Management of electronic information resources in Nigerian university libraries: A critical review of literature

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Abstract

Electronic information resources are regarded as important tools for providing library services to users especially in the digital age. Electronic information resources still need to be selected, acquired, described and effectively managed for utmost utilization by the growing number of library users. This paper explores on the management of electronic information resources in Nigerian university library environment. Through critical analysis of literature, the paper gave an in-depth evaluation of the concepts and significance of EIRs, types and formats. In addition, the paper described the Management practices of EIR in academic libraries. Such practices include the Back-end Management Tools for Library Staff and the Front-End Management Delivering Access to Users. A critical evaluation of the Management strategies of EIRs were also presented. Furthermore, the paper identified and reported a number of challenges associated with the management of EIRs in academic libraries. It is clear from the critical evaluation of the literature that, thus, the management of electronic information resources raises a new set of issues for libraries and stakeholders particularly in developing country like Nigeria, yet, these issues can still fit within the classical theoretical frameworks of collection development and management. Hence, the paper identified and evaluate a number of management models and integrates this body of knowledge into a whole comprehensive framework for effective management of EIRs in Nigerian Academic libraries. It is believed that the framework will serve as a working tool for librarians and other stakeholders in ensuring effective management of EIRs in their libraries.

Keywords: Electronic information resources, EIRs management, Information resources development, Academic libraries, Nigeria

Introduction

Today's rapidly changing world highlights the influence and impact of Information and Communication Technology (ICT) in all aspects of life. ICTs is especially important because they are fundamental requirements for the current globalization that leads to the knowledge society. The electronic media has provided many possibilities and opportunities for providing faster and quicker access to information locally and globally. ICTs has tremendous impact on educational functions of teaching, learning and research in institutions of higher learning especially the universities. ICTs offer rich opportunities to embed technological innovations within the learning environment especially in universities. Universities globally are creating electronic information resources as a result of the day to day activities which systematically evolve through technological development. EIRs has broadly been defined as information accessed by a computer, may be useful as bibliographic guides to potential sources but, as of yet, they infrequently appear as cited references in their own right Kazaure (2014).

Therefore, EIRs are referred to any source of information encoded and made available for access directly or remotely through the use of computer and other electronic devices accessed via the internet and the CD ROM resources since they too can be accessed online. However, the management of electronic information resources raises a new set of issues for libraries particularly in developing country like Nigeria, but these issues can still fit within the classical theoretical framework of collection development and management. EIRs still need to be selected, acquired, processed or catalogued, preserved and made available

for use by the user community, but most importantly in a radically different way from traditional print materials. The type of collection management issues raised by EIRs will of course, vary between libraries in Nigeria depending on their individual missions. These issues can only be addressed effectively if examine from the theoretical framework perspective. This paper is an attempt to explore the management of EIRs in Nigerian university libraries from that perspective. The paper identifies and evaluate a number of published literature. The literature was critically evaluated to determine the theoretical requirements for effective management of EIRs.

Literature perspective: Nigerian university system: The objectives and functions of the Nigerian university libraries

The university system is an intellectual community globally recognized to be responsible for the transmission of high-quality knowledge, attitude and skills for the development and sustenance of the individual and the society (Agbetuyi, Adegbilero-Iwari and Subair, 2017). They are designed for the acquisition of professional knowledge and skills relevant for the advancement of the society. Essentially therefore, one of the objectives of establishing a university is to promote scholarship, research, learning and community development. As stated in the national policy on education, one of the goals of university education is to acquire both physical and intellectual skills which will enable individuals to become self - reliant and useful members of the society (Okebukola, 2014)). The university library is always there to support the attainment of the university objectives. This is made possible through the provision of information resources that support teaching, learning and research objectives.

University libraries form a distinct category in the general pattern of libraries that include national, public and special libraries. Well-equipped university library is the central bedrock for effective functioning of a university system. University libraries have a pivotal role in providing equal access to information resources especially EIRs. This aspect has been emphasized by the fact that virtually the entire academic activities in universities revolve around university library resources. Hence, in Nigeria, the National University Commission attaches great importance to the strengthening of library resources in universities, and to their efficient administration (NUC, 2012). If the purpose of education is learning, then the library is therefore, an indispensable source of learning and there is no replacement of it. The objectives of a Nigerian university have been to archive knowledge and that of the libraries have been aimed at dissemination of information for lifelong learning and research for new knowledge and a well-established library with all round and up-to-date information resources is therefore suitable for learning and research that is necessary for university system to function properly and effectively.

Status, availability and use of EIRs in the Nigerian university libraries

The advent of information technology has led to the growth of digital or electronic information resources and now electronic resources are a significant part of the library collection. Libraries in Nigerian universities irrespective of ownership— federal, state and private according to Iroaganachi and Izuagbe (2018) subscribe and manage electronic resources in a number of ways, simply because the quality of academic and research output of their products is greatly dependent on the availability, management and use of such resources to support academic and research activities of these universities. Obviously, several studies within Nigerian universities context have been carried out to examine the status, management and use of EIRs. While some of these studies as

cited in astudy by Iroaganachi and Izuagbe (2018) focused on federal and or state universities such as Madu (2012) Egberongbe (2011) Owolabi (2012), others such as Izuagbe, Hamzat and Joseph (2016), Aregbesola and Oguntayo(2014) and Fasola (2013) on the other hand, x-rayed the scenario from the private universities perspective.

Therefore, the use of electronic resources is common in Nigerian universities,while in Niger Delta Universityfor example, these resources according to Fyneman, Idiedo and Ebhomeya (2014) are available at the college of Health Sciences and the main library, in Rivers State University of Science and Technology these resources are accessible both within and outside the university environment. Further, their study established that, while forty-four percent of the Nigerian university libraries have Internet connectivity, some of the system development units in these libraries still function like commercial cybercafés such that they do not subscribe to relevant electronic resources. Equally, Alhassan and Macaulay (2015) in a study, availability and utilization of electronic resources by university students in Niger state, revealed that electronic resources like internet, e-mail, online databases and electronic journals were highly used by the respondents inthe two universitiesunderstudy, while others e-resources such as CD-ROM databases, e journals, Online Public Access Catalogue (OPAC) and e books were rarely used. Also studies by Obaje and Camble (2008), Oduwole and Akpati (2003), Hamade and Al-Yousef (2010) and Jagboro (2003) cited by Fyneman, Idiedo & Ebhomeya (2014) found that there is high use of electronic resources in Nigerian universities especially at university of Jos, Amadu Bello University, Zaria, Lagos State university and Bayero University, Kano.

Types of electronic information resources available for University libraries

Libraries all over the world make available a wide variety of EIRs for use by the university community; undergraduates, postgraduates, researchers and staff in their respective institutions. These electronic information resources form an essential part of the reference services provided by the university libraries. But provision according to Kazaure (2014) is only part of the equation; resources must be utilized by staff and students at undergraduate and postgraduate levels if they are to be of any added value. Jonathan and Udo (2015) identified some categories of electronic information resources as follows:

i. *Federated search:* This is a technology that came into existence as a result of the desire by database and electronic resource subscribers to search and retrieve resources from multiple and disparate sources on a single interface (Breeding, 2017).

ii. *Virtual reference:* Virtual reference service refers to the remote delivery of reference sources and resources to users who are not inside the library physically. This service includes; Knowledge base, Online chats, Text Messaging, and Co-browsing.

iii. *Digital institutional repository:* Institutional repositories are "digital collections capturing and preserving the intellectual output of a single or multi-university community (which) provide a compelling response to the strategic issues facing academic institutions.

iv. *Digital libraries:* A digital library may be perceived as an information service or a collection of electronic information resources, in which all the

information resources are available in computer processable form.

v. *Virtual libraries:* Virtual library refers to an information service or collection of electronic resources whose collections are entirely in virtual or digital form and information is accessed over a network. Such a library provides access to virtual indexes, catalogues, and books.

vi. *Open access repository:* Open access is interested in the free availability of scholarly outputs on the Internet granting the user to make legal and non-commercial use of the document and at the same time acknowledging the intellectual ownership of the author of the document (Jonathan & Udo, 2015).

In addition, other writers Gakibayo, Odongo and Okello-Obura (2013), categorized the types of EIRs to include the Internet; Electronic Journals; Electronic Books; Online Database and CD-ROM Databases. Libraries subscribe to electronic content in a number of different ways. Some publishers offer packages that include many electronic journals, some products may include electronic journals from many different publishers, and libraries acquire some of these electronic journals individually (Jonathan & Udon, 2015).

Management practices of electronic information resources in university libraries

As libraries build ever-larger collections of EIRs, finding ways to manage them efficiently becomes a major challenge. The number of electronic journals, citation databases, and full-text aggregations held by most libraries has grown rapidly. Managing EIRs involves providing the library's user with convenient ways to find and access them and providing library staff with the tools to keep track of such resources accessed (Obidike and Mole,

2015). Consequently, some of electronic information resourcesmanagement practicesaccording to Breeding (2017) include: Back-end management tools for library staff and Front-end management delivering access to users.

i. *Back-end management tools for library staff:* This according to Breeding (2017) comprises of three major categories as follows:

a. *Traditional online catalogue approach:* One obvious place to manage e-journals and other electronic content is the library's ILS. The acquisitions and serials modules exist just for that purpose. Librarians can create serial records for each of the electronic journals they own, indicating the span of dates and issues available, while the acquisitions module manages the invoices, payments, and other business-process issues.

b. *E-journal holdings data services:* Keeping track of the specific holdings available through all of a library's subscriptions to electronic journals can be daunting. This is especially true for the products that combine a large number of electronic journals, such as ProQuest, EBSCOhost etc. The titles and holdings may vary over time, and it may be difficult to determine the specifics of the beginning and ending dates of each title (Breeding, 2017).

c. *Electronic resource management applications:* Interest in an automation module for managing electronic resources has arisen because of the limitations of the serials and acquisition modules to deal

with all the parameters related to the licenses. Should this be an extension of existing modules of the ILS, or a stand-alone application? Products are emerging based on both models and according to Breeding, (2017) Innovative Interfaces, Inc. was the first among the commercial ILS vendors to develop and deliver an Electronic Resources Management application.

ii. *Front-end management delivering access to users:* While the key jobs of Front-End Management Delivering Access to Users on the other hand is delivering access to electronic resources and as the library increases its investments in electronic information—usually at the expense of print materials—it's vital to provide convenient ways for users to find the information they need within those resources and such according to Breeding (2017) is usually achieved through the following five processes:

  a. *Links from the online catalogue:* The online catalogue provides one means for accessing electronic resources. Through title searching and subject headings, users can find any electronic journal the library subscribes to and go to that journal through the link provided. The main limitation of this approach is that it works only to find the journal itself, not the individual articles (Breeding, 2017).

  b. *E-journal locator resources:* Many libraries maintain an electronic finding aid that consists of lists of electronic databases

and e-journals on their Website apart from the main online catalogue. These e-journal locaters according to Breeding, (2017) work as good navigational tools for researchers that want a quick way to get to an e-journal without the complexities of the online catalogue.

  c. *Linking to full text:* Library users, however, might not care about finding an e-journal, but might want to read the full text of articles on their research topics. This process typically involves searching an A&I resource that yields lists of citations of the articles that contain the information. Finding good ways to link the user from that citation to the full text is one of the key challenges in the development of a library's information environment. Within self-contained, aggregated products like EBSCOhost and those from ProQuest, the process is simple and automatic. Yet, the scope of these products according to Breeding, (2017) is limited to a specific set of disciplines.

  d. *Open URL-based link resolvers:* These are links that may point to resources that the local library doesn't subscribe to. Given that many resources are available through multiple sources, knowing which version to link to is a problem. It would be unfortunate for the link to point to the article in one

resource when the researcher would have been able to access it through another. This scenario according to Breeding, (2017) has grown to be called the "appropriate copy" problem. A growing genre of products has emerged in response, both to address this problem and to offer additional services and options to searchers as they navigate among library-provided electronic resources.

e. *Federated search:* Another major area of interest is in applications that allow users to search multiple sources simultaneously so they don't have to decide which resource might have the information they need. This approach according to Breeding, (2017) goes by various names: federated searching, cross searching, or meta search. A number of products with differing technological underpinnings are available in this category. The products are based on a mechanism that knows how to send a query to each individual resource behind the scenes, and then receive the results. When the user enters a search request, the system translates it into the form needed by each of the selected targets, gathers and collates results as they are returned, and then presents the orderly results.

Critical evaluation of EIRs management strategies

Generally, EIRs resources need to be

investigated for selection from a content perspective, then acquired, implemented, preserved and reviewed or evaluated annually for cancellation or replacement against the same policies, guidelines and criteria that apply to such resources. Typically, such criteria might state that the resource:

i. Supports the main research aims and goals of the organization.

ii. Complements or add depth or breadth to the existing collection supported by subject profiles.

iii. Be of a certain quality, e.g., peer reviewed, or have a reputable producer.

iv. Supports the requirements of the key audience.

v. Generates an acceptable level of use, thus the major components or strategies involved in the management process of electronic resources, according to Emery and Stone (2013).

