

DE GRUYTER
SAUR



PUBLICATIONS 153

Anthi Katsirikou (Ed.)

OPEN ACCESS TO STM INFORMATION

TRENDS, MODELS AND STRATEGIES FOR LIBRARIES



DE
|
G



International Federation of Library Associations and Institutions
Fédération Internationale des Associations de Bibliothécaires et des Bibliothèques
Internationaler Verband der bibliothekarischen Vereine und Institutionen
Международная Федерация Библиотечных Ассоциаций и Учреждений
Federación Internacional de Asociaciones de Bibliotecarios y Bibliotecas
国际图书馆协会与机构联合会

الاتحاد الدولي لجمعيات ومؤسسات المكتبات

About IFLA

www.ifla.org

IFLA (The International Federation of Library Associations and Institutions) is the leading international body representing the interests of library and information services and their users. It is the global voice of the library and information profession.

IFLA provides information specialists throughout the world with a forum for exchanging ideas and promoting international cooperation, research, and development in all fields of library activity and information service. IFLA is one of the means through which libraries, information centres, and information professionals worldwide can formulate their goals, exert their influence as a group, protect their interests, and find solutions to global problems.

IFLA's aims, objectives, and professional programme can only be fulfilled with the cooperation and active involvement of its members and affiliates. Currently, approximately 1,600 associations, institutions and individuals, from widely divergent cultural backgrounds, are working together to further the goals of the Federation and to promote librarianship on a global level. Through its formal membership, IFLA directly or indirectly represents some 500,000 library and information professionals worldwide.

IFLA pursues its aims through a variety of channels, including the publication of a major journal, as well as guidelines, reports and monographs on a wide range of topics. IFLA organizes workshops and seminars around the world to enhance professional practice and increase awareness of the growing importance of libraries in the digital age. All this is done in collaboration with a number of other non-governmental organizations, funding bodies and international agencies such as UNESCO and WIPO. IFLANET, the Federation's website, is a prime source of information about IFLA, its policies and activities: www.ifla.org

Library and information professionals gather annually at the IFLA World Library and Information Congress, held in August each year in cities around the world.

IFLA was founded in Edinburgh, Scotland, in 1927 at an international conference of national library directors. IFLA was registered in the Netherlands in 1971. The Koninklijke Bibliotheek (Royal Library), the national library of the Netherlands, in The Hague, generously provides the facilities for our headquarters. Regional offices are located in Rio de Janeiro, Brazil; Pretoria, South Africa; and Singapore.

IFLA Publications 153

Open Access to STM Information

Trends, Models and Strategies for Libraries

Edited by
Anthi Katsirikou

De Gruyter Saur

IFLA Publications
edited by Sjoerd Koopman

ISBN 978-3-11-025328-3
e-ISBN 978-3-11-026374-9
ISSN 0344-6891

Bibliographic information published by the Deutsche Nationalbibliothek

The Deutsche Nationalbibliothek lists this publication in the Deutsche Nationalbibliografie;
detailed bibliographic data is available in the Internet
at <http://dnb.d-nb.de>.

Walter de Gruyter GmbH & Co. KG, Berlin/Boston

© 2011 by International Federation of Library Associations
and Institutions, The Hague, The Netherlands

∞ Printed on permanent paper

The paper used in this publication meets the minimum requirements of American National
Standard – Permanence of Paper for Publications and Documents in Libraries and Archives
ANSI/NISO Z39.48-1992 (R1997)

Cover image: SuperStock/Getty Images.

Typesetting: Dr. Rainer Ostermann, München

Printing and binding: Strauss GmbH, Mörlenbach

Printed in Germany

www.degruyter.com

Contents

<i>Anthi Katsirikou</i>	
Preface	7
<i>Janet Webster</i>	
Foreword	9
Committees.	11
<i>Anthi Katsirikou</i>	
Creativity and Copyright: Introductory Thoughts	15
Best Practices and Management	
<i>Katalin Miszori</i>	
How to Build an Institutional Repository? Practical Guide from a Special Library	19
<i>Laura Bowering Mullen</i>	
Open Access and Academic Library Public Services: Roles for Reference and Instruction	29
<i>Manolis Koukourakis and Angela Repanovici</i>	
Marketing Strategies for Increasing the Visibility of Scientific Research in the View of Open Access Principles.	39
<i>Natassa Tsoubrakakou and Panorea Gaitanou</i>	
Managing Virtual Environments in Libraries: Second Life and Information Literacy	51
Open your Society	
<i>Mirjana Brković</i>	
Academic Authors, Scientific Information and Open Access Publishing.	63
<i>Ana Ivković</i>	
Towards a New Technology for Science Online. Open Access Portals and Social Networking as a Source of Scientific Information	75
<i>Zoran Zdravkovic</i>	
Open Access and Web 2.0 Convergence: Information Foundation of the Future	83

Repository

Xantal Romaguera and Reverté Carmen

An Institutional Repository Project as an Organizational Change Vision
in IRTA 97

R. B. Lamptey and A. Corletey

Enhancing Institutional Repositories (IR) in Ghana. 105

Liauw Toong Tjiek (Aditya Nugraha)

Surabaya Memory: Opportunities and Challenges of
Open Access e-Heritage Repositories. 113

Claire Bundy

Developing a Repository: A Library's Journey 121

Journals

Ageliki Oikonomou

Open Access and Academic Libraries Journal Subscriptions 129

Assimina Vlachaki and Christine Urquhart

Copyright and Open Access Journals in Greece 137

Publications and Publishing

Roxana Theodorou and Ourania Konsta

Open Access Collaborative Disciplinary Repositories –
An Alternative Publishing Model. 147

Services and Technology

*Sho Sato, Yuko Nagai, Takashi Koga, Shigeki Sugita, Mika Saito and
Hiroshi Isumura*

ZS Project: Zoological Science Meets Institutional Repositories 157

P. Stathopoulos, N. Houssos, and G. Stavrou

Technology Trends, Requirements and Models for Providing
Sustainable Technological Support for Libraries in an Evolving En-
vironment 167

Guleda Duzyol, Zehra Taskin and Yasar Tonta

Mapping the Intellectual Structure of Open Access Field
through Co-citations 177

Quality and Evaluation

Aristeidis Meletiou

Open Access Books Collection's Improvement According to Cost,
User's Satisfaction and User's Demands 189

Preface of the Conference Chair

It was a pleasure to us to welcome our guests in Chania for the IFLA Satellite pre-conference.

The meeting contributed to the dialogue between librarians and the other stakeholders of the scholarly communication to discuss the alternative solutions, in a more cost-effective and efficient manner. The Satellite pre-conference was an International meeting, participants from 16 countries and 4 continents took part.

The program included two full day presentations and social events. According to the program, the scientific part lasted from 9.00-18.30 and the social one lasted from 19.00- . There were two short archaeological visits, one conference dinner and one one-day excursion.

According to participants' comments, the conference was successful because:

1. A lot of topics on Open Access covered a holistic overview instead of an advocacy attitude in favour of OA.
2. Different perspectives were presented (the researchers', librarians', publishers', Open Access activists' point of view) and
3. There was enough time and opportunity for further conversation.

Indicatively we refer to the different identities of professionals and stakeholders that participated: Librarians, Researchers, Practitioners, Theorists, Repositories developers, Publishers, OA publishers, Technologists, Methodologists, Wikipedia representative, who presented different options/approaches of the same topic.

Generally speaking, participants found the whole organization successful, the location attractive and people friendly and hospitable, so the whole environment made them feel free to exchange ideas, to discuss and listen to each other.

Finally, the conference compiled a statement on OA.

I'd like to thank all of the participants who joined the meeting, the program committee and the organization committee, the sponsors and MAICH.

I'd also like to thank Janet Webster and Heather Todd, chairs of IFLA-Science and Technology Libraries Section and IFLA-Health and Biosciences Libraries Section, respectively, for accepting to organize the Satellite pre-conference in Chania, as well as the colleagues at IFLA Headquarters for their cooperation.

On behalf of the IFLA Satellite pre-conference of Chania,

Anthi Katsirikou

University of Piraeus Library

Conference Chair

Foreword of the IFLA STL Section Chair

Open access to the world's scientific and technological information is a worthy goal for the library profession. The users of our libraries require timely and affordable access to the information they need to frame their research questions, devise their approaches and verify their results. They both consume and produce the scientific and technological information. As librarians, we must facilitate both of these functions. Open access is one vital approach.

The IFLA Science and Technology Libraries Section recognizes the challenge of providing equitable access to information. Our role is to support science and technology librarians, and by so doing, the users of their libraries. The section tracks and responds to current challenges relevant to librarians working with the physical sciences, engineering and technology. Activities include monitoring the dynamic environment in the field, promoting discussions, as well as exploring and sharing best practices among members who serve in research, public, corporate and government libraries. Working with colleagues in developing nations is a high priority.

In the past two years, we have focused on elevating awareness of open access to scientific and technological information among our colleagues worldwide. The 2010 Satellite Workshop on Open Access to Science Information: Trends, Models and Strategies for Libraries provided an excellent forum to discuss the challenges of providing open access to information. The conversation was broad and resulted in a strong statement encouraging the IFLA Governing Board to investigate several factors when developing its stance on open access. These include the restrictive nature of many national copyright regimes, the wide variety of our libraries users' needs, and the complex relationship between information and learning.

The IFLA STL Section applauds the efforts of the workshop participants in articulating that an open society requires open access to information. Subsequent to the workshop, a Professional Resolution was submitted to the IFLA Professional Committee asking IFLA to clearly define its stance towards open access and to more actively advocate for strategies that promote open access. As the chair of the IFLA STL Section, I thank the Workshop participants and organizers for their thoughtful statement as this adds critical support for this important work of IFLA. Together, we will help create a more open society through better access to information.

Janet Webster
Chair, IFLA STL Section
Oregon State University, U.S.A.
November 11, 2010

Committees

International Programme Committee

George Bokos (Ionion University, Greece)

George Christodoulou (Technological Educational Institution of Thessaloniki, Greece)

Michalis Gerolimos (Ionion University, Greece)

George Giannakopoulos (Technological Educational Institution of Athens, Greece)

Sarantos Kapidakis (Ionion University, Greece)

Anthi Katsirikou (University of Piraeus Library, Greece, chair)

Evangelia Lappa (KAT Hospital Library, Greece)

Afrodite Malliari (Technological Educational Institution of Thessaloniki, Greece)

Ageliki Oikonomou (University of Piraeus Library, Greece, secretary)

Gordana Stokic Simonic (University of Beograd, Serbia)

Heather Todd (University of Queensland Library, Australia, IFLA-Health and Biosciences Libraries Section, chair)

Eva Tolonen (Helsinki University of Technology Library, Finland)

Giannis Tsakonas (University of Patras Library, Greece)

Asimina Vlachaki (Library of Health Sciences, University of Athens, Greece)

Janet Webster (Oregon State University, United States, IFLA-Science and Technology Libraries Section, chair)

Dina Youssef (Bibliotheca Alexandrina, Egypt)

Organizing Committee

Anthi Katsirikou, Chair

Ageliki Oikonomou, Secretary

Mary Karadima

Aristeidis Meletiou

Argyro Tzorbatzaki

Yiannis Dimotikalis

Creativity and Copyright: Introductory Thoughts

Anthi Katsirikou

University of Piraeus Library

Open access services are based on the copyright exceptions context. Open access movement supports not only students and researchers' work but mainly supports citizens', industries', professionals' development.

If we agree that open access is a scholarly communication movement that developed by scholars to increase the impact of future scientific research and create a cost-effective publication system (Zuccala, 2010), then copyright for creativity is the main slogan, as prerequisite and as a result of open access.

The goal of open access is to:¹

1. Enhance scientific knowledge work by making per-reviewed research literature openly available on the Web with the creation of institutional preprint repositories or archives and free online journals,
2. Minimize the over-writing of scientific activities, because of the wideness of the publicity,
3. Increase the interoperability between scientific disciplines, because of the open communication,
4. Increase the research opportunities and the citations,
5. Enforce the text mining and their integration to the open scientific systems,
6. Improve the public opinion on scientific research, because of the wider access to the scientific results,
7. Improve the learning experience of students,
8. Change the whole educational chain and the learning procedure.

Seeking the relationships among the terms of Creativity and Copyright, I was advised ERIC and EUROVOC thesauruses for terminology and found that Copyright and creativity are interrelated terms and interdependent actions, the two faces of Janus.

A number of questions are emerging:

- How could the stakeholders, namely writers, publishers, libraries balance between them?
- How innovation be encouraged in the strict frame, even for libraries, of copyright laws?

1 Zuccala, 2010 and Voss, 2007.

- Are there flexible solutions for libraries?
- Is open access the key for synthesizing them?
- Who are our readers/users?
- Who are open access DB’ readers/users? We suppose (researchers, students, professionals, citizens) but do we actually know?
- What’s the mission of Libraries?
- Why do writers write, publishers publish, readers/libraries buy?
- Isn’t the mission the economic, social, cultural development?

If societies decide to be creative, innovative, competitive in research and development, in education and economy, they have to rethink, to review the copyright rules in the library and information area. They (we) have to find the balance for public interest, for the public good.

And, of course, Libraries can serve goals, preserving the intellectual rights of creators and supporting public good. Libraries are convinced that “articles that are freely available on the Internet have greater impact”.

As Victor Keegan right insists and life have proved “consumers gain from more variety and lower prices because, never forget, copyright is a form of monopoly – which always means higher prices than otherwise. Always.”²

Copyright for creativity: a declaration for Europe:³

1. Harmonise exceptions across Europe,
2. Act as a spur to innovation,
3. Support user creativity and wider participation,
4. Ensure accessibility by all Europeans,
5. Support for education and research,
6. Facilitate preservation and archiving,
7. Ensure monopoly rights are regulated in the online environment,
8. Promote these principles in international discussions.

Innovation is generated by communication, by taking others’ ideas, even by false. Innovation is not replica, is not a copy but is based on previous ideas and creations. That’s why in the electronic information age we live the copyright barriers are useless. Copyright law has forbidden the copy for commercial and for profit activities. Copyright laws were not designed to forbid creators from learning from existing creations. It’s a totally different issue. In this situation answers the Creative commons solution.⁴

2 Shorter copyright would free creativity, guardian.co.uk, 7.10.2009, <http://www.guardian.co.uk/technology/2009/oct/07/shorter-copyright-term>.

3 <https://www.copyright4creativity.eu/bin/view/Main/Declaration>

4 Why Creativity Needs Shorter Copyright Terms, 09 October 2009, <http://opendotdotdot.blogspot.com/2009/10/why-creativity-needs-shorter-copyright.html>

We must exercise our societies to pass from the copyright restrictions to the public good.⁵ Public domain manifesto insists that it is comprised of our shared knowledge, culture and resources that can be used without copyright restrictions by virtue of current law.

The public domain is the basis of our self-understanding as expressed by our shared knowledge and culture. It is the raw material from which new knowledge is derived and new cultural works are created. The Public domain acts as a protective mechanism that ensures that this raw material is available at its cost of reproduction- close to zero- and that all members of society can build upon it. Having a healthy and thriving Public domain is essential to the social and economic well-being of our societies. The Public Domain plays a capital role in the fields of education, science, cultural heritage and public sector information.

Exceptions and limitations to copyright, fair use and fair dealing need to be actively maintained to ensure the effectiveness of the fundamental balance of copyright and the public interest.

No other intellectual property right must be used to reconstitute exclusivity over Public domain material. The Public domain is integral to the internal balance of the copyright system. The internal balance must not be manipulated by attempts to reconstitute or obtain exclusive control via regulations that are external to copyright.

So, copyright protection must be gradually replaced by the protection against plagiarism. This is a cultural change and takes a long, but it's essential to succeed.

Exceptions and limitations to copyright, fair use and fair dealing need to be actively maintained to ensure the effectiveness of the fundamental balance of copyright and the public interest.

The new roles for librarians/information scientists are derived by the new central library operations, which are Information literacy, Marketing and Knowledge Management. Consequently, the important roles of next generation librarian/information specialist are:

- Teacher librarian, protagonist in the librarianship scene,
- Subject librarian, a role stronger than before,
- Marketing librarian, new important role, equal to system librarian.

Main basis of three: Focus on target groups, emphasis to the identity of users.

Open access gradually influences not only the scholarly communication system, but mainly, the educational system as a whole.

As much the knowledge dissemination changes so the learning procedures differentiate.

5 Public domain manifesto <http://publicdomainmanifesto.org/>

Is there a matter of validation? The future answers.

One is the certain point: libraries strengthen their importance, their central role.

Bibliography

1. Public domain manifesto <http://publicdomainmanifesto.org/>, access 10.3.2011.
2. Shorter copyright would free creativity, *guardian.co.uk*, 7.10.2009, <http://www.guardian.co.uk/technology/2009/oct/07/shorter-copyright-term>.
3. Copyright for Creativity – A Declaration for Europe. <https://www.copyright4creativity.eu/bin/view/Main/Declaration>, access 10.3.2011.
4. Why Creativity Needs Shorter Copyright Terms, 09 October 2009, <http://opendotdotdot.blogspot.com/2009/10/why-creativity-needs-shorter-copyright.html>, access 10.3.2011.
5. Voss, Rüdiger (2007): Open Access Publishing in Particle Physics. IATUL 2007. http://scilib.typepad.com/science_library_pad/2007/06/iatul_2007_june_1.html, access 10.3.2011
6. Keegan, Victor (2010): Is copyright getting in the way of us preserving our history? The issue of copyright is a global nightmare for anyone interested in digital preservation. *Guardian*, Thursday 25 February 2010. <http://www.guardian.co.uk/technology/2010/feb/25/digital-copyright-british-library>, access 10.3.2011.
7. Zuccala, Alesia (2010), Open access and civic scientific information literacy. *Information Research*, 15 (1). <http://informationr.net/ir/15-1/paper426.html>, access 10.3.2011.

Best Practices and Management

How to Build an Institutional Repository? Practical Guide from a Special Library

Katalin Miszori

Szent Istvan University Veterinary Science Library, Hungary

Abstract

There are repositories in almost every university in the world. Lots of them are hosted by the libraries, because they have the data and this is the best way to archive, store and serve it – first of all the theses and PhD works.

The staff of the University and the Veterinary Science Library (Szent Istvan University, Hungary) decided in 2008 to build an institutional repository. There were „best practises” in Hungary, but every case is unique.

First we have chosen an open access repository-building system called ePrints, because there were lots of good examples with it. This system can solve the problem of preserving increasingly complex and multifaceted digital objects. The type of the stored data was first only text. But the formats of the text files were variable, so we had to choose the most frequently implemented and supported one, and the one which is the easiest to migrate.

Just like data, users are also important. There are three types of users of the system. Those who access the system for its content (mostly people from the university), those who create the content and those who administer and maintain the system.

The work was not simple, but to see it in practice could be great for everybody hesitating to create such a storage system.

Keywords

Repository, DoItYourself, Dspace, special library, veterinary, open access, Hungary

1. National Research Environment in Hungary

The Hungarian research institutions are organized into two groups. The first are the 71 higher education institutions: 19 state universities, 7 non state universities, 10 state colleges, and 35 non state colleges. The other is the Hungarian Academy of Sciences and its research institutes. According to Act XL of 1994, the Academy is a scholarly public body founded on the principle of self-government, whose main objectives are the study of science, the publicizing of scientific achievements, and the aid and promotion of research. Its members are the academicians. The Academy maintains 48 research institutes and other institutions (libraries, archives, information systems, etc.) assisting their work, and extends aid to university research centers.

The Hungarian Scientific Research Fund (Hungarian abbreviation: OTKA) has been the major funding agency of basic science and scholarship since 1986 when the transition to competitive research funding started in Hungary. Established by a government decree, OTKA has been operating as an independent non-profit organisation since 1991. Its legal status and rules of operation were established in an act in 1993 and reinforced in 1997 by the Hungarian parliament in order to provide independent support to scientific research activities and infrastructure, to promote scientific achievements of international standards, and to provide assistance to young researchers. As an independent institution, OTKA reports to the parliament and the government of Hungary. With regards to the funds provided within the annual budget of the Republic of Hungary, the appropriations of OTKA are administered via the budget of the Hungarian Academy of Sciences.

OTKA signed the Berlin Declaration in 2008. “The scientific publication supported by an OTKA grant has to be made freely available according to the standards of Open Access, either through providing the right of free access during publication, or through depositing the publication to an open access repository. Depositing is possible in a repository of an institution or that of a scientific field, as well as in the Repository of the Library of the Hungarian Academy of Sciences - REAL.¹”

Certain groups of the Hungarian research community are aware of Open Access and its benefits, but they are still reluctant to provide Open Access to their publications. The main obstacles are a lack of knowledge about relevant copyright issues and the resistance by researchers to allocate time and effort to the depositing process. Advocacy programmes (attached to a network of institutional repositories) by higher education libraries could be an effective way of increasing national research visibility and impact.

Institutional repositories in Hungary:

- Ph.D. theses defended at the Corvinus University of Budapest – BCE Doktori disszertációk archívum²
- DEA - University and National Library University of Debrecen³
- MIDRA - Miskolci Egyetemi Digitális Raktár és Adattár⁴
- EAL – Repository of the Library of the Hungarian Academy of Sciences. This archive contains full-text publications of research projects funded by OTKA.⁵
- CUB – Archive of the Institute of Business Economics⁶
- Central European University's Academic Archives

The HUNOR (HUNGarian Open Repositories) consortium was established by the libraries of Hungarian higher education institutions and the Library of the Hungarian Academy of Sciences to advance national open access practices. The members of HUNOR are dedicated to promoting Hungarian research both nationally and internationally and to achieving effective dissemination of scientific outputs through the implementation of a national infrastructure of open access repositories. Other proposed activities include the organization of a methodology center, adopting international know-how and standards, the establishment of complementary scientific communication channels, and international relations

2. Repositories in Hungary

MIDRA – Miskolci Egyetem Digitális Raktár és Adattár (Digital Store and Repository of the University of Miskolc)

The digital store and repository was launched in May 2007 for digital documents created at the university in research or education. It covers lecture notes, textbooks, major study aids, studies prepared for the Scientific Student Circle competition, dissertations, university regulations, videos, etc. It is a domestic software based on the free eleMEK programme.

DEA – Debreceni Egyetem Elektronikus Archívum és Adattár (Electronic Archive and Repository of the Debrecen University)

The Department of Solid State Physics, University of Debrecen initiated the idea of creating an archive first for the department, later for the whole university. The department has chosen Dspace thus it seemed obvious to use this software for the development of the university repository as well. It covers theses, conference papers, study materials, institutional documents. DEA uses the OAI-PMH protocol for data transfer, while its content may also be searched in the OpenDOAR project.

Repositories of the Corvinus University, Budapest

The Corvinus University uses Eprints 2.4 for building its repositories. Three digital repositories may be accessed through the homepage of the Central Library:

Theses and studies for the Scientific Student Circle's conference

PhD-dissertations

Archive of the Archive of the Institute of Business Economics

3. Repositories on the Field of Veterinary Science

DViikki⁷ at University of Helsinki: Dviikki is the repository of the Viikki Science Library, University of Helsinki. So far as its contents is concerned, it incorporates documents belonging to the interest of the faculty (such as biotechnology, veterinary science, pharmacology, agriculture, forestry), publications from the library and conference proceedings. Its language is English and Finnish. The software used is DSpace.

Elektronische Publikationen der Universität Hohenheim⁸: The electronic publication database of the Universität Hohenheim was also established by the university library. It is possible to access the publications of the institution through it. It focuses on publications and theses in agriculture and veterinary science. URL:

Obihiro University of Agriculture and Veterinary Medicine Academic Repository⁹: The database of the Japanese Obihiro University of Agriculture and Veterinary Medicine is managed by the university. It aims at gathering the publications, postprints, dissertations, grey documents of the institution. URL:

Tierärztliche Hochschule Hannover¹⁰: The repository of the Tierärztliche Hochschule Hannover are managed by the library and offer full text access to theses of the students and PhD theses. Registered users may also access institutional publications. The agricultural, food science and veterinary repository contains also dissertations from 1990, however, these can be accessed only through the German interface.

4. Veterinary Science Library – Budapest

The need for starting an institutional repository emerged at the Veterinary Science Library, Szent Istvan University in 2007. The faculty and the library set the goal of including and preserving theses, PhD dissertations, as well as research reports, educational materials, aids of further training. These documents have been stored by the library in print, however, the storage and safe dissemination of these in digital form has become significant.

We intended to follow an established practice, thus all three softwares used in Hungary were tested. The advantage of eleMEK is that it is a domestic development following special local needs, however, after some communication with the developers and the difficulties of the installation it turned out that this project has not been looked after properly recently. EPrints is popular in other countries as well, and technical problems may be overcome easily with support from the mailing list. EPrints 3 was launched in November 2007 – this is the first that can be installed under Windows. All the computers as well as the server of the library use Windows, therefore the less elaborate EPrints 3 beta could be installed only. The installation can be solved by means of the wiki of and that of another institution. There were problems with character setting. It turned out on the basis of our own experiences and some discussions that DSpace is the most effective framework for an archive under Microsoft Windows which contains Hungarian characters. DSpace also describes the steps of installation in a wiki.

5. How to Begin?

The American Library Association (ALA) has records of digital libraries since the end of 1980. The first steps were made by the Library of Congress in 1989 and by 2000 their electronic collection already counted 5 million records. The content management systems of the late 1990s offered good opportunities for sharing digital documents though they had been developed for non-library settings, and were also rather expensive. Librarians fancied a system which combines Dublin Core, the metadata schemes and supports the application of Z39.50 as a minimum requirement. Beside the expensive software packages, the first open source softwares appeared already in 2002 like DSpace (MIT/Hewlett Packard) and Greenstone from New Zealand and MyCore elaborated by some German institutions in collaboration.

The general requirements concerning library softwares were that they have to make the import, cataloguing, editing, storing, searching of records possible; should be able of capturing the contents and metadata, and compiling statistics. Digitization may be carried out by libraries or outside firms. Open source softwares are usually the ones which are free and which offer the source code together with the software. It is a great advantage that they are free or very inexpensive and free trial is available at any time. Their installation and management is much cheaper than that of other softwares, and can be supplemented by new applications by users.

Open standards are normally independent of their creator, are free or very inexpensive, and users may participate freely in their elaboration and development. A university repository is a service offered by the institution for its staff and students to manage and share documents created at the university. Its

main function is the management of digital materials, i. e. ensure proper storage in the long run, organise uploading, and offering the possibility of access and sharing. The use of the documents to be found in the repository is regulated by the author. Creative Commons makes it possible for the owners of copyrighted works to transfer some of these rights to the community while retaining some for themselves.

6. Choose a Software

Surveying open access repositories I found that there is a number of different softwares matching different needs which may be used for creating a repository. As a matter of fact there are ones which are more popular, and some less widespread. There are others used in a continent more, still others which are capable of handling special characters, etc. Sometimes the ease of use, implementation and management may be a decisive factor.

So we have chosen DSpace. The aim of the software is the same as that of EPrints: digital research materials are collected, served and stored in a database. Different articles, work documents, preprints, reports, conference- and educational materials may be stored in the repository in different formats.

Mostly academic institutions and research institutes use DSpace. It is popular because it is relatively easy to install and manage. It supports archiving, and the transfer of records from a storage device to the other does not cause difficulties since each record has its own URI. The advantage of DSpace is a handicap at the same time: it is a massive software which does not like user modifications. After all, UNESCO offers this software for the long term preservation of digital documents.

7. Working Machine

DSpace and the environment, settings, uploading documents

Environment

- Java 1.4 or higher running environment
- Apache Ant 1.5 Webserver
- PostgreSQL 7.3 (or Oracle 9) relational database management system
- Jakarta Tomcat 4.x/5.x
- And the DSpace, of course.

Installing

Step one: install *Java*: select the folder C:\Program Files. The location of the program has to be given in the PATH variable of Windows, and a new one has to be created named JAVA_HOME with the value of the route of the program. Step two: install *Apache Ant*, selecting the folder C: and name it Ant. In this case the location has to be given in the environment variables of PATH. Step three: before installing the *PostgreSQL* database server, check if NTFS type file system is set in the drives of the computer which will be used by Postgres. Step four: install *Jakarta Tomcat*. Select port 8080 and give the user password of admin, and the installation of the component will be ready.

Installing and configuring DSpace

1. Copy the installation package to the C:\Dspace folder.
2. Copy the file PostgreSQL JDBC.jar (C:\ProgramFiles\PostgreSQL\8.1\jdbc\postgresql-8.1-404.jdbc3.jar) to the folder C:\Dspace\lib
3. Open the config file of DSpace (C:\Dspace\config\dspace.cfg) and make some alterations:


```
dspace.dir = C:/dspace
dspace.url = http://IP_No_of_Machine or hostname/:8080/dspace
dspace.hostname = hostname or IP
dspace.name = DSpace – name of the repository
config.template.log4j.properties = c:/dspace/config/log4j.properties
config.template.log4j-handle-plugin.properties = c:/dspace/config/log4j-handle-plugin.properties
config.template.oaicat.properties = c:/dspace/config/oaicat.properties
mail.server=host or the IP of the mail server
mail.from.address = dspace-noreply@email_identifier
```
4. Open the command line and give the following command in the Ant folder:


```
ant fresh_install
```
5. Create a super-administrator user
6. Check that the dsrun.bat and the buildpath.bat files can be found in the C:\DSpace\bin library. If not, download them from the DSpace web-page and start the command:


```
dsrun org.dspace.administer.CreateAdministrator
```
7. Give the password
8. Copy the dspace.war and the dspace_oai.war files from the C:\DSpace\build folder to C:\Program Files\Apache Software Foundation\Tomcat 5.5\webapps library
9. Restart Tomcat-et
10. Open a browser and give the URL:


```
http://IP_of_our_computer:8080/dspace
```

Configuration

If the instructions were followed the opening page of DSpace will appear in the browser window:

- Community/Collection: It is possible to create collections and subtopics.
- E-people: Creating new user profiles.
- Groups: User groups and their authentication may be specified.
- Items: Elements may be edited or cancelled here.
- Metadata registry: Creating new metadata schemes.
- Default is Dublin Core.
- Bitstream format registry: formats to be used in the repository can be set here, e. g.: pdf, xml, css, text, jpeg, gif, rtf.
- Authorization: access authentication of collections, users, groups, records may be specified in a single interface.
- Edit news: altering the text of the initial screen and the right window. It is possible to use a minimum of html codes.
- Edit default license: a user licence is inbuilt into the system which can be altered or changed by the administrator.
- Statistics: use statistics.

The modification of the configuration file [C:\DSpace\config\dspace.cfg] offers lots of different possibilities. Default settings may be given here, and functions may be switched on.

- use licences of uploaded files next to the record:
webui.licence_bundle.show = true
- Creative Commons licence allowed:
webui.submit.enable-cc = true
- RSS enabled
webui.feed.enable = true
- Number of records in the repository:
webui.strengths.show = true
- Enable suggestion of records:
webui.suggest.enable = true
- The default operator between search lines is 'OR', but this may also be altered:
search.operator = AND

8. Experience

At the age of free softwares, I felt threatened by the fact that all computers, including the webserver of the library, use the Windows operation system. The creation of the repository was relatively simple and easy. The installation guides and helps really meant great aid. Surveying institutional repositories (repositories, archives, databanks, etc. are yet exchangeable names of the repository – even the terminology is not settled), which have been operational for years, I concluded that Hungary is lagging behind in this respect with 3-4 years. Without intending to make projections for the future, we are convinced that archive materials on several storage devices in different formats will survive for a long time, as will the preserving function of libraries.

References

1. http://www.otka.hu/index.php?akt_menu=3658
2. <http://phd.lib.uni-corvinus.hu>
3. <http://dea.lib.unideb.hu>
4. <http://kvt99.lib.uni-miskolc.hu:8080/eleMEK/kereso.jsp>
5. <http://real.mtak.hu>
6. <http://edok.lib.uni-corvinus.hu>
7. <http://www.tiedekirjasto.helsinki.fi/dspace/>
8. <https://typo3-ub.uni-hohenheim.de/62810.html>
9. <http://ir.obihiro.ac.jp/dspace/index.jsp>
10. <http://elib.tiho-hannover.de/dissertations/dissertations.html>

Bibliography

- Boss, R. W. (2006): Digital collections management
<http://www.ala.org/ala/pla/plapubs/technotes/digitalcollectionmanagement2006.doc>
- Bankier, J. G. and Perciali, I. (2008): The institutional repository rediscovered: What can a university do for open access publishing? *Serials Review* doi: 10.1016/j.serrew.2007.12.003
- Bradley, K. and Lei, J. and Blackall, C (2007): *Towards an Open Source Repository and Preservation System* Paris: UNESCO, 34 p.
- Corrado, E. M. (2006): A három „O”: Open Access, Open Source, Open Standards, a publikációkhoz való szabad hozzáférés, a nyílt rendszerek és a nyílt szabványok a könyvtárakban. *Tudományos és Műszaki Tájékoztatás* Vol. 53., No.3., p. 143.
- Csirmaz L. and Holl A. (2007): Open Access – Open Source szabad hozzáférés tudományos cikkekhez, szabad szoftverrel. NIIF IPSZILON seminar,
<http://www.ipszilon.niif.hu/oa/oa-holl.pdf>, <http://www.ipszilon.niif.hu/oa/oacsirmaz-2.pdf>

- Dudás-Varga Zs. (2008): Apache Tomcat és az apache webkiszolgáló összeépítése.
[http:// www.codexonline.hu/CodeX10/alap/java/DunasVargaZsolt/Apache.htm](http://www.codexonline.hu/CodeX10/alap/java/DunasVargaZsolt/Apache.htm)
- Finta A(2008): Kliens – szerver architektúra
[http://www.codexonline.hu/CodeX10/alap/ webpr/webthe/clise/ksze.htm](http://www.codexonline.hu/CodeX10/alap/webpr/webthe/clise/ksze.htm)
- Greenberg, C. J. (2005): Good old days? In: Biomedical Digital Libraries Vol. 2, No. 3, doi: 10.1186/1742-5581-2-3
- Harangi G. (2008): A DEA születése – egy digitális adattár létrehozásának kihívásai. Net-workshop, Debrecen
- Karácsony Gy: DEA: A Debreceni Egyetem elektronikus Archivuma
[http://hdl.handle.net/ 2437/2345](http://hdl.handle.net/2437/2345)
- Lynch, C. A. (2003): Institutional Repositories: Essential Infrastructure for Scholarship in the Digital Age. *ARL*, No. 226, p. 1-7.
- Millington, P. and Nixon, W. J. (2007): EPrints 3 Pre-Launch Briefing. *Ariadne* Vol. 50.
<http://www.riadne.ac.uk/issue50/eprints-v3-rpt/>
- Rentier, B. (2008): Open Access to scientific documentation: institutional electronic repositories – a mandate for all researchers
<http://www.universitiesuk.ac.uk/research/downloads%5CResearchInformationandManagementWorkshop%5CProfessorBernardRentier.ppt>
- Royster, P. (2008): Publishing original content in an institution repository. *Serials Review*. doi: 10.1016/j.serrev.2007.12.002
- Ság Z (2008). Corvinus - tapasztalatok *KIT Hírlevél* 2008/13. márc. 26.
- Swan, A. and Carr, L. (2008): Institutions, their repositories and the web. *Serial Review* doi: 10.1016/j.serrev.2007.12.006
- Suleman, H. (2006): What is wrong with digital repositories software?
<http://www.lib.sun.ac.za/Sym2006/Presentations/hussein.ppt>
- Shirley, S. (et.al.) (2004): Bringing hidden treasures to light: illuminating DSpace.
<http://www.vala.org.au/vala2004/2004pdfs/17SHGY.PDF>

Open Access and Academic Library Public Services: Roles for Reference and Instruction

Laura Bowering Mullen

*Rutgers University Library of Science and Medicine, Piscataway,
New Jersey, USA*

Abstract

Librarians advocate for open access to the scholarly literature as a way to promote the library values of openness, and also as a mechanism to effect change in scholarly communication. While librarians in collections and scholarly communication work may have become immersed in advocacy and even action, those working on the front lines of public services, especially in reference and instruction, may have not integrated open access publications and research tools into their “everyday” interactions with library users. This type of grassroots effort will be necessary if the open access movement is to be successful in changing the way library users view acceptable forms of scholarly literature for use in their various research endeavours. Reference and instruction librarians can use many venues to promote open access, and must change traditional practices if open access advocacy is to “filter down” to all library users.

Keywords

Open access, instruction, reference, public services, openness, scholarly communication, advocacy, information literacy, LIS education

1. Introduction

Moving open access advocacy forward into action in academic libraries has required a sustained commitment on the part of librarians in their roles as authors, editors, liaisons, collection development specialists, publishers of open access journals and managers of repositories. However, a disconnect may occur when librarians do not change their behaviour in their daily public services work with library users. A plethora of research articles as well as the more

passionate editorial pieces have predicted great changes to the business of libraries and the profession of librarianship as a result of a move toward open access. So much of the conversation may be missing the librarians who interface most with students, faculty, and the public; the reference and instruction librarians. “Best practices” for reference and instruction may not have incorporated scholarly communication trends, and an adequate awareness of the use of open access materials.

Two of the major reasons for librarians to “get on board” with open access advocacy have been the promise of libraries gaining some potential budgetary relief from the exponential growth of costs of serials, as well as for the promotion of the “library value” of democratization of access to information. Maximum accessibility of scholarly information is especially important for research that results from taxpayer funds. Many libraries have not realized much budgetary savings from open access but most librarians can agree that libraries of all types want scholarly information to be disseminated in ways that enhance society at all levels. Reference and instruction librarians take available collections, both subscribed and by extension, those freely available on the web, and present them to users in a variety of ways. Reference encounters and instruction sessions allow librarians a platform to communicate information about all relevant and available information resources to users and classes. If these public services roles have not changed, and if librarians are relying only on traditional subscription products, then the library misses an opportunity to promote some non-traditional digital materials for use in research. The increasing presentation and integration of a variety of open access materials in library public services will increase researcher awareness of alternatives for their own searching, research, self-archiving and writing for publication. Extending the suite of materials presented to researchers to those out on the web need not diminish in any way the use of any traditional library materials.

Scholarly communication librarians and committees, as well as university library administrators have exhorted librarians to go out to their constituencies and educate faculty about the value of open access to the community at large, as well as its potential as a vehicle for increasing personal and article research impact. This type of outreach can happen at the reference desk, in the classroom, and in the library’s virtual space as well. Librarians may find a scholarly communication role a new one, and will need continuous educational opportunities in order to maximize their own efficacy in this new and possibly unfamiliar role. LIS educators will set a tone when teaching about materials acceptable for use by librarians in reference and instruction at all levels.

Listservs, blogs, articles and books have been written by sometimes evangelistic authors whose intent may be to see wholesale change in the way librarians do business with publishers and vendors, while opening up huge amounts of information that was formerly “locked up” behind access walls for a large majority of the world’s readers. Freeing information for readers and the

ability to showcase an institution's scholarly output have been major reasons for the development of repositories. The creation of open access journals and books, and collaborations with university presses and even college stores are only a few of the potential opportunities facing academic libraries. However, there may be a large segment of the library community that has not followed suit by changing public services roles that have the potential to open the discussion beyond the library and teaching faculty to other groups of library users such as students and the public.

Public services functions in libraries serve to extend the collection focus and partner in bringing the materials to the library users. Librarians in public services roles corral all of the available resources, and organize them for users. By virtue of this organization through library websites, portals, discovery engines, online research guides, and a variety of lists, the library is able to present the user with a coherent and manageable suite of resources with which to work. While organizing the library's suite of offerings, the public services librarian is able to influence to a degree which materials are used and promoted. If public services librarians wish to continue the emphasis and advocacy carried on by various other groups, they may wish to keep a focus on open access materials, thereby removing the mystique and the issues surrounding "scholarliness" often plaguing open content in terms of credibility and level of peer review. Open access materials may differ by business model, but not by quality, relevance, or appropriateness. Open access materials, in the case of this paper, include all resources, whether articles in all forms, books, journals, media, repository materials, data, institutional output such as dissertations, and any other products of a scholarly nature. Whether created digitally as open access materials, open access status paid for by authors or institutions, or traditional materials transitioned to open formats, open access materials are free to readers. Aside from free to read, open access of course extends other benefits such as downloading, copying, or distribution. Librarians can assist in the search and discoverability of the open access material by students, faculty and researchers in an organization through effective communication and organization and presentation of library resources. Public services librarians know that the library extends out onto the open web. Integrating open access into the mindsets of public services librarians requires only awareness and education, not expenditure of any funding.

2. Integrating Open Access into Reference Work

Reference librarians get their training, whether they work in the virtual or traditional environment through their graduate school training, through professional development in their institutions and organizations, and from "shadowing" or working with more experienced reference librarians. Training, whether

in LIS programs or in the current library environment depends on the availability of librarian expertise in scholarly communication trends, and that includes full knowledge of search and discovery of relevant open access materials. Institutions, with continued economic pressures, are unable to subscribe to all needed content, and many individuals do not have affiliations that would allow access to even a minutia of available scholarly output in a particular research area. In both situations, librarians can offer open access materials alongside whatever subscription materials might be available. Today, library users still consider the library a source of scholarly, credible information and approach their search for materials in a variety of ways. The challenge for both librarian and user in the current environment is to distill the vast array of resource choices down to an appropriate, targeted, and manageable grouping for a particular information need. Excellent reference librarians are able to see across a vast landscape of available materials, and without overwhelming the researcher, set a strategy and a path for the user to follow in gathering material, organizing it, and eventually incorporating it into current work. The unmet realization of open access is not solely the responsibility of those librarians who teach and work in public service reference roles, but certainly these “frontline” librarians have every ability and opportunity to explain the added value to the library of materials that are freely accessible to the reader. Individual libraries will be able to determine how open access materials fit into their lists of resources, and how to prioritize or specifically showcase these materials.

