

Driving forces behind the management of Institutional Repositories: Qualitative evidences

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ABSTRACT

An Institutional repository (IR) is a contemporary paradigm of scholarly communication that operates on a open access initiative. IRs have become essential infrastructure for the global research community with the expectation that IRs will address the issues of visibility, and facilitate the rapid dissemination of knowledge in a sustainable manner. However, scholars show concern about these expectations due to some shortcomings in the management of repositories and digitization projects, especially in Africa. This study aims to gain a deeper understanding of how personnel involved in institutional repository at their respective institutions are managing the IR, and identify the driving forces behind the management of these IRs. It also attempts to explore the key challenges in the context of IR management, specifically in Nigeria. The study adopts a descriptive qualitative approach using a semi-structured interview guide as the main instrument for data collection, supported by content analysis and group discussions. Three research questions were constructed to guide the investigation: (a) How are IRs being managed in Nigeria? (b) What are the driving forces behind the management of IRs in Nigeria? An (c) What are the challenges in the management of IRs in Nigeria? Findings reveal that manager of IRs are heavily dependent on mediated depositing and digitization processes. Increasing visibility and ranking of the institution, need for preservation, and need for organization of intellectual output, were among the key drivers of IR management. While, plagiarism, piracy, absence of guiding policies, and inadequate internet connectivity were among the hinderances faced in the management of IRs. The results are imperatively useful for practitioners, especially those managing or aspiring to manage successful IRs in developing countries, particularly in Africa. The study recommends strategic development and enforcement of policies by the institutions, use of similarity checkers, massive awareness creation and staff training for the success of IR management in Nigeria.

Keywords: Institutional repositories; IR management; Scholarly communication; Open access; Nigerian universities.

INTRODUCTION

The formation of open access (OA) has furnished institutions with tremendous opportunities to easily showcase their research output to the global research community and has supplied scholars with an avenue to disseminate their research findings, mostly free of charge. OA is an initiative that entails providing peer-reviewed literature and other scholarly works online for free, permanent, and full access to anyone interested in

assessing it (Bashir, Mir and Sofi 2019). OA emerged as a result of collaborative efforts to curtail the barrier of access to knowledge imposed by commercial publishing industries. It facilitates dissemination, use and impact of research findings, enhances the capability of scholarly communication and alleviates restriction of access to knowledge due to financial, geographical, political or other constraints (Ghosh and Das 2007).

In order to accomplish the purpose of OA, there is a need for the establishment of successful archives of open access content which will ensure long-term stewardship and perpetual access to the content over time. This has given rise to the development of repositories across the world. Institutional Repositories (IRs) are publishing platforms that operate under the creative commons license of the green OA initiative. Lynch (2003) defines IR in a university as “*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*” (p.328). He stresses that this includes commitment to the stewardship of digital materials, including long-term preservation, as well as organization and access or distribution – or in other words the management of the IR. Over time repositories have evolved into archives of research materials that support self-archiving and mediated depositing (Nemati-Anaraki and Tavassoli-Farahi 2018). They are managed to disseminate and provide free access to scholarly materials across organizations and research institutions globally. Within the higher education institutions, the responsibility of managing an IR may be at a central independent unit, but more commonly the IRs are managed by the academic libraries. This advantageous position makes management of IRs a crucial task for librarians and information professionals. Henceforth, managing an IR requires a structured process that are designed not only for disseminating scholarly publications, but also for sustaining knowledge creation and dissemination in the global research community.

A few studies have examined the success factors for IRs (Lagzian, Abrizah and Wee 2015; Singeh, Abdullah and Kaur 2021). Despite the prediction that the implementation of IRs will resolve the issues of visibility and facilitate the rapid dissemination of knowledge from African countries, and further boost the citation and enhance the ranking of the universities, there are a number of issues that may hinder efficient management of IRs. Imo and Igbo (2015) assert that scholars show concern about the ability of IRs for effective dissemination of knowledge due to some shortcomings in the management of repositories and digitization projects in the African continent. To date much of the research has focused on either the content management (Ofoegbu, Asogwa and Ogbonna 2021; Ukwoma, Osadebe and Dim 2019), or management of open source platforms for the IRs (Adam and Kaur 2021; Ifijeh et al. 2020). However, there is little grounded investigation into what influences or drives aspect of IRs management that can assist librarians to manage the IRs in a sustainable manner. The widespread use of an IR is first dependent on the foundation of a well-managed IR. It is so far unclear as to what drives the management of IRs, especially within specific barriers or challenges faced by those managing IRs in Africa.

LITERATURE REVIEW

Institutional repositories can serve as a scholarly enterprise for the higher education institution, expanding and growing over time to service not only the local institution community, but also the stakeholders within the larger community. Nevertheless, Lynch (2003) had cautioned that IRs can *fail over time*, mainly because of : (i) lack of funding, (ii) incompetent management and probably (iii) technical issues. Researchers have over the

years, given emphasis on the implementation status, development, experience and challenges, and identification of critical success factors. Greene (2010) had observed that very few studies had focussed on investigating activities involved in the management of IRs, or even proposed a standard IR management approach. Although Nabe (2012) had highlighted that well managed institutional repositories could assist the institution in marketing its research and staff creativity, the trend in IR management studies did not see an impactful increase. Asadi et al. (2019) revealed from their review of 115 studies on IRs in higher learning institution, that most of the research focused on the "deployment, implementation, and adoption" and "benefits and challenges" of institutional repositories. The importance of management to the success of IRs cannot be disregarded and it is notable that Priyadarshani (2019) recognized the emergence of management of IRs as a growing research topic across two decades (2002-2017).

Several studies have investigated and identified essential activities that form the characterization of IR management. Initially Gibbons (2004) indicated submission of materials, application of metadata, control of access, support for discovery, distribution, and preservation of the content as core management issues. While Gonzalez and Porcel (2007) expanded management to include selection of IR software, acquisition of content, setting up quality control mechanisms, copyright management, use of metadata standard, integrating different approaches for enhancing visibility and securing support from the management of the institution. Their views were based on management activities as practised by the Alfa Network Babel Library. An investigation by Greene (2010) into the management of the IR at a single library was limited to the planning phase of the IR. The investigation emphasizes that applying a standard methodology during the planning process can have a positive impact on the overall IR project management. With the intention of proposing a framework for IR development, Cambell-Meier (2011) examined best practices at several repositories using a case study method. The study recommended early involvement of stakeholders as an impetus for successful IR development. Subsequently, Sawant (2012) investigated the issues around the management of developed IRs in India. Though he identified the key players, such as policy development, funding and copyright issues, there was no discussion on what was the push factor in the management of these IRs that were considered well developed.

