

# **ESARBICA JOURNAL**

**JOURNAL OF THE EASTERN  
AND SOUTHERN AFRICA  
REGIONAL BRANCH OF THE  
INTERNATIONAL COUNCIL ON  
ARCHIVES**

**Volume 30**

**2011**

Editor: Patrick Ngulube  
Deputy Editor: Mpho Ngoepe

Cover design by: Marcel van Rossum

ISSN 2220-6442 (Print), ISSN 2220-6450 (Online)

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## SELF-ARCHIVING BY LIS SCHOOLS IN SOUTH AFRICA: PRACTICES, CHALLENGES AND OPPORTUNITIES

Omwoyo Bosire Onyancha  
University of South Africa, Department of Information Science  
Email: [onyanob@unisa.ac.za](mailto:onyanob@unisa.ac.za)

Received: 29 December 2009

Revised: 5 February 2010

Accepted: 1 January 2011

### Abstract

*This article reports findings of an exploratory study of institutional repositories (IRs) in South African institutions of higher learning and more particularly the practices, challenges and opportunities of self-archiving by the library and information science/studies (LIS) scholars. A content analysis of the IRs and a survey involving the Heads of LIS Departments/Schools were conducted in order to find out the existence and number of IRs; the document types indexed in the IRs; publication language; the software used to create the IRs; LIS departments' contributions in the IRs; factors motivating self-archiving; challenges faced by LIS scholars in self-archiving; and to determine the LIS scholars attitudes and fears on self-archiving. Results indicate that there are few IRs in Africa as whole; South Africa has the highest number; most IRs are located in institutions of higher learning; some IRs are subject-specific while others are multidisciplinary; a variety of documents are self-archived; LIS scholars are aware of the importance of self-archiving; and LIS scholars face several challenges in self-archiving which include lack of facilities, know-how and institutional support. The article concludes by providing areas for further research and other recommendations.*

**Keywords:** Content Analysis, Institutional repositories, Self-Archiving, Webometrics, South Africa

### Introduction

Self-archiving, described as the process of depositing digital documents in a publicly accessible website (preferably an Open Access Initiative (OAI)-compliant Eprint archive)<sup>1</sup>, is increasingly becoming common among researchers and various institutions.

The proliferation of the self-archiving literature, open access (OA) journals, discussions about self-archiving in various LISTSERVS and discussion forums, and institutional repositories attests to the popularity of self-archiving as a means of making the full-text peer-reviewed research output of scholars/scientists and institutions visible, accessible, harvestable, searchable and useable by potential users with access to the Internet.<sup>2</sup> One other emerging trend that may be indicative of researchers' willingness to embrace OA mode of scholarly publishing and dissemination of research findings for purposes of visibility and impact, is the use of e-mail and individual websites as tools for creating awareness about one's recently published research article. Researchers are increasingly using emails to send pre-print manuscripts and peer-reviewed and published articles to colleagues for awareness as well as citation purposes. The potential benefits of OA initiatives, coupled with the funders' demands on researchers' accountability and the increasing demand that research should benefit the public whose money was used to fund the said research, have all necessitated the growth of OA repositories. The concept of self-archiving, although much opposed in some quarters, has gained popularity in Europe and the USA. The Open Archives Initiative of 1999, the American Scientist Open Access Forum, Open citation linking, Budapest Open Access Initiative, and Open access archivangelism are just but a few of the European and American-based initiatives and blogs that are at the forefront for popularizing OA and self-archiving.

It is not surprising to find that European countries and the USA lead in the number of OA repositories in the world. A quick analysis of the contents of both the Directory of Open Access Repositories (DOAR)<sup>3</sup> and the Registry of Open Access Repositories (ROAR)<sup>4</sup> reveal that the USA has the highest number of repositories in the world. The country's total number of repositories in DOAR is 367 – accounting for 23% of the world's total (i.e. 1566) repositories – while its share of ROAR's world total of 1509 is 297 (20%). The UK, with a total of 169 (11%) is placed second in DOAR, ahead of Germany which recorded 138 (9%) entries. ROAR has so far registered a total of 158 (10%) UK-based repositories while Germany, which is ranked third, has a total of 109 (7%) repositories registered in ROAR. An analysis of DOAR's repositories in terms of the number of organizations shows the highest contribution coming from the USA (249 or 20%) followed by the UK (136 or 11%), Germany (107 or 9%), Japan (72 or 6%),

Spain (51 or 4%) and Australia (44 or 4%), just to name but a few. According to the two sources (i.e. DOAR and ROAR), Africa, as a whole, has contributed only 35 (DOAR) and 27 (ROAR) repositories. At the time of conducting this study, Botswana, Cape Verde, Egypt, Ethiopia, Ghana, Kenya, Namibia, Nigeria, South Africa, Uganda and Zimbabwe were the only listed African countries with OA repositories.

It is however worth mentioning that there is lack of information concerning OAI-compliant repositories and self-archiving practices in Africa. Whereas some institutions have adopted the OAI compliant approaches to self-archiving, others simply place their articles (pre-print and/or post-print) on personal or institutional websites. The status of OA repositories and self-archiving services and practices in Africa is, as a result, not known. Evaluating or assessing self-archived materials in institutional repositories in the region therefore becomes a challenging and daunting task.

