

Prospects and Challenges of Cataloguing in the Digital Age

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Abstract

The digital age offers technological support to cataloguers to simplify the processes of cataloguing of information resources. This paper investigates the prospects and challenges of cataloguing in the digital age. It uses the topology design to structure its major headings into stages, based on their importance and relevance to the phenomenon being discussed. Thus, after justifying the rationale for understudying the prospects and challenges of cataloguing in the digital age, this paper explores the nexus between digital age and cataloguing before explaining the major prospects of cataloguing in the digital age and finally discussed the challenges of cataloguing in the digital age. It concludes that digital age has unbundled the restrictions of availability of bibliographic records of information resources beyond the four-walls of libraries, which has driven cooperations and collaborations among libraries. Its main recommendation is that adequate IT infrastructure required for digital cataloguing should be made available in libraries.

Keywords: Prospects, challenges, digital age, cataloguing.

Introduction

Technological advancements have redefined the narratives of every profession. In Librarianship, it has caused systemic disruption penetrating every component of Library and Information Science practices premising on the notion of digital age. Digital age, according to IGI Global (2014), is the present development epoch in which economic, social and political activities or processes are driven by ICTs.

The 21st century has experienced a new term known as digital age. The digital age refers to the time-period in which personal computers and other subsequent technologies were introduced to provide users the ability to transfer information easily and rapidly. Digital age in Librarianship is the age librarians, library officers and other information providers have to meet users' requirement to find the information, irrespective of whether it is in print or digital form and whether it is held locally or on the web (Ede, 2001).

Digital age, according to Kamba (2020) is an era dominated by technological applications. The technological applications are products of information technology involving the study, design, advance development, accomplishment, support, or administration of computer foundation information system, mostly software application and computer hardware. It works with the use of electronic computers and computer software to renovate, defend, develop and broadcast information.

The digital age is the contemporary practices dominated and driven by ICT to reposition library operations and services. One of the operations of libraries and information centers perceived to be at vantage in the vortex of digital transformation is cataloguing. Cataloguing is the process of describing the physical aspects of information resources. It can also be regarded as the logical, systematic analysis of the physical components of information materials with the aim of using those physical components as details that can be used to describe, locate and retrieve the information materials (David-West & Angrey, 2018).

The physical components of information materials, which are known as bibliographic details include the title of an information material, author(s), place and year of publication, publisher, edition, series, ISBN/ISSN, etc. Knowing that cataloguing is one of the activities performed in libraries to enhance ready access to information resources resulted in the formation of many standards and principles hinging to harnessing digital devices for its preparations. Basically, the digital age has enabled cataloguers to describe the information materials in their libraries for both onsite and off-site library users. These types of cataloguing results into what is known as OPACs and WebPACs where users can have access to the bