PROMOTING INSTITUTIONAL REPOSITORIES IN NIGERIAN RESEARCH INSTITUTES: THE RESEARCH LIBRARIANS' ROLES

BY

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Abstract

This study was undertaken to investigate the promotional strategies of the research librarians for implementing institutional repositories in four research institutes in Nigeria. Descriptive survey research design was employed and thirty (30) research librarians participated in the study. A self-developed questionnaire was used to collect information from the librarians. The quantitative data obtained were analysed using descriptive statistics. The results revealed that no research institute in Nigeria has implemented open access institutional repository. This is because the libraries were not proactive in implementing institutional repository as they lack promotional strategies such as advocacy, infrastructural development, training of library staff among others. As a matter of urgency the libraries should engage the institutions management with well-articulated written proposals for the implementation of institutional repositories. It is important the libraries do more in training library staff by encouraging them to attend workshops and conferences where issues of institutional repositories implementation are discussed. They should also understudy the strategies being employed by university libraries that have

implemented institutional repositories.

Keywords: Institutional Repositories, Research Institutes, Scholarly Communication, Open Access Publishing, Grey Literature

introduction

Research institutions are focal points for research and development in any viable economy. Thus, they are established with the mandates to carry out researches into various aspects of national economy such as educational, social, economic, legal, agricultural, industrial and medical. In Nigeria, the early research institutes such as the Federal Institute of Industrial Research Oshodi (FIIRO) established in 1956; Forestry Research Institute of Nigeria established in 1954 and Nigerian Stored Products Research Institute (NSPRI) established in 1948, were established by the colonial government for the purpose of conducting research mostly in the area of agriculture which was the main stay of the economy then. Other research institutes were established after the independence. Though no data is currently available on the actual number of research institutes in Nigeria, Udegbunam, (2019) that there are about hundred and fifty research institutes. Shonaike (2016) opined that more than sixty-six research institutes have been established in Nigeria. Christian (2008) listed 39 research institutions in Nigeria though some of the institutions like Nigerian Institute of Medical Research, Nigerian Institute of Advanced Legal Studies, Nigerian Institute of International Affairs, were omitted in the list.

These institutions include medical, agricultural, science and technology, education, religion and socio-economic research institutes. The research institutions along with the academic institutions turn out chunk of research outputs relating to developmental issues not only in the country but also within the region. The research outputs are mostly published in journals

that are not openly accessible or locked up in the various institutions' libraries. The implication of this was captured by UNESCO (2005) which observed that many researchers in developing countries often find it difficult, through lack of resources, to gain a foothold in the international scientific arena, even when they are producing high-quality work. The reasons for non-availability and accessibility of these research data are not far-fetched. The traditional model of scholarly publication which is mostly the means of scholarly communication by researchers in the developing countries is cumbersome; takes a lot of time for research work to be published; very expensive and operates a closed system of access (John-Okeke, 2008).

Open access institutional repository (OAIR) is a new paradigm in the scholarly communication system. The overarching benefit of institutional repositories lies in making openly available and accessible, archived scholarly outputs from universities and research institutions through the Internet without any restriction. Many countries have taken advantage of OAIR and are making available invaluable data to the global research community and this has tremendously increased research activities and made research a lot interesting. Nigeria has improved on the number of institutional repository from zero in 2008 (Christian, 2008) to 30 in 2020 (Directory of Open Access Repositories, 2020). Most of the institutional repositories are university based and the only repository outside the university is the Repository of Central Bank of Nigeria (OpenDOAR, 2020). No research institute in Nigeria has established OAIR. The reason might be that the stakeholders are not proactive in implementing institutional repositories. Thus, the purpose of this study is to investigate the research librarians' strategies for promoting and implementing institutional repositories in four selected research institutes in Nigeria.

Research Questions

The following research questions were formulated to guide the study:

1. Are the research librarians aware of IR?

2. What are the strategies employed by the research librarians to promote the building of IR?

3. What are the potential challenges the research librarians face in building IR?

Literature Review

Research and Development

Research implies a careful examination of an object or situation for the purpose of effecting development and improvement. It is a way of acquiring dependable and useful information and data about a particular object of research as well as the analysis of data collected in order to arrive at a valid conclusion. The prime function of research is therefore to discover answers to meaningful questions aimed at remedying societal challenges (Odia & Omofonmwan, 2013). The importance of research to development is clearly understood in Nigeria. Hence, the establishment of many universities and research institutes. The research institutes are charged with the responsibility of conducting research in their various areas of mandates. The former president of Nigeria, Goodluck Ebere Jonathan once stated that "I personally attach great importance to research and development (R & D) as I am convinced that no nation can prosper without them" (Emmanuel, 2012).

Some of the research institutes in Nigeria are: the Nigerian Institute of Advanced Legal Studies (NIALS), the apex institution for research and advanced studies in law established in 1979 with the mandate to provide

primary source of information, training and advice to the highest level policy formulation on legal matters; Nigerian Institute of International Affairs (NIIA) established in 1961 to serve as an intellectual base upon which decision-makers rely for informed opinion and expert advice in order to make rational choices between contending policy options; Nigerian Institute of Medical Research (NIMR) established in 1977 to conduct research into health problems in Nigeria; and the Federal Institute of Industrial Research Oshodi (FIIRO) established in 1956 to assist in accelerating the industrialisation of the Nigerian economy through finding utilisation for the country's raw materials and engaging in research projects, seminars, conferences, workshops, roundtable upgrading indigenous production technologies. These research institutes generate a lot of data from lecture series, staff seminars, and short and long term research projects. The Nigerian Institute of Advanced Legal Studies also engages in advanced legal studies and awards Post Graduate Diploma, Masters and PhD in legislative drafting. Thus among the research outputs generated in NIALS are research projects, thesis and dissertations on varying areas of law.

One important document that emanates from research institutions is grey literature. Grey literature includes research reports, theses, dissertations, unpublished seminars, technical specifications and standards, workshop proceedings and official documents. Schopfel cited in Samzugi (2017) defined grey literature as manifold document types produced on all levels of government, academics, businesses and industries in print and electronic formats that are protected by intellectual property rights, of sufficient quality to be collected and preserved by libraries and institutional repositories, but not controlled by commercial publishers, i.e. where publishing is not the primary activity of the producing body. Grey literature poses a great challenge in managing them because of their nature. Some of

them appear as leaflets, and even when they appear as tangible documents (theses and dissertations) are cumbersome to manage because of their frequency and nature of production. Moreover, grey literature is mostly institutional based and as such accessing them outside the institution is usually difficult especially in developing countries were utilisation of information and communication technology is still at a low level.

The inaccessibility of research data emanating from the various institutions which are meant to inform decision making of researchers, policy makers and the general public has created a very big gap between knowledge, innovation and development. UNESCO (2005) observed that the problem with developing countries is that they are often not successful in basing their economic growth on knowledge and innovation. Shonaike (2016) analysis of global publication growth regretted that Nigeria, the most populous country in Africa is not leading in research activities. Instead, South Africa which is about a third of Nigeria's population is the leading research country in Africa. Shonaike concluded that Nigeria is not doing much in terms of publications due to lack of research facilities. The issue here is not dearth of research data but according to Ezema (2011) is the inability to devise appropriate method of disseminating these research findings that supposed to enable colleagues within and outside the country to have access to them. These research findings are usually published in journals with very limited access and mostly floated for the purpose of gaining academic promotion and a large number of them are left unpublished or even archived.

Open Access Publishing

The work activities of research staff at the various research institutes depend so much on the availability and accessibility of scientific publications which are the major communication channels among

researchers. According to UNESCO (2005), publication represents a key instant in the production of scientific knowledge, for it is then that the results are formalised and made public. For a very long time, print production was the major model for publishing scholarly work. The new technologies are a vital technical means of reducing the difficulties of publishing or of consulting scientific research in developing countries. Open access movement utilises the new technologies in making available research data universally without any restrictions. The two roads to this movement are open access journals and institutional repositories.