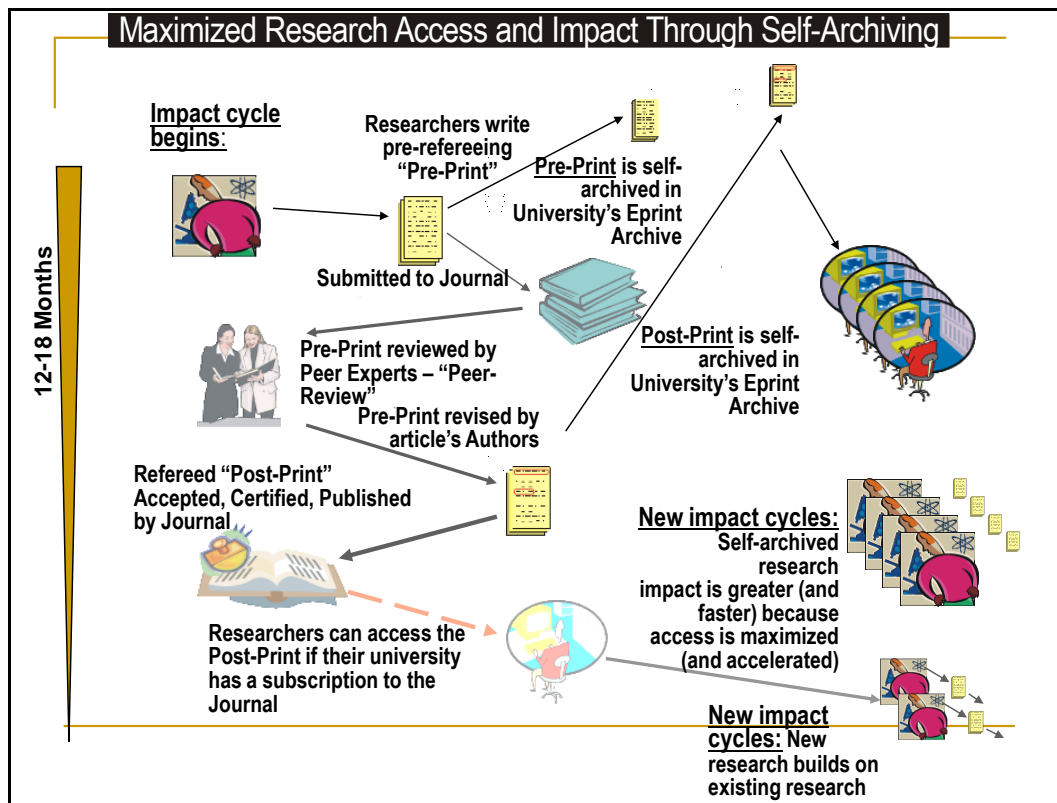
## **Literature review**

### *Self-archiving: the process*

The process of self-archiving involves simple web interface where the depositor copies and pastes in metadata and then attaches the full-text document (Xia and Sun 2007). The depositor can be the author of the document or any other person acting on behalf of the author, e.g. the Webmaster, institutional repository (IR) manager or a colleague with whom an academic staff member works in the case of the university learning environment. However, authors are encouraged to conduct the self-archiving activities by themselves as, indeed that is what the term 'self-archiving' portrays. The metadata referred to in the process of self-archiving includes the document's author, title, publisher, date of publication, journal name, and type of publication, etc. The amount and type of metadata for each document largely depend on the number of fields provided by the software that is used to develop the repository. The full-text document refers to journal articles, pictures, conference papers, artefacts, book chapters and books, technical reports, research reports, maps, theses and dissertations, patents, etc. The whole process can take as short as five to ten minutes to complete. Majority of the OA repositories provide the HELP function which authors can use to carry out the self-archiving exercise.

### Reasons for self-archiving

According to Brody and Harnard (n. d.), the objective of self-archiving is to maximize research impact by maximizing research access. In other words, if one's research is readily and easily accessible, one's research influence is likely to be high. Brody and Harnard (n. d.) illustrates this argument graphically as shown in Figure 1.



**Figure 1: Maximized research access and impact** (Brody and Harnard, n. d.)

The illustration shows that a complete impact cycle of a published journal article takes about 12 to 18 months. This cycle involves the following steps:

- Step 1: The researcher writes a pre-refereeing 'pre-print' manuscript.
- Step 2: The 'pre-print' manuscript is submitted to a journal.
- Step 3: The 'pre-print' manuscript is 'peer-reviewed' by experts and returned to the author.
- Step 4: The 'pre-print' is revised by the author and submitted to the journal for publication. If accepted, then step 5.
- Step 5: The refereed 'post-print' is certified and published by journal.

Step 6: Researchers can now access the post-print on condition that their university or institution has a subscription to the journal.

Step 7: Another cycle of impact begins.

However, if the pre-print in Step 1 was self-archived in a given University's E-print, the likelihood of it being accessed within a shorter time than it takes to consult a published journal article is high thereby having an opportunity of receiving more citations and therefore higher impact. Similarly, the 'post-print' that is self-archived in the University's E-print archive is likely to generate higher impact than the published journal article because it has fast accessibility. One of the challenges faced by sub-Saharan African researchers is lack of access to research published in foreign journals, which are largely indexed in prohibitive e-databases. Many are the African scholars who publish in foreign journals and yet cannot access even their own articles unless they purchase them or their institutions subscribe to the journal that has published the said article or the database that has indexed the journal containing the article. In the latter's case, the author should pray that the database indexes the full-text article. This scenario is slowly changing. Many journal publishers are increasingly allowing the authors to self-archive the post-prints as long as they (i.e. authors) acknowledge the publisher by way of providing the Digital Object Identifier (DOI) reference number. In a nutshell, self-archiving leads to quicker and wider dissemination of research findings which in turn increases visibility and access which increases downloads which may lead to more citations and finally, increased impact.

#### *Related studies*

Worldwide, there are few studies that have been conducted to review or assess OA repositories and/or examine the practices of self-archiving. These studies are lacking in Africa, as a whole and sub-Saharan Africa, in particular. Xia and Sun (2007:14) attribute this scenario whereby few studies have been conducted to assess IRs to the 'short history of IRs, most of which are less than five years old and still in their experimental stages'. The few studies that have been conducted outside Africa have generally focused on the development and assessment of OA repositories and less on identifying authors' attitudes towards and challenges faced by authors in self-archiving. In their paper, Xia and Sun (2007:14)



underscores the need to assess self-archiving thus:

Assessment is a necessary way of providing data for realigning the practice of self-archiving in the operation of IRs, thereby re-negotiating the infrastructure of repositories. An appropriate evaluation of the progress of a digital repository within the institution can demonstrate usage, justify investment, and support the case for further development. Beyond an institution, a repository evaluation can identify community trends and support regional, national and international collaborations.

Xia and Sun (2006) outline factors that one should take into consideration when assessing self-archiving in institutional repositories. These factors include: information of depositor; number of deposits (e.g. numbers by class, sub-class, department, version, type, date, location, etc); availability of full-text; cost per deposit; author's attitudes; usage assessment; and interoperability. They add to these factors the copyright, quality control, staff support and software management. This implies that an OA repository should provide most of the required information for purposes of assessing self-archiving processes and practices. In that regard, Anuradha (2005:171) observe that broadly, the functions of a well designed and developed IR should be to: publish and archive scholarly work of an institution locally, using authentic information sources; enable long-term preservation of scholarly work; facilitate constituent members of an institution an easy and rapid way to publish and archive their research locally; provide an integrated view of and act as a single entry point to scholarly work of an institution; provide wider accessibility, visibility and distribution of the scholarly work of an institution; and act as self-evaluation tool for the management. The same author notes that in order for these functions to be carried out effectively, the following broad steps should be taken into consideration when designing and developing an IR (Xia and Sun 2007:171):

- External sources should be clearly identified;
- User-friendly search strategy should be created/formulated;
- Heterogeneous resources should be integrated;
- The metadata fields should be standardized;
- Removal of duplicate records is critical;
- Different publication categories and metadata should be identified;

- Links to sources, which provide full-text access should be provided; and
- The database should be web-enabled.

Carr, White, Miles and Mortimer (2008) note that, for a repository to support an institution's management agendas and concerns, the repository has to fulfil about 13 criteria. These may act as a checklist of any well developed IR.

1. The repository must uniquely identify each local (institutional) author for each item
2. The repository must contain a complete, accurate and updateable list of all the academic staff, faculty, researchers and professors in the institution.
3. The repository must track the affiliation between individuals and their departments or research groups.
4. The repository must be able to handle content-free items
5. The repository must be able to manage dark items
6. Reports generated by non-system staff
7. The repository must provide quality assurance processes that can handle high throughput
8. The repository must be able to support high-throughput deposit processes
9. The repository should have a policy for dealing with 'very low quality' items deposited by schools or individuals.
10. The repository must support metadata fields to tie its records in with other information systems (e.g. funded projects databases or citation reporting).
11. The repository should involve (and should be involved by) senior management and administrative committees to guarantee institutional embedding.
12. The repository needs a strategy for maximizing "full text deposit" along with metadata records.
13. The repository needs to support the practices and assimilate the legacy systems of fiercely independent departments and schools.

In their assessment of the Brazilian Digital Library of Computing (BDBC) self-archiving service, Silva, Goncalves and Laender (2007) noted, among others, that the users found the services easy to learn, comfortable and useful. This study however did not delve into examining the content of the self-archiving service and the practices and attitudes of the authors. Their study focused on the user-friendliness of the service. On their part, Xia and Sun

(2007) conducted a study in order to assess self-archiving in seven institutional repositories across four disciplines (i.e. Chemistry, Physics, Economics and Sociology) and noted that none of the disciplines had done better than the other thereby concluding that self-archiving is dependent on a liaison system and mandate policies. In another study conducted by the same authors, it was found, among other results, that individual deposits showed slow (and in some cases, negative) performance of self-archiving in the making of IR content documents; majority of the IR deposits were contributed by non-authors; and that many IR deposits were presented in a non-full-text mode.

### **Purpose of the study**

Broadly, the purpose of this study was two-fold, namely to: (a) evaluate self-archiving practices in OA IRs; and (b) identify challenges faced by and opportunities created for LIS professionals in South Africa.

In the first instance, the study sought to:

- Find out the number of OA IRs in South Africa;
- Identify the language of publication acceptable by different IRs;
- Determine the software used to design and develop the existing IRs;
- Find out the number of different types of deposits in South African IRs; and
- Determine the LIS departments' contribution in various IRs in South Africa.

In the second instance, the study's objectives were:

- To find out the factors that motivate the LIS scholars to self-archive;
- To identify the different types of materials the selected LIS scholars have so far self-archived;
- To determine the most challenging self-archiving issues faced by LIS scholars; and
- To determine the attitudes (e.g. personal opinion and fears) of the LIS scholars towards self-archiving.

## Methods and materials

A combination of the survey method (qualitative research method) and webometric (quantitative research method) approaches were adopted to conduct this study. Whereas the survey method was used to seek opinions of scholars concerning self-archiving practices, challenges and opportunities, the webometric approaches were used to collect quantitative data in order to assess the current situation regarding the development of IRs in South Africa.

