Usage of open access institutional repositories in some of the European peripheral scientific communities

Hebrang Grgić, Ivana

Conference presentation / Izlaganje na skupu

Usage of Open Access Institutional Repositories in Some of the European Peripheral Scientific Communities

Ivana Hebrang Grgić
Faculty of Humanities and Social Sciences University of Zagreb
I. Lučića 3, Zagreb, Croatia
ivana.grgic@ffzg.hr

Summary

In the introduction, institutional repositories and Open Access movement will be explained. In literature review, citation impact of Open Access articles will be discussed based on several researches (e.g. by Harnad, Brody, Kennicutt, Kurtz etc.). Further on, differences between scientifically mainstream and peripheral countries will be emphasized. Two important factors in defining peripheral scientific communities – language and economy – will be explained. Scientists in peripheral scientific communities sometimes communicate in "small" language (although the languages usually have long traditions, they are spoken and understood by relatively small number of scientists), and sometimes their countries' economy is marked as "developing" or "semi-developed". We will not discuss scientific communication problems in developing countries, but the problems of seven European semi-developed and developed countries with official languages other than English (Croatia, Slovenia, Bulgaria, Hungary, Italy, Poland and Greece). Institution repositories, especially if they are Open Access repositories, can significantly increase research impact of their institutions. Number and productivity of Open Access institutional repositories in the seven scientifically peripheral countries will be discussed.

Key words: Open Access, institutional repository, research impact, scientifically peripheral country

Introduction

Open Access institutional repositories (OA IRs) can play an important role in improving visibility and impact of research output of any scientific institution. Thanks to such repositories, scientific research results can be accessed anywhere in the world. As the unofficial language of scientific communication is English, some scientists who work in countries with official languages other then English, may have visibility problems when they publish scientific articles written in their mother tongue. They can also have problems if they publish

their articles in English in their local scientific journals that are not accessible to wider scientific community. OA IRs can increase visibility and impact of research results published by the scientists in scientifically peripheral countries.

Literature review

As defined by Lynch in 2003, institutional repository is a set of services that a scientific institution offers to the members of its community for management of digital materials produced by employees (or students) of the institution. It facilitates access to the materials, their distribution, long-term preservation and organization.[1]

According to *SPARC* (*Scholarly Publishing and Academic Resources Coalition*) definition, institutional repositories are digital collections capturing and preserving the intellectual output of a single university or a multiple institution community of colleges and universities. An OA IR has to be institutionally defined, scholarly, cumulative, perpetual, open and interoperable.[2]

Access to materials in an institutional repository can be free for anyone using Internet, or restricted to some users (e. g. registered users, employees and/or students of the institution, users who paid for the access). We will here discus Open Access repositories - repositories with no access barriers.

Open Access movement was firstly defined in the *Budapest Open Access Initiative* (*BOAI*) in 2001 as free and unrestricted online availability of scientific journal literature. Open Access should permit any users "to read, download, copy, distribute... the full texts of the articles, and use them for any other lawful purpose, without financial, legal, or technical barriers other than those inseparable from gaining access to the Internet itself."[3] The *BOAI* recommends two ways to attain Open Access to scientific literature. The first one is self-archiving, i. e. depositing full-texts of scientific papers (that will later be called Open Access repositories). The second way is publishing articles in new generation journals - Open Access journals. OA repositories are sometimes called "green route to OA" or "green road" because publishers have to give "green light" for self-archiving articles published in their journals.[4]

[1] Lynch, Clifford A. Institutional repositories : essential infrastructure for scholarship in the digital age. // Libraries and the Academy, 2, 3(2003), pp. 327-336.

[2] Association of Research Libraries. The case for institutional repositories : a SPARC position paper. 2002. http://www.arl.org/sparc/bm~doc/ir_final_release_102.pdf (accessed May 02, 2011).

[3] Budapest Open Access Initiative. http://www.soros.org/openaccess/read.shtml (accessed May 02, 2011).

[4] Harnad, Stevan et al. The access/impact problem and the green and gold roads to Open Access. // Serials Review 30, no. 4 (2004), available at: http://eprints.ecs.soton.ac.uk/10209/1/impact.html (accessed May 02, 2011).

