
Perspectives on Trends and Development of Institutional Repositories in the Context of Africa

Prof. Priti Jain
Department of Library & Information Studies
Faculty of Humanities
University of Botswana
Gaborone, Botswana
E-mail: jainp@mopipi.ub.bw

Abstract

Advancement of new technologies has led to new scholarly communication model open access (OA), which has revolutionized scholarly communication and digital scholarship. There are two major initiatives to open access: Institutional Repositories (IRs), and Open Access Journal Systems (OAJs). This paper focuses on IRs. Institutional repositories (IRs) have the potential to enhance the access to scholarly information, which can play a key role in the development of Africa. Hence, increasingly, academic institutions are recognizing and adopting institutional repositories as means to manage the digital scholarship of their academic communities to maximize access to research outputs. The purpose of this paper is to examine the trends in institutional repositories with a specific focus in Africa. Firstly, the paper discusses the benefits of IRs and then growth of institutional repositories in Africa over the past 10 years. Thereafter, the challenges and impediments to effective IR implementation and utilization are discussed. Finally, conclusions and recommendations follow. The paper is based on an in-depth desk-top review of mostly past 5 years literature in Africa and the author's own points of view.

Key words: Institutional Repositories; Challenges; Africa; Academic Institutions; Open Access; Scholarly communication.

Introduction

The revolution in digital infrastructures has transformed the traditional scholarly communication system to Open Access (OA). There are two major strategies to Open Access: Open Access publishing in Journals (Gold Route) and Open Access Self-Archiving in repositories (Green Route). The "golden road" of OA journal publishing is where journals provide OA to their articles (either by charging the author-institution for refereeing/publishing outgoing articles instead of charging the user-institution for accessing incoming articles, or by simply making their online edition free for all). The "green road" of OA self-archiving is where authors provide OA to their own published articles, by making their own e-prints free for all. Providing gold OA is in the hands of publishers while green OA is in the hands of researchers (Harnad, 2012).

Open Access repositories are digital collections that make their contents freely available over the Internet. These digital repositories collect the research outputs of the members of a university's research community and support the archiving and long-term preservation of the institution's intellectual outputs (Swan & Chan, 2009). Through OA repositories, authors provide open access to their research-outputs by making them free to everyone. There are four types of repository publications: the subject-based repository, the research repository, the national repository system and the institutional repository (Jain, 2012). The focus of this paper is on Institutional Repositories in Africa. "Access to appropriate scholarly information can play a positive role in the development of African countries. Institutional repositories (IRs) have the potential to enhance access and sharing of research based information generated in Africa" (Dlamini & Snyman, 2017, p. 1).

"Institutional repositories are playing key roles in enhancing scholarly communication by enabling wider circulation of research outputs of institutions and, this has made academic libraries to embrace it" (Ukachi, 2018, p.2). IRs are usually hosted within academic libraries to digitally collect and preserve academic papers and documents in order to make them freely accessible to the faculty, students and the public. The terms Institutional Repositories (IRs) would refer to repositories in academic institutions through-out the paper.

Institutional Repositories (IRs) Defined

IR has been defined diversely by different authors. Johnson (2002) defines an IR as a digital archive of the intellectual product created by the faculty, research staff, and students of an institution and accessible to end-users both within and outside of the institution with few if any barriers to access.

According to the most frequently cited IR definition from Lynch (2003), IR 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 community members. It is most essentially an organizational commitment to the stewardship of these digital materials, including long-term preservation where appropriate, as well as organization and access or distribution. This definition valuably formalizes the concept of stewardship, service provision and commitment and describes IR appropriately.

