

## **Strategies for Preservation of Electronic Information Resources in Academic Libraries in Nigeria**

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doi: <https://doi.org/10.37745/ijliss.15/vol9n35062>

Published April 23, 2023

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**Citation:** Olubiyo P.O. and Olubiyo L.M. (2023) Strategies for Preservation of Electronic Information Resources in Academic Libraries in Nigeria, *International Journal of Library and Information Science Studies*, Vol.9, No.3, pp.50-62

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**ABSTRACT:** *Modern academic libraries preserve collections that include not only printed materials such as, books, periodicals, newspapers, and magazines, but also electronic resources such as art reproductions, films, sound and video recordings, maps, photographs, microfiches, microfilms, CD-ROMs, computer software, online databases, and other media. In addition to preserving collections within library buildings, modern academic libraries often feature telecommunications links that provide users with access to information at remote sites. Digital preservation, in this context is the process of giving electronic information resources long life. Preservation of Electronic Information Resources is essentially a way of preserving the functionality of and access to digital information which might otherwise be lost due to technological obsolescence, therefore, migration and other methods of preserving electronic records can be adopted. Migration is a set of organized task designed to achieve periodic transfer of digital materials from one hardware/software configuration to another or from one generation of computer technology to a subsequent generation.*

**KEY WORDS:** strategies, preservation of electronic information resources, academic libraries, Nigeria

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### **INTRODUCTION**

Traditionally, university libraries provide access to both print and electronic information. In recent times, university library patrons have developed preference for electronic information resources over print information resources due to the ease of use and their convenience. This has compelled university libraries to increase their electronic information resources for their users in order to

maintain continued patronage of their services, thereby sustaining their relevance in this electronic or digital age (Friday and Eze, 2022).

Provision of electronic information resources as a concept, is described by Chandwani, (2006), Okongo (2014) as cited in Igbo, Ibegbulam, Asogwa and Imo (2022) as functions through which librarians and other information professionals assist information seekers to have access to information using electronic infrastructures. This implies a paradigm shift in a library's traditional mode of operations with emphasis on online provision of access. The aim is to enhance easy access to information without the restrictions of time and location. Numerous benefits abound in the provision of electronic information resources in libraries. Without doubts, students are offered the opportunity of being better exposed to academic materials which invariably enhances their academic performance.

In the light of these development, Bigirimana et al., (2015); Malanga and Kamanga, (2018); Masenya and Ngulube, (2019); Wells and Scellenbach, (2015) in Igbo, Ibegbulam, Asogwa and Imo (2022) expressed that no library can expect to remain relevant should it continue to depend solely on the traditional mode of service provision characterized by physical interaction between the librarian and library user. The result is that, globally, libraries are responding by redefining their services to meet new expectations. Some of the responses by libraries include the addition of a ubiquitous and networked environment as an extension of traditional library services, changes in the collections to include digital formats, changes in the method of delivery of services (to include online modes) using social media platforms, e-mail, chat services, among others for electronic information provision.

Khan et al., (2016), Woody et al., (2010), Anasi, (2012), Uwaifo and Azonobi, (2014) in Igbo, Ibegbulam, Asogwa and Imo (2022) expressed that, today, most students use the internet to source their information and the perception of the library as a physical place has changed to include virtual space due to the opportunities offered by the digital information landscape. To the library as a system, benefits of using electronic information resources include: cost-effectiveness, minimizing of space and reduction in user-traffic, multiple and simultaneous remote access to digital information, reduction in physical deterioration of library books and journals, enhancing distant learning programmes and promoting resource sharing. In addition, the possibility of digital access to information supports elimination of the digital divide, increased use of information, improved communication and timely access to information which enhances information exchange and search, and information manipulation. Hence, provision of digital information is an essential part of the improvement of quality of service of today's libraries because such information can be shared, accessed, utilized, and exchanged faster and made available to numerous individuals at the same time irrespective of location.