Institutional repositories have provided a platform for research institutions to make available their research output through the Internet free of charge. Crow (2002) defined institutional repository as a digital archive of 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. Prepublication [an aspect of self-archiving] is another way of making materials accessible online while avoiding the time lags inherent in bringing out works in print, which are often too long for leading-edge research (UNESCO, 2005). This means that research results can be published in institutional repositories while waiting for journal publication which takes much longer time.

Some of the characteristics of institutional repositories are:

(1) it is institutional based, that is, it captures only the intellectual property of the host institutions such as purely scholarly work, or administrative, teaching and research materials, both published and unpublished;

(2) it is open and interoperable and the primary goal is to disseminate the institution's intellectual output;

(3) it is cumulative and perpetual and this carries with it a long term obligation on the host institution to preserve institutional repository content; and

(4) it contributes to the process of scholarly communication in collecting, storing and disseminating the scholarly content (Crow, 2002).

The major benefits are that it makes the institutions visible, encourages collaborative research while attracting funds to the institutions and making research data perpetually available to both internal and external researchers globally through the Internet. Also, the availability of research results enables policy makers to formulate evidence-based policies and regulations for innovations and development.

Institutional repositories emerged since 2002 when major research universities in the U.S.A (such as MIT and Cornell University, using Dspace and the U.K. (Southampton and Oxford University using E-print) launched their own institutional repository systems. By mid-2006, all Australian universities had established institutional repositories (Abrizah, 2009). Africa is still far behind in building OAIR with South Africa having the highest repositories (44) in Africa while United State of America tops the list with 900 (OpenDOAR, 2020). Molteno (2016) lamented that half a century into the information age, Africa's own intellectuals and researchers remain largely invisible. For Molteno, institutional repository should be a game changer in the continent's intellectual landscape. Omekwu (2016) warned that scholars from developing countries risk becoming strangers in the electronic super highway if they fail to contribute their scholarly communication output to the global pool.

The benefits of institutional repositories attracted many researches on the implementation of institutional repositories in universities globally; however, research on its implementation in research institutes is sparse. Most researches on institutional repositories are university based (Jackman, 2007, Ivwighreghweta, 2012; Ezema & Okafor, 2016; Anenene, Alegbeleye & Oyewole, 2017; Ukwoma & Okafor, 2017; Ukwoma & Ngulube, 2019 and Adam & Kaur, 2019). Renjith's (2017) study on

institutional repositories of geoscientific research institutions in India found out that though there are a number of geoscientific research institutions in India only a few have their own digital libraries or institutional repositories. Majority are not using any digital library software instead; they provide access to their publications through their respective websites. The repositories include preprints, unpublished and peer reviewed articles. The study recommended that information professionals in the organisations should come forward to build their institutional repositories so as to disseminate newly emerging knowledge and expertise. India has 94 institutional repositories and about 30 are from research institutes while South Africa has 44 institutional repositories out of which only about 7 are from research institutes (OpenDOAR, 2020). OpenDOAR (2020) also revealed that no research institute in Nigeria has established institutional repositories.

The Role of Librarians in Implementing IRs

Libraries are highly instrumental in the development and maintenance of institutional repositories because of the strategic position they occupy in teaching, learning and research in academic institutions. Kamraninia and Abrizah (2010) pointed out that academic libraries are becoming very involved in managing electronic scholarly products and participating in the evolving scholarly communication process through institutional repositories. Moreover, libraries are being funded to digitise their special collections such as theses and dissertations in order to preserve and provide access to them. Moahi cited in Martin-Yeboah, Alemna & Adjei (2018) observed that in many universities the librarian is often solely responsible for the development of repositories. Kamraninia and Abrizah (2010) articulated the role of librarians in setting up and implementing institutional repositories as:

- collection management and stewardship of collection
- understanding of software and giving training to authors
- establishing a standard metadata and comprehensive catalogue system
- review submission for quality of content
- persuading authors to contribute with self-archiving
- training users search techniques in IR promotion and marketing