Shearer (2013) has aptly articulated the characteristics of an IR:

- An IR is digital; it collects digital material only.
- An IR is institutionally defined because it represents the intellectual outputs of a particular institution.
- An IR collects only scholarly contents.
- It is cumulative and perpetual; because once submitted material cannot be withdrawn from an IR and all materials keep accumulating for a long term preservation and accessibility.
- An IR is Open Access because it provides free and open access to its contents.
- An IR is interoperable; because its metadata can be harvested and all the documents can then be jointly searched and retrieved as if they were in one global collection, accessible

to everyone (Open Archives Initiative 2002). Another type of IR interoperability is integration of the IR with course management tools (Crow, 2002; Lynch, 2003; Shearer, 2013).

Benefits of IRs

A review of literature reveals several benefits of IR, which are grouped into the following four main categories:

Benefits to the Institutions: An IR offers the following institutional benefits:

- An IR is a means of increasing global visibility and prestige of the institution (Pickton& Barwick 2006). According to Palmer (2014), the primary benefit of institutional repositories is that they raise the visibility and enhance the accessibility of publications by providing free, unrestricted, online access to these publications. This is reinforced by Oguche (2018) averring that by opening up institutional research-outputs to a world-wide audience, IRs maximize the visibility and impact of these outputs).
- Instrumental in institutional learning and teaching;
- A system of standardised institutional records;
- A way of breaking down publishers' costs and permissions barriers;
- A platform to long-term digital preservation of institutional intellectual outputs; it captures the scholarly output/ intellectual capital of the institution for long term preservation for continued use by the users (Ukachi, 2018).
- A single consolidated integrated system; an IR provides a single consolidated, integrated system for easy access (Farida, Tjakraatmadja, Firman&Basuki, 2015).
- A mechanism to keep track of and analyse research performance; some institutional repositories are integrated with faculty profile tools that showcase individual researchers, their research interests, and their publications, which can help departments manage, measure and track staff research and publishing output (Palmer, 2014, Oguche, 2018).
- A medium to keep academic community up to date;by establishing flourishing repositories, faculty, researchers, and institutions keep up with the latest scholarly communication trends. It increases their participation and role in the research and communication process, as well as increases their visibility and value to the community” (Pickton& Barwick, 2006; CARL & SPARC, 2008;Jain, 2016; Palmer, 2014).
- A platform for the storage and access to a wide range of institutional material (Ukachi, 2018);

Benefits to Authors: An IR advances the following benefits to authors and researchers:

- More exposure and universal access of research work; repositories make authors' work accessible to world-wide audience (Farida, et al., 2015). As a result, it creates room for greater citation rates for their research works;
- Greater security and longer term accessibility of research outputs compared to a personal web site;
- Feedback and commentary; through IR, authors are able to receive commentary on pre-publication 'pre-prints', hence, IR provide a workspace for work-in-progress (Oguche, 2018).
- Added value services such as hit counts on papers, personalised publication lists and citation analyses, linked CVs;
- A central archive of a researcher's work (Pickton & Barwick, 2006; CARL & SPARC, 2008; Jain, 2012).
- An IR exposes staff researches with students 'theses and dissertations to a wider international audience (Ukachi, 2018).
- An IR provides opportunities for research collaboration (Ukachi, 2018; Oguche, 2018).
- An IR facilitates the development and sharing of digital teaching materials (Oguche, 2018).

Benefits to Students: CARL and SPARC (2008) reported that IR offers benefits to students. For instance, no library can afford to subscribe to all the resources students need, hence; through a digital/institutional repository students can read and learn from them. Also, students benefit from digital repositories by depositing their theses and dissertations expanding the accessibility of these important works (CARL & SPARC, 2008). Improved access to scholarly information enhances student learning experience and academic performance.

Benefits to Librarians/libraries: IR provides the following benefits and opportunities to academic libraries and librarians:

- Increased visibility and institutional presence; academic librarians become visible institution-wide through IRs, because most IRs are owned by librarians. By virtue of their expertise to own and manage IRs librarians are much esteemed by the academic institution and thus they improve their stereotype image.
- Opportunity to work hand-in-hand with academia; IRs create avenues that enhance cross-fertilization of ideas among scholars. Through IRs academic librarians work with academia as intellectual property and copyrights advisors and facilitate self-archiving.
- Viable partner in research; IRs provide libraries with the opportunities to develop new strategies and standards for digital collection management and they work as a viable research partner in institutions.
- IR is a means to provide improved services to library customers; through the establishment of IRs, libraries have minimized serial and permission crises. This enhances library customer services and customer satisfaction.

