosmos and History : the Journal of Natural and Social Philosophy
- Erasmus Journal for Philosophy and Economics
- European Journal of Pragmatism and American Philosophy
- Foucault Studies
- International Journal of Transpersonal Studies
- Journal of Macrodynamic Analysis
- Kant Studies Online
- Lyceum
- Open Journal of Philosophy
- Phenomenology & Practice
- Philosophy for Business
- Praxis
- Ramon Llull Journal of Applied Ethics
- Rhizomes : Cultural Studies in Emerging Knowledge
- Theoretical & Applied Ethics
- Tradition & Discovery : the Polanyi Society Periodical
- Contemporary Aesthetics
- Philosophy & Theory in Biology
- Hyle : International Journal for Philosophy of Chemistry
- Spontaneous Generations : Journal for the History and Philosophy of Science
- Philosophy of Mathematics Education Journal
- Libertarian Papers
- Dialogues in Philosophy, Mental and Neuro Sciences
- Journal of Philosophy and Scripture
- Journal of Philosophy, Science and Law
- Journal of Ethics and Social Philosophy

Physics

- Acta Physica Polonica A
- Advanced Computational Techniques in Electromagnetics
- Advances in Condensed Matter Physics
- African Physical Review
- Applied Physics Research
- Brazilian Journal of Physics
- Electronic-Liquid Crystal Communications (e-LC)
- EPJ Web of Conferences
- Indian Journal of Pure & Applied Physics
- Ingineria Iluminatului
- International School Bangkok Journal of Physics
- ISRN High Energy Physics
- Journal of Modern Physics
- Journal of Theoretical Physics and Cryptography
- Living Reviews in Relativity

- Open Applied Physics Journal
- Open Condensed Matter Physics Journal
- Open Plasma Physics Journal
- Papers in Physics
- Physical Review X
- PMC Physics A
- Pramana : Journal of Physics
- Research Letters in Physics
- Turkish Journal of Physics
- World Journal of Condensed Matter Physics
- AAPPS Bulletin
- Acta Physica Polonica B
- Advances in Applied Physics
- Advances in High Energy Physics
- African Review of Physics
- Armenian Journal of Physics
- Electronic Journal of Theoretical Physics
- Entropy
- Europhysics News
- Indian Journal of Radio & Space Physics
- International Journal of Energy, Information and Communications
- ISRN Condensed Matter Physics
- Journal of Atomic, Molecular, and Optical Physics
- Journal of Physics : Conference Series
- Journal of Thermodynamics
- New Journal of Physics
- Open Chemical Physics Journal
- Open Journal of Microphysics
- Open Surface Science Journal
- Physical Review & Research International
- Physics Research International
- PMC Physics B
- Progress in Physics
- Symmetry
- Ukrainian Journal of Physics
- Astrophysics and Space Sciences Transactions (ASTRA)
- International Journal of Physical Sciences
- Latin American Applied Research
- International Journal of Microwave Science and Technology
- Latin American Journal of Solids and Structures
- Advances in Materials Science and Engineering
- Atmospheric Chemistry and Physics
- Physics and Philosophy

Physiology

- BMC Physiology
- Frontiers in Neuroinformatics
- Frontiers in Physiology
- International Journal of Tryptophan Research
- Journal of Bangladesh Society of Physiologist
- Journal of Physiology and Pharmacology
- Journal of Smooth Muscle Research
- Neural Development
- Open Enzyme Inhibition Journal
- Open Pacing, Electrophysiology and Therapy Journal
- Physiological Research
- Proteome Science
- Skeletal Muscle
- ASN Neuro
- Egyptian Academic Journal of Biological Sciences : Physiology & Molecular Biology
- Frontiers in Neurorobotics
- International Journal of Physiology, Pathophysiology and Pharmacology
- JLR Papers In Press
- Journal of Molecular Signaling
- Journal of Physiology and Pharmacology Advances
- Lipids in Health and Disease
- Nigerian Journal of Physiological Sciences
- Open Journal of Molecular and Integrative Physiology
- Open Physiology Journal
- Physiology Journal
- Reproductive Biology and Endocrinology
- Journal of Lipids
- Proceedings of the Japan Academy, Series B Physical and Biological Sciences
- Advances in Physiology Education
- Cough
- Neurobiology of Lipids
- National Journal of Physiology, Pharmacy and Pharmacology

Plant Sciences

- Asian Journal of Crop Science
- Australian Journal of Crop Science
- Crop Breeding and Applied Biotechnology
- European Journal of Medicinal Plants
- Fruit Growing Research
- International Journal of Plant Production
- Italian Journal of Agronomy
- Journal of Cotton Science
- Journal of Plant Protection Research
- Plant Breeding and Seed Science
- Plant Protection Science
- Scientific Papers of the Research Institute for Fruit Growing Pitesti, Romania
- American Journal of Plant Sciences
- Asian Journal of Plant Sciences
- Breeding Science
- Czech Journal of Genetics and Plant Breeding
- Frontiers in Plant Science
- Indian Phytopathology
- International Rice Research Notes
- Journal of Biopesticides
- Journal of Pesticide Science
- Open Horticulture Journal
- Plant Pathology Journal
- Plant Tissue Culture & Biotechnology
- Plant Production Science
- Communications in Biometry and Crop Science
- Plant Methods
- Journal of Plant Development
- Plant Root