Public services librarians will have to grapple with the way students make use of the library, whether starting with Wikipedia or other open access work and linking to new articles through references found there, or by starting with Google or Google Scholar. Librarians must be open to assisting students with a discussion of the variety of paths used to reach scholarly materials, whether open or subscribed. Pushing usage of subscribed materials is now a desire of many in the institution, but open access materials may be used in a complementary fashion. Justifying institutional expenditure on expensive databases or journals may be a reason that librarians direct users first toward subscription materials in reference encounters or in instruction sessions. Further research can determine how librarians decide what to offer the use in terms of integration of open access materials. Recent studies have begun to analyze librarian attitudes toward open access (Palmer, Dill and Christie 2009), but other research looking specifically at public services librarians’ behavior in terms of the integration of open access materials will be necessary.

For those libraries deploying institutional repositories, making them a silo, and not an integral part of any library search will not expose the contents adequately. If the purpose of the repository is twofold; to gather together the products of institutional scholarship and research, and to make those materials available to the wider community, then the librarian could include a search of repository contents in reference encounters with users. Without an institutional reposi-

tory, or in fields where there exists a robust disciplinary repository, that source must be considered to be like any other disciplinary source of scholarly full text, and shown to users. Some disciplinary repositories hold vast stores of scholarly materials and are established parts of the information chain in particular fields. Examples would be arXiv for the physics community, or dList and E-LIS for aggregation of library and information science material.

Public services librarians need to continue to stay abreast with trends in dealing with “versioning” of materials in repositories. Repository materials might be in unfamiliar formats such as preprints or postprints, and users may be reticent to use such materials as citable objects in bibliographies. Newer style guides are incorporating some of these versions and providing guidance for citation. Consulting with users on author rights might be a serendipitous result of offering these versions as acceptable substitutes for the branded publisher PDF in research. Where postprint versions contain biomedical data or other sensitive material, the librarian might expect to hear some understandable concern from the patron wanting to only cite the fully branded publisher PDF. Seeing and using such versions might provide extra impetus for faculty authors to deposit their own materials in the institutional or disciplinary repository (or both). Researchers may see the value of these versions for readers, even if they don’t consider them citable.

One of the primary occurrences in reference interviews or encounters is the listing of appropriate scholarly indexes and databases for a particular subject search. The librarian may be consulted for a list of appropriate indexes. Librarians who wish to maximize the scholarly result will need to consider free indexes that expose appropriate open access material. Indexes and databases that make up a library’s suite of products need to include open access indexes and databases such as Google Scholar, Open J-Gate, DOAJ (Directory of Open Access Journals), and others. These indexes have a variety of searching options and limits, and may really be valuable to researchers in terms of discovery of open access materials. Google Scholar, in particular, even with its problems regarding transparency in terms of what it covers, has been added to the indexes and databases lists of many academic library members of the Association of Research Libraries (ARL). (Hartman and Mullen, 2008). Library catalogs or ILSs can benefit from a wide variety of added free open access content, whether from book digitization efforts or the inclusion of free open access journal links that have been vetted for quality either by subject specialists in the library or because of their inclusion in traditional indexes and databases like PsycINFO, Web of Science, Scopus, or others. Reference and instruction librarians are instrumental in suggesting the inclusion of various types of open access material into library collections. Libraries’ collections benefit from including open access materials.

Many libraries add their institutional repository contents to federated or integrated search products, or the newer discovery services. A prominent place

on the library website as well as catchy branding can draw further attention to the repository as a place for institutional scholarship and collaboration. Reference librarians are in a position to at least mention the repository in reference encounters. Further studies on librarian behavior with respect to open access advocacy may provide information on whether reference librarians actually feel comfortable suggesting repository materials to patrons at the desk or in the virtual reference space. This is a training issue for reference librarians, and further study will show where the issues surrounding open access and scholarly communication fall in LIS programs training future librarians. All future librarians dealing with public service roles must be conversant in issues surrounding open access to materials. Library administration will need to determine the individual library's attitude about open access advocacy from public services librarians. There must be a consistency in terms of "best practices" surrounding open access and reference.

No longer is the open access conversation only of interest to science libraries and librarians, but it is crossing boundaries into other areas such as open access books initiatives in the humanities. However, science researchers will certainly be more amenable to using open access journal materials due to the ubiquitousness of both the conversation and the materials. Most scientists have probably, by this point, encountered author charges for open access journals, have had some involvement in conversations about open access legislation and mandates, or have some familiarity with the branding on some of the open access alternatives from popular publishers such as Public Library of Science (PloS), Springer/BMC, Hindawi and others. Science researchers have undoubtedly heard of repositories such as arXiv. They may be less familiar with more independently created free to author, free to reader open access journals in their fields. If promotion and tenure, or research assessment exercises allow, the reference librarian may be able to promote some of these newer, niche, open access journals. This is especially advantageous in the public relations efforts that assist a library published open access journal or open textbook project. A discussion of open access in a single encounter can lead to further discussion of issues of peer review, research impact, or the availability of new types of scholarly publications. Library users, used to linking seamlessly to subscription materials, may not even realize that there is a cost to information, or that the library is making certain online content available. Mentioning this in instruction sessions can raise some awareness. Talking about scholarly communication issues in reference and instruction roles can also raise awareness of the added value of librarians to an institution.

Public services librarians responsible for content on library websites and portals such as subject research guides or LibGuides have an opportunity to extend the reaches of the local collection by gathering together sources of open access materials and highlighting them in a variety of ways. Librarians will still need to vet open access indexes, book sources, and individual journals for

scholarly quality before including them alongside toll products on the library website and in the catalog. The role of the public service librarian or subject specialist librarian will be to organize and recommend these free resources alongside any others. Popular subject indexes such as PsycINFO also include open access materials if deemed of scholarly value by the publishers of the database. Public services librarians, while attending the virtual or in person training sessions of the index producers, may want to ask them whether the source includes open access materials. Indexing open access materials provides added value to the reference or instruction encounter, making more scholarship available at the point of search. The indexes can help with the organization of open access materials so they do not exist simply as disparate digital object on the web. Free and subscription indexes may be listed together by subject or other category. Library users starting with the library website will find quality materials, regardless of business model, organized together. LibGuides and other research guides can include all important scholarly disciplinary materials side by side, regardless of business model.

3. Instruction and Information Literacy with Open Access

Library instruction and information literacy efforts which only include subscription materials miss the opportunity to provide awareness of and access to open materials. Many librarians teach as they have always taught; starting with the library website and focusing on subscription materials accessed through the institutional connections. Even at institutions with robust collections, library users can be taught to pull in appropriate free resources from many web sources. Researchers do not need to focus on business model, but will benefit from some discussion of trends in scholarly communication. For basic classes, students will need to know how to evaluate research material, and to understand peer review as a value. This type of conversation with students allows them to feel free to use scholarly open access materials in their papers and classes. Advanced researchers will be interested in the conventions of the disciplines in terms of promotion and tenure, impact and other metric analyses available for evaluation, and a might require a more international scope to the discussion. Instruction session can include the open access conversation at an appropriate level of complexity.

Information literacy standards, such as those available for some disciplines through the ACRL (Association of College and Research Libraries), or by accreditation groups could begin to incorporate more fully important discipline-specific scholarly communication issues, and lead to enhanced discussion of open access topics. In discipline-specific classes, especially those taught at the graduate level, or sessions targeting faculty and other researchers, librarians can offer discipline-specific information about metrics, impact, copy-

right, data issues, author rights, open access journals, disciplinary repositories, and any other issues affecting the field's journals, publishers, or vendors. Instruction at this disciplinary level can also incorporate discussion of the economics of publishing. Disciplines and even subfields vary distinctly in their uptake of various types of open access, whether repository uptake, open access journals, author pays models, and availability of the open corpus of the specific book literature. Many scholars will welcome these discussions, and the conversation can be opened in instruction sessions or reference encounters. It may be a steep learning curve for reference and general instruction librarians to be able to discuss these issues with all categories of library patrons, but it is a responsibility if the library is serious about participating in, or even leading the discussion of scholarly communication issues such as open access. Librarians in public services roles have the opportunity to be leaders in specific scholarly communication efforts not only in the home institution, but in national and international organizations. Looking at open access from a public service perspective would round out the conversation.

Continuous education for instructors, and collaborations and conversation with departmental faculty will make it easy to integrate open access and changing publication paradigms into disciplinary conversations. Librarians may want to gather together by discipline in physical or virtual conferences for discussion of scholarly communication topics. Library instruction should not just continue year to year in the same manner with little credence given to enormous changes taking place in the publication and information industry, and new opportunities for participation in a conversation about evolving methods of scholarship. Starting with defining the concepts around more open models in basic classes, and scaffolding to more complicated discussions in the higher levels of the disciplines will provide a wider conversation that will benefit disciplinary scholarship. It is also possible to reach particular classes or groups by putting resources directly into courseware. Faculty may choose reserve materials for students from open access materials found on the web, or consider use of open textbooks, thus highlighting the scholarly nature of many non-traditional materials. Discussions of open textbook initiatives might be an area where all librarians can focus on critical needs of students while giving the library added relevance to that group.

Open access advocacy with students and others in the library can be promoted through use of brochures, posters, and other visuals in the library. Students may respond to some of the SPARC initiatives, such as activities for Open Access Week, and become engaged in new conversations. A targeted focus during this one week of worldwide advocacy may garner interest alongside a more diffuse discussion throughout the institution. Librarians promoting open advocacy may be doing the most work with the faculty and researchers, but need to remember that the students are the readers and information consumers of the future. Outside of marketing efforts involving the physical li-

brary building, the library website can feature any library efforts that focus on open access issues by promotion of initiatives in news items or short communications. If the library is to create a culture where the promotion of efforts to ensure that the maximum amount of scholarly information is available for all readers, all librarians will have to incorporate the conversation into their reference and instruction work. Many public services librarians will want to discuss best practices for actually integrating more open access materials and behaviours into daily work.

4. Conclusions

Future research may include the study of the teaching of open access and newer trends in scholarly communication in LIS graduate programs, and the study of all modes of reference and instruction training for librarians and the extent to which open access has been integrated into the practical business of public services in the academic library. Another issue surrounds the consistency of the message, and whether academic librarians are “on board” with the strident advocacy messages that filter through academic library circles. The discussion may be best promulgated by crosspollination of teams where public services librarians discuss best practices with those working on the collections being pushed out to users through public service channels.

Surveys of science faculty and understanding the various pressures pushing researcher behaviour, such as need to demonstrate personal impact when seeking promotion, tenure, or continuing appointment, or to use traditional materials with demonstrated impact factor, may be helpful. Sometimes controversial, the adage that open access increases research impact may motivate certain researchers to consult with reference librarians for issues of traditional and newer metrics, or to discuss different business models used by journals. It may be a steep learning curve for both new and experienced reference librarians to keep up with these issues. An academic library may have a scholarly communication librarian or other specialist who may take on the role of coordinating continuous education for librarians. Without open advocacy efforts actually filtering down to librarians on the “front lines” of reference and instruction, little is likely to change in the library. Library leaders recognized for their expertise in public services areas will need to discuss this topic and set expectations for librarian behaviour.

Libraries demonstrating a commitment to open access in reference and instruction roles will undoubtedly be held up as examples of those who serve researchers well while advancing what has come to be a basic tenet of academic librarianship; the need to make research literature, especially the product of taxpayer funding, available to all on a global scale. Opening up the actual data will likely follow, and will provide another opportunity for reference

and instruction librarians to add value to the library experience for the researcher. Promotion of open access resources and development of new scholarly communication expertise is an exciting area for public services in the academic library. Direct contact with library users, whether virtually or in person gives the public services librarian a unique vantage point to influence uptake of new ways of looking at scholarly search and discovery.

Public services librarians, with their many lists, online fora, and dedicated organizations may need to decide what their place is in the open access conversation. Thus far, it has not been very robust. After more than 15 years of open access advocacy by library groups, the LIS literature seems sadly lacking in treatments of interest written for and by front line public services librarians. LIS education programs provide the place for learning information on “new” reference and information literacy practices, and will determine whether there will be any wholesale change toward using interaction with users (either physically or virtually) as a means of advancing the open access agenda. Library users will approach librarians with the expectation of accessing an appropriate suite of choices for use in their research. The public services librarian role of teaching today’s students to properly evaluate materials for scholarliness will not preclude the gathering together of materials produced by many different methods, but having in common free accessibility. Librarians will realize the benefits of offering open access materials to library users, and over time, these materials may not be set apart in any separate category. At that time, there may be a fuller realization of the impact of open access to the collective researcher community. Open access materials will be accessed on mobile devices and in classrooms and serve the widest audience. Reference and instruction librarians can offer the best of the available scholarship to the user, and that can and should include all appropriate open access materials.

References

- Hartman, K.A. and Mullen, L.B. (2008) Google Scholar and Academic Libraries: an Update. *New Library World*, 109(5-6): 211-222.
- Mullen, L. B. (2010). *Open Access and its Practical Impact on the Work of Academic Librarians: Collection Development, Public Services, and the Library and Information Science Literature*. Chandos Publishing, Oxford, UK.
- Palmer, K.L., Dill, E, and Christie, C. (2009). Where There’s a Will, There’s a Way? Survey of Academic Librarian Attitudes About Open Access. *College & Research Libraries*, 70(4): 315-55.
- Suber, Peter (2007). *Open Access Overview*, Available from: <http://www.earlham.edu/~peters/fos/overview.htm>

Marketing Strategies for Increasing the Visibility of Scientific Research in the View of Open Access Principles

Manolis Koukourakis

University of Crete Library, Greece, and

Angela Repanovici

Transilvania University of Brasov, Romania

Abstract

The promotion of the scientific work produced within universities through open access institutional repositories deals with the concepts of academic production and the development of scientific research in today's information society. These concepts are approached through the prism of marketing methods and techniques. The 2 authors collaborated in many projects. Transilvania University of Brasov developed the first Institutional Repository in Romania, while University of Crete had already implemented and developed its IR, which was also the first in Greece. In this paper we will present the particularity of each university's experiences of implementing institutional repositories. We will finally present a *SWOT analysis* of these 2 cases, with conclusions and recommendations.

Keywords

Internet technology, web 2.0, scientific production, marketing mix, 8P, marketing strategies, marketing research, open access, institutional repositories

Current Concerns Regarding the Implementation of Institutional Digital Repositories

The promotion of the scientific work produced within universities through open access institutional repositories deals with the concepts of academic production and the development of scientific research in today's information society. The concept of "knowledge-based society" refers to a society within which

the production, transmission and usage of knowledge are key factors in assuring the welfare and prosperity of its members. Knowledge and information represent major sources for creation of value and the role of the university becomes a significant one. A performance university education system is not imaginable without an academic research component entailing permanently updated information about scientific achievements worldwide. Approaching a new research theme requires the knowledge of all the previous achievements and publications in that specific field worldwide up to the very beginning of the proposed research.

Being in fact a set of services, an institutional repository can also be seen as a product of information technology offered by the university to its members for managing and disseminating digital materials created by the university's community. This product is essentially an organizational commitment regarding the management of the university scientific materials for organizing, accessing, sharing but also long-term preservation.

In this paper we will present the conceptions and marketing strategies for designing, implementing and putting in productive operation respective institutional repositories at University of Crete and Transilvania University. Although the two initiatives are both geographically but also temporally distanced, even more than one decade, they both had a pioneer role in their different countries, being the first open access attempts in each case. We will present the particularity of each university's experiences of implementing an institutional repository and finally provide a *SWOT analysis* of the two cases, with conclusions and recommendations.

Case Study at the University of Crete

The University of Crete Library from its very establishment in 1977 foresaw in automation a crucial element for its development and tried to introduce information technologies in all aspects of its operation. Within this strategy towards a thorough organization that combines traditional and modern sources of information, we realized the promising role of digital repositories from 1997, when first systems had started to appear internationally. Acknowledging the potential of such applications for both the collection management and preservation of material, as well as for the promotion of the work done within the university, we started to experiment with the implementation of a digital library instance, which resulted in the first operational institutional repository in Greece.

The creation of a digital library was incorporated as a certain work-package of the Library's development project for the period 1997-1999. Apart from being able to utilize some funding from the Library's 2nd CSF project, it was very important that we could also benefit from the support of the univer-

sity administration: the university rector was himself convinced that arising digital library applications were to play an important role in academic libraries development, and provided the necessary backing for all relevant issues.

Since there was no previous experience from similar efforts in the Greek environment, or standardized results from the so far gained international experience, we devoted a lot of thinking for the initial conception and planning of the task to be undertaken, regarding the overall scope, organizational and technical aspects of such an attempt. We did not want to insist a lot on theoretical issues, but develop an adequate and feasible, working solution. This pilot implementation would help us explore the field and test our potential, by highlighting the requirements for the development, support and maintenance of a digital library. It would also subsequently allow us to take further decisions for any investment in this area, which at the time seemed rather risky, due to ignorance of the real facts.

We decided not to opt for a general purpose repository, but rather limit ourselves in a university-wide, yet specific scale project, starting with a well-defined field of application. We should start by incorporating the university's grey literature, mostly MA theses and PhD dissertations and also a few more pilot collections (containing some examples of digitized rare material from the library's Closed Collections and issues of a university journal). Master and doctoral theses was high-demand material, also easy to start collecting.

Although it was not a very big project, it involved a lot of issues which we had to face and decide upon, in order to conceive and establish realistic and operational work-flows and procedures. Apart from the specifically technical issues (ranging from the overall functionality of the system, to the software to be used and its required modifications), our main concern was to set up policies and organizational structure that would result in a self-evident digital library service, yet fully incorporated within our existing library operation, and also to adequately promote the new service to the academic community: to create the required consensus for such an innovatory step, the university society should understand and appreciate the advantages of creating and using a digital library. This would also support the accumulation of material.

To better reflect the library needs, but also be closer to the varying wishes and attitudes of the individual academic departments, the digital library team we set up consisted, apart from the project leader and the software specialist, of members of each of the library branches at the different university campuses. This group, working part time in the project in parallel with other duties in the library, was responsible for creating adequate channels of library communication with the university environment, to ensure the smooth flow of information, and also with the collection, processing and proper promotion and display of digital material.

As regards software, we wanted to develop a stable system, easy to administer and maintain and also user friendly, to be easily adopted by the university

community. We chose the DIENST platform, mostly because it was open source, already in use for similar purposes (the Networked Computer Science Technical Report Library), it had a simple and friendly WWW user interface, while our software specialist was already familiar with it, also doing research in the field. Although being aware of its various limitations, not negligible in our specific case, we decided to use it as our base platform, and proceed with desired modifications (Kapidakis 1999). We ended up with a digital repository fully interoperable with our main library catalog and other similar systems. We created one collection for each academic department, further divided in sub-collections according to the type of material (doctoral dissertations, masters theses, graduate theses, technical reports, various).

As regards populating the repository, two issues were of main concern to us, also related to its promotion and establishment as a valuable library service to the academic community: to provide a fully working instance as soon as possible, and to “to ensure the completeness of the material of the resulting digital library, as much as possible” (Kapidakis 1999). In this we had from the very start the support of the university rector: being also one of the initiators of the idea, he undertook the required administrative steps to formally establish the library as the official place to deposit, administer, preserve and disseminate the scientific work produced within the university. The relevant Rector Council’s mandate determined that for all MA and PhD theses approved by the academic departments, one copy in both print and electronic format should be deposited at the library, as a prerequisite for the official issuing of the respective titles from the departmental secretaries.

Even given the mandate, we felt we also had to actively promote the new service to the academic departments, employing personal contact and consultation with both the secretaries, to consolidate formal procedures, and the faculty members, to explain the aims and overall scope of the initiative and also respond to the various concerns regarding making openly available the theses material. As already evident from evaluating questionnaire responses, many of the faculty members and post-graduate students were not very eager to provide the theses for open, wide access. Apart from general copyright concerns, in many cases their material was already prepared or accepted for publication, so making it publicly available was not a happy perspective. Soon, however, after realizing the benefits of both communicating the research done and getting the appropriate acknowledgment, but also facilitating access to available scientific results as a basis to conduct further research building on existing achievements, everybody wanted his/her thesis to appear in the repository.

For the start, we tried to retrospectively collect the theses already approved by the university. We tried to contact all authors, to get permission to incorporate their works, ask for print copies, in case not deposited in the library or their departments, and even ask for digital copies, if existed. We took advantage of the bibliographic database of the “National Archive of PhD Theses”

created from 1986 at the National Documentation Centre of Greece (NDC 2010), and imported our university's dissertations records in our system. We digitized all gathered print copies, while we reviewed the various formats of the available born-digital documents (accepting anything provided, for the start) and tried to convert them to formats acceptable by DIENST, or modify the system to accept them. We also decided on the format requirements we should pose on future works. All those parallel actions cumulated in presenting a working, quite populated repository soon after the start of the project, which also helped us in further promoting the service to the academic community.

To help stabilize procedures and properly inform the authors for future works, we prepared two different documents with instructions, one for the faculty and departmental secretaries and one for the authors, designating the official work-flow and the formal requirements of the digital copies that should be deposited in the library. We separately prepared a "submission form for depositing a thesis in the library", which should also be used as a library certificate of receipt, so that the departmental secretaries could then issue the respective title. To address the concerns on copyright restrictions or pending publications, we allowed for a maximum of three years delay for making the digital copies freely accessible on the Internet, upon author's request, also following NDC's policy on the matter.

The "Digital Library of the University of Crete" officially started to operate at 1998. In a short period of time, a quite big amount of theses and dissertations issued at the university were gathered. The original provisions and organization proved efficient enough, and the system continued its operation in the next years, with minor modifications. In 2008 it was renamed to "Elocus Institutional Repository" (<http://elocus.lib.uoc.gr>) and transferred to a new environment, also based on open source operating system and IR software (Debian Linux – Keystone). The new system, apart from being especially designed to offer the end user ease of browsing and access to the material, provides a modern, flexible and friendly tool, both for the system administrators and the support librarians, fully interoperable and integrated with all other our library systems (library OPAC, meta-search platform etc). Supporting all relevant current interoperability protocols, it is registered with most international open access registries, is harvested by major metadata harvesters and search engines, while it also supports modern open access schemes such as the Creative Commons licenses, features that actively help communicating and promoting the scientific work done within the university to the international research community and the general public. The repository contains today more than 3450 EDTs from all university departments, 2063 of which are masters theses and 1028 doctoral dissertations.

Swot Analysis

Internal

Strengths

The first IR in Greece;
 Institutional commitment for the creation of the repository; Deposit mandate; IR established as a comprehensive university ETD service-material reflects the institution's ETD capital;
 Library's commitment in introduction of automation and application of IT in all aspects of its operation, also in exploitation of digital information sources, to come up with a thorough organization that combines traditional and modern sources of information – IR part of library development plan; Library established as a core university facility; A scrutinized and carefully designed implementation strategy and promotion plan;
 Human resources: a strong IT library team and a specific library group to support the repository;
 Incorporation and integration of the IR with the rest of library services.

Weaknesses

No previous experience in the field;
 IR infrastructure and procedures had to be developed from the scratch;
 IR platform needed a lot of modifications/extensions to meet UOC Lib requirements;
 Uncertainty regarding the future directions and developments in the field;
 The support staff worked only part time at the project, in parallel to other responsibilities;
 Academic population is divided into 16 areas with different interests;
 Academic community was not familiar with these instruments and their role.

External

Opportunities

New ways to use and access university's research capital; Development of a new database of research information resources, on which academic community could build for further research; Preservation and long-term conservation; A very active and productive academic community, with remarkable scientific results, also receptive to innovation and change, despite original concerns; Increasing

Threats

Technological change;
 No known benefits of using open source;
 Scientists' mentality, concerns about compromising intellectual property and plagiarism.

research visibility and impact; Self archiving could become a scientific and social time; Producers of information resources are consumers too.

Table 1: Swot analysis of greek repository

Case Study at the Transilvania University of Brasov

The EU-system of scientific editing is considered as a fundamental element of the European research system. When referring to the new paradigm of the academic communication, the “open access” movement, few initiatives exist in Romania. (Ignat & Repanovici, 2009)

The members of the academic community at *Transilvania* University are concerned with the development of scientific research and participate in all national and European competitions to access research funds. The number of won projects is great which, in turn, results in an impressive scientific production. This academic environment is very adequate for a successful implementation of a digital repository, (Lynch, 2008). However, analysing the impact of citations among the staff of the university does not reveal any remarkable performance. Implementing a digital repository could therefore represent the ideal solution for increasing the visibility of the university’s scientific production. (Repanovici, 2009).

The initiative of develop of one repository was made by one research department, not by the university library. Here was identified the need of increasing visibility of scientific research. A quantitative marketing research “*Attitudes, opinions and behaviours of academic staff regarding the creation of an institutional digital repository for the scientific production of Transilvania University*” was conducted at Transilvania University in February-March 2009. Sample reveal that the structure of most interest to establish a digital repository posed by lecturers. One explanation may be the fact that they are in the process of promovation. Concepts of “free access to information” and “open access journal” are very poorly known. Databases subscribed by the university are less accessible. Professors want a rate of 52% to archive their scientific work without resorting to dedicated staff and 97% want to create a digital repository with the university’s scientific output.

Based on these analyzes, the first pilot digital repository was implemented, containing the scientific production of two of the Transilvania University’s research departments.

The Digital Repository Implementation Team

In order to ensure the involvement of specialists so as to provide an efficient partnership we involved the following departments and research directions to create, for the beginning, our pilot digital repository.

1. The IT department, for the overall IT implementation, adoption and support of the system;
2. The Statistical Analysis Economic and Social Prediction and Marketing Research Laboratory/Platform. This integrated platform for scientific research and application development offers the required objective and subjective conditions for implementing the digital repository.
3. The research department for high precision mechanics and mechatronic systems with its direction of Digitization and image processing.

Marketing Strategies for Implemented one Digital Repository

The Promoting strategies.

There were send information about new instrument for archive scientific production. E-mail example sent to the members of research departments:

What is ASPECKT-Dspace: <http://aspekt.unitbv.ro/dspace/>

The Communication Strategies.

The four directions of action of the communication strategy	What	How	By means of
The profiling strategy „to make this issue an important one”	Advantages and motivation of the scientific position by programme profiling	Information Increased gratifications Education Dissemination of success stories	PR, Media Gratification via Web site News Viral Marketing
The attracting strategy „making the institutional repository an attractive location for storing the researches”	Creating an attractive storing environment	Attractive environment Easy to use environment Thanks	Specific actions Information on practical aspects (in the case of and how) Send mementos to encourage the required actions

<p>The pushing strategy „consolidating a positive attitude”</p>	<p>Encouraging the conditions that make the repository an attractive one and promote the custom of document archiving</p>	<p>Involving the innovators, implicitly the opinion Involving the political, management and administrative decidents. Including the interested parties in the communications plan. Provide feedback on the usage of repository</p>	<p>Lobby, provide feedback Encourage incentives from a certain management level. Presentation of data</p>
<p>The consulting strategy „knowing the audience very well” „leaving the scientists make the promotion”</p>	<p>Look for bidirectional communication and involving people of the target group</p>	<p>Communication Checking feedback Checking the evolutions in the digital domain Mobilizing and involving scientists for repository promotion</p>	<p>Surveys, face-to-face meetings informal conversations, workgroups, panels. „official statements of approval from scientists”</p>

Table 2: Communication strategies for the institutional digital repository

Internal

Strengths

The first digital repository in open access in Romania;
From very rich literature we could choose a model with freely available open sources, tested;
Warehouse was the result of marketing research and involving of research departments, not the library;
Digital repository is the institution's intellectual capital;
There are new ways to use and access of digital university content;
There is a marketing plan to promote repository;

Weaknesses

Academic population is divided into 16 areas with different interests;
Academic community is not familiar with these instruments and their role;
There are not clearly defined working papers which will be archived like collections, there is no clear direction for development;
University is not prepared for archiving mechanisms and technologies;
There are not human resources personally involved and develop warehouse.

Preservation and long-term conservation;
 Producers of information resources are consumers too.

<i>External</i>	
Opportunities	Threats
<p>A very active academic community, with an impressive scientific production</p> <p>An already well-established, world-wide open access movement;</p> <p>Creating a virtual place where members can archive university scientific and administrative working papers;</p> <p>Promoting unknown collections;</p> <p>Increasing research impact, obtaining rewards through citations. The authors are more interested than the moral rights of the property, the authors are rarely paid for publishing;</p> <p>Self archiving could become a scientific and social time;</p> <p>Database of information resources in development.</p>	<p>Technological change;</p> <p>No known benefits of using open source;</p> <p>Scientists mentality;</p> <p>Each institution creates its own model;</p> <p>Academic population is not receptive to new;</p> <p>Impact analysis authors and citations are not an assessment tool in universities.</p>

Table 3: Swot analyses of Romanian repository

SWOT Analysis Summary

In Romania there is not know-how in development models of digital repository in open access;

There is not a national movement to promote open access; Authors impact analysis and citations are not an assessment tool in universities;

There is no practice in using open source;

In Greece there is expertise and developed open access repositories during last 10 years;

Technology is advanced in this area, easy to implemented and develop; There are many options available, free and open source;

Institutional commitment to open access is important for the development of Institutional Repositories.

Table 4: Swot analysis summary

Conclusions and Suggestions

Digital repositories require ongoing evaluation to determine their quality and new directions for growth. The experiences reaped in one university can be the basis for development in other places. As academics, the teaching staff mentality is ambivalent regarding open access. We see, however, that the digital repositories offer a strategic response both to the opportunities of the digital networked environment and to the systemic problems in the today's scholarly journal system. This response can be applied immediately, reaping both short-term and ongoing benefits for universities and their faculty and advancing the transformation of scholarly communication over the long term.

One thing is sure: institutional repositories will represent the memory of a society and a factor of progress in scientific research.

References

- Hayes, H. (2005), *Digital Repositories: Helping universities and colleges*, JISC Briefing Paper – Higher Education Sector, August.
- Ignat, T., & Repanovici, A. (2009). Institutional repository marketing: from research to knowledge transfer. *Advances in Marketing, Management and Finances, Proceedings of the 3rd International Conference in Management, Marketing and Finances, (MMF'09)* (pg. 107-110). Houston, USA: WSEAS.
- Kapidakis, S. (1999), "Issues in the Development and Operation of a Digital Library", *Lecture Notes in Computer Science*, vol. 1696, Springer-Verlag, pp. 363 - 382.
- Kosson. (2009). *Depozite digitale*, www.kosson.ro
- Lynch, C. A. (2008, February). Institutional Repositories: Essential Infrastructure for Scholarship in the Digital Age. ARL: <http://www.arl.org/newsltr/226/ir.html>
- NDC (2010). National Documentation Centre of Greece, About National Archive of PhD Theses, <http://phdtheses.ekt.gr/eadd/aboutEADD.jsp>
- Repanovici, A. (2009). Marketing Research about Attitudes, Difficulties and interest of academic Community about Institutional Repository, PLENARY LECTURE. *Advances in Marketing, Management and Finances, Proceedings of the 3rd International Conference in Management, Marketing and Finances, (MMF'09)*, Houston, USA, April 30–May 2, 2009, pg. 88-95. Houston, USA: WSEAS.
- Tzanodaskalakis, G. (1998), "The Digital Library of the University of Crete", *Proceedings of the 7th Conference of Hellenic Academic Libraries*, University of Thessaly Library, Volos 1998, pp. 383-396.
- Van Raan, A. (1988). *Handbook of Quantitative Studies of Science and Technology*. Amsterdam: North-Holland

Managing Virtual Environments in Libraries: Second Life and Information Literacy

Natassa Tsoubrakakou

OTE S.A., Athens, Greece, and

Panorea Gaitanou

Department of Archive and Library Sciences, Ionian University, Greece

Abstract

The advent of new technologies in the library environment has led to the transformation of the traditional library reference services incorporating printed books, periodicals and card catalogues in new services, such as e-books, e-journals, web 2.0 technologies, virtual worlds, etc. Through these new environments, the libraries' role is evolving towards new directions; nevertheless the main goal remains the same: to equalize access to information and make an effort to develop lifelong learners, promoting in this way literacy educational programs. Specifically virtual environments are considered to be an important factor towards this direction, as information literacy could be significantly enhanced through these environments. This paper emphasizes on the educational role of virtual games within library services and refers to Second Life, as one of the most widely known virtual worlds implemented by libraries. In addition, it aims to present how Information Literacy can be strongly empowered in libraries with the use of such environments. Finally, the paper concludes with some remarkable considerations and suggestions.

Keywords

Libraries, virtual environments, Information Literacy, Second Life, gaming

1. Introduction

The last decades, libraries are facing a plethora of new challenges. Recent developments in the information and communication industry have urged them to discover new forms of activities and provide new added value services, so as

to have a competitive and dynamic Web presence. In addition, within this new era, libraries seek ways to successfully satisfy users' needs and information expectations. Therefore, they have to find methods to make information available wherever and whenever the user requires it. Web 2.0 technologies, such as social networks and virtual environments, are some of the widely known technologies that offer great opportunities for progressive libraries to proceed beyond the boundaries of their buildings. Many libraries have already begun to make use of virtual environments, so as to expand their existent services. Through these worlds, user interaction is enhanced and distance education is empowered.

This paper provides a detailed description of the term "Virtual Reality" and presents some basic characteristics of virtual environments in education. Next, it refers to virtual world's implementation in libraries domain. Specifically, Second Life is presented as a case study. Furthermore, the paper aims to focus on the term "Information Literacy" by highlighting its relation to the libraries environment. The authors consider virtual environments of great importance for the enhancement of Information Literacy. Finally, the paper draws some important conclusions.

2. Virtual Reality and its Role in Education.

Virtual Reality (VR) can be considered the means to visualize and manipulate complex information data via human-computer interaction, as it allows people to expand their perception of the real world in ways that were previously impossible. Changes to virtual objects and their interrelationships can be performed very easily, which is often not feasible with real objects [1]. For instance, library researchers, who use virtual reality applications, have now the ability to generate precisely the same conditions for all users-participants and modify certain environment variables in real time in order to have more control over experimental settings [1].

There are a lot of different definitions of the term "Virtual Reality" used by different people. Some refer to "*a specific collection of technologies, such as Head Mounted Display, Glove Input Device and Audio*", while others expand the term to include conventional books, movies or pure fantasy and imagination. Nevertheless, the most widely used definition refers to "Virtual Reality as a way for humans to visualize, manipulate and interact with computers and extremely complex data". The visualization part refers to the computer generating visual, auditory or other sensual outputs to the user of a world within the computer. This world may be a CAD model, as a scientific simulation or a view of a database. The user can interact with the virtual world and directly manipulate objects within it. Some worlds are animated by other processes, perhaps physical simulations, or simple animation scripts. A crucial test

for every VR environment is to achieve an at least near time control of the viewpoint. Some people are objecting to the term “Virtual Reality”, by saying that it is an oxymoron. Finally, a portion of people use relative terms, such as Synthetic Environments, Cyberspace, Artificial Reality, Simulator Technology, etc.

VR applications can be subdivided into three different kinds, depending on the level of users’ involvement and interaction with the virtual environment [3]:

- **Passive:** learners have minimal control over the training event,
- **Explorative:** students are enabled to explore and construct their own learning, or
- **Interactive:** enable learners to immerse themselves in the virtual world.

Through VR technology, students are able to [3]: visualize abstract concepts, observe events at atomic or planetary scales, visit new environments and interact with other users, master, retain, and generalize new knowledge when they are actively involved in constructing that knowledge in a learning-by-doing situation.

The benefits of VR applications are often inadequate to persuade teachers and the academic staff for an extended use in classrooms, as they don’t need just another instructional tool forced on them without the appropriate provisions for training, preparation and implementation [4]. Therefore, in order to create a VR environment, teachers have to be informed on what makes a good virtual environment. Additionally, they have to select among all available types of VR systems that match their needs and capabilities and have a good impact in teaching and learning.

Libraries, Games and VR Environments

VR applications can be considered a kind of gaming, thus it would be essential to refer to some features of games used in libraries. It is a fact that, over the last few years, there has been an increasing focus on libraries hosting gaming programs. Jenny Levine, a.k.a. The Shifted Librarian [5] highlights the different types of video gaming activities in libraries, while several other librarians have written about their experiences in print and online [6] [27]. Gaming is rapidly growing into the next new media [26]. In particular, public libraries have supported gaming for a long time. For instance, British libraries in the 1800’s had gaming rooms as a way to lure patrons away from the public houses [8]. Public libraries have usually used chess, scrabble or backgammon in their environments and children libraries in particular incorporate several games in their programs. Thus, we could say that gaming is not something new for libraries. What is nowadays changing and evolving though, is the type of

games libraries are using in order to meet the needs and the expectations of the community they serve.

Many people support the idea that games in libraries have a strong educational role and this is partly right, since all games are educational in some way. James Paul Gee [7] has written a book about the different literacies taught by games. Therefore, the primary goals for games being used in libraries are [29]:

1. To provide a source of entertainment for community members and an additional service for a group of active library users.
2. To attract new groups of users to the library.
3. To enhance the library's reference role, introducing library patrons to services provided.
4. To recognize the cultural significance of the gaming and participate in it.

Many researchers looking at the value of games focus on the different types of new literacy that gaming can teach.

It is generally agreed that there are increased opportunities in using the internet as an online field for communication and interaction. Libraries have always been social spaces, communities of users who use their physical library environment to interact with library staff and, increasingly in modern education, to interact with each other via group learning activities. Social networking capacity offers librarians the opportunity to extend face-to-face interactivity into a new sphere of virtual service delivery. [ANTAEUS] Second Life, one of the most widely known virtual worlds, provides a virtual social environment for promoting interactive library services to a new level of sophistication. Developed by Linden Lab on June 2003, it is used as a service point and learning environment for both business and academia [11] [25]. Many researchers have distinguished it from other online gaming environments, redefining its main goal and referring to it as a community space [9]. Several others support that it is used as a platform for course delivery. For example, Aaron Delwiche [16] used Second Life to teach a course on game design and found it an effective learning environment. Megan Conklin [15], has written a guide for setting up and delivering courses in Second Life, but has not conducted an assessment of the classes delivered from the perspective of instructor or student [18] [ANTAEUS]

In the last years, over 200 librarians from all types of libraries around the world have contributed time, energy, and other resources to create virtual collections, deliver virtual reference, create virtual displays, produce virtual programs, such as book discussions, lectures and author visits, art and history exhibits and much more. Moreover, unique partnerships with colleges and universities, museums, library vendors and various organizations have been developed. Concluding, VR applications can create an engaging and motivating environment, where users can retrieve information effectively.

4. Information Literacy

Information Literacy (IL) has been a subject of interest within the education domain for many years. It is a very important issue that provides the opportunity to many researchers and especially teachers, librarians and information scientists to exchange ideas and points of view. Basically, when someone is information literate he is information wise. Many attempts have been made to define this concept. The most widely known definition is the one adopted by the American Library Association (ALA, 1998): “To be information literate, a person must be able to recognize when information is needed and have the ability to locate, evaluate, and use effectively the needed information”. As derived from the Alexandria Proclamation of 2005, adopted by UNESCO’s Information for All Programme (IFAP), “Information Literacy is the capacity of people to recognize their information needs; Locate and evaluate the quality of information; Store and retrieve information; Make effective and ethical use of information, and Apply information to create and communicate knowledge [19]. Information literate individuals are those who have learned how to learn”. They know how to learn because they know how knowledge is organized, how to find information, and know how to use information in such a way that others can learn from them [24]. Moreover, IL is defined as the ability to access and evaluate information effectively for problem solving and decision making. It is a constructivist process that reflects the students’ ability to employ critical analysis of communication and information gathering tools, processes and networks [18].

IL has evolved beyond early library instruction and information skills-focused programs to the current concept of the term, focusing mainly on information strategies. This means that it is based on information use policies. Therefore, users need to develop information competencies to become effective learners [20]. Finally, we could argue that IL skills are necessary for people to be effective lifelong learners and to contribute in knowledge societies [18].

5. Information Literacy and Libraries

Lifelong learning is considered to be a core element in contemporary social reality, where everything changes rapidly and unexpectedly. On the other side, libraries are trying to refocus on IL [13]. IL as applied in Library Instruction is implemented in various ways. We could mention the most important: stand-alone courses, online tutorials (such as using the Opac, online searching, citing websites, etc), workbooks (how students will find ways to become independent users of information), courses-related instruction etc. Today’s concept of literacy, called 21st century literacy or digital literacy, mainly includes the ability

to understand digital resources, recognize and use them to create and evaluate information.

Libraries are places where knowledge is stored and disseminated and anyone can have access to a wide range of information. They are also a place for education and self-help. They are changing and dynamic spaces, at the forefront of the information age. Knowing how to use a library, you know how to learn for a lifetime. In this context, librarians are information wise. They are capable of finding the best information, despite its format. Therefore, teaching users how to critically evaluate information is a unique skill, in a society, which suffers from information overload. By providing critical expertise, librarians offer added value services. Consequently, they teach IL skills, guiding users to the best sources. They add the 'high touch' in high tech [13].