- Opportunity to lead IR projects based on their inherent skills; it exposes academic librarians to IR training and on-job experience. Hence, it provides librarians with an opportunity to showcase their inherent skills in IR project.
- IRs are time-effective for both librarians and students in searching for scholarly materials on line.
- An IR can help libraries to reduce the cost of purchasing academic articles and journals because they can get these articles and journals from another institution’s IR (Oguche, 2018).

Thus, there are numerous benefits of IRs. Due to apparent benefits, academic institutions all over the world are embracing IR as a means of bridging the gap between the authors, scholars, researchers’ output and the information users and to preserve their wealth of knowledge (Okoroma, 2018). The following section presents the trends and growth of institutional repositories in Africa.

Trends in Institutional repositories in Africa

The world-wide development of institutional repositories has been phenomenal over ten years as shown in Table 1: Growth of IRs in different regions of the world. Europe has the highest concentration of IRs. Out of a total of 3801 IRs, only 165 (5%) belong to Africa. Looking at the above Tables and Figure, a question arises, if institutional repositories are not evenly widespread can they be rightly and fairly considered as a major benchmark of Digital Scholarship?

Table1: Growth of Institutional Repositories by Region

Countries by Region (3801)
<ul style="list-style-type: none"> • Africa (165) • Americas (1022) • Asia (722) • Europe (1789) • Oceania (103)

Source: OpenDOAR (2018).

Table 2 below shows the spread of IRs in Africa. Out of the 165 existing institutional repositories, 60 belong to Eastern Africa; 1 middle Africa; 30 Northern Africa; 44 Southern Africa and 30 Western Africa. Of the 44 Southern African repositories, 39 are maintained by South African institutions.

Table2: Spread of Institutional Repositories in African Region

Institutional Repositories in Africa (165)

- Eastern Africa (60)
- Middle Africa (1)
- Northern Africa (30)
- Southern Africa (44)
- Western Africa (30)

Source: OpenDOAR (2018).

Figure 1 below shows the growth of OpenDoar in Africa. Africa started with three IRs in 2005 and after 14 years currently, there are 165 IRs in Africa.