Political Science

- Administrative Issues Journal
- AntePodium
- Baltic Worlds
- Brazilian Political Science Review
- Cadmus

- Caucasian Review of International Affairs
- Central European Journal of Public Policy
- CEU Political Science Journal
- Crossroads
- Electronic Journal of e-Government
- Ethics & Global Politics
- European Journal of Economic and Political Studies
- Fascism
- Homeland Security Affairs
- International Journal of Euro-Mediterranean Studies
- International Journal of the Commons
- Jamba : Journal of Disaster Risk Studies
- Journal of Administration & Governance
- Journal of Conflict Transformation & Security
- Journal of Critical Globalisation Studies (JCGS)
- Journal of Identity and Migration Studies
- Journal of Public Administration and Governance
- Journal of Security Sector Management
- Journal of World-Systems Research
- Living Reviews in Democracy
- Marxist Interventions
- Open Government : A Journal on Freedom of Information
- Peace and Conflict Review
- Peninsula : A Journal of Relational Politics
- Public Knowledge
- Russian Analytical Digest
- Transylvanian Review of Administrative Sciences
- Alternatives : Turkish Journal of International Relations
- Azerbaijan Focus : Journal of International Affairs
- Borderlands e-Journal : New Spaces in the Humanities
- Bulletin of Italian Politics
- Canadian Political Science Review
- Central European Journal of International and Security Studies
- CES Working Papers
- Commonwealth Journal of Local Governance
- Cultural Logic : an Electronic Journal of Marxist Theory and Practice
- Essex Human Rights Review
- European Integration Online Papers
- European Journal of Government and Economics
- Global-e : a Global Studies Journal
- Interdisciplinary Political Studies
- International Journal of Inclusive Democracy
- International Socialism
- JANUS.NET : e-journal of International Relations
- Journal of Comparative Politics
- Journal of Conflictology
- Journal of Global Analysis
- Journal of Politics in Latin America
- Journal of Public Deliberation
- Journal of Tourism and Peace Research
- Konturen
- Living Reviews in European Governance
- Northwestern University Journal of International Human Rights
- Open Political Science Journal
- Peace, Conflict and Development
- Pitt Political Review
- Resistance Studies Magazine
- Studies of Transition States and Societies
- The Cato Journal : an Interdisciplinary Journal of Public Policy Analysis
- International Journal of Public Information Systems
- Water Alternatives
- Island Studies Journal
- American Diplomacy
- Mediations
- Journal of Politics and Law
- Global Media Journal : Mediterranean Edition
- International Journal of Conflict and Violence

Psychiatry

- Annals of General Psychiatry
- Autism Research and Treatment
- BMC Psychiatry
- Clinical Practice and Epidemiology in Mental Health
- Frontiers in Psychiatry
- GMS Psycho-Social-Medicine
- International Journal of Mental Health Systems
- ISRN Psychiatry
- Mental Illness
- Open Journal of Psychiatry
- Open Sleep Journal
- Psycho-Social-Medicine
- Sleep Disorders
- Suicidology Online
- Australasian Journal of Disaster and Trauma Studies
- Biology of Mood & Anxiety Disorders
- Case Reports in Psychiatry
- The European Journal of Psychiatry
- German Journal of Psychiatry
- Industrial Psychiatry Journal
- Iranian Journal of Psychiatry
- Journal of Pakistan Psychiatric Society
- Nature and Science of Sleep
- Open Psychiatry Journal
- Orissa Journal of Psychiatry
- Schizophrenia Research and Treatment
- Sri Lanka Journal of Psychiatry
- Journal of Psychiatry and Neuroscience
- Depression Research and Treatment
- Iranian Journal of Psychiatry and Behavioral Sciences
- International Journal of Dream Research
- Pragmatic Case Studies in Psychotherapy
- **Psychology**
- Advances in Cognitive Psychology
- Behaviormetrika
- Comparative Cognition & Behavior Reviews
- Current Psychology Letters/Behaviour, Brain & Cognition
- Dynamical Psychology : an International, Interdisciplinary Journal of Complex Mental Processes

- Europe's Journal of Psychology
- Evolutionary Psychology: an International Journal of Evolutionary Approaches to Psychology and Behavior
- Health Psychology Research
- i-Perception
- International Journal of Behavioral Consultation and Therapy
- International Journal of Psychological Studies
- Interpersona : An International Journal on Personal Relationships
- Journal of Credibility Assessment and Witness Psychology
- The Journal of Mind-Body Regulation
- Journal of Social, Evolutionary and Cultural Psychology
- Life Span and Disability
- Open Access Journal of Forensic Psychology
- Open Psychology Journal
- PsyArt
- Psychology
- Psychology & Society
- Psychology in Society
- Psychology of Well-Being
- Psychology Science Quarterly
- Annual Review of Critical Psychology
- Child Development Research
- Comprehensive Psychology
- Current Research in Social Psychology
- E-Journal of Applied Psychology
- European Journal of Psychology Applied to Legal Context
- Frontiers in Psychology
- HUMANITAS
- Indian Journal of Psychological Medicine
- International Journal of Comparative Psychology
- International Journal of Wellbeing
- Journal of Articles in Support of the Null Hypothesis
- Journal of Indian Association for Child and Adolescent Mental Health
- Journal of Problem Solving
- JUNG: the e-Journal of the Jungian Society for Scholarly Study
- The New School Psychology Bulletin
- Open Behavioral Science Journal
- Polish Psychological Bulletin
- Psychological Test and Assessment Modeling
- Psychology & Neuroscience
- Psychology in Russia : State of Art
- Psychology of Language and Communication
- Psychology Science
- Sexual Offender Treatment
- Judgment and Decision Making
- Edo Journal of Counselling
- Australian Journal of Educational & Developmental Psychology
- Journal of Educational and Developmental Psychology
- Journal of Writing Research
- Janus Head
- The Internet Journal of Mental Health

Public Health

- Advances in Preventive Medicine
- Annals of Long-Term Care
- BMC Health Services Research
- BMC Public Health
- Bulletin of the World Health Organization
- Chronic Diseases and Injuries in Canada
- Clinical Medicine : Reproductive Health
- Comparative Effectiveness Research
- Cost Effectiveness and Resource Allocation
- Egyptian Academic Journal of Biological Sciences : Toxicology and Pest Control
- Emerging Themes in Epidemiology
- Environmental Health Insights
- Epidemiology Research International
- EPMA Journal
- Eurosurveillance
- Global Health Governance
- Health and Human Rights
- Health and Quality of Life Outcomes
- Health Economics Review
- Health Promotion Perspectives
- Health, Culture and Society
- Healthcare Review Online
- Human Resources for Health
- Implementation Science
- Indian Journal of Community Medicine
- Interdisciplinary Toxicology
- International Journal of Collaborative Research on Internal Medicine & Public Health
- International Journal of Health Geographics
- International Journal of Health Sciences & Research
- International Journal of Preventive Medicine
- International Journal of Public Health Science
- The Internet Journal of Allied Health Sciences & Practice
- The Internet Journal of Healthcare Administration
- Iranian Journal of Environmental Health Science & Engineering
- Israel Journal of Health Policy Research
- ISRN Toxicology
- Journal of Aboriginal Health
- Journal of Environmental Health Research
- Journal of Health Science
- Journal of Preventive Medicine
- Journal of Public Health in Africa
- Journal of Research in Health Sciences
- Journal of Toxicologic Pathology
- Journal of Toxicology
- Journal of Venom Research
- MEDICC Review
- MMWR : Morbidity & Mortality Weekly Report
- National Journal of Community Medicine
- New South Wales Public Health Bulletin
- Nutrition and Dietary Supplements
- Nutrition Noteworthy
- Open Access Medical Statistics
- Open Health Services and Policy Journal
- Open Public Health Journal
- Open Vaccine Journal

- Patient Related Outcome Measures
- Population Health Metrics
- Progress in Health Sciences
- Rural and Remote Health
- SJWEH Supplements
- Substance Abuse Treatment, Prevention, and Policy
- Tanzania Journal of Health Research
- World Journal of Vaccines
- Addiction and Health
- African Journal of Primary Health Care & Family Medicine
- Antimicrobial Resistance and Infection Control
- BMC International Health and Human Rights
- BMC Women's Health
- Californian Journal of Health Promotion
- Clinical Audit
- Clinical Medicine Insights : Reproductive Health
- Conflict and Health
- Current Health Sciences Journal
- Emerging Health Threats Journal
- Environmental Health
- Epidemiologic Perspectives and Innovations
- Epidemiology, Biostatistics and Public Health
- Ethiopian Journal of Health Development
- Global Health Action
- Harm Reduction Journal
- Health and Interprofessional Practice
- Health Care and Informatics Review Online
- Health Policy and Development
- Health Research Policy and Systems
- Healthcare in Low-resource Settings
- Healthline
- Hygiea Internationalis : an Interdisciplinary Journal for the History of Public Health
- Indian Journal of Community Health
- Indian Journal of Public Health
- International Journal for Equity in Health
- International Journal of Environmental Research and Public Health
- International Journal of Health Research
- International Journal of Integrated Care
- International Journal of Psychosocial Rehabilitation
- International Journal of Yoga
- The Internet Journal of Epidemiology
- The Internet Journal of Toxicology
- Iranian Journal of Public Health
- ISRN Public Health
- Italian Journal of Public Health
- Journal of Environmental and Public Health
- Journal of Global Health Care Systems
- Journal of Healthcare Leadership
- Journal of Primary Health Care
- Journal of Public Health Research
- Journal of Rural and Tropical Public Health
- The Journal of Toxicological Sciences
- Journal of Vector Borne Diseases
- Jurnal Kesehatan Masyarakat
- Minnesota Medicine
- MMWR Recommendations and Reports
- Nepal Journal of Epidemiology
- Noise and Health
- Nutrition Bytes
- Online Journal of Public Health Informatics
- Open Epidemiology Journal
- Open Journal of Preventive Medicine
- Open Toxicology Journal
- Patient Intelligence
- Pimatisiwin : a Journal of Indigenous and Aboriginal Community Health
- Preventing Chronic Disease
- Risk Management and Healthcare Policy
- Safety Science Monitor
- Substance Abuse : Research and Treatment
- Tanzania Health Research Bulletin
- The Health
- Journal of Research in Interprofessional Practice and Education
- Health Scope
- Australian Journal of Emergency Management
- Journal of Punjab Academy of Forensic Medicine and Toxicology
- Journal of Nepal Medical Association
- The Internet Journal of Nutrition and Wellness
- South African Journal of Clinical Nutrition
- Journal of Community Nutrition & Health
- Globalization and Health
- Canadian Journal of Aboriginal Community-Based HIV/AIDS Research

Religion

- Approaching Religion
- Australian e-Journal of Theology
- Common Ground Journal
- Denver Journal : an Online Review of Current Biblical and Theological Studies
- Homiletic : a Review of Publications in Religious Communication
- Intermountain West Journal of Religious Studies
- Journal for Christian Theological Research
- Journal of Buddhist Ethics
- Journal of Hebrew Scriptures
- Journal of Southern Religion
- Methodist Review
- Practical Matters
- Studies in Christian-Jewish Relations
- American Theological Inquiry
- Ars Disputandi : the Online Journal for Philosophy of Religion
- Catholic Education : A Journal of Inquiry and Practice
- Cyberjournal for Pentecostal-Charismatic Research
- Electronic Journal of Vedic Studies
- Hope's Reason : A Journal of Apologetics
- International Journal of Mormon Studies
- Journal for Cultural and Religious Theory
- Journal of Global Buddhism
- Journal of Religion and Society
- Journal of World Christianity
- Mythological Studies Journal
- Religions
- Journal of Men, Masculinities and Spirituality
- Theological Librarianship
- The Journal of Religion and Film

- Japanese Journal of Religious Studies
- Journal of Biblical Perspectives in Leadership
- Inner Resources for Leaders
- T C : a Journal of Biblical Textual Criticism
- The Bible and Critical Theory

Science in General

- Advances in Natural and Applied Sciences
- Advances in Science and Research
- American Academic & Scholarly Research Journal
- Applied Sciences
- Asian Journal of Scientific Research
- BioData Mining
- Bitlis Eren University Journal of Science and Technology
- Chinese Science Bulletin
- Columbia Undergraduate Science Journal
- Dio : The International Journal of Scientific History
- Ethics in Science and Environmental Politics
- The IIOAB Journal
- Indian Journal of Scientific Research
- International e-Journal of Science, Medicine & Education
- International Journal of Advances in Applied Sciences
- International Journal of Electrical, Electronics and Computer Systems (IJEECS)
- International Journal of Fundamental Physical Sciences
- International Journal of Multidisciplinary Sciences and Engineering
- International Journal of Pharmaceutical, Chemical and Biological Sciences
- International Journal on Advanced Science, Engineering and Information Technology
- Journal of Analytical Science & Technology
- Journal of Asian Scientific Research
- Journal of Chemical, Biological and Physical Sciences
- Journal of Encapsulation and Adsorption Sciences
- Journal of Innovative Research in Engineering and Sciences
- Journal of Physical Science
- Journal of Quantum Information Science
- Journal of Scientific Research
- Journal of the Arkansas Academy of Science
- Leonardo Journal of Sciences
- Membranes
- Momona Ethiopian Journal of Science
- Open Toxinology Journal
- Polar Research
- PoS - Proceedings of Science
- Recent Research in Science and Technology
- Science Journal Ubon Ratchathani University
- Science World Journal
- Scientific Journal of Pure and Applied Sciences
- Scientific Research and Essays
- Silpakorn University Science and Technology Journal
- University of Toronto Journal of Undergraduate Life Sciences
- Walailak Journal of Science and Technology
- Advances in Applied Science Research
- Advances in Natural Science
- AIP Advances
- American Journal of Scientific and Industrial Research
- Asian Journal of Engineering, Sciences & Technology
- Bayero Journal of Pure and Applied Sciences
- Bioscience Discovery
- Canadian Journal of Pure and Applied Sciences
- Colonial Academic Alliance Undergraduate Research Journal
- Contemporary Materials
- Dio and the Journal for Hysterical Astronomy
- Facta Universitatis Series : Physics, Chemistry and Technology
- Indian Journal of Science and Technology
- Insciences Journal
- International Journal of Advanced Science and Technology
- International Journal of Advances in Science and Technology
- International Journal of Energy Science
- International Journal of Lifescience and Pharma Research
- International Journal of Natural Sciences
- International Journal of Science and Advanced Technology
- Journal of Advanced Scientific Research
- Journal of Analytical Sciences, Methods and Instrumentation
- Journal of Bangladesh Academy of Sciences
- Journal of Emerging Technologies in Web Intelligence
- Journal of Fundamental Sciences
- Journal of International Research Publications : Materials, Methods & Technologies
- Journal of Pure and Applied Science and Technology
- Journal of Science and Technology
- Journal of Surface Engineered Materials and Advanced Technology
- Kybernetika
- McGill Science Undergraduate Research Journal
- Modern Applied Science
- Open Cybernetics and Systemics Journal
- Pertanika Journal of Science & Technology
- Polymers
- Proceedings of the Arkansas Academy of Science
- Science Diliman
- Science Studies
- ScienceAsia
- Scientific Reports
- The Scientific World Journal
- TOJSAT
- V Care For Life Sciences Journal
- Zbornik Matice Srpske za Prirodne Nauke
- Trakia Journal of Sciences
- Australian Journal of Basic and Applied Sciences

- Journal of Biomedical Discovery and Collaboration
- International Journal of Internet Science
- International Journal of Emerging Sciences
- International Poster Journal of Science & Technology
- Pacific Journal of Science and Technology
- World Journal of Science and Technology
- International Journal of Engineering, Science and Technology
- Maejo International Journal of Science and Technology
- Thammasat International Journal of Science and Technology

Social and Public Welfare

- Animal Liberation Philosophy and Policy Journal
- Disability, CBR & Inclusive Development
- International Journal of Criminal Justice Sciences
- International Journal of Cyber Criminology
- Journal for Critical Animal Studies
- Journal of Global Social Work Practice
- Journal of Indigenous Voices in Social Work
- Open Criminology Journal
- Southwest Journal of Criminal Justice
- Western Criminology Review
- Alcohol Research and Health
- Currents : New Scholarship in the Human Services
- First Peoples Child & Family Review
- International Journal of Criminology and Sociological Theory
- International Journal of High Risk Behaviors and Addinction
- Journal of Blindness Innovation and Research
- Journal of Indigenous Social Development
- Open Addiction Journal
- Social Work and Society
- Studies in Social Justice
- War Crimes, Genocide and Crimes Against Humanity

Social Sciences

- Arts and Social Sciences Journal
- Asian Social Science
- Catholic Social Science Review
- Childhoods Today
- Contemporary Issues and Ideas in Social Sciences
- Culture, Society & Praxis
- darkmatter Journal: In the Ruins of Imperial Culture
- Developing Country Studies
- E-Journal of International and Comparative Labour Studies
- Electronic Journal of Radical Organisation Theory
- Ephemera : Theory and Politics in Organization
- The Future of Children
- Geo-Analyst
- Graduate Journal of Social Science
- Hmong Studies Journal
- IIASS : Innovative Issues and Approaches in Social Sciences
- The Interdisciplinary Journal of International Studies
- International Journal of Asian Social Science
- International Journal of Social Networking and Virtual Communities
- International Review of Social Sciences and Humanities
- Journal of Artificial Societies and Social Simulation
- Journal of Community Positive Practices
- Journal of Contemporary European Research
- Journal of Indonesian Social Sciences and Humanities
- Journal of Methods and Measurement in the Social Sciences
- Journal of Social Sciences
- The Journal of Social Work Values and Ethics
- Khazar Journal of Humanities and Social Sciences
- Nordic Journal of Working Life Studies
- Open Social Science Journal
- Practice Reflexions
- Research and Practice in Social Sciences
- Research Journal of Social Sciences
- Social Policy Report
- Societies
- South Asia Multidisciplinary Academic Journal
- Surveillance and Society
- Tourismos : an International Multidisciplinary Journal of Tourism
- United Academics Journal of Social Sciences
- Asia-Pacific Journal of Social Sciences
- Canadian Social Science
- Childhood in Africa: An Interdisciplinary Journal
- Collegium : Studies across disciplines in the humanities and social sciences
- Corvinus Journal of Sociology and Social Policy
- Current Research Journal of Social Science
- Demographic Research
- Disability Studies Quarterly
- Electronic Journal of Contemporary Japanese Studies
- Enterprise and Work Innovation Studies
- Euxeinos : Governance and Culture in the Black Sea Region
- Gateways : International Journal of Community Research & Engagement
- Global Labour Journal
- Grounded Theory Review : an International Journal
- IASSIST Quarterly
- Indus Journal of Management & Social Sciences
- International Journal of Ageing and Later Life
- International Journal of Qualitative Methods
- International Journal of Social Sciences and Humanity Studies
- Journal of Alternative Perspectives in the Social Sciences

- Journal of Asia Pacific Studies
- Journal of Comparative Social Work
- Journal of History and Social Sciences
- Journal of Management and Social Sciences
- Journal of Social and Development Sciences
- Journal of Social Sciences
- Journal of the Society for Social Work and Research
- Kotuitui: New Zealand Journal of Social Sciences Online
- Open Communication Journal
- Pertanika Journal of Social Sciences & Humanities
- Qualitative Report
- Research Journal of Social Science & Management
- SAGE Open
- Social Sciences Directory
- South African Journal of Human Resource Management
- Stigma Research and Action
- Survey Research Methods
- Transcience : a Journal of Global Studies
- Vulnerable Groups & Inclusion
- Structure and Dynamics : e-Journal of Anthropological and Related Sciences
- Trocaire Development Review
- Online Journal of Rural Research & Policy
- Journal of Bhutan Studies
- African Studies Quarterly: the Online Journal for African Studies
- Vestnik : The Journal of Russian and Asian Studies
- CLCWeb : Comparative Literature and Culture
- E-Sharp
- Aspeers : Emerging Voices in American Studies
- Human Rights & Human Welfare
- Discrete Dynamics in Nature and Society
- Transformations
- Indo-Pacific Journal of Phenomenology
- Mens Sana Monographs
- Fast Capitalism
- ERCES : Online Quarterly Review
- Finnish Yearbook of Population Research
- Australian Journal of Emerging Technologies and Society

Sociology

- Aboriginal Policy Studies
- Advances in Social Work
- Australian Critical Race and Whiteness Studies
- Culture Machine
- Electronic Journal of Sociology
- European Journal of Spatial Development
- IDEA : A Journal of Social Issues
- International Journal of Child, Youth & Family Studies
- International NGO Journal
- Journal of Criminal Justice and Popular Culture
- Open Family Studies Journal
- Other Voices : The e-Journal of Cultural Criticism
- Professions & Professionalism
- Sociation Today
- Southern Rural Sociology
- Theory and Science
- Ufahamu : a Journal of African Studies
- Vienna Yearbook of Population Research
- Acta Universitatis Sapientiae : Social Analysis
- Americana (Hollywood) : the Journal of American Popular Culture
- Critical Race and Whiteness Studies
- Dhaulagiri Journal of Sociology and Anthropology
- Ethnicity and Race in a Changing World : A Review Journal
- Focus
- International Indigenous Policy Journal
- International Journal of Motorcycle Studies
- Irish Journal of Applied Social Studies
- Journal of Social Inclusion
- Open Sociology Journal
- Outlines. Critical Practice Studies
- Provenance : The Journal of Public Record Office Victoria
- Sociology Mind
- Studies in Sociology of Science
- tripleC : Communication, Capitalism & Critique. Open Access Journal for a Global Sustainable Information Society
- Urban Studies Research
- Journal of Financial Therapy
- Australian Review of Public Affairs
- Women's Health & Urban Life
- Crimes and Misdemeanours : Deviance and the Law in Historical Perspective
- The International Journal of Baudrillard Studies
- Journal of Sonic Studies
- SoundEffects
- Studies of Changing Societies : Comparative and Interdisciplinary Focus
- Behavior and Social Issues
- Qualitative Sociology Review

Sports Medicine

- Asian journal of Sports Medicine
- Human Movement
- Medicina Sportiva
- Open Access Journal of Sports Medicine
- Physical Education and Sport
- Sport Scientific And Practical Aspects
- Archives of Exercise in Health and Disease
- Biomedical Human Kinetics
- Journal of Physiotherapy & Sports Medicine
- MLTJ : Muscles, Ligaments and Tendons Journal
- Open Sports Medicine Journal
- South African Journal of Sports Medicine
- Sports Medicine, Arthroscopy, Rehabilitation, Therapy and Technology (SMARTT)

Sports science

- Acta Universitatis Palackianae Olomucensis : Gymnica
- Advances in Physical Education
- Archives of Budo
- Baltic Journal of Health and Physical Activity
- Biology of Sport

- Facta Universitatis Series : Physical Education and Sport
- International Journal of Sport Management, Recreation & Tourism
- International Quarterly of Sport Science
- Journal of Physical Education and Sport
- Open Sports Sciences Journal
- Physical Culture and Sport : Studies and Research
- Research in Kinesiology
- The Sport Journal
- Activities in Physical Education and Sports
- Annals of the University Dunarea de Jos Galati, Fascicle XV : Physical Education and Sport Management
- Athletic Training Education Journal
- Biology of Exercise
- Choregia
- International Journal of Exercise Science
- International Journal of Swimming Kinetics
- ITF Coaching and Sport Science Review
- Journal of the International Society of Swimming Coaching
- Ovidius University Annals : Series Physical Education and Sport/Science, Movement and Health
- Polish Journal of Sport and Tourism
- Serbian Journal of Sports Sciences
- Sportscience
- Entertainment and Sports Law Journal
- Journal of the International Society of Sports Nutrition
- Journal of Sports Science and Medicine

Statistics

- Chilean Journal of Statistics
- Electronic Journal of Applied Statistical Analysis
- Electronic Journal of Probability
- International Journal of Statistics and Probability
- ISRN Probability and Statistics
- Journal of Modern Applied Statistical Methods
- Journal of Probability and Statistics
- Journal of Statistical Software
- Open Journal of Statistics
- Pakistan Journal of Statistics and Operation Research
- RevStat : Statistical Journal
- Statistics Education Research Journal
- Technology Innovations in Statistics Education
- Brazilian Journal of Probability and Statistics
- Electronic Communications in Probability
- Electronic Journal of Applied Statistical Analysis : Decision Support Systems and Services Evaluation
- Electronic Journal of Statistics
- InterStat
- Journal of Data Science
- Journal of Official Statistics
- Journal of Reliability and Statistical Studies
- Journal of the Japan Statistical Society
- Open Statistics & Probability Journal
- Probability Surveys
- SORT
- Statistics Surveys
- The R Journal
- Journal of Applied Quantitative Methods
- R News
- Journal of Choice Modelling
- Journal of Statistics Education
- Journal of Research of the National Institute of Standards and Technology

Surgery and Orthopedics

- Advances in Orthopedics
- Archives of Plastic Surgery
- BMC Surgery
- Case Reports in Orthopedics
- Case Reports in Transplantation
- ePlasty: Open Access Journal of Plastic and Reconstructive Surgery
- Foot and Ankle Online Journal
- Indian Journal of Plastic Surgery
- International Journal of Shoulder Surgery
- The Internet Journal of Head and Neck Surgery
- The Internet Journal of Spine Surgery
- ISRN Minimally Invasive Surgery
- ISRN Surgery
- Journal of Current Surgery
- Journal of Orthopaedic Case Reports
- Journal of Orthopaedic Surgery and Research
- Journal of Surgery Pakistan
- Journal of Surgical Case Reports
- Kerala Journal of Orthopaedics
- Nigerian Journal of Surgery
- Open Cardiovascular and Thoracic Surgery Journal
- Open Journal of Modern Neurosurgery
- Open Orthopaedics Journal
- Open Surgery Journal
- Orthopedic Reviews
- Perioperative Medicine
- SA Orthopaedic Journal
- South African Journal of Surgery
- Transplant Research and Risk Management
- World Journal of Cardiovascular Surgery
- World Journal of Orthopedics
- Acta Orthopaedica
- Annals of Surgical Innovation and Research
- BMC Anesthesiology
- Bone & Joint Research
- Case Reports in Surgery
- East and Central African Journal of Surgery
- European Journal of Surgical Cases
- Indian Journal of Neurosurgery
- International Journal of Organ Transplantation Medicine
- The Internet Journal of Hand Surgery
- The Internet Journal of Plastic Surgery
- The Internet Journal of Surgery
- ISRN Orthopedics
- Journal of Craniovertebral Junction and Spine
- Journal of Minimally Invasive Surgical Sciences
- Journal of Orthopaedic Surgery
- Journal of Orthopaedics and Traumatology
- Journal of Surgical Academia
- Journal of Transplantation

