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# OPEN DIGITAL REPOSITORIES: PROSPECTS OF AFRICAN COUNTRIES WITHIN THE GLOBAL INFORMATION SPACE

John I. Ogungbeni

*Lagos State University, Ojo, Lagos, Nigeria., ogungbeni@gmail.com*

Amaka R. Obiamalu Mrs.

*Nnamdi Azikiwe University Awka Nigeria, amakaobiamalu@gmail.com*

Kingsley U. Obiora Mr.

*Nnamdi Azikiwe University Awka Nigeria, obioraudem@yahoo.com*

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# OPEN DIGITAL REPOSITORIES: PROSPECTS OF AFRICAN COUNTRIES WITHIN THE GLOBAL INFORMATION SPACE

## Abstract

This study examines the contributions of African countries to open digital repositories in the world information space. Two online directories of open digital repositories were used as data sources. The OpenDOAR is an authoritative directory of academic open access repositories listing 3,670 repositories as at 6<sup>th</sup> January, 2019. The Registry of Open Access Repositories (ROAR) is a directory of 4,580 institutional repositories and their contents as at 7<sup>th</sup> January, 2019. Extracted data were analysed using quantitative techniques and presented in tabular and pictorial formats to reveal findings in accordance with desired objectives. The results revealed that Dspace is the most preferred open digital repositories software across the world. The results showed that the contributions of African countries (3.78%) to open digital repositories in the world are low. The results also showed that only 22 African countries contribute to global open digital repositories and that the rate of contribution increased rapidly in the last few years. The study concludes that for Africa to overcome the challenges associated with open digital repositories there is need for more African countries to be involved in the African Open Access Initiative and the need to tap into the experiences of various professionals on the African continent.

**Keywords:** Open Digital Repositories, Digital repositories, Institutional repositories, African repositories

## Introduction

African countries are yearning for development and will embrace any programme that will make their effort to develop sustainable. The implementation of Sustainable Development Goal of United Nations is guided by Education 2030 Framework for Action. A key component of the framework is that information is very important in achieving qualitative higher education (UNESCO, 2015). African countries like other developing nations face enormous challenges in developing and maintaining library collections that will grant patrons access to current and relevant information. The advent of open digital repositories has therefore come with great relieve for librarians, researchers and students in African academic institutions

Open digital repository, an offshoot of open access, is a database of institutional or governmental electronic resources that is freely accessible. Open access is a concept of free and unrestricted access to content of information resources (Pinfield, 2005). The need to provide alternative form of access to research literature by taking advantage of the versatility of the internet led to the creation of open repositories (Fayaz, 2014 ). The components of an open digital repository should include the hardware, software, digital information resources that constitute the content and the human resources to drive the process. However, the status of the software as open source software is what makes a repository an open digital repository.

The broad aim of this study is to take the pulse of open digital repositories in Africa and establish how far African countries have come, what they have achieved, where they are

going next with respect to open digital repository in a global environment driven by information technology.

In 2005, University of Nottingham, UK created the Directory of Open Access Repositories (OpenDOAR). The OpenDOAR is an authoritative directory of academic open access repositories listing 3,670 repositories as at 6<sup>th</sup> January, 2019 ([http://v2.sherpa.ac.uk/view/repository\\_visualisations/1.html](http://v2.sherpa.ac.uk/view/repository_visualisations/1.html)). The Registry of Open Access Repositories (ROAR) created by EPrints at University of Southampton, UK, in 2003 is a searchable international database indexing the creation, location and growth of open access of 4,580 institutional repositories and their contents as at 7<sup>th</sup> January, 2019. (<http://roar.eprints.org/>) . These two online information sources on open digital repositories constituted data sources for this study.

## **Research Questions**

This study is to provide answers to the following research questions:

1. What are the open digital repositories software available in the global information space?
2. What numbers of open digital repositories are in the continents of the world?
3. What numbers of open digital repositories are available in African countries?
4. What is the rate of increase in number of open digital repositories in Africa?