In the early 2000s OA proponents had to prove the impact and citation advantage of OA articles. Without proving it, scientists would have never totally accepted OA as a way of communicating in science. According to T. Brody and S. Harnad, OA increases number of potential article users by adding the users who would otherwise have been unable to access it because of price barriers. Access is not a sufficient precondition for citation, but it is a necessary one.[5] G. J. Schwartz and R. C. Kennicutt proved in 2004 that the articles self-archived as pre-prints are cited earlier than those published and/or archived as post-prints. Also, the articles from the first group are twice as cited as the articles from the second group. The reason is the fact that an average article from the first group is accessible 12 months earlier than conventionally published articles.[6] Other authors to prove positive correlation between OA and the number of citations were Shin in 2003,[7] Moed in 2005,[8] H. Besemer in 2006,[9] Eysenbach in 2006[10] and others.

In this paper we will base our discussion on the fact that the OA advantage is proved and based on open access, early access, quality advantage and usage advantage.[11]

Defining scientifically peripheral countries

Two factors are important when distinguishing between scientifically mainstream and scientifically peripheral countries - language and economy. Global scientific community communicates in English through high-quality scientific journals, and all the countries whose scientists do not communicate in English

[5] Harnad, Stevan; Brody, Tim. Comparing the impact of Open Access (OA) vs. non-OA articles in the same journals. // D-lib Magazine 10, 6(2004), available at: http://www.dlib.org/dlib/june04/harnad/06harnad.html (accessed May 02, 2011).

[6] Schwartz, Greg J.; Kennicutt, Robert C. Demographic and citation trends in Astrophysical Journal papers and preprints. 2004. http://www.publingresearch.net/Citations-SummaryPaper 3_000.pdf (accessed May 05, 2011).

[7] Shin, Eun-Ja. Do impact factors change with a change of medium: a comparison of impact factors when publication is by paper and through parallel publishing. // Journal of information science 29, 6(2003), pp. 527-533.

[8] Moed, Henk F. Statistical relationships between downloads and citations at the level of individual documents within a single journal. // Journal of the American Society for Information Science and Technology 56, 10(2005), pp. 1088-1097.

[9] Besemer, Hugo. Gathering evidence about the effectiveness of "Open Access" publishing policies in agriculture. 2006. http://agriscontent.wordpress.com (accessed May 05, 2011).

[10] Eysenbach, Gunther. Citation advantage of Open Access articles. PloS Biology. 2006. http://biology.plosjournals.org/archive/1545-7885/4/5/pdf/10.1371_journal.pbio.0040157-S.pdf, (accessed May, 10, 2011).

[11] Harnad, Stevan; Hajjem, Chawki. The Open Access citation advantage: quality advantage or quality bias? 2007. http://eprints.ecs.soton.ac.uk/13328/1/moed.html (accessed May 05, 2011).

may be considered scientifically peripheral. Official languages of countries they live in can have a long tradition, but are not the usual channel for scientific communication. That is the reason why the countries are considered scientifically peripheral. Another important factor is economy. Some of scientifically peripheral countries that will be discussed later are highly developed, but some of them are countries with transition economies. A transition economy is an economy which is changing from a centrally planned economy to a free market. The process has been applied in some Central European countries (Bulgaria, Croatia, Bosnia and Herzegovina…).[12]

Scientists in scientifically peripheral countries have two serious access problems. The first one is the same as the problem that scientists in scientifically mainstream countries have – price barriers that block access to high quality scientific journals. Another problem is visibility of their own research results in global scientific community. Scientists from those countries occasionally publish research results in international high-quality journals, but most frequently they publish them in local journals that do not reach global scientific community (usually because of language barriers that minimize international subscriptions, readership and influence).[13] Contemporary scientific communication system enhances the differences between journals from developed and semi-developed (or developing) countries.[14] Research results from peripheral scientific communities are invisible to the wider scientific community – there is a danger for those research results to become a part of so called "lost science". Some scientifically peripheral countries, such as Croatia, have one more characteristic – Croatian scientific journal publishers are mainly not-for-profit organisations (universities, faculties, departments, associations…). Croatian *Ministry of Science, Education and Sports* (*MSES*) gives grants only to not-for-profit scientific publishers. Another *MSES'*s funding criteria gives priority to the journals that have at least some content (not necessarily full-text articles) available on the Internet.[15] Some European scientifically peripheral countries' experiences with OA institutional repositories will be described. Their practice will be compared to Croatian practice and some recommendations for the future will be emphasized.

[12] International Monetary Fund. Transition economies : an IMF perspective on progress and prospects. http://www.imf.org/external/np/exr/ib/2000/110300.htm#I (accessed May 05, 2011).

[13] Stojanovski, Jadranka; Petrak, Jelka; Macan, Bojan. The Croatian national Open Access journal platform. // Learned Publishing 22, 4(2009), pp. 263-273.