Electronic information resource management procedures

While achieving access to electronic information resources is actually a very simple concept, the reality of ensuring access through agreement to license terms, provision of IP addresses and contact information, and agreement to pay for privilege of access is much more complex. Thus, the following constitute some of the major procedures that ensure effective EIRs management in university libraries:

i.

i. *Electronic information collection policy statement (for internal use by staff):* While traditional collection development criteria, such as subject, level and target audience apply to the selection of most electronic titles, the management of this format is more complex and as such, it is good practice to develop a supplementary policy which addresses specific format related

issues. Such a policy according to Emery and Stone (2013) should be used in conjunction with the more traditional collection development policy and the policy should provide guidance to assist selectors in establishing the library's expectations and preferences.

ii. *Investigating new content for purchase/addition:* A basic framework should be considered with every new purchase or addition to content that is selected for inclusion into the 21st century library. Collection development and management policies do help outline the general aspects for collection purchase. In today's libraries, many of the standard rules applied to print acquisition are no longer sufficient (Vasishta, 2013). However, generally the following checklist according to Emery and Stone, (2013) can be used when evaluating electronic resources: Contents; Know what you want to achieve; Write your specific terms; Desk top review of market/literature and trial set up; Talk to suppliers/vendors; Making your choice.

iii. *Acquiring new content:* Acquiring resources once they are selected can be very straightforward or very complicated depending on the resource to be purchased. The following acquisitions steps usually occur when acquiring new content and services: Comparing specifications; Negotiate terms of contract; Check the license; Re-negotiation of licensing terms; Signing of the agreement and Record administrative metadata (Emery and Stone, 2013).

iv. *Implementation:* Any new e-resource will need to be implemented, while this may be relatively straightforward for smaller resources, larger resources

and new services may take a few months to get just right. Generally, the implementation process according to Emery & Stone, (2013) includes: Testing; Marketing; Training and documentation; Soft Launch; Assess Feedback; Launch.

v. *Evaluation and access:* Evaluation of user behaviour and usage data according to Emery and Stone, (2013) is important in building up a detailed picture of the appropriateness of the resource over time, and is invaluable when it comes time to review the resource in the future.

vi. *Types of evaluation:* Presently, most electronic databases and journals can be evaluated using counter-based statistics. Other means of evaluation however, include: Checking the implementation; Ask your users; Changes to coverage of resources or platform migration; Track downtime/availability; Communication with the vendor etc (Emery and Stone, 2013).

vii. *Annual review:* In times of fiscal constraint it is very important to make sure all resources are providing value for money. This goes for all resources, whether established or recent acquisitions. Value for money can be calculated in a number of ways, the most obvious being cost per downloads. Other factors which should be taken into account according to Emery and Stone, (2013) include but not limited to: Renewal date; Usage; Access queries; License changes; Pricing model; Impact factor changes & review of Eigen etc.

viii. *Cancellation and replacement review:* In the current digital environment, electronic content and services provided to

access electronic content are constantly evolving and changing. What seems appropriate now is not as relevant two to five years later, thus, the need for cancellation and replacement review timeframes (Emery and Stone, 2013).

ix. *Preservation of electronic information resources:* While there are many strategies for preserving the electronic information resources, there is no single solution, no best practice, and no established policies or procedures that meet widespread needs. These preservation issues however, according Hoke (2012) fall into four categories: Storage Media Longevity, Hardware Lifespan, Software Obsolescence, Governance Continuity. Whereas the Preservation Strategies according to him include: Print to Paper: Establish a Computer Museum, Migrate Periodically, use an Archival Format: Use Microforms and Consider Emerging Technologies.

x. *Electronic information resource management systems:* An EIRM system, according to Breeding (2017) is a software module that assists the library in managing all the details related to its subscriptions of electronic content. It focuses primarily on article content delivered in electronic journals and databases that aggregate collections of e journals. In recent years' libraries have become more involved in licensing e books and ERM system products are likewise expanding to help manage this type of material. One of the most obvious trends in libraries over the last decade involves the shift towards providing electronic content for the benefit of library patrons (Hartnett et al, 2013). Almost all libraries provide some forms of electronic information. Some libraries, such as those specializing in science, technology, and medicine, deal with electronic content as very large proportions of their overall collections. As librarians make ever-increasing investments in electronic content, they require automation tools to manage them efficiently and responsibly Hartnett et al. (2013). Some of the major commercial EIRMSs now available for libraries include EBSCO ERM Essentials, Ex Libris Verde, Innovative Interfaces Millennium and Serials Solutions 360 Manager.