In order to assess the IRs webometrically, two directories were used, namely: the Directory of Open Access Repositories (DOAR)<sup>5</sup> and the Registry of Open Access Repositories (ROAR)<sup>6</sup>. OpenDOAR is a project tasked to list and categorize academic OA research institutional repositories from all over the world. The metadata is harvested and assigned by OpenDOAR staff to allow categorization and analysis for purposes of assisting wider use and exploitation of repositories. For a repository to qualify for inclusion in the Directory, it should wholly embrace the concept of open access to full text resources (University of Nottingham 2007). On the other hand, the ROAR is developed by the University of Southampton in the United Kingdom. The Registry uses Celestial software (GNU E-Prints) to register and harvest repositories around the world. The registry, which was started in 2004, has two functions: (1) to monitor overall growth in the number of e-print archives and (2) to maintain a list of GNU E-Prints sites (the software Southampton University has designed to facilitate self-archiving) (University of Southampton 2008). Addition of sites to the Registry's list is at the discretion of the site editor. 'Dead sites' (i.e. sites that would not appear or would not be included in the Registry) include the duplicates, non-functional or inappropriate sites and web spam.

Once the South African repositories were identified from both the DOAR and ROAR, each IR was examined in order to extract relevant information to conduct this study. The information extracted included the name of the repository, the Uniform Resource Locator (URL), the name of the institution, the type of resources in the repositories, the publication language of materials covered in the repositories, the software used to develop the repositories, and LIS-specific materials that have been deposited in IRs. The search was limited to documents published before

2010. This information was used to discuss matters related to the first part of the purpose.

The survey method targeted the Heads of the departments of library and information science/studies (LIS) in South Africa. The choice of the Chairpersons of LIS departments as the target population was based on the fact that major changes or policies affecting departments are initiated or made with the permission of chairpersons unless those decisions, changes and policies come from higher up in the hierarchy of the parent organization. At this stage, the study focused on finding out what the chairpersons thought about self-archiving and if there were any challenges they face. The next phase of this study will widen the scope to include other scholars in institutions of higher learning in South Africa.

A short questionnaire consisting of 9 open-ended questions was developed (see Appendix I) and emailed to 12 chairpersons of LIS departments in South Africa (see Appendix II). Out of the 12 questionnaires that were sent out, only 7 (58.3%) were completed and returned. The collected data was analyzed both quantitatively and qualitatively so as to fulfil the aforementioned objectives.

## **Results and discussion**

This section provides and discusses the results in two sub-sections: web-based and questionnaire-based findings.

### *Findings from the Web-based study*

This sub-section presents and discusses findings that were generated from the webometric study of the IRs. It covers the number of repositories in South Africa; the subject coverage of IRs; the software used to develop the IRs; the type of resources in the IRs; and the language of publication acceptable by the IRs.

Institution	Name of Repository	Software	Subjects scope	Content	Languages	URL
CPUT	Digital Knowledge	Digital commons	Multidisciplinary	Theses	English	<a href="http://dk.cput.ac.za/">http://dk.cput.ac.za/</a>
DUT	DUT IR	DSpace	Multidisciplinary	Articles; Theses	English	<a href="http://ir.dut.ac.za/">http://ir.dut.ac.za/</a>
NWU	Boloka: Research Repository	DSpace	Multidisciplinary	Articles; Theses	English; Afrikaans	<a href="http://dspace.nwu.ac.za/">http://dspace.nwu.ac.za/</a>
Rhodes	Rhodes eResearch Repository (ReRR)	EPrints	Multidisciplinary	Publications; Conferences; Theses	English	<a href="http://eprints.ru.ac.za/">http://eprints.ru.ac.za/</a>
Stellenbosch	Stellenbosch University Institutional Repository	DSpace	Multidisciplinary	Theses; Multimedia	English	<a href="http://ir.sun.ac.za/dspace">http://ir.sun.ac.za/dspace</a>
UCT	UCT Computer Science Research Document Archive (UCT CS Archive)	EPrints	Computers and IT	Publications; Conferences; Theses; Unpublished; Books	English	<a href="http://pubs.cs.uct.ac.za/">http://pubs.cs.uct.ac.za/</a>
UJ	Electronic Thesis and Dissertation Database	ETD-db	Multidisciplinary	Theses	English	<a href="http://etd.rau.ac.za/">http://etd.rau.ac.za/</a>
UKZN	Digital Innovation South Africa; ResearchSpace@UKZN	Not specified; DSpace	Multidisciplinary	Articles; Conferences; Theses; Books, etc; Theses	English	<a href="http://www.disa.ukzn.ac.za/">http://www.disa.ukzn.ac.za/</a> ; <a href="http://researchspace.ukzn.ac.za/">http://researchspace.ukzn.ac.za/</a>
UP	UP electronic theses and dissertations; UPSpace (Institutional Research Repository - University of Pretoria)	ETD-db; DSpace	Multidisciplinary; Civil Engineering; Library and Information Science; Education; Ecology and Environment; Agriculture, Food and Veterinary; Arts	These; Postprints; Conferences; Multimedia	English; Afrikaans	<a href="https://www.up.ac.za/dspace/">https://www.up.ac.za/dspace/</a>