Preservation of deteriorating electronic information resources in libraries has become a global phenomenon to which academic libraries must aggressively respond if their mission of providing information needs to their patrons is to be achieved in this era of dwindling budgetary allocation which the libraries received in the present economic recession dispensation. The aim of electronic information resources preservation programs is to maintain and preserve information materials accordingly to aid their use and their significance. Preservation of information resources is an important aspect of library and information management. Their importance and necessity are more paramount in countries where resources are limited like Nigeria and libraries need to balance up with the needs of an ever increasing number of users hoping to use them (Ogar 2020). Thus, Ogar (2012) in Ogar (2020) noted that degradation of electronic information resources, especially have been in existence for some decades but have escalated drastically. He added that Librarians and information practitioner must declare a state of emergency on the rate of degradation of their collections, in other to ameliorate the situation. However, in spite of the awareness and technological advancement in the field of preservation there seems to be more materials degrading especially in the developing countries (Ogar 2020).

Igbo, Ibegbulam, Asogwa and Imo (2022) expressed that this is rather worrisome as situation was corroborated by pre-research observation made by the researchers which revealed that indeed many university libraries in Nigeria have Websites while some others have online databases, Web-OPACs, institutional repositories, subject portals, and links to electronic resources like e-books, e-journals, e-theses and dissertations. With all these in place, the expectation is that academic libraries and librarians will be able to provide users with remote or real time access to digital information services through e-mails, Ask services, chats, instant messaging, FAQs, and other related digital platforms, however, the preservation problem have affected their services.

### **Information and Communication Technology Resources in Libraries**

The convergence of computers and telecommunication technology has popularized the electronic generation and access to information. Consequently, different technological applications are now created in order to support the operational activities of human life and organization. As a result of this, users are now expected to be computer literate to enable them explore information resources in the library. ICT is mainly concerned with the storage, retrieval, manipulation, transmission or receipt of digital data. It includes all types or components of technological tools used to provide, store, disseminate and retrieve information for effective library service delivery. The tools include internet, personal computers, scanners, printers, CD-ROMs, flash drives, floppy diskettes, photocopies, fax machines, audio/video tape players, digital projector/screen digital camera and T.V (Anyagou, 2007).

Similarly ICT was explained as Combination of computers, ancillary equipment, software, hardware services and resources inter-connected together to form network that is fused in the acquisition, storage, manipulation, management, movement control, interchange, transmission or

reception of information. It is an umbrella term that includes all the manipulation and communication of information. Information and Communication Technologies encompass any medium to record information (magnetic disk/tape, optical disk, CD/DVD, flash memory etc and arguably paper records); technology for communicating through voice and sound image microphone, camera, loud speakers and telephone to cellular phone. It also includes a range of technological equipment such as computers, mobile telephones; MP3/MP4/WMA, storage devices, file transfer protocols, satellites, World Wide Web etc are used for information exchange among people for different purposes. These devices are capable of both synchronous and asynchronous communication format, and the most advanced of these technological application is the concept of multimedia, which refers to teaching and learning devices that include a combination of data manipulator e.g. video, CD ROMs, floppy disks e.t.c which facilitate interactive communication between and among researchers ( Akinola, 2011).

Achebe (2005) categorized ICT into five broad groups as follows: Capturing technologies (e.g. keyboard, touch screens, voice recognition system, image scanner etc). These technologies help researchers to send in their data to the system for processing, while storage technologies (e.g. floppy disks, smart card, magnetic tapes, disc e.t.c.) enable them to get from the system what data have been stored into the storage devices for use at a convenient time. Processing technologies comprise the system and application software while communication technologies are meant to display the captured object or information (e.g. Digital video, disc, CD ROM drives, audio CD, printers, computer display screen).

In this digital age, university libraries and other academic libraries are shifting from traditional to electronic library services. Libraries now make use of ICT to capture, process, store and disseminate information for users' satisfaction. Students, staff and other researchers make use of web pages, e-mail, CD ROM, electronic journal in library for research and other activities. Thus, Postgraduate students have access to internet at various points such as knowledge retrieval center (library), computer center as well as the department and departmental laboratories. Consequently, they can now access a wide range of e-journals in various academic disciplines. Such access includes full text journal articles, abstracting and indexing services (Patil, 2012). Obviously, the present demand of a good research student has transcended the norms of black and white (paper) only. Researchers are becoming advanced in retrieving information from electronic medium. Definitely the use of ICT has been of immense help in successful completion of a good research. In the light of this, accelerated, adoption and use of information and communication technology (ICT) has resulted in the globalization of information and knowledge resources (Islam and Islam, 2007).