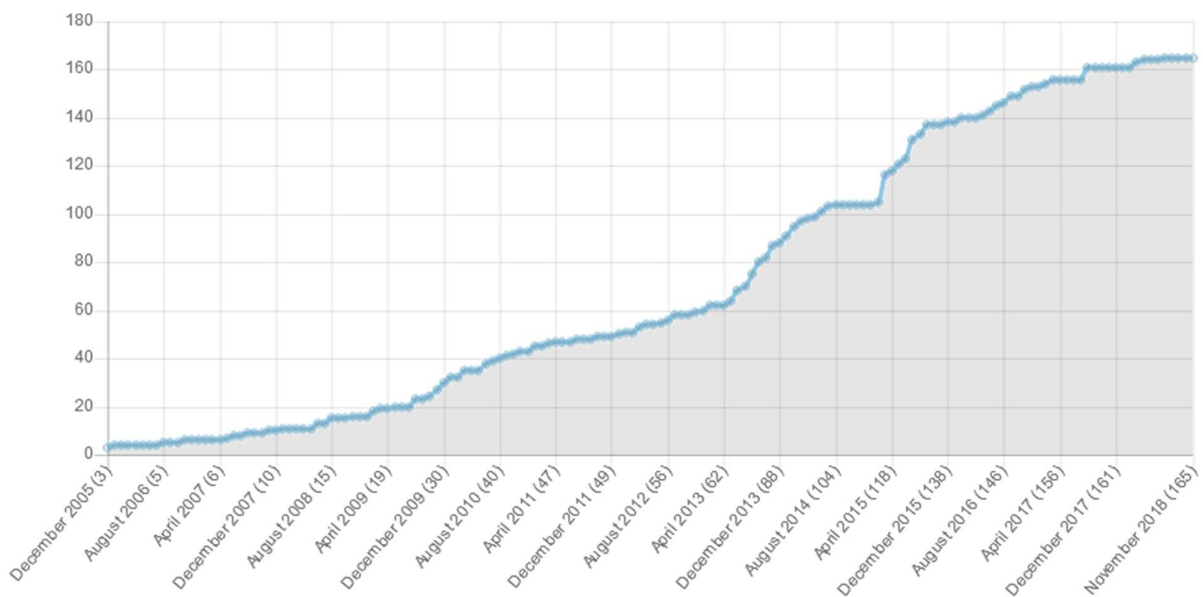


Figure 1: Growth of Institutional Repositories in Africa

Source: OpenDOAR (2018).

It is clear from Table 1 and Figure 1 that world-wide number of IRs has been increasing steadily and Africa has a slow uptake in IRs. However, it is promising to note that Africa is making perpetual progress in establishment of IRs. Africa started with three IRs and today the number has increased to 165. Unlike developed countries, Africa faces a number of challenges, which are unique to Africa. The slow uptake of IRs in Africa can be attributed to the lack of resources and other impediments that Africa is confronted with. The following section discusses the challenges and impediments to IR success in Africa:

Potential Challenges/impediments to IR success

Despite numerous benefits, there are potential challenges and impediments to IR success. The recent literature reveals the following major challenges that are more specific in Africa:

- **Policy Challenges:** An IR will only function to its optimal potential when a mandate is in place to populate it. Lack of policies to mandating staff and students to submit their research outputs also serves as a constraint. Unavailability of policy mandating staff to submit their research outputs was identified as a challenge by several recent empirical studies (Fasae, et al., 2017; Ukachi, 2018; Kakai, Musoke, & Okello-Obura, 2018).
- **Content recruitment:** Content recruitment is a very crucial aspect of institutional repository (IR), and yet it is a major challenge in the implementation of an IR system (Okumu's, 2015; Ukachi, 2018; Okoroma, 2018). According to Palmer (2014), it is difficult to grow a repository when researchers lack the motivation to deposit, overestimate the time and effort required, are overwhelmed by the complexity of copyright issues. In 2015, Okumu's, study established the impact of difficulty in content recruitment on the adoption of institutional repository by a majority of 86.2% participants. Pursuant to establishing the Open Access universities' IR achievements in East African Universities, Kakai, Musoke, and Okello-Obura (2018) discovered a similar situation, where it was difficult for researchers to share their research outputs, especially when there were no open access policies operating within the institution.
- **Legal framework/ intellectual property right:** Copyright issue was revealed a hindrance to adoption of institutional repository by 92.5% participants in East African Universities (Okumu, 2015). Recently, Ukachi (2018:8) empirically exposed that "the most strongly agreed challenge was legal framework/intellectual property right in East African universities (Okumu, 2015; Fasae, et al., 2017). Copyright restrictions by publishers and double transfer of copyright first from author to publisher and then from publisher to institution are issues. Some IR submissions require copyright clearance which can take a while. As a result, academic institutions and the authors encounter this challenge.
- **Poor internet connectivity:** Poor and slow internet connectivity is a common problem in most parts of Africa, which is vital for successful implementation and utilization of IRs. Poor internet connectivity is another impediment to effective implementation of IRs in Africa (Fasae, et al., 2017; Ukachi, 2018).
- **Epileptic/unstable power supply:** Epileptic and unstable power supply are yet another common challenge in most African countries. Epileptic and unstable power supply was empirically identified as a challenge to effective IRs implementation by (Fasae, et al.2017;Dlamini&Snyman, 2017;Ukachi,2018). According to Fasae, et al. (2017, p. 13), unstable power supply is "posing a serious threat towards the effective implementation and use of an institutional repository containing digitized special collections in Nigeria, Ghana and Uganda". Epileptic power supply is also affecting Nigeria's economy negatively.

- **Maintenance of Software and hardware:** Software and hardware maintenance issues, such as, compatibility of software, upgrading and replacement of software were disclosed as challenges to successful IR implementation in Africa (Ukachi, 2018).
- **Lack of skills and knowledge among academic staff and librarians:** Lack of skills and knowledge is another challenge that hinders effective utilization and implementation of IRs in Africa. At the Sokoine University of Agriculture in Tanzania a majority, 85.7% academic staff identified lack of skills and knowledge as a challenge. Academic staff were not aware of how to deposit their scholarly work in the institutional repository, hence, the majority of them never deposited their scholarly work in SUAIR, the IR (Mnzava, 2018). A study carried out by Okumu (2015) on the adoption of institutional repositories in universities in Kenya revealed that the library staff lacked the necessary skills to manage the repository effectively, intellectual property right, Internet Self-Efficacy, as well as cost of institutional repositories, among others.
- **Attitude towards using IR:** Attitude of academic staff and researchers towards using IR is a challenge. At the Sokoine University of Agriculture in Tanzania, less than half (48.6%) of the academic staff believe that using the university repository is a pleasant experience, yet a significant number of 45.7% neither agreed nor disagreed with the statement on the attitude towards using their institutional repository (Mnzava, 2018). This finding is an indication of poor attitude towards using IRs.
- **Inadequate funding:** Inadequate funding was identified as a leading challenge by Fasaie, et al. (2017). The above authors expressed that financial resources are dwindling in this part of the continent, leading to reduction in budget allocated to IRs while the development and implementation of an institutional repository is capital intensive in Africa because of lack of well-established ICT infrastructure like in developed world. "Lack of funding and financial support" was identified as the most popular obstacle to the development, implementation and use of IRs in African academic institutions by 96% respondents (Dlamini & Snyman, 2017, p.1).
- **Lack of awareness of IR's existence and benefits among academics and researchers:** According to a recent study in Nigeria, the majority of the lecturers in Nigerian Universities are either unfamiliar with the concept of IR or have very little knowledge on the aims and objectives of IR, and therefore submitting their work in IR is a low priority (Okoroma, 2018). This is further supported by Oguche (2018) by asserting that the knowledge of IR is very low among the major stakeholders including lecturers, researchers, librarians and students in Nigeria. The similar situation was found at the Sokoine University of Agriculture in Tanzania, where lack of awareness of the existence of the SUAIR institutional repository was identified as one of the significant barriers to the effective utilization of SUAIR (Mnzava & Chirwa, 2018). Lack of awareness of open access IRs among researchers and academicians was also found as an impediment in other universities in Africa (Dlamini & Snyman, 2017; Kakai, et al., 2018).
- **Inadequate ICT Infrastructure:** This is another common problem specific to Africa. According to two recent studies, deficiency of ICT infrastructure and facilities is a major problem in Africa, which negatively affects the successful implementation of IR in African libraries and institutions (Dlamini & Snyman, 2017; Oguche, 2018, Ifijeh, et al., 2018). As lamented by Ifijeh, et al. (2018), Universities and libraries in developing

countries like Nigeria have to contend with inadequate funds, technology problems, lack of stable electricity, copyright issues and so on.

- **Inadequate advocacy and marketing of an IR:** Inadequate advocacy and marketing are identified as challenge to successful IR implementation in Africa (Fasae, et al., 2017; Dlamini & Snyman, 2017). Appropriate IR advocacy strategies are vital to ensure that the user community understands the role and the purpose of the IR; it maximizes the use of IR and enhances the access to and sharing of research-based information and consequently, contributes to the development of Africa as a whole.