Institution	Name of Repository	Software	Subjects scope	Content	Languages	URL
			and Humanities General			<a href="http://upetd.up.ac.za/UPeTD.htm">http://upetd.up.ac.za/UPeTD.htm</a>
UNISA	UNISA ETD; Unisa IR	ETD-db; DSpace	Multidisciplinary	Theses; Articles; special	English	<a href="http://etd.unisa.ac.za/">http://etd.unisa.ac.za/</a> ; <a href="http://uir.unisa.ac.za/">http://uir.unisa.ac.za/</a>
UFH	UFH ETD	ETD-db	Multidisciplinary	Theses	English	<a href="http://etd.uovs.ac.za/">http://etd.uovs.ac.za/</a>
UWC	AHERO (African Higher Education Research Online); UWC research repository; UWC Theses and Dissertations	Not specified; DSpace; Not specified	Education; Multidisciplinary	Articles; Publications; References; Conferences; Theses; Unpublished; Books; Special	English; Afrikaans	<a href="http://ahero.uwc.ac.za/">http://ahero.uwc.ac.za/</a> <a href="http://repository.uwc.ac.za/">http://repository.uwc.ac.za/</a> <a href="http://etd.uwc.ac.za/">http://etd.uwc.ac.za/</a>
WITS	WITS IR	DSpace	Multidisciplinary	Articles; Conferences; Theses; Unpublished; Learning objects; Special	English	<a href="http://witsetd.wits.ac.za:8080/dspace">http://witsetd.wits.ac.za:8080/dspace</a>
UNIZULU	UZSpace	DSpace	Multidisciplinary	Theses	English	<a href="http://196.21.83.35/">http://196.21.83.35/</a>

Table1: Summary of OA-compliant academic institutional repositories in South Africa

### *Number of and institutions behind OA IRs' development in South Africa*

It was indicated in the introduction that the world total of OA IRs repositories differs from one directory to another. Whereas the DOAR yielded a total of 1566 IRs, ROAR's coverage was 1509. Of these, only 35 belong to Africa. South Africa produced the majority (i.e. 23). The number of and institutions that have developed IRs in South Africa are as follows: Academy of Science of South Africa (ASSAf) (1); Cape Peninsula University of Technology (CPUT) (1); Council for Scientific and Industrial Research (CSIR) (1); Durban University of Technology (DUT) (1); North-West University (NWU) (1); Rhodes University (RU) (1); Stellenbosch University (SUN) (2); University of Cape Town (UCT) (2); University of Johannesburg (UJ) (1); University of KwaZulu-Natal (UKZN) (2); University of Pretoria (UP) (2); and the University of South Africa (UNISA) (2). Others are: the University of Free State (UOVS) (1); University of Western Cape (UWC) (3); University of Witwatersrand (WITS) (1) and University of Zululand (UNIZULU) (1). One emerging pattern from this analysis is that most IRs are developed and maintained by universities. Although it was not possible to establish the exact dates of establishment of each IR from the websites, available information from contacts in the parent institutions indicate that IRs in South Africa are relatively young. Other institutions such as the University of Limpopo, Tshwane University of Technology, Vaal University of Technology, etc are still developing, or yet to develop their IRs, or they have not registered their IRs with DOAR or ROAR.

### *Subject coverage of SA IRs*

Table 1 summarizes the subject content of the publications archived in the above mentioned IRs. As the focus of the study was on the university repositories, the Table provides the names of the universities, the name of the repository, the software, subject coverage, document type, language and the URL. Subject-wise, it was found that most repositories are multidisciplinary in their subject coverage. These include the CPUT's Digital Knowledge, DUT's IR, NWU's Boloka, RU's e-Research repository, SUN's IR, UJ's electronic theses and dissertations, UKZN's digital innovation and Research Space, UNISA's ETD and IR, UOVS' ETD, UP's UPeTD, UWC's Theses and Dissertations repository, WITS' IR and UNIZULU's UZSpace.



The UPSpace (UP) IR is also multidisciplinary and covers such subjects as civil engineering, library and information science, education, ecology and environment, agriculture, food and veterinary science, arts and humanities and general resources. There are two IRs that are subject-specific, namely: UCT's Computer Science Research Document Archive (UCT CS Archive) and the UWC's AHERO (African Higher Education Research Online). The former specializes in computer and information technology resources while the latter focuses on education materials.

It was also noted that some institutions such as UKZN, UP, UNISA and UWC have created more than one IR, offering multidisciplinary and subject-specific resources. While this practice (i.e. multiplicity of IRs) will ensure that there exist enough outlets for research outputs in a given institution, the management and maintenance of such IRs may be cumbersome. Subject-specific IRs are effective in yielding relevant information with high precision and recall while multidisciplinary IRs ensures that one searches for documents in one IR without necessarily logging out or switching from one IR to another thereby saving the user's time. However, if properly developed, with links to related documents within the same IR, a multidisciplinary IR is the most appropriate.

#### *Content/document types covered in the South African IRs*

The variety of documents covered in any given IR is another indicator of assessing the quality of an IR or success of self-archiving. Column 5 in Table 1 and the entire Table 2 show the variety as well as the number of resources covered in the different IRs. There were a total of 16 unique items covered by the South African IRs as at 2009. Leading the pack are theses and dissertations which totalled 16526 followed by journal articles (6013), reports (e.g. annual reports) (2092), conference/workshop presentations (1087), student projects (644), departmental technical reports (560), and books/monographs (271). The UCT recorded the highest number of document types (i.e. 11) followed by UP (8), while RU yielded 7 document types. The category labelled 'others' in the last row of the Table consisted of maps, pictures, lectures and artefacts. Indeed UP recorded more document types in the 'others' category than any other institution. Evidently, theses and dissertations are the majority document types.