## **Literature Review**

Open digital repositories can be institutional or governmental. Clifford (2003) defined institutional repository as set of services which on organization offers to the members of its community with the purpose of management and dissemination of digital information resources authored by the institution and members of the community. The main objectives of building institutional repositories are the long term preservation and effective dissemination of the contents of the repositories.

Several research works have been carried out on open digital repositories. In a study on the distribution of digital repository globally, Roy, Biswas, and Mukhopadhyay (2012) found out that Europe and North America contributed 48% and 21% respectively to open digital repositories worldwide. Xia (2007) examined cultural differences among researchers in seven repositories and found out that the language of digital repository software is a strong factor for adoption of the software. In a study on open digital repositories in Asian continent, Abrizah, Noorhidawati and Kiran (2010) ranked Japan as the country having the highest number of repositories followed by india and Taiwan.

A major challenge of digital repositories has been getting authors to deposit content, this has been captured in many studies such Kim (2007) and Allen (2005). A range of factors seem to influence use of repositories by academics. In a study by Creaser, et al (2010) on authors' awareness and attitudes toward open access repositories, 46% of authors expressed a preference for depositing in subject-based repositories, 22% preferring an institutional repository; only 37% of respondents knew of a suitable subject repository they could use.

A survey by Kim (2010) suggested that open access advantages to users, positive influence on academic reward and disciplinary norms are some motivation for researchers to participate in open digital repositories. However, according to Nicholas, Rowland, Watkinson, Brown, Russell & Jamalli (2013) barriers to self-archiving, including concerns about copyright, the extra time and effort required, technical ability or lack thereof, and age, indicate the necessity for services to assist faculty with copyright management, and with technical and logistical issues, in order to achieve higher rates of self-archiving. Overall, the review of the literature shows that very few studies have evaluated how far digital repositories have developed and what their future might be.

## Methodology

The online survey method of research was used for data collection and quantitative approach was applied for data analysis. In the present study, the data was collected about four hundred African countries contribution to open digital repositories as recorded by *Registry of Open Access Repositories (ROAR)* and *Open Directory of Open Access Repositories (OpenDOAR)* that provide information about country, subject, language(s), content(s) and many other features. These two online databases of repositories were accessed from December 20<sup>th</sup>, 2018 – January 6<sup>th</sup> 2019. Microsoft Excel files of the collected data were created, and data were analysed using mathematical formulae. Data were later presented in tabular forms to show findings in accordance with desired objectives.

## Findings

### Open Digital Repository Software

Repositories in countries across the world use software that serve as the database and retrieval system for the stored information content. Majority of repositories use Dspace (43%) and Eprints (13%), see Fig. 1. There are other software like Islandora (3%), WEKO (3%), dLibra (2%), OPUS (2%), CONTENTdm (2%) and Fedora (1%)

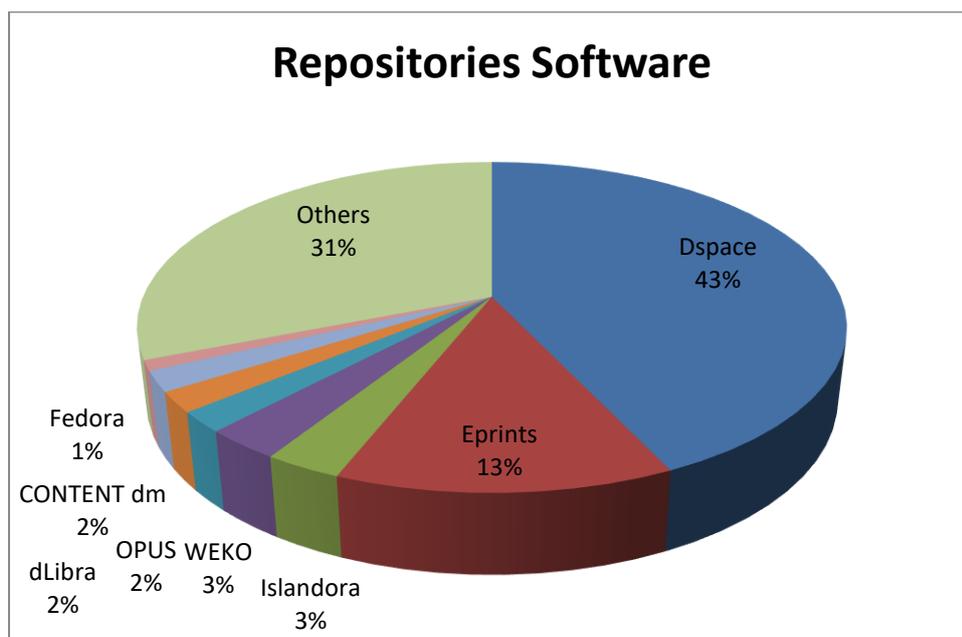


Figure 1: Repositories Software (OpenDOAR)

## Number of repositories in continents of the World

The distribution of the repositories in continents of the world on the ROAR database (Table 1), shows Africa contributing 3.78% and in 5<sup>th</sup> position behind Europe (39.26%), North America (23.23%), Asia (20.02%) and South America (9.76%).

Table 1: Repositories by continents (ROAR)

| S/n | Continent     | No. of Repositories | Percentage |
|-----|---------------|---------------------|------------|
| 1   | Europe        | 1798                | 39.26      |
| 2   | North America | 1064                | 23.23      |
| 3   | Asia          | 917                 | 20.02      |
| 4   | South America | 447                 | 9.76       |
| 5   | Africa        | 173                 | 3.78       |
| 6   | Australasia   | 86                  | 1.88       |
| 7   | Oceania       | 3                   | 0.07       |
| 8   | Unknown       | 92                  | 2.01       |
|     | <b>Total</b>  | <b>4580</b>         | <b>100</b> |

## Number of Repositories by Countries in Africa

Findings from ROAR online database show that only 22 countries in Africa have open digital repositories (Table 2). South Africa has the highest number of repositories 51 (29.48%). Kenya 22 (12.72%), Nigeria 13 (7.51%), Sudan 13 (7.51%), Egypt 11 (6.35%) and Zimbabwe 11 (6.35%) occupies the 2<sup>nd</sup> to 4<sup>th</sup> positions.

Table 2: Repositories by Countries

| S/n | Country      | Number of Repositories | Percentage |
|-----|--------------|------------------------|------------|
| 1   | South Africa | 51                     | 29.48      |
| 2   | Kenya        | 22                     | 12.72      |
| 3   | Nigeria      | 13                     | 7.51       |
| 4   | Sudan        | 13                     | 7.51       |
| 5   | Egypt        | 11                     | 6.35       |
| 6   | Zimbabwe     | 11                     | 6.35       |
| 7   | Algeria      | 09                     | 5.20       |
| 8   | Tanzania     | 09                     | 5.20       |
| 9   | Ghana        | 06                     | 3.47       |
| 10  | Morocco      | 04                     | 2.31       |
| 11  | Uganda       | 04                     | 2.31       |
| 12  | Botswana     | 03                     | 1.73       |
| 13  | Ethiopia     | 03                     | 1.73       |
| 14  | Lesotho      | 02                     | 1.16       |
| 15  | Mozambique   | 02                     | 1.16       |
| 16  | Namibia      | 02                     | 1.16       |
| 17  | Senegal      | 02                     | 1.16       |
| 18  | Tunisia      | 02                     | 1.16       |
| 19  | Cameroon     | 01                     | 0.58       |

|    |              |            |            |
|----|--------------|------------|------------|
| 20 | Libya        | 01         | 0.58       |
| 21 | Malawi       | 01         | 0.58       |
| 22 | Ruwanda      | 01         | 0.58       |
|    | <b>Total</b> | <b>173</b> | <b>100</b> |

### Increase in Number of Repositories in Africa

The increase in number of repositories in Africa from year 2006 to year 2018 is shown in Figure 2. The number of open digital repositories increased from 7 in 2006 to 62 in 2012 and to 173 in 2018.