Globally, university libraries are embracing the use of information and communication technology (ICT) because their collections are large, information demand is high; users are diverse and fast service delivery is expected of them. The avalanche of information sent online daily are the

ingredient for research and university libraries should no longer operate without ICT due to the volume of the information. For proper management, Nworu and Enwereuzor (2006) pointed out that the application of basic information technology and system to meet the expectation of modern users, whose focus have turned world class, has become imperative. In essence, any university that wants to be relevant and up to date in this information age must be ICT-friendly. However, any attempt to sideline ICT will render such a library archaic. Thus, it is very important for universities to ensure that their library maintain credibility in the provision of ICT to meet the researchers' needs. With installation of ICT in the library, there will be simultaneous access for many users and self-service might become encouraged. And for library users to explore the ICT resources that are available in the library, they need to possess the required skills. Essentially, it is the skill they possess that will complement the technology the library has provided for maximal result and satisfaction. More so, the acquisition of such skills can be of immense benefit to them later in life.

Tella...et al. (2007) in Okello-Obur and Ikoja-Odongo (2010) affirmed that the students' ability to find and retrieve information effectively is a transferable skill useful for their future life as well as enabling the positive and successful use of the electronic resources while at school. They noted that in this digital era, any student at higher level who intends to be an achiever should have the ability to explore the digital environment. Postgraduate students especially, are increasingly expected to explore electronic information resources while at the university because they are the pacesetters in research among the generality of students. Therefore, students who are using the growing range of electronic resources must acquire and practice the skills necessary to explore them. They must have the ability to surf web and know the relevant websites that are useful to them. They are also expected to have the basic knowledge of computer applications. Equally, other technological tools must not be strange to them. This has a lot to do with their research work or other basic academic exercises.

Practically, ICTs have made resource sharing and online academic friendship easier. Users always want to consult information from the online environment, particularly the World Wide Web (www) to unlimited sources of information globally and ICT has provided the solution for the problem of delay in information access and use. Subsequently, it has made information sharing effective and efficient. For instance, global satellite mobile (GSM) phone can be used for communication or information exchange among researchers to save the cost of traveling a long distance.

In support, Aliu (2007) stated that internet has made it possible for people to discuss and share information the same time regardless of time, space and distance constraints. The use of internet can help to avoid duplication of research work to be carried out on related disciplines and title. On the same note, Okiki and Asiru (2011) writing on the importance of internet stated that student offering correspondence course in Africa have the benefit of the use of e mail and world wide web

to embark on postgraduate studies on line. Consequently, time and distance is no longer a barrier to research because at any time of the day, contact can be made to gather the needed information from anywhere in any part of the world.

### **Strategies to Preservation of Electronic Information Resources in Academic Libraries**

Preservation of library resources has been defined by Akporhonor (2010) in Idoko and Onwudinjo (2021) as the totality of steps necessary to ensure the permanent accessibility of any particular material forever. It can be seen as the maintenance of library and information materials so that they can be closed to the original condition as much as possible. Preservation of information resources refers to all necessary strategies, measures and steps taken to prolong the lives of library and information resources.

Modern academic libraries as stated by Ikegune (2016) in Idoko and Onwudinjo (2021) preserve collections that include not only printed materials such as, books, periodicals, newspapers, and magazines, but also electronic resources such as art reproductions, films, sound and video recordings, maps, photographs, microfiches, microfilms, CD-ROMs, computer software, online databases, and other media. In addition to preserving collections within library buildings, modern academic libraries often feature telecommunications links that provide users with access to information at remote sites. Digital preservation, in this context, can be simply defined as the process of giving electronic information resources long life. Musa and Safiyanu, (2015) in Friday and Eze (2022) expressed that Digital preservation can be explained as the act of securing digitized and born-digital information resources for a long time so that they can be accessed and used again.

Electronic resources in the University libraries, not properly protected against technological modification may undergo challenges in the future. This may occur as a result of advancement in information and communication technology (ICT). Electronic Resources have become the trend in Libraries and Information Centres across the world today. These resources are said to have more advantage over their physical counterparts. E-resources guarantee reduced space, accessibility and management. The objective of electronic resources preservation is the perfect interpretation of valid contents over time. Preservation of electronic contents has become an issue in University libraries. Therefore, there is need to ensure the sustainability of electronic resources through proper preservation, even though it has been realized that the preservation of electronic resources is not as simple as the printed materials due to non-availability of appropriate criteria relating to the format and media type (Ilo, Fagbohun, Idiegbeyan-Ose, Esse, Nwokeoma, Adebayo, Olawoyin and Osinulu, 2018). However, there are appropriate strategies for the establishment of implementation that will certify a stable, accessible and long term preservation of electronic materials for future use (Ilo, Fagbohun, Idiegbeyan-Ose, Esse, Nwokeoma, Adebayo, Olawoyin and Osinulu, 2018).