[14] Marušić, Ana; Marušić, Matko. Small scientific journals from small countries: braking from a vicious circle of inadequacy. // Croatian Medical journal 40, 4(1999), pp. 508-514.

[15] Hebrang Grgić, Ivana. Open Access to scientific information in Croatia : increasing research impact of a scientifically peripheral country. Saarbrücken : Lambert Academic Publishing, 2011, p 54.

OA IRs in Croatia and some other European countries

The starting point for our analysis of OA IRs in seven European scientifically peripheral countries will be two databases – *Directory of Open Access Repositories* (*DOAR*)[16]; *Registry of Open Access Repositories* (*ROAR*)[17] – and the report that resulted from a 2010 meeting *Open Access in South European Countries*.[18] The databases and the repositories were searched at the end of April 2011. Although some aspects of institutional repositories are not comparable, we will show the total number of repositories, number or IRs, language of deposited items, material types and software used in IRs in seven European countries – Croatia, Italy, Hungary, Poland, Slovenia, Bulgaria and Greece.

According to the *DOAR*, there were five OA repositories (4 of them IRs) in Croatia in April 2011 – *Digital Archive of the Faculty of Humanities and Social Sciences* at the *University of Zagreb*, *Repository of the Faculty of Mechanical engineering and Naval Architecture* at the *University of Zagreb* (*FAMENA PhD Collection*), *University of Zagreb Medical School Repository*, *FOI* (*Faculty of Organization and Informatics*) *digital library* and *Hrčak* portal. According the *ROAR*, there were, in April 2011, three repositories – all of them mentioned earlier –*University of Zagreb Medical School Repository*, *Digital Archive of the Faculty of Humanities and Social Sciences* at the *University of Zagreb* and *Hrčak* portal. Analysing software used in Croatian repositories, we can see that two of them use EPrints, one uses dSpace and two repositories use some other software. All the repositories have items written in Croatian and three of them also have items written in English. Material types in Croatian OA IRs are journal articles (in 3 repositories), theses (in 3 repositories), books or chapters (in two repositories), conference papers (in two repositories) and there are also other material types (presentations, working papers, unpublished material…).

If we analyse content of and access to all the repositories, we can see that not all of them meet the full definition of an OA IR. The *FOI* digital library has an intention to become an OA IR, but is in a test phase and has only 5 items, all of them administrative documents of the institution.[19] The *Hrčak* portal is a valuable project but it is not really an OA repository – it is a platform for access to Croatian OA journals. The *Digital Archive of the Faculty of Humanities and Social Sciences* at the *University of Zagreb* (720 items) has an intention to be an OA IR, it operates on the EPrints software and is OAI PMH compliant but it

[16] DOAR: Directory of Open Access Repositories. www.opendoar.org (accessed May 11, 2011).

[17] ROAR: Registry of Open Access Repositories. 2010. http://roar.eprints.org (accessed May 11, 2011).

[18] Open Access in Southern European Countries. http://www.accesoabierto.net/sites/accesoabierto.net/files/OASouthEurope.pdf (accessed May 11, 2011).

[19] FOI dlib. http://dlib.foi.hr/handle/10439/1 (accessed May 11, 2011).

still does not allow OA to all of its content (to access some full-texts registration is required). The repository archives mainly diploma thesis, although it has an intention to archive other material types. *Repository of the Faculty of Mechanical engineering and Naval Architecture* at the *University of Zagreb* (684 items) does not allow OA to all of the deposited items; it is not OAI-PMH compliant and does not use open source software although it also has an intention to become an OA repository. It archives master thesis and PhD thesis, but have the intention to archive other material types in future (journal articles, books etc.). The only Croatian repository that meets full definition of OA repository, and the only one that archive journal articles, is the *University of Zagreb Medical School Repository* (837 items). Full texts of all of the items are freely available and the repository is OAI PMH compliant. Open source software EPrints, version 2.3.13.1 was chosen and adapted to meet the institution's and the users' needs. Types of archived material are journal articles (658 items), thesis (170), book sections (6), conference or workshop items (2) and one book.
Comparing Croatian practice to those in some other European countries, we have to have in mind, beside other characteristics, the size of the countries. Table 1 shows number of OA repositories in the seven countries (according to the DOAR database), number of OA IRs in the same countries and the population of the countries.

