



## Preservation and Organization of Electronic Resources for Effective Service Delivery in Federal College of Education Libraries in Northern Nigeria

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### Abstract

*The study investigated the preservation and organization of electronic resources for effective service delivery in Federal College of Education Libraries in Northern Nigeria. The objective is to examine the electronic resources preservation strategies, ICT facilities used for resources preservation, organization of electronic resources and types of electronic resources organized. The research adopted qualitative research methodology. The population of the study is the 12 college librarians and was sampled. Interview was used for data collections, data collected were analyzed using thematic analysis. The findings revealed that, the strategies applied for preservation of resources were migration and normalization. The libraries used external hard drive, drop box/cloud and institutional repository for preserving electronic resources. Majority of the libraries organize their resources. In conclusion, proper management of e-resources is a prerequisite to easy access and use of the resources to enhance research, teaching and learning. The study recommended the use of preservation strategies that can prolong the life span of the resources; organize the resources for easy retrieval; provides access to the resources remotely and lastly, the management of the colleges and their libraries should ensure that all the challenges are minimized in order to provide access for use of the resources.*

**Keywords:** Access, Electronic Resources, Library, Management, Organization, Preservation and Use.

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### Introduction

Management of e-resources of whatever forms and, formats is very essential in order to facilitate and enhance easy access and retrieval to information resources and services for teaching, learning and research in the academic environment. Therefore, e-resources are acquired and preserved by the college libraries for future access and use as well to ensure that the lifespan of the e-resources survive in forms and formats accessible and useable to the target users. Consequently, libraries used different methods in organizing their information resources which include; cataloguing, classification, abstracting, indexing, etc. for easy identification and retrieval. Emojorho (2012) submitted that the

management of e-resources includes selection, acquisition, organization, preservation and provision of access to relevant information resources.

Meanwhile, Onyegiri (2012) proclaimed that these resources do not fly into the library or find themselves in the library by accident; therefore, coordinated efforts should be adopted towards the selection, acquisition, cataloguing and their maintenance. As such, any college library that effectively applied e-resources preservation management approaches may provide effective service delivery to their clients. Preservation is any measure applied on to the information resources to safeguard their physical and its architectural forms. According to Oluwaniyi



(2015) preservation is an aspect of the management of the library. Its objective is to ensure that information resources of any kind or form survive in an accessible and useable form for as long as it is wanted. Preservation of library materials for the future use is one of the main functions of college libraries and it also applies to e-resources. Though, preservation of e-resources is entirely different from print materials. Because of the nature of challenges associated the preservation of the e-resources.

E-resources preservation and sustainability require the determination of the selection criteria for resources to be maintained perpetually, the development of a local strategy in which to make that sustainability and preservation happen, investigation of the metadata needed, the choice of what local practices and cloud-based practices are most viable for a library, and, finally, the development and initiation of existing strategies for leaving content and purchasing models successfully. Indeed, the issue of e-resources preservation is no long new. But the first choice is determining what needs to be preserved and maintained (Emery, Stone & McCracken, 2020). Physical deterioration and digital obsolescence are the two main challenges faced by the librarians while preserving digital information. Currently, different preservation strategies are used to preserve digital information. However, there is no effective or cost-effective method available for the preservation of complex digital resources and sources for a long period of time. Hence it is advised that whatever the libraries think of preserving its e-resources, it is important to ensure their accessibility for the future use and it should always consider file formats. Gbaje (2013) described digital preservation as the series of management procedures and activities necessary to ensure the enduring usability, authenticity, discoverability and accessibility of content over the very long term.

Apparently, selecting file format that is not easily affected by rapid change of technology is essential. File formats that go unsupported within short period of time are those created on word processing document and saved as an

American Standard Code for Information Interchange (ASCII) file format should be avoided in digital preservation. On the same point, Kavishe and Dulle (2016) warned that crucial information should not be held in files that will no longer be compatible with the future software because as electronic information becomes more and more complex and integrated, the threat of file format obsolescence is expected to increase. However, if such file formats are fully utilized it would help in the proper organization of the e-resources for preservation and future use particularly through indexing.

Seidu (2012) observed that electronic information resources can be organized in technological environment by describing and representing EIRs and identifying the connections and relationships between the resources and the people responsible for their creation and/or production. Since most users predominately search for the resources under subject heading predominantly, Pierce and Lee (2016) reported that the rationale for indexing of electronic information is the same thing as it is done for print materials. Ideally cataloguing and indexing of the e-resources provide a surrogate for the items discovery and access. But, what has changed in the electronic information environment is the terminology. In the Internet environment, the terms cataloguing and indexing have been replaced with the term "metadata." Metadata is often defined as "data about data" or "information about information." The term, which originated with the data and computer science communities, is now in general use for the cataloguing and indexing of electronic information sources.

Indexing is one of the most important processes in the management and access to e-resources via the information retrieval system. It forms the main function in the information retrieval process as it is the first step in helping to retrieve the information accurately and efficiently (Radzuan, Yatin, Junaide & Mazlan, 2018). Indexing process help users to search for information as quick as possible and the users need not to search for information by flipping through the pages before finding out the terms or the information needed from the



information retrieval system. It is obvious that the standardization of EIRs organization is vast in nature, as advanced by scholars cited above. It is in line with this that the study investigates strategies employed by federal colleges of education libraries in Northern Nigeria in the preservation and organization of electronic information resources, in order to enhance e-resources management for better information dissemination in the colleges.

### Statement of the Problem

The shift from print information resources to e-resources requires proper management procedures, such as the preservation and organization of e-resources for effective service delivery. As these resources change at a very rapid pace and as libraries continue to build larger collections. Hence e-resources, preservation and organization of e-resources are pre-requisite for effective access and use which enhances teaching, learning and research. Management procedures of e-resources from selection, acquisition, preservation, organization and provision of access to licensing and renewal are becoming major challenges for librarians because their bibliographical features need special management procedures. Despite the availability of the preservation strategies and organizational patterns of e-resources for libraries and information centres, the researcher observed that the libraries under studies were yet to implement the strategies and patterns for proper e-resources management that would enhance research, teaching and learning in the colleges under studies. In this regard, this research was conducted to investigate the preservation and organization of e-resources in Federal College of Education Libraries in order to bridge the identified gaps for better preservation and organization of e-resources to achieve the parent organization goals and objectives.

### Research Questions

The following research questions were addressed:

1. What are the strategies adopted in the preservation of e-resources in the Colleges Libraries under study?
2. What are the types ICT facilities used in the preservation of e-resources in the Colleges Libraries under study?
3. What procedures are employed by these libraries for organization of e-resources?
4. What are the types of e-resources organized in the Colleges Libraries under study?

### Research Methodology

The research adopted qualitative research methodology. The population of the study is the 12 Federal College of Education libraries in Northern Nigeria. The sampled participants were 9 college librarians because they reported to have e-resources available in their libraries, while two libraries indicated non availability. Purposive sampling was used to select the college librarians because of their administrative and managerial positions related to preservation and organization procedures of e-resources, financial administration, practices and challenges. This is supported by Sharma (2018) that purposive sampling is a non-random sampling technique used in which the sample is arbitrarily selected because characteristics, which they possess, are considered very relevant to carry out the research. The research used self-developed semi-structured interview using the variables in line with the e-resources lifecycle model for data collections. The data collected were analyzed using thematic analysis.

### Results

The position of the research participants, code assigned to each participant and methods of interview are presented on Table 1:



**Table 1: Schedule of the Interview**

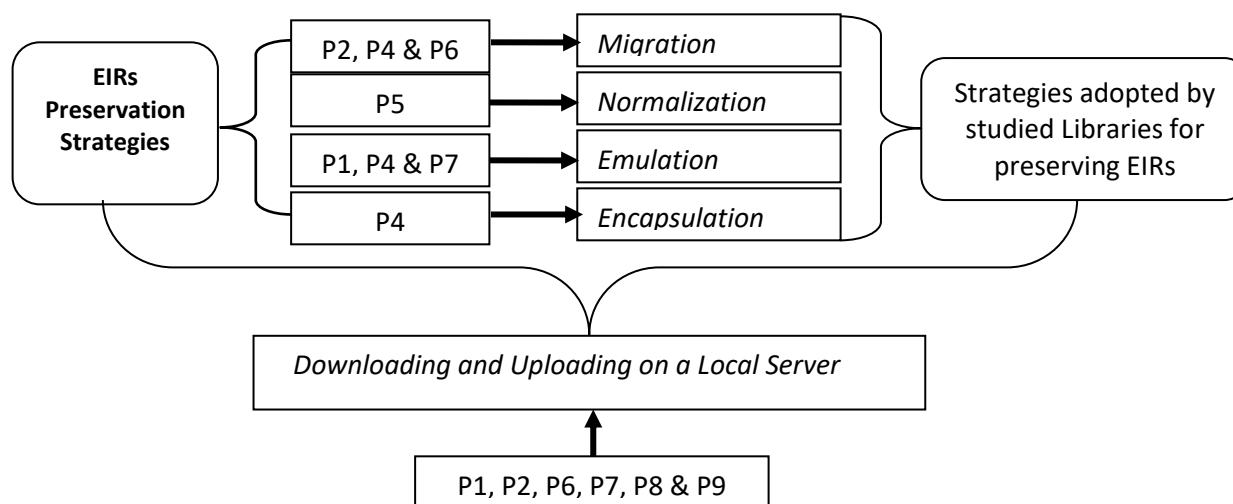
S/N	Name of College	Codes	Participants	Interview Method
1	FCE, Yola	P1	E- Librarian	Face-to-face
2	FCE(Tech), Gombe	P2	College Librarian	Face-to-face
3	FCE(Tech), Potiskum	P3	College Librarian	Face-to-face
4	FCE, Zaria	P4	E- Librarian	Face-to-face
5	FCE (Techn), Bichi	P5	E-Librarian	Face-to-face
6	FCE, Kastina	P6	E-Librarian	Face-to-face
7	FCE, Kontagora	P7	E-Librarian	Telephone
8	FCE, Pankshin	P8	College Librarian	Face-to-face
9	FCE, Okene	P9	E-Librarian	Telephone

The researcher interviewed all the nine respondents from the participating college libraries. The interviews were held in the respective offices of the 7 participants face-to-face while telephone interview was conducted with 2 participants. The responses of the participants of individual colleges were analyzed according to the research variables. Thematic analysis was used in analysing the data collected through interview because it

focused on examining themes within the data in an attempt to give meaning to what was being expressed by the participants.

### Preservation Strategies

The researcher asked the participants on the preservation strategies adopted for e-resources acquired by the library. In response to this question, the data obtained from the participants were presented in Figure 1.



**Fig. 1: Preservation Strategies**

The finding on the strategy for preserving e-resources of the federal college of education libraries under study is by migration and emulation of resources, as indicated by participants (P1, P2, P4, P6, and P7). As observed from the reviewed literature, migration has been widely used to move obsolete e-resources into current e-resources formats. When e-resources format becomes obsolete, a migration tool is used to transform

the digital object into e-resources format which can be rendered and used on a current computer platform. When this format becomes obsolete, another transformation is performed, and so on. Migration is the copying or conversion of digital objects from one technology to another, whilst preserving their significant properties.

Some aspects of preservation which need to be taken care of during the process of e-resources



preservation include integrity, intelligibility, authenticity, originality and accessibility. The most used strategies (migration and emulation) for preserving e-resources involve a combination of adopting standards that limit the variety of digital formats that a digital repository accepts, converting digital materials to a standard format when they are accessioned into a digital repository, and migrating the EIRs from obsolete to current formats so that the information can be accessed using current hardware and software. Emulation of e-resources is the process of preserving the old environment of e-resources by using latest technologies, mimicking the original environment that was used to create the e-resources. This will technically ensure that no e-resources is lost in the new technology environment; this way, a new technology is used without losing the old e-resources. Emulation ensures the validity and integrity of e-resources and provides access to such in their original environment even though the technology has changed. This means that the libraries move its e-resources or database entirely to another system without losing any

data as a result of the library changing to a new information management system. The record's authenticity, reliability and usability are however maintained. It is a good method through which libraries can ensure that the preservation of electronic resources.