Most of the aforementioned roles have been part of the job activities of librarians and other information managers for a very long time. Collection management, quality control, creation of metadata, promotion and marketing of information product, and others, are as old as library profession and services. However, knowledge of software and other technical issues such as negotiating licensing agreements seem to be tough issues for librarians. Kamraninia and Abrizah (2010) observed that institutional repositories are not fully developed in some universities because the librarians are often not aware of their roles and are not skilled in the implementation of institutional repositories. Their survey revealed that the act of collecting materials for depositing is mainly done by librarians rather than authors and researchers. Martin-Yeboah,*et al*, (2018) upholding the view that the implementers/ promoters should be fully aware and knowledgeable of the issues around institutional repositories averred that marketing and promotion activities work very well when the promoter understands and communicates the benefits of the product or service for the prospective user to understand same. Thus, the librarians who are the implementers of the repository service should first understand the significance of the digital initiatives in order to drive other members of the academic community to buy into such a new phenomenon.

Awareness and Knowledge of IRs

Lack of awareness and knowledge of IR seem to be the major issues in the development of open access institutional repositories. Christian (2008) and Nwokedi and Nwokedi (2018) observed that ignorance or lack of knowledge of open access institutional repository seems to be one major issue to the development of Open Access Institutional Repository in Nigeria and it is only when this ignorance is tackled that any meaningful progress can be made. South Africa embarked on massive campaign to make the feat as the country in Africa with the highest number of institutional repositories (44) as evident in OpenDOAR (2020). Open access repository was introduced in South Africa in 2004 by the Electronic Information for Libraries (elFL) in collaboration with South African Site Licensing Initiatives (SASLI) a coalition of SA Libraries Consortia. Series of workshops were organised focussing on hands-on-training on open access software and other issues related to the establishment of open access such as copyright, metadata, policies, populating and marketing institutional repositories.

In Nigeria, similar workshop was held in Ahmadu Bello University Zaria, in 2008 by the elFL with the same issues discussed. A subsequent workshop was organised in 2009 by IT Section of Nigerian Library Association (NLA) at the University of Nigeria, Nsukka on open access repositories. Despite these initial interventions, it has been observed that lack of awareness remains a recurrent decimal in the issue of building institutional repositories. Most studies found out that lack of awareness and knowledge of the benefits of institutional repositories on the part of the researchers, scholars, lecturers, students hinder its development (Christian, 2008, Fasae, Larnyoh, Alanyo & Holmner, 2017 and Nwokedi & Nwokedi (2018). Few of the studies consider the awareness and knowledge of

institutional repositories by the librarians as the key issue in the building and maintaining IR. Lynch cited in Martin-Yeboah *et al*. (2018) rightly noted that for any institutional repository to be sustainable, its developmental process must engage key members of a campus community. Key members are librarians, information technologists, archivists and records managers, faculty, university administrators and policy makers. The content generators are lecturers, students, administrative staff; implementers are librarians, information technologists, archivists; and users are students, lecturers, researchers. Among the key players, the implementers are largely involved in marketing and promotion activities. Awareness of all the stakeholders is important but that of library staff is critical as it could lead to the establishment of institutional repositories. It is after institutional repositories have been established that awareness of users will come to play (Anenene *et al*., 2017).

Strategies for the Implementation of IRs

To create awareness and achieve the desired knowledge needed for the implementation of institutional repositories, the librarians should embark on massive training of library staff on the benefits and issues such as creating digital contents through digitisation, copyright and intellectual property rights management of institutional repositories. This can be achieved through organising seminars, in house training, workshops, roundtable discussions and conferences (Asamoah-Hassan, 2010).

Another, important issue to be dealt with is infrastructure provision. The librarians should ensure that there is adequate supply of power by considering alternative power supply and a robust Internet bandwidth provision (Ukwoma & Ngulube, 2019). Funds availability is another important issue to be considered. This is heavily tied to advocacy.

Advocacy is very critical in attracting funds and creating awareness for institutional repositories in Nigeria. Ivwighreghweta (2012) and Nwokedi and Nwokedi (2018) found that best ways to promote the development of open access institutional repositories in developing countries is through advocacy. Ezema and Okafor (2016) found that the major advocacy strategies were the use of institutions websites, face to face interaction with target groups, seminars and workshops. Anunobi and Ape (2018) also found that the promotional strategies employed were advocacy and infrastructural development. Ukwoma and Ngulube (2019) found that having IR policy is one of the means of implementing IRs. A well-articulated institutional repositories policy should be the content of the advocacy strategy. The policy statement should include: aims and benefits of institutional repositories to the institute, cost of software and hardware; cost and method of digitisation; staff training; robust Internet bandwidth; contents of the repositories and means of generating contents; copyrights and intellectual property rights management among others.