Armstrong (2014) explored IR management models by extracting the ideology behind IR services to support dissemination of scholarship, promote creation of new knowledge and help recognize the impact of the universities. The exploration included service frameworks, a mediated deposit model, and mass customization without any specific recommendation for IR management. Darmayanti (2019) attempted to investigate IR management from the perspective of policies in a state Islamic University of North Sumatra. The study revealed that the University did not have a written policy on IR management. While contents of the repository are produced by campus academic civitas, the university does not digitize its resources, rather it only accepts softcopies for deposit. Thus, it has in place standard procedures for uploading the content into the repository. Similarly, Nurdin and Mukhlis (2019) explored the management of IRs in three universities in Indonesia from the perspective of production, processing, promotion, and distribution of scholarly information. Their study illustrated the significance of IR as an infrastructure for scholarly communication.

In Nigeria, Nkiko, Bolu and Michael-Onuoha (2014) identified scanning, bookmarking, rasterizing, categorizing and classification, PDF conversion, and uploading as the main processes involved in the management of an IR. They further indicated that the major

management routine activities focus on digitization of the existing publications and rasterizing the records.. Similarly, Imo and Igbo (2015) studied the effects of an institutional policy on the management of IRs in Nigerian universities using the essential component outlined by McGovern (2007). These include organizational infrastructure, technical infrastructure, and requisite resources. They conclude that the problem in the management of IRs in Nigeria rests on the lack of guiding policies. More recently, Ukwoma, Osadebe and Dim (2019) investigated the management of IRs in 15 Nigerian universities that have IRs registered with the Directory of Open Access Repositories (OpenDOAR). They used a descriptive survey to investigate the content of these IRs using. Their findings revealed that, though adequate support and motivation were not provided by some institutions, both mediated submission and self-archiving were adopted for content recruitment.

In a study of repository management as an emerging profession in UK, Wickham (2020) acknowledged the paradigm shift in the roles of librarians from facilitators of access to knowledge, to disseminators of intellectual products of the universities. The study resulted in the identification of the roles and skills required for repository managers in the context of open access. However, this alone does not help us understand how these roles and responsibilities can be put into action that will contribute to successful execution of these roles. Shajitha and Abdul Majeed (2020) used a quantitative approach to evaluate IRs in India based on the feedback from 23 IR managers. They identified 64 indicators for five main aspects comprising of policy and procedures, technology, content and contributors, promotion and assessment and personnel. Though their findings resulted in identifying promotion and assessment activities as key engagement areas of IRs, there was no indication of what drives the IR managers towards successful managerial activities.

As literature points towards IR management as a key influence which is in need of further investigation, this study adopts a qualitative approach to thoroughly investigate the activities involved in the management of IRs in Nigeria to understand what drives or motivates management of IRs in Nigeria. The study was systematically structured to extract information from experienced practitioners and analyze the actual practice using a comparative analysis of empirical evidence. Likewise, the study adopted a structured approach for data analysis and presentation of the result. The findings of this study will be significant towards the improvement of IR management that will subsequently contribute to successful IR implementation in Nigeria.

SITUATIONAL ANALYSIS

This study adopted a descriptive qualitative approach to understand and identify the driving forces behind the management of IRs in research institutions across four geopolitical zones of Nigeria, namely (i) University of Jos (UniJos) from North Central, (ii) Ahmadu Bello University, Zaria (ABU) from North West, (iii) University of Nigeria Nsukka (UUN) from South East, and (iv) University of Ibadan (UI) from South West of Nigeria. It was imperative to select universities with established IRs so that rich data on the management of these IRs can be obtained. Evidences from previous studies were used for this purpose. The universities were selected for the following reasons:

- a) These universities are among the first-generation, prestigious, and highly ranked universities in Nigeria (Sheeja, Mathew and Cherukodan 2018).
- b) These universities are the pioneers of IR practices in Nigeria (Aliyu and Mohammed 2013).

- c) These universities exhibit a strong commitment toward the management of IRs and maintain a keen interest in providing access to scholarly output produced by scholars in their respective communities (Okeji 2019).
- d) These universities maintained functioning IRs with relatively reasonable amount of content (Adam and Kaur 2019; Oguche 2018; OPENDOAR 2019).

(a) University of Jos (UniJos)

As the first research institution to start the practice of IRs in Nigeria, the University of Jos was initially established as a branch campus of the University of Ibadan in 1971 and became an independent institution through an Act of Parliament in 1975. The university comprises of 12 faculties, 74 departments and 18 centers and directories (UniJos 2020).

The Institutional Repository was installed at the University of Jos using Dspace software in June 2009. Following the creation of the repository, the university became one of the highest-ranked universities on Webometric Ranking in Africa. In 2010, the University of Jos was ranked 4th in Nigeria and 74th in Africa respectively. While in 2012, it ranked number 669 out of the 1173 repositories in the world, being the only university that represented Nigeria. The success of IRs in Unijos was due to the responsible leadership exhibited in creating cordial relationships between librarians and IT staff of the university (Akintunde 2009; Nwadiutolgwé 2013).

(b) Ahmadu Bello University (ABU), Zaria

This university was founded by the federal government on October 4th, 1962. The University maintains two campuses; Samaru as the main campus and Congo as the branch campus in Zaria. Currently, the university comprises 16 faculties, 99 departments, 16 research institutes and 3 colleges of agriculture (Ahmadu Bello University 2020).

Digitization process started officially in Kashim Ibrahim Library (KIL), ABU 2005. Initially, the library's local area network (LAN) and Database of African Thesis and Dissertation (DATAD) were used as a platform for sharing the digitized resources. In 2009, the Library Policy was completely reviewed to include an ICT division. A committee was able to successfully install a repository using DSpace on the Microsoft Windows operating system in 2010 (Mohammed 2012). In 2013, the library established an effective collaboration with both local and international organizations, such as the Nigerian Centre of Expertise for Greenstone Digital Collections, Carnegie Foundation, and became among the first five institutions from Nigeria to register with OpenDOAR (Aliyu and Mohammed 2013; Musa, Shittu and Abdulkadir 2014).

(c) University of Ibadan

This is the first university in Nigeria, established in 1948 as the College of the University of London and became autonomous in 1962. The University has 12 faculties, 6 institutes, and 6 colleges. Kenneth Dike Library (KDL) is also considered as the first university library founded along with the establishment of the University of Ibadan in 1948 (University of Ibadan 2020).

KDL started a library automation project in order to ensure that information resources produced by scholars are made available and accessible within and outside the university. Collaboration with Mac Arthur Foundation has brought significant transformation in the library services. KDL was also among the first five institutions to implement IR in Nigeria. The repository was installed using DSpace (Ilesanmi 2013; Musa, Shittu and Abdulkadir 2014).