<i>Institution</i>	<i>CPUT</i>	<i>DUT</i>	<i>NWU</i>	<i>RU</i>	<i>SUN</i>	<i>UCT</i>	<i>UJ</i>	<i>UKZN</i>	<i>UNISA</i>	<i>UNIZULU</i>	<i>UOVS</i>	<i>UP</i>	<i>UWC</i>	<i>TOTALS</i>
TOTAL no. of types	4	1	5	7	1	11	1	1	6	1	1	8	1	
Journal article	110*	18	417	688	46	45	7	-	104	-	-	4647	41	6013
Journal articles (online/unpaginated)	-	-	-	-	-	1	-	-	-	-	-	-	-	1
Books/monograph	-	-	-	20	-	1	3	-	-	-	-	247	-	271
Book chapters	-	-	-	37	-	9	-	-	-	-	-	-	-	46
Conference papers	-	-	-	46	-	155	-	-	21	-	-	92	-	314
Conference posters	-	-	-	-	-	12	-	-	-	-	-	-	-	12
Newspaper/magazine articles	-	-	-	-	-	1	3	-	-	-	-	107	-	111
Reports	-	-	-	4	-	-	403	-	-	-	-	1685	-	2092
Theses and Dissertations	273	365	2294	483	2413	39	1839	233	2035	203	434	4833	1082	16526
Presentations	-	-	-	-	17	2	-	-	-	-	-	1068	-	1087
Departmental technical reports	-	-	-	-	-	109	384	-	-	-	-	67	-	560
Student projects	-	-	-	-	-	-	-	-	-	-	-	644	-	644
Working papers	-	-	-	-	-	-	-	-	-	-	-	91	-	91
Other	-	-	7	5	35	1	218	-	545	-	-	1418	-	2229
TOTAL	273	383	2718	1283	2511	375	2857	233	2705	203	434	14899	1123	29997

**Table 2: Document types covered in the South African IRs**

Key: \*CPUT classified papers and reports in one category and therefore it was not easy to differentiate between the two

**NOTES:**

UCT Law Space was not accessible at the time of data collection

WITS has self-archived a total of 5464 examination papers only

This can be attributed to the fact that theses and dissertations do not require the permission of the authors (usually the authors are students) in order to be self-archived as such copyright is owned by the student's institution. Authors in Africa, as we will discover shortly, have argued that the copyright is a major hindrance to self-archiving in the region. However, this argument is slowly becoming invalid as more and more journal publishers are granting permissions to authors to self-archive their published research articles, i.e. post-prints.

The distribution pattern of the number of documents by institution, in descending order was as follows: UP (14899), UJ (2857), NWU (2718), UNISA (2705), SUN (2511), RU (1283), and UWC (1123). Again, UP is the highest contributor to the local IRs, having contributed almost 50% of the total 29997 documents that have been so far deposited in IRs of institutions of higher learning in South Africa.

#### *Publication language of the resources in the IRs*

The dominating language of resources as shown in column 6 of Table 1 is English. A total of 20 IRs cover materials published in English only. The rest of the IRs (i.e. 3) include materials that are published in Afrikaans and English languages. Language has been identified as one of the factors that influence the citedness of a given publication (Garfield 1993). A document that is predominantly published in a language that is foreign to a reader will receive no citation from the said reader. South Africa has 11 official national languages each spoken by a fraction of the country's population as follows: isiZulu (22.4%), isiXhosa (17.5%), Afrikaans (15.1%), Sepedi (9.8%), English (9.1%), Setswana (7.2%), Sesotho (6.9%), Xitsonga (4.2%), siSwati (2.6%), Tshivenda (1.7%), isiNdebele (1.5%), and Afrikaans/English (0.2 %) (Republic of South Africa, Department of Environmental Affairs and Tourism 2003; Onyancha 2006). Other non-official languages are spoken by the remaining 1.8% of the population. This distribution of official languages indicates that most of what is covered in IRs in South Africa is written in a minority language (i.e. English language) which is spoken by a mere 9.1% of South African population. It implies that the research findings in the IRs in the country can be used by about one-tenth of South Africa's population. Some questions that immediately come to mind with regard to this pattern include: What about the rest of the country's population?

What happens to resources written in other languages that are non-English and non-Afrikaans languages? Is there need to develop an IR that covers non-English and non-Afrikaans language resources? Answers to these questions will depend largely on the audience targeted by IRs and the policies governing the operations of the IRs in the country.

#### *Software used to develop the IRs*

South African IRs are developed using a variety of softwares, most of which are open source. The most common among the institutions is Dspace. The software, which is freely accessible, is easily customizable to fit the needs of academic institutions, non-profit and commercial organizations alike. Dspace preserves and enables easy and open access to all types of digital content including text, images, moving images, mpegs and data sets (see: <http://www.dspace.org/index.php/Introducing-DSpace/>). The other software that is commonly used to develop IRs in South Africa is E-prints. This software is also freely available and can be downloaded from the following URL: <http://www.eprints.org/software/>. It is also easy to install and customize to suit any institution's requirements. The third software is called the Electronic Theses and Dissertations Database (ETD-db). The ETD-db was developed at Virginia Tech as a joint project between the Graduate School at Virginia Tech, the Digital Library and Archives and the National Digital Library of Theses and Dissertations. The software is freely available at <http://scholar.lib.vt.edu/ETD-db/index.shtml>. Other softwares that can be used to develop IRs include: Bepress, OPUS (Open Publications System), DiVA, Open Repository, CDSWare, Fedora, HAL, ARNO, DoKS, MyCore, Fez/Fedora, EDOC, Scix, and Open Journal System.

#### *Contributions from the Departments of LIS in parent IRs*

It was very difficult to pinpoint LIS' contributions in some institutions because most repositories gave no clear indication of the same while others provided information about the departments' deposits through the *communities and collections* link. This link provided information about deposits by various departments (both academic and administrative) in the respective institutions. Table 3 provides the total number of LIS-specific resources archived in the respective university IRs. It should be stated that the number of resources shown in Table 3 are those that were easily identifiable in the various IRs.