Nowadays, librarians try to find ways to disseminate IL techniques to library users. Research has shown a very interesting method for accomplishing this task. A relatively new area for library services is podcasting, which describes the subscription to audio material using web-based RSS technology and the publication of audio content as individual files or parts of series [23]. This material can be then automatically downloaded through a specific web location. This new technology provides librarians with new ways of delivering library-related content and includes IL concepts, marketing of library services, and exploring other ways to collaborate with library stakeholders. Podcasting also enhances library web pages and engages all library users in an innovative way. Furthermore, the podcasting format allows users to listen to the selected content according to their own time schedule. Therefore, they can return to the podcasts again and again and have the chance to listen parts they have missed or forgotten. Podcasting provides asynchronous access for time-shifted student learning. This feature is especially crucial for distance learners [22].

6. Information Literacy and Virtual Environments

An additional and interesting method for applying IL techniques in libraries context is the implementation of virtual environments. These environments can help library users to understand better how to critically evaluate the various communication tools and social environments available to them. We mentioned in previous sections the case of Second Life, thus the question is whether it can provide an effective learning environment, which will facilitate library users to grasp of IL. Under these circumstances, IL as a social practice is extended beyond information gathering skills. Users must have the ability to critically analyze the ways about using and evaluating the communication process, personal and professional experiences, and information gathering within a scholarly and workplace environment. In the twenty-first century, library services should include virtual environments.

Thinking about IL in this way, we realize that its role is extended to new concepts. Emphasis is given on collaborative learning among the students-users, support of user questioning, the teacher-librarian as co-learner and collaborative knowledge production. Nevertheless, library users are exposed to a new and undefined situation, considering IL in an innovative way [18]. And what's the most important, their learning opportunities are enhanced by enabling them to participate in team-based global projects, in which they experience different cultural contexts and access a wide range of digital information sources [12].

7. Conclusions

From the above review, we obtain a positive indication that virtual environments already play an important role in libraries context. They enhance library users' ability to employ critical analysis of communication and information gathering tools, while at the same time facilitate active learning, critical thinking, collaboration and development of confidence and lifelong learning habits [18]. Bundy [21] has observed the role IL has to play in participative citizenship and social inclusion. Therefore, through these social networks, IL is strongly empowered. Nevertheless, the development of virtual libraries, which transforms them into three dimensional electronic information centers, will successfully take place if and only if they manage to work together collaboratively. We have all witnessed the long history of cooperative innovations within library environments, such as interlibrary loans, union catalogues, library consortia etc.

A lot of theoretical and experimental studies are currently under consideration for the development and application of virtual environments in libraries. Hence, it is still a rather new research area that offers a lot of space for innovative techniques and methods to be studied and explored. We could support the idea expressed by many librarians that a virtual library includes the concept of digital library. But it is more than a collection of digitized resources. The main goal of a virtual library is to provide access to an integrated collection of any kind of resources such as print, electronic and multimedia resources delivered seamlessly and transparently to users regardless either of their physical location or the location and ownership of the information, overcoming any physical barrier of communication. Before building, for instance, a virtual reference service, there are some basic issues that need to be addressed, such as the general methodology that has to be followed in order to ensure that the whole project will be successful. The most important challenges that a library should face can be categorized in four axes: the policies that have to be followed, the selection of the appropriate software, the training of the staff, and finally the users.

Regarding the development of virtual reality policies, it should be stressed that they have to be planned with the best possible intentions, and that they should be revisited frequently in order to ensure that they will continue to

guide services in a productive and safe way. Moreover, the software that will be selected should be based on the requirements that the library team will have set, so as to meet each library's specific needs. In addition, it is essential that the staff will be adequately trained to develop the required technical skills to manage the virtual services of the library. Furthermore, users are the most important factor, as virtual services are user-centered. Thus, they should be encouraged to participate in the library's virtual activities. Finally, an important goal of each library is to make non-users to become library users and find ways to promote its services [28].

References

1. Ramsamy P., Haffegge A., Alexandrov V. N. (2007): Generic Control Interface for Networked Haptic Virtual Environments. *International Conference on Computational Science (2) 2007*: 768-775
2. <http://www.springerlink.com/content/r236828456112g3j>
3. Whitelock D. (2000): Education and Information Technologies. *Official Journal of the IFIP Technical Committee on Education*, 5(4)
4. Auld L. P., Veronica S. (1999): VIRTUAL reality. *T H E Journal*, 27(4), 48-54
5. Levine J. (2006): Gaming & libraries: Intersection of services. *Library Technology Reports* 42(5)
6. Neiburger E. (2007): Gamers...in the library? *American Libraries* 38(5), 58-60
7. Gee J. (2003): *What Video Games Have to Teach Us About Learning and Literacy* (2nd edition). New York: Palgrave Macmillan
8. Snape R. (1992): Betting, billiards, and smoking: Leisure in public libraries. *Leisure Studies* 11, 187-199
9. Grassian E., Trueman R. B. (2007): Stumbling, bumbling, teleporting and flying ... librarian avatars in Second Life, *Reference Services Review*, 35(1), pp. 84-89
10. Cheal C. (2007): Second Life: hype or hyperlearning?, *On the Horizon*, 15(4), pp. 204-10
11. Antonacci D. M., Modares N. (2005): Second life: The Educational Possibilities of a Massively Multiplayer Virtual World. *EDUCASE Southwest Regional Conference* <http://connect.educause.edu>
12. Macgregor G., McGill L. (2005): Digital libraries and information literacy issues within virtual learning environments: an e-learning impasse? In: *Librarians' Annual Information Literacy Conference (LILAC)*, London, UK. <http://strathprints.strath.ac.uk/2334/1/strathprints002334.pdf> Managing virtual environments in libraries: Second Life and Information Literacy 61
13. A library advocate's guide to building information literate communities <http://www.alia.org.au/advocacy/literacy.kit.pdf>
14. Conklin M. (2007): 101 Uses For Second Life in the College Classroom. 2005. Elon University, Department of Computing Sciences http://statewideit.iu.edu/resources/101_SL_Apps.pdf
15. Delwiche A., (2006): Massively Multiplayer Online Games (MMOs) in the New Media Classroom. *Educational Technology & Society*. 9.3, pp. 160-172 http://www.ifets.info/journals/9_3/14.pdf

16. Lee J. J., Hoadley C. M. (2006): Ugly in a World Where You can Choose to Be Beautiful: Teaching and Learning about Diversity via Virtual Worlds. Making a Difference. In: Proceedings of the Seventh International Conference of the Learning Sciences (ICLS), Indian University, Bloomington, IN., pp. 383-389
<http://www.tophe.net/papers/Lee-Hoadley-ICLS06.pdf>
17. Rodrigues D. B., Sedo, D. R. (2008): Experiencing information literacy in Second Life. Partnership: the Canadian Journal of Library and Information Practice and Research, 3(1)
<http://www.criticalimprov.com/index.php/perj/article/viewFile/426/860>
18. Catts R., Lau J. (2008): Towards Information Literacy Indicators
<http://unesdoc.unesco.org/images/0015/001587/158723e.pdf>
19. Lau, J. (2006): Guidelines on Information Literacy for lifelong learning
<http://www.ifla.org/VII/s42/pub/IL-Guidelines2006.pdf>
20. Bundy A. (2004): One Essential Direction: Information Literacy, Information Technology Fluency. Journal of eLiteracy, 1(1), pp. 7-22
http://www.jelit.org/archive/00000006/01/JeLit_Paper_1.pdf
21. Roberts R. L. (2007): Podcasting for Information Literacy. In: World Library and Information Congress: 73rd IFLA General Conference and Council "Libraries for the future: Progress, Development and Partnerships" 19-23 August, Durban, South Africa
<http://www.ifla.org/IV/ifla73/papers/133-LeeRoberts-en.pdf>
22. Podcasting for Learning and Teaching at The University of Sheffield
<https://www.shef.ac.uk/content/1/c6/06/96/83/PodcastingWhitePaper.pdf>
23. Byerly G., Brodie C. S. (1999): Information Literacy Skills Models: Defining the Choices. In Learning and Libraries in an Information Age. Principles and Practice, ed. Barbara K. Stripling, Englewood: Littleton: Libraries Unlimited, p.54-82
24. Foster A. (2005): The Avatars of Research: Students and Professors Join Popular Virtual Worlds Like Second Life to Study the Real-World Interactions They Represent. The Chronicle of Higher Education, 52.6
25. Alpert F. (2007): Entertainment software: Suddenly huge, little understood. Asia Journal of Marketing and Logistics. 19(1). 87-100
26. Gallaway B., Schwarzwald J., Czarniecki K. Game On: Games in Libraries
<http://libgaming.blogspot.com>
27. Lipow Godzines Anne (2002), The virtual reference librarian's handbook, Neal-Schuman Publishers Inc
28. Nicholson S. (2009): Go Back to Start: Gathering Baseline Data about Gaming in Libraries. Library Review
<http://librarygamelab.org/backtostart.pdf>
29. Virtual reference, Second Life and traditional library enquiry services: ANTAEUS, Library Review, 57(6), pp. 416-423, 2008, Emerald.

Open your Society

Academic Authors, Scientific Information and Open Access Publishing

Mirjana Brković

Head of the University of Novi Sad Central Library

Abstract

This paper discusses the contribution of academic authors to the policy of Open Access publishing. The main reason academic authors make their articles openly accessible is to maximize their research impact. An open access makes citation of scientific information easier and cheaper, so the OA should be the way to increase the citation rate. But, the attitude of academic authors towards the publishing of their scientific information in an OA is not uniform. The purpose of this paper will be to describe whether the literature is freed from all access barriers and impact barriers by self-archiving. And if it is not, what are the obstacles to self-archiving and OA publishing? This paper will try to find some answers to that question.

Keywords

OA policy, OA publishing, self-archiving

1. Introduction

As it is well known, the Open Access movement traces its history back to the 1960s, however, it becomes much more prominent in the 1990s with the beginning of the rapid development of digital technology. With the spread of the Internet and the potential to copy and distribute electronic data at no cost, the arguments for open access gained new importance. A meeting held in Hungary in December 2001 and The Budapest Open Access Initiative (OAI) was created. The purpose of this meeting was to accelerate progress in the international effort to make research articles in all academic fields freely available on the Internet. The participants represented many points of view, many academic disciplines, and many nations and they explored. The result was that the Buda-

pest Open Access Initiative produced a statement of principle, a statement of strategy, and a statement of commitment.

The most famous definition of the OA literature is: “Open-access (OA) literature is digital, online, free of charge, and free of most copyright and licensing restrictions. What make it possible are the internet and the consent of the author or copyright-holder. In most fields, scholarly journals do not pay authors, who can therefore consent to OA without losing revenue. (...) There are two primary vehicles for delivering OA to research articles: OA journals and OA archives or repositories.” (Suber, 2004)

OA archives or repositories make their contents freely available to the world and may contain unrefereed preprints, refereed postprints, or both. They may belong to institutions, such as universities and laboratories, or disciplines, such as physics and economics. Authors may archive their preprints without anyone else’s permission, and a majority of journals already permit authors to archive their postprints. When archives comply with the metadata harvesting protocol of the OAI, then they are interoperable and users can find their contents without knowing which archives exist, where they are located, or what they contain. In Serbia there is the Centre for Evaluation in Education and Science (CEON/CEES) as an independent science and technology observatory. CEON is creator of SCIndex – Open Access Citation Index. Purpose of this programme is to promote Open Access (OA) in Serbia and within the region. The purpose is to make OA a dominant model in periodical and serial S&T publishing in the country.

OA journals perform peer review and then make the approved contents freely available to the world. Their expenses consist of peer review, manuscript preparation, and server space. OA journals pay their bills in various ways. Suber pointed out: “Sometimes this means that journals have a subsidy from the hosting university or professional society. Sometimes it means that journals charge a processing fee on accepted articles, to be paid by the author or the author’s sponsor (employer, funding agency). OA journals that charge processing fees usually waive them in cases of economic hardship. OA journals with institutional subsidies tend to charge no processing fees. OA journals can get by on lower subsidies or fees if they have income from other publications, advertising, priced add-ons, or auxiliary services. Some institutions and consortia arrange fee discounts. Some OA publishers waive the fee for all researchers affiliated with institutions that have purchased an annual membership.” (Suber, 2004)

But, even today there exists a debate over the economics and reliability of various ways of providing OA among researchers, academics, librarians, university administrators, funding agencies, government officials, commercial publishers, and society publishers. This paper will try to overview some of the main questions concerning OA publishing.

2. Open Access Pro and Con

OA primary target content are the articles published in scholarly journals. It is usual to keep an article's content intact and to associate it with its author. The Creative Commons licenses can be used to specify usage rights. OA can be provided in two ways – Green OA and Gold OA, plus Delayed OA. So called *Green OA* is provided by authors publishing in any journal and then self-archiving their postprints in their institutional repository or on some other OA website. Green OA journal publishers endorse immediate OA self-archiving by their authors. *Gold OA* is provided by authors publishing in an open access journal that provides immediate OA to all of its articles on the publisher's website. (Hybrid open access journals provide Gold OA only for those individual articles for which their authors, or their author's institution, or funder, pay an OA publishing fee.) There is a third possibility and that one is called *Delayed OA* and it is defined in the following manner: "One option is to publish those papers whose authors do not want to pay Open Access publishing fees in non-Open Access form for a certain period of time, before making them Open Access..." (Lin, 2006).

One of the questions that can be considered is what considers the contribution of academic authors to the policy of OA publishing? The main reason academic authors make their articles openly accessible is to maximize their research impact. An OA makes citation of the scientific information easier and cheaper, so the OA should be the way to increase the citation rate. But, the attitude of academic authors towards the publishing of their scientific information in an OA is not uniform. The purpose of this paper is to describe whether the statements of this kind are true or false: "As soon as all refereed journal articles are self-archived by their authors in their institution's eprint archive, the literature is freed from all access barriers and impact barriers. Self-archiving could be done virtually overnight. The day after, all refereed research becomes freely accessible online to researchers the world over" (Berners-Lee, 2001). If this statement is true, what are the obstacles to self-archiving and OA publishing?

On one side there are publishers of scientific journals, on the other are academic authors and the third are the readers, but the main group of readers of scientific journals are scientists themselves. All three sides are in the same circle and can not function without each other. The question who has discovered something completely new and at the same time so important that everybody should read it remains one of the main questions of science now, as important as it has ever been. That is why academic authors need to publish their articles and gain impact in contemporary science. Since the second and the third side are almost the same, we are talking about a bipolar relationship in which OA publishing can make a lot of change.

If the publisher considers that he could earn enough money out of selling scientific journals and thus preserve an economic equilibrium, then he has the same standards and interests as the academic author, since the author is also living from the money he earns in the process. But, the academic authors are usually supported by the government, through their salaries, funds and grants. Scientific papers are financially supported from exactly the same resources or they gain fees from authors who are publishing their research in those journals. On the third side there are different libraries, institutions and scientific institutes, as well as the scientists themselves, who are getting money from the same resources and they spend large sums of money for the acquisition of scientific papers, journals and databases. As we can see the money is circulating around in the above mentioned circle.

Ever since the OAI started it became more obvious that the producers of knowledge and scientific discoveries have to pay twice – once to publish their papers and again to read what was published. The idea of the OA is often thought to be a good solution for this problem, since the authors and the readers will be able to read the articles for free. Different publishers have a wide range of different solutions and rules regarding the OA publishing procedures. There are web sites with lists of those rules and comments about the copyrights. The question is: if the problem is associated only with the author's copyright why it is not solved yet? Is the problem only in our routine, or is it psychological or is there something else which is not so obvious and that continue to neglect? How can we discover what is the main obstacle for the OA?

From our customer point of view there is always the fear that what we can get for free is, in fact, worthless. We usually think the essence of science is to be exclusive and elitist. The most expensive scientific journals should to be the best ones with the most recent scientific data. Recently, this point of view has been modified by the Public Library of Science (PLOS) where the most recent and singularly important articles are published in an OA. This is the best way to show how the best articles can be gained for free. The other problem may be the fact that the scientific work might be misused and cited without the author's name, since anybody can find it and copy it without any kind of permission. Years of hard work could be wasted.

But the most important question, it seems to me, is how long the online version of the article will be available. We know that the newspapers and the books printed or written on the paper lasted for centuries, but nobody can be certain how long any database will last. Databases and repositories must be accurate and updated and cared for, as well as the books. When the information is transferred from one media to another one some details could be lost forever. Paper, which may seem the most fragile media, lasted for centuries and the floppy discs lasted ten years or so, therefore the question remains of what is more fragile? If that is so, is this the main reason why academic authors do not want their articles to only be published online or in OA repositories only?

We will comment the article published by Jeffery (2006) where he pointed out that the motivation for OA publishing can be ethics, research impact, costs and just reward.

“Ethics: There is an ethical argument that research funded by the public should be available to the public. Since research is an international activity, this crosses national boundaries.” This attitude is implied in the FP 7 funded by EU, i.e. that all the scientists who get the money for the project FP7 are obliged to publish some of their papers in an OA. In the *Strategy of Scientific and Technological Development of the Republic of Serbia for the period from 2010 – 2015* the same attitude is incorporated.

“Research Impact: The Internet provides an opportunity. Modern harvesting techniques and search engines make it possible to discover publications of relevance if they are deposited in an OA repository with a particular metadata standard. If all authors did this then the world of research would be available ‘at the fingertips’. There is evidence that articles available in an OA repository have more accesses (readers), citations and therefore impact.” There is also the possibility that in the future impact of an academic author will be estimated by the number of downloads, instead of citation numbers. This is more likely to happen if the access is for free.

“Costs: There is concern over the hindrance to research caused by the cost of journal subscriptions, whether electronic or paper. These costs run well above the rate of inflation with the result that libraries with restricted budgets (i.e. all of them!) are no longer providing many journals needed by researchers.” Not only the money, but the acquisition policies of some libraries are the obstacle. Sometimes the libraries are confined to one scientific area which is not broad enough. This gap between scientific areas can only be solved by OA to all the areas of knowledge.

“Just reward: There is also concern that in traditional scholarly publishing, most of the work (authoring, reviewing, editing) is done freely by the community and that the publishers make excessive profits from the actual publishing (making available) process. In conventional publishing, the institution subscribes to the publication channel to obtain electronic access or paper copies.” The logic says that nobody will work on something that is completely pointless and in the Western world pointless means without any profit. The publishers have their expenses, but there must be some optimum in making a profit, especially because: “...authors of journal articles donate their labor, so do most journal editors and referees participating in peer review.” (Suber, 2004)

Jeffery (2006) also said that the major advantage of OA is research impact – the available e-article is likely to have more accesses, citations and impact, but there are additional advantages – links and access.

Links: Electronic availability of a publication (whether ‘green’ or ‘gold’) has another advantage; it is possible to crosslink the publication to any research datasets and software used in producing the paper; this improves ‘the

research process' by permitting other researchers to examine in depth the published work and validate, or contradict, the conclusions.

Access: In the case of non-OA electronic publishing, a researcher has to access separately (with identifier and password provided upon payment of the annual subscription) the databases of publications of each publisher to obtain information. In the case of 'gold' OA publishing a researcher has to access separately the open databases of publications of each publisher to obtain information. In both of these cases the user interface is different from publisher to publisher. In the case of 'green' open access the OAI-PMH (Open Access Initiative – Protocol for Metadata Harvesting) facility links OA repositories so that all repositories obeying the protocol can be harvested and their contents are available freely." (Jeffery, 2006)

This author says that, in fact, there are only two barriers to OA:

"Loss of publisher income: The major objection to 'green' self-archiving comes from publishers and learned societies (many of which depend on subscriptions to their publications) who fear that 'green' OA threatens their business viability. To date there is no evidence that 'green' archiving harms the business model of publishing. There is evidence that 'green' archiving increases utilisation, citation and impact of a publication. Whilst the major commercial publishers provide additional value-added services that could offset the impact of OA on current business models, the impact on learned societies may require new business models to be developed.

Copyright: Copyright agreements between authors and publishers may inhibit the 'green' route. However, to date, between 80 and 90% of publication channels (the variability depends on exactly what is counted) allow 'green' author deposit although some insist on an embargo period before the publication is available for OA. In contrast some publishers of journals – of which 'Nature' is the most well-known – do not demand copyright from the author but merely a licence to publish, leaving copyright with the author or their institution."

From my point of view there are some other disadvantages of the OA publishing. It is not always possible to access the needed document or paper, since it is not easy to find it. If the metadata are not done properly, the paper is hard to find. The costs of keeping the server and the databases working and updated are not disappearing. There will always be a need for the support of the national bodies in order to keep the institutional repositories alive and accessible. Will there always be enough virtual space for all the documents and scientific papers to be kept? What about persons who do not have information knowledge or the areas in the Third World without Internet access and without

enough PCs? Those areas are obviously left behind. How long will the scientific papers be accessible? Are we sure that the Internet will work forever? Is there anybody who can guarantee that the e-versions will be alive forever? Books have survived for centuries; will the repositories do the same? What about the information formats, tools needed, media, etc.? Who can keep the knowledge transformed, updated and accessible forever within the OA repositories?

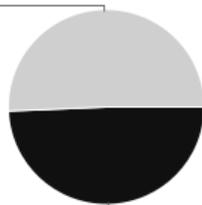
3. Open Access in Serbia

While reading articles on the OA literature, I was wondering if the OA publishing is popular at the University of Novi Sad. The University of Novi Sad is one of four state universities in the Republic of Serbia, with 3.000 staff members, so I made a questionnaire for them. The idea was to find out how many authors are aware of the OAI and if they use the advantages of this type of publishing. The answers are as follows:

1. Da li ste upoznati sa postojanjem pokreta za otvoren pristup naučnim informacijama?

(Are you aware of the open access initiative?)

Ne [78]



Da [76]

Da (Yes)	76	49%
Ne (No)	78	50%

2. Da li smatrate da je sa stanovišta nauke opravdano publikovati u otvorenom pristupu?

(Do you think that it is just from the scientific point of view to publish in an open access?)

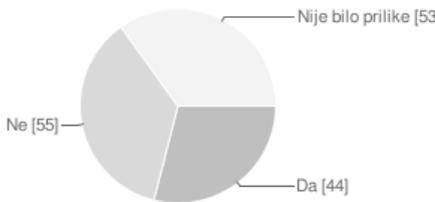


Da (Yes)	135	87%
Ne (No)	3	2%
Nemam određeno mišljenje (I do not have an opinion)	14	9%

3. Po Vašem mišljenju, da li je otvoren pristup dobro rešenje za:
(Do you think that open access publishing is a good solution for:)

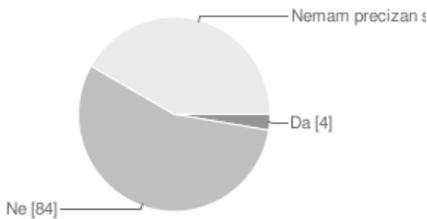
Prirodne nauke (Sciences)	6	4%
Društvene nauke (Social Sciences)	6	4%
Primenjene nauke (Applied Sciences)	3	2%
Sve napred navedeno (All above)	116	75%
Nemam određeno mišljenje (I do not have an opinion)	20	13%

4. Da li ste neki svoj rad objavili u otvorenom pristupu?
(Have you ever published a paper in an open access?)



Da (Yes)	44	28%
Ne (No)	55	35%
Nije bilo prilike (I did not have an opportunity)	53	34%

5. Da li se u Republici Srbiji posvećuje dovoljno pažnje otvorenom pristupu?
(Is open access publishing carefully considered in the Republic of Serbia?)

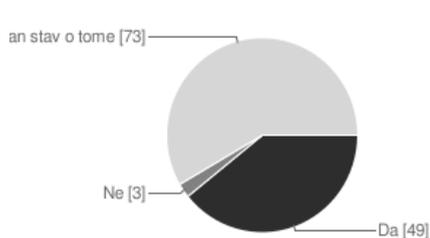


Da (Yes)	4	3%
Ne (No)	84	54%

Nemam precizan stav o tome (I do not have a fixed attitude)	63	41%
---	----	-----

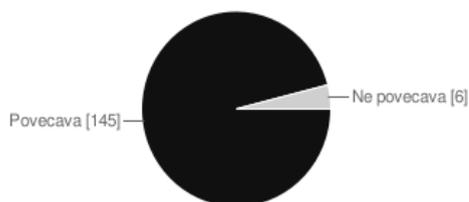
6. Ukoliko ste urednik naučnog časopisa, da li se slažete da je poželjno da Vaši saradnici članak objave i u otvorenom pristupu?

(If you are an editor of a scientific journal, do you agree that it is preferable that your authors publish their paper in the OA, as well?)



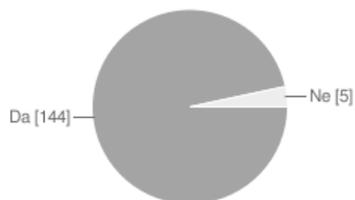
Da (Yes)	49	32%
Ne (No)	3	2%
Nemam precizan stav o tome (I do not have a fixed attitude)	73	47%

7. Da li smatrate da publikovanje naučnih informacija u otvorenom pristupu povećava njihovu vidljivost i uticaj? (Do you think that open access publishing of scientific data can increase its visibility and impact?)



Povećava (It does increase)	145	94%
Ne povećava (It does not increase)	6	4%

8. Da li smatrate da bi u Srbiji trebalo da postoji više repozitorijuma sa otvorenim pristupom? (Do you think that there should be more OA repositories in Serbia?)



Da (Yes)	144	93%
Ne (No)	5	3%

9. Da li bi za stvaranje repozitorijuma sa otvorenim pristupom na UNS-u trebalo da se zalažu:

(Who should be called upon to make an OA repository at the University of Novi Sad?)

Naučni radnici (Scientists)	36	23%
Menadžment fakulteta/instituta/Univerziteta (Management of the faculties/institutes/University of Novi Sad)	34	22%
Ministarstvo nauke RS (Ministry of Science of the RS)	67	43%
Bibliotekari zaposleni na fakultetima/Univerzitetu (Librarians at the faculties/University of Novi Sad)	14	9%

10. Ukoliko je naučni članak objavljen u hibridnoj formi, da li biste ga čitali:
(If the scientific paper is published in hybrid form, would you read it?)

Isključivo u papirnoj formi (Paper form only)	1	1%
Isključivo u elektronskoj formi (On- line form only)	15	10%
Obe forme su prihvatljive (Both forms are acceptable)	137	88%

Perhaps there is no need to comment on the above answers, but some obvious conclusions come to mind. One half of the staff members do not know that there is an OAI, but they answered the questions anyway. These are the same ones that did not have an opinion about publishing in an OA. Three thirds of the staff thought that the OA is the right solution for all scientific areas, and the staff is divided into equal groups of those who have published, those who have not and the ones that did not have the opportunity to publish in an OA. Those who do not know much about OAI obviously could not have a fixed attitude about the OAI in Serbia. However, there is cause to concern – the fact that the editors do not have a clue if they would let their authors publish their article in an OA. It is obvious to everybody that OA is increasing the visibility of a scientific article and that there are not enough OA repositories in the Republic of Serbia. The main persons to be blamed for not having repository at the University of Novi Sad with an OA are the members of Ministry of Science and Technological Development of the Republic of Serbia. The most appalling of all is the answer to the last question that only the paper form is acceptable for a scientific worker at the University of Novi Sad, but 88% voted for both forms, so the result is not completely distressing.

There is a long way ahead of us to bring OAI closer to the academic authors in Serbia and to explain to all sides that there will be no moving forward if everybody does not do their share. The scientific authors, librarians, managers, the government are all corners of the same building embodying the academic knowledge of one country.

4. Conclusions

The community of academic authors, publishers and stakeholders will soon be forced to agree on some basic questions.

1. What is more important: a) money or knowledge, b) impact of the academic author or knowledge, c) prestige of a journal or knowledge, d) exclusivity or knowledge, e) scientific diversification or the wide open access to knowledge?

2. Who will pay for updating the scientific paper: a) authors, b) readers, c) national governments, d) scholarly institutions, e) somebody else?
3. Is citing the only way to prove that the author's work is significant since there are general trends or mainstream in science, and should those articles which are not trendy, but are possibly equally important stay out of sight? Will they ever be published in the core journals? Is it possible to change their importance by publishing in an OA?

And to conclude this paper in more poetic way I will quote Slobodan Zubanović, a poet from Belgrade, who says: “Ne puštajući glas, / nemo smo se pitali jedno: / hoće li to svetlucavo biće / uspeti, ovakve, da zapamti nas.” (“Without uttering a single sound / we have wondered aloud / if this scintillating being / will attain to, thus, remember us.”) We can also pose a further question: How long will the computers be able to save all the knowledge that we deposit in them?

References

- Berners-Lee, T., Hendler, J. Harnad, S. & Mellman, I., (2001). Access all areas? *Nature*, 410(6832), 1023–1024.
- Jeffery, K. G., (2006). Open Access: An Introduction. *ERCIM News*, 64, 16-17
http://www.ercim.eu/publication/Ercim_News/enw64/jeffery.html
- Lin, S. K., (2006). Delayed Open Access or Permanent Non-Open Access. *Molecules*, 11, 496-497.
- Suber, P., (2004). *A Very Brief Introduction to Open Access*
<http://www.earlham.edu/~peters/fos/brief.htm>

Towards a New Technology for Science Online. Open Access Portals and Social Networking as a Source of Scientific Information

Ana Ivković

Library of Institute for Oncology and Radiology of Serbia

Abstract

In order to increase knowledge rapidly, each developing society is fighting for free access to scientific information. Open Access is gaining momentum constantly and is taking a more significant place in the world of science.

In fact, Open Access is breaking down all technical and financial barriers in our scientific society. The use of copyright gives publishers the exclusive rights to own the paper and sell it for their own prices. This old model of publishing in academic journals is being replaced by a new way of publishing: Open Access. Copyright is no longer a restriction when approaching scientific information. The restriction of access to scientific information presents a very expensive problem in terms of scientific research and development.

Free information exchange, free publishing, free discussion and peer reviews are benefits of Open Access. What is the librarian's role? How can one convince scientists to use Open Access?

New portals for Open Access publishing arise everyday. Scienceblogs are also an important forum for posting scientific articles and holding discussions. Authors of science blogs certainly have no lack of ideas and they always have the feedback of their readers. In addition to the Open Access portals and Science blogs, social networking is becoming very popular for exchanging scientific information.

Keywords

Open Access, open archive, social networking, scientific information

Introduction

Nowadays, thanks to web-based technologies and the development of the Internet into an open and accessible universe, scientific information can be reached and spread much easier.

To live and work in a world of science does not mean just searching for new scientific information. It means both, providing information and sharing it with others. The incessant need for learning and spreading information is part of human nature.

Open Access to scientific information presents a new era in science, a new way of learning and reaching the literature for students, academic staff and researchers. Limited library resources can disable the spreading of science, and unlimited online publishing should be an automatic right of all authors of scientific papers.

The use of citation analyses as a measure of success for scientific papers makes the competition in the small world of copyrighted papers huge, especially in smaller countries such as Serbia. The use of Open Access and the emergence of the Internet as publication medium can take away the competition and speed up scientific progress as well as the spreading of information.

Accessibility

Open Access to scientific papers is a key enabler for a higher accessibility compared to the restricted world of copyright. Easier access results in higher visibility and it leads to a concomitantly greater chance of being cited. The number of cited articles can thus increase significantly and therefore speed up scientific progress as well as the spreading of information. Thanks to open availability, barriers such as licenses of use, are coming down. The author retains the exclusive right to publish the material elsewhere, Björk, (2004)¹

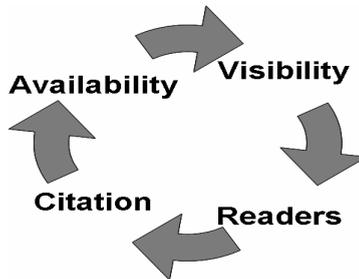


Figure 1: Availability

With OA journals or even with restricted availability journals, researchers enjoy more benefits in measuring the quality of their work. Many journals are available online and recent established journals can build their prestige. Open Access journals, or just hybrid papers offer an opportunity to researchers in terms of evaluation of their work, and measuring its quality. Article-level metrics i.e. the evaluation of individual articles presents the best way of measuring scientific work instead of measuring the Impact Factor of the journals in which the article was (is) published, Patterson, (2009).²

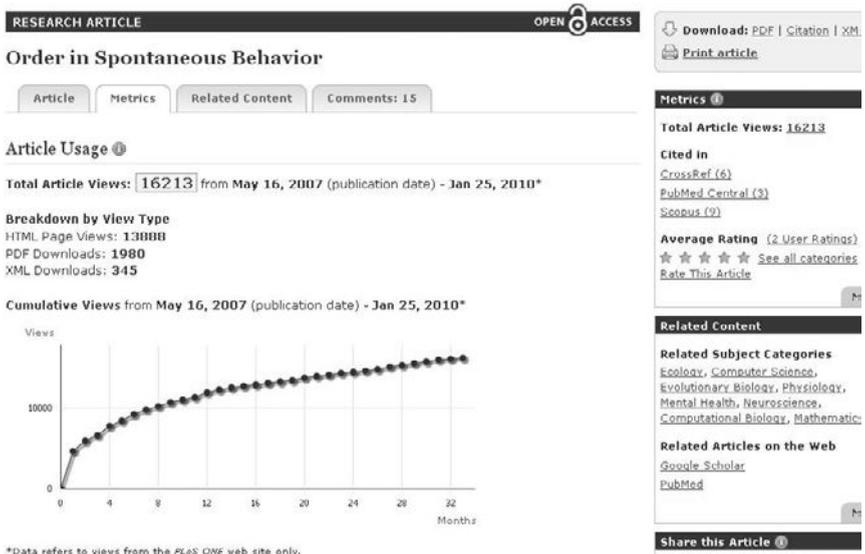


Figure 2: Article Level Metrics

In this manner, the old way of publishing in papers with copyright is bypassed and overtaken by platforms for online publishing. What is the benefit that the Open Access publishing platform offers?

It offers more than just an article. Scientific communities can enhance their collaboration with comments and discussion about the article or create another derivative paper presenting an ongoing story of one topic. Peer-reviewed articles become a part of online publishing.

Institutional Repositories

Open Access repositories are growing every day. Today we have many universities, institutions and associations with open archives, i.e. repositories online, with journal content and full text readily available online. With the develop-

ment of repository use of free software (e.g. DSpace), repositories of scientific institutions and universities are very easily handled. University websites can have a space where the full text of researchers' documents can be posted as E-prints, Jasco (2006).³ Institutional repositories however, must be created with great care. For example when posting a copy of article, the institution may find itself in breach of the copyright contract with the journal's publisher.

ROAR, register of Open Access Repositories, created by Timothy Brody presents a summary of many representative and most significant repositories, collected in one place. Brody (2009).⁴

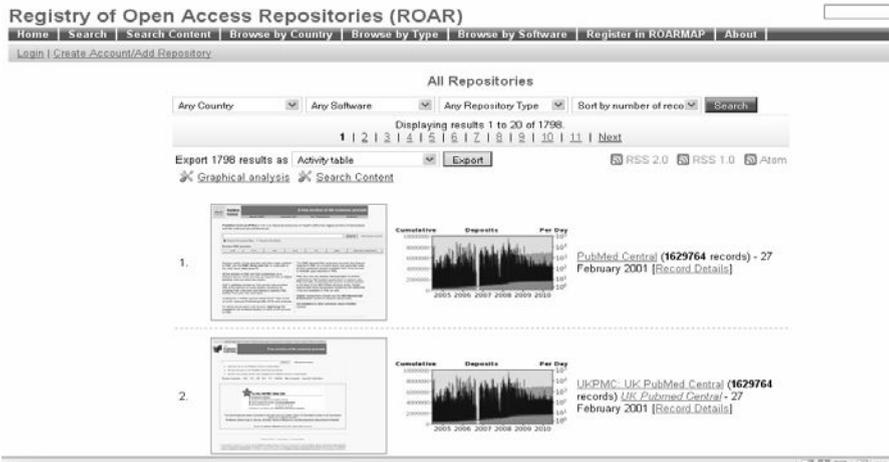


Figure 3: ROAR

DOAJ, the Directory of Open Access Journals maintained by University of Lund, also provides more than 2,200 open access journals and approximately 650 institutional digital archives, DOAJ (2010).⁵ Both repositories are very important in the academic scientific world, as they allow searching of content by the use of keywords.

Aggregators

Aggregation of freely accessible scientific information is a useful way to collect and sort scientific information by topic. In Serbia, the Linux Center has created several RSS feed aggregators in order to help people gain better access to information and knowledge, Vučić (2009).⁶ Aggregators aggregate information from various sites as well as from educational and scientific blogs. An Aggregator has a search engine and simplifies the search for articles by using keywords.

Blogs

Bloggging is very popular in the scientific world, and as a sort of website, a blog is commonly organized in a chronological order and allows one to offer opinions thoughts and commentaries with ongoing discussion on a vast range of topics. Creating a blog is simplicity itself, as the form is not in HTML, but in DOC form and editing and publishing tools are available online. Authors of science blogs are, for the most part, experts, bringing new scientific achievements, and related discussions, into the public arena.

Many research experts create their own blogs and become part of the “blogosphere”. It is impossible to track all these experts’ blog posts. Bloggers therefore organize blog carnivals – a special type of blog events. A blog carnival is a blog-post that contains links to posts on other blogs. Zivkovic (2005)⁷. Each edition, published at regular intervals, is a collection of the best blog posts focusing on a particular topic.

Furthermore, there are numerous blogs written by librarians which represent a key source for bringing new tools, applications, literature, search engine and events to the attention of professionals and the public.

Many institutional websites also produce blogs highlighting new achievements, often under a banner such as “News” or “Research”.

Podcasts

Open Access papers may also come with a podcast, presenting an audio article. These are very easy download to a personal computer or MP3 player and enable one to listen to lectures or talks when “on the move” and thereby save much time. Podcast articles are very common in the academic community. Such an invention represents an invaluable step forward in making scientific papers available to people with sight

Podcast archive

All Cancer Research UK Podcasts



October 2009 podcast
[Download](#)



The October podcast is focusing on breast cancer, as it's breast cancer awareness month. We find out how our scientists are working to understand the disease and develop better treatments, get the lowdown on how to be breast aware, and hear about the importance of screening.



September 2009 podcast
[Download](#)



We're back after our summer break with news of a novel drug that's showing promise for treating cancer in the lab, a new trial for treating lung cancer, and bad news for smokers of roll-up cigarettes. Plus, we find out about the importance of spotting the symptoms of cancer early – do you know what to look for?



July 2009 podcast
[Download](#)



In this month's podcast we head North to find out about a new

Figure 4: Podcast

Emerging Technologies

There are new technologies that appear overnight only to wither and die almost as rapidly as they appeared, while some not only survive, but indeed thrive, and continue to grow every day. In this way they have a huge impact on information specialists and researchers, linking several scientific areas and branches, especially in health care. This development of new technologies comes under the heading “emerging technologies” and established Information Technology implementations. Bioalthmatics (2010)⁸

Mashups

Some papers have the format of a classic research paper, some have a video format – i.e. a “visualized” paper, while audio “papers” are often in podcast format, perhaps a lecture recorded during a conference. All these new techniques and web applications available online, can be brought together into what is termed a “mashup”. A mashup presents a web application that com-

bines freely available data from various sources into one and so creates a new way to reach scientific information.

“Mashups have recently exploded on the web, for two main reasons. First, many of the major internet companies...have opened up their data to be used with other data sources without a lengthy licensing negotiation. In just a minute or two, you can set up and use the data resources they make available. The other reason for this rapid growth is the advent of new tools that make creating mashups easy for anyone, regardless of their technical know-how.” Library Mashups, Engard (2009)⁹

Librarians have a new role: they are web tools researchers! In a changing from the traditional role of making scientific literature available and providing access to it, they are becoming increasingly obliged to dig up web tools that allow for easier ways to access research papers. The aim is to modify the library by sharing and combining digital content.

Sharing Content

Tools, such as Flickr , Picasa, Youtube, Bliptv, Delicious, Technorati as well as Blogs and Social Networks, are very common amongst librarians and researchers. They are very useful for getting to information faster and making the sharing of content easier.

Social Networking

Social networking functions like an online community of internet users. Networking facilitates research, connecting to colleagues, creating interest groups, building sharing communities, and learning communities. Tracking the information posted on social networks could have a special innovative meaning for people occupied with a similar scientific area.

Connection between researchers enhances collaboration and fast communication which is the most important value. Social media as Facebook, Twitter and GooleWave play the same role. How to make a network social? Choosing friends, following friends, trusting friends, sharing information, all these factors play key roles to social networking, and with more visitors and new profiles, the network grows. Online communities share not only: information about their work, but also ideas about technical problems , latest tools, and sending links about the recent tech content, Cook and Wiebrands (2009).¹⁰ For librarians social networks present a favourite place to meet, share ideas and learn from each other.

Conclusion

Information availability presents a major challenge for scientific and scholarly people. Free flow of information is a treasure of inestimable value. Accessibility to information for more people anytime, any place anywhere means saving time and effort in data mining (digging for information). This is especially important for science, research and development particularly within a short time frame. New technologies and Open Access can assist in accelerating the process of learning and providing information in order to increase knowledge rapidly.

Each developed modern society is fighting for free access to scientific information. Open Access is gaining momentum constantly and is taking on an increasingly higher profile in the world of science.

References

1. Björk, B-C. (2004) Open access to scientific publications – an analysis of barriers to change. *Information Research*, 9 (2). Retrieved 28 June, 2010
from <http://informationr.net/ir/9-2/paper170.html>
2. Patterson, M. (2009) Plos Journals-measuring impact factor where it matters. *PLOS*. Retrieved August 2009
from <http://www.plos.org/cms/node/478>
3. Jasco, P. (2006) “Open access scholarly databases – A bird’s eye view of the landscape.” Keynote address of the Asia and Oceania Section of IFLA. Retrieved
from <http://archive.ifla.org/IV/ifla72/papers/157-Jasco-en.pdf>
4. Brody, T. (2009). ROAR. Registry of Open Access repositories. Retrieved
from <http://roar.eprints.org/>
5. DOAJ (2010). Directory of Open Access Journals. Retrieved
from <http://www.doaj.org/>
6. Vučić, V. (2009) RSS Feed aggregators. Retrieved 8 May 2009
from <http://gnulinux.centar.org>
7. Zivkovic B. Blog Carnivals and the Future of Journalism. (2005) Blog Around the Clock. Retrieved 28 June
from http://scienceblogs.com/clock/2006/09/blog_carnivals_and_the_future.php
8. Emerging Healthcare technologies. (2010) Retrieved 28, June 2010
from <http://www.biohealthmatics.com/technologies/emergingtech.aspx>
9. Engard N C. Library Mashups: Exploring New Ways to Deliver Library Data (2009) Retrieved
from <http://mashups.web2learning.net/>
10. Cook S, and Wiebrands C. (2009) Keeping up: strategic use of online social networks for librarian current awareness. Retrieved 26 June 2010
from http://www.vala.org.au/vala2010/papers2010/VALA2010_78_Cook_Final.pdf

Open Access and Web 2.0 Convergence: Information Foundation of the Future

Zoran Zdravkovic

Belgrade City Library, Serbia

Abstract

Paper analyzes information society based on network platformed social software and services (OPAC, SNS, RSS, IM, blogs, wikis...) incorporated in Open Access concept: no or low costs for finding, reaching and using science information, long tail principle of serving users satisfying information needs, cumulative world and historical knowledge storage in digital repositories, large number of information in shared data bases, publishing, reviewing and sharing informational resources through networking, and its influence to libraries, library services and users..

Information foundations of the future like user centricity, active users' role in processes of content creating and services tailoring according to their needs, multimedia, diverse and dispersed communication models, technological innovations are postulate of tomorrow. Paper presents some Serbian experiences in libraries habit in Web 2.0 sphere incorporated in Open Access concept. That way present society is heading toward Society 2.0: Future is starting with Open Access and Web 2.0 symbiosis.

Keywords

Open Access, web 2.0, library 2.0, information society

Introduction

Widespread accessibility and ease of Internet services enable the availability of electronic content to any user, anywhere at any time. Bearing in mind papers of scientists, researchers, general academic population, especially articles published in scientific journals, conference reports, dissertations and research reports and the possibility of their free electronic version available online at any time to

anyone, without restriction, placed in electronic archives–repositories, inevitable leads to the concept of Open Access.

Need for publishing research results, presentation to the scientific public, revealed who and how came to the results, enabled their usage to scientific community. On the other hand very restrictive limit through the inability to afford subscription to all needed scientific journals for each library, or scientific institution, much less individual subscription, resulted with very rarely done subscription to the needed and only sometimes to sufficient number of magazines. Dissemination of scientific information from a particular scientific field is becoming a privilege only for those who can pay for information, which contributes to the fact that the majority of researchers, scientists, potential users at all, remains deprived of a number of information sources and the many other scientific information remains unavailable. The concept of Open Access changes this situation and greatly facilitates overcoming this state of any limits in searching, locating, accessing and use of scientific information for each user, anywhere where information technology allows, at any time, free of charge.

Modern society, based on information, education and cultural backgrounds have to adjust, implement structural and organizational changes to its institutions under the influence of technological development in the inevitable process of globalization. The complex nature of the increase in the level of need for information, number of technological discoveries, growth and development of media and telecommunications, the advent of the Internet phenomenon, overall shape modern society. Information society based on the platform of social network software and electronic network services like SNS, RSS, IM, blogs, wikis and other, incorporated the concept of Open Access. Characterized by no or low cost to retrieve, find and access to scientific information, the principle of “long tail” in the process of serving customers and meeting their information needs, cumulative global and historical knowledge stored in digital repositories, in shared databases, through networking via services of global information network, scientists, researchers, academic population, students, business users, people – society in general, could get the most benefit from open access information resources and network services.

Libraries

Internet and the Web made possible information access regardless temporal, spatial, racial, educational and any other barrier. Contemporary libraries are not any more places which users have to visit. They are extended beyond the library walls to encompass rich contents: from their collections to whole spread of modern services toward their users, potential users, even non-users – to the community. Users are no more obligated to come to the library, to become registered member in order to use its services or access information they

need. It is possible distantly to use library simply by remote access to the library's web site using a computer, PDA or mobile phone, retrieve abstracts, articles from electronic journals and download needed information. Libraries already have been, or are now, in processes of diverting from physical places to virtual digital environments. Based on social networks, rich communication and information exchange there are no limits what, how and when anybody will use library. Physical collection as a critical aspect of the library 1.0 is just one of a number of services presented by the library 2.0. It becomes increasingly irrelevant in today's networked world because libraries today present a more holistic information environment: the role of library systems is to make the management and delivery of that environment both effective and efficient, through three interoperable processes in library as Murray sees: synthesize (combining often diverse conception into a coherent whole, like collections, electronic resources and other library contents, knowledge, policies, user services, web services); specialization (involving specific knowledge in order to serve a particular purpose, problem oriented approach including local service, values, content and knowledge); and mobilization (putting into action, active approach, direct communication, user-centered activities, user needs satisfaction orientation...) (Murray, 2006)

Web 2.0

Tim O'Reilly's vision of Web 2.0 as a set of principles and practices which makes "Web as platform" provides services and enables users to control their own data (O'Reilly, 2005). His seven principle characteristics of Web 2.0: the web as platform, harnessing collective intelligence by user participation, dynamic and remixable data sources, services instead of packaged software, lightweight programming models, software above the level of a single device, and rich user experiences lead to occurrence and development of Web 2.0 concepts. His list of Web 2.0 core competencies are:

- Services, not packaged software, with cost-effective scalability;
- Control over unique, hard to recreate data sources that get richer as more people use them;
- Trusting users as co-developers;
- Harnessing collective intelligence;
- Harmonization the long tail through customer self-service
- Software above the level of a single device;
- Lightweight user interfaces, development models and business models.

Openness and freedom as an integral part of Web 2.0, together with social networking, led to evolution of web-culture communities. According to Prensky's

view of two opposite sides, “digital natives”, (kids, teenagers, current day students born and surrounded with digital media), vs. “digital immigrants” (a little bit older people, parents, colleagues, teachers who grew up being more used to the print world), it is possible to see that process in its early stage (Prensky, 2001). “Digital natives” spend more time playing video games than reading, using digital media such as computers, cell phones with audio and video capabilities, e-mail, and the Web became “integral parts of their lives”. They are used to receive information really fast, like parallel processes and multitasking, prefer random access (like hypertext), and function best when networked.

O’Reilly’s vision of Web 2.0 include radically new approach to information: blogging instead personal websites, as it was in Web 1.0, participation against publishing, wikis, tagging (folksonomy) instead of taxonomy, syndication over stickiness ... reveal entirely new world of information. With Web 2.0 Meme Map (O’Reilly, 2005) which shows web as an information platform concept started to evolve. Wikipedia, an online encyclopedia based on possibility that an entry can be added by any web user, and edited by any other, was a radical new invent based on that wikis. Maybe the most visible primer of open source software, incorporated in open access concept is situation that Wikipedia is already in the top 100 websites, with such dynamism of content creation. Sites like del.icio.us and Flickr, have pioneered a concept called “folksonomy” in contrast to taxonomy, collaborative categorization of sites using freely chosen keywords, often referred to as tags, freed of rigid categories. Open access and data liberation against proprietary and closed access to information; dynamic, participative and non hierarchical approach approved to be much better in information sense than standalone information. Participation (reached in blogs and comments), syndication along with RSS features improved a lot user possibility to contribute to information source and usage. User contributions are the key of Web 2.0. Users are seen as co-developers. „Push“ principle, when information comes to the user, is rather likeable and effective than „pull information principle“. More information freedom and space for user resulted in simpler and easier access to information while electronic documents take huge advantage than paper ones, like Google documents which can be edited, altered, revised and republished by almost non limited number of authors contributors at any time, from everywhere, instead of hard printed paper copy made in Microsoft Word manner.

Web 2.0 and Its Implications on Libraries

Recent changing Web into “Web 2.0” will have substantial implications for libraries (mission of libraries particularly). New Web is recognized as concept evolving into a more interactive, multi-media driven technological space, where

as O'Reilly (2005) observes personal web-pages are evolving into blogs, encyclopedias into Wikipedia, text-based tutorials into streaming media applications, taxonomies into "folksonomies," and question-answer/email customer support infrastructures into instant messaging (IM) services. Web 2.0 is not a web of textual publication, but a web of multi-medial communication. It is a user-centered matrix of dialogues, rather than a collection of monologues, collaborative in nature, interactive, dynamic, so the line between the creation and consumption of content in these environments was not sharp anymore (users create the content as much as they consume it).

Revolutionary new and enormous occurrences in the Web influenced lot implications in libraries. Librarians' awareness of it is primarily in the "biblioblogosphere" (weblogs written by librarians) while journals and other more traditional literatures have yet to reshape and fully address the concept to the user, applying new technologies in library services incorporated in new concept widely framed as "Library 2.0" in which users interact with library, its collections, services and one to another. It is the beginning of future libraries evolving into interactive, media-rich web places (although still physical), into Web 2.0, and new society, reaching information society; society in which Library 2.0 becomes significant intermediate between information user needs and information as the application of interactive, collaborative, and multimedia web-based technologies occupied into web-based library services and collections system with four cornerstone elements (Mannes, 2006):

- User-centered dynamic system where Users participate in the creation of the content and services they view within the library's web-presence, OPAC, etc.
- Multi-medial experience (text, audio, video, streaming, hypertext, RSS ...)
- Socially rich communication including virtual social networks (Facebook, My Space and other) in what library's web-presence includes users' presences, with both synchronous (IM) and asynchronous (wikis) ways for users to communicate with one another and with librarians.
- Communally innovative system, as libraries are founded as a community service, but understands that as communities change, libraries must change, not with them, but allow users to change the library. It should be user-centered virtual community, socially rich, electronic space, Web manifestation of the library as place.

Library 2.0 is a mashup, a hybrid of blogs, wikis, streaming media, content aggregators, instant messaging, and social networks, allows the user to edit OPAC data and metadata, saves the user's tags, IM conversations with librarians, wiki entries with other users; user is able to make all or part of their profile public; users can see what other users have similar items checked-out, borrow and lend tags, and a giant user-driven catalog is created and mashed with the traditional

catalog. Library 2.0 is user-centered and user-driven. It is a mashup of traditional library services and innovative Web 2.0 services. It is a library for the future society—Society 2.0, rich in content, interactivity, and social activity.

Open Access

The advantages of Open Access altogether with Library 2.0 issues and services apply on society as a whole. Accelerating the research cycle, shortening the period of time required to find, read, use and quote by other researchers, significantly contribute to the scientific community. Researchers have immediate access to the scientific facts they need, even if do not have funds, don't work in specific research institutes, or do not have sophisticated technology and technical equipment available. The greatest benefits of the system of scientific information are achieved through the results available in open format where all the articles that are needed can be accessed easily, without restriction with low or no cost. On the other hand, the authors are increasingly interested in providing open access to its article due to the higher citation impact (articles offered in the regime of open access are cited more than others).

Open access allows researchers higher visibility, usability and impact (impact factor), and result in feedback through skills, scientific level and quality of their work for future research, also in growing ability to find, access and use the findings of other authors. Indirectly universities, institutes and research institutions whose scientists and researchers through an open approach increase the scientific level and impact of their work, thereby raising the scientific importance of the institution where they work, increase possibility for future investments in institutions, from government institutions, foundations and charitable organizations, also non-governmental sector, for the future development of institutions, improvement of equipment and future projects. Education of individuals, self-education, life-long learning and permanent improvement are enabled with open access approach, because of less restrictions (even material costs) when used for educational purposes – requires only URL of the article. Publishers, on the other hand, have benefits through greater dissemination, visibility in the retrieve processes, more citing and higher impact factor of their journals and articles published in it.

Streaming Media

The streaming of video and audio media is for many one of most recognizable issue of Web 2.0. For reasons libraries begin to realize maximizing streaming media's usefulness for their patrons, especially in some of the features which, for example You Tube provides. That way, librarians can post their manuals,

instructions or tutorial for service they provide, or publish virtual guided tour through the library, department or collection. (The Association of College and Research Libraries' Instruction Section provides a database of tutorials, many of which are Web 2.0 in their nature, called Peer Reviewed Instructional Materials Online (PRIMO))

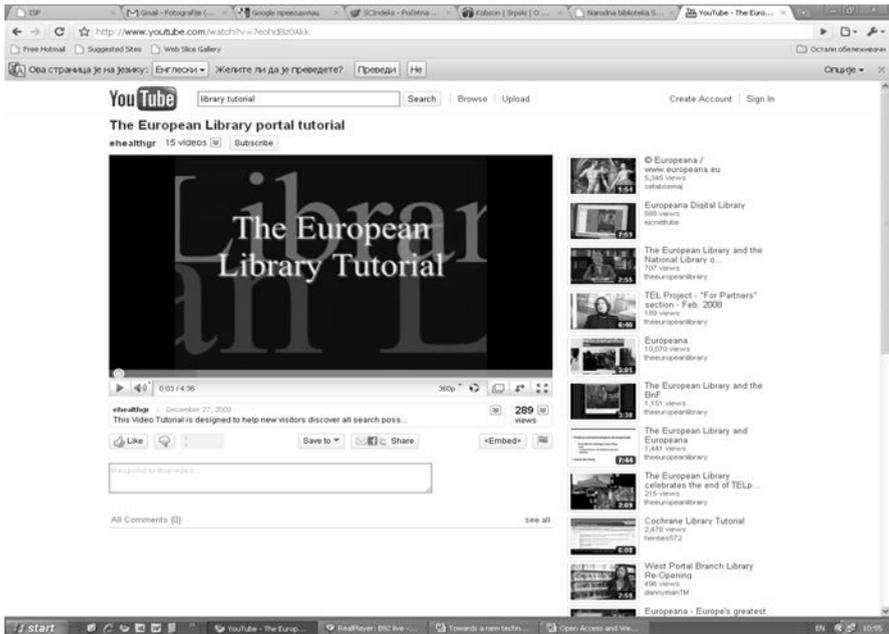


Figure 1: Streaming media at The European Library portal tutorial

Serbia Experiences

In February 2010, Serbian Ministry of Telecommunications announced in Paris (organized by UNESCO) the project on the use of Facebook for educational purposes. Pilot project was first implemented in the Fifth Belgrade High School, teaching literature, such as sections made for serbian romantic poets, whose works are taught in second grade teaching Serbian language and literature. Facebook profiles of poets beside basic information include a description of their life, work and achievements. Since last year, most important Serbian poets got their profile:

The project has met with great interest the representatives of youth in UNESCO because there are no extra charges, and motivates students to use and learn at the same time, as they spend free time on the Internet, with the aim to use and create educational contents and participate in modern educational

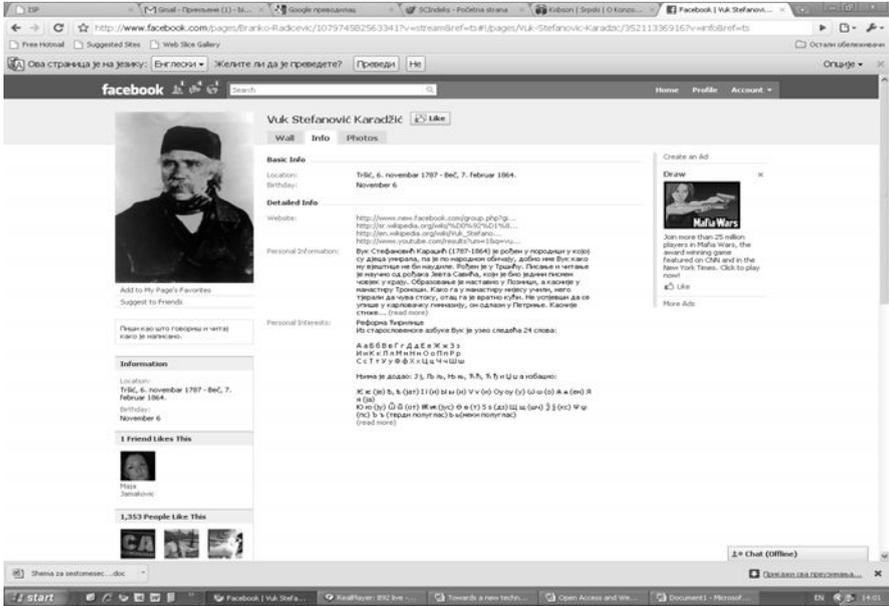


Figure 2: Serbia state project on Facebook

process. UNESCO is interested in the project proposed by the Member States, and the same attitude expressed by numerous representatives of which will, as announced, to recommend to their teachers and professors. Together with UNESCO plan is to make a brief description, as a sort of guide, as Facebook can be used in teaching, particularly social subjects such as literature, philosophy, sociology or history so this project will definitely be recommended to teachers and professors not only in Serbia. UNESCO will put a similar recommendation for this project on its site and recommend to their members. That way, Facebook and other social networks became meaning of communication, providing and distributing educational, pedagogical, ethical and cultural content, developing not only reading- but also information- and computer literacy having in mind that library's collection will change, becoming more interactive and fully accessible. Library services will change, focusing more on the facilitation of information transfer and information literacy rather than providing controlled access to it.

SCIndex Serbia

SCIndeks, the Serbian national citation index, developed to serve as a supplement to the international (Thompson-ISI) citation indexes. Refers domestic journals classified as periodicals of scientific character. All journals are in-

dexed on the “cover to cover“ form. In addition to basic descriptions of articles, the database contains abstracts and references / citations (metadata). Articles published in journals that have achieved a certain level of quality and adopted open access as an additional mode of publication are presented in full text.

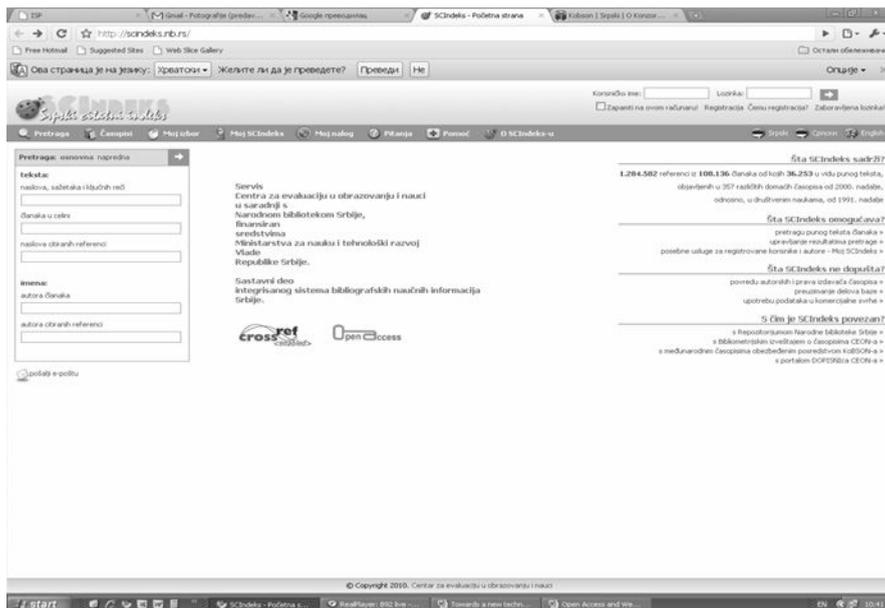


Figure 3: SCIndex – The Serbian national citation index (<http://scindeks.nb.rs/>)

Journals listed in SCIndeks subject to permanent evaluation (monitoring) due to the impact at the base, and complementary, in the international (Thompson-ISI) citation indexes. At the same time the so-called indicators follow bibliometric quality of journals, mainly derived from the requirements for their inclusion in the Thompson-ISI citation indexes. Journals selected in this way are recommended for publishers' inclusion in international citation databases, and the Ministry of Science and Technological Development of Serbia for supplementary support.

Before the release of all cited references SCIndeks thoroughly breaks down into parts in order to ensure their format under a variety of publishing standards, facilitate online networking (linking) with primary sources, if available in electronic form, and ensure their normalization. Normalization references is necessary, since the base is used as the basis for the evaluation of various research entities from individuals, institutions, projects, journals, publishers, conferences.

SCIndex Serbia provides 1.284.582 references from 108.136 articles of which 36.253 articles are in full text, published in 357 different national maga-

zines since 2000, and since 1991 in social sciences. SCIndeks enables searching the full text articles, managing search results and special services for registered users and authors, not allowing violation of copyright and the rights of magazines publishers, database parts download and data usage for commercial purposes.

Conclusions

Widespread application of Web 2.0 and Open Access principles leads to new possibilities for global society. E-mail, tagging and rating options in OPAC, folksonomy, Flickr services in presenting graphic library collections, e-learning by Slideshare, information literacy based on remote Wiki contents, different societies and cultures presented through social networking contributed to information decentralization. Open access as a free tool, reaching of the patrons long tail, allow users to control data, choosing how, when and where will use what information, publishing own data in amount they want to present and share. Open Access through Web 2.0 invites to participation by social computing with human, no barrier, user centered frame, based on user rating and contents comments, sharing rich user experience. Customer self-services in technology savvy environment characterized by technology advances, improvable hardware platform, perpetual beta allowing constant change, along with improvable software, software that gets better the more people use it, with open standards regarding ethics, copyrights, with some rights reserved are the foundation of the future. Open access and web 2.0 convergence will be most effective especially through libraries in societies in development, where education, transfer of technology and knowledge are important matters, contributing to informational decentralization, dispersion and information equality. Open access as a simple free tool by providing information services to users according to the "long tail" allows the user choice in the manner, place and time of use information (how, when and where to use that information), presenting and publishing their results in the desired volume and desired volume of sharing with others under copyright law. Open access via Web 2.0 calls for the participation of social networking-based computer to a user-oriented concept. That way, present society is transformed into Information Society heading toward Society 2.0. Future is starting with Open Access and Web 2.0 symbiosis. In other words, the symbiosis of Open Access and Web 2.0, transforms society into information society, perhaps not too early to tell, the Society 2.0.

References

- Berlin Declaration on Open Access to Knowledge in the Sciences and Humanities, Conference on Open Access to Knowledge in the Sciences and Humanities 20–22 Oct 2003, Berlin, URL: <http://oa.mpg.de/openaccess-berlin/berlindeclaration.html>
- Casey M. and Savastinuk L. (2006). Service for the next-generation library. *Library Journal*, 9/1/2006
- Maness, J., (2006). Library 2.0 Theory: Web 2.0 and Its Implications for Libraries. *Webology*, Volume 3, Number 2, June, 2006. Available at: <http://www.webology.ir/2006/v3n2/a25.html>
- Murray, R., (2006). Library systems: Synthesise, Specialise, Mobilise. *Ariadne*, No. 48. Retrieved, 15 May 2010, from <http://www.ariadne.ac.uk/issue48/murray/>
- O'Reilly, T. (2005). What Is Web 2.0: Design Patterns and Business Models for the Next Generation of Software. Retrieved, 27. May 2010, from <http://oreilly.com/web2/archive/what-is-web-20.html>
- Open Access, JISC–The Joint Information Systems Committee (16.5.2009)
URL: <http://www.jisc.ac.uk/publications/briefingpapers/2009/bpopenaccessv3.aspx>
- Prensky, M. (2001). Digital Natives, Digital Immigrants. *On the Horizon* 9(5):1-6
- Tonta, Y. (2008). Information Services and WEB 2.0: New Challenges and Opportunities, Proceedings of *Electronic Library* International Scientific Conference held in Belgrade, September 25th–28th, 2008, pp 249-253

Repository

An Institutional Repository Project as an Organizational Change Vision in IRTA

Xantal Romaguera and Reverté Carmen

*IRTA – Institute for Food and Agricultural Research and Technology,
Catalonia, Spain*

Abstract

The proliferation of national repositories on the World Wide Web has been of immense benefit in the promotion of scientific research and organization, access, and preservation of scientific knowledge. In IRTA, the consequences of the appearance in 2007 of the National Repository (Recercat) were expected to create great organizational change. As a result, we are developing a new institutional repository which is understood to be a strategic key for organizational positioning and increase in visibility.

Keywords

Repositories, Open Access, citation accounts, research assessment, agriculture, food and technology

1. Introduction

IRTA's repository project will be launched during 2010 and it is expected to provide access to 700 full text publications. This project has three main steps, the context study, data and document management and implementation. Within the first step of the repository project there are two processes that we would like to present: the model of our new institutional repository and the evaluation of our open access documents available in the Recercat.

In the first part of this study we present the context of the emergence of the new repository. The second part it shows the foundations to implement the institutional repository. The third part is based on our preliminary examination and discovery of citation counts, based on a sample of 285 IRTA documents taken from the national repository. The objective of this study is to compare the Recercat repository with the popular data bases (Web of Science and Sco-

pus) to evaluate the impact of our research productivity. Finally, we present the conclusions and bibliography.

2. Background

IRTA is a Research Institute of the Catalan Government. IRTA's activities are concerned with scientific research and technology transfer in the area of agriculture, aquaculture and the agrifood industry and it functions under private sector law. IRTA has 717 staff located in 10 centres.

Until relatively recently, IRTA had only a bibliographic database, PubPro, that was trying to gather its own scientific production. But since the emergence of the Recercat in 2005, we have the opportunity to contribute to a national repository with the objective to increase the visibility of documents, authors and research produced in IRTA which could not be accessed in other traditional subscription databases (WOS or Scopus). Recercat (Research Open Access Repository of Catalonia) is a cooperative archive of digital documents of the universities and research institutions of Catalonia. The submission model of IRTA documents in Recercat is centralized; the author sent the document via e-mail to the IRTA librarian who uploaded it to the Recercat. The researchers are following a self-selection bias that really has not worked as expected. The Statistical data of Recercat show us that we have upload 309 documents since we joined this repository, but we produced 2.338 research publications during the same period. But, the repository served its purpose, because our institution is more visible than before and as a consequence, our research productivity. In May 2010 statistical data shows that IRTA is the second-ranked institution in number of documents looked up (15%).

Over time, that mixed system (Pubpro+Recercat) based on an internal record of publications which is then partially replicated into Recercat has proven ineffective. It has been shown necessary to evolve to a more dynamic model.

3. Repository Project

The objective of our institutional repository is to store the scientific and technical research documents produced by IRTA and give greater visibility and impact to the research. IRTA'S Repository model is based in the old application, PubPro.

The new repository represents a mandatory model where the institution requires all documentation relating to scientific production. The researcher has to self-archived a document, subsequently it is the librarian who concludes the process (include metadata, checking availability, rights, and so on) and publishes the document in the repository. This model is supported by our previous

experience in Recercat where there was a self-selected model with a low participation (about 13%).

The process is limited to 3 basic stages, developed from the model that we had (PubPro): the design of the workflows (the description process where it is the information and documents fluxes are shown) with the design of the policies and requirements, the implementation stage and the diffusion period. Within the design phase, we have detected a problem. As this model is mandatory, the researchers are not keen on using it. And we propose to offer benefits that make see the Open Access (OA) repository as an advantage and not as a problem. These include, training in OA, Copyrights, etc., recycling of data (display statistics and rank their use of OA publications) and download bibliographic records in EndNote format.

The objective is to improve the effectiveness of the process and facilitate the distribution, management and preservation of scientific production. At the same time, we want to improve the visibility of the science produced by IRTA.

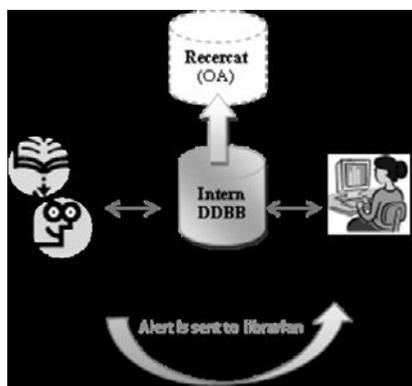


Figure 1. New model of publications management

Main features of the repository, Flores-Cuesta (2007)

Harvesting Model: documents store in the institutional repository with a minimum of metadata collected by the researchers. Then, this metadata is improved and normalized by the expert (librarian) who will make them accessible to users and providers.

Software model: SharePoint Server (MOSS) is an Internal System used as a CMS (Content Management System).

Document typology: any document that represents the scientific output of the institution can be in the repository.

Procedure for submitting documents: the researchers should self-archive their work by uploading to the platform (including a minimum of metadata). After this process, the expert librarian, who receives an alert, introduces qualified metadata and checks if the document may be published or not.

The next step is publishing the document to the OA Repository, and if it is not possible, the expert has to put an alert on the document specifying the date of availability.

Common use, quality and standardization of metadata: With regard the access or use policy, documents should be made public as soon as possible. We will only consider restriction cases when the document is subject to intellectual property restrictions, the document is in a phase of validation for library staff, or when the documents contain raw data. In Metadata terms, we are using Dublin Core Standard Qualified.

Intellectual Property policy: We always follow the Publisher or journal copyright policies. As librarians have no access to the transfer of IRTA author's copyright we use Sherpa/Romeo and the information provided in the journal/publisher web site. All OA documents upload to the system are subject to the Creative Commons 2.5 license.

Digital Preservation: use of standardized formats (XML and Dublin Core) and preserving file formats (PDF-A). In a short-term preservation we contemplated the use of backups on our server for documents and metadata records. For long-term preservation we should have to study the best options (emulation or format migration possibilities).

4. Experimental Analysis to Test the Impact of the OA Irta Documents through Recercat Repository

The impact of the media and our participation in a national repository favoured the creation of an open access institutional repository. But from there we are faced with a different kind of work that will provide us the opportunity to improve our repository and build policies for research assessment of OA Irta's documents. We formulated three hypotheses: The participation in open access repositories increases the visibility of both the research and the organization itself; The OA greater citation impact than Non-OA documents. Therefore, greater visibility of the institution on the World Wide Web; The OA makes the scientific study of new indicators for a more accurate and objective research assessment.

Methods: standardized methodology based in citation data analysis of our OA documents uploaded in Recercat between 2007 and 2010. It is compared the citations produced in Web of Science, Scopus and Google Academic systems. The sample collection is composed by 294 documents (15 articles, 1 book, 24 conference proceedings, 97 technical papers, 11 varieties and 54 Workshops). For this study we are not considering the varieties or the software, because there are not indexed in any database. For each document, it was counted their citations, the overlapping among citation account systems (Web of Science, Scopus and Google Academic) and we discriminated the self-citations

and the false citations. According to the bibliography, Google Academic is the only system that retrieves false citations.

Citation Analysis

The first thing to Analyze is ‘how our collection is represented in the citation databases?’ After the sample selection of 282 documents, we saw that the only data base which indexed all the documents was Google Academic. The others had a low indexed level, Scopus (22) and WOS (18). These first results show clearly Google Academic as the most exhaustive system. Comparing with the other systems analyzed we saw that they are very similar in coverage and both of them are not really useful for the assessment of the research impact of our collection. According to the literature, the main disadvantage that Scopus and WOS have versus Academic is the coverage in terms of document types, because it is restricted to journal literature. The second step was doing a first assessment of the documents which were received more citations and what type of document belonged. The results show that the articles papers are following the more relevant source. Surprisingly, such technical papers as Final Project Reports, what there are located only in Google Academic database, were more cited than conference proceedings or workshops.

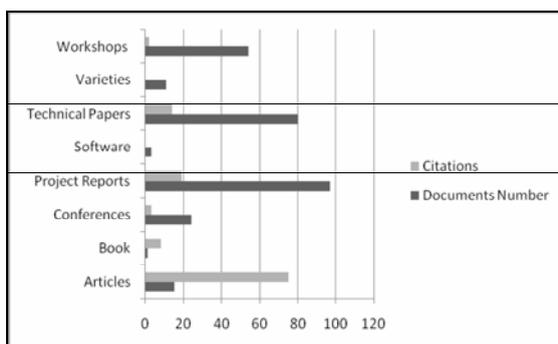


Figure 2. Sources and citations

The next step it was to study the overlap for each database. In this line we know that we have not enough data to compare in deep the overlapping. Although we have reached the same conclusion as other studies that we have been reviewed, Scopus and Web of Science have the highest overlap.

The overlapping of the different databases can only be studied from the perspective of the study and analysis of the journal articles, because it does not overlap to other documents. This is because the lack of coverage in Scopus and Web of Science in documents typology. The results show us that the biggest overlap it is between Scopus and Web of Science (overlap in 5 journals), but between Scopus and Google Academic there are a similar coincidence (overlap

in 4 journals). The biggest difference is between Goggle Academic and Web of Science where there are only 3 coincidences of a total of 15 journals.

Evidence of Open Access Impact: In the citation analysis, the biggest amount of citations are for the journal articles, but, when we analyzed the citations of the IRTA's documents, we found a significant data, about the 45% of the article citations come from Google Academic. The language was not the reason, all of them are in english except 6 that they are in other languages (3 spanish, 2 french and 1 in swedish). We cannot prove it but it is because Academic can retrieve documents for different bias than Wos or Scopus (repositories, OA journals, etc.). These results answer partially the first and second research questions, about the idea that the repositories increase our visibility and Open Access give us a greater impact of our research in the Web where other traditional databases not arrive.

The heterogeneity of information and the diversity of documents typology and the increase of social media (Web 2.0) are so broad that it is necessary to improve the current indexing systems of traditional data bases, which they may be overtaken by the advances of the free systems (Academic). Although, Google Academic is not an alternative to the traditional systems, because it is not fully functional, it is often quite effective to analyze all the research productivity in an institution. An example of that it is the different documents retrieved by the references and the different languages and 21 countries involved:

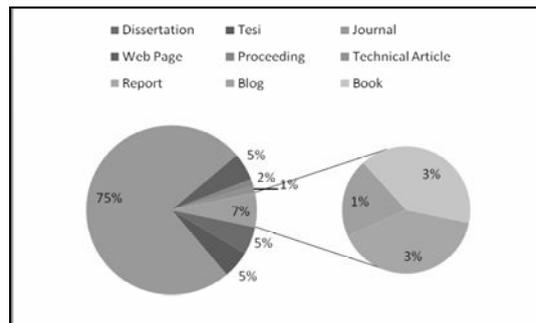


Figure 3. Documents retrieved by the citation analysis

General Considerations

The evaluation study showed that citation counts in Google Academic were higher than both WOS and Scopus. However, the results are inconclusive because it is difficult to ascertain from where the Google Academic citations come from.

In these analyses we could see the impact of our OA documents is not really high. Only 72 documents are cited and 51 of them are cited after the Open Access, but really a low percentage could be influenced by the OA. Although,

we can conclude that in terms of visibility, Academic is more useful than the traditional databases because it indexes more documents. For this reason is necessary to develop new metrics.

5. Conclusions

The citation analysis can measure the impact of our research. We can see who is citing us, where they come from and who is interesting in our research. It provides clues to discover whether the increase in citations is due to the fact of the Open Access or not. But the citation analyses are heavily influenced by the coverage of the each database. We can only conclude that the effectiveness of Goggle Academic is in language and typology coverage but when we are analysing journals, the most coverage is in traditional systems. At this moment, Wos, Scopus and Academic could be complementary systems but not exclusive. We cannot generalize any result for concluding the research questions. Looking ahead, we have now identified two further research objectives. Primarily, we need to source creditable, objective scientific indicators to measure and analyze our repository's data. Secondly, we would like to participate in an information exchange with other agricultural and food technology repositories to collaboration on repository studies and information integration.

Bibliography

- Bar-Ilan, J. (2010). Citations to the “Introduction to informetrics” indexed by WOS, Scopus and Google Scholar. *Scientometrics*, Vol.82, 495-506
- Bornmann et al., (2009). Convergent validity of bibliometric Google Scholar data in the field of chemistry—citation counts for papers that were accepted by *Angewandte Chemie International Edition* or rejected but published elsewhere, using Google Scholar, Science Citation Index Scopus, and Chemical Abstracts, *Journal of Informetrics*, Vol. 3, 27-35
- Brody, T. and Harnad, S. (2004). Comparing the Impact of Open Access (OA) vs. Non-OA Articles in the Same Journals. *D-Lib Magazine* 10(6)
- Craig, I. D., et al. (2007). Do Open Access Articles Have Greater Citation Impact? A critical review of the literature Publishing Research Consortium, *Journal of Informetrics*, 1 (3): 239-248
- Day, M. (2004). Institutional Repositories and research assessment. *ePrints UK Project*, v.0, 2 December 2004
- Eysenbach, G. (2006). The Open Access Advantage. *J Med Internet Res*, Vol. 8, No. 2. Available: <http://www.jmir.org/2006/2/e8/>
- Flores-Cuesta, G. And Sánchez Tarragó, N. (2007). Los repositorios institucionales: análisis de la situación internacional y principios generales para Cuba. *Acimed*, Vol. 16, No. 6
- Gargouri, Y., et al. (2010). Self-Selected or Mandated, Open Access Increases Citation Impact for Higher Quality Research. Available: <http://arxiv.org/abs/1001.0361>

Harnad S. Maximizing Research Impact through Institutional and National Open-Access Self-Archiving Mandates.

URL: <http://eprints.ecs.soton.ac.uk/12093/02/harnad-crisrev.pdf>

Kousha K., Thelwall M., Rezaie S. (2010). Using the web for research evaluation: the integrated online impact indicator. *Journal of Informetrics*, Vol. 4, No. 1, 124-135

Meho LI, Yang K (2007). Impact of data sources on citation counts and rankings of LIS faculty: Web of Science versus Scopus, and Google Scholar. *J Am Soc Inf Sci Technol*, Vol. 58, 1–21. Recercat.

Available: http://www.cbuc.cat/cbuc_en/programes_i_serveis/recercat

Enhancing Institutional Repositories (IR) in Ghana

R. B. Lamptey and A. Corletey

*Institutional Repository, Kwame Nkrumah University of Science
and Technology-Kumasi-Ghana*

Abstract

Academic and Research libraries in Ghana have difficulty accessing research work done in their institutions and in Ghana as a whole. This is a challenge in supporting teaching, learning, research and knowledge dissemination. Therefore, an alternative solution can be to enhance the Open Access Institutional repositories (OA- IR). The technology is currently new in Ghana with only one university hosting it. This article provides an overview of the establishment of OA- IRs in Ghana, the challenges and making a case for key decision makers to consider ways in setting up and enhancing their institutional repositories.

Keywords

Intellectual output, digital archiving, open access, publishing, information professionals, Ghana, institutional repository

1.0 Introduction

Preserving knowledge and looking forward to its wider availability has never been more important than it is today for the information society. Librarians and information professionals should be reminding themselves that we live in a world that is saturated in information, Asamoah-Hassan (2009) says a world which good, well understood, well managed information is easily accessible, can mean the difference between prosperity and destitution. Tise (2010) argues that reading which is the tool for growth and development, information and knowledge, was alien to Africans, and was clearly absent. This has contributed to the growing unemployment, widespread poverty and limited availability of social services. The information famine is a significant contributor to the growth of a country. There is information famine in most developing countries even in Ghana. It is crucial that researchers, academics and scholars in Ghana,

seek solutions for alleviating the information famine and thereby integrating their respective universities or countries into the global economy as a supplier and user of information.

Open access institutional repositories for global information from a remote place are present day's requirement for academic and research libraries. The Implementation of institutional repositories has emerged as a new strategy that has allowed universities and research institutions in the developed world to apply serious, control to accelerate changes taking place in scholarship and scholarly communication.

1.1 Access to Information in Academic Environment

Seibert et.al (2001) argue that "a person seeks information to enhance his competency and skills and greater access to information and information resources would lead to his higher level of motivation" The nature of information seeking may range from trivial information to a sensitive research area. For example, the information access could be to monitor development of a well-known topic or subject over the period of time; or to carryout stereotyped series of searches to achieve a particular goal; or to explore and understand the new subject of interest.

Manjunatha and Shivalingaiah (2003) defines information access as the modes or means through which information is made available, or to an entire range of possibilities for making information and information services available to the users. Libraries are repositories of information sources and play an important role in the academic world by furthering research among academics and researchers. The current information landscape has offered a plethora of options for accessing the various format and types of information. With this glut of options, Academic and Research libraries in Ghana still have difficulty accessing research work carried out in their institutions and in Ghana as a whole. The traditional way has been to publish research work in their institutions printed journal or journals outside the institution and displaying bound postgraduate theses on the library shelves for limited or no access. However this can cause serious plagiarism in the country's universities and research institutions. An alternative could be to deposit them into an online database of the institution which can be accessed by all members of the institution and outsiders as well. Johnson (2002) is of the view that the open access movement and institutional repositories could contribute significantly to economic growth by broadening the market for scholarly publications and research results.