(d) University of Nigeria, Nsukka (UNN)

University of Nigeria is the first Nigerian indigenous university established in 1960. The university comprises 17 faculties, 12 institutes, and 25 centers and has three campuses; Nsukka, Enugu, and Ituku-Ozalla campuses - all located in Enugu State, Nigeria (UNN 2020). Being the second oldest university library in Nigeria, the Nnamdi Azikiwe Library of UNN launched a digitization project in 2008 to ensure sustainable access to local resources produced by faculty members, researchers, and students through the repository. The project began with the digitization of undergraduate research projects, postgraduate theses, and dissertations and other publications generated by the university. As a center for digitization and repository management, advanced hardware and software facilities were adequately provided for the project, librarians and technical staff were also recruited to specifically handle the digitization process and other technical aspects of the repository management (Ezeani and Ezema 2011). While the Nnamdi Azikiwe Library was approved as a depository library by the Publication Board of the United Nations 1965, it was also among the first five institutions to register with OpenDOAR and maintain a functioning repository with the largest number of resources in the country (Ejikeme and Ezema 2019; Musa, Shittu, and Abdulkadir 2014; Oguche 2018).

The institutional repositories of all four universities were examined using both the OpenDOAR database and the IR platforms of the participating institutions. The distribution of the resources by type as extracted from the respective platforms on 1st March 2020 is as presented in Table 1.

Table 1: Number of Scholarly Outputs by Institutional Repositories

Repository Platforms	Link	TD	JA	CPP	Books	IL	Others	Authors
ABU Space	http://kubanni.abu.edu.ng/jspui/	9,858	286	70	17	27	27	9,872
UniJos IR	https://irepos.unijos.edu.ng/jspui/	134	2,490	-	-	36	6	6,447
UI Space	http://ir.library.ui.edu.ng/	211	4,951	-	10	129	6	4,275
UNN Space	http://www.repository.unn.edu.ng	5,946	1,853	3	1	47	241	8,906

Key TD=Thesis and Dissertation; JA= Journal Articles; CPP= Conference Proceeding and Papers; B= Books; IL= Inaugural Lectures
Date accessed:1st March 2020.

Investigation of the IR platforms of the participating repositories revealed that theses and dissertations, journal articles, conference proceeding and papers, books and inaugural lectures formed the major types of the information resources deposited in Nigerian IRs. While, an analysis of IR records on OpenDOAR platform showed that there is no record of metadata policy, data policy, content policy, submission policy or preservation policy supplied by the participating institutions on the platform. Similarly, only Uni Jos and UNN developed OAI-PMH URL. Also, UNN and ABU have dual records of registered IRs with different date (2010 /2015, & 2013 /2015) and metadata count (23367 / 6464, & 8449 / 7970). Table 2 presents the repository information of the respective IRs.

Table 2: Repository Information of the Institutional Repositories on the OpenDOAR Platform

Fields and Items	Uni Jos	UNN	ABU	UI
Repository Name	UniJOS IR	UNN IR	ABU IR / OpenAIR@ABU	UI Repository
Repository Type	Institutional	Institutional	Institutional	Institutional
Description	Provided	Provided	Provided	Provided
Repository URL	http://irepos.unijos.edu.ng/jspui	http://www.repository.unn.edu.ng	http://kubanni.abu.edu.ng/jspui/	http://ir.library.ui.edu.ng/
OAI-PMH URL	http://www.repository.unn.edu.ng/oai	http://www.repository.unn.edu.ng/oai	Not available	Not available
Software Name	DSpace	DSpace	DSpace	DSpace
Languages	English	English	English	English
Content Types	Diverse	Diverse	Diverse	Diverse
Subjects	Multidisciplinary	Multidisciplinary	Multidisciplinary	Multidisciplinary
Record Count	1837	23367 / 6464	8449 / 7970	Not available
Organization	University	University	University	University
Organization Name	University of Jos	University of Nigeria Nsukka	Ahmadu Bello University	University of Ibadan
Organization URL	http://www.unijos.edu.ng/	http://www.unn.edu.ng/	http://www.abu.edu.ng/	http://ui.edu.ng
Identifiers	https://ror.org/009kx9832	https://ror.org/01sn1yx84	Not available	https://ror.org/03wx2rr30
Country	Nigeria	Nigeria	Nigeria	Nigeria
Location	9.9503,8.8894	6.9352,7.3608	11.0819,7.716	7.44496,3.89919
Metadata Policy	Not available	Not available	Not available	Not available
Data Policy	Not available	Not available	Not available	Not available
Content Policy	Not available	Not available	Not available	Not available
Submission Policy	Not available	Not available	Not available	Not available
Preservation Policy	Not available	Not available	Not available	Not available
System Metadata	-	-	-	-
Date Created	2009	2010 /2015	2013 /2015	2019

Source and date of access:

https://v2.sherpa.ac.uk/view/repository_by_country/Nigeria.html (9th May 2020: 1:20PM)

OBJECTIVE AND METHODS

The main aim of this study is to have a deeper understanding of what are the driving forces relating to IR management within the context of the challenges faced by IR managers in Nigeria. In this context, the driving forces refers to conditions which provides impulse or motivation to those managing an IR. These driving forces are identified via an investigation of the management practices of those directly involved in managing the IRs at their respective institutions. The following research questions were framed to guide the investigation:

- a) How are institutional repositories being managed in Nigeria?
- b) What are the driving forces in the management of IRs in Nigeria?
- c) What are the challenges faced by IR management in Nigeria?

A semi-structured interview was used as the main instrument for data collection, supported by content analysis and group discussions. Evidence of IR management, data on operational procedures and IR practices were obtained and corroborated with the interviews. The Interview Protocol is as in the Appendix.

The data was collected from eleven (11) experienced staff, comprising librarians and IT personnel. These two groups of people were considered as those actively involved in the management of IRs at their respective institutions. Purposive sampling technique was used in selecting the participants of this study from each of the four IRs at the participating universities, namely University of Jos (UniJos), Ahmadu Bello University, Zaria (ABU), University of Nigeria Nsukka (UUN) and University of Ibadan. Fair representation was ensured by identifying librarians and repository managers working at IR units across the four universities. The criteria for the selection included long-term working experience at IRs unit, publications on IRs and scholarly communication, and having postgraduate qualifications. The reason behind the purposive selection of the participants is because they have the practical experience and professional expertise on IR practices, which include management of IRs. In other words, they are the right candidates to provide the researchers with rich empirical information that will enable the researcher to understand and identify management activities, as well as to explore the actual challenges in the IR practices. Table 3 depicts the demographic details of the participants. The participants were given codes as follows: P1, P2, P3, P4, P5, P6, P7, P8, P9, P10 and P11. To ensure confidentiality, the universities were not identifiable in the participant code. Position refers to the official employment status of the staff. Among the eleven, seven participants, P1, P2, P4, P7, P8, P9 and P11 are also researchers in the area of IR.