Table 1: Number of OA repositories and OA institutional repositories in seven European countries compared to the population of the countries

	OA repositories	**OA IRs**	**Population**
Italy	59	51	61 000 000
Poland	45	37	38 000 000
Greece	14	12	11 000 000
Hungary	11	10	10 000 000
Bulgaria	3	3	7 200 000
Croatia	5	4	4 500 000
Slovenia	3	3	2 500 000

It is obvious that the countries with more inhabitants have more repositories – Italy, for example, with its population of about 61 million, has 59 repositories, Poland has 45 repositories, and the smallest countries, Croatia and Slovenia, have 5 and 3 Open Access repositories. It is also obvious that the majority of the repositories in all the countries are institutional repositories and in the countries with the smallest number of repositories – Bulgaria and Slovenia – all of the repositories are institutional. That shows the importance of institutions (mainly scientific institutions) in setting up Open Access repositories. The institutions and their libraries are aware of their users' needs, they know that the repositories can raise impact of research results of the institution.
Table 2 shows five most usual material types in OA repositories in the seven European countries. All the countries have repositories with journal articles

(that is the most common material type), books or chapters and conference papers. Almost all the countries have repositories with theses and learning objects.

Table 2: Material types in repositories in seven European countries

	Journal articles	Books or chapters	Conference papers	Theses	Learning objects	Total no of repositories
Italy	37	24	34	39	9	59
Poland	36	34	7	14	13	45
Greece	8	4	4	7	2	14
Hungary	2	3	3	2	1	11
Croatia	3	2	2	3	-	5
Slovenia	2	1	2	2	1	3
Bulgaria	3	1	1	-	1	3

When analysing software used for setting up and operating OA repositories, we have to have in mind that numerous Open Access initiatives recommend usage of open source software (such as EPrints and dSpace). Another recommendation is OAI-PMH compliance (Open Access Initiative – Protocol for Metadata Harvesting) that is important for ensuring better visibility and interoperability of OA repositories.

Table 3: Software used in OA repositories in the seven European countries

	EPrints	dSpace	Other	Total no of repositories
Italy	28	21	10	59
Poland	2	3	40	45
Greece	-	9	5	14
Hungary	8	2	1	11
Croatia	2	1	2	5
Slovenia	1	-	2	3
Bulgaria	1	2	0	3

Majority of repositories in the seven countries use EPrints or dSpace software (Table 3). The only country with significant use of other software is Poland where 34 repositories use dLibra software that emerged from a Polish national project for building digital libraries (the software is OAI-PMH compliant).[20]
Another important issue when comparing OA repositories in the seven countries is language of deposited material. Official languages in the countries are not understandable to a great number of people (although some languages are "larger" than others). That is the reason why scientists in the countries sometimes publish their research results in English. As can be seen from the Table 4, in four of seven countries there are more repositories with the items written in

[20] DLibra : digital library framework. http://dlibra.psnc.pl/index.php?lang=en (accessed May 12, 2011).

the countries' official languages – 49 of Italian 59 repositories have texts in Italian; 43 of Polish 45 repositories have texts in Polish; all the 14 Greek and all the 5 Croatian repositories have texts written in their countries' official languages (i. e. in their scientists' mother tongue). The second language represented in the repositories is English. All the countries have at least two repositories (Slovenia) that deposit material written in English. Other languages that are represented in the repositories are French (in 3 Italian and one Polish repository), German (in two Polish repositories), Spanish (in two Italian repositories), Czech (in one Hungarian repository), Russian (in one Hungarian repository), Armenian (in one Polish repository) and Arabic (in one Italian repository).

Table 4: No. of repositories with items in different languages

	Official language of the country	**English**	**Other**	**Total no of repositories**
Italy	49	40	6	59
Poland	43	16	4	45
Greece	14	10	2	14
Hungary	2	8	1	11
Croatia	5	3	0	5
Slovenia	2	2	0	3
Bulgaria	1	3	0	3

Conclusion

Literature review proves that OA IRs can increase impact and visibility of a country's research output. It is very important when a country is scientifically peripheral – research results published by its scientists are not always visible and accessible to the global scientific community. If we analyse some of European repositories, we can see that the majority of them are institutional repositories, set up mainly at universities or some other scientific institutions. They are usually set up on librarians' initiative. It proves the importance of scientific institutions in preserving and making available their research output. It also proves the importance of libraries that are the first place where access problem has to be solved if the users needs want to be met.

The majority of the OA repositories in analysed countries preserve journal articles, conference papers, theses and books. They usually use open source or other software that ensures interoperability and increase visibility of the OA repositories. Majority of repositories in four countries deposit material written or produced in their official languages but there is also a significant number of repositories that deposit materials in English.