1.2 Open Access (OA)

Open access (OA) scholarly literature is composed of free online copies of peer-reviewed journal articles and conference papers as well as technical reports, theses and working papers with no licensing restriction on their use by

readers. They can therefore be used for research, teaching and other purposes thereby enhancing knowledge dissemination. According to Asamoah-Hassan (2007) it enables developing countries to have access to research output from the north. However this will aid academic and research libraries to satisfy the information needs of their users as cost of acquiring journals are going outside their budget. This is an urgently needed opportunity for the improvement of academic research quality assurance, a major asset for the developing world like Ghana.

1.3 Importance of Institutional Repositories to Academic and Research Libraries in Ghana

According to Lynch (2003) a university-based institutional repository is a set of services that a university offers to the members of its community for the management and dissemination of digital materials created by the institution and its members.

The developments of institutional repositories have largely taken place in universities in Europe, America, Asia and South Africa and have been of great benefits. Gradually it is becoming clear that academic and research institutions may in the near future no longer pay the subscription prices charged by publishers of scholarly publications. It therefore means that universities in Ghana can adopt the strategy used by the South African universities to promote free and easy access to scholarly information. Below are some benefits of IR for academic and research libraries in Ghana. IRs:

- Can provide users with online access to various research articles produced within and outside Ghana.
- Ease and speed of use to a great amount of information sources just at the touch of a few keys which the current system of information retrieval in libraries does not.
- Can be accessed by multiple users at the same time, any time, and any day once the host server is always on or uninterrupted power supply.
- Saves shelf space and labour cost in libraries

2.0 Overview of IR Implementation in Ghana

According to Lynch (2003), the development of institutional repositories emerged as a new strategy that allows universities to apply serious, systematic leverage to accelerate changes taking place in scholarship and scholarly communication. He further states that many technology trends and development efforts came together to make this strategy possible. Online storage costs have dropped significantly; repositories are now affordable, hence universities and research libraries should take advantage. Developing or establishing institutional repositories in Ghana does not require that each institution act entirely

on its own. Consortia like the Consortium of Academic and Research Libraries in Ghana (CARLIGH) could provide a logical infrastructure for implementing institutional repositories via collective development. Such cooperation could deliver economies of scale and help institutions avoid the needless replication of technical systems and information sources. Indeed, consortia might well prove the fastest path to proliferating institutional repositories and attaining a critical mass of open access content.

2.1 The Current State of IR in Ghana

Setting up the first Institutional repository (IR) in Ghana was initiated by Mrs Helena Asamoah-Hassan, the University Librarian of Kwame Nkrumah University of Science and Technology-Kumasi. She setup the IR in her University and populated it with research papers from faculty and postgraduate theses of the university. These theses were in print, so the abstract had to be scanned and converted to digital format to enable upload onto the IR. This strategy was used till the university approved the IR policy for postgraduates to mandatorily submit their theses in both soft and hard copies.

This technology is new in Ghana with only Kwame Nkrumah University of Science and Technology (KNUST) hosting one online, filled with theses of postgraduate students and research work of few faculty and researchers. The KNUST IR called KNUSTSpace was set up in February 2009 and had a test run for 5 months and was opened to public use in July 2009. The software used (Dspace) is an open source software developed by the Massachusetts Institute of Technology (MIT) and Hewlett-Packard (HP) and was customised to meet the needs of the university.

The IR currently has 101 full text documents in portable document file (pdf) all articles from the Journal of Science and Technology publications (JUST) which is the university's quarterly print journal, 1,110 abstracts of postgraduate theses and some individuals research and conference articles. Since it is an open access IR any person anywhere can have access to these documents archived in the IR. It can be accessed through the major search engines like the Google, Yahoo or Exalead and others the URL <http://dspace.knust.edu.gh>

The IR is governed by a policy which has been approved by the University, and is managed by the IR team consisting of the University Librarian, the Systems Librarian and the Institutional Repository Librarian. It has a policy approved by the University for students, researchers and faculty members to deposit their research work, including conference papers, lecture notes and anything of academic and research use into the institutional repository. It is mandatory for all postgraduate students to submit their theses in soft copies for uploading online. This will help populate the repository with the full texts of their research work. Even with the policy in place, the IR team is finding it

difficult in getting access to these soft copies. So far the university has not created the awareness about the implementation of the IR and its policy to enable staff members to mandatorily deposit their papers. This hinders the progress of the repository. There is therefore the need for the university authorities to provide the necessary confidence in the IR policy to enable faculty members contribute their research works to the repository and also ensure long-term administrative attention span and commitment to the preservation and maintenance of the repository.

Recently the International Network for the Availability of Scientific Publications (INASP) and the Consortium of Academic and Research Libraries in Ghana (CARLIGH) initiated setting up IR platforms for some CARLIGH member institutions. So far (5) five of them have the IR platforms, with the onus on the institutions to populate the IR. Although this initiative was successfully implemented, the awareness about its importance is extremely low in Ghana.

2.2 Challenges of IR Establishment in Ghana

Establishing IRs in Ghana presumably could be the pad that will launch the Academic and research Libraries into the publishing of scholarly communication and the free flow of scholarly work. There are therefore some challenges in pushing for its establishment. For instance, Asamoah-Hassan (2009) argues that it is difficult convincing university management, researchers and academics that it is necessary to have IR and get them to agree to plan and support it on long term basis. Funding to start and to sustain the IR and reliably electricity supply, and reliable and good internet connectivity are major issue and also permissions for licensing and copyright issues and resistance from computer phobia of some faculty and researchers.

3.0 The Way Forward

Academic and Research libraries in Ghana have a substantial role to play in growing the information and knowledge pool and to ensure quick access. Johnson (2002) confirms that providing no- or low-barrier access to the intellectual product generated by an institution increases awareness of research contributions. This should be the motivating factor for academic and research institutions in Ghana to create and maintain a digital repository. Librarians and Information professionals in Ghana should demonstrate leadership in the IR field, creating IRs and encouraging open access mandate, and preparing key decision makers to understand the importance of digital archiving.

Regardless of the above listed challenges information professionals and Librarians should see the benefits more than the challenges and seriously advocate for its establishment in their respective institutions. Moreover, knowl-

edge of the information professionals immensely helps in advocating for the establishment so therefore one need to be knowledgeable about IRs first. The libraries need to have standby generators as well as increase their internet bandwidth. Information professionals will have to make presentations at gatherings of academics and researchers, featuring the benefits of an IR to them.

Lynch (2003) states that most individual faculty lack the time, resources, or expertise to ensure preservation of their own scholarly work even in the short term, and clearly cannot do it in the long term which extends beyond their careers; the long term can only be addressed by an organizationally based strategy. Institutional repositories can address both the near-term questions about continuity of access by providing an environment in which such new works of scholarship can be managed and disseminated.

4.0 Conclusions

Academic and research libraries, perform functions of identification, acquisition, processing, storing, dissemination and validation of information, therefore they must play a key role in the online production of scholarly information.

Setting up and enhancing open access repositories, digitising and putting academic works online must be their major priority in this current information overflow. Enhancing institutional repositories in Ghana will offer a strategic response both to the opportunities of the digital networked environment and the systemic problems in today's access to research and scholarly work. This response can be applied immediately, reaping both short-term and on-going benefits for research institutions, the universities and their faculty and advancing the transformation of scholarly communication over the long term. Academic and research libraries in Ghana will have to optimally ensure the survival of values that the library has represented in the academic sphere for its future existence.

References

- Asamoah-Hassan, H (2009) Institutional Repositories in Ghana – Status Report at the AAU/KIT/CARLIGH International Seminar on DATAD & Advocacy for Institutional Repository, 16th – 18th March, Accra, Ghana.
- Asamoah-Hassan, H. (2007) Embracing Electronic Scholarly Publishing In Africa: The Kwame Nkrumah University of Science and Technology (KNUST) Library, Kumasi, Ghana as a case study. Paper presented at the 1st PKP Conference in Vancouver, Canada 11–13 July 2007.
- Johnson, K. R (2002) Institutional Repositories: Partnering with Faculty to Enhance Scholarly Communication D-Lib Magazine Vol. 8. No. 11

Available at <http://www.dlib.org/november02/johnson/11johnson.html> (Accessed on 18 July 2010)

Lynch, Clifford A. (2003). Institutional Repositories: Essential Infrastructure for Scholarship in the Digital Age. *ARL*, No.226, pp1-7

Available at: <http://www.arl.org/resources/pubs/br/br226/br226ir.shtml> (Accessed on 16 July 2010)

Manjunatha, K. and Shivalingaiah, D. (2003) Information Access in Libraries. *Annals of Library and Information Studies*, Vol. 50, No. 2; 85-90.

Seibert, S. E, Kraimer M. L, and Liden, R. C. (2001), A social Capital Theory of Career Success. *Academy of Management Journal*. 44,2: 219-237

Tise, R.E. (2010) Isolation and information famine stifling Africa's growth. *IFLA journal*, Vol. 36, No. 1, 5-6

Surabaya Memory: Opportunities and Challenges of Open Access e-Heritage Repositories

Liauw Toong Tjiek (Aditya Nugraha)

Petra Christian University

Abstract

The paper explores the potential, opportunities, and obstacles in open access digital repository of heritage resources – with Surabaya Memory, an initiative dedicated to the digital documentation and education of Surabaya city’s heritage, as a case study – to be used as learning resources for campus community, and to educate and increase local history & heritage awareness of the society. The paper will also explore the possibilities and opportunities – as well as challenges – of libraries to reach out to people outside their traditional boundaries through digital heritage projects.

Keywords

Surabaya Memory, digital repositories, e-heritage, digital heritage, open access, heritage goes to malls, digital cultural heritage initiative

1. Introduction

Initiated by Petra Christian University (PCU) Library, Surabaya Memory (<http://surabaya-memory.petra.ac.id>) is an initiative dedicated to capturing digitally the heritage of Surabaya city. The project was started in 2001 out of ‘desperation’ that most information regarding the city heritage could only be found in the Netherlands or other developed countries. Initiatives in the national level that deal with heritage preservation were so rare. Digital initiatives on this sector were virtually non-existent.

Surabaya Memory (SM) is dedicated to preserving digitally the city heritage, and increasing awareness of local communities in the appreciation and preservation of their own heritage, especially the heroic characteristic of its people during the independent movements of Indonesia. As the initiative came

from PCU Library, emphasis is given in digital documentation-related efforts; a field where libraries excel. SM – simply put – is a digital repository of heritage-based information. However, as PCU Library evolves so does the project. The initiative grows to include website, exhibitions, heritage walks, and other fun/enjoyable heritage-based activities for PCU communities as well as the society in general.

The discussion will explore the impacts of digital heritage initiatives, such as SM, to the campus communities as well as challenges and opportunities faced by PCU Library in its efforts to reach out to the society.

2. Developing Learning Resources for Campus Community

There are various types of resources in SM. In its initial phase, SM digitized only visual resources related to Surabaya city. Mostly were old photographs, which were acquired from various sources inside or outside of PCU campus communities. The digital collection was started out with postcard images of old Surabaya. Later, more variety was added to the collection with the acquisition of old photographs, artist's documentary paintings and sketch, and old documents/manuscripts. SM is now in the process of digitizing PCU Architecture Department students' documentation project reports. The reports consist of records (including photographs) of old/traditional markets and settlements in Surabaya, which now cannot be found anymore due to the city development. SM is also striving to include local history materials from various minority groups that have inhabited Surabaya for centuries.

There is recently an interesting development in the digital collection development of SM in terms of local history. It used to be that SM held only 'old' documents created/produced at least a couple of decades ago in the form of archival, semi-published, or published materials. However recent exhibition that featured personal branding of Surabaya and East Java luminaries by the PCU Library and Visual Communications Design Department has sparked new ideas. The exhibition featured local (unknown) 'heroes'. Materials exhibited were mainly intended to emphasize the design features. However they are also rich in local history in terms of content. These materials can be considered to be a 'new genre' of local history content. Trends like this one signifies what the author has coined as "the blurring boundaries of libraries, archives, and museums" (Liauw, 2005). However this is out of the scope of this discussion.

Heritage-based contents – such as in SM – can be invaluable as learning resources for campus communities. Initially it was predicted that user base would mainly be coming from the Architecture Department students and faculties. However it turns out that students and faculties from Tourism and Leisure Management Department, and Hotel Management Department have also use been using the resources as part of their teaching and learning process. Uses

from other departments have also been detected but they are not yet integrated into the teaching and learning process. Usage statistics for SM is currently unavailable since SM is part of larger Desa Informasi (Information Village) collections. The only usage statistics available is for the whole Desa Informasi collections, which is 99.753.564 hits for the period of Jul 2009–May 2010 (Source: <http://digilib.petra.ac.id/awstats/awstats.pl>).

In order to give readers a glimpse of SM collection in the overall Desa Informasi collections, below is a table that shows the breakdown of digital collections in Desa Informasi.

Collection Name/Theme	# of Records	# of Digital Objects	Total Size (bytes)
Digital Theses	11.917	121.952	154.942.838.780
eDIMENSI	787	787	276.835.736
Petra iPoster	122	244	365.416.831
Petra@rt Gallery	233	784	3.953.120.859
Surabaya Memory	237	609	428.607.837
Petra Chronicle	178	560	1.423.511.287
TOTAL	13.474	124.936	161.390.331.330

Breakdown of Desa Informasi's Digital Collections (as of June 10, 2010)

It is worth noting also that SM – as digital repository platform – has given birth to a new special (physical) collection on Surabaya. The collection consists of books (including rare books) and audio visual materials. A growing number of 'semi-archival' materials – the 'new genre' of local history content mentioned above – are also forming a significant portion of SM (physical) collection. Ultimately SM collection encompasses digital resources as well as physical resources/materials.

Challenges were encountered in encouraging public participation in developing digital collection for SM. Public involvement in contributing content to SM was and is still not as good as it could be. Although SM has managed to gather resources (mostly old photographs) from some members of the society – as can be seen from the Creator or Contributor metadata of the resources – the number of such people is too small to make collection development in SM a true public collaboration effort. Based on informal conversations with many people, two main reasons behind the obstacle are the lack of information-sharing culture and the sentimental/personal values of heritage-related resources to their owners or copyright holders. Some people have been making money out of selling duplicates of old photographs and manuscripts. Contributing digital copies to SM will only affect their source of income. On the other end of the spectrum, big collectors tend to collect for their own enjoyment. One of SM's strategies to alleviate this condition is by holding joint-exhibitions

with big collectors. When these collectors have seen how ordinary people react to and appreciate their collections, they usually are more inclined – or at least more open – to the possibility of donating digital surrogates of their collection to SM, usually with access restricted to low resolution images only. Another strategy is to network with other heritage-based organizations to identify individuals with possession of cultural heritage materials. The bottom line is that continuous efforts are needed to raise awareness among the people that Surabaya heritage are supposed to be enjoyable by the owner of the heritage, which is the people of Surabaya instead of a small group of (privileged) people.

In all its successes and failures, digital repositories such as SM – as open access platforms of heritage information – have helped to “overcome the digital divide in our [global] society”. (Lux, 2008, p. 19) In the case of developing countries, it is beneficial to local societies when they start sharing and contributing information to the global society, instead of merely consuming information from the developed countries.

3. Educating the Society and A Common Platform for Community Outreach

The second focus of SM is educating the society on the awareness, appreciation, and preservation of Surabaya’s heritage. In achieving this goal SM strives as much as possible to create fun and edutainment events, where common people can learn to appreciate their own heritage. Various activities or events have been held, such as the creation of a website, annual exhibitions, competitions, cultural performances, heritage walks, etc.

The website (<http://surabaya-memory.petra.ac.id>) has served as an access point for people of common interest to explore (part of) the history of Surabaya. SM has received various requests for information and/or collaborations from within Indonesia and overseas. It has also served as an initial contact point, where people of the same interests can collaborate with one another. PCU Library – through SM – has been unofficially serving as a ‘broker’ for connecting people to information and people to people.

An annual exhibition is usually held in May to commemorate the anniversary of Surabaya. Through this event SM can create a full-scale exhibition that features a variety of educational materials on/about Surabaya. Materials exhibited can be old photographs and maps, green maps (of different aspects of Surabaya, mostly heritage-based information), local history, milestones of the city development, local artistic expressions, etc. In the early years of SM, exhibitions were held at several cultural institutions in Surabaya. However these cultural institutions don’t get visited by general public; only certain groups of people could enjoy the exhibitions. Beginning in 2006, full scale exhibitions were moved



Annual Exhibition of Surabaya Memory in A Mall

to various malls in the city. The move proved to be very effective since ordinary people are able to stop by the exhibitions while they are doing their shopping with their families. Natural interactions occur when parents tell their children some stories of the old city when they were children themselves. Stories are told of what happened, what has changed, what was the most memorable experience to each person. A full-scale exhibition can easily attract four thousand (Liauw, 2008) up to seven thousand and five hundred (Liauw, 2009) visitors in a five to eight-day exhibition. Besides the full-scale exhibitions, these past couple of years SM has also received invitations to hold exhibitions as part of larger ones organized by private and government entities.

Heritage-based activities are usually held during full scale exhibitions, ranging from performances (local dances, stage show in Surabaya flavor, heroic songs that is a special characteristic of Surabaya, etc.), competitions (information scavenger and drawing competition for elementary school children, local pattern/designs competition, etc.), and heritage walks. Heritage walks are the favorite of these activities. SM has created four different heritage walks based on special characteristics of Surabaya. They first are the “Journey to the Past” that explores the old section of the city that is mostly dominated by Dutch colonial architecture, Chinese and Arabic quarters, and the still-existing-and-functioning traditional harbor. The second is the “Tour de Kampoengs” that explores traditional settlements (“kampoeng”) in Surabaya. Tour de Kampoengs emphasizes on the cultural aspects of the old city. The heritage walks includes walks along several oldest remaining “kampoengs” in Surabaya including traditional fisherman “kampoengs”, where participants can enjoy a ride along the river to the Madura bay on traditional fisherman’s boats. The third is “Heroic Trails” that visits several landmarks – including houses and cemeteries – that are significant in the heroic struggles of the people of Surabaya during the independent movement in the 1940s. The fourth is “Enchanting Batik” that explores some community centers that specialized in producing traditionally-made Batik cloths.



Seeking Hidden Facts on Information Scavenger Game for Elementary School Students

All these events – including engaging the society through the media during talk shows – have served as educational tools for educating the society, making them more aware of heritage issues. When people start to realize what they can or will lose, they will be more sensitive to preservations efforts. McDonald

corroborated this fact when he said that “[t]he public will not realize the importance of saving this valuable information over time unless they are educated on the impact of losing it.” (McDonald, 2004, p. 34)

PCU Library manages to hold all those SM events due to the fact that SM has become a platform for collaborations among different campus units and integrated as much as possible into academic departments’ teaching and learning. Even though SM was initiated and advocated by PCU Library, it is now owned together by different campus units through intense communication and collaborations. The strategy is to bring values to different campus units and making them feel that they own SM, instead of making SM as merely a project by PCU Library.

The manifestation of SM as a collaboration platform for various campus units is evident in the preparation and execution of SM annual exhibitions. An Event Management class at the Hotel Management Department has adopted SM exhibitions as real world projects. Students of this class will help PCU Library in preparing proposals, creating events/activities (such as performances, competitions, etc.), seeking sponsors, preparing logistics, and handling on-site matters of the exhibitions. PCU Library needs only to provide seed funding through its annual budget. Another example is the heritage walks that have been prepared and organized by the Cultural Tourism class at the Tourism and Leisure Management (TLM) Department. A heritage walk is usually organized in conjunction with the annual exhibition. However the TLM Department can and have organized other heritage walks throughout the year. There usually are two to four heritage walks annually.

Besides collaborations in term of organizing activities, collaborations can also be seen in the content development for the exhibitions. SM exhibitions used to be featuring only old photographs of Surabaya. However since 2008 SM expanded the concept and has been featuring numerous other exhibit materials related to Surabaya. They, among others, are green maps, personal branding of Surabaya’s influential figures, design concepts for public spaces in Surabaya, special interest photo exhibitions about Surabaya, and destination branding of Surabaya tourism. These exhibit materials are produced by various academic departments in collaboration with PCU Library. Most of these exhibit materials are digitized after the exhibition and consolidated into SM’s digital collection.

Along with increased collaborations come also challenges that PCU Library has to face as facilitator of collaborations under SM. The biggest challenge is communication and/or coordination. Conflicts can sometimes arise due to miscommunications between different campus units involved in the collaborations, either with PCU Library or among themselves. In such cases it will help tremendously when campus units acknowledge the library’s leadership and commitment to mutually beneficial collaborations. Another challenge is that often we have to make some compromises to ensure that all parties see the

collaborations as mutually beneficial. Challenges can sometimes be a discouraging factor. However the small successes achieved so far and the prospect of SM to become a broader collaboration platform has set aside such negative impact.

As SM has evolved to become a collaboration platform for/among different campus units, the public value of SM has ultimately made it to becoming a common platform for PCU campus communities to reach out to the society. This is in line with “a major direction” for digital repositories, which “is connecting and integrating digital libraries with broader individual, group and societal activities” (Lynch, 2005, p. 6). This value has significant impacts on the institutional visibility of PCU.

4. Institutional Visibility

The digital collections and various outreach activities of SMU have gained recognition from PCU stakeholders. This is obvious in the collaborations and use of resources provided by SM. More private and government entities have collaborated with SM for a variety of heritage-based activities. Webometrics (ranking of world universities based on their commitment to open access) has placed PCU on the fourth place in its Rank of Universities of Indonesia – Jan 2010 (http://www.webometrics.info/rank_by_country.asp?country=id). This achievement is very significant considering that the first, second, and third rankings belong to big state universities. This is largely due to the digitization efforts by PCU Library through its Desa Informasi, where SM is a part of.

Besides the apparent impacts – such as the Webometrics ranking and media coverage – we need to provide statistics that can speak for themselves to justify the funding, time, and efforts spent in developing an open access e-heritage repository and the outreach activities. Statistics on web access and exhibition visitors are crucial in advocating the initiative to the university administrators, which in the end correlates to the sustainability of the initiative. Zorich (2003, p. 30) reported that:

“[o]ne reason cited for the inability of DCHIs [Digital Cultural Heritage Initiatives] to demonstrate the importance of their efforts was the absence of supporting metrics that prove the value of their resources to a broader public. Another reason was that DCHIs fail to promote their efforts outside their own narrow community of users.”

As the collection development and outreach efforts are absorbed into PCU Library’s annual program and budget, sustainability will be more assured than project-based activities.

It important to note that with heritage initiatives – such as SM – should provide direct benefit to the campus itself, which is the availability of (usable)

learning resources to campus communities. However it should be stressed that continuous advocacy must always be carried out to show the values that heritage initiatives can bring to the university as a whole, which is institutional visibility.

5. Conclusions

It is apparent from the discussion so far that open access e-heritage repositories – such as SM – can provide learning resources for campus communities and the society in general. They can also serve as collaboration platform and common outreach platform for the whole campus communities to reach out and make themselves visible to the society. Open access e-heritage repositories can serve as “a powerful tool to expand the libraries’ sphere of influence” outside their traditional user base. (Liauw, 2006, p. 130) In order to achieve that libraries must go beyond merely developing digital collections, which is reaching out to the communities that are beyond the boundaries of their traditional user base?

References

- Liauw, Toong Tjiek. (2005). *Desa Informasi: Local content global reach*. Proceeding of the 2005 Seminar of the International Council on Archives, Section on University and Research Institution Archives held in Michigan State University, East Lansing, MI, USA on September 6-9, 2005, pp. 35-45.
- Liauw, Toong Tjiek. (2006). *Desa Informasi: The role of digital libraries in the preservation and dissemination of indigenous knowledge*. *International Information and Library Review*, 38(3), pp. 123-131. Elsevier B.V.
- Liauw, Toong Tjiek. (2008). *2007/2008 Petra Christian University library annual report*. Surabaya, Indonesia: Petra Christian University Library.
- Liauw, Toong Tjiek. (2009). *2008/2009 Petra Christian University library annual report*. Surabaya, Indonesia: Petra Christian University Library.
- Lux, Claudia. (2008). Libraries and open access. *Open access: Opportunities and challenges – A Handbook*, pp. 91-92. European Commission, Directorate-General for Research – Science, Economy and Society.
- Lynch, Clifford A. (2005) Where do We Go from Here? The Next Decade for Digital Libraries. *D-Lib Magazine*, 11(7/8). Mar 27, 2006
<http://www.dlib.org/dlib/july05/lynch/07lynch.html>
- McDonald, Buffy. (2004). Saving Our Digital Heritage. *Library Hi Tech News*, (8), pp. 34-36. Emerald Group Publishing Limited.
- Zorich, Diane M. (2003). *A survey of digital cultural heritage initiatives and their sustainability concerns*. Council on Library and Information Resources.

Developing a Repository: A Library's Journey

Claire Bundy

Open Repository

Abstract

This paper focuses on the very latest developments in the institutional repository market and how institutions worldwide are now using repositories to achieve 'green' open access.

Topics examined include why institutions require repositories and the benefits that they have. Institutional repositories are primarily used for content management and the preservation and dissemination of key research findings, however they can also be used as a marketing tool to showcase the institution's intellectual research.

The benefits of a hosted repository solution over an in-house solution for an institution is also discussed.

Keywords

Open Repository, green open access, repositories, digital archives

1. Introduction

Open access describes the public's unrestricted online access to the intellectual output of an organisation.

BioMed Central pioneered the open access movement 10 years ago, aiming to help organizations fulfil their open access needs via either the gold or green open access route. Making the content fully accessible to all maximises the dissemination of an institute's research, benefiting both the institute and the researchers themselves.

BioMed Central is the world's largest open access publisher of peer-reviewed journals. In 2004, the demand within the community for repository services was identified and Open Repository was launched.

This paper will look into what a repository is, why it is necessary and the benefits they can bring to an institution.

2. Benefits of Open Access

Open access increases scholarly communication, increases the audience of the submitted research regardless of whether the institution is known to the user. This can result in an increase in the number of citation counts of the research, as well as the profile of the author, leading to more funding for the institute (depending on which field the research has taken place).

Due to the present economic climate, there is a decrease in the number of subscription journals currently being purchased. Work that is deposited in an open access journal removes this barrier to readership, making the research available to a much wider audience on a global basis.

In support of open access, there are now a number of funder mandates and policies that require institutes to make their research open access. These include the National Institutes of Health (NIH) and Wellcome Trust.

An ideal way of meeting these requirements and achieving green open access is by putting research into a repository.

3. About Repositories

3.1 Why Institutions Require a Repository

A repository is as an open access digital archive which enables a managed and persistent way of making research, learning and teaching content with continuing value discoverable and accessible.

They can either be subject or institutional in their focus supporting research, learning and administrative processes. The submitted content enables staff and institutions to manage and preserve it, deriving the maximum value from it.

Originally, repositories were used to store post-prints of journal articles. Today, they are more commonly being used as a centralised solution for an institution's output. Reasons they have repositories include:

- To comply with funding agencies' mandates and policies.
- To raise the profile of the scholarly output that is held within the institute and maximizes global visibility, not only for the institute but also the authors and researchers.
- To maximise the dissemination of research on a global basis and collect content in a single location to ensure easy management of the output from the library.
- To store and preserve other institutional digital assets, including unpublished or otherwise easily lost ("grey") literature (e.g. theses and technical reports), showcasing this information.

- Dark archives, allowing classified/sensitive and internal information to be kept on a repository without making it open access and therefore for internal use only.

Articles deposited into a repository have persistent access and unique identifiers, ensuring their long-term preservation.

3.2 Additional Uses of Repositories

Repositories are suitable for a number of other uses including:

- For scholarly communication
- To store learning materials and coursework
- To manage collections of research documents
- To preserve digital materials for the long term
- For knowledge management
- As an internal collaboration tool for the researchers and faculties to find co-authors for new research that they may undertake.

4. Benefits of Setting up an Institutional Repository

The diverse uses of repositories mean that they have various benefits for different stakeholders.

4.1 For Researchers

As explained earlier, when a researcher's article is made open access within a repository, citations of it can raise the profile of the author. Repositories also allow the continuous accessibility of research through any web-enabled device, as well as satisfying funder's mandates.

4.2 For Librarians

Repositories provide new ways to archive and preserve valuable work. They allow trends within the institution to be identified and reduce the level of duplication of articles as they are all in a central location.

4.3 For the Institution

Open access institutional repositories are effective marketing tools for the organization, raising its profile within unknown markets through published research. This in turn increases the visibility, reputation and prestige of the institution.

Repositories are also very useful to facilitate the gathering of data such as publications for assessments and audits that the institute may have to adhere to.

It is difficult for organizations to predict what output has been frequently accessed and surprisingly, it is not necessarily the high profiled research that is viewed the most. Repositories with this functionality allow these statistics to be seen and analyzed by the institution.

4.4 Benefits for the Global Community

Within the global community, open access research within repositories means there is free access to scholarly information without any subscription barriers, enabling a wider audience to view the research unlike if the work was circulated in a journal alone. This also enables developing countries to access research they were previously unable to.

In addition to this, as taxpayers fund a large amount of scientific research, funders are now demanding that their funded research is accessible to the public away from academia.

4.5 For the Faculty

Numerous types of documents can be deposited into repositories including pre-prints, post-prints, research findings, working papers, technical reports, conference papers, data sets and other ancillary research material. They can be deposited in various formats including office documents, multimedia and video.

Currently, the likelihood of faculty members depositing articles into a repository varies greatly depending on their publishing trends. However, changes are already being seen in low-depositing fields as the benefits of this evolving product are becoming increasingly evident to faculty members.

4.6 For the Students

Theses, dissertations, projects and performances can all be deposited from students into a repository.

5. Implementing a Repository

5.1 Problems with In-house Repositories

Although the benefits of repositories are clear, many obstacles can occur when they are implemented in-house.

The major problem is that although open source repository software is free to acquire, it can be expensive to implement. The software needs to be sourced, installed by a knowledgeable developer to fit in with the needs of the commu-

nity, and managed by a systems administrator on a daily basis. Often, due to the lack of personnel with the correct skills and other priorities, repository projects can take a long time to implement.

In addition to this, upgrades regularly occur. This means that many institutions continue to run repositories on old versions due to overburdened IT services being unable to implement any changes. Therefore, institutions and researchers are unable to take advantage of any new functions and features.

5.2 Benefits of a Hosted Repository Solution

A hosted repository solution from Open Repository can benefit organizations in a number of ways:

- Simple and quick installation for institutes that can be fully branded, customised and implemented within 3 months.
- Enables organizations to collect, showcase and preserve their scholarly output without any expertise needed by the institute.
- With a minimal amount of information, a fully functioning repository can be delivered.
- Regular upgrades, bug fixes and technical support are provided as part of the service.
- Transparent pricing is available so that budgeting can be easily planned.
- Ownership and control is retained by the customer without needing any technical expertise/hardware from the institute itself.

5.3 Features of Open Repository

Open Repository offers a hosted DSpace enhanced repository solution. DSpace is the most popular open source repository platform globally, with a vibrant open source development community around it both for the development of the platform and the users of the repository platform. Additionally, it has a logical and flexible infrastructure, using a hierarchy of communities and collections.

Some key features of Open Repository include:

- Customization and branding of the repository to suit the organization.
- Enhanced researcher pages enable a personal workspace for them to showcase the items that are held within the repository.
- Historical data can be batch uploaded, taking the burden away from the repository administrators.
- Sophisticated search functionalities are provided, enabling ease of use for the user.
- Enhanced statistics – Open Repository were the first hosted solution to incorporate Google Analytics directly into the repository. It allows re-

porting, audits and assessments whether on an institutional, community, sub-community, collection or item level.

- External article linking to various bibliographic sites and social networking media.
- Training is provided for users & administrators.
- Marketing & PR is provided using the organization's network and BioMed Central's global network as part of the service. This element can incorporate articles in newsletters and journals, tweets, blogs, presentations and soft and external launches.
- Daily back-ups.
- Disaster management at a 3rd party site.

6. Conclusion

An open access repository is a digital archive that enables a managed and persistent way of making research, learning and teaching content with continuing value discoverable and accessible. It provides benefits for numerous internal and external stakeholders including librarians, researchers and the global community.

This paper shared best practice on the benefits of implementing an open access hosted repository, and the route librarians and institutions may take to incorporate stakeholders in it. Repositories are now being used as a centralized solution for the library, and it is the choice of the organization what type of data may be stored in the repository. It also provides a viable solution for the libraries' needs of collating, preserving and reporting on the organizational research information and internal data as a whole.

References

- <http://www.earlham.edu/~peters/fos/overview.htm>
- <http://www.biomedcentral.com/>
- <http://openrepository.com/>
- <http://www.nih.gov/>
- <http://www.wellcome.ac.uk/>

Journals

Open Access and Academic Libraries Journal Subscriptions

Ageliki Oikonomou

University of Piraeus Library

Abstract

Academic libraries acquisitions began to face financial difficulties in the mid-1980s which influenced their collections development. Studies have shown that serial unit costs have growth by 180% and serial expenditures by 132% in the past twenty years (ARL Statistics) which leading libraries to find alternatives solutions to the subscription funding model. In parallel, philosophical and ideological considerations have been denounced as unethical multiple universities pay for articles published in traditional journals. The development and expansion of Internet on the other hand, gave impetus to scientific communication and also helped the spread the movement of Open Access which is the free by local and cultural commitments dissemination of scientific literature. The paper emphasizes on current Open Access (OA) features and their possible impact on academic libraries acquisitions.

Keywords

Open Access, Institutional Repositories, academic libraries, journal subscriptions

1. Introduction

The development and expansion of Internet stimulated strongly the scientific communication and the dissemination of scientific knowledge in general, at the same time, however, the appearance of three additional developments in the commercial publishing industry (publishers mergers, high cost of academic journals and pricing formulas of new journals), led libraries and academic community in this so-called “serials crisis” (Bergman, 2006). The purchase cost of academic journals, especially in Scientific Technical Medical (STM) field, rose significantly more than the general inflation increase in the economy and the budgets of libraries, causing many libraries to spend much more

to get much less. The large increase in the cost of journals in relation to the same of book cost during the period 1986-2002 reached 227% for journals and 75% for books, compared with inflation of the U.S., according to data Statistics from the American Research Libraries (ARL Statistics). Nowadays, it is seemed that the scientific communication and the dissemination of scientific knowledge have radically changed due to the availability of the scientific works free of charge through scientists' personal web sites (Tonta & Unal, 2007) or Institutional Repositories and other forms of OA publishing option.

2. Benchmarking Features of OA

The main features of researchers concerns on OA issues compared with library acquisitions which the literature review presented brought to light a number of characteristics associated with various stages of development and/or the adoption of OA worldwide. For the geographical distribution of the evaluation followed a division into two categories of countries, particularly in terms of space, but also because that there is a globally tendency to assimilate the conditions and views of the countries of Europe and other developed countries (USA, Australia, etc.) compared with the others, the so-called developing countries. Generally, the electronic scientific communication, dominated by the most developed countries (Oppenheim, 2008), as shown by researchers in all countries, has changed ways and channels of diffusion. Undoubtedly, scientific communication has benefited from OA publishing which is likely to reduce costs and improve efficiency of funds spent on Research and Development (R&D) (Houghton & Sheehan, 2006) on public expenditures and libraries in different countries offering free access to research worldwide (Oppenheim: 2008, Sachini et al.: 2009). Overall, the results of scientific communication funded by the state for the majority of researchers indicated that should be public property and freely disseminated to the research community and the general public (Dala Sala & Grafman: 2009, Kierkegaard: 2009), but this process seems to require reliable computer networks and reliable telecommunication technology which are not available in undeveloped countries like China, Sri Lanka or others (Garusing Arachchige: 2009, Fang & Zhu: 2006). Large publishing organizations and non-profit entities, in developed countries especially, have begun to adopt (Oppenheim: 2008, Dala Sala & Grafman: 2009) or create new authorities of disposal scientific knowledge to cope with the increased needs of the global community (Sachini et al., 2009) and to adapt to the demands to reduce prices of their journals (Fang & Zhu, 2006). Furthermore, everyone agrees that the dissemination of new methods and standards provided by the OA is needed between the various stakeholders (Kersting & Pappenberger: 2009, Walker: 2009), between local (Kersting & Pappenberger, 2009) or international level for the least developed countries (Irvwieri

Welfare, 2009) and introducing authors to technical or other aspects of this new scientific publication process by which potentially they can increase the impact of their research production (Nickolas et al., 2007).

OA is recognized as an important factor in removing financial and other constraints that prevent researchers from developing countries to global knowledge (Bankier & Perciali: 2008) and is more diffuse in developing countries than in Western Europe and North America (Houghton & Sheehan, 2006). However, OA is not spread across all developing countries (Fang & Zhu: 2006, Garusing Arachchige: 2009) due mostly the poor state initiatives and the anxiety or reluctance of publishers to reduce their incomes. But, it is recorded that, already many initiatives adopted OA through volunteer efforts of researchers (Fang & Zhu, 2006) or through early interventions by the state (Garusing Arachchige, 2009).

Main problems of the OA publications considered to the most researchers the quality (Suber: 2008, Kaufman & Wills: 2005, Tsakonas & Papatheodorou: 2008) of articles submitted to OA archives/journals, the insurance of assessment procedures (peer review) to full OA new journals and the question is whether its business model could be sustainable. Some researchers (Suber: 2008, Campbell & Wates: 2008) proposed the adoption by the editors or the sponsors the author-pays model, which will provide an alternative source of income in order to ensure the continuity and the necessary traditional publishing process.

For the broader issue of self-archiving researches show that there is a significant difference in the tendency of authors to deposit their works of each discipline (Xia, 2008) associated with individual perceptions of authors and also a trend in which many authors prefer to deposit more than in thematic repositories than in Institutional Repositories. Also, it is noted a reluctance on authors to self-archiving (Xia: 2008, Garusing Arachchige: 2009, Bankier & Perciali: 2008) at global level which leads to reduced coverage of the Repositories collections. Developing countries, in particular, face poor but necessary initiatives by local governments (Garusing Arachchige, 2009) as well as problems related to the lack of proper equipment, insufficiency of digital material for deposit, inadequate technical knowledge of librarians for assistance and various concerns of editors/authors for the intellectual rights. Furthermore, the need for collaboration of academic institutions, state and other entities identified by researchers as a factor in strengthening the procedures for self-archiving.

The copyright restrictions are an important factor discouraging authors to deposit in an OA archive at international level. For the developing countries, particularly where the maintenance and integrity of scientific knowledge is treated more as a challenge (Kanyengo, 2009), copyright restrictions are a further issue that requires education and information for librarians and all others involved in research process. Similar concerns exist in most developed countries, where there are differences in attitudes about copyright between

authors and publishers (Morris, 2009). Specifically, it appears that there are often misconceptions about the rights and obligations on both sides thus preventing the eventual intention of authors on deposit in OA repositories.

Developing Institutional Repositories appears to be a major factor in the progress of OA to all countries (Kersting & Pappenbenger: 2009, Bankier & Perciali: 2008: Kuchma, 2009) which results from their early creation. While the developing countries seemed to be most concerned with issues of early development of Institutional Repositories, such as the need for initiatives by the university administrations for their creation (Kuchma, 2009), in other countries face more complex issues. That is, countries that developed early Institutional Repositories recognize that it is important the mandatory filing of authors in order not to remain empty (Bankier & Perciali: 2008, Albanese: 2009), an adequate institutional commitment and the need of developing the OA Gold model which means to be developers of OA journals (Bankier & Perciali: 2008, Walters: 2007). Also, in countries such as USA, Australia etc., repositories managers indicate that their future development issues will be the issues of delimitation of roles and responsibilities of individual staff (Henty: 2007, Jones: 2007), quality content, promotion and advertising of the service (Albanese: 2009, Henty: 2007), maintenance issues, grants and data interoperability problems (Jones, 2007). However, what most agree is that libraries and librarians are invited to take new and more enhanced roles (Walters: 2007, Bosc & Hamad: 2005) and encourage the academic community in adoption of this new form of scientific communication through the projection of the service and encouraging authors to deposit new material.

The concept of academic journals Acquisitions budget has for years turned into an option to purchase a license to view (Sale, 2007) at international level. Since the budgets of academic libraries around the world have begun to decline, the librarian began to seek solutions to serve their users. International researches (Morris: 2009, Beckett & Inger: 2006, Ware: 2006, Walters: 2007) indicate that librarians have an increasing tendency to substitute OA materials for subscribed resources due to their free of charge availability. However, researchers agree that the short-term development of OA choice for acquisitions in academic libraries can not provide us with reliable conclusions about whether OA is an important factor leading to possible journal subscriptions cancellations (Morris: 2009, King & Alvarado- Albertorio: 2008, Houghton et al.: 2009).

3. Estimations for Subscription Cancellations

The OA publishing policies by benchmarking their main characteristics emerged that can be: welcomed by the authors, consistent with the restrictions of copyright, accepted by the academic community, aligned with the objectives of most institutions and sponsors, and also be effective.

In the current financial year, 2010, low cost, high returns on R&D and greater flexibility will be appreciated and may lead several libraries to cancellations or cuts in collections (ARL, 2009). For these reasons the OA can be an alternative to the diffusion of science communication, a method of strengthening research and a new source of information for library users. But the literature review showed that librarians consider that the premature records of OA publishing can not effectively replace the traditional subscription model and are not a strong factor in changing their acquisition policies.