In addition to the popular preservation strategies used, as shown in figure 1, majority of them were practicing other preservation strategies like uploading to their respective local server for preserving their electronic information resources, as revealed by participants (P1, P2, P6, P7, P8 and P9). The libraries used one or more preservation strategies to preserve their EIRs, because all preservation strategies have some shortcomings, they can be used to complement one another.

### ICT Facilities Used for Preservation

The researcher asked the participants on the types of ICT facilities used for preserving e-resources in their library. In response to the question, the data obtained from the participants were reported in Figure 2:

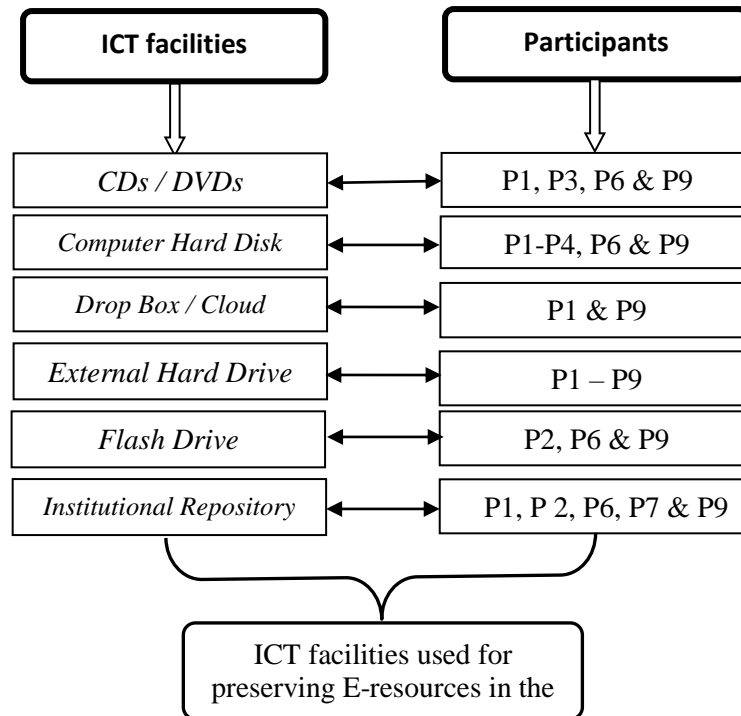


Fig. 2: ICT Facilities





Figure 2 reveals that all the libraries (P1-P9) used external hard drive for preserving electronic information in their libraries for future use. This could be attributed to the fact that an external hard drive enables users to store EIRs separately as a backup from a computer main or primary storage and memory at a relatively low cost. It increases storage capacity without having to open up a system. It can serve as primary storage connected to servers through Ethernet or Fibre Channel switches, or as secondary storage for backup and archiving purposes. The device is often used to store information that is accessed less frequently by applications running on a computer and also more accessible which demand less IT skill for usage than cloud storage device. Computer hard drive was used for the preservation of EIRs in addition to external hard drive by six of the college libraries.

Only participants (P1 and P9) preserve their resources in the drop box /cloud. This could be attributed to deficiency in IT knowledge of using drop box / cloud for preservation of resources among the participants that were not using it. Storage of EIRs on cloud is a service where e-resources is remotely maintained, managed, and backed up. The service is available to users over a network, which is usually the internet. Instead of storing the e-resources on your computer's hard drive or other local storage device, it allows the user to store e-resources online so that the user can access them from any location via the Internet. The cloud provider company makes them available to the user online by keeping the uploaded files on an external server. The Internet provides the connection between your computer and the database. Cloud storage reduces hardware and software demands on the user's side. This gives libraries using cloud storage services ease and convenience, but can potentially be costly.