Since Electronic Information Resources (EIRs) deteriorate differs from other print resources in the library, so also are the techniques and strategies for its preservation and conservation differs. Some of these techniques as identified by Sawant (2014) in Adetunla and Agbetuyi (2018) are explained as: back up, refreshing, emulation, migration, conversion to paper format, preservation metadata, and encapsulation. Back up, as a procedure involves copying and storing contents in multiple locations to create availability and ready replacement of information in the case of failure or other catastrophe of EIRs. Also, refreshing technique is the periodic copying of EIRs to new storage media. It is a short-term preservation technique for copying information to new media before the old media becomes unreadable. On the other hand, Emulation is a strategy for long-term preservation of EIRs. Here, old media are mimicked into new media environment. The digital archive will be able to pick the resources itself.

According to Sawant, (2006) in Adetunla and Agbetuyi (2018), preservation of EIRs is essentially a way of preserving the functionality of and access to digital information which might otherwise be lost due to technological obsolescence. Migration is a set of organized task designed to achieve periodic transfer of digital materials from one hardware/software configuration to another or from one generation of computer technology to a subsequent generation. Thus, Iyishu & Nkanu, (2013) in Adetunla and Agbetuyi (2018) explained that EIRs can also be converted to paper format through printing, photocopying and scanning again and this hard copy would be kept. This approach is however limited as digital objects become more complex and could contain features that can only be preserved in digital formats. Preservation metadata is another technique. It is highly useful for long – term preservation of EIRs. Metadata is data associated with objects which relieves the potential users of having to have full knowledge of their characteristics.

Another preservation strategy as stated by Sawant, (2006) in Adetunla and Agbetuyi (2018) is encapsulation which involves the grouping together of resources and whatever is necessary to maintain access to it. In contrast to the migration approach, the encapsulation approach retains the record in its original form, but encapsulates it with a set of instruction on how the original should be interpreted. Encapsulation is considered a key element of emulation. Nevertheless, in preserving electronic or non-book resources, the use of air-conditioners, fans and windows in ensuring good air circulation is highly recommended. This is because electronic resources are particularly sensitive to the effect of ultra violet, light and heat. It therefore means that many of them, if not all, should never be shelved near a window or expose to heat of light levels within the library and should also be controlled using appropriate techniques including the use of blinds and curtains to reduce ultra-violet rays of sun and the use of fluorescent UV-filters. Fumigation is also acknowledged as one of the best management techniques for preservation of electronic or non- book materials or fragile documents in the library and archives.

Furthermore, digitization is another way in which electronic and non-book materials are being preserved for posterity in library and archives (Idoko and Onwudinjo, 2021). According to

Ikegune (2016) in Idoko and Onwudinjo (2021), many institutions and libraries have undertaken projects to exploit the potential of digitizing technology for displaying and researching unique and fragile materials. Many institutions prioritize electronic collections for digitization because of their value.

Ikegune (2016) in Idoko and Onwudinjo (2021), found that library software, database computer hard drive, compact discs are commonly available in the three universities libraries surveyed, with library software having the highest. It was also found that the commonly used technique in management and preservation of these electronic resources in their libraries are cleaning and dusting, shelving of electronic resources or non-books for free flow of air and adequate security. Thus, cleaning and dusting were the most frequent techniques used in the preservation and management of electronic resources or materials.

In preserving digital materials in the library, certain strategies are being put into consideration. UNESCO (2003) in Nworie (2019), in adopting strategies for preserving digital heritage stated that, Strategies and policies to preserve the digital heritage can be developed, taking into account the level of urgency, local circumstances, available means and future projections. The cooperation of creators, holders of copyright and related rights, and relevant institutions in setting common standards and compatibilities, and resource sharing, will facilitate this. The preservation strategies stated by UNESCO in their charter (2003) in Nworie (2019), for preservation of digital materials in data carriers/ storage media are:

- a. Let the institution, government, organization, individual etc decide on the format that will be accepted for preservation. If possibly, negotiate with producers to use widely accepted standards and to provide adequate documentation
- b. Store media / data carriers in appropriate conditions
- c. Copy data to more stable media and make back-up copies, using good quality media
- d. Store data securely, including offsite storage for backup if possible
- e. Check data for errors regularly
- f. Establish a data refresh regime suited to the life of the media
- g. Record information that will be needed to provide short term access – the identity of the material, access requirements, passwords etc
- h. Retain necessary access equipment and software, maintaining hardware and protecting software within license arrangements
- i. Plan to pass the digital materials to another suitable care taker, that is, liaising with other institutions who have similar interest or responsibilities or experience in preserving or managing the kind of materials that you are interested in and seek guidance and mentoring
- j. Alternatively, find ways to adequately reflect the material in a stable non digital form (such as printing out).

For data on web pages (websites, online databases, emails, correspondences, web blogs, etc), these are the guidelines noted by UNESCO (2003) in Nworie (2019):

- a. Allocate responsibility to a skilled and trained staff to manage the data
- b. Protect data by using third party service providers to continue to maintain access online
- c. Plan to continue to provide access to users in case the service providers services are no longer available
- d. Copy data out to a more secure storage media for adequate back up
- e. Transfer data to a new or refreshed carrier without loss.

Also, Ilo, Fagbohun, Idiegbeyan-Ose, Esse, Nwokeoma, Adebayo, Olawoyin and Osinulu (2018) expressed the different ways of preserving electronic information resources. It is as listed below:

- Medium refreshing–It is copying digital files from one storage medium to another medium. The condition of the storage media is examined periodically by an auditing application
- The hardware/storage media are periodically swapped with a new, recent and healthy alternative.
- Electronic information resources are duplicated in multiple copies.
- All preservation system within the federation is linked with distributed environment.
- An emulation application is used to simulate the function of old computer environment. Besides, the original programme can be performed in the emulation application.
- Required hardware/software is preserved for accessing and manipulating digital information from the old storage medium
- The format requirement is entrenched with the digital information. The preservation system develop new software in terms of the stored format specification
- The electronic information and the required software are transformed to a set of particular commands, which can be translated by a virtual computer.
- The preservation system periodically transforms the old formats to new formats
- Digital materials are transferred from one hardware/software configuration to another.

Various strategies of electronic records preservation abound in literature Ngoepe and Van Der Walt, (2009); Electronic Records Management, (n.d); Ifijeh, (2014); Kavishe and Dulle, (2016) in Ilo, Fagbohun, Idiegbeyan-Ose, Esse, Nwokeoma, Adebayo, Olawoyin and Osinulu, (2018) as far back as in the 1990s, each with its peculiarities. Some of these strategies include: migration, emulation, cloud computing, institutional repository and conversion. Migration is the process of transferring electronic data/information from one technology to another, without losing its properties. This means that a particular library moves its 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 is however maintained. It is a good method through which libraries can ensure that the preservation of electronic resources.

According to the above researchers, in a bid to solve the challenge of losing some complex data during the process of migrating from one system to the other, some researchers came up with emulation. Emulation is the process of mimicking the hardware of older versions of a technology that are compatible with a new technology to access electronic data. Emulation is the process of preserving the old environment of electronic records by using latest technologies, mimicking the original environment that was used to create the records. This will technically ensure that no data is lost in the new technology environment; this way, a new technology is used without losing the old data. It was reported that emulation ensures the validity and integrity of electronic records and provides access to such in their original environment even though the technology has changed. Cloud computing is also a new technology through which libraries preserve electronic resources and records for posterity. It is maintained that cloud computing is one of the most effective strategies for preserving electronic records in the library.

Ngoepe and Van Der Walt, (2009); Electronic Records Management, (n.d); Ifijeh, (2014); Kavishe and Dulle, (2016) in Ilo, Fagbohun, Idiegbeyan-Ose, Esse, Nwokeoma, Adebayo, Olawoyin and Osinulu, (2018) expressed that electronic records are preserved through sharing or using applications and infrastructure in a network environment to achieve set goals without having concerns of its ownership, network management or resources. Institutional Repository has also become a valuable method for the preservation of electronic resources. It is an archive for the collection and preservation, as well as dissemination of intellectual materials emanating from faculty, staff and students of an institution. Institutional repository offers opportunity for the members of a university community to manage and disseminate electronic materials created by the community members of the institution. According to the authors, just a minor fraction of the libraries in Nigeria have repositories. Conversion is defined as the process of changing records from one medium to another or from one format to another when a record's format becomes obsolete as a result of the application becoming unsupported because the developer goes out of business and it is the oldest method of electronic data preservation.