However, there are changes in the diffusion of scientific communication mainly because of the economic hardship data which affect libraries and society in general. Overall, OA will not yet affect the library acquisitions policies since their decisions depend on also other criteria such as their use and their impact (Beckett & Inger: 2006, Ware: 2006). But libraries, can help in spread and support self-archiving in order to broaden their sources of information.

4. Conclusions

The survival of the libraries affected by a succession of social, political and economic factors such as the ever escalating increase in acquisition expenditures, the state reluctance for adequate funding, the staff shortages and the constant pressure of publishers/suppliers in checking and obtaining information.

The collections of academic libraries in particular, even when they have the most generous budgets can not cover the increased needs of the faculty research and the users' needs in general.

The OA publishing is a new method of dissemination of scientific communication and promotes, mostly, the public funded research and information. It could be a viable alternative model of scientific communication and it may make a real difference in saving of library budgets. However, for its successful implementation, as emerged from a literature review of recent articles, there are several issues that need further analysis. Among them are the sustainability concerns of its business model, quality issues (e.g. the presence or absence of peer-review process), the impact (e.g. number of citations) or the adoption of Gold Road model (purely OA journals), copyright issues, authors grant, the reluctance or non-activation of authors to deposit articles in OA archives and low or inadequate functioning of Institutional Repositories. Nevertheless, the literature review revealed answers and solutions to the above problems of OA, which apply at international level on all players and participants in this new form of scientific communication. The present system of publishing and promoting scientific research may remain the preferred, but it will have face competition for survival and be obliged to make changes. Regarding the possible cancellation of subscriptions to academic journals by libraries, research has

shown that there are still no safe answers, mainly because of the short-term existence of OA. The process of journal subscriptions cancellation is a decision that is taken together with the entire educational community, but librarians are the ones who take initiative through the use of periodic tests, consultations, financial management and/ or data collection from their users. The librarians' responses show a trend for future subscription cancellations when there is a variety of quality scientific articles are freely available and when there is a timely availability of an article because delay reduces the validity of their content. Then, the libraries will be invited to respond.

References

- Albanese, A. R. (2009). *Institutional repositories: Thinking Beyond the Box. Repositories leapt into the national spotlight in 2008. Now what?* Library Journal. 3/1/2009.
- ARL Statistics. <http://www.arl.org/stats/annualsurveys/arlstats/>
- Association of Research Libraries (ARL) (2009). *ARL Statement to Scholarly Publishers on the Global Economic Crisis. February 19, 2009.* [Internet] <http://www.arl.org/bm~doc/economic-statement-2009.pdf>
- Bergman Sherrie, S. (2006). *The scholarly communication movement: highlights and recent developments.* Collection Building. 25 (4), pp. 108-128.
- Bankier, J.-G. & Perciali, I. (2008). *The Institutional repository rediscovered: what can a university do for open access publishing?* Serials Review. 34, pp. 21-26.
- Beckett, Ch. & Inger, S. (2006). *Self-Archiving and Journal Subscriptions: Co-existence on Competition? An International Survey of Librarians' Preferences* http://www.publishingresearch.net/documents/Self-archiving_summary2.pdf
- Boss, H., Harnad, St. (2005). *In a paperless world a new role for academic libraries: providing open access.* Learned Publishing. 18 (2), pp. 95-99.
- Campbell, R. & Wates, E. (2008). *Subscription-based Journal Publishing.* In: European Commission, Directorate-General for Research; German Commission for UNESCO, Open access: opportunities and challenges; a handbook, Luxembourg: Office for Official Publications of the European Communities. pp. 93-96.
- Dala Sala, S. & Grafman, J. (2009). *Cortex new open policy.* Cortex. 45, pp. 135-136.
- Fang, C., Zhu, X. (2006). *The open access movement in China.* Interlending & Document Supply. 34 (4), pp. 186-193.
- Garusing Arachchige, J. J. (2009). *Promotion of Open Access through self-archiving in Sri Lanka: getting experiences from E-LIS.* 7th National Conference on Library and Information Science – NACLIS 2009, Colombo, Sri Lanka, 25 June, 2009.
- Henty, M. (2007). *Ten Issues In Proving a Repository Services in Australian Universities.* D-Lib Magazine. [on-line]. 13 (5/6).
- Houghton, J. & Sheehan, P. (2006). *The economic impact of enhanced access to research findings.* CSES Working Paper No. 23. July 2006. [Internet]. <http://www.cfes.com/documents/wp23.pdf>
- Houghton, J. et al. (2009). *Economic implications of alternative scholarly publishing models: Exploring the costs and benefits.* Report to The Joint Information Systems Committee (JISC), Victoria University & Loughborough University. [on-line].

- Irivwieri Welfare, J. (2009). *Research into open access science publishing*. Library Hi Tech News. 26 (3/4), pp. 16-18.
- Jones R. (2007) Giving birth to next generation repositories. International Journal of Information Management. (27), pp. 154-158.
- Kanyengo, W. Chr. (2009). *Managing digital information resources in Africa: preserving the integrity of scholarship*. The International Information & Library Review. 41, pp. 34-43.
- Kaufman, C. & Wills, A. (2005). *The facts about Open Access: A study of the financial and non-financial effects of alternative business models on scholarly journals*. Baltimore: Kaufman-Will Group, LLC, 2005.
- Kersting, A. & Pappenberger, K. (2009). *Promoting open access in Germany as illustrated by a recent project at the Library of the University of Konstanz*. OCLC Systems & Services: International digital library perspectives. 25 (2), pp. 105-113.
- Kierkegaard, S. (2009). *Open access to public documents—More secrecy, less transparency!* Computer law & security review. 25, pp. 3-27.
- King, D., Alvarado-Albertorio, F. (2008). *Pricing and other means of charging for scholarly journals: a literature review and commentary*. Learned Publishing. 21 (4), pp. 248-272.
- Kuchma, I. (2009). *Open Access Policies in Developing and Transition Countries*. [on-line]. World library and information congress: 75th IFLA General Conference and Council, 23-27 August 2009, Milan, Italy.
- Morris, S. (2009). *Journal author's right: perception and reality*. PRC (Summary Paper 5). [Internet].
<http://www.publishingresearch.net/documents/JournalAuthorsRights.pdf>
- Nickolas, D. et al. (2007). *Open access in context: a user study*. Journal of Documentation. 63 (6), pp. 853-878.
- Oppenheim, Ch. (2008). *Electronic scholarly publishing and open access*. Journal of Information Science. 34 (4), pp. 577-590.
- Sachini, E. et al. (2009). *Open Access in the humanities: a case study of developing three open-access journals in Greece*. Proceedings of ELPUB 2009: 13th International Conference on Electronic Publishing: Rethinking Electronic Publishing Innovation in Communication Paradigms and Technologies. Milan, Italy 10 June 2009–12 June 2009.
- Sale, A. (2007). *A Challenge for the Library Acquisition Budget*. D-Lib Magazine. 13 (5/6).
- Suber, P. (2008). *Open Access and Quality*. DESIDOC Journal of the Library and Information Technology. [on-line]. 28 (1), pp. 49-56.
- Tonta, Yasar and Unal, Yurdagul (2007). *The impact of electronic journals on document delivery services*. ELPUB2007. Openness in Digital Publishing: Awareness, Discovery and Access-Proceedings of the 11th International Conference on Electronic Publishing, Vienna, Austria 13-15 June 2007.
- Tsakonas, G., Papatheodorou, Ch. (2008). *Exploring usefulness and usability in the evaluation of open access digital libraries*. Information Processing and Management. (44), pp. 1234-1250.
- Walker, St. (2009). *Bioline International: a case study in the open access and its usage for enhancement of research distribution for scientific research from developing countries*. OCLC Systems & Services: International digital library perspectives. 25 (2), pp. 125-134.
- Walters, T. O. (2007). *Reinventing the Library-How Repositories Are Causing Librarians to Rethink Their Professional Roles*. Portal: Libraries and the Academy. 7 (2), pp. 213-225.

- Ware, M. (2006). *ALPSP survey of librarians on factors in journal cancellation*. [Internet]. http://www.alpsp.org/ngen_public/article.asp?id=200&did=47&aid=157&st=&coaid=-1
- Xia, J. (2008). *A comparison of Subject and Institutional Repositories in self-archiving practices*. *The Journal of Academic Librarianship*.34 (6), pp. 489-495.

Copyright and Open Access Journals in Greece

Assimina Vlachaki

University of Athens Library of Health Sciences and

Christine Urquhart

Aberystwyth University

Abstract

Modern copyright policies reflect, to some extent, two different legal perspectives, prevention of piracy or “droit d’auteur” (author rights). This paper discusses how Greek biomedical research authors react to copyright and open access. The publisher perspective is examined through a survey of Greek publishers on copyright policy and open access journals in biomedicine. The findings indicate confusion and ignorance among the researcher authors, with little evidence of increase in knowledge about open access between 2007 and 2010. Publishers are generally happy to allow self-archiving but wish authors to ask for permission first. Concludes that publishers’ views of copyright follow piracy prevention, authors need to be alert to their rights (droit d’auteur).

Keywords

Copyright, open access, biomedicine, Greece

1. Introduction

The advent of printing press in the fifteenth century was inter-related with new social circumstances. Until that era, access to the manuscripts was a privilege for the few, while the illiteracy of most of the population portrayed people’s generally poor educational status. The new type of book production was, however, quick and prices were lower. Consequently, with easier reproduction, piracy was encouraged and commercial interests were affected. England became the first country which implemented trade control of books and other countries such as France followed. Although copyright legislation in England provided some protection for author, the emphasis was to prevent piracy and

ensure publishers were fairly rewarded. English “Copyright” terminology means the right of making copies, but the French Law was based on “droit d’auteur” the right of the author, the right to dispose of his or her work as he or she wishes. The UK 1988 Copyright Law recognized the “first ownership of copyright” to the author but not in the case in which the work is an artefact of employment; in this case the employer is the first owner. As far as Greece is concerned, the first completed and actual law on intellectual property was integrated into Greek legislation in 1920, much later than in England and France. Different reasons for this delay have been proposed. One is the later transition from oral to literate culture Geller (2000). Another possible reason is a greater acceptance of the democratization of knowledge in Greek society. The law 2387/1920 was shaped according to the French “droit d’auteur”. But the most important law in Greek legislation about this subject is 2121/1993 because it revised previous law and was adjusted to comply with the directives of European Community. This law has been in force since then (1993).

Intellectual property has different philosophical meanings Spinello & Tavani (2005). Nowadays, the Internet has made copy and publication much cheaper and easier. It is not surprising that the growth of open access journals, with new business models for publishing, have required a re-assessment of copyright aims and objectives. However, interest in copyright is uneven. Rowlands et al. (2004) in an international survey of authors found that authors (particularly older authors, and authors based in medical schools) were not interested in copyright, although authors based in hospitals were more interested in copyright. The reasons for this are unclear, but few authors were totally happy with prevailing copyright conditions. The survey did not ask for views on responsibilities for dealing with the situation. Harper (2009) calls for new business models that can fund the creation of works, which is still going to be costly, whichever publishing route is used, without sacrificing the benefits of digital distribution, almost free, to anyone who needs to access the work.

Since 2004, several surveys have been conducted to detect the knowledge and attitudes of researchers towards open access. The Spanish survey conducted in 2004 Hernando-Borges et al (2006) showed that only 22% of respondents were aware of access publishing models. Swan and Brown’s studies Swan & Brown (2004) found that awareness of open access remained at a low level. Recent research indicates that the level of awareness remains low. Swan mentioned in her study results published in 2008 that researchers remain poorly informed about open access. Awareness is growing but still only slowly and there remain many misconceptions. Researchers are eager to maximise their own impact and reputation but do not understand what means and opportunities are available to them. A survey conducted in 2007 in Cuba by Sánchez-Tarragó & Fernández-Molina (2009) emphasized the problem even more as they stated that over 50% of the Cuban biomedical researchers included in the study stated that they had never heard of open access journals, a surprising

statistic given the greater access provided by open access journals to readers who cannot afford high journal subscriptions.

The aims of this paper are 1) to discuss the findings of a survey of Greek biomedical publishers on copyright and open access, and 2) to compare these with findings from two surveys of biomedical researcher authors in Greece.

2. Methods

The sample of Greek scholarly biomedical publishers was chosen to include the following:

1. High quality journals based on age and/or regularity of publication.
2. Open access journals (Greek, and international but with Greek editors).

Fourteen publishers were identified and contacted mostly by telephone, and of these ten agreed to participate. The interview schedule was based on a Spanish questionnaire to Spanish biomedical publishers Dulcinea Project (2008). The questionnaire was translated into English by one of the authors [CU] and then translated into Greek by the other author [AV]. Initial contacts emphasized the need for reducing the time required for the interview. Accordingly, the initial section of the questionnaire which asked for factual data about the journal was completed in advance by the interviewer [AV] and checked for accuracy in the interview. The questionnaires (including the part completed version) were sent to the interviewees prior to the telephone interview. Interviews were conducted between January and February 2010. Interviewees were generally very helpful and contributed additional comments on publishing procedures.

A survey of biomedical researchers ($n=70$, response rate= $62/70$) in hospitals and the University of Athens was conducted in early 2007. A convenience sample was used. The questions were the same as those used in another survey Hernandez-Borges et al. (2006), with minor adaptations. The questionnaire was translated into Greek. Of the 62 returns, there were 59 usable responses. The questions were concerned with publishing activity, awareness of open access publishing, attitudes towards open access sources and sources of information about open access. Questionnaire data were entered into SPSS for further analysis. A second phase of the survey, with minor modifications was conducted in early 2010, with a different sample of biomedical researchers in Athens. The response was similar to the first phase ($n=70$, response rate= $59/70$), with 59 usable responses.

3. Results

This paper focuses on the findings from the interviews and the questionnaires that concerned copyright and open access.

All but one of the publishers permitted self-archiving but in interviews it was clear that the publishers wanted authors to apply for permission in order to monitor such activity.

Nine out of ten publishers allowed authors to self-archive the post print (journal) version to avoid duplicate publication, one publisher permitted self-archiving of the post-print (author version with corrections made after reviewing). One publisher commented that the existence of the paper in two websites would be confusing for the readers. Publishers were content for authors to self-archive on personal web pages (n=9), institutional repositories (n=8) or subject repositories (n=8). Self-archiving was mostly permitted immediately on publication of the journal version (n=8), one allowed self-archiving after acceptance of the manuscript. Most of the publishers (n=8) considered themselves in the blue Romeo – Sherpa category (self-archiving of the post-print version), one was in the white category (no self-archiving permitted) and one was in the green category (self-archiving of both the pre-print and post-print permitted). No publisher provided details of Creative Commons Licences.

In phase one of the questionnaire survey of biomedical researchers, the majority of respondents (n=32/57, two null responses) were not aware of open access publishing, and 43.9% (25/57) were aware. Surprisingly, in phase two the results were similar (n=34/59 were unaware of open access publishing, n=25/59, 42.4% were aware). In phase one, the majority of respondents (31/53, with six null responses) had no opinions over their knowledge or lack of knowledge about copyright in open access journals. Similarly, in phase two, most respondents had no opinion (n=22/47, with 12 null responses). The high number of null responses could also indicate a lack of opinion on the topic. A slighter higher percentage in phase two (34.0%, 16/47) stated they were uncertain about copyright in open access journals compared to phase one (20.8%, 11/53).

Statistical tests were conducted to check for any association between usage of open access journals and state of uncertainty about copyright in open access journals. Unfortunately, very low numbers of respondents stated they were certain about copyright, despite not using open access journals (unsurprisingly). This meant that the chi square test was invalid, and there were complications over using the Fisher exact test. In phase one, the majority of respondents (n=31/53) indicated that they did not know about their usage of open access journals, and they were also unable to state whether they were certain or uncertain about their knowledge of copyright in open access journals. The respondents were very doubtful about their state of knowledge, therefore, although the majority of those who had used open access journals (n=36) were

able to state they were uncertain about copyright in open access journals (n=10) or certain (n=11). In phase two, the proportions were similar apart from the group who claimed they were unfamiliar with open access journals, and were definitely uncertain about copyright in open access journals. The simplest interpretation of the changes was that respondents in the second phase survey were more aware of their state of ignorance (knowing that they did not know about copyright of open access journals). Perhaps they are at a cross-over point, when acknowledgement of ignorance leads to a need for learning, but that can only be speculation.

4. Discussion

As far as this survey concerned the findings from phase 1 and phase 2 confirm other research that general awareness of open access among biomedical researchers is still comparatively low (Hernando-Borges et al. (2006) Sánchez-Tarragó & Fernández-Molina, 2010), little different from researchers in general (Swan (2008)). In fact, for the population of biomedical researchers in Athens, knowledge does not appear to have increased at all between 2007 and 2010. The small size of the sample makes it impossible to say for certain that knowledge among biomedical researchers in Athens has decreased (the confidence intervals for the percentages overlap) but equally, there is no significant increase. The Greek levels of awareness fall somewhere in between those of Spain (in a 2004 survey) and the later Cuban survey in 2007.

The situation over copyright in open access journals seems complicated. Biomedical researchers seem to ignore the matter of open access journals' copyright, and as Swan (2008) identified, authors often do not understand copyright regulations in general. The ignorance of open access journals' copyright in this survey, and the large percentage of respondents in both phases of the survey who could provide no opinion on their state of certainty (or not) about copyright confirms this. Further examination of the instructions to authors on some of the publisher sites suggests that publishers themselves provide little guidance to authors on their rights. One publisher that claimed to offer guidance in fact focused on publishers' rights rather than authors' rights (again, reflecting the common practice noted by Swan (2008)). In instructions for authors the reference to author's rights is generally too short, and more analysis of the content of publishing agreements will be undertaken to clarify this. Nevertheless, the publishers (especially scholarly societies) have a positive attitude towards self-archiving of published articles, but only after authors have applied for permission from the publishers. In this way, publishers can be aware of the usage of their articles, avoiding the duplication, or republishing "their" publications. Most of the Greek biomedical publishers fell into the "blue" Romeo category, unlike the (larger) Spanish survey of publishers (Melero et al.

(2009) which found that only 45% did. Even publishers of open access journals are not informed about Creative Commons Licences. As noted in the Spanish survey of publishers Melero et al. (2009), publishers themselves may be a little confused.

This confusion could be attributed to the divergent views on the purposes of copyright. The Greek biomedical publishers wanted authors to apply for permission, and piracy, via duplicate publication without attribution, bothered them. Authors' rights do not concern the publishers very much, but authors themselves are ignorant, or simply do not seem to need to care. Copyright transfer to the publisher, as Swan (2008) notes, has become a habit. With digital publication and easier re-use of material, authors need to be more vigilant, but there are few mechanisms for ensuring that they do become more aware. Publishers may have few incentives, and librarians may need to work with scholarly societies, to ensure that authors are made aware of rights and responsibilities.

For the Greek biomedical publishers, the main concern was to monitor authors' actions in self-archiving, to ensure, presumably, that any self-archiving publicised the journal. As scholarly publishers, prestige is important for them. Scholarly publishers have debated various options for adopting or integrating open access Prosser (2003); Velterop (2003) but often their concerns have, understandably, been to maintain their revenues. The question of authors' rights has not been a prominent concern for many scholarly publishers facing open access publishing challenges. As already indicated, the next phase of the research will include examination of the content of existing publishing agreements and instructions to authors about copyright. Such analysis could help the Greek biomedical publishers improve the guidance they offer.

A major open access publisher in biomedicine is Biomed Central, which is now part of the Springer Group, a healthcare publisher originally founded in Germany. Interestingly, a survey in Germany in 2006 Hess et al. (2007) found that although the medical researchers had least experience of open access journals, there was the intention to publish in open access journals. Biomed Central's business model is to encourage institutions to join as members, allowing discounts over article processing charges. An announcement on the Biomed Central blog (28 June 2010) notes the start of SpringerOpen, a series of journals covering all scientific, technical and medical disciplines. Articles published in SpringerOpen will be immediately and freely available online, licensed under the Creative Commons Attribution Licence. Smaller scholarly publishers, particularly those who work independently of publishers' associations, need to be able to compete, on their own terms, with such developments. The future for small scholarly publishers in countries such as Greece is unclear.

5. Conclusions

Survey findings show that the biomedical researchers in Greece seem to be very unaware and uncertain about open access publishing and the copyright policy of open access journals. In addition, biomedical publishers seem to have no knowledge on the subject of Creative Commons Licences as they do not use them in order to protect their rights as copyright holders, and to protect authors' rights. The apparent ignorance of both groups of stakeholders is an indication that more factual information has to be provided. Librarians have to act not simply to promote open access journals for readers. They also need to help authors understand their rights, as well as providing more factual information about aspects such as impact factors, copyright and peer review processes. The next phase of the research will include a content analysis of publisher agreements and instructions to authors among Greek biomedical journals. Another future survey should be conducted to clarify whether knowledge and attitudes of biomedical researchers towards open access publishing in Greece has changed as a result. Ideally, this should be a larger survey of sufficient power to detect whether there have been significant changes.

References

- Dulcinea (2008). *Revistas científicas españolas y los derechos sobre el auto-archivo de sus trabajos*. Available from URL:
<http://ignucius.bd.ub.es/repositorio/index.php?sid=76761&lang=es>
- Fry J., Oppenheim C., Proberts S. (2009). *Peer Behavioural Research: Authors and Users vis-à-vis Journals and Repositories*. Available from URL:
http://www.peerproject.eu/fileadmin/media/reports/Final_revision_behavioural_baseline_report_-_20_01_10.pdf
- Geller, P. E. (2000). Copyright history and the future: what's culture got to do with it? *Journal of the Copyright Society of the USA*, Vol. 47, 209 – 264.
- Harper, G. (2009). OA and IP: open access, digital copyright and marketplace competition. *Learned Publishing*, Vol. 22, 283 – 288.
- Hernández-Borges, A. A., Cabrera, Rodríguez, R., Montesdeoca-Melián, A., Martínez-Pineda, B., Torres-Álvarez de Arcaya, M. L. and Jiménez-Sosa, A. (2006). Awareness and attitude of Spanish medical authors to open access publishing and the “author pays” model. *Journal of the Medical Library Association*, Vol. 94, 449 –451.
- Hess, T., Wigand, R. T., Mann, F. and von Walter, B. (2007). *Management report 1/2007: Open access and Science Publishing – Results of a Study on Researchers' Acceptance and Use of Open Access Publishing*. Available from URL:
http://openaccess-study.com/Hess_Wigand_Mann_Walter_2007_Open_Access_Management_Report.pdf
- Melero, R., Abad, M. F., Abadal, E. and Rodríguez Gairín, J. M. (2009). DULCINEA: copyright policies and type of access to Spanish scientific journals. Available from URL:
http://elpub.scix.net/data/works/att/89_elpub2009.content.pdf

- Prosser, D. (2003). From here to there: a proposed mechanism for transforming journals from closed to open access. *Learned Publishing*, Vol. 16, 163–166.
- Rowlands, I., Nicholas, D. and Huntington, P. (2004). *Scholarly communication in the digital environment: what do authors want? Findings on an international survey of author opinion: project report*. London: City University, Centre for Information Behaviour and the Evaluation of Research. Available at URL:
<http://www.ucl.ac.uk/ciber/ciber-pa-report.pdf>
- Sánchez-Tarrago, N. and Fernández-Molina, J. C. (2010). The open access movement and Cuban health research work. *Health Information and Libraries Journal*, Vol. 27, 66- 74.
- Spinello, R. A. and Tavani, H. T. (2005). *Intellectual Property Rights in a Networked World: Theory and Practice*. Hershey: Information Science Publishing.
- Swan, A. (2008). *Key Concerns within the Scholarly Communication Process: Report to the JISC Scholarly Communications Group*. United Kingdom, Truro: Key Perspectives.
- Swan, A. and Brown, S. (2004). Authors and open access publishing. *Learned Publishing*, Vol. 17, 219 – 224.
- Velterop, J. (2003). Should scholarly societies embrace open access (or is it the kiss of death?). *Learned Publishing*, Vol. 16, 167–169.

Publications and Publishing

Open Access Collaborative Disciplinary Repositories – An Alternative Publishing Model

Roxana Theodorou

Ionian University, Dpt Archive and Library Science, Corfu, Greece and

Ourania Konsta

Library of Ionian University, Corfu, Greece

Abstract

Given the fact, that libraries are facing serious economic hardship for quite a long time now, with no actual solution to the problem, this paper is trying to propose an alternative publishing method, based on open access, institutional repositories and peer review, in order to facilitate the dissemination of scientific information.

Keywords

Open access publishing, open access repositories, academic libraries, publishing models, academic journals, peer-review, scientific information

For the last two decades at least, academic (and not only) libraries are facing serious economic problems that do not allow them to serve their purpose to the fullest. Additionally to that, subscriptions to scientific journals have been rising to extraordinary levels, making the situation even more difficult. In fact, between 1975 -1995 the prices of subscription based journals have risen to 300% above inflation. After 1995 and until today, subscriptions continue to rise rapidly, although, to be fair, not as much or as fast as previously (Tenopir and King, 1997). It has, however, become clear, that library budgets cannot meet these financial demands. So, they have to face their problems in some other way, mainly by forming consortia and negotiating the prices with the publishers and trying hard to address the needs of their users as best as they can.

But how did the publishing world became so tough? Until WW2 academic publishing was mainly in the hands of universities and learning societies (Cox,

2005). With the end of WW2 there was an ever rising interest in science and scientific information. Commercial publishers saw an opportunity there and were very keen and quick to invest, buying out small publishers or simply by founding new journals. Through time and after many mergers and acquisitions, today, scientific publishing is in the hands of a few, very important and very fierce publishers. And because of this new found oligopoly they have the power to decide and enforce the rules of the game.

Additionally, Academic publishing belongs to a special kind of market; it's a two-sided market (Rochet & Tirole, 2005, Roson, 2005). Two-sided markets, also called two-sided networks, are economic networks having two distinct user groups that provide each other with network benefits. Example markets include credit cards, composed of cardholders and merchants; HMOs (patients and doctors); operating systems (end-users and developers), travel reservation services (travelers and airlines); yellow pages (advertisers and consumers); video games (gamers and game developers); and communication networks, such as the Internet. Benefits to each group exhibit demand economies of scale. Consumers, for example, prefer credit cards honored by more merchants, while merchants prefer cards carried by more consumers. In two sided markets the act of creating a good and giving it to consumers cannot be separated. That, in fact, means that the intermediate has an additional power in deciding the price of the product.

Another paradox about academic publishing is the fact that the end user (namely the reader) is rarely ever burdened with the cost of the product. Libraries are those that have to pay for scientific journals and ensure that the users will have continuous and unhindered access.

Also, the authors of scientific content almost in whole belong to the institutions that buy their works in the form of published articles. But the fact is that part of the authors' salaries is for that purpose exactly: to research, write and publish their conclusions. So the institution ends up paying twice for the same product, which partly belonged to them in the first place.

In order for libraries to cope with the increasing prices of subscriptions they have formed coalitions that negotiate with the publishers in order to ensure lower rates and better terms of access. And although, at first there was some success, the prices are still too high, and with the help of secret deals with some of the partners of coalitions publishers have managed to prevail, once again.

Open access is a very popular term nowadays. There are many implementations of open access with the two most important being open access journals and open access repositories. Each implementation has its own advantages and disadvantages that academic libraries and institutions can examine and try and find the most efficient way to publish scientific information.

The goal is always to create a product that is cheap (or at least cheaper), easy to use, reliable and of high quality. Using the experience of the past and

combining partnerships through coalitions and open access implementations, we now propose a new publishing system that could take libraries and institutions out of their very difficult situation.

The business model of coalition publishing is based on the idea of “returning” the dissemination and administration of scientific publishing to the hands of academic institutions and their corresponding libraries. The basic idea is this; institutions of the same scientific interest form publishing coalitions and create and maintain cross institutional repositories in which they publish (in electronic form only) all the scientific production of their members (and anyone else interested, as long as the works cover the given subject). But, in order for these repositories to be able to compete against subscription based journals their contents should be of high quality. That means that they should undergo some kind of selection policy, the best till now being, peer review.

Half of the existing open access repositories are subject based. And only 13% (OpenDOAR, 2010) of those are cross institutional. But, till now, there are no certain selection policies enforced that ensure the quality of the contents. And there is no certain way to tell either, what *kind* of works is accumulated in them (theses, articles, preprints or post prints, teaching material etc). It would then be fair to say that till now, the contents of institutional repositories are not considered equally useful and credible as that of scientific journals.

Most academic and scientific libraries in their effort to develop and offer e-services to their users come to face a phenomenon known as competitive convergence. This actually means that competitive establishments, in their effort to obtain competitive advantage, come to use the same techniques and offer the same services in a similar way. The only way to break this vicious cycle is for a business to try and find the functions that make it unique in its market and try and use them to its benefit. In the case of academic libraries that could mean that they have to manipulate and use some the practices of their competitors.

A subject based repository has a starting advantage. Its content is fairly obvious. The user can automatically know which science is covered in any particular repository and not lose time and effort looking among information irrelevant to her research. But of course, thematic relevance is not enough. In order for a repository to be really of use to its users has to be exhaustive, inclusive, valid, and up to date. These characteristics can only be achieved through the active participation of as many authors as possible. But authors also need some incentives in order to submit their works in a repository, instead of an established scientific journal. The repositories should provide that:

- In the coalition take part scientific/research and teaching institutions acclaimed internationally at their respective fields. This will draw to the coalition smaller institutions which wouldn't otherwise attempt such an ambitious project. It will also give the guaranty needed to the authors for the credibility and longevity of the repository.

- The repository should include as many file formats and genres of works as possible. On the same time though there must be a strict selection policy enforced, that will clearly state what should and should not to be included in the repository. This two should be carefully balanced so that they do not to mutually cancel one another.

Much like traditional library coalitions, cooperative subject repositories have to be centrally controlled in order to function properly. But on the same time, the goal has to be the creation of a flexible and effective cooperative union in order to survive in the world of scientific publishing.

Probably the most effective way to go about it would be to create a central management system that would encompass the basic logic of a P2P network. That way all of the participants will have equal access to and share resources, control and responsibility of procedures. P2P networks can be separated into 3 different categories.

1. Centralized (1st generation) networks. There is a centralized index server on which is stored information about the contents of the files that the users wish to share. Users search the index server and when the desired document is found a link opens between the user and the owner of the file. (Napster and DC++ are examples of such networks)
2. Decentralized (2nd generation) networks. The philosophy here is completely different. Every system that participates in the network serves both as client and as server. As long as someone is connected to the network with the use of the appropriate software his existence is made known to a small group of connected computers, which in turn, make their existence known to a larger group of computers etc. The user can, this way, search for any information on the shared files between the connected computers.
3. 3rd generation. These networks have mainly characteristics of anonymity, like Freenet and Entropy. They are decentralized, and their philosophy is based, besides anonymity, on high viability, constant file sharing, and encoding, so that no one ever can take absolute charge of the network. This kind of networks is still evolving and has been characterized as small global networks.

Creating small and closed off repositories will not contribute much to scientific information. One main reason why repositories exit is that they function as a vivid, living, growing advertisement of the institution they belong to and an easy way to manage their scientific production. But a repository could not be only that, otherwise it is damned to wither and die.

It would be difficult to describe in such a short time the whole organization of the proposed model. But, in rough terms the concept is this:

1. Following the necessary negotiations institutions of the same orientation agree to form a publishing coalition. In order to maintain the cost low, publication should be only in electronic form.
2. The definitive structure of the coalition will not be discussed at this presentation but it would certainly have a basic managerial department that organizes the whole business, and two basic departments one for administrative and another for economic affairs.
3. The most difficult part of this project would be, of course, the funding. Funds could come from a variety of places:
 - a. Advertisements, if the coalition desires it, there could be some advertisement space on the site of the repository that could in fact generate a steady income.
 - b. Author payments. Authors pay a small fee in order to publish their works. Of course in order for author to be *willing* to pay, the repository should ensure that the quality of its services is very high.
 - c. Member fees. All members of the coalition pay annual fees in order to sustain the repository. The fees depend on the size of each institution.
 - d. Added value products. Although the publications of the coalition are strictly in electronic form, in order to lower costs, if a user wishes to obtain a printed and bind volume of, let's say, a collection of works, this service could be charged extra. Almost all institutions have a publications office that is already equipped to do such works, so it wouldn't be really difficult to organize such services.
 - e. Public funds. Most scientific institutions are already funded (partly or in whole) by the governments of their countries. A small part of these funds could be reallocated to cover some of the expenses of the publishing coalition. If the project meets success, then the coalition could ask for additional funds (taking into account that subscriptions to scientific journal will be a lot less).
 - f. Private funds. The coalition could ask for donations from private donors.
 - g. Depending on the structure of the coalition, it should be decided where and how the servers and the services are based.
4. Finally, comes the organization of the peer review process. In the case of cooperative subject repositories peer review can be enforced in two distinct stages, before and after publication, intensifying the participatory process and upgrading the role of the reader to reviewer. More precisely, at first, groups of 2 or 3 reviewers (that come from the institutions that take part in the coalition) assess in a blind process the submitted works and decide whether it gets published or not, if there is any need for editing etc. After publication the review process is open to the public and the readers can place their comments on the site (of course the moderator of the site, always, retains the right to delete any com-

ments that are insulting, irrelevant or in any way inappropriate). The process of open review can quickly transform itself into a need kind of citation method, especially if the users start to interlink relevant works and comments to the original work, making this way, new research more visible and creating a more intense impact for any published work.

But, what comes to everybody's mind when we talk about publishing (or any other kind of business for that matter) is how much does it cost? Publishing in a repository, even if we take into account peer review, is very much cost effective.

The cost can be broken down into many categories. There is the cost of the installation of the software, the cost of any customization needed, salaries for the staff, functional costs etc.

According to S. Gibbons (Gibbons, 2005), installation and maintenance cost of a repository can vary dramatically, depending on its size and orientation. It depends on the software chosen (whether it is open source or commercial), the number of people working for the repository, the equipment that will be used etc. If the institution chooses to join SHERPA then the cost of mere installation (the cost of the server and man-hours) comes up to € 4.300. Queen's University, QSpace, cost for the organization and setting up, € 37.000 (including, equipment, customization and salaries). It also costs € 37.000 / p.a. to maintain the repository.

Presumably, the repository with the largest setting up and maintenance cost in that of MIT, which is considered the most advanced and complicated of its kind. Setting up MIT's DSpace cost € 1.307.000, but we should take into account that this figure includes the cost of the development of DSpace, an open source software used globally by a large number of users and institutions. The annual maintenance cost of the repository is a lot less, of course, and it totals € 207.000. This includes all the costs of the repository (hardware, software, functional costs) and all the salaries and insurance costs of the staff.

The repository of the University of Rochester cost around € 145.000 to set up, with major customizations. At this point, the repository has more than 50 collections depending on the subject and the department they serve.

Houghton, on his JISC repost on 2009 determined the total cost of an article from the time the author captures the concept until it gets processed from a library and is finally available to the users. Houghton calculated this cost to be € 10.600. From that figure only a small part burdens the publisher. And depending the form of publication the publishing cost may vary. In the case of subscription based journals the publishing cost is € 2.580 (for e-only publishing), and for open access journals the publishing cost is € 1.682. In the case of open access repositories (and if a paper is submitted for publication only once) the publishing cost is even lower, although it very hard to determine exactly.

But what can be determined is the cost per article for the system of higher education depending on the form of publication. For subscription based jour-

nals the cost for HE is € 9.160 / per article, for open access journals is € 8.262 and for OA repositories € 8.262. It should be noted that this figure includes the peer review process. The cost differences are very big and should be taken seriously into account.

But a project as ambitious as this could face a number of problems:

1. There could be difficulties for different institutions to reach agreements.
2. There could be lack of funds for the initial stages of the project.
3. Members of the coalition may disagree in the use of standards and procedures.
4. The larger and more robust members of the coalition may try to enforce their priorities to the other members.
5. If there is no robust business plan and clear priorities the project could reduce itself in mere vision.
6. Commercial publishers will oppose to such an effort and try to boycott it in any way possible.
7. Lack of cross-functionality between different applications.

But there is also some true potential to such a project:

A cross institutional repository is economically viable and cost effective. It is not just easy to maintain but also, if it functions properly and grows in time, it could save serious money from cancelled subscriptions.

Researchers themselves seem to be every day more eager to participate in open access mediums. Open access journals are growing and repositories are being constantly set up in all kinds of institutions. On January 2008 there was an unprecedented movement of support of Open Access. The European research council and the US National Institute of Health officially adopted their open access mandates. But that was not the end of it. 8 other very important organizations actively supported open access. Of course, these movements are not the only ones. All around the world, publicly funded research bodies are supporting open access, either by setting up repositories, either by encouraging researchers to submit their works in open access mediums or by adopting open access mandates.

The advantages of OA are many, especially when high standards of quality are achieved. Access to scientific results becomes easier and quicker. This saves time and money not only to researchers themselves, but also for their funding bodies, institutions and libraries. On the other hand, open access articles are more likely to be cited compared to the subscription based model. This means increased visibility for the work and the authors and their institutions.

Maybe it is still too early to come to any definite conclusion as to how open access is going to be in the future. But for the time being it seems that repositories will play an important part in scientific communication. Open access is not going to be the only publishing alternative in the near future. But

its popularity can be a force for changes. Coalition publishing cannot completely overturn the present status quo, which exists and serves scientists and scientific information for nearly 350 years. But, it can, and probably will be, the excuse and means needed in order to improve the system to the benefit of society.

Bibliography

- Tenopir C., King D. W., 1997, Trends in scientific scholarly journal publishing in the U. S., *J. Scholarly Publishing*, 48 (3), 135-170.
- Rochet, J.-C. and J. Tirole, 2004, Two-Sided Markets; An Overview, Mimeo IDEI, Toulouse. [online] Available at:
http://faculty.haas.berkeley.edu/HERMALIN/rochet_tirole.pdf
- OpenDOAR, Directory of Open Access Repositories, <http://www.openoar.org/>
- Houghton, J., 2002, The Crisis in Scholarly Communication: An Economic Analysis, Paper presented at the meeting of the Victoria Association for Library Automation 2002.
- Jefferson, T., P. Alderson, E. Wager, and F. Davidoff, 2002a, Effects of editorial peer review: A systematic review. *Journal of the American Medical Association* 287:2784-2786
- King, D.W., 2007, 'The cost of journal publishing: a literature review and commentary,' *Learned Publishing* 20(2), April 2007, pp85-106.
- McCabe, M. J., 2004, Information Goods and Endogenous Pricing Strategies: the Case of Academic Journals, *Economics Bulletin*, 12(10), 1-11.
- Odlyzko, A., 1998, 'The economics of electronic publishing,' *Journal of Electronic Publishing*, 4(1). [online] Available at:
<http://quod.lib.umich.edu/cgi/t/text/textidx?c=jep;view=text;rgn=main;idno=3336451.0004.106>.
- Gibbons, S. (2004). Establishing an Institutional Repository. *Library Technology Report*. 40:4, pp. 11-14.
- Gibbons, S. (2005). Establishing an Institutional Repository. *LITA Regional Institute*. November 8, 2005, Available at:
<http://docushare.lib.rochester.edu/docushare/dsweb/Get/Document-19852/Establishing%20an%20Institutional%20Repository.ppt>
- Houghton, J.W. & Oppenheim, C. (2009) The Economic Implications of Alternative Publishing Models. *Prometheus* 26(1): 41-54
<http://www.informaworld.com/smpp/content~db=all~content=a920247424>

Services and Technology

ZS Project: Zoological Science Meets Institutional Repositories

Sho Sato

*Graduate School of Library, Information and Media Studies, University of
Tsukuba*

Yuko Nagai

The Zoological Society of Japan

Takashi Koga

Research and Development Laboratory, Kyoto University Library

Shigeki Sugita

*Library & Academic Information Section, Otaru University of Commerce
Library*

Mika Saito

Electronic Resources section, University of Tsukuba Library and

Hiroshi Itsumura

*Graduate School of Library, Information and Media Studies, University of
Tsukuba*

Abstract

To evaluate how the deposition of journal articles in Institutional Repositories (IRs) affects the number of citations and e-journal usage, we placed some articles published in *Zoological Science* in two IRs, and compared their use in IRs with e-journals, as well as with the number of resulting citations between 2008 and 2009. The results reveal that deposit in IRs did not reduce e-journal usage. Moreover, whereas the journals gained new readers, this did not have an effect on the number of citations.

Keywords

Open Access, Institutional Repositories, usage analysis, citation analysis, scholarly publishing, zoological science

1. Introduction

The objective of this study was to determine how article deposition in Institutional Repositories (IRs) affects both citations and e-journal usage. It has been said that open access will make research output more visible and accelerate research progress. For example, significant attention has been paid to the question of whether open access will increase the number of citations, including studies by Lawrence (2001) and Harnad and Brody (2004). Some of these studies have focused on open access papers deposited in Subject Repositories (SRs) such as arXiv (Moed, 2007; Henneken et. al., 2006), and others have used a comparative approach by making e-journals partially available to the public (Davis, 2008; Davis, 2009). Moreover, whereas IRs play an important role in open access, their effect on citations has not been sufficiently studied.