It is important to be strategically prepared before embarking on the implementation of institutional repositories to avoid some of the mistakes made by institutions who have implemented institutional repositories. Most institutions within and outside Nigeria have faced numerous challenges while embarking on institutional repositories implementation. Asamoah-Hassan (2010) highlighted challenges that have been overcome and those that are still being dealt with regarding the Kwame Nkrumah University of Science and Technology's IR, known as KNUSTSpace. The challenges included:

1. Sensitization of university management
2. Sensitization of library leadership

3. Educating faculty and researchers on the submission of content
4. Choosing software that will suit the needs of the university
5. Formulating policy to guide the operation of the IR
6. Registration with international indexing services and repository directories such as the
   OAI, the ROAR and the IAR to enable global searches
7. The sustainability of the IR in terms of funding and content

Other authors like Ivwighreghweta (2012), Fasae *et al*. (2017), Nwokedi and Nwokedi (2018) and Ukwoma and Ngulube (2019) attributed the challenges faced in implementing institutional repositories to insufficient funds, an unstable power supply, software problems, poor infrastructural facilities, low bandwidth, a lack of awareness of IRs and issues relating to copyright and intellectual property rights. Some of these challenges can be tackled if the government approves an intervention funds for research institutes as it is the case with government own universities that have access to Tertiary Education Trust Fund (TETFUND).

Methods

A descriptive survey design was adopted for this study. The area of study was Lagos State Nigeria where thirty (30) research librarians from four research institutes were selected for the study. Research data were obtained through the use of self-constructed questionnaire. The quantitative data obtained were analysed using simple percentages and presented in tables.

Results

Demographic Data

Table 1 Number of respondents

Institutions	Frequency	Percent
NIMR	7	23.3
FIIRO	7	23.3
NIALS	9	30.0
NIIA	7	23.3
Total	**30**	**100.0**

A total number of thirty (30) research librarians participated in the study. 30% of the respondents were from the Nigerian Institute of Advanced Legal Studies (NIALS) while 70% were from NIMR, FIIRO and NIIA.

Table 2: Qualifications of the respondents

Respondents	Frequency	Percent
PhD	4	13.3
MPhil	3	10.0
MLS/MLIS	18	60.0
BLS	5	16.7
Total	**30**	**100.0**

The highest number of the respondents (60%) possessed master degree in Library Science, 16.7% had bachelor of Library Science degree, while 13.3% and 10% were PhD and MPhil holders respectively.

Table 3: Availability of Irs

Availability of IR	Frequency	Percent
YES	14	46.7
NO	16	53.3
Total	**30**	**100.0**

53.3% of the respondent reported that their institutions do not have institutional repositories while 46.7% affirmed that their institutions have institutional repositories. The result from the interview with the Head of the libraries confirmed that none of the libraries have implemented institutional repositories even though some attempts have been made towards building digital libraries.

Table 4: Knowledge and Awareness of Irs

	Means of Awareness	Agree	Disagree
1	I heard about institutional repositories through conferences and workshops	11(36.7%)	19(63.3%)
2	I have presented papers on IRs	30(100%)	-
3	I have published research paper(s) on IRs	26(86.7%)	4(13.3%)
4	I have read a lot about IRs	11(36.7%)	19(63.3%)
5	I have visited IRs platforms	13(43.4%)	17(56.6%)
6	I have downloaded information materials from IRs	11(36.7%)	19(63.3%)
	Knowledge of Institutional Repository		
7	I understand the different open source software that run/or are used for creating IRs	11(36.6%)	19(63.3%)
8	An IR permanently archives my institution's research output	8(26.7%)	22(73.3%)
9	It will increase the visibility of my institution's research output	2(6.7%)	28(93.3%)
10	It will provide free access to my institution's research output	14(46.7%)	16(53.3%)
11	It will showcase research activities of my institution thereby justifying the public funds invested on it	5(16.7%)	25(83.3%)
12	It will enable my institution to contribute research content to the global community	2(6.7%)	28(93.3%)
13	It opens door for our research scholars to collaborate with global community	2(6.7%)	28(93.3%)
14	It will enable the library to be embedded in the scholarly communication activities of my institution	2(6.7%)	28(93.3%)