**Table 3: LIS schools/departments' deposits in IRs**

Institution	Pre-Prints	Post-prints		Theses and Dissertations	TOTAL
		Journal articles	Conference papers/presentations		
UP	-	68	3	75	146
UJ	-	-	-	40	40
UNISA	-	-	-	30	30
UNIZULU	22	-	3	4	29
UWC	-	-	-	18	18
DUT	-	5	-	2	7
SUN	-	-	-	6	6
CPUT	1	-	-	-	1
NWU	-	1	-	-	1
UOVS	-	-	-	1	1
RU	-	-	-	-	0
UCT	-	-	-	-	0
UKZN	-	-	-	-	0
<b>TOTAL</b>	<b>23</b>	<b>74</b>	<b>6</b>	<b>176</b>	<b>279</b>

The Department of Information Science at the University of Pretoria (UP) yielded a total of 146 documents, comprising 68 journal articles, three conference papers/presentations, and 75 dissertations and theses. UJ's total deposits totalled 40 followed by UNISA which yielded a total of 30 documents, UNIZULU (29), UWC (18), DUT (7), and SUN (6). There was one LIS record each deposited in CPUT's, NWU's and UOVS' repositories. In total, of the 279 LIS records deposited in South Africa's IRs, theses/dissertations were the majority (176) followed by journal articles (74), pre-prints (23) and conference papers/presentations (6). This pattern is congruent with

the general pattern of self-archiving in South Africa; theses/dissertations are the majority document types that are self-archived in IRs in the country.

### *Questionnaire-based findings*

This sub-section presents and discusses the findings from the questionnaire under the following sub-headings: motivations for self-archiving, challenges of self-archiving, importance of self-archiving, and fears of LIS scholars about self-archiving.

### *Motivations for self-archiving*

A question on what motivates the LIS scholars to self-archive was posed to the LIS departments' chairpersons who indicated that they carry out the exercise of self-archiving in order to:

- Maximize access to one's research findings
- Be more visible in the world of research
- Share knowledge with the peers and students
- Promote local content
- Popularize research within the university in which they work
- Aid in teaching
- Provide sources to assist scholars to conduct further research

### *Challenges of self-archiving*

Several challenges faced by LIS scholars in self-archiving in South Africa were identified. These include lack of:

- *Initiation and implementation:* The scholars argued that the person(s) charged with the responsibility of initiating and/or implementing self-archiving in their institutions is/are unknown. In some institutions, there is nobody charged with such responsibility.
- *Leadership:* This challenge is similar to that of initiation and implementation. Leadership in the processes of self-archiving in institutions of higher learning is either lacking or not clearly spelt out to the relevant faculty members.
- *IT knowledge on web development:* The departments are deficient of the IT knowledge, especially with regard to web development. This challenge is however not critical as the faculty will not be required to develop their own websites for self-archiving purposes. All that is needed is basic computer

literacy skills and training on how to self-archive. The rest should be left in the hands of the parent institutions' ICT departments.

- *Facilities*: Although the respondents did not specify the type of facilities, it was taken that the lack of facilities largely meant technological facilities, e.g. Web Servers, Software, and computers. This challenge is, in our view, not very critical as most universities, particularly in South Africa, are fairly equipped in regard to computer technology. All universities in South Africa have established IT departments that deal with the supply of such facilities. Scholars can liaise with this department for purposes of self-archiving their articles.
- *Lack of institutional support*: It was not clear what the scholars meant by 'lack of institutional support'. Nevertheless, support from the Management of institutions of higher learning in terms of enacting policies on self-archiving and awarding of incentives to the scholars who have self-archived their documents in the institutional repository is vital to any success of any self-archiving initiatives in the said institutions.
- *Lack of staff to spare for self-archiving*: Some respondents felt that self-archiving is an extra workload which requires employment or engagement of extra staff. As argued in the literature review, self-archiving is rendered its actual meaning when the author himself/herself deposits his/her document in the institutional repository. This process takes a very short time; sometimes less the time it takes to write and send an email. It therefore does not require an extra staff member to do the job.

#### *Importance of self-archiving*

The respondents were asked to state their opinion about self-archiving of scholarly publications. All the respondents concurred that self-archiving is a good idea:

- a. Because it promotes access to a variety of resources which otherwise could have had restricted access and therefore minimal circulation and impact;
- b. As the author assumes higher or wider circulation;
- c. It is one way through which an author receives comments about his/her article from his/her peers;
- d. The author's visibility is enhanced and posterity assured.

These statements concur with several writers (e.g. Brody and Harnard n. d.; E-Prints 2007) who have outlined several gains that can be realized from self-archiving. Some of these issues have been outlined in the introduction and literature review. A statement from E-Prints (2008) summarizes it all:

The purpose of thus maximizing public access to research findings online is that this in turn maximizes its visibility, usage and impact – which in turn not only maximizes its benefits to researchers and their institution in terms of prestige, prizes, salary, and grant revenue but it also maximizes benefits to research itself (and hence to the society that funds it) in terms of research dissemination, application and growth, hence research productivity and progress.