Table 3: Demographic Information of Participants

Participant Code	Position	Gender	Qualification	Library Experience (years)
P1	Librarian	Male	PhD	14
P2	Repository Manager	Male	MLS	8
P3	System Administrator	Male	MSC	12
P4	Librarian	Male	PhD	46
P5	Repository Manager	Male	MLS	8
P6	Repository Librarian	Male	PhD	14
P7	Librarian	Male	PhD	35
P8	Repository Manager	Male	PhD	16
P9	Librarian	Male	PhD	20
P10	System Administrator	Female	MSC	10
P11	Repository Manager	Female	PhD	14

The interview transcription, conducted using word processor, produced 28 pages and 16,172 transcribed words. The words were thoroughly checked, systematically organized into related themes for the three research questions. For the management of IRs, 3 main themes (planning, execution and administration [Figure 1]) and 14 sub-themes were identified. Whereas, six themes (Figure 2) evolved from the data indicating drivers for IR, while twelve distinct challenges (Figure 3) emerged from the responses of the participants.

FINDINGS

The findings of the study are presented according to the three research questions. The management of the repositories is presented and discussed in the three distinct management phases : planning, execution and administration (Figure 1). Subsequently, sub-themes were presented as they emerged from the responses to ascertain the driving forces behind the IRs management practices. The findings are also reported the challenges faced by the personnel involved in the management of IRs. The findings were illustrated by a summarized graphical presentation for ease of understanding and as a visual guide.

Management of Institutional Repositories (IRs) in Nigeria

In seeking to investigate the driving forces in the management of IRs, it is useful to first identify and understand the key processes that play significant roles in managing an IR. This gives an insight into the dynamism of IR management, the result of which provide very important information about drivers or motivations behind the management of IRs in Nigeria.

The result of the analysis shows that management of IRs in Nigeria include a set of activities and processes which can be categorized into three main phases: the planning, execution and administration phase.

Planning Phase

Though a repository is normally setup based on the scope and objectives of the university, planning is essential for the successful implementation and management of an IR. Planning mainly involves identification of financial implications, repository management team, ICT and infrastructural facilities, policies and guidelines, flows of activities and supervision techniques (Oak and Patii 2015).

Assigning tasks and responsibilities and follow up with related training for skills and competencies seem to be essential in the early stages of planning. IR planning and management activities take place in the library complex and are supervised by the university librarian. Planning starts with initial request for setting up a committee under the advice of the Vice-Chancellor or University Librarian (Chief). According to P2 : *“a committee was set up to identify the requirements, cost implications and come up with modality on how to establish institutional repository”* [P2].

The committee comprises of librarians and ICT staff, who will be responsible for identifying ICT infrastructure, financial, personnel and other requirements as well as developing modalities for implementation and management of the repository. Participant informed that *“management team comprises of librarians, IT and support staff. The librarian handles the content submission and editing... the IT staff help with the technical aspect of the work. The Librarian is responsible for the content management while the IT staff are responsible for software platform and other technical aspects of the project* [P11].

Following the approval from the management of the university, a committee is constituted within the library. The committee formulates recommendations for types of computers and other essential

IT facilities for digitization and repository management. Dspace is the endorsed repository system software. Subsequently, a unit responsible for the management of the repository is established. The unit normally comprises librarians, IT and other supporting staff as the repository management team. At the same time, tasks are shared among the team members. Librarians oversee the managing of repository contents, while IT staff are responsible for system, network and other technical issues.

Before the establishment, those that were identified to be responsible for managing the repository were trained locally and internationally for them to be able to run the repository. ...We were able to draft a policy which mandates the library to handle deposit of all research in the university, but that policy has no wider acceptability because the university has not made strong statement that will empower the library to go ahead with that [P1].

Before the installation, the library conducts a training or sends the repository management team for capacity building on IR management, both local and at times international training. In most cases, the training is restricted to only the repository management team and does not seem to be continuous. Finally, the planning ends with a draft of recommendation for policies for further development and enforcement by the university.

It is worthy of notice that, faculty members and students were neither involved at the planning stage nor they were adequately consulted for their demands in terms of scholarly communication services. It is of concern that in one of the universities, the need for a 'strong statement' from the university management was seen as an impediment to the success of the IRs.

Execution Phase

This phase includes a series of activities and processes for IRs management in Nigeria. The management activities emerging from the responses of the participants include: selection, installation and configuration of the platform; identification of repository contents and recruitment strategies. The processes explored encompass digitization, depositing, editing, approval, back up and preservation of the content as well as registration with OpenDOAR.

Interviews revealed that most of the universities in Nigeria choose to install Dspace software because of its vast popularity, simple procedures, and international standard. However, installation of the software has never been easy in many universities in Nigeria. In fact, universities hire experts to install, configure and train selected staff how to install and manage the platform. After the training, the staff subsequently take over the management of the platform.

On the other hand, the majority of materials selected for deposit into the repository are intellectual output produced by scholars within the universities and special indigenous resources.

"We started with upload of master's theses and Ph.D. dissertations. Then other materials such as staff paper, conference papers, committee papers, special Africana materials... we scanned a lot of these resources. We opened an email and asked the staff of the university to send their papers there.... As for theses and dissertations, the university has a policy that a copy must be submitted to the library... we also go to PG school and collected a copy of those that are not in the library" [P10].

It should be noted that, digitization is an integral part of IR practice, especially in Nigeria. Although most of the recently produced scholarly works are born-digital, there is still a huge number of information resources that only exist in physical form. The digitization of these print materials is a tedious process borne by the librarians. As the deposit process can be through mediated depositing or self-archiving, the universities in this study adopted mediated depositing for uploading the content into the repository. In other words, librarians are the only stakeholders that were given the privilege to upload the content of the repositories, except for at one university.

Additionally, content editing and approval are reported among the top tasks in the management of IRs. Applying relevant metadata standard facilitates the sharing, access, and use of the contents.

"We collect publication from our faculty members in-form of hard or soft copies. If they are hard copies, we digitize... then we convert them to PDF and upload them on the repository. Before that, the item is edited by editor to confirm that the metadata are properly entered, if they are not properly entered he can do the editing before granting final approval to go online, so that any other person can be able to access it, but if he cannot edit he will return it to the person who did the upload and call the personal attention in order to act on it [P5].