It has also been suggested that making journal articles public through the web affects the numbers of readers of the commercial publishers. In this regard, Davis and Fromerth (2007) revealed that deposit in arXiv reduced publisher downloads for mathematics articles. There has been no sufficient analysis as to whether IRs would reduce publisher e-journal usage, however. It may be posited that IR users differ from SR users, and consequently the deposit of an article in IRs will have a different effect on e-journal usage than when deposited in SRs.

To evaluate how the deposition of journal articles in IRs affects citations and e-journal usage, we initiated the «*Zoological Science* meets Institutional Repositories Project» (ZS Project). We placed articles published in *Zoological Science* (the peer-reviewed journal of the Zoological Society of Japan) in two IRs to study their usage in each IR, the number of resulting citations, and any differences in usage when comparing them with e-journals offering publisher versions. The project period was between 2008 and 2010, and we describe interim results in this paper.

2. Data and Methods

This study is based on article-level data of *Zoological Science*, which has been published electronically on BioOne.2 (<http://www.bioone.org/loi/jzoo>) since 2008 and on J-Stage (<http://www.jstage.jst.go.jp/browse/zsj/>) until 2009. We secured cooperation from the authors of several articles and deposited those articles in two IRs, the Hokkaido University Collection of Scholarly and Academic Papers (HUSCAP) and the Kyoto University Research Information Repository (KURENAI), in 2008.

The four variables analyzed in this study were the number of ISI citations, the number of BioOne.2 full-text downloads, the number of J-Stage full-text downloads, and the number of IR full-text downloads. While the IRs and J-stage

usage logs have been made available since 2008, the statistics available on BioOne.2 began in 2009. Access by programs, including search engine bots, continuous accesses, and double clicks, were removed from the download statistics based on the COUNTER code of practice (2008).

Using these data, we analyzed the IR usage statistics, including access path and user domains, the conditions of full-text download from both IRs and publisher websites, and the relationships between the number of full-text downloads and citations.

3. Results

From a total of 3,281 articles published in *Zoological Science* between 1984 and 2008, 1,718 were in BioOne.2, 1,376 in J-Stage, and 171 in the IRs.

3.1 IR usage statistics

The total number of IR full-text downloads between 2008 and 2009 was 10,099 (average=59.0/median=43). Table 1 shows the access path for articles deposited in IRs.

Access path	2008 (<i>N</i> = 171)		2009 (<i>N</i> = 171)		Total (<i>N</i> = 171)	
	downloads	%	downloads	%	downloads	%
Direct access	1,112	22.0%	648	12.8%	1,760	17.4%
Through other IR pages	449	8.9%	563	11.1%	1,012	10.0%
Through search engines	3,361	66.6%	3,656	72.4%	7,017	69.5%
Through other pages	122	2.4%	184	3.6%	306	3.0%
Total	5,044		5,051		10,095	

Table 1. Access path to articles deposited in IRs

The majority of users (66.6% – 72.4%) found articles using search engines, especially Google. Only a few people found articles through other paths, including IR interfaces.

Table 2 shows the types of user groups defined by domain: .ne and .net (private users and network operators); .ac and .edu (academic users); .co and .com (corporate users); and others. We identified user domains by IP address (unfortunately some of these could not be resolved).

User groups	2008 (<i>N</i> = 171)		2009 (<i>N</i> = 171)		Total (<i>N</i> = 171)	
	downloads	%	downloads	%	downloads	%
Private users (.ne or .net)	1,121	34.7%	1,200	38.7%	2,321	36.6%
Academic users (.ac or .edu)	558	17.3%	512	16.5%	1,070	16.9%
Corporate users (.co or .com)	572	17.7%	462	14.9%	1,034	16.3%
Others	983	30.4%	928	29.9%	1,911	30.2%
Total	3,234		3,102		6,336	

Table 2. Types of user groups for articles deposited in IRs

The largest user group was private users (34.7%-38.7%). The private and corporate users together accounted for more than 50% of all repository users. While *Zoological Science* is a refereed scientific journal, it indicates that researchers and students as well as the general public read the articles that are free on the web.

Table 3 shows the number of full-text downloads by Japanese (.jp domain users) and foreigners (other domain users).

Domains	2008 (<i>N</i> = 171)		2009 (<i>N</i> = 171)		Total (<i>N</i> = 171)	
	downloads	%	downloads	%	downloads	%
Japanese (.jp)	440	13.6%	553	17.8%	993	15.7%
Foreigners (not .jp)	2,794	86.4%	2,549	82.2%	5,343	84.3%
Total	3,234		3,102		6,336	

Table 3. IRs full-text downloads by Japanese and foreigners

Although the IRs HUSCAP and KURENAI are managed by Japanese universities, and *Zoological Science* is published by a Japanese society, the majority of users were from outside Japan (82.2%-86.4%). This may be because most of the articles in *Zoological Science* are written in English. Sato et. al.'s 2009 analysis of the usage patterns in four Japanese IRs revealed that most of the users for English-language papers were from outside Japan. IR users from Japan tend not to read papers written in English.

On the other hand, many of the users of publisher websites and authors who cited *Zoological Science* were Japanese. Table 4 summarizes the top 10 countries that downloaded full-text from IRs, from J-stage, and that cited *Zoological Science* between 2008 and 2009. We calculated the number of J-stage users and ISI citations by using articles deposited in IRs (*N*=171). User domains are not available from BioOne.2 (BioOne's Privacy Policy does not allow us to share user domains).

Rank	IR downloads		J-stage downloads		ISI citations	
	Country	Downloads	Country	Downloads	Country	Citing authors
1	USA	2,388	Japan	2,052	Japan	383
2	Japan	993	China	998	USA	178
3	Germany	183	USA	851	Canada	56
4	India	183	EU	576	China	52
5	Russia	157	Indonesia	386	England	37
6	Indonesia	153	India	287	Germany	34
7	Italy	151	Thailand	190	Italy	31
8	Australia	150	Korea	184	France	29
9	England	147	Taiwan	182	Taiwan	27
10	Brazil	117	Italy	178	Argentina	23

Table 4. Top 10 countries that used IRs, J-stage and cited *Zoological Science*

The majority of J-stage users and authors who cited *Zoological Science* were from Japan. However, in IRs most of the users came from the USA. As for user location, there were different tendencies between countries depending on the frequency of access to IRs or to J-stage, and the number of citations.

3.2 Relationships between IR deposit and publisher downloads

Table 5 provides descriptive statistics comparing J-stage full-text downloads that were deposited in IRs with those that were not between 2008 and 2009.

	deposited in IRs (N=126)	not deposited in IRs (N=1,192)
Average	57.9	51.6
Median	50.5	36.0
Maximum	184	935
Minimum	8	0

Table 5. Descriptive statistics of J-stage full-text downloads

The average number of full-text downloads of articles deposited in IRs was higher than that of those not deposited. A Mann-Whitney test shows that the difference between downloads of those articles deposited and not deposited is statistically significant ($p < 0.001$). Accordingly, IR registration did not reduce the number of J-stage users.

Table 6 illustrates BioOne.2 full-text downloads of articles deposited in IRs and those not deposited in 2009. Here, the average number of full-text downloads of articles not included in IRs was higher than that of those that were deposited. However, a Mann-Whitney test shows that the difference between articles deposited and not deposited in IRs is statistically insignificant ($p > 0.1$). It has been demonstrated that articles published in recent years are used more often than older articles (Tenopir and King, 2009). There were many recent articles (published in 2008) included in the articles not deposited in IRs because we started this experiment in 2008 where *Zoological Science* had a one-year embargo. This inflated the average number of full-text downloads of articles not deposited in IRs. Table 7 presents descriptive statistics of BioOne.2 full-text downloads, not including the articles published in 2008.

	deposited in IRs (N=135)	not deposited in IRs (N=1,629)
Average	52.4	62.1
Median	35.0	43.0
Maximum	287	840
Minimum	3	0

Table 6. Descriptive statistics of BioOne.2 full-text downloads

	deposited in IRs (N=135)	not deposited in IRs (N=1,476)
Average	52.4	54.6
Median	35.0	39.0
Maximum	287	793
Minimum	3	0

Table 7. Descriptive statistics of BioOne.2 full-text downloads (not including articles published in 2008)

Compared with Table 6, there is some difference in use between the articles deposited and not deposited in IRs in Table 7. Thus we can say that IR registration did not reduce the use of BioOne.2 articles.

Figure 1 showing the scatter plots of full-text downloads further supports our assumption.

There were significant positive correlations between IR full-text downloads and J-stage (Spearman's $\rho = 0.363$) and BioOne.2 ($\rho = 0.519$). However, the correlation coefficients were not very high. The scatter plots also tell us that, whereas some articles were downloaded many times in IRs, this was not the case on publisher websites. These analyses therefore indicate that IR registration does not reduce the number of users on publisher websites. Instead,

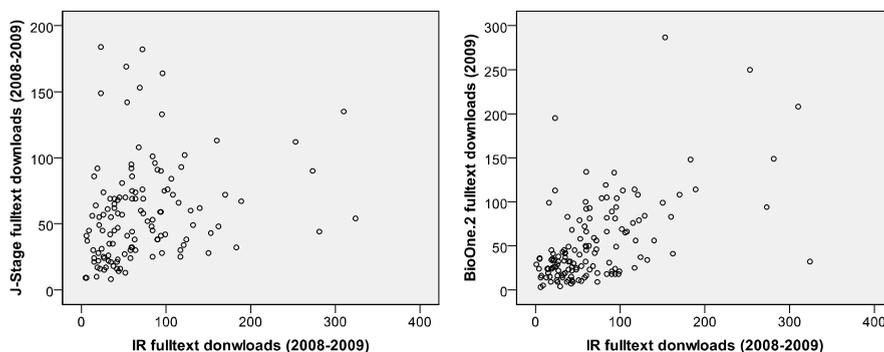


Figure 1. Scatter plots of IR full-text downloads and J-stage / BioOne.2 downloads

deposition in IRs tends to attract new users, some of whom read articles that are not read by academic readers.

Relationships between full-text downloads and citations

Table 8 shows descriptive statistics for ISI citations of articles deposited in IRs compared with those that were not between 2008 and 2009 (*after* deposition in IRs). Table 9 presents another set of descriptive statistics showing the data between 1984 and 2007 (*before* deposition in IRs).

	deposited in IRs (N=171)	not deposited in IRs (N=3,144)
Average	2.2	1.2
Median	2.0	0.0
Maximum	16	24
Minimum	0	0

Table 8. Descriptive statistics of ISI citations between 2008 and 2009

	deposited in IRs (N=171)	not deposited in IRs (N=3,144)
Average	7.3	6.1
Median	5.0	3.0
Maximum	43	193
Minimum	0	0

Table 9. Descriptive statistics of ISI citations between 1984 and 2007

The average and median number of citations of articles in IRs *after deposit* was higher than those of not deposited. A Mann-Whitney test shows that the difference is statistically significant ($p < 0.001$). However, it cannot be determined whether the difference was caused by IR registration. From Table 9, the

average and median number of article citations in IRs *before deposit* were also higher than those of those not deposited. This difference is likewise statistically significant ($p < 0.001$), and thus suggests that the difference is not due to IR registration, but rather to quality-bias.

In addition, Figure 2 shows the relationship between the numbers of IR full-text downloads and ISI citations between 2008 and 2009. Although there was a significant positive correlation between IR full-text downloads and ISI citations, it was weak (Spearman's $\rho = 0.334$). The scatter plot shows no relationship between IR full-text downloads and ISI citations. We could not determine whether IR registration affects the number of ISI citations.

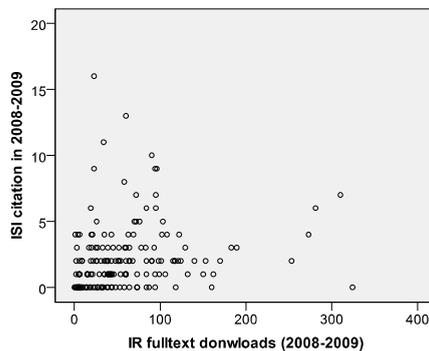


Figure 2. Scatter plot of IR full-text downloads and ISI citations

4. Conclusions

This project revealed that (1) articles deposited in IRs were used by various people including non-researchers who accessed the information through search engines; (2) there are different patterns of use between countries depending on the frequency of downloads from IRs or from e-journals, and the number of citations; and, (3) IR registration did not reduce the number of e-journal users and there were distinctive differences between papers often read in IRs and those in e-journals. Whereas we could not determine whether the presence of an article in an IR affects the number of citations, the results show that depositing journal articles in IRs enhances distribution rather than replaces traditional publication. Depositing journal articles in IRs after a one-year embargo will do more good than harm to scholarly journal publishers.

References

- Counting Online Usage of Networked Electronic Resources, (2008). *The COUNTER Code of Practice: Journals and Databases, Release 3*. Retrieved 22 May 2010 from <http://www.projectcounter.org/r3/Release3D9.pdf>.
- Davis, P. M. and Fromerth, M. J., (2007). Does the arXiv lead to higher citations and reduced publisher downloads for mathematics articles?. *Scientometrics*, Vol. 71, No. 2, 203-215.
- Davis, P. M. et. al., (2008). Open access publishing, article downloads, and citations: randomised controlled trial. *BMJ*, Vol.337, a568.
- Davis, P. M., (2009). Author-choice open-access publishing in the biological and medical literature: A citation analysis. *Journal of the American Society for Information Science and Technology*, Vol.60, No.1, 3-8.
- Harnad, S. and Brody, T., (2004). Comparing the Impact of Open Access (OA) vs. Non-OA Articles in the Same Journals. *D-Lib Magazine*, Vol.10, No.6.
- Henneken, E. A. et. al., (2006). Effect of e-printing on citation rates in astronomy and physics. *The Journal of Electronic Publishing*, Vol. 9, No. 2.
- Lawrence, S., (2001). Free online availability substantially increases a paper's impact. *Nature*, Vol.411, No.6837, 521.
- Moed, H. F., (2007). The effect of "open access" on citation impact: an analysis of ArXiv's condensed matter section. *Journal of the American Society for Information Science and Technology*, Vol.58, No.13, 2047-2054.
- Sato, S. et. al., (2009): Usage log analysis of the contents of institutional repositories: user domains, types of referrals and content attributes. *Proceedings of the DRF International Conference 2009*: P-8, 108.
- Tenopir, C. and King, D., (2009). Variations in article seeking and reading patterns of academics: What makes a difference? *Library & Information Science Research*, Vol. 31, 139-148.

Technology Trends, Requirements and Models for Providing Sustainable Technological Support for Libraries in an Evolving Environment

P. Stathopoulos, N. Houssos, and G. Stavrou

1 EKT – Hellenic National Documentation Center/N.H.R.F.

Abstract

In this paper we present requirements, trends, models and proposed methods relating to the issue of providing libraries with sustainable, technological support, both in terms of economic sustainability and in terms of successful adaptation to the continuously evolving user needs and environment. Tangible benefits, but also limitations, regarding established trends such as open source software, appropriate to library needs are highlighted while new application and service delivery models, such as Software as a Service (SaaS), virtualization and/or Cloud Computing are presented, in relationship with practical issues libraries are facing.

Keywords

Cloud computing, SaaS, virtualisation, ABEKT, repositories

1. Introduction

In this paper we present requirements, trends, models and proposed methods relating to the issue of providing libraries with sustainable technological support platforms, both in terms of economic sustainability and in terms of successful adaptation to the continuously evolving user needs and environment.

Different scenarios, based on a coarse grained taxonomy of libraries profiles and requirements, highlighting their capacity to access various levels of economic and human resources, are examined. Factors that affect the Total Cost of Ownership (TCO) that libraries' technological support platforms pose are qualitatively examined, in relationship with the requirements and the key technological models employed for the purchase, development and operation of the technology support platform elements.

In greater detail, open access to scientific information has presented libraries with an excellent opportunity to expand their role but also frequently requires a multitude of new technological support systems, i.e. new services, software, applications, and infrastructure, in combination with the need to operate with the more traditional library automation systems, OPACs, union catalogues, which are still of utter importance. Furthermore, these tools, and the end user requirements and trends that drive their development, are dynamic, quickly changing and transforming, thus requiring continuous updating and modernization. Technology support systems that libraries could be required to operate in order to fully exploit the open access environment are expanding in numbers and sometimes also in complexity.

Balancing the distribution of the available resources efficiently, among the operation of such technological support infrastructures and the actual support and delivery of end user services can be quite a challenge and it is tightly dependent on the specific library profile and requirements. The sustainability of this level of technological support poses a significant challenge for libraries both with regard of the expenses associated with operating it, it but also with the complexity of further developing it in order to address the evolving and non static user requirements in a dynamic environment. Thus, sustainability can be considered as both the capability to keep adapting services and the relevant software tools to the end users needs, and the capability to support the operation of an expanding list of technological infrastructure and software systems. Libraries are faced with the two dimensional problem, with regard to the technology support required, of combining economic sustainability and functional sustainability in order to adapt to long term user needs.

Benefits that can be achieved by key, technology related, decisions such as employing or not open source, cloud computing, software as a service and virtualization are examined. The full technological support lifecycle is taken into account, from development, testing, maintenance, operation and subsequent upgrade and refinement. It will be shown that open source for a wide variety of technological support elements has real tangible effects; however a certain level of expertise and local or contracted support is required. However, open source alone cannot guarantee that the level of technology support a library requires, is cost effective and sustainable in the long run. The variety of systems needed for a library technological support makes the employment of a mix of local virtualization or Software as a Service and/or cloud computing delivery models, appropriate for ensuring long term sustainability of services and depending on the library profile, when combined with open standards, open interfaces and libraries cooperation consortiums.

2. Changing Requirements and New Applications

The necessary software tools, infrastructures and systems for providing services to users has expanded and now includes a great variety of systems, usually employing different technologies and each one requiring an amount of libraries resources. These systems may include, depending on the library role:

- Integrated Library Systems supporting the core of library activities. Acquisition, Cataloguing, Circulation and OPAC are the most common modules of library process in an ILMS; mature open source and proprietary tools are available in this area internationally.
- Electronic reading rooms, for providing local users with electronic resources on the library.
- Backoffice digitization processes and software tools necessary for supporting that such as OCR, content management and workflow support tools.
- Metasearch engines for providing integrated research results to libraries users among a variety of resources.
- Institutional/Subject repositories. Repositories, like the online library catalogs, contain bibliographic information about items in the library. However, their focus is on the digital material itself; it is worth noting that typically the metadata in repositories is less detailed and rigorously defined than in library systems. Furthermore, a particularly interesting category of repositories is those that maintain collections of cultural heritage material, for example images of works of art, monuments, etc.
- Electronic academic, scientific and educational Journals. A single platform should handle the entire peer-review based publishing procedure comprising, among others, tasks like the uploading of articles by authors, submission of reviews by reviewers, editor decisions, copy-editing and final layout production by journal personnel, storing the publications full-text and providing it to Internet users as well as indexing and search engines. Recently, there is a trend to build e-publishing platforms for material other than e-journals and in particular e-books/monographs, something that is critically important for subject domains like social sciences and humanities.
- Interoperation of repositories, especially for academic and research libraries, with systems such as Current Research Information Systems (CRIS), which aim to capture the research context in which scientific publications have been produced. For example, a typical CRIS maintains information about researchers and research organization, projects, funding programmes and research infrastructures, all linked with each other and – most importantly – with research output, for example in the form of publications, patents or data sets. While there is overlap among

the information held in CRIS and repositories, the latter concentrate more on storing, indexing and preserving the digital content (e.g., publications full-text) besides the metadata.

The aforementioned list is not in any case exhaustive; it aims to highlight some of the necessary tools and software systems that a library may have to support. For most of these areas a number of mature tools have evolved, both open source and proprietary. Open source software has been a disruptive changing force over the last years, especially in the area of libraries, Cervon F., (2003), however the sustainability of libraries services, and the corresponding IT systems, cannot be guaranteed only with the open source promise.

In greater detail for systems such as repositories, there are available quite a few popular, robust, open source platforms (e.g., DSpace, Fedora, EPrints) that are being used in thousands of real-life installations worldwide for institutional, thematic or cultural heritage repositories. A number of commercial products also exist, providing an alternative to consider for repository managers. Repositories can significantly vary in size, from local installations with a few hundred items to aggregators providing access to millions of documents through federated repository architectures, needing IT infrastructures from the small to the large scale. Furthermore, electronic journals and publishing can be handled by commercial platforms or services; a few open source solutions are also available, the most popular one being by far Open Journal Systems (OJS) which, unlike other free software alternatives, provides an out-of-the box solution for all major tasks in the operation of a scientific e-journal with a rich set of features. Regarding Integrated Library Systems (ILS) there is a greater maturity, due to the decades old experience in relevant systems, however, an ILS needs to transform in order to support the new library functions. Furthermore lately a number of successful open source ILS systems have become available such as the Koha (<http://www.koha.org>), the OpenBiblio (<http://obiblio.sourceforge.net/>), the PhpMyLibrary (<http://sourceforge.net/projects/phpmylibrary/>), and the Evergreen system (<http://www.open-ils.org/>). These systems target from small to large scale libraries and they offer some of the basic to the most advanced features sets. Many of them are built around the open source Linux-Apache-MySQL-Perl/Python (LAMP) software stack, while proprietary systems have required specialized software stacks, including proprietary databases, operating systems, etc.

It is becoming apparent that while there are a lot of common building blocks for each one of these tools, each additional software system being added adds also burden to the libraries resources, in terms of in house or contracted software developers, system administrators, and IT equipment and infrastructure. In the next section we will refer with greater detail to necessary IT resources an information organization, such as the libraries, needs to provide in order to afford a sustainable technological support path.

3. Applications Technological Support Requirements

The aforementioned applications require a wide range of resources for their technological support. These resources and the cost they inhibit are only partially defined if the initial purchase or development costs are taken into account. Every software and IT system cost should be calculated over the system's entire lifecycle, specified as the Total Cost of Ownership (TCO), Ellram L. (1998), of the relevant asset. The total cost of ownership, can be simplified as the total cost for the organization to have the relevant IT system running and providing its services. Libraries when examining IT systems costs for their operation and when assessing their sustainability should always look beyond the initial purchase and installation cost. They should include the whole software's development lifecycle, the iterations needed for coping to the changing library needs, and the accompanying operational costs.

In greater detail, at the development phase, regardless of whether open or closed source software is being used, costs include the design, implementation, testing and delivery of the finished software product. Furthermore, a software system is seldom a finished product by itself; continuous updates are required in order to better cope with changing library requirements and/or bug fixing etc. Agile processes, which are state-of-the-art in software development, require different iterations with each iteration being based on the previous one and produce at least a functional prototype of the system, even a small part of it. This prototype is available for testing to users; their feedback is taken into account in subsequent iterations. The planning of iterations changes after the end of each one, depending on developer experiences, un-anticipated issues encountered and user feedback. Tools are needed like version control, unit testing, continuous integration, issue tracking, that assist in the rapid modification of the code according to changes in requirements– the latter are unavoidable in real-life systems.

Agile development process suit open source software customization projects, due to the low initial cost for trying / using a new tool – not only in terms of money for paid licenses but in terms of acquisition time. The aforementioned description of tasks, design, implementation, testing, are even more complex in other s/w development processes. Furthermore for development and operation purposes, there should be a robust staging environment, with at least three separated installations of the system: **development** (where newly added code is tested by developers), **quality assurance** (where end users do their testing) and **production**.

In the operational phase of the technological system supporting the library a number of factors contribute to the TCO of each software application and service. These factors include:

1. The initial development and customization costs such as the **design, implementation**, testing of the application.
2. **Hardware** equipment and support needs, including the **initial purchase cost**, but also the **depreciation, maintenance** and **support** costs, which are different based on the level of availability required.
3. **Software maintenance and support**. As aforementioned in many ways after the initial rollout only a part of the final functionality required by the library eventually has being fulfilled. In order to better provide services, especially in emerging areas, a flexible work plan is needed in order to provide the features requested by the library users. Thus even after the software roll out a significant amount of personnel, in house or contracted resources, should be employed.
4. **System platform support**, personnel or external contractors for Operating Systems updates, security patches and fixes, applied to the whole range of the software stack, from the application to the operating system, or the storage/networking firmware.
5. **Monitor and control loop**, which includes the aforementioned platform support, costs. At the time of the single ILMS application monitoring and estimating system health and performance was a simple task, nowadays that a multitude of systems are required in order for the library to provide its services a strong real time services and performance monitoring system, such as the open source nagios and cacti systems, enterprise – level IT support infrastructure able to implement aspects that are described with the IT infrastructure Library best practice as the “control and monitor loop”.
6. **Datacenter/computer room infrastructure**, electricity, facilities and infrastructure cost.

Each of the aforementioned resources usually requires a different type of internal or external personnel capabilities and profiles, even if it is required as a percentage of equivalent full time staff. In conclusion, IT systems development and operation is a process, not a goal with visible end. There are future costs that one must pay in order to keep the system viable and sustainable. This is common, although with varying weights, for both open source and proprietary software, internal or external development teams. Nevertheless, open source has truly been a disruptive force in library information systems and in information systems in general. It can provide libraries with lower initial cost, having in principle no licence fees attached, greater control over their computer environment, no vendor lock-in, better support for open standards, and more predictable ownership costs. However, factors such as software development processes and operation costs, which require a multitude of resources and technological capabilities, are still present.

4. Technology Trends: the Emerging Landscape

Over the last years emerging technology trends have arisen that change significantly the landscape for the whole range of library information systems. These technology advances can be highlighted as the open source development model, virtualization and cloud computing paradigms such as Software as a Service (SaaS), and Infrastructure/Platform as a Service (IaaS/PaaS) systems, Geng L, (2009). The benefits of open source software have been thoroughly described and libraries have exploited them. However, as described in the previous section, the software license is only a part of the libraries IT systems sustainability factors. Developments and trends such as virtualization, SaaS and IaaS/PaaS, can provide a much broader area of choices that could improve IT systems sustainability and possible lower IT costs. In greater detail the emerging trends are:

1. Virtualisation is a mature, nowadays, technology, that can provide a mean for virtualising system hardware, in order to improve utilization of idle IT infrastructure equipment. It can reduce operational costs related to hardware systems maintenance and support, and can significantly increase flexibility and availability. However, due to the specialized technologies being used it requires personnel with a high degree of technical competence that ranges from system administration to networks and storage systems.
2. Cloud computing in the forms of IaaS/PaaS and SaaS. Using IaaS and PaaS models enables the organization to have access to hardware computing storage and networking resources, over a virtualized infrastructure that a Cloud Computing provider offers. In this case libraries can eliminate the need and hidden costs of hardware and Datacenter operations costs, while still having full control to their software and capability to adapt to new requirements. These can include system level support relating to a hosted system service, however with much greater flexibility. Examples include the Amazon Elastic Compute Cloud, the Amazon Simple Storage Service and the Rackspace Cloud. A standardized API and interfaces however do not yet exist.
3. Cloud Computing in the form of Software as a Service. As referred at Boss R., (2010), SaaS resembles functionality provided by Application Service Providers. Using SaaS an organization can outsource the whole operational lifecycle of an IT system. It is worth noting that major ILS have being offered using a SaaS model, Hadro J., (2009), Kimpton M, (2010). Using the SaaS model libraries do not need in-house support while SaaS providers can achieve significant economies of scale.

Despite its advantages the aforementioned Cloud Computing approaches also have disadvantages such as cost in the long run, questionable migration paths

to alternative systems and eventually no capability of internal support for areas considered as critical. Furthermore, data migration and security issues or concerns still exist, both of them are of crucial importance for libraries. It should be noted that both open source and virtualization has being a key technology enabler of Cloud Computing. Recently open source projects started offering SaaS options; there is a concern about possible conflict of interest, Hadro J., (2009). In conclusion while a SaaS system can be a value for some of the libraries systems some key prerequisites should be taken into account when selecting a Cloud Computing solution:

- Ensuring data portability and preservation both in IaaS/PaaS and in SaaS solutions. It is crucial to be able to migrate data from particular systems and vendors. In IaaS/PaaS services standardization on some key areas has begun. Regarding libraries, it can be considered that they are on an advantageous position due to the inherent focus on data compatibility and portability/preservation issues. While for bibliographic data mature other aspects should be taken into account, especially for ILS systems, repositories and journals.
- Readily available open source alternatives. It is crucial that apart from data/metadata migration path also an open source alternative exists. Especially to the SaaS case there should be an open source alternative that one could migrate easily on a local solution with small burden. While for library related systems this seems to be the case it is not a widespread rule of all SaaS offered IT systems.
- Capability to manage and monitor the Service Level Agreements the service provider and the library have agreed. It is necessary to both formulate the SLA and to have the necessary tools in order to enforce and monitor it. Furthermore, as in the case of outsourced solutions there should a mechanism for monitoring and enforcing the appropriate quality levels and checks.
- Another important factor is the trust issue at a private organisation, etc. In this case library consortia and alliances can find in SaaS and Cloud Computing technologies an enabler for achieving economies of scale.

Cloud computing infrastructures can assist libraries to better manage their costs, since library IT systems are thoroughly being built around standards and migration strategies, while most widespread cloud solutions have also an open source alternative. Regarding work done at the Hellenic National Documentation Center (EKT), these developments have being taken into account. EKT operates since 2007 a large scale virtualization platform, Stathopoulos P., (2009), has used extensively open source software and has included cloud related approaches to the design of new tools and services. EKT is considering to offer a DSpace based repository installation as a virtual appliance, ready to be

used in virtual infrastructures while the new version of ABEKT, which is under planning, could include features such as being available as open source software, design from the beginning with the option to run as a standalone and as a Software as a Service application, delivery of the application as a lightweight virtual appliance. Furthermore ABEKT's planned version will include integration of all available bibliographic record formats (MARC21, UNIMARC, MODS, DC), new web design using open source development tools and frameworks, authority database development supporting bibliographic catalog functions via web services and linking of digital content to bibliographic records and publishing on the Internet through an integrated search and retrieve environment, among others.

5. Conclusions and Future Work

New technologically driven capabilities are available today that promise to reduce libraries IT operation costs while increasing the services they offer. As mentioned previously, the open source approach can provide a lot of benefits but only if the limitations and the advantages are well understood. Cloud computing offers an opportunity for small and medium size organizations to reduce operating costs in areas that are not considered a key strategy asset, however different scenarios can be employed based on each library profile. Crucial to the adoption of cloud computing approaches is the availability and widespread adoption of standards both in the infrastructure and in the service area, the capability of migration to alternatives and the trust to operators of the Cloud infrastructures. The library software ecosystem features a number of well established open source tools, that are used as cloud computing infrastructures building blocks, widespread standards adoption and seems a proper candidate, based always on the libraries profiles and needs, and to the operation of Library consortiums and cooperation's for adopting Cloud computing approaches in order to further enhance the services offered to the final user.

References

- Cervon F., (2003). The open source option, *The Library Journal NetConnect Summer*, pp. 8-12
- Ellram L. (1998) Total cost of ownership: a key concept in strategic cost management decisions – *Journal of Business Logistics*, Vol 19. No. 1, 1998
- Geng L., (2009). Cloud Computing: IT as a Service, *IEEE IT Professional*, pp. 10-13, March/April, 2009
- Hadro J., (2009). LibLime's "Enterprise Koha" Prompts Frank Conversations on Open Source Issues, *libraryjournal.com website* available at <http://www.libraryjournal.com/lj/technology/products/vendors/855795-296/story.csp>

Boss R., (2010), Software as a Service, *PLA technote* available at

<http://www.ala.org/ala/mgrps/divs/pla/plapublications/platechnotes/>

Kimpton M, (2010), Strategic overview DuraSpace Roadmap DSpace and Fedora, *Open Repositories 2010, Madrid, 2010*

Stathopoulos P.,(2009),The case study of an F/OSS virtualization platform deployment and quantitative results, *Proceedings, 5th International Conference on Open Source Systems*, Skövde, Sweden 2009

Mapping the Intellectual Structure of Open Access Field Through Co-citations

Guleda Duzyol, Zehra Taskin and Yasar Tonta

Hacettepe University, Department of Information Management, Beytepe, Ankara, Turkey

Abstract

Open access is one of the major research trends and hottest topics in electronic publishing. This paper aims to assess the evolution of open access as a research field using bibliometric and scientific visualization techniques. It maps the intellectual structure of open access based on 281 articles that appeared in professional literature on the topic between 2000-2010. Using bibliometric and co-citation analyses, co-citation patterns of papers are visualized through a number of co-citation maps. CiteSpace is used to analyze and visualize co-citation maps. Maps show major areas, prominent articles, major knowledge producers and journals in open access. The letter written by Steven Lawrence (“Free online availability substantially increases a paper’s impact”, 2001) appears to be the most prominent source as it was cited the most. The journal article by Kristin Antelman (“Do open Access articles have a greater research impact”, 2004) and the report by Alma Swan and Sheridan Brown (“Open access self-archiving: An author study”, 2005) are the following most highly cited papers in the network. “JASIS/JASIST” is the most cited journal by the authors writing on open access. The most recent research topics appear to be institutional repositories, open access publishing/open access journals and scientific communication. Rob Stevan Harnad is mostly co-cited author, Alma Swan, Steven Lawrence and Peter Suber follows. The preliminary findings show that open access is an emerging research field. Findings of this study can be used to identify landmark papers along with their impact in terms of providing different perspectives and engendering new research areas.

Keywords

Open access, co-citation, information visualization, mapping, Cite Space

1. Introduction

The internet has rapidly become a world-wide publishing platform, and open access to these publications has been a hot topic for scholars, librarians and publishers over last few years. According to Budapest Open Access Initiative, open access provides free availability on the public internet, permits any users to read, download, copy, distribute, print, search or links to the full texts of articles, crawls them for indexing, passes them as data to software, or uses them for any other lawful purpose, without financial, legal, or technical barriers (Budapest Open Access Initiative, 2004).

Open access is an important development of bibliometrics, too. Citation databases allow the literature to be navigated backwards and forwards in time, following citations to and from any article, guided also by co-citation analysis in order to find related papers. Citation analysis can be used to find emerging fields, to map the time-course and direction of research progress, and to identify synergies between different disciplines. For current users it will at first be just a pleasant surprise to find that the citation links within an article can retrieve the full texts of the articles it cites; yet this is just one of the many rich scientometric possibilities that will be provided by open access (Brody, 2004).

Open access journals have established a new paradigm of scholarly communication and their scholarly impact has been argued in the library and publishing communities (Zhang, 2006). In parallel with these arguments, the correlation between citations and open access has been major subject in many studies (Mukherjee, 2009a; Mukherjee, 2009b; Craig, Plume, McVeigh, Pringle, Amin, 2007; Turk, 2008; Kousha, Thelwall, 2006; Eysenbach, 2006).

In conjunction with the developments in open access field, there have been many works in literature about open access in recent years. It creates major knowledge producers, significant journals and prominent articles in this area. From this point forth, the main aim of this study is to evaluate open access field using scientific visualization techniques. This study attempts to answer the following research questions:

- What are the prominent articles in the open access field?
- Which authors are major knowledge producers?
- Which journals are the most cited?
- Which keywords are used mostly in the open access field?

2. Data and Methods

A topical search on Web of Science (WoS) database using the term “open access” was performed to identify papers on open access that appeared in the literature after 2000 (2000–2010) and a total of 281 journal articles under the

subject category of “Information Science & Library Science” were identified (Proceedings, book reviews, editorials, letters and other document types were excluded). The full bibliographic records including authors, titles, abstracts and reference lists for 281 articles were downloaded.

CiteSpace was used to produce co-citation networks. CiteSpace is a visualization tool developed by Chaomi Chen from Drexel University (<http://cluster.cis.drexel.edu/~cchen/citespace/>). CiteSpace facilitates the analysis of emerging trends in a knowledge domain which can be called as “knowledge domain visualization” aims to create a picture of how science grows and evolves over time (Chen, 2004; Dell, 2004).

Four co-citation networks (document co-citation network, author co-citation network, journal co-citation network, network of keywords and noun phrases) were generated to analyze open access field.

3. Findings and Discussion

Table 1 provides descriptive statistics about 281 articles on open access that appeared in the literature between 2000 and 2010. During this period these articles were cited 730 times. On the average, 26 articles published annually (SD = 22). While the number of papers was very few at the beginnings of 2000s, they have increased considerably then. The increase has slowed down after 2007.

Year	# of articles	# of times cited
2000	2	14
2001	0	0
2002	7	20
2003	11	48
2004	13	136
2005	27	108
2006	36	128
2007	62	148
2008	47	91
2009	55	33
2010	21	5
Total	281	730

Table 1. Number of articles on open access (2000–2010)

Figure 1 shows a document co-citation network derived from the citing behavior of authors writing on open access. This network is the result of merging 11 one-year document co-citation networks generated by the WoS dataset (2000–2010). The document co-citation network consists of 245 papers (not only articles, all type of papers – letters, editorials, conference proceedings etc.) that have been cited by 281 open access articles in our dataset and there are 1337 co-citation links between the 245 papers on the network. Citations made in 2000-2003 are shown in blue rings, 2004-2007 in green rings and 2008-2010 in yellow and orange. The colors of co-citation links represents the first year the connection between two documents was made (Chen, C., Song, I. Y., Yuan, X. and Zhang, J., 2008). Colors of the network depict that studies on open access has mainly started in 2002 (light blue colors on the left-hand part of the network), there is not dark blue colors (colors of 2000 and 2001 time slices) on the map.

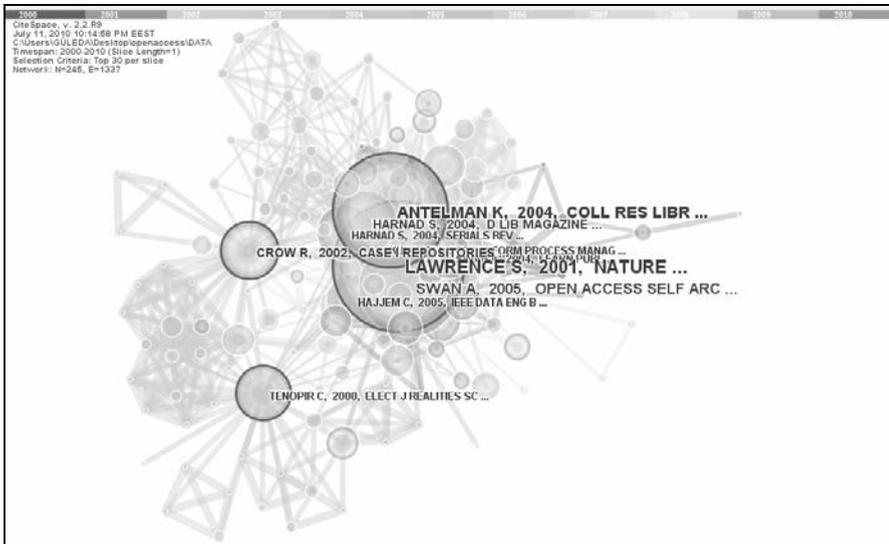


Figure 1. Document co-citation network of open access, 2000-2010

Structurally strategic papers that are most frequently cited by 281 articles on open access can easily be identified in Figure 1. The letter written by Steven Lawrence (“Free online availability substantially increases a paper’s impact”, 2001) appears to be the most prominent source as it was cited the most. The journal article by Kristin Antelman (“Do open Access articles have a greater research impact”, 2004) and the report by Alma Swan and Sheridan Brown (“Open access self-archiving: An author study”, 2005) are the following most highly cited papers in the network. Papers by Stevan Harnad (“The access/impact problem and the green and gold roads to open access”, 2004; “Comparing the impact of open access (OA) vs. non-OA articles in the same

journals”, 2004), Raym Crow (“The case for institutional repositories: a SPARC position paper”, 2002), Michael J. Kurtz (“The effect of use and access on citations”, 2005), Chawki Hajjem (“Ten-Year Cross-Disciplinary Comparison of the Growth of Open Access and How it Increases Research Citation Impact”, 2005) and Carol Tenopir’s book (“Towards Electronic Journals: Realities for Scientists, Librarians, and Publishers”, 2000) are also seen on the document co-citation networks to be the prominent articles of open access field. These prominent articles were not started to get cited soon after their publication, they have started to get cited about 2-3 years after their publication as the inner ring color is not same with the color of publication year. For example Lawrence’s letter was published in 2001 but started to be cited after 2004, similarly Antelman’s article that published in 2004 started to be cited after 2006. These prominent papers seen on the network still continue to be cited today, as the outer orange rings indicate. This indicates that open access is an evolving field and the studies on open access continue.

