



Digital preservation of health records in tertiary hospitals: implications for health information management in Nigeria

Ruth Onajite Owolabi¹, Idayat Odunola Agboola², Susan Oguiyi³

¹Department of Information Resources Management, Babcock University, Ilishan-Remo, Nigeria; ²University Library, Federal University of Technology Abeokuta, Nigeria; ³Babcock University Library, Ilishan-Remo, Nigeria

Corresponding author: E-mail: owolabir@babcock.edu.ng

ABSTRACT

Digital preservation of health records is very essential in every facet of the health institution. This is especially at the tertiary hospitals as it allows for easy access and easy retrieval of patients' health records and for future references when required. Health information management (HIM) professionals are trained to create and preserve patients' health records in different format because of the sensitive nature of those records. Tertiary hospitals are known for the specialized service provided and they form the zenith of healthcare delivery. Health records are generated daily at tertiary hospitals in Nigeria in large amount as such occupies large storage space that can be cumbersome to retrieve by HIM professionals either for continuity of patient care and for secondary purposes. Reported cases of missing or misplaced health records have been attributed to inadequate storage space and preponderance of paper-based health records systems resulting in inefficient records management and ineffective health care service delivery. The preponderance of paper-based health records poses a great threat on the performance of the physician and other healthcare providers therefore; health records generated at this level require close monitoring and preservation. One of the ways to curb the prevailing paper-based is through digital preservation which is the process of converting existing health records from its conventional form into digital form to ensure the document retains its original form. It can also be achieved through the adoption of electronic medical records and provision of IT equipment. Digital preservation could be achieved in tertiary hospitals through strong hospital management support. This will ensure availability of appropriate IT infrastructure and adequate training of HIM professionals in retaining inactive and active health records into electronic form for easy access. It will also save physical storage space and time required to access patients' health records for continuity of care, which may relatively transform the healthcare industry in Nigeria.

Keywords: Digital preservation; Electronic medical record; Health records; Preservation, Tertiary Hospitals; Nigeria

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INTRODUCTION

Hospitals are known for the unique functions of providing treatment and relief for sickness and diseases. Physicians and other healthcare professionals provide astute services to

patients by generating records at regular intervals of patients' interaction with the care givers in the hospitals. Hospitals provide an indispensable service by ensuring restoration of patients' health through treatment and follow-up on schedule. In

order to provide quality service to patients especially in the treatment of complicated cases, patients are referred to tertiary hospitals that handle complicated conditions effectively and efficiently. There are three levels of healthcare delivery in Nigeria; the primary, secondary and tertiary health care levels. For the purpose of this paper emphasis will be placed on tertiary hospitals. Tertiary hospitals are known for specialized treatment rendered to patients' with complicated issues that cannot be managed at the primary and secondary levels. Examples of tertiary hospitals in Nigeria are teaching hospitals, federal medical centres, specialist hospitals and the National hospital. A typical tertiary-level hospital has specialist physicians, other highly trained and motivated healthcare providers, equipment and units. For example, cardiologist in heart clinic, intensive care unit, accident & emergency unit and specialized imaging units; clinical services highly differentiated by function; could have teaching activities; size ranges from 300 to 1500 beds¹.

Other specialties in tertiary hospitals include: obstetrics and gynaecology, pharmacy, dental surgery, paediatrics, histology, pathology, psychiatry, physiotherapy, virology and health information management departments for the treatment of special cases. These units enlisted reveal the nature of duties discharged at the tertiary hospitals with lots of specialized activities ranges from the laboratory test, x-ray, pharmacy, billing section and health information management, which generates and preserve patients' health records. The aforementioned departments in tertiary hospitals have distinctive functions to ensure quality service experience during patients' visits to the hospitals. Tertiary hospitals are to provide adequate teaching, medical research, and education & health care services. All these cannot be achieved without a well-organized, effective and efficient health information management

department². The challenges of health records management such as misplacement and difficulty in retrieval for continuity of care has become a great concern in tertiary healthcare therefore; this paper discusses the health records strategy of digitizing the records, its benefits and challenges.

Concept of health records

Health records generated in tertiary hospitals are much thus occupying large storage space compared to records generated at other levels of health care system. This overwhelming increase in health records at tertiary hospitals could be attributed to increased patronage, large population of users and the diverse specialized cases handled at this level of care. Records generated at this level require conscious effort by health information management (HIM) professionals to preserve over a long period. The American Health Information Management Association (AHIMA) referred to health records as the principal repository (storage space) for data and information about the health care services provided to an individual patient. This record documents, who?; what?; when?; where?; why?; and how of patients' care³.

Conventionally, health records are paper based with patients' name written on the folder as means of identification before shelved. The frequency of patients' visit to the hospital will directly lead to growing volumes of paper records. In addition, health records that existed in paper, images, sounds and graphic have the prospect of occupying large storage space, decay and get missing easily. To reduce the menace of misplacement of patients' folders, wearing and tearing as a result of time lag and uneven-growing-end of health records could be preserved when digitized. Digital preservation is the process of maintaining a digital object for as long as required, in a form which is authentic and

accessible to users⁴. Over the years, it has been observed that most tertiary hospitals preserve patients' health records in folders on a shelf or drawers which expose patients' identifiable information to the third party as a result of inadequate security of the document. Also, the tertiary hospitals may likely run out of storage space to preserve health records which calls for the urgent need to develop a means of preserving large volume of information through digitization.