Therefore, it is very important to effectively edit the uploaded contents and ensure accuracy of the metadata before making research available for online access. Editing and approving of the contents takes place virtually within the IR system and is applicable in both self-archiving and mediated depositing situations.

We back of the data (data backup) using the external hard drive and backup the users using the complete server (system backup). In other words, we use an external hard drive to back up the content from time to time and a complete clone of the server to back system, software, and settings. So we back up software, users, setting and the contents [P3].

Finally, registration of the IR in OpenDOAR was among one of the management activities reported by the participants. The registration process requires detailed information and some element of policies related to the materials to be shared in the directory. Table 2 depicts the fields to be included as specified by OpenDOAR. The directory provides eight fields and under each field there are number of items that should be made available through the user interface.

Administration Phase

The administration phase explores managerial support for execution, promotion, and collaboration for IR management in Nigeria. Administration of IRs in Nigeria is run fully by the library and the support originates directly from the university management, local and international organizations or agencies. Participants acknowledge adequate managerial support from the university's management committee. The support come in forms of payment of monthly salary for the repository management team, provision of funds for daily maintenance and establishment of directives for smooth compliance by scholars. While some universities make use of special forums to promote and sensitize scholars on the use and benefits of IRs, others organize seminars and workshops. However, a participant reported having no special arrangement for sensitization of scholars on IRs in his university.

Sustainable management of IRs requires partnership and internal collaboration among the stakeholders and external collaboration with the information industry (Chowdhury 2014; Eschenfelder et al. 2019). This study found that, the IRs were initially established and managed through collaboration among universities, international organization and agencies. However, over time the management of the IRs became the sole responsibility of the respective university. The collaborations were in form of training, resource sharing and provision of facilities for the IR management. Participants of this study (P1 and P4) confirmed having collaboration with MacArthur, West and Central African Research Education Network (WCAREN), and Association of African University (AAU) for training purposes. Figure 1 depicts the main phases of the management of IRs in the four universities.

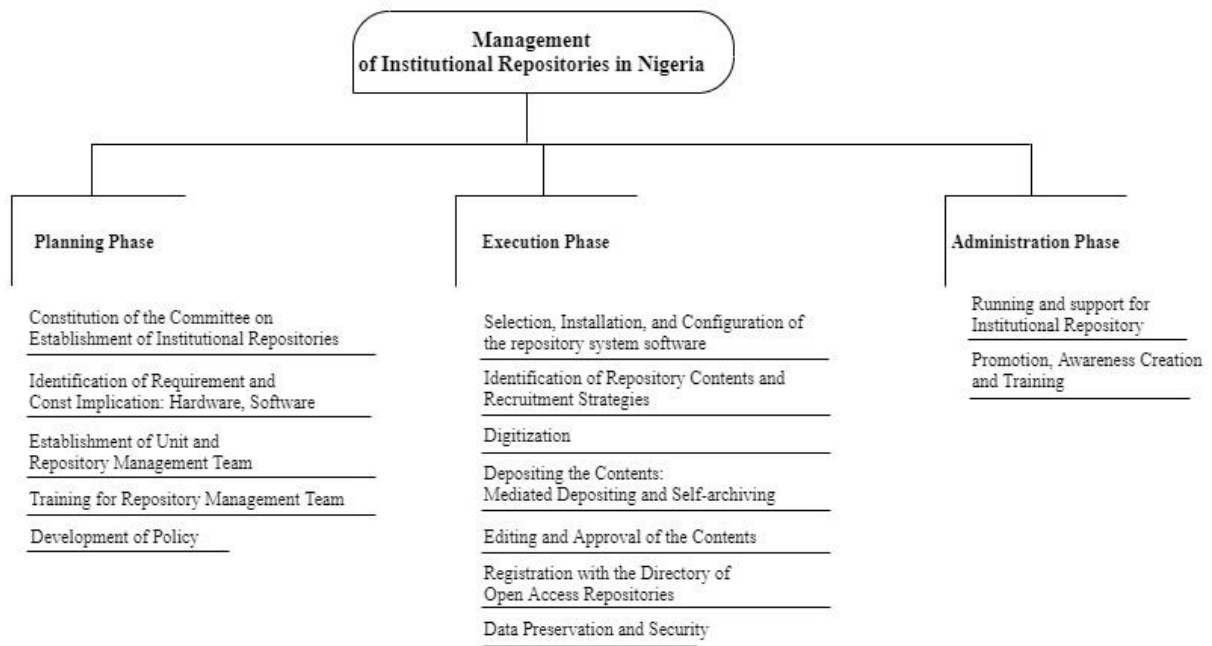


Figure 1: The Planning, Execution and Administration Phases of IR Management

Drivers for the Management of Institutional Repositories (IRs) in Nigeria

The management of IRs has been a fundamental requisite for modern scholarly communication. Institutions and libraries are dedicating human capital, infrastructure, and funds for managing sustainable repositories globally. Therefore, it very necessary to identify the driving force behind the management of IRs. Identifying drivers will assist in forming sustainable management, shaping the services, and addressing future demands of the practice. Management of IRs refers to procedures and activities involved from the planning, implementation, and routine administration for handling a repository. During the interview, the researcher solicited responses to showcase what forms the push factor for the management of IRs in Nigerian universities. As the discussions on the management phases were being conducted, several pertinent drivers were revealed.

Making scholarly output available and accessible

Institutional repositories were established to facilitate distribution and provide democratic access to knowledge. There was concern among the researchers that local and indigenous journals were being published in Africa, particularly, Nigeria, but most of these research outputs were neither shared nor a number of these journals were indexed or made available for online access (Abbas 2016). Therefore, scholars believe that IRs can streamline the scholarly contribution of African institutions and enhance their global visibility (Onwubiko 2020). As for the librarians, their expertise and role in the dissemination of information materials became a motivator for ensuring local scholarly publications are made available and accessible to the global research community. For this reason, participants indicated that they were doing everything possible to ensure scholarly output produced by their institution were made available to the global community.

In order to make sure the research output is visible and accessible, the university librarian decided to directly supervise everything that is happening in that unit, to make sure that they are neither lacking nor lagging behind [P6].

The driver behind managing IRs in our University is to make available and accessible research output of scholars that are staff, researchers, and students, also, to motivate them to make contributions to knowledge [P4].