Five of the libraries used Institutional Repository (IR) for the preservation of information resources. This shows that these five libraries are familiar with IR technical know-how for preserving and disseminating

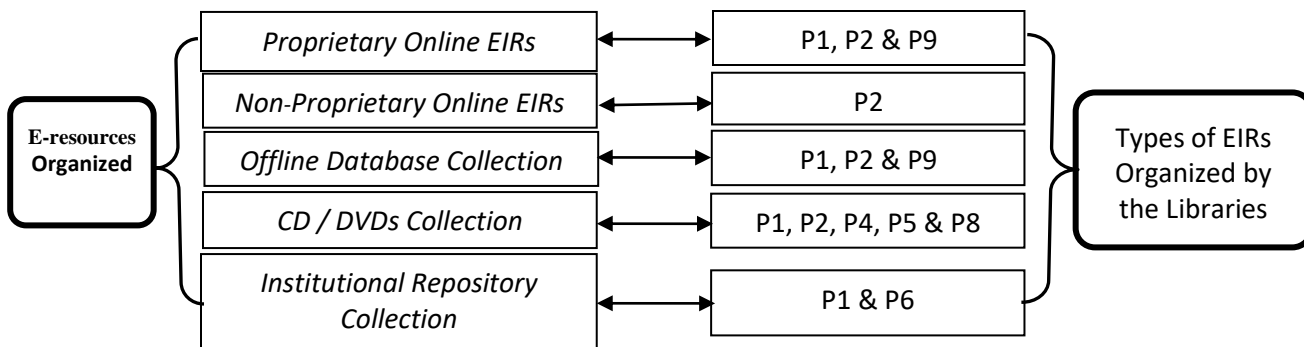
information to their users. The use of IR by the libraries could be attributed to its several benefits as observed from the reviewed literature; that repositories make it easier for faculty members to get previously scattered or restricted-access materials in a single location. Research scholars and faculty members are also expected to benefit from the increased visibility associated with repositories. Since repositories are typically defined as open access systems, the content receives more use from the academic community because it is free. This may translate into higher citation rates than comparable material published in subscription-only journals. Moreover, repositories eliminate what many academics consider the artificial space limitations of printed journals, allowing for more and different kinds of information to be published. As these constraints are lifted, researchers can expect more of their own work and that of colleagues to become available for review. It should help in the creation of knowledge to advance the field of study.

### **Organization of E-Resources**

Similarly, the respondents were asked whether they indexed the E-resources acquired by the college library. The data obtained from the participants were reported below: In response to the above question, seven out of nine participants (P1, P2, P4, P5, P6, P8 and P9) of federal college of education libraries under study *said yes, that they indexed their electronic information resources for easy accessibility and retrieval* while; the other two respondents (P7& P3) *responded negatively (No), meaning that their library e-resources only depend on indexing from the publisher or agents*. This implies that the libraries made efforts to eliminate the difficulties encountered by users in identifying e-resources relevant to their information needs.

### **Types of Electronic Information Resources Organized**

The participants were asked what types of e-resources they organized in the college library. They responded as presented in Figure 3:



**Fig. 3: Types of E-Resources Organized**

Participants (P1, P2 and P9) in Figure 3, reported the types of e-resources organized by their college libraries were proprietary online e-resources, Open source online e-resources, Offline database and CD/DVD collections. The libraries organized the EIRs mentioned by providing metadata related to their scope, subject, means of accessibility and retrieval by the academic community. More so, the participants from college libraries (P1, P2, P4, P5, and P8) reported indexing CD/DVD collections. This enable the libraries provide users with the metadata of the resources available in their libraries in CD/DVD formats.

Six college library indexed information resources in their institutional repository for easy identification, access and retrieval by the users. Participants (P3 & P7) reported they did not index any types of e-resources but only used e-resources organization from the publisher or agents. This could lead to lack of awareness of the resources available in the library by users, because information was not giving by the libraries on the metadata, accessibility and retrieval of e-resources acquired. In general, the libraries were organizing the electronic documents by extracting and providing metadata of available e-resources. This finding indicated that majority of the libraries organize only their offline e-resources which were mostly accessible within their library by users.

### Discussion of the Findings

The findings on the preservation strategies used include migration and emulation. In addition, some uploads to their respective local server as a way of preserving their e-resources. The libraries use external hard drive, drop box /cloud, institutional repository and computer hard drive for preserving electronic information for future use. The choice of these preservation strategies was to preserve EIRs for long-term future access and used by library users. The libraries used one or more preservation strategies to preserve their e-resources, because all preservation strategies have some shortcomings, they can be used to complement one another.