Conclusion and Recommendations

This paper has discussed benefits and challenges associated with IRs. Despite numerous challenges, many universities in Africa are increasingly establishing IRs for collecting, preserving and promoting scholarly outputs of their institutions, thus increase the research impact through wider dissemination. It is indeed an indicator that African institutions recognize the potential of IRs to enhance the access and dissemination of scholarly information and IRs can play a significant role in the development of Africa. The author believes that with this positive and consistent growth of repositories, the future of IRs and the provision of open access in Africa is expectant.

To overcome some of the identified challenges, the following recommendations are put forward:



Figure 2: Recommendation for Institutional Repositories

- **IR Advocacy and Publicity:** To combat the problem of lack of awareness, there should be vigorous IR advocacy accompanied by IR awareness campaigns. There is a need for a comprehensive promotion and publicity of the benefits of IR to the faculty and all other stakeholders by academic institutions, with librarians playing a central role in the comprehensive promotion.
- **Mandated depository policies:** Strict institutional implementation policy to mandated depository is essential to guide and encourage authors to submit their research outputs in an IR. This would provide institutions and authors with optimal benefits of an IR and will increase the visibility and accessibility of scholarly information.
- **User training:** With the rapid advancement of information and communication technologies, there is a need for training on a regular basis for academic staff, librarians and all other stakeholders to enable them to manage access and use IR resources smoothly.
- **Senior management commitment:** Sustained support from senior management is crucial for the successful implementation and maintenance of an institutional repository, which includes adequate provision of resources (finance, space, human and technology).
- **IRs ongoing projects:** IRs should be considered as an ongoing project not once done and dust.
- **Incentives:** Introduction of incentives is imperative to encourage academia to publish through IRs and academic librarians to manage IR more seriously.

- **Steady Power Supply:** Government should make provision for the steady power supply to support academic institutions' IR implementation initiatives.

References

- CARL & SPARC. (2008). *Greater reach for your research: Expanding readership through digital repositories*. Retrieved from http://www.carl-abrc.ca/uploads/pdfs/sparc_repositories.pdf
- Crow, R. (2002). *The Case for Institutional Repositories: a SPARC Position Paper*. Retrieved from http://www.arl.org/sparc/bm~doc/ir_final_release_102.pdf
- Dlamini, N.N., & Snyman, M. (2017). Institutional repositories in Africa: obstacles and challenges. *Library Review*, 66(6/7), 535-543.
- Farida, I., Tjakraatmadja, J.H., Firman, A., & Basuki, S. (2015). A conceptual model of open access institutional repository in Indonesia academic libraries: Viewed from knowledge management perspective, *Library Management*, 36(1/2), 168 – 181. Retrieved from <http://www.emeraldinsight.com/doi/abs/10.1108/LM-03-2014-0038>
- Fasae, J.K. et al. (2017). Institutional repositories and heritage materials in selected institutions within three African countries. Retrieved from <http://digitalcommons.unl.edu/cgi/viewcontent.cgi?article=4625&context=libphilprac>
- Harnad, S. (2012). *What is open access?* Retrieved from <http://www.eprints.org/openaccess/>
- Ifijeh, G., Adebayo, O., Izuagbe, R., & Olawoyin, O. (2018). Institutional Repositories and Libraries in Nigeria: Interrogating the Nexus. *Journal of Cases on Information Technology (JCIT)*. Retrieved from <https://www.igi-global.com/article/institutional-repositories-and-libraries-in-nigeria/201197>
- Jain, P. (2016). *New Metrics of Scholarly Communication and Transforming Roles of Academic Librarians: A case of Institutional Repositories* in (Veeresh B. Hanchinal, Vidya V. Hanchinal & P.R. Pragasam), *Re-imagining Academic Libraries: A Perspective on Institutional Repositories*. EssEss Publications, New Delhi, ISBN: 978-81-7000-804-0, Pp. 56-77.
- Jain, P. (2012). Promoting open access to research in Academic libraries: Development and Initiatives. *Library Philosophy and Practice*, May 2012 Issue, ISSN 1522-0222, Retrieved from: <http://www.webpages.uidaho.edu/~mbolin/jain.pdf>
- Johnson, R.K. (2002). Institutional repositories: partnering with faculty to enhance scholarly communication. *D-Lib Magazine*, 8(11), Retrieved from <http://www.dlib.org/dlib/november02/johnson/11johnson.html>
- Kakai, M., Musoke, M.G.N. & Okello-Obura, C. (2018). Open access institutional repositories in universities in East Africa. *Information and Learning Science* <https://doi.org/10.1108/ILS-07-2018-0066> Retrieved from <https://www.emeraldinsight.com/doi/pdfplus/10.1108/ILS-07-2018-0066>