Storage, and preservation of institutional scholarly output

Sustainable management of IRs depends heavily on the preservation of the contents (Rieger 2012). Realization of the need for storage and preservation of scholarly output by the librarians was among the most influential drivers for the management of IRs in Nigeria. Although most of the universities declared having no specific strategy or policy implemented regarding preservation, the digitization, regular backup, data conversion to PDF format, and databases such as Dspace were being used for preservation purposes. While essential infrastructure was implemented for the storage of scholarly output to ensure seamless delivery of repository services. The librarians focused their emphases on the preservation of information produced by scholars in their respective universities.

To us, IR is a means for storing and preserving the intellectual output produced by faculty members through the digitization process. You know if you digitized your work and stored in a database like IRs is going to stay for a very long time and it does not get deteriorated [P5].

As a result of the global trend in open access. We create the repository in order to have a central database that hosts our students' thesis and dissertation, and other research works. The impetus for the management of the repository database is to store the scholarly output of the institution [P3].

Creating global awareness of research conducted by the institution

Many scholars believe that credible research is continuously being conducted by Nigerian universities. However, the majority of these researches were not exposed by the world, simply because the universities were not able to share or index these for online access (Abbas 2016). Perhaps the findings of such research could have a significant contribution to the development of knowledge if it was widely open to the global research community. Institutional repositories have the potential ability for disseminating African scholarly output to other parts of the world and making the global community aware of the availability of such intellectual products (Bangani 2018). As such, librarians were moved to create a global awareness of the available research being conducted at their various universities through the management of IRs. According to the participants:

Much research is being produced here in our universities, but the world is not aware of such products, this is why we were enthused by the management of IRs so that other part of the world could be able to see what is conducted as a research from our universities [P7].

Making the university visible and the general public aware of the research being conducted and the output of this research has been always our purpose at the initial stage before the establishment and source of encouragement after the successful implementation, I mean during daily activities for the management of the project [P1].

Increasing visibility and ranking of the institution

Institutions were inspired to obtain a strategic position in the regional and global ranking. While IRs were being used to boost visibility, enhance the citation and impact, and subsequently increase the ranking of the institutions (Onwubiko 2020). Likewise, despite numerous challenges, scholars uphold that managing IRs is achieving its desired goals for increasing the ranking of institutions in Africa (Bangani 2018). These assertions have seriously engrossed the mindset of librarians and encourage institutions to dedicate special infrastructure for the management of IRs in Nigeria. Participants identified increasing visibility and ranking as a central drive for the management of IRs.

Nowadays, you will hear that Nigerian universities ranked lower than expected. It does not mean that we don't have sound scholars, we do have a lot of intellectual output that the outside world cannot lay its hands on [P2].

We embarked on IR project because is support and enhancement invisibility, ranking and elevate staff [P10].

Promoting scholarly output of the institution

Collection development is the core to the existence of the library. As such, building a collection and continuously expanding it to contribute to the intellectual growth of the organization is deemed important by the librarians. Several of the researchers too felt that the library's role is to promote the intellectual outputs of the researchers by making it visible and accessible to all. Institutional repository is an online platform used for enhancing visibility and providing wider access to the intellectual output of the institution. The intellectual outputs of many institutions in Africa need to be promoted so that it could be visible and have some impact on the global community. Thus, IRs are being managed for this purpose in Nigeria.

One of the drives is to showcase to the world the intellectual output of the university...and to sell out our members of staff I mean faculty members and the work they are doing [P5].

What prompted the establishment of IR is the need to make sure whatever that is produced by researchers is made available so that other part of the world could be able to see what is conducted as a research from our university [P9].

Promoting and elevating the faculty members

Faculty members and research students are the major contributors of IRs content. Their contribution is highly associated with the impetus they received. It is observed that the more faculty members are promoted by the practice, the more they are encouraged to contribute. Scholars similarly observed that most African scholars are invisible online (Ukwoma, Osadebe and Dim 2019). They were also not recognised because their works were not made available. Hence, librarians urged that these scholars should be visible, and their works should be made available through IRs. The drive is to promote them so that they could be easily persuaded to make contributions. Participants said in plain English:

We regard not promoting our scholars, that is why as a critical for the management of IRs, we are putting efforts to make their publications visible online [P8]

A scholar is an authority in his area, the IR can make his works visible globally [P6].

In summary, librarians in Nigeria consider IRs as an opportunity to create an avenue for sharing and storing their locally produced scholarly works, promote their scholars, and achieve global visibility. Issues surrounding the above-mentioned themes are the driving forces behind the management of IRs in Nigeria. The drivers mainly include making scholarly output available and accessible to the global research community, promoting intellectual output of the institutions, increasing visibility, and ranking of the institutions, creating global awareness of the research conducted by the institutions, elevating and motivating faculty members to make contributions to knowledge, storage, and preservation of the intellectual output of the institution. Figure 2 outlines the drivers for the management of IRs.

Challenges of the Management of Institutional Repositories

Even though IRs have been successful to some extent in Nigeria (Oguche 2018), the practice is still suffering from numerous challenges. Identifying these challenges will go a long way in ensuring development of solutions to mitigate these challenges and contribute to successful management of IRs. The result of the analysis of the responses from the participants revealed the occurrence of the following issues faced by IRs in Nigeria.

Firstly, electricity is a serious problem that severely hinders the management of IRs in Nigeria. Literature continuously reports the instability in the supply of electricity for decades. The problem is still very much in existence in the country (Ejikeme and Ezema 2019) even in this 21st century. The main issue arising from low electricity supply is the disruptions to the smooth running of IRs and ICT projects in the library. Efforts to digitize and provide access are jeopardised due to lack of electricity. An unstable IR system is certainly not a push factor for successful IR management.

As a result of the power failure that we experience frequently, it was unanimously agreed that the server should be move from the library to the university data center, where there are a lot of cooling systems and 24 hours power supply even in case of a power outage as they have standby generators, inverters, and other facilities that take an institution to hold a server. The issue of power ... is seriously affecting our work... we have stop whatever we are doing [P2].