This is supported by the submission of Gbaje (2013), which described digital preservation as the series of management procedures and activities necessary to ensure the enduring usability, authenticity, discoverability and accessibility of content over the very long-term. Similarly, Benny (2015) in the study, “selection and acquisition of e-resources in academic libraries: challenges, Mumbai University”, revealed that the majority of the college librarians do not preserve their e-resources. However, replication and hardware and software preservation are the commonly used preservation strategy among the college librarians. That both of these methods are economical compared to other preservation methods.

This finding corresponds with study conducted by Emery, Stone and McCracken (2020) who found that in techniques for electronic



resource management and preservation for sustainability requires a good determination towards selection criteria for resources to be maintained perpetually, development of a local strategy,, investigation of the metadata needed, the choice of what local practices and cloud-based practices are most viable for a library, and finally the development and initiation of existing strategies for leaving content and purchasing models successfully. But determining what needs to be preserved and maintained should be first priority.

The findings on organization of e-resources revealed that majority of college libraries organize their e-resources for easy access and retrieval, especially offline databases and CD/DVD resources. It is important because it helped in eliminating the difficulties encountered by users in identifying e-resources relevant to their information needs. This was confirmed by Seidu (2012) that electronic information resources can be organized in technological environment by describing and representing EIRs and identifying the connections and relationships between the resources and the people responsible for their creation and/or production.

The findings of this study are in line with those of Benny (2015) in the study, “selection and acquisition of e-resources in academic libraries: challenges, Mumbai University”. The survey result shows that 56% of the college librarians catalogue their e-resources while 44% do not. That 80% of the college librarians index their CD/DVD collection (purchased) while 47% index their subscribed e-resources. Again, 27% of the college librarian index useful free online e-resources. Again, this finding corroborate with the observations made by Pesch (2009) that in e-resources lifecycle model that the system manager should have good professional skills to organize the available e-resources effectively. Moreover, the shift posed by e-resources preservation in the modern digital library and information system, is also requesting the librarians to possess some skills like computing, database management, networking, and other management skills relating to IT environment. This is in addition

Devi and Devi (2019) observed and submitted that the librarians are expected to consider the following points while organizing e-resources. That they should include those resources either in OPAC or to make different list for browsing; to organize different access points under a separate authority; to provide access to the resources either by alphabetical arrangements or under specific subject headings; to organize the e-resources within the context of other resources and websites and to check the method of access to e-resources, abstracting or full.

### Conclusion

The study concludes that the extent of e-resources preservation and organization in these college libraries indicated that they were not left out in the global trend to manage, provide and promote access to current e-resources for teaching, learning and research. However, the college libraries did not actually manage their e-resources effectively for easy access and use. Proper preservation and organization of e-resources is a prerequisite to easy access and use of the resources to enhance research, teaching and learning. In effect, it could be stated that the underutilization of some e-resources that were available in the college libraries was as the result of their inability to properly managed the available e-resources. Proper management of e-resources which covers preservation, organization, access and use would address the lapses identified in the findings of this study. Finally, all the stakeholders (government, institutions and individuals) in the management and use of electronic information resources have roles to play in the management and use of e-resources.

### Recommendations

1. In order to meet the unique preservation needs of e-resources, the college libraries should introduce different preservation practices, including developing a preservation policy, preparing a risk assessment, establishing security and access controls, ensuring the integrity of the E-resources, managing metadata,





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managing the content of E-resources and planning for emergencies.

2. Libraries should preserve their electronic information resources using more reliable ICT tools like drop box / cloud or Institutional repository with adequate backup means.
3. Libraries should organize both online and offline electronic information resources for easy identification, access and retrieval. This will help users choose particular resources to use because all of them are visible.
4. The public catalogue of the library should be converted to electronic formats, so that more clientele could be served.
5. Several access topologies should be configured in order to satisfy the increased demand from the laptop owners, who need to access and use E-resources.

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