Some of the analysed countries do not use all the possibilities OA offers. They should set up more institutional repositories as their research results could be more visible and accessible outside the countries. The worst situation is in Bulgaria, but the number of OA repositories in Croatia and Slovenia is also far too small (although the countries are smaller than other analysed countries). Institu-

tions and their libraries should try to organize working groups to make project proposals for setting up institutional repositories. Those working groups should have in mind the size and the organizational structure of the institution as well as scientific fields covered by the researchers of the institution. The groups should propose the most appropriate software and material types that could be deposited in a future repository. Members of working groups should be librarians, scientists, management, policy makers, technical staff etc. Setting up an OA repository is not easy; it includes short term and long term planning. But the results could be positive – research impact of the institution, its scientists and students can be improved.

References

Association of Research Libraries. The case for institutional repositories: a SPARC position paper. 2002. http://www.arl.org/sparc/bm~doc/ir_final_release_102.pdf (accessed May 02, 2011).

Besemer, Hugo. Gathering evidence about the effectiveness of "Open Access" publishing policies in agriculture. 2006. http://agriscontent.wordpress.com (accessed May 05, 2011).

Budapest Open Access Initiative. http://www.soros.org/openaccess/read.shtml (accessed May 02, 2011).

DLibra: digital library framework. http://dlibra.psnc.pl/index.php?lang=en (accessed May 12, 2011).

DOAR: Directory of Open Access Repositories. www.opendoar.org (accessed May 11, 2011).

Eysenbach, Gunther. Citation advantage of Open Access articles. PloS Biology. 2006. http://biology.plosjournals.org/archive/1545-7885/4/5/pdf/10.1371_journal.pbio.0040157-S.pdf, (accessed May, 10, 2011).

FOI dlib. http://dlib.foi.hr/handle/10439/1 (accessed May 11, 2011).

Harnad, Stevan et al. The access/impact problem and the green and gold roads to Open Access. // Serials Review 30, 4(2004), available at: http://eprints.ecs.soton.ac.uk/10209/1/impact.html (accessed May 02, 2011).

Harnad, Stevan; Brody, Tim. Comparing the impact of Open Access (OA) vs. non-OA articles in the same journals. // D-lib Magazine 10, 6(2004), available at: http://www.dlib.org/dlib/june04/harnad/06harnad.html (accessed May 02, 2011).

Harnad, Stevan; Hajjem, Chawki. The Open Access citation advantage: quality advantage or quality bias? 2007. http://eprints.ecs.soton.ac.uk/13328/1/moed.html (accessed May 05, 2011).

Hebrang Grgić, Ivana. Open Access to scientific snformation in Croatia: increasing research impact of a scientifically peripheral country. Saarbrücken: Lambert Academic Publishing, 2011, p 54.

International Monetary Fund. Transition economies: an IMF perspective on progress and prospects. http://www.imf.org/external/np/exr/ib/2000/110300.htm#I (accessed May 05, 2011).

Lynch, Clifford A. Institutional repositories: essential infrastructure for scholarship in the digital age. // Libraries and the Academy, 2, 3(2003), pp. 327-336.

Marušić, Ana; Marušić, Matko. Small scientific journals from small countries: braking from a vicious circle of inadequacy. // Croatian Medical journal 40, 4 (1999), pp. 508-514.

Moed, Henk F. Statistical relationships between downloads and citations at the level of individual documents within a single journal. Journal of the American Society for Information Science and Technology 56, 10(2005), pp. 1088-1097.

Open Access in Southern European Countries. http://www.accesoabierto.net/sites/accesoabierto.net/files/OASouthEurope.pdf (accessed May 11, 2011).

ROAR: Registry of Open Access Repositories. 2010. http://roar.eprints.org (accessed May 11, 2011).

Schwartz, Greg J.; Kennicutt, Robert C. Demographic and citation trends in Astrophysical Journal papers and preprints. 2004. http://www.publingresearch.net/Citations-SummaryPaper3_000.pdf (accessed May 05, 2011).

Shin, Eun-Ja. Do impact factors change with a change of medium: a comparison of impact factors when publication is by paper and through parallel publishing. // Journal of information science 29, 6(2003), pp. 527-533.

Stojanovski, Jadranka; Petrak, Jelka; Macan, Bojan. The Croatian national Open Access journal platform. // Learned Publishing 22, 4(2009), pp. 263-273.