From the data above the respondents are relatively aware of open access institutional repositories. The highest means of awareness are through conference/workshop attendance, readings on IR and visiting IR sites. However, the respondents have never presented any paper on the issue of open access institutional repositories and about 80% have not published on IR. On the knowledge of the benefits of open access institutional repositories (items 7-14) to their research institutes, the responses are very positive.

Table 5: Strategies for Promoting Irs

	Strategies	**Agree**	**Disagree**
1	My library has a written proposal for the implementation of IR	21(70%)	9(30%)
2	We have organised round table discussion/workshops/seminars on implementing IR	18(60%)	12(40%)
3	We have embarked on digitisation of grey literature	15(50%)	15(50%)
4	My institution has a policy of submitting digital copy of research and technical reports	16(53.3%)	14(46.7%)
5	My library has created and distributed brochure to faculty/researchers on the importance of IRs	20(66.7%)	`10(33.3%)
6	We have published in the newsletter about the need to implement an IR	27(90%)	3(10%)
7	Our library staff are consistently trained on IR issues	25(83.3%)	5(16.7%)

The data on the strategies for promoting open access institutional repositories show that not much have been done to promote the development of open access institutional repositories. 70% affirmed that their library had no written proposal for the implementation of institutional repositories. About 90% consented to not have been published in the newsletter about the need to implement open access institutional repositories. On the issue of digitising grey literature, 50% agreed that they have embarked on digitising grey literature while 50% have not done any of such. Training staff for IR was at a very low key as about 80% of the respondents disagreed with the fact that staff were consistently trained on IR issues.

Table 6: Challenges Faced in Implementing Irs

	Challenges	**NO**	**YES**
1	Lack of awareness and knowledge of the benefits of IR among researchers and librarians	11(36.7%)	19(63.3%)
2	Poor electricity supply	6(20%)	24(80%)
3	Lack of support from my organisation	6(20%)	24(80%)
4	Lack of institutional policy on the development or building of IR	3(10%)	27(90%)
5	Inadequate ICT skills	6(20%)	24(80%)
6	Copyright issues	8(26.7%)	22(73.3%)
7	Software and hardware issues	10(33.3%)	20(66.7%)
8	Inadequate ICT infrastructure and facilities	11(36.7%)	19(63.3%)
9	Poor internet connectivity and insufficient bandwidth	6(20%)	24(80%)
1	Inadequate budget	2(6.7%)	28(93.3%)

The data reveal that items (1-10) above could pose great challenge to implementing institutional repositories in the research institutes with inadequate budget (93.4%) capable of posing the greatest challenge.

Discussion of Results

The results of this study revealed that no research institute in Nigeria has implemented institutional repositories. This is also evident from OpenDOAR (2020). This result corroborates the findings of Ivwighreghweta (2012) that the International Institute of Tropical Agriculture (IITA) embarked on digitisation project towards building an IR but could not go public due to some copyright issues. Anunobi and Ape (2018) also found out that majority of institutional repositories of Nigerian university libraries were yet to be listed in OpenDOAR.

Awareness and Knowledge of IRs

The essential ingredient in the implementation of institutional repositories is awareness of what institutional repositories are and knowledge of its architecture. It is obvious that the research librarians are not adequately aware of the issues of institutional repositories even though the study found that they are knowledgeable about the numerous benefits of institutional repositories. Most studies on IR identified lack of awareness as one of the critical challenges of implementing IRs (Ivwighreghweta, 2012, Fasae et al., 2017, Ifijeh, Adebayo, Izuagbe & Olawoyin, 2018 and Ukwoma & Ngulube, 2019).