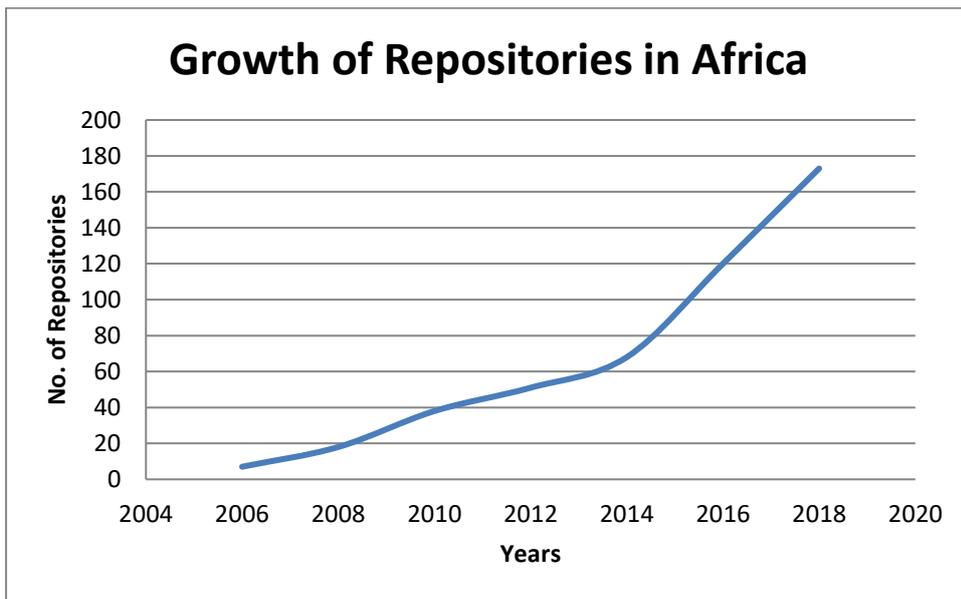


Figure 2: increase in repositories

### Discussion of Findings

A vital component of an open digital repository is the software that drives the repository. Among the software that are available in the open source platform, this study has shown that *DSpace* has no second close competitor all over the world. Most repository managers across the world have found *Dspace* most suitable because of its following features; flexibility, customizable, interoperability, greater visibility, searchability and free availability. Another open digital repository that rank next to *Dspace* is *Eprint*. *Eprint* equally has features that make it easier to manage compared to some other commercial and open source software brands used by the repository managers. *Dspace* also rank first among open digital repository software on the Africa Continent.

The 3.78% contribution of the African countries to the total open digital repositories across the word is not a good percentage to cheer over. The contribution of a continent like South America (9.76%) that all the countries are developing just like countries on the African continent shows that African countries need to do more in order to make their research findings feasible through open digital repository.

The distribution of open digital repositories across countries in African shows a lot of lopsidedness with South Africa (28.48%) and Kenya (12.72%) contributing the largest chunks. The contribution of Nigeria (7.51%) with one hundred and sixty-five universities

compare to Kenya with smaller number of universities (forty-nine universities) is indicative of the fact that some countries need to invest more on open digital repository, The finding shows that only 22 out 54 countries in Africa have open digital repositories. The findings show that more awareness needs to be created for stakeholders in scholarship and research on the African continent to invest more on the open access movement

The findings of this study show that although growth in the number of open digital repositories has been rapid in the last few years, the increase has not been well distributed. Many countries are still not contributing to open digital repositories and some countries like Nigeria contributing below their capacities

## **Conclusion**

Some of the challenges facing African countries with respect to open digital repositories are: slow rate of accepting electronic information; absence of information management strategies/policies; copyright and Intellectual Property Rights (IPR) concerns; inadequate technical infrastructure; lack of awareness and understanding of the concepts and lack of funds. A good approach to surmounting these challenges is for more African countries to be part of the African Open Access Initiative to enable them share resources and ideas.

There is also the need to tap the experiences of various professionals on the African continent for upgrading open digital repositories software and making this more user-friendly. Information and technology experts and computer scientists can provide a helping hand in this direction. The author of this study believes that Africans has the potentials to make their research outputs more visible to the global community but for this to happen institutions in Africa need to create an environment that would support the development of open digital repositories.

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