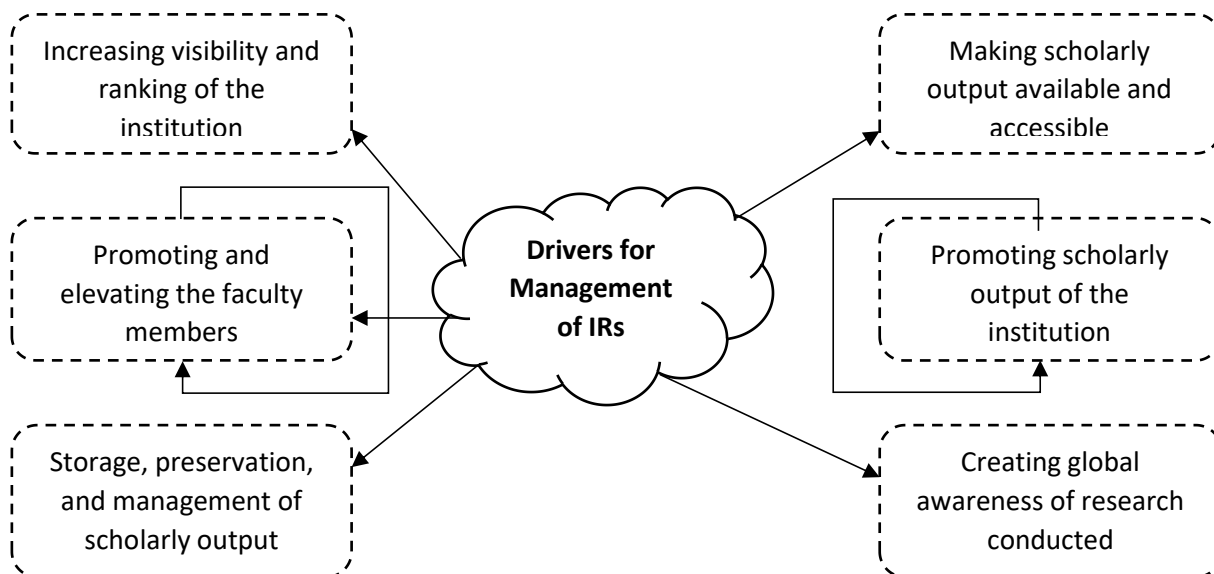


Figure 2: Drivers for the Management of IRs

Secondly, adequate skills, dedicated staff, and continuous training were required for the management of IRs, as also cautioned by Wesolek et al. (2017). Participants too revealed that IT skills and scholarly communication competencies are among the global challenge of IRs practice and the lack of these are prevalent in Nigerian universities.

Although it has to do with funding, the issue of training is also challenging. I was opportune to be trained in USA but since then I do not think anybody in the university attends any kind of these training again. IT is dynamic, things are changing, and we are still managing with little skills we acquired almost ten years back [P1].

Even though IRs are open access and most of the universities use open-source software that requires not much funding for the installation, there is always a need of funds for providing adequate facilities, training, and daily maintenance of the repository (Erway 2012; Kodua-Ntim and Fombad 2020). In other words, funds are essential for sustainable management of IRs. Although the participants were confident that there are adequate funds available to the libraries, the challenge remains in identification of the mode of access to the funds and assigning special allocation for IRs management by the library managers. The participants informed about a substantive allocation of the budget was needed just to ensure a strong and stable internet connection. Funding reliable and sustainable internet connectivity will no doubt ensure sustainable management of IRs over time (Jain 2011). However, establishing a strong internet connection remains a challenge in Africa and some parts of the world (Siyao et al. 2017). Good management of IRs is seriously threatened by a weak and flawed internet connection in Nigeria.

We still have the issue of internet access in our country. Sometimes we have internet downtime. Once there is internet downtime we can no longer work. The process of logging and uploading document become very tedious, this affects the speed of the work [P9].

Another pertinent issue revealed by the participants was on copyright. Copyright has been a stumbling block to the practice of IRs for decades. This issue has deprived many scholars from depositing their published papers into the repository and restricted the full-text open access service of the repository (Siyao et al. 2017). Participant [P2] revealed that people started to misuse the opportunity provided by open access service through IRs by committing commercial and intellectual offenses in Nigeria: *“There are some people scouting around, since our repository is open access, they try to download our content and sell it to other people. whose will subsequently go and present it in other universities. So, we have both plagiarism and piracy at a time”* [P2].

Cases were reported where people intruded into the repository, downloaded the full thesis, and used it for commercial gain or presented it as an academic exercise. Though these cases may be isolated, it causes mistrust among the users, both content providers and end users. This may in turn reduce content upload to the IRs.

Another concern of the librarians is preservation of data or the content in IR. Development of the repository content is an accumulative process in nature, it does not happen within a short time, rather it takes a lot of effort and continues over time. Losing data will have financial implications to the library and the university. Therefore, preservation of data is very essential. Likewise, securing data against intruders, viruses, and malware is a challenging task, especially through a system that requires a permanent internet connection and open access service. Participants acknowledge that, safety of IRs server including hardware, software, settings, and other configurations is a challenge for IRs management in Nigeria [P3, P5].

Faculty members' contribution toward the practice of IR is a global challenge (Dubinsky 2014). In Nigeria, the participants believe that reward for content submission could be a good motivator.

I have heard in some institutions, saying that they reward those with the highest number of documents in the repository...like paying for their conferences... giving laptops, financial reward, etc. Those are motivations some other institutions may have adapted, but for us, we think that, if we can sensitize people, once we make and enforce the regulation about the mandatory deposit of research work it should work [P4].

Maintenance of IRs in Nigeria is also suffering from the lack of IT skills and non-contributory attitude of the scholars. Most of the time the orientation of the library managers play an important role in achieving sustainable management of IRs. While citing challenges of IR management, interview participants complained about the attitude of some library managers in Nigeria. They believed some of the managers lacked management skills, thus poor planning and administrative skills hindered the successful management of IRs in Nigeria.

In conclusion, challenges of IRs management include lack of stable power supply, lack of skills training for staff, inadequate funding approach, inadequate internet connectivity and bandwidth, copyright, plagiarism and piracy issues, lack of motivation, data security and preservation strategies, system safety, IT skills, non-contributory attitude of the faculty members and lack of orientation of library administrators and repository staff. Figure 3 summarises evidences from the interview.



Figure 3: Challenges of IRs Management in Nigeria

DISCUSSION

The practice of IRs has been successful for more than a decade in Nigeria. Different resources are being shared and accessed online. Institutions started to reap the benefits of sharing their resources. The number of shared repositories is growing on a steady pace. Skills and awareness of both repository team and scholars are equally increasing (Adam and Kaur 2021). Similarly, literature covering the facets of practice is expanding in return. However, the speed of the implementation is still below the expectation, and the outcome of the practice is not yet yielding reasonable impact (Salau et al. 2020). Therefore, qualitative investigation of the management of IRs in Nigeria will go a long way in exploring evidences in practice, as well as exposing the good practice for replication and suggesting possible solutions for the problems.

Management of IRs is a complex process that requires strategic planning, responsible management, and collaborative administration. A well-managed IRs does not only indicate responsible stewardship of the repository team, rather it promotes scholars and elevates the institutions (Nabe 2012).

An IR is an elegant open access service that has the potential ability to boost access, impact, and dissemination of research findings across institutions globally (Jones 2018). This potential feature stimulates the desires of many institutions for enhancing the impact of their research output and making their institution visible within the global research community (Idriss and Al Sarraj 2019). For this reason, institutions in Africa and other developing countries grabbed the opportunity and start to implement and manage successful repositories (Siyao et al. 2017).