- Minimally Invasive Surgery
- Open Access Surgery
- Open Journal of Cardiovascular Surgery
- Open Neurosurgery Journal
- Open Spine Journal
- Open Transplantation Journal
- Patient Safety in Surgery
- Plastic Surgery International
- Scoliosis
- Surgical Science
- Transplantation Research
- World Journal of Emergency Surgery
- Interactive Cardiovascular and Thoracic Surgery
- Indian Journal of Orthopaedics
- Journal of Orthopaedics
- Journal of Bangladesh College of Physicians and Surgeons
- Orthopedic Research and Reviews
- The Internet Journal of Neurosurgery
- Surgical Neurology International
- Neurosurgical Focus
- Journal of Indian Association of Pediatric Surgeons
- APSP Journal of Case Reports
- Journal of Minimal Access Surgery

Technology in General

- Acta Periodica Technologica
- Advances in Natural Sciences : Nanoscience and Nanotechnology
- Applied Nanoscience
- Beilstein Journal of Nanotechnology
- Bulletin of the Polish Academy of Sciences : Technical Sciences
- EPJ Photovoltaics
- Gold Bulletin
- International Journal of Advanced Technology & Engineering Research
- International Journal of Advances in Engineering and Technology
- International Journal of Engineering and Technology
- International Journal of Network and Mobile Technologies
- International Journal of Research in Engineering and Advanced Technology
- International Journal of Security and Its Applications
- International Journal of Technology and Research
- ISRN Nanotechnology
- Journal of Applied Research and Technology
- Journal of Industrial Technology
- Journal of Nanotechnology
- Journal of Scientific & Industrial Research
- Journal of Technology Education
- Letters in Applied NanoBioScience
- Nano Reviews
- Nanomaterials and Nanotechnology
- Open Journal of Safety Science and Technology
- Open Renewable Energy Journal
- Soft Nanoscience Letters
- World Journal of Nano Science and Engineering
- Acta Polytechnica Hungarica
- Advances in Operations Research
- Applied Technologies and Innovations
- Bonfring International Journal of Power Systems and Integrated Circuits
- E-Journal of Surface Science and Nanotechnology
- EURASIP Journal on Wireless Communications and Networking
- International Journal for Science and Emerging Technologies with Latest Trends
- International Journal of Advancements in Technology
- International Journal of Current Research and Review
- International Journal of Nano Devices, Sensors and Systems
- International Journal of Recent Technology and Engineering
- International Journal of Scientific Engineering and Technology
- International Journal of Technology
- International Nano Letters
- Journal of Aerospace Science and Technology
- Journal of Engineered Fibers and Fabrics
- Journal of Laser Micro/Nanoengineering
- Journal of New Technology and Materials
- Journal of Sensors
- Leonardo Electronic Journal of Practices and Technologies
- Nano Biomedicine and Engineering
- Nano-Micro Letters
- OAtube Nanotechnology
- Open Nanoscience Journal
- Research & Reviews : Journal of Engineering and Technology
- Transactions of the VSB : Technical University of Ostrava
- Sensors
- Journal of Technology Research
- International Journal of Emerging Technologies in Learning (iJET)
- Educational Technology & Society
- The Journal of Literacy and Technology
- International Journal of Innovative Technology and Creative Engineering
- International Journal of Online Engineering (iJOE)
- Sprouts : Working Papers on Information Systems
- Journal of STEM Education : Innovations and Research
- PsychNology Journal
- International Journal of Pure and Applied Sciences and Technology
- Global Journal of Technology and Optimization
- Journal of Applied Science and Engineering Technology
- International Journal of Emerging Technologies and Society
- Science, Technology & Innovation Studies