Strategies for the Implementation of IRs

As regards strategies for promoting institutional repositories in the research institutes, the study found that most research libraries had no written proposal for the implementation of IR. A written proposal and an IR policy

to guide the implementation are very important. Ukwoma and Ngulube (2019) study identified the existence of an IR policy to serve as a guide to collection and submission of publications, continuity and sustainability of the IR project as one of the strategies employed to avoid most challenges faced in implementing institutional repositories. The study also identified lack of advocacy among the research institutes' librarians. It is obvious that librarians in the research institutes are yet to play leading roles for the adoption of IR. They are expected to drive the process for the implementation of IR in their institutes. This result painted an abysmal picture of disinterest and apathy on the part of research librarians. This study is in line with the finding of Ifijeh et al, (2018) that many Nigerian institutions, especially universities, do not have functional IRs because of the inability of their libraries to run them.

Challenges of Implementing IRs

The study identified a number of obstacles to the implementation of IR in the research institutes. Though the research institutes are yet to implement institutional repositories, they identified those challenges as capable of posing obstacle to the establishment of institutional repositories since they have encountered similar challenges in carrying out digital projects in their libraries. These challenges are similar to reports from other studies by Asamoah-Hassan (2010), Bashiru (2010), Ivwighreghweta (2012), Rahman and Mezbah-Ul-Islam (2014), Yang and Li (2015),Bossaller and Atiso (2015), Fasae et al, (2017), Ukwoma and Ngulube (2019) who found that lack of awareness, lack of infrastructure and supports from the organisations, lack of IR policy, inadequate technical skills, epileptic power supply, copyright issues among others hinder the development and use of IRs in institutions.

Conclusion

Open access institutional repositories offer numerous benefits to research intensive institutions. Among the benefits are archiving research data while providing free and unlimited access to research data globally. Specifically, it archives grey literature in digital format and allows open access to them both within and outside the institutions. For the research institutes to fulfil their mandates of communicating research data to policy makers and the public at large, there is need to implement open access technology. Non-implementation of institutional repositories by research institutes will continue to place Nigeria as a stranger in the digital market place; and research data including researchers from the nation will remain hidden from global research arena.

The major issue in the implementation of institutional repositories in the research institutes is the inability of the research librarians to take the lead in the implementation of institutional repositories. Majority of the libraries have not written proposals for the implementation of institutional repositories; neither have they created awareness among the stakeholders through newsletters and brochures. The implication is that the nation's content remains inaccessible to both policy makers and researchers in and outside the country.

Recommendations

1. Awareness and knowledge of the research librarians about the benefits and issues of implementing institutional repositories is very paramount. For the implementation of institutional repositories to be successful, research librarians who understand open access architecture are in the position to implement institutional repositories. Knowledge of copyright and intellectual property

rights management is very important. The librarians should understand licensing negotiations of copyrighted contents, must be computer literate and internet savvy. To be able to achieve the level of awareness and knowledge needed for successful implementation of institutional repositories, a coordinated training of library staff should be considered. In-house training and attendance to workshops and conferences where issues of open access are discussed, and exchange programmes are options for consideration. The librarians should explore and investigate issues about open access architecture and its implementation. This will sharpen their knowledge of institutional repositories and give them confidence to approach their management for implementation.

2. Written proposals to the managements of the organisations are needed. The managements of the institutions should be communicated through written proposals showing deep understanding about issues around implementing institutional repositories. The proposals should be robust enough to include choice and costs of software and hardware, internet bandwidth, alternative source of power supply, training of staff, digitisation and licensing agreements.

3. Extensive marketing and advocacy is needed. A written proposal to the managements should not be the end. Instead a follow up should be embarked upon. Libraries can organise round table discussions on the benefits of open access institutional repositories where stakeholders are in attendance. There is no doubt that proper understanding of the benefits of institutional repositories by the stakeholders will spur action towards building them.

4. Government should pay greater attention to research and development. An intervention fund is needed to support scholarly publishing. Government should extend the Tertiary Education Trust Fund (TETFUND) to research institutes. This will provide financial supports towards providing infrastructures and training for staff for the implementation of institutional repositories and also provide funds for ground breaking researches.

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