Concept of digital preservation

The world is going digital and as such, making available vast array of data in a portable and compressed form. Document that should have occupied a vast expanse of area is now available in a digital form and saving lots of space in good and conducive work area. Health records occupy large storage area and to reduce the space requires digitization of these records in order to provide good avenue for preservation. Digital preservation is processed in a closed environment to keep safe and accessible information on the long-term⁵. Digital preservation refers to all of the actions required to maintain access to digital materials beyond the limit of media failure or technological change. Digital preservation is the process of maintaining digital object for as long as required, in a form which is authentic and accessible to users⁴.

Digital preservation is also referred to as the process of maintaining and managing digital object for future use. Digital object in this context is the electronic health records because it has been converted from manual and made available in digital form. Strategies are made to preserve digital information for long-term use. It was discovered that digital preservation has to comprise routines and strategies to protect digital assets against unauthorized or unintended changes detectable and to document all authorized required

changes carried out as part of the digital preservation strategy in the metadata⁶. Digital preservation involves the management of digital information overtime to ensure its longevity and accessibility as required.

Digital preservation process is expected to be ongoing and should not be allowed to fade out with the trend of new technology. Digital preservation is long-term efforts which require sufficient allocation of financial, human, and technological resources⁷. It is important to put into consideration when planning digitization to develop or purchase software that can stand the test of time with longevity. Advance and progression in technology has made documents saved onto floppy disk obsolete therefore, in preserving health records digitally requires the use of format that can be accessed after a long period of time. Digital materials, regardless of whether they are created initially in digital form or converted to digital form, are threatened by technology obsolescence and physical deterioration⁸. Digital preservation can also be seen as the series of managed activities necessary to ensure continued access to digital materials for as long as necessary⁹. Every activity required in the preservation of health records in digital form after a long-term is referred to as 'Digital Preservation'. The paper-based health records is converted into digital form when it is scanned and saved in format that can be retrieved digitally either through the use of computer or other means. Digital preservation of health records entails the continuous maintenance of the content and managing it to ensure that the format the health record was digitized does not become obsolete.

There should be adequate preparation on the preservation techniques to adopt in preserving health records in order to keep abreast of modern technology and update the data stored digitally. Preservation of health records in some virtually

tertiary hospitals in Nigeria is in its growing stage. In African context, it is seen that access to health records is chaotic. In a South African study of public health systems, access to patients' medical histories was not always possible¹⁰.

Factors to consider before embarking on digitization of health records

There is need to consider the technology, organization and the available resources when planning to digitally preserve health records. Organizational infrastructure to be considered requires the mission statement of the establishment, policies and procedures expected to ensure adequate preservation of digital information, the authority and management of the health records with the effective implementation. Technological infrastructure needs adequate consideration and attention like: digital collections, archival storage, storage practice, obsolescence, depository, depository development, security, and its compliance with regulatory body. Resources referred to that availability of sustainable funding, staffing, administrative structure for its long-term value⁶.

Ways of digitizing health records digitization

1. by installing affordable scanners to the different tertiary hospitals;
2. Storing health records using the right format like pdf, jpeg, documents in Microsoft word to enhance access and retrieval and to convert every health records in paper form-to-digital by uploading in to existing system.
3. Every tertiary hospital is expected to develop policy on security, access and use to prevent every form of illicit access. The policy should be in line with Health Insurance Portability and Accountability Act of 1996¹¹.

4. The inactive health record of patients' can be digitally preserved by scanning and either retaining the original copy or discarding. Also, the health record digitally preserved will prevent deterioration of the document and allows for easy access and retrieval overtime.
5. Furthermore, active records of patients can be preserved into the tertiary hospital database to prevent duplication of health records in hard and soft copy. The act of preserving health record digitally will prevent redundancy and create space for other things in the tertiary hospital.
6. The health record is directly entered into the hospital database as the patients' visit the physician for treatment and medical check-up.

Requirements for digitization

In accomplishing digitization of health records requires the conversion of conventional health records into digital form by setting out time to scan and save the document on platforms that can be easily maintained, managed, accessible and retrievable over time by the tertiary hospital management.

The software available to promote effective digital health records preservation are¹²:

1. eclinicalworks: to provide customized health records management.
2. EpicCare EMR: HER software to organize patient data using order management and chat review tools.
3. Allscripts Professional EHR: it is designed to mimic practice workflow, while its simple navigation mirrors a physician thinking process.
4. iPatientCare EHR: relays patients information over secure, HIPAA compliant

wireless networks to leading handheld devices.

5. EHR 24/7: EHR solution that offers features such as eprescribing, scanning, dictation, customizable SOAP notes and more.