Similarly, open-source EIRMSs are particularly attractive to very small libraries where cost is a primary motivator and the collection is relatively small. One advantage of open-source according to Hartnett et al. (2013) is that the software is free and even though the following does not constitute an exhaustive list of open-source EIRMSs, but, according to their own websites, all are used by more than twenty libraries, and all have active user communities for support: CORAL, CUFTS and ERMes. In addition to the above also, there are emerging Library Service Platforms which according to Breeding (2017) called the next generation of library automation software. These are new products, just starting to be available, that combine all the functionality of library software into one or two modules. This software generally promises to combine link resolver and ERM functionality with patron discovery and a single search module, as well as print item management traditionally done in the ILS and some of the library Service Platforms according Breeding

(2017) comprise OCLC World Share, Ex Libris Alma, Serials Solutions Intota: D. Kuali OLE, Innovative Interfaces Sierra, Discovery—Federated and Indexed Tool, Integrated Library System, Interlibrary Loan Software and Link Resolvers and Ticket Management Software etc.

Challenges associated with electronic information resource management

As the libraries the world over focus their attention on satisfying the information needs and wants of their community of users, they find themselves bedevilling with challenges associated with EIRs selection, acquisition, processing and access establishment. Although in Nigeria, efforts were made in literature and by extension in libraries to practically solve some of these problems, many such challenges still persist and they include:

i. *Lack of training and insufficient technical support staff:* Lack of training and insufficient technical support staff and risks associated with implementing innovations in library services, particularly those which require the use of technologies are the most significant barriers to the EIRSM in the Nigerian university libraries. This finding was relevant to the finding of Alhassan and Macaulay (2015) who noted that, the main factors affecting electronic information resources management in the Nigerian university libraries was lack of technical support staff, training and network failure.

ii. *Lacks of affordable tools required for EIRs management:* There are lacks of affordable tools and polices to effectively manage EIRs in the Nigerian universities and without institutional polices and tools required, the usability and accessibility to such e resources may be compromised. This finding

was supported by the finding of Iroaganachi and Izuagbe (2018)who posit that "perceived lack policies, equipment and risks associated with implementing innovations such as EIRs management are some of the challenges associated with EIRM.

iii. *Lack of maintenance and poor infrastructure:* Also some studies identified inadequate and poor infrastructure such as poor power supply and slow Internet connectivity as some of the biggest problems associated with EIRs management. This finding was equally supported by finding of Manjack, Dangani and Fari, (2019) wherethey identifiedincessant power outage,poor internet connectivity and non-availability of required tools as some of the problems affecting EIRs management.

iv. *Lack of subscription to relevant EIRs:* Majority of the relevant EIRs on the Internet can only be accessed through subscription and many universities in Nigeria have Internet connectivity in their libraries but do not subscribe to the required academic e-journals and other relevant databases. This finding was also corroborated by the finding of Manjack, Dangani and Fari, (2019) Who observed that lack of subscription to the required electronic resources relevant to the disciplines run by the universities and limited subscribed titles as some of the major challenges associated with EIRs management.

v. *Poor or inadequate funding:* Generally, finance is indispensable for staff training, acquisition and maintenance of infrastructure and EIRs management in university libraries. However, in Nigeria, universities are faced with serious financial challenges which

generally affect the efficient management of such resources. This finding was supported by the finding of Maidabino and Zainab (2011) who identified poor funding; declining budgets; poor infrastructure and rising costs of information products services and users' costs; staffing issues; crimes as the major challenges affecting libraries.

Conclusion

In the light of the forgoing discussion, it is safe to conclude that EIRs have come to stay in our educational institutions especially at the university level due to their relevance and huge potentials. Their availability, management and use would only take to a new dimension. However, while achieving access to electronic information resources in the Nigerian universities is actually a very simple concept as established through literature review, the reality of ensuring access through agreement to license terms, provision of IP addresses and contact information, and agreement to pay for privilege of access is much more complex. Thus, the management and delivery of consistent as well stable access to electronic information to the right people at the right time, in the right place, and in the manner which user's desire should now preoccupy the attention of academic libraries in Nigeria and should also constitute the major concern of an electronic information resource librarian in such a digital age and it is on this note that this paper wishes to recommend as follow:

1. There is a strong need for the right people with the right skills to preoccupy the provision and management of EIRs in Nigerian university libraries, because It is only when right people are at the right place and at the right time that user's desire for effective and proactive library services can be provided especially in this digital age.

2. The university libraries should ensure the training and retraining of their staff, while ensuring the provision of sufficient technical support staff who shall ensure effective management of EIRs.
3. The university libraries should ensure the provision of high bandwidth, stable power supply, required EIRs management tools and the needed policy guidelines.
4. The universities management should ensure proper maintenance of the existing infrastructures in their libraries, while ensuring the provision of the required EIRM tools.
5. The universities management should ensure the provision of adequate funds for the subscription of the required e-journals and databases relevant to their programs.

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