Lynch, C. (2003). Institutional repositories: Essential infrastructure for scholarship in the digital age. *ARL*, 226, 1–7. Retrieved from <http://www.arl.org/bm~doc/br226ir.pdf>

Mnzava, E.E., & Chirwa, M.N. (2018). Usage of Sokoine University of Agriculture Institutional Repository among academic staff at the College of Veterinary Medicine and Biomedical Science in Tanzania. *Global Knowledge, Memory and Communication*, 66(8/9), 510-522. Retrieved from <https://www.emeraldinsight.com/author/Chirwa%2C+Mussa+Ndambile>

Oguche, D. (2018). The state of institutional repositories and scholarly communication in Nigeria. Retrieved from <https://www.emeraldinsight.com/doi/pdfplus/10.1108/GKMC-04-2017-0033>

Okoroma, F.N. (2018). Awareness, knowledge and attitude of lecturers towards institutional repositories in university libraries in Nigeria. *Digital Library Perspectives*, 34(4), 288-307. <https://doi.org/10.1108/DLP-04-2018-0011>

Okumu, O. D. (2015). Adoption of Institutional Repositories in Dissemination of Scholarly Information in Universities in Kenya with reference to United States International University, Africa. (Unpublished Master Projects) University of Nairobi. Retrieved from http://erepository.uonbi.ac.ke/bitstream/handle/11295/93088/Ogenga_Adoption%20of%20institutional%20repositories.pdf?sequence=3&isAllowed=y

OpenDOAR (2018). *Browse by Country and Region*. Retrieved from http://v2.sherpa.ac.uk/view/repository_by_country/countries=5Fby=5Fregion.html

Palmer, L. A. (2014). Cultivating scholarship: The role of institutional repositories in health sciences libraries. *Against the Grain*, Retrieved from http://escholarship.umassmed.edu/cgi/viewcontent.cgi?article=1157&context=lib_articles

Pickton, M., & Barwick, J. (2006). A Librarian's guide to institutional repositories. Loughborough University. Retrieved from <http://magpie.lboro.ac.uk/dspace/handle/2134/1122>

Shearer, K. (2013). *Institutional Repositories: Towards the identification of critical success factors*. Retrieved from <http://www.cais-acsi.ca/ojs/index.php/cais/article/download/408/578>

Swan, A., & Chan, L. (2009). *Support and implementation of open access*. Retrieved from http://www.openoasis.org/index.php?option=com_content&view=article&id=136&catid=79&Itemid=258

Ukachi, N.B. (2018). *Enhancing scholarly communication through institutional repositories: salient issues and strategies by libraries in Nigeria*. Retrieved from <http://library.ifla.org/2268/1/163-ukachi-en.pdf>

A brief biography: Priti Jain is a Professor of Information and Knowledge Management in the Department of Library and Information Studies at the University of Botswana. In her 16 years' work experience in Library and information world, Priti has written extensively in referred journals and has presented several papers in international conferences. She serves on five editorial boards in international journals. She is engaged in various community initiatives. She teaches and researches in knowledge management and information Science courses. Her current areas of research interest are: Knowledge management, Open access, Institutional Repositories, and Digital Scholarship.