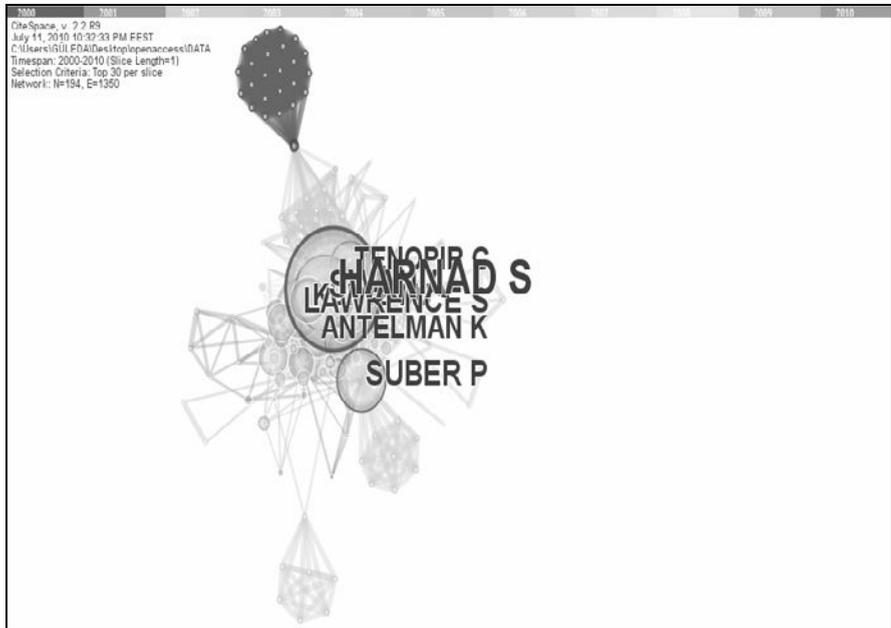


Figure 2. Author co-citation network of open access, 2000-2010

Figure 2 shows the results of author co-citation analysis that consists of authors contributing to open access literature. Author co-citation network contains 194 mostly cited authors by 281 articles in our data set and 1350 co-citation links between these mostly cited 194 authors. On an author co-citation map, the size of a node is proportional to the number of open access articles the writer on that node has published. In Figure 2, Steven Harnad has the largest

citation circle. The colors of nodes give information about the citation patterns of an author, in which years years he/she was cited most/least for example. The nodes of authors with purple rings around them (Steven Harnad, Peter Suber, Carol Tenopir for example) are strategically important in pulling other nodes together, they have the highest betweenness centrality (Chen et al., 2008). Most of the citations to the prominent articles were made after 2005. The colour of outermost ring of almost all the authors are orange, indicate that many of these authors continue to publish on open access that they continue to be cited.

Mostly cited journals by the 281 open access articles can be seen on the journal co-citation network (Figure 3). Figure 3 consists of 170 journals along with 1395 co-citation links among them. The “JASIS/JASIS” is the most highly cited journal by the writers of open-access. Learned Publishing, Nature and D-Lib Magazine follows. The journal “Learned Publishing” has the highest centrality and have been cited since 2004 in open access articles. The ring color of the mostly cited journals are heavily yellow and orange, indicates that these journal started to get cited in last years and continue to be cited.



Figure 3. Journal co-citation network of open access, 2000-2010

Figure 4 shows a hybrid network of keywords as circles with black labels and noun phrases as triangles. Keywords and noun phrases were extracted from titles and abstracts of papers. “Open access” noun phrase is a pivotal node that has a purple ring. “Open access” is also mostly used keyword in open access

papers. The most recent research topics appear to be institutional repositories, open access publishing/open access journals and scientific communication as the mostly used keywords and noun phrases indicate. The lower part of the Figure 4 has keywords and noun phrases on electronic publishing (can be seen on the map when threshold values reduced) that shows open access formed as a sub-topic of electronic publishing.

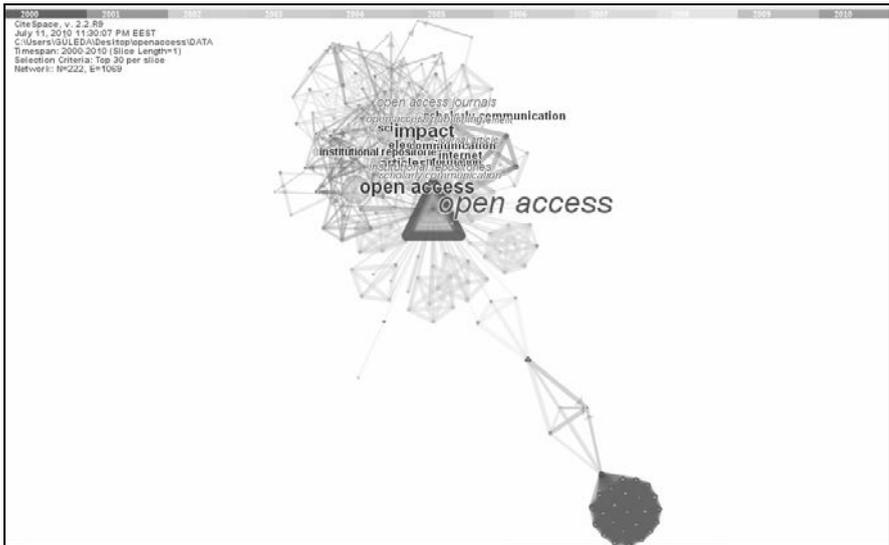


Figure 4. Networks of keywords and noun phrases, 2000-2010

4. Conclusions

We have analyzed the structure and evolution of open access between 2000–2010 which is a popular subject in electronic publishing recent years using co-citation maps derived from CiteSpace. Findings of our study show that open access is a nascent and rapidly emerging field. First three prominent papers are Lawrence, 2001, “Free online availability substantially increases a paper’s impact”, Kristin Antelman, 2004, “Do open Access articles have a greater research impact” and Swan and Brown, 2005, “Open access self-archiving: An author study”. Harnad is the most influential author and JASIS/JASIST is the mostly cited journal by the authors writing on open access. Major research tracks appear to be institutional repositories, open access publishing/open access journals and scientific communication.

References

- Brody, T. (2004). Citation analyses in the open access world. *Interactive Media International*. Retrieved 25 July, 2010 from http://eprints.ecs.soton.ac.uk/10000/1/tim_oa.pdf
- Budapest Open Access Initiative. (2004). Guide to business planning for converting a subscription-based Journal to open access. Retrieved July 25, 2010 from http://www.soros.org/openaccess/oajguides/business_converting.pdf
- Chen, C., Song, I. Y., Yuan, X. and Zhang, J. (2008). The thematic and citation landscape of Data and Knowledge Engineering (1985-2007). *Data and Knowledge Engineering*, 67, 234-259.
- Chen, C. (2004). Searching for intellectual turning points: Progressive knowledge domain visualization. *Proceedings of the National Academy of Sciences of the USA (PNAS)*, 101 (Suppl.(1)), 5303-5310. Retrieved July, 13, 2010 from <http://www.pnas.org/content/101/suppl.1/5303.full.pdf>
- Craig, I., Plume, A., McVeigh, M., Pringle, J., Amin, M. (2007). Do open access articles have greater citation impact?: critical review of the literature. *Journal of Informetrics*, 1(3): 239-248
- Dell, H. (2004). Mapping intellectual milestones. BioMedNet: Special Report. Retrieved July 13, 2010 from <http://cluster.cis.drexel.edu/~echen/citespace/doc/biomednet.pdf>
- Eysenbach, G. (2006). Citation advantage of open access articles. *Plos Biology*, 4(5): 692-698
- Kousha, K., Thelwall, M. (2006). Motivations for URL citations to open access library and information science articles. *Scientometrics*, 68(3): 501-517
- Mukherjee, B. (2009a). Do open-access journals in library and information science have any scholarly impact?: a bibliometric study of selected open-access journals using Google Scholar. *Journal of the American Society for Information Science and Technology*, 60(3): 581-594
- Mukherjee, B. (2009b). Scholarly research in LIS open access electronic journals: a bibliometric study. *Scientometrics*, 80(1): 167-194
- Turk, N. (2008). Citation impact of open access journals. *New Library World*, 109(1-2): 65-74
- Zhang, Y. (2006). The effect of open access on citation impact: a comparison study based on web citation analysis. *Libri*, 56, 145-156.

Appendix: Papers Depicted in the Network Clusters and Mentioned in the Text

- Antelman, K. (2004). Do open access articles have a greater research impact? College and Research Libraries, 65 (5): 372-382.
- Brody, T. and Harnad, S. (2004) Comparing the impact of open access (OA) vs. non-OA articles in the same journals. D-Lib Magazine, 10 (6).
- Hajjem, C., Harnad, S. and Gingras, Y. (2005). Ten-Year Cross-Disciplinary Comparison of the Growth of Open Access and How it Increases Research Citation Impact. *IEEE Data Engineering Bulletin*, 28(4): 39-47.
- Crow, R. (2002). The case for institutional repositories: a SPARC position paper.

- Harnad, S., Brody, T., Vallières, F., Carr, L., Hitchcock, S., Gingras, Y., Oppenheim, C., Stamerjohanns, H. and Hilf, E. R. (2004). The access/impact problem and the green and gold roads to open access. *Serials Review*, 30 (4): 310-314.
- Kurtz, M. J., Eichhorn, G., Accomazzi, A. Grant, C., Demleitner, M. Henneken, E. and Murray, S. S. (2005). The effect of use and access on citations. *Information Processing and Management*. 41(6): 1395-1402.
- Lawrance, S. (2001). Free online availability substantially increases a paper's impact. *Nature*, 411, p. 521
- Swan, A. and Brown, S. (2005) Open access self-archiving: An author study. Technical Report, External Collaborators, Key Perspectives Inc.
- Tenopir, C. and King, D. W. (2000). *Towards Electronic Journals: Realities for Scientists, Librarians, and Publishers* (Special Libraries Assoc., Washington DC

Quality and Evaluation

Open Access Books Collection's Improvement According to Cost, User's Satisfaction and User's Demands

Aristeidis Meletiou

Technical University of Crete, Greece

Abstract

Libraries constitute a highly developing area as they always enrich their offered Services in order to satisfy users' expectations. One of the most important offered services is the ability for users to use open access books' collection to satisfy their needs. However, open access books collection's improvement is a vital issue of a Library and needs specific attention. The main objective of this work is to present a framework for analyzing the way of open access books collection's improvement in an Academic Library concerning not only the cost but also satisfaction and demands of users. The paper presents a way by using data received from resources of Technical University's of Crete Academic Library, like ILS (Integrated Library System) and user surveys satisfaction. However, the framework can be applied in every modern Library and also can be applied in books' collection in general. It is mainly focused on the presentation of a valid method and guidelines of collecting and analyzing multiple data resources in order to realize how cost, user satisfaction and demands can be involved in open access books collection's improvement. The goal of presented study is to help Library decision makers to take right decisions about what actions can do to improve efficiently "open access books collection" in their Library Organization.

Keywords

Collection improvement, users' satisfaction, evaluation, strategic planning, quality management

1. Introduction

Services will be offered or improved in a Library depend on several factors. One of the most important is users' preferences. All decision makers have to take in mind these preferences as they are expressing not only users' needs but also trends and demands. Collection in the Library is a very important factor that can affect users' satisfaction. If a user believes that the collection meets his needs and expectations can say that Library is good and offers good services in this section. However the evaluation and improvement of collection (e.g. open access books collection) is a major issue and concerns every person that is involved in a Library's Organization Management.

It is fact that Libraries are changing their role in information society as they are changing their initial pattern in order to follow the new demands that are arising. Before some decades we were speaking about Libraries and now we are speaking about Digital Libraries. The classical methods for information and knowledge provision and dissemination are giving their positions to new methods. It is the time where Libraries are implementing and supporting ways for making their services accessible for anyone and from everywhere. It is the time where Libraries are trying to change or improve their collections in order to be openly accessible (Open Access in knowledge). According to all mentioned it is fact that one of the most important things in a Library is Open Access Books Collection it manages.

An important issue is the way this Collection will be improved and kept up-to-date. To do this decision makers and collection developers in a Library have to choose what subjects have to be improved and what factors they will consider to do it?

It is fact that various methods have been used to develop book collections in general, in academic libraries for some time (Enger, 2009). Most academic libraries bring faculty members into the selection process, drawing on their subject expertise in designing a collection and relying on them to represent their research interests through journal selection and book purchases (Ameen & Haider, 2007). However in a lot of cases faculty members don't help enough in this process because of time they can spend as they have many duties and responsibilities. The curriculum is often also examined and reflected upon before purchasing materials. Collection development librarians examine syllabi and course catalogs, or meet regularly with academic departments to determine the material needed by faculty and students in carrying out the curriculum and meeting course requirements (D.A. Smith, 2008). Librarians may conduct use studies using focus groups or surveys to determine local faculty and student needs or to compare purchases with circulation or interlibrary loan activities (Wallace & Van Fleet, 2001). Through reference and instruction activities, librarians may learn directly what is needed in the collection from

interaction with students. The collection, therefore, is developed largely on the local needs of individual campuses (Schmidt, 2004).

In large research universities, blanket orders and approval plans may be established to directly order all of the books in one particular area, or from one publisher. Another common method for collection development is the use of book selection aids such as the American Library Association's Choice, Publishers Weekly, the New York Times Book Review, or Library Journal (Evans, 2000).

While all of these methods contribute to design strong academic library collections, any particular academic collection may represent local user needs at certain points in time throughout the development of the collection, without truly reflecting the disciplines that are represented in the collection. Periodically, the collection may be analyzed to discover existing gaps. When academic collections are evaluated retrospectively, they may show that essential materials representing a discipline are missing. "Materials are selected by different people over a long period of time. Librarians may vary in their conceptions of the general principles of selection" (Curley & Broderick, 1985, p. 297).

Few collection management strategies are applicable across academic libraries; most academic library selection procedures are primarily based on local user needs. Universal and standardized methods of selection that successfully anticipate patron needs would be of great value to those charged with collection development.

Osburn (1983) suggested: A very strong argument could be made that the theory of librarianship does reside in an undiscovered theory of collection development and that the tardiness of the profession to address collection development matters per se is directly responsible for its inability thus far to arrive at a satisfactory theory of librarianship (p.176).

Another method that Enger (2009) suggests is based on citation analysis. While citation analysis has been used extensively to manage journal collections, it has not been used to develop book collections. It is, however, one measurable way to effectively manage them. Using citation analysis to develop core book collections in academic libraries is discipline centered and goes beyond the walls of individual libraries to include material discussed by scholars in the academic literature. Using citation analysis, then, is most relevant to academic library collections that represent a wide spectrum of disciplines and whose collections are centered on scholarship, as opposed to public or special library collections. Citation analysis gives selectors a tool to recognize important works in a field. However there are a lot of cases where citation analysis in books collection can't be applied: a lot of Libraries don't have the appropriate databases for consulting in citation analysis of books or don't have the necessary staff to do it.

So, another approach has to be examined to evaluate books collection and in our case open access books collection in a simple way in order to be used

from everyone in a Library Organization apart from specific knowledge skill and huge staff experience.

Academic libraries build on existing knowledge and bring collections forward. A method has to be adopted in order to provide a baseline for collection management, ensuring that the ideas represented in the scholarly literature are reflected in the college or university library collection. This particular work describes all necessary data resources that can be used to evaluate a Library's open access book collection focused not only in quantitative measures but also in users' needs and demands.

2. Cost, User's Demands and Satisfaction

It is fact that a modern library, apart from its role (Academic, Public etc.) has to cover a wide range of knowledge subjects that must satisfy not only scholar and education needs but also a set of other specific needs. For example an Academic Library that belongs to a Technical University must not has only books about Sciences, Mathematics etc. but also books about literature, arts, history, medicine. Alike an Academic Library that belongs to a social science University has to enrich its collection with books about Sciences, Computers and Mathematics. In recent days readers have a wide range of interests and this fact applies directly to their demands from a Library. The degree of coverage of all these additional subjects depends on several factors. The most important are: the allocated budget that Library has every year, the users' satisfaction of existing material in open access book's collection and the demands and expectations of users' about subjects are covered by this collection.

As mentioned it is very important to give the opportunity to users for accessing book material through Internet. So, it is very important for a Library to have the ability to offer access to digital content and open access books. As offered services about books changed dramatically last years and new opportunities for accessing books remotely (electronic books-open access books) is very important Library to focus in development of open access books collection. If we want to answer the major question: "*Why open access books?*" we can give a lot of answer that are expressing the main advantages of them:

- *Cost of purchasing*: It is fact the an open access book (e-book) is cheaper even 30% of printed
- *Easily and rapidly access, extremely less storage space*
- Libraries have the potential to store much more information, simply because digital information requires very little physical space to contain it. As such, the cost of maintaining a digital library is much lower than that of a traditional library

- *No physical boundary of reading a book.* The Library's user need not to go to the library physically
- *Round the clock availability.* People can gain access 24/7 to the Open Access Books' Collection
- *Multiple access.* The same book resources can be used simultaneously by more than one users according of course to relevant copyrights and digital rights of the Open Access material
- *Fast delivery.* An Open Access e-book can be obtained in Library's collection in a few minutes
- *Information retrieval.* The user is able to use any search term (word, phrase, title, name, subject) to search the entire book in a simple movement
- *Preservation and conservation.* It is extremely simpler to preserve and conserve an e-book instead of a printed book
- *Space.* Whereas traditional libraries are limited by storage space, now libraries have the potential to store much more information, simply because digital information requires very little physical space to contain them and media storage technologies are more affordable than ever before.
- *Added value.* Certain characteristics of objects, primarily the quality of images, may be improved. Digitization can enhance legibility and remove visible flaws such as stains and discoloration
- There are *a lot of actions and initiatives* about Open Access and especially about Open Access Books (*e.g. Open Access Publishing in European Networks (OAPEN)*)

From above mentioned reasons it is obvious that the importance of open access books collection will start to be vital in a Library Organization and will be a main factor of offering modern and quality services to users.

However, another major question could be “what we can use to find all the necessary information about book collection quality and especially about open access book collection?” We can basically consider that the term “quality” means if collection accomplishes all users' demands. So, one of the major resources we have to use are collected data from surveys about users judgments for “books' collection” quality. It is very important periodic surveys to be conducted in order to examine users' opinions and evaluate their satisfaction for all offered services. In these surveys a specific topic must be included about their judgment for books' collection. It is a very important information source as it is directly connected with Library's “customer”, that is user.

User's satisfaction, demands and expectations can be evaluated and measured by methods that can be applied directly from Library. Specifically users' satisfaction can be measured from data collected by surveys that have to be conducted at least every year. For this purpose it is necessary to make questionnaires that have appropriate questions in order to receive their opinions

about books collection of the Library. A questions like “Are you satisfied from subjects covered from open access book’s collection? If not select what subjects have to be enriched with new titles in order to be satisfied?” After this question a full list of all subjects (Science, Literature, Fine Arts etc.) has to present in order to be easy for user to select. This way is a direct way of estimating coverage of subjects in Library according to users’ judgments. It is very important to notice that if periodic surveys are conducted it is easy to find also trends of users about their demands in subject coverage of book’s collection (Meletiou, 2010). These trends can also help significantly to decide about improvement and enrichment of book’s collection.

After collection of data from surveys we can analyze them using a lot of methods, either statistical or better using multicriteria methods. A method of evaluating users’ satisfaction about a service is described by Meletiou (Meletiou, 2010) and uses non-parametric statistical techniques and multicriteria methods. Using this way we can obtain data that are referred to users opinions about open books collection and specifically to their judgments about what subjects need attention for improvement.

The second data source we are using is the OPAC log files. Using OPAC we can examine all users’ requests in material searching. Modern Integrated Library Systems (ILS) have all necessary software and procedures to report efficiently a lot of details about searches in OPAC. Analyzing relevant data it is easy to find users’ demands as their searches are expressing what they need. Next chapter refers in detail what data can obtain and how we can use them in proposed framework.

Third data source has to be the proposed lists of titles from the faculty. In all modern Academic Libraries faculty plays a major role in collection creation and improvement as they have the most experience and knowledge about curriculum of the Academic Organization. In most cases Librarians are asking them to evaluate new titles and suggest how many of them have to be acquired in order to improve open access books collection. So, final book title lists that faculty give to Library are very important in proposed framework. More details about this procedure are giving in next chapter.

Finally, we are using allocated budget in proposed framework. Unfortunately allocated budget in most cases is a factor that it doesn’t depend on Library’s Organization but in University’s Organization decision makers and has to be respected and remained fixed. This criterion has to be combined with cost of every item. This means that in final lists of open access books material for acquisition, cost of every material is necessary to be noticed. This is the last criterion that can be applied to the lists that refer to open access book material that could be purchased and acquired.

3. Proposed Framework for Collection's Improvement

As mentioned, presented framework is applied to Academic Library of Technical University of Crete and we used the following data sources: *Data from users' satisfaction surveys, Search Logs from OPAC, proposed order lists from Faculty for titles that could be acquired and Allocated budget to the Library*. Our purpose is to combine and consider all above for making a final list that will define what titles will be purchased and acquired in order to improve Library's collection.

One of the most important facts is that the customers of a Library are its users and is crucial to be satisfied when are using from a Library's product, that is the knowledge it offers through material (collections) it has and acquires.

To estimate this satisfaction we are using results of relevant users' surveys about their satisfaction for coverage and completeness of Library's books collection. As mentioned, it is very important, periodical surveys to be conducted in order to evaluate not only the satisfaction and opinions of users about Library but also to find trends and demands. In our case study (Meletiyou, 2010), a questionnaire was completed by Library's users and there were specific questions in it about the open access books collection. Specifically there were the following questions:

OPEN ACCESS BOOK COLLECTION: "Are you satisfied from subjects covered from open access book's collection?": YES NO
"If your answer is NO, what subjects do you believe that have to be enriched with new titles in order to be satisfied?"

After this question, a detailed list of all relevant main subjects (e.g. Philosophy, Psychology, Science, History, Social Sciences and Technology) was existing. We used "Library of Congress Classification" to describe all main subjects and secondary subjects of an item. We can increase or reduce the list with main subjects or secondary subjects in order to be easy for user to select. This way is a direct way of estimating coverage of subjects in Library's open access books collection according to users' judgments.

At this point it is necessary to notice that Technical University of Crete has the following departments: Electronic and Computer Engineering, Production Engineering and Management, Mineral Resources Engineering, Environmental Engineering, Architectural Engineering and Sciences Department. So, the main subjects of University's curriculum (according "Library of Congress Classification Schedules") are: Science, Social Sciences, Fine Arts and Technology.

In our case study the following table shows the satisfaction of users for specific subjects and the percentage value that shows how many of the survey users (percentage) are not satisfied for specific subjects. These users believe that collection needs improvement in relevant subjects in order to satisfy their needs.

Subject	% of not satisfied users
Science: Computer Science	35,0%
Science: Chemistry	21,0%
Science: Mathematics	17,0%
Science: Physics	14,0%
Technology	32,0%
Philology and Linguistics	15,0%
Literature (general)	18,0%
History (general)	14,0%
Social Sciences	28,0%
Fine Arts	10,0%
Education	5,0%
Library Science	2,0%

Table 3.1. Satisfaction of users for each subject

According to results of the survey we found that 63% of the participated users were satisfied from open access book collection but 37% were not satisfied. It is possible users were not satisfied with more than one subject of the open access books collection. According to their judgments, all subjects of Table 3.1 have to be improved. For example, 28% of users that were not satisfied with collection believe that Social Arts Subject has to be improved. In our case we decided that every value above 15% is a significant value and relevant subject needs immediate attention in order to improve users' satisfaction. At this point we have to notice that it is very important the sample that participates in surveys to be relevant to the population of the University. For example if the students belong to department A are 25% of the population of the University then survey users that are students from department A has to be around 25% of the survey sample.

Using this way we can have a detailed ranking table about subjects that users believe need attention and improvement. Furthermore, we can define a threshold and focus in subjects that have values above it. Presented results can help Librarians to have a clear perspective what happens with user's opinion about specific subjects of open access books collection.

Another source, as mentioned, is OPAC data log files. Using it we can obtain all necessary information about the searches that users did in a specific period. Analyzing these data we can measure how many times users did not find what searched for and furthermore for what they searched for. For example, the question "*Did you find what you search for in OPAC?*" after every search in OPAC can show the completeness of collection according to users demands. In presented case study the above question was displaying after

every search in OPAC for a period of 3 months to concentrate data and results about users' demands and searches.

So, we can see clearly what subjects of the collection have problem and have to be improved. In most cases, unfortunately, there are no specific software programs that can automatically do all above. So it is a need to create a new one or to configure properly an existed one. However, it is not so complicated to do it. A typical simple table that is produced after above analysis is presented below:

Results of all Searches between 1/4/2010 until 30/6/2010

No of Searches	Subject	Found	Not Found	% Not Found
3867	Science	3452	415	10,73%
1765	Science: Computer Science	1478	287	16,26%
378	Science: Chemistry	294	84	22,22%
378	Science: Mathematics	356	22	5,82%
218	Science: Physics	176	42	19,27%
1023	Technology	961	62	6,06%
43	Philology and Linguistics	21	22	51,16%
238	Literature (general)	105	133	55,88%
121	History (general)	68	53	43,80%
103	Social Sciences	81	22	21,36%
421	Fine Arts	317	104	24,70%
52	Education	37	15	28,85%
32	Library Science	21	11	34,38%

Table 3.2. Users' searches for each subject

At this point we have to notice that initial table with all data from OPAC search logs has to be transformed in order to receive a readable and explained result. For example some type of queries could be: "Autocad", "*Autocad*". These queries were easy to be defined as "Subject: Sciences". Other queries that were not clear like: "Evaluation methods*" were ignored from analysis. The same method was followed when the queries concerns about Author. In this query type a new table was produced where "Subject" header was substituted by "Author". In "Not Found" items a new alphabetical list with all titles that were not found is produced and by this it is very clear for the Librarian to see what items were asked (once or multiple times).

All necessary data can be collected from ILS Circulation logs and a table like the Table 3.2 can be produced in order to give a perspective to any Librarian about the demands of asked book titles.

The third data source we are using is the set of order lists that faculty members are sending to the Library for titles acquisition. In our case an on-line web based system is responsible for collecting applications for acquisitions (order new titles requests). This system is accessible only by faculty (Professors and Teaching Staff) of the University Organization (by giving the appropriate credentials). So, it is very easy for the Librarians to have any time a detailed list with proposed titles for purchasing. Furthermore, this system obligates faculty to define a rank in their title lists in order to exist one more criterion that will help the Librarian to accept or reject the relevant order requests. This rank list shows the priorities that every faculty member gives in titles needs for his teaching of research activities. In most cases faculty is a group that plays the most important role in selection of book material (Ammen, K., & Haider, S.J., 2007). Librarians and specifically Collection Management Staff, takes in mind very seriously the faculty's requests for new titles orders.

At this point we have to notice that faculty must be well informed by booksellers/publishers for new editions and titles in order to be able to decide what books can use for their needs (educational or research). But this is also a responsibility of a Librarian to inform faculty for all new editions in every subject using either modern methods like Internet (email, alerting systems) or classical methods (post brochures or catalogues by mail).

Last factor we are using is the allocated budget for acquisition of new titles. Unfortunately in most cases depends on external factors where Library is unable to be involved and is a constant value that is given from central authorities of the University Organization. In most cases Library accepts a standard amount of all its needs and has to allocate it in all cost centers (e.g. operational costs, database subscriptions, journals costs, reference and special collections costs, acquisition of new titles or collection's improvement). It is fact that like most academic institutions, budgetary limitations do not allow purchase of all desired materials. Thus, one of the initial imperatives of the Collection Development and Management position was to develop a rational materials budgeting process. While there are no written collection development policies in place, the Library's intent is to support the University's goals by collecting and maintaining materials in all formats at the appropriate depth and breadth to support the degree programs offered by each department and school. Deciding on how to allocate the material budget was no small task given that is the primary tool for collection development; collecting priorities are necessarily reflected in the funds assigned to each academic department (Smith, 2008). In our case a method like PBA (Percentage based allocation) used in order to allocate initial budget that University Organization gives in Library at the beginning of the year, in all related cost centers that Library includes and in all

Academic Departments that serves. So, a specific amount is allocated to improve collection and will be used in final decisions as will be described in next paragraphs.

In Library of Technical University of Crete some assumptions and decisions were taken in order to apply proposed method. So, Library decided to give *first priority to open access books*. This means that at the final list of titles that will be purchased the first priority will be to examine the existence of the title in open access form (e-book) and if exists then will be purchased at this form. This title will be purchased in printed form only if electronic form will not be available. It is important to notice that is actually the first movement of Library to obtain open access books and it is very important to be done by a valid method. So, after these assumptions and decisions Library applied the proposed framework in order to make a final rank list of proposed titles for acquiring.

The first step is to estimate a rank list with all subjects that will be involved in the procedure. To do this three important factors have to be considered:

1. The results that show the satisfaction of users, that is expresses the coverage of collection for each subject (Table 3.1)
2. The results that show users' searches for each subject from OPAC. It expresses what subjects needs improvement according to search requests (Table 3.2)
3. The order lists requests from Faculty. These lists are ranked and can be transformed in order to show subject of every request title. So final rank list will have all requests classified by subject.

Proposed methodology considers that the most important factor is users' satisfaction. So the procedure starts by making a list that shows the priorities about the subjects will be focused and have to take more attention. Furthermore we are giving a score value in every subject according to its position in the lists. In our case Table 3.3 shows this ranking:

Subject	% of not satisfied users	Score
Science: Computer Science	35,0%	12
Technology	32,0%	11
Social Sciences	28,0%	10
Science: Chemistry	21,0%	9
Literature (general)	18,0%	8
Science: Mathematics	17,0%	7

Subject	% of not satisfied users	Score
Philology and Linguistics	15,0%	6
Science: Physics	14,0%	5
History (general)	14,0%	4
Fine Arts	10,0%	3
Education	5,0%	2
Library Science	2,0%	1

Table 3.3. Ranked table for satisfaction of users for each subject

Second mentioned criterion is OPACs search results. We are making a rank list according to the initial results (Table 3.2) and defined threshold and we are taking following table. Furthermore we are giving a score value in every subject according to its position in the lists as we did before in Table 3.4.

No of Searches	Subject	Found	Not Found	% Not Found	Score
238	Literature (general)	105	133	55,88%	12
43	Philology and Linguistics	21	22	51,16%	11
121	History (general)	68	53	43,80%	10
32	Library Science	21	11	34,38%	9
52	Education	37	15	28,85%	8
421	Fine Arts	317	104	24,70%	7
378	Science: Chemistry	294	84	22,22%	6
103	Social Sciences	81	22	21,36%	5
218	Science: Physics	176	42	19,27%	4
1765	Science: Computer Science	1478	287	16,26%	3
1023	Technology	961	62	6,06%	2
378	Science: Mathematics	356	22	5,82%	1

Table 3.4. Ranked table about Users' searches for each subject

In order to make the rank list table of Subjects that need attention we are adding scores for each one and we are making the following table (Table 3.5):

Subject	Priority
Literature (general)	20
Science: Computer Science	15
Social Sciences	15
History (general)	14
Technology	13
Library Science	10
Education	10
Fine Arts	10
Science: Chemistry	9
Science: Physics	9
Science: Mathematics	8
Philology and Linguistics	6

Table 3.5. Priority rank list of subjects

Subjects that have biggest score need immediate attention. So, actions have to be focused on improvement of these subjects.

In next step we are considering the lists that faculty proposed about new title orders. We are merging all these lists and are making a final one that has the title and the subject of it. It is clear that these lists will have in greatest percentage, subjects that are vital to Library and covers the main subjects that University is teaching in curriculum. In our case this list had subjects relevant to faculty educational and research interests (Science, Technology, Social Science, Fine Arts). A typical table could be the following (Table 3.6):

Title	Depart	Member ID	Priority	Subject
Advances in Evolutionary Algorithms	ELCE	121	1	Science: Mathematics
SQL Fundamentals	ELCE	121	2	Science: Computer Science
An introduction to macroeconomic model	PRMGT	225	2	Social Sciences: Economic Theory
Flight stability and automatic control	PRMGT	225	1	Social Sciences: Motor Vehicles
Nonlinear phenomena in science and engineering	SCI	301	1	Science: General

Title	Depart	Member ID	Priority	Subject
Physical chemistry of surfaces	SCI	301	2	Science: Chemistry
Applied Enhanced Oil Recovery	MINRES	404	1	Technology: Mining Engineering
Blow Out prevention	MINRES	405	1	Technology: Mining Engineering
Architecture and modernity: a critique	ARCH	510	1	Fine Arts: Architecture
Computer system architecture	ARCH	511	1	Science: Computer Science
Ground water pollution control	ENVENG	620	1	Technology: Environmental Technology
Heavy metals in the environment	ENVENG	620	2	Technology: Environmental Technology

Table 3.6. Requests from Faculty

By making a table like this we are able to have all requests and relevant information that will help the Collection Developers to have a perspective of all Faculty requests.

In next step we are making a list of all proposed requests about all other subjects that were not included in “Requests from Faculty” list in order to make a list about titles that could improve subjects other than main subjects of the Library. In most cases this list is made by Collection Developers Librarians as it refers to subjects that Faculty’s teaching and research activities are not involved. In our case these subjects are about History, Library Science, Literature and Philology and Linguistics. Another approach could be the combination of preferences of Librarians and Faculty about these subjects. This means that Faculty has to be asked for proposing titles for subjects different than their main activities in another list that will be combined with relevant one of Librarians.

It is important to add at every final list a column with the cost of every proposed item and a column that will define if finally relevant title will be purchased and acquired or not.

Continuing the procedure, we are subtracting for the budget that will be used for “Books Collection” improvement (and is defined after the application of a budget allocation procedure, as mentioned) the amount that will be used to purchase the extra items (copies) of existed book titles. A methodology proposed by Meletiou and Katsirikou (Meletiou, A., & Katsirikou A. (2006)) applied to obtain the final list of it. The remaining budget will be used to improve subjects of the collection.

Next step refers to the decision of what percentage of this amount will be allocated for every subject of the books collection. So, we are considering the results from OPAC's searches and Users' satisfaction surveys that were analyzed in previous steps (see Table 3.6). In these results we are considering an important factor that refers to the main and vital subjects that Library has to focus. These subjects, as mentioned, depend of the curriculum of the University. In our case as it is Technical University the main and vital subjects are: Science, Social Sciences, Fine Arts and Technology. So we are dividing Table 3.6 in two tables: the first has only the vital subjects of the Library and the second all the others. These two tables continue to be ranked according to the relevant priority of the initial table:

Subject	Priority
Science: Computer Science	15
Social Sciences	15
Technology	13
Fine Arts	10
Science: Chemistry	9
Science: Physics	9
Science: Mathematics	8

Table 3.9a. Main and vital subjects

Subject	Priority
Literature (general)	20
History (general)	14
Library Science	10
Education	10
Philology and Linguistics	6

Table 3.9b. Other subjects

So, we have the priority list that we will use to decide about subjects' improvement. Before doing this we have to decide what percentage of the remaining budget of "Books Collection" improvement will be used to Main Subjects' (Table 3.9a) and to Other Subjects' (Table 3.9b) improvement. There is no any specific guideline for this and it depends on strategic management of the Library. In our case the decision was to use 80% to "Main Subjects" (Table 3.9a) and 20% to "Other Subjects" (Table 3.9b) improvement. So, about the amount the allocation was as following:

Initial budget allocated from University to Library for this year: 300.000 €
Allocated budget from Library to "Books Collection" improvement: 30.000 €
Cost for purchasing new copies items for existed titles: 4.300 €
Remaining budget for "Books Collection" improvement: 25.700 €
Allocated budget for "Main and vital subjects" improvement: $80\% \times 25.700 \text{ €} = 20.560 \text{ €}$
Allocated budget for "Other subjects" improvement: $20\% \times 25.700 \text{ €} = 5.140 \text{ €}$

As there are completely defined all allocated budget and as there all lists with requested, final step is to do the final selection of the titles will be purchased. To do this we are considering the ranked tables 3.9a and 3.9b and we are doing a normalization of ranking values to estimate the ratio of the budget to be allocated in every subject. For example to find the normalized value of “Science: Computer Science” we do: $15/(15+15+13+10+9+9+8) = 0,1899$, that is 18,99%. So, the new tables will be the following:

Subject	% budget	Amount	Subject	% budget	Amount
Science: Computer Science	18,99	€ 3.904	Literature (general)	33,33	€ 1.713
Social Sciences	18,99	€ 3.904	History (general)	23,33	€ 1.199
Technology	16,46	€ 3.383	Library Science	16,67	€ 857
Fine Arts	12,66	€ 2.603	Education	16,67	€ 857
Science: Chemistry	11,39	€ 2.342	Philology and Linguistics	10	€ 514
Science: Physics	11,39	€ 2.342			
Science: Mathematics	10,13	€ 2.082			

Table 3.9a. Main and vital subjects

Table 3.9b. Other subjects

The last step is to decide from two lists of “Main and vital subjects” requests and “Other subjects” requests what titles we will purchase according to above budget allocation tables.

Below there is a list of all necessary steps that described in proposed methodology:

1. Collect data from users’ surveys about their satisfaction and demands about covered subjects in collection, analyze them and make a rank table with all subjects that users are not satisfied with. Put a score in every row.
2. Collect data from OPAC logs, analyze them and find users queries that didn’t find the desired result. Make a rank table that will include the “% of not found” queries and relevant subjects. Put a score in every row.
3. Add the relevant scores of every subject from above 2 steps and make a rank table that expresses the priorities of subjects’ improvement.

4. Receive ranked lists with requests for the acquisition of new titles from Faculty and put them in a single table by adding a column with cost of every item and the relevant subject of each one.
5. Make a ranked table with all requests about titles for subjects that are not included in the Faculty's lists. This table will have a column with cost of every item and the relevant subject of each one, too.
6. Estimate using budget allocation methods the amount will be used for improvement open access books collection.
7. Subtract this amount the cost of purchasing new item copies for existed titles as it explained in the relevant step of the methodology.
8. Make two separate tables o "Main Subjects" and "Other Subjects" that will express the priority of improvement in each one.
9. Decide the amount (from the remaining budget) that will be allocated in "Main Subjects" and "Other Subjects" open access books collection's improvement
10. Normalize the two tables and allocate % of the budget for every subject
11. Considering the final budget allocation tables for each subject make the final selection of open access book titles will be acquired from relevant request lists. In this final step rank lists with subjects could be also considered.

4. Conclusions

Modern Library systems are giving the ability to collect all necessary data in order to find useful information about collection. All these data can be analyzed using a lot of tools and useful results can be presented to help Librarians to see what the weak points in books collection are and what they have to improve in it.

The main objective of the study presented in this paper was to demonstrate a framework and propose a methodology for improving Books Collection in a Library according to four important factors: *Data from users' satisfaction surveys, Search Logs form OPAC, proposed order lists from Faculty for titles that could be acquired and Allocated budget to the Library.*

This particular work explained what the necessary data sources are and how data from them can be collected, analyzed and interpreted. It described in detail all necessary steps that have to be followed in order Collection Developer Librarian to be able to decide about the titles that has to be purchased. Proposed methodology gave a perspective of how a collection could be improved according not only to allocated budget and items costs but to users' satisfaction and demands, too.

Furthermore, it gave the ability to the decision maker to realize what are the subjects that need immediate attention and defined priorities that would be followed in order to manage an efficient and productive improvement of Open Access Books Collection.

However, the development of decision support system software tool may also be considered in order to further support the presented methodology.

The final purpose of this work is to make the exported information useful for decision makers and specifically Collection Developers in such way to help them in taking decisions and planning strategies and actions in order to improve the Books and E-Books Collection of Library Organization.

References

- Ammen, K., & Haider, S.J. (2007). Book selection strategies in university libraries of Pakistan: An analysis. *Library Collections, Acquisitions, & Technical Services*, 31, 208-219
- Broadus R.N. (1977). "Evaluation of Academic Library Collections: A Survey of Recent Literature", *Library Acquisitions: Practice and Theory*, Vol.1 (1977), pp. 149-155
- Curley, A., & Broderick, D. (1985). *Building library collections* Metuchen, NJ: the Scarecrow Press
- Enger B.K. (2009). "Using citation analysis to develop core book collections in academic libraries", *Library & Information Science Research*, Vol. 31 (2009), pp. 107-112
- Evans, G. (2000). *Developing library and information center collections* (4th ed.). Englewood, CO: Libraries Unlimited
- Meletiου, A., (2010). "Tracking changes of Library users' preferences using multicriteria analysis", presentation to the International Conference on "Qualitative and Quantitative Methods in Libraries", Chania 2010.
- Meletiου, A., & Katsirikou A. (2006): "Qualitative Indicators of Services of Libraries and Management of Resources: Methodologies of Analysis and strategic planning", 15th congress of Academic Libraries, 2006
- Meletiου, A., & Katsirikou, A. (2008). "Methodology of analysis and interrelation of data about quality indexes of library services by using data- and knowledge mining techniques". *Library Management*, Vol. 30 No. 3, 2009, pp. 138-147
- Narasimha Murty M., Anil Jain K. (1995), "Knowledge-based clustering scheme for collection management and retrieval of Library books", *Pattern Recognition*, Vol. 28 No. 7 (1995), pp. 949-963
- Nisonger Th.E., "Collection Evaluation in Academic Libraries. A literature guide and annotated bibliography" (1992). Libraries Unlimited Inc. Publications
- Osburn, C.B. (1983). *Towards a re-conceptualization of collection development*. In G. McCabe, & B. Kreissman (Eds.), *Advances in library administration and organization* (pp. 175-198). Greenwich, CT: JAI Press.
- Perrone A. (2009). "Electronic Book Collection Development in Italy: a case study", *World Library And Information Congress: 75th IFLA General Conference And Council*, 23–27 August 2009, Milan, Italy

- Schmidt, K. (2004). Past perfect, future tense: A survey of issues in collection development. *Library Collections, Acquisitions, & Technical Services*, 28, 360-372
- Smith, D. A. (2008). Percentage based allocation of an academic library materials budget. *Collection Building*, 27, 30-34
- Wallace, D.P., & Van Fleet, C. (2001). *Library evaluation: A casebook and can-do guide*. Westport, Ct: Libraries Unlimited