Therapeutics

- Acta Pharmaceutica Sinica B
- Asian Journal of Pharmaceutics
- Avicenna Journal of Phytomedicine
- Bangladesh Journal of Pharmacology
- BMC Clinical Pharmacology
- British Journal of Pharmaceutical Research
- Chemotherapy Research and Practice
- ChronoPhysiology and Therapy
- Clinical Medicine Insights : Therapeutics
- CPT: Pharmacometrics & Systems Pharmacology
- Drug Target Insights
- Frontiers in Pharmacology
- International Journal of Applied Biology and Pharmaceutical Technology
- International Journal of Medicinal Chemistry
- International Journal of Pharmaceutical Sciences and Drug Research
- International Journal of Pharmacology and Clinical Sciences
- International Journal of Phytochemistry & Pharmacology
- International Journal of Therapeutic Massage & Bodywork
- Iranian Journal of Pharmacology and Therapeutics
- ISRN Pharmacology
- Japanese Journal of Hyperthermic Oncology
- Journal of Advances in Drug Research
- Journal of Current Pharmaceutical Research
- Journal of Exercise Physiology - Online
- Journal of Innovative Trends in Pharmaceutical Sciences
- Journal of Pharmacological Sciences
- Journal of Physical Therapy
- Journal of Rehabilitation Research and Development
- Journal of the Japanese Physical Therapy Association
- Jundishapur Journal of Natural Pharmaceutical Products
- Molecular and Cellular Pharmacology
- New Zealand Journal of Physiotherapy
- Open Drug Metabolism Journal
- Open Pharmacology Journal
- Patient Preference and Adherence
- Pharmacognosy Reviews
- Pharmacology & Pharmacy
- Phytopharmacology
- Substance Abuse and Rehabilitation
- Vaccine : Development and Therapy
- Asian Journal of Occupational Therapy
- Australian Prescriber
- Ayurpharm : International Journal of Ayurveda and Allied Sciences
- Biologics in Therapy
- BMC Pharmacology
- British Journal of Pharmacology and Toxicology
- Chronicles of Young Scientists
- Clinical Medicine : Therapeutics
- Clinical Pharmacology : Advances and Applications
- Drug Metabolism and Pharmacokinetics
- Drugs and Therapy Studies
- Indian Journal of Pharmacology
- International Journal of Green Pharmacy
- International Journal of Pharmaceutical Research and Development
- International Journal of Pharmacology
- International Journal of Physiotherapy and Rehabilitation
- International Journal of Telerehabilitation
- The Internet Journal of Pharmacology
- Iranian Rehabilitation Journal
- ISRN Rehabilitation
- The Japanese Journal of Pharmacology
- Journal of Blood Transfusion
- Journal of Drug Delivery and Therapeutics
- Journal of Experimental Pharmacology
- Journal of Pharmaceutical Science and Bioscientific Research
- Journal of Pharmacology and Pharmacotherapeutics
- Journal of Physical Therapy Science
- Journal of Reports in Pharmaceutical Sciences
- Journal of Xenobiotics
- Malaysian Journal of Pharmaceutical Sciences
- Motivational Interviewing : Training, Research, Implementation, Practice
- Open Drug Discovery Journal
- Open Journal of Occupational Therapy
- Open Rehabilitation Journal
- Perspectives in Medicinal Chemistry
- Pharmacological Reports
- Pharmacologyonline
- Polish Journal of Pharmacology and Pharmacy
- Thermal Medicine
- Research Journal of Pharmaceutical, Biological and Chemical Sciences
- Orphanet Journal of Rare Diseases
- Journal of Global Drug Policy and Practice
- DARU : Journal of Pharmaceutical Sciences
- International Journal of Medicinal and Aromatic Plants
- International Journal of Integrative Psychotherapy
- Doping Journal

Transportation

- Air & Space Power Journal
- European Journal of Transport and Infrastructure Research
- Fatigue of Aircraft Structures
- International Journal for Traffic and Transport Engineering
- International Journal of Lean Thinking
- Journal of Public Transportation
- Journal of Transportation Technologies
- Open Aerospace Engineering Journal
- Recent Patents on Space Technology
- TransNav : International Journal on Marine Navigation and Safety of Sea Transportation
- Archives of Transport
- European Transport Research Review
- INCAS Bulletin
- International Journal of Aerospace Engineering
- Journal of Konbin

- Journal of Transport and Land Use
- Nordic Road and Transport Research
- Open Transportation Journal
- Transactions on Transport Sciences
- Transport and Telecommunication

Urology

- Advances in Urology
- BMC Nephrology
- Case Reports in Nephrology
- International Journal of Nephrology
- The Internet Journal of Nephrology
- Iranian Journal of Kidney Diseases
- Journal of Nephrology and Renal Transplantation
- Nephro-Urology Monthly
- Open Access Journal of Urology
- Open Urology & Nephrology Journal
- Saudi Journal of Kidney Diseases and Transplantation
- Urology Journal
- BANTAO Journal
- BMC Urology
- Case Reports in Urology
- International Journal of Nephrology and Renovascular Disease
- The Internet Journal of Urology
- ISRN Urology
- Journal of Nephropathology
- Nephrology Reviews
- Open Journal of Urology
- Research and Reports in Urology
- Urology Annals

Visual Arts

- Depth of Field
- Mediascape : UCLA's Journal of Cinema and Media Studies
- Contemporaneity : Historical Presence in Visual Culture
- International Journal of Design
- Trans-Asia Photography Review
- Digital Culture & Education
- Visual Culture & Gender
- Invisible Culture : An Electronic Journal for Visual Culture

Zoology

- African Zoology
- American Museum Novitates
- Animals
- Biawak
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- Contributions to Zoology
- Egyptian Academic Journal of Biological Sciences : Zoology
- Euscorpius
- Florida entomologist
- Illiesia
- International Journal of Insect Science
- International Journal of Zoological Research
- Invertebrate Survival Journal
- IUCN Otter Specialist Group Bulletin
- Journal of Hymenoptera Research
- Journal of Venomous Animals and Toxins
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