### **Challenges to Preservation of Electronic Information Resources in Academic Libraries**

In spite of the need for the preservation of electronic resources in libraries, the efforts are hindered by challenges obvious in the area of planning. Planning is one of the initial crucial matters to consider when thinking of preservation. Planning entails that libraries will be ready to preserve their e-resources. Decision has to be taken on whether it will be outsourced or carried out in-house. If the decision is to have it done in-house, then, there will be need for Management to consider if there are sufficient members of staff to carry out the assignments. This is because electronic preservation will involve different skills and roles as well as availability of required infrastructure. However, if preservation of electronic resources will be outsourced, it will be necessary to consider the integrity of the outsourcing organization as part of planning. Sometimes, these issues constitute the bottlenecks (Ilo, Fagbohun, Idiegbeyan-Ose, Esse, Nwokeoma, Adebayo, Olawoyin and Osinulu, 2018).

Lack of prerequisite experience also hinder preservation of e-resources. According to Ngoepe and Van Der Walt,(2009), Lamidi, Alafiatayo and Dangwaran,(2016), Ogunmodede and Adefunke, (2013), Osunride and Adetunla, (2017) in Ilo, Fagbohun, Idiegbeyan-Ose, Esse, Nwokeoma, Adebayo, Olawoyin and Osinulu, (2018) the technical expertise is needed for the preservation of electronic e-resources in Africa. In their studies it was reported that there was a need for specialized training in electronic information resources preservation techniques. There is the lack of skill and expertise in the act and training of electronic records preservation, especially in Africa as compared to America and Europe. Technological hardware and software are not static neither are data formats. This will mean that libraries will keep upgrading their systems to meet up with the changes. This could pose a very big challenge for libraries especially with the meager budget Nigerian libraries have to operate with. Its either libraries preserve their digital records themselves, putting in place the infrastructure, manpower and the technical skill involved or they outsource it and pay the bill. It is very crucial to consider where to preserve digital information. The file format that is not software dependent is recommended for adoption in saving electronic record to overcome the challenge of format obsolescence. Preservation of information resources is an expensive venture which requires proper funding.

Digitization, and preservation of both digitized and born digital records entails acquiring or accessing infrastructure, cloud computing processes among others are all capital intensive processes, yet library funds are inadequate. It was also reported that the major constraints to preservation of records in academic libraries is lack of funds and storage facilities, still part of offshoot of lack of fund. To preserve electronic resources, libraries must have some level of automation to generate electronic records, have qualified technical and professional staff and access either by acquisition or otherwise. This is a challenging task to academic institutions in Nigeria.

Also, according to Jimada and Aduku (n.d) There is a study that revealed that the predominant challenges militating against successful preservation of digital information resources were lack of digital preservation policy, inadequate power supply, unskilled professionals, technological obsolescence, poor maintenance culture, technophobia, storage media degradation, inadequate funding, changes in technology and inadequate infrastructure which require Continuous Migration of which was stated in Adetunla and Agbetuyi (2018). Another challenge of digital preservation, which arises from the challenge of rapid technological obsolescence, is the need for continuous migration. Migration is a means of overcoming technological obsolescence by transferring digital resources from one hardware/ software generation to the next.

Hence, Rotenberg, (1999) as cited in Adetunla and Agbetuyi (2018), it is an organized task designed to achieve periodic transfer of digital materials from one hardware/software configuration to another or from one generation of computer technology to a subsequent

generation. Migration then becomes a challenge in preservation and conservation of EIRs because the migrated version of a document is never the same as the original resource.

## CONCLUSION AND RECOMMENDATIONS

Information age, though with its many prospects, has resulted in information overload. This is as evident in the creation of large electronic information formats which include emails, social networking websites, e-journals, e-books and databases. The form and content of electronic resources and records are liable to change from time to time. Therefore, it behooves librarians to ensure that electronic records are properly preserved to ensure continuous sustainability (Ilo, Fagbohun, Idiegbeyan-Ose, Esse, Nwokeoma, Adebayo, Olawoyin and Osinulu, 2018). It can therefore be recommended that library stakeholders should network together to ensure electronic resources are well preserved for continuous use.

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