#### *Fears associated with self-archiving*

What are your fears, if any, about self-archiving? This question was posed to the respondents, majority of who said that they did not have any fears. But there are caveats. The LIS scholars raised the issues of ownership and copyright. One scholar wondered whether or not he can be permitted to self-archive his published article given that the publisher owns the copyright. Another respondent wondered about the quality of documents that have not gone through the processes of peer review? These concerns are not new. Actually these and many other self-archiving ‘fears’ are dispelled by Eprints.org (n. d.). Although the answers provided at this URL are not universally or widely shared by other proponents and opponents of self-archiving, they nevertheless provide guidelines and benchmarks upon which we can practice self-archiving. The site has dedicated 20 pages in which the author has responded to 27 ‘worries’ which include: *copyright, peer review (e.g. certification, evaluation, tenure/promotion, and censorship), royalties, preservation (e.g. authentication, corruption, version control, mark-up, classification, graphics, readability, serendipity, libraries/librarians’ future, and IRs), learned societies’ future, publishers’ future (e.g. downsizing, paying the piper, capitalism, etc), university-related issues (e.g. rechanneling money towards self-archiving, and affordability), priority (e.g. secrecy) and plagiarism*. The site is highly a recommended reading for anyone who wishes to self-archive.



## Conclusions and recommendations

The development of IRs in Africa is at its initial stages and relatively a recent practice. Out of the 53 independent African countries, it is only in 11 (20.8%) countries that IRs have been established. In total, there are 35 IRs in Africa which accounts for approximately 2% of the world's total. South Africa has the highest number of IRs (23). Generally speaking, therefore, IRs in Africa are few and underdeveloped. For the situation to improve there is need for cooperation between stakeholders (e.g. institutions, authors and publishers). The institutions' role for instance could involve (a) installing OAI-compliant E-Print Archive; (b) encouraging its staff to deposit their curriculum vitae on the departmental or institutional websites; (c) mandate their staff to deposit materials in the IR; (d) train digital librarians who may assist as 'proxies' in self-archiving (Eprints.org, n. d). Another approach to ensure maximized deposits in South African IRs is to mandate the deposits of articles published in South Africa's journals. There are over 250 SAPSE-accredited journals in South Africa the majority of which are published by university presses. Given that these institutions own majority of the journals, it is much easier for authors to self-archive the articles published therein. Alternatively, the repository managers can be mandated to self-archive all articles published in journals belonging to the respective universities.

It was noted that some institutions (or departments) conduct self-archiving activities by posting documents in their websites (e.g. Department of Library and Information Science, University of Zululand). Whereas these initiatives can provide access to materials online, they pose challenges with regard to preservation and permanence of the materials self-archived in the said websites. The ideal solution is to develop OAI-compliant E-Print Archive or repository.

It is encouraging to note that LIS scholars approve of self-archiving as a means of increasing the impact of their research. Although the Heads of Departments may not mandate the faculty in their departments to deposit materials in the IRs, they can nevertheless influence their involvement by, for instance, leading by example. In this way, LIS departments' contribution to the growth of IRs – which

was found lacking in this study – may be strengthened. Generally, it has been observed that “while digital repositories have been adopted by many higher educational institutions around the world, faculty contributions to the IRs have been generally scarce” (Xia 2006). It therefore implies that the scarcity of contributions to IRs is not limited to LIS scholars or Africa alone but it is a worldwide phenomenon. We propose that workshops and seminars be held regularly to popularize self-archiving and dispel some of the fears that are held by scholars in Africa.

It is highly recommended that IRs be regularly evaluated in order to find out whether or not they have met the objectives for which they were created. In order for the assessment to succeed, the IRS should:

- a. Be OAI-compliant E-Print Archive;
- b. Allow the capture of all metadata (e.g. author’s name, copyright date, name of depositor, date of entry, title, publisher, whether full-text or not, type of document, language of publication, and departmental affiliation of author);
- c. Permit both simple and advanced searches of their contents;
- d. Permit browsing by faculty/department, author, date of entry, copyright date, software, etc;
- e. Provide Help options in regard to depositing or submitting documents, searching tips, and downloading documents; and
- f. Generate Hits (or citation) counts to specific documents.

Further research is recommended in regard to the following:

- a. It was noted that some institutions have mandated libraries to act as repositories of publications produced by their staff. A study of the libraries’ roles and challenges that they face in addition to an examination of the existing policies on self-archiving is therefore in order.
- b. A study should also be conducted to find out the reactions of authors, publishers, funding agencies, and author’s institutions on self-archiving and mandates.

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### **Endnotes**

1. <http://www.eprints.org/openaccesss/self-faq/> (Accessed 12 September 2007).
2. <http://www.eprints.org/openaccesss/self-faq/> (Accessed 12 September 2007).
3. <http://www.opendoar.org/countrylist.php> (Accessed 12 September 2007).
4. <http://roar.eprints.org/> (Accessed 12 December 2007).
5. <http://www.opendoar.org/countrylist.php> (Accessed 12 September 2007).
6. <http://roar.eprints.org/> (Accessed 12 December 2007).

## Appendices

### *Appendix I: Departments of Information Science included in the survey*

Department of Information Science, University of South Africa

Department of Library and Information Science, University of Zululand

Department of Library and Information Studies, Durban University of Technology

Department of Information Science, University of Pretoria

Department of Information and Knowledge management, University of Johannesburg

Department of Information Studies, University of Limpopo-Turfloop Campus

Department of Library and Information Science, University of Cape Town

Department of Library and Information Science, University of Fort Hare

(Library and information science), Rhodes University

Department of Information Science, Stellenbosch University

Department of Library and Information Science, University of Western Cape

Department of Library and Information Science, Walter Sisulu University

### *Appendix II: Questionnaire for collecting data*

Question 1: Name of the institution

Question 2: Name of department

Question 3: Whether or not the department carries out self-archiving

Question 4: The website address (i.e. URL) of the self-archived resources

Question 5: Motivating factors for self-archiving

Question 6: The type of materials so far self-archived by the departments

Question 7: Most challenging self-archiving issues faced by LIS scholars

Question 8: Opinions about self-archiving of scholarly publications

Question 9: If the LIS scholars had any fears about self-archiving