The driving forces behind the management of IRs in Nigeria circle around promotion of knowledge, scholars, and institutions. Therefore, responsible stewardship is required to realize the drivers, overcome identified challenges, and join global trend of IRs management. In other words, the practice of IRs in Nigeria is ushered with numerous challenges. Most of these challenges are consequences from the approach adopted in managing the project. Clearly, many issues of IRs in Nigeria were initiated as a result of method of implementation and management of the project. In fact, organizational orientation with regards to policy implementation could have a significant role in confounding some of the confronts (Kodua-Ntim and Fombad 2020). For instance, in spite of having policies partially drafted, as in all the institutions in this study, these policies have not been effectively enforced (Salau et al. 2020). Having policies drafted is a very commendable initial step, but application of the policies is the secret behind smooth running and effectiveness of the project.

Indeed, enforcing the policies will aromatically eliminate most of the confronts. For this reason, scholars called for framing general policies that will guide the overall management of IRs from all perspectives in Nigeria (Ejikeme and Ezema 2019).

Issues related to this is data preservation, data preservation plan is very essential aspect of repository management (Kim 2020). Evidences confirmed that there is no designed plan or policy for data preservation and security adopted for the management of IRs in Nigeria. Literature has recorded similar observation (Pandey and Kumar 2020; Salau et al. 2020). In addition to this, plagiarism usually occurs as a result of nonuse of anti-plagiarism software for similarity checking by some institutions, or foibles in the management that resulted in making IRs no longer accessible online or completely breakdown as reported in one of the plagiarism cases by daily papers (Rakiya 2020).

Moreover, it is not sustainable for IR management to depend completely on mediated submission. For sustainable recruitment of repository content, management of an IR should consider strategies such as mediated depositing, self-archiving, content harvesting, author profile-raising, promotions, and usage of statistics (Mark and Shearer 2006).

Finally, effective collaborations were initially established both locally and internationally for the management of IRs in Nigeria, however, these collaborations were not maintained. Some of the confronting issues especially concerning technical expertise and resource sharing could be easily solved through collaboration. So also, partnership with other digital repositories, journals and publishers need to be considered for sustainable content recruitment. These and many other issues could be articulated and addressed through application of the repository policies.

CONCLUSION

Institutional repositories in African countries are initiatives budding from the need to overcome the limitations of access to scholarly information. The optimization of IRs is important to enable research output generated in Africa to be made available in Africa even when a multitude of barriers and challenges hinder the growth of IRs in Africa. Institutional repositories not only need to be initiated, but the management of these IRs must continue and be enhanced overtime to sustain the IRs. This study investigated and exposed the drivers for IR management from the empirical practice and experienced librarians in Nigeria. The need to increase the institution's visibility and ranking is an important factor in pushing the managers to showcase good IR management practices. Closely related to this is the need to promote and elevate faculty members to become producers of scholarly information and to be known globally. The demand to create a global awareness of research conducted in Nigeria by making the output available and accessible drives the management of the IRs. Beyond availability is the push to make sure these resources in the IR are preserved for the long-term use and dissemination. These drivers contribute to the management of IRs in which the people, funding, infrastructure and dedicated processes are essential.

The management practices of planning, execution, administration, and daily maintenance within the context of the challenges faced by Nigerian universities, have revealed several areas of management that are of concern. Starting from the development and enforcement of intuitional policies for the management of IRs; whatever efforts the library and librarians are making on the management, sustainable management of IRs will always depend upon the strategies and policies put in place. If there is no policy enforced, the management of IRs will continue to suffer from avoidable challenges, like faculty contribution, plagiarism, copy right, internet, security, difficulty in digitization, editing,

staffing etc. Therefore, universities should give more emphasizes on the development and enforcement of policies with regards to the implementation and management of IRs.

Secondly, adoption of only mediated submission approach for deposit into the repository has made management of IRs tedious and difficult for librarians to handle. However, adopting both mediated submission and self-archiving simultaneously can significantly reduce the burden on librarians, and subsequently make the practice simple and convenient for both librarians and researchers. In line with this, deposit mandate should be enforced and treated with intolerance. Mandating scholars to deposit their publications ensures sustainable content development, reuse, and availability of research.

Thirdly, best practices and sustainable management of IRs can easily be achieved through collaboration. Effective collaboration in terms of collection recruitment, content sharing, training and technical support is required for sustainable management of IRs. Literature described how internal collaboration between repository's stakeholders could lead to successful management of IRs (Buehler 2013). Similarly, Cho (2018) and Karacsony (2013) reported successful management of IRs through both national and international collaboration.

Finally, continued training, orientation, and massive awareness creation on open access, copy right, plagiarism and IRs practice should be the main areas of concern. If Nigerian universities are committed to providing IR services for a sustained period of time and to reduce ineffectiveness, emphasis on IR management practices and what drives IR management need to be constantly reviewed and considered in management decisions.

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Interview Protocol

Date : _____

Introduction

My name is Usman Ahmed Adam. I am a PhD candidate from the University of Malaya, conducting a study on the IR management practices in Nigerian universities. You have been selected for this interview because you are identified as an expert in IR practices and as someone who has vast experience in the management of IRs in Nigeria. There is no doubt that your participation will immensely contribute the achievement of the objective of this study.

Let me first thank you for accepting our invitation and creating time within your tight schedule. To facilitate my note-taking, I'd like to record this interview. Please acknowledge your acceptance in the Participant Consent form. For your information, only the researchers will have access to the recorded conversation for the purpose of transcribing the data.

The following is a brief background to the study:

Research title: Driving forces behind the management of Institutional Repositories: Qualitative evidences

Research aim: The main aim of this study is to have a deeper understanding of what are the driving forces relating to IR management within the context of the challenges faced by IR managers in Nigeria

Ethics: All information provided during this interview will be treated confidential, participation is voluntary, and you may stop at any time if you feel doing so. Thank you for accepting to participate.

Please verify the following information:

- i. Your Institute: _____
- ii. Your Title and Name (Interviewee): _____
- iii. Your Experience and Qualification: _____

Interview main questions:

- i. How is the institutional repository (IR) managed at your university?
- ii. Thinking specifically about your involvement in the management of the institutional repository in your university, how would you describe the driving forces behind the management of the IR? In more general context, what other driving forces would you describe?
- iii. Thinking specifically about your involvement in the management of IR at your institution, what are the challenges faced by IR management? In general what other challenges would you describe in the management of IRs in Nigeria?