Digital preservation of health records

A study emphasized that digitization is a process of converting a diverse form of information such as text, sound, image or voice into digitized format¹³. Health record is converted into digital form when the hospital decides to convert the service delivery into electronic. This include converting the active, semi-active, and inactive patient files into electronic form by scanning, typing directly patient entry details, the storing using a portable document file (pdf) to ensure easy access and retrieval. Digitization is categorized into three which are long-term preservation, medium-term preservation and short-term preservation. The Long-term preservation allows for continued access to digital materials, or at least to the information contained in them, indefinitely. Medium-term preservation ensures continued access to digital materials beyond changes in technology for a definite period of time but not indefinitely. The short-term preservation allows for access to digital materials either for a defined period of time while use is predicted but does not extend beyond the foreseeable future and/or until it becomes inaccessible because of changes in technology⁹.

In an attempt to preserve health records, the content of the folder containing the patients' health records are digitized. The digital object in this instance is the individual clinical record that is contained in the patients' file over the period of the file existence. It is the digital object digitized that is preserved. Therefore, digitization allows for

the preservation of health records in digital format. Health record digitization could be started by training the HIM professionals on the benefits of digitally preserving health records and the process involved in the accomplishments. Digitization process involves personnel, resources, funding and infrastructure. All these should be put in place before embarking on digitization of health records.

Implementation of digital preservation of health records in tertiary hospitals

The health records are converted into a digital form in a way that could be easily accessed and retrievable by authorized users. There are processes required in preserving health records which is the conversion of inactive patient files. This is achieved by digitally archiving newly inactive files, when clearing shelves of inactive patient folders, one can scan documents and store them in a digital archive, the paper charts could be disposed after scanning, making information available on site. New and active patients' files require a progressive plan to introduce digitization into normal office workflow by converting contemporaneous paper records as they enter the system. One can as well start new patients' health records with digital files and can also create a digital record for each new patient by uploading patient enrolment forms digitally. These include insurance information, and initial encounter forms to existing practice management system that will be added to the digital record on subsequent visits. All incoming paper should also be digitally preserved^{3,14}. Important forms like insurance cards, encounter forms, and other information in custody of the tertiary hospital should be scanned to the patient files.

Benefits of digital preservation in tertiary hospitals in Nigeria

There are several benefits attached to digitization and digital preservation of health records, this include:

1. the exploration of different health records of different patients' at the same time.
2. make available health records that would have taken a whole day to identify located at a click without stress by the user.
3. It allows for easy access and retrieval of health records by the physician and allows for the transfer of health records from one clinic to another to ensure consistency and follow-up on treatment.
4. reduces the paper utilized on daily basis.
5. It changes the services provided by the hospital to become paperless thus, physical storage space is reduced.
6. prevents illicit access to other patients' health record because of the security encryption on the tertiary hospital systems. When it seems like there is an exposure to patients' identifiable information there is a law guiding every patients and the patient has the right to sue whoever is found committing such an offense.
7. Mitigation risk is curtailed,
8. The issue of poor handwriting in clerking health records is eliminated,
9. duplication of health records are minimized, also,
10. misplacement and the damage that could occur by mishandling over a period of time becomes a bye-gone.
11. enhances the service quality to patients by providing a real-time service and increases the number of patients each HIM professional attends to at the same time.
12. Furthermore, Technobrain discovered that the new system led to a fast and speedy

search and retrieval of patient records which has helped in reduction of manual intervention during records retrieval process thus mitigating risks of records getting damaged, mixed up and duplicated with enhanced security¹⁵.

13. It is expected to enhance the service quality of HIM professional and physicians who make use of the health records frequently in the treatment and follow-up of clinical schedules.

Challenges of digital preservation of health records in tertiary hospitals in Nigeria

There are several challenges attached to digital preservation of which requires adequate consideration when planning for digital preservation. Some of which are:

- i. Obsolescence of software and hardware that is used for the preservation of the health records.
- ii. Inadequate technology and infrastructure required in the conversion of conventional health records into digital records.
- iii. Lack of funding and support by the government and hospital management on acquiring relevant technology to start-up the project.
- iv. Poor maintenance culture that could affect the sustainability and implementation of digital preservation of health records in tertiary hospitals.
- v. The security issue might be one of the threatening causes of digital preservation of health records in tertiary hospitals. This could be as a result of hacking into patients' personal identifiable information which could pose as a threat on the implementation of digital preservation of health records.

CONCLUSION

In conclusion, digital preservation of health record will prevent deterioration of materials over time thus making access and retrieval easier and faster.

Recommendations

1. The paper recommends that digital preservation be adopted and implemented in tertiary hospitals in Nigeria so as to facilitate harmonized health care delivery in the country.
2. The implementation will enhance the referral service provided by tertiary hospital thus allowing treatment from different part of Nigeria, where health records have been digitized.
3. In addition, digital preservation saves time of the physician thereby enhances the service quality of physician and health information management professional making services real time.
4. The paper also recommends that adequate security measure be put in place to prevent illicit access to patients' health records by encrypting the way database of health record is preserved to control access.

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Authors Contribution:

ORO conceived of the study, initiated its design, participated in literature search, article selection and review, data analysis and coordination and drafted the manuscript. AIO and OS participated in the design, literature search, article selection and review, data analysis and coordination and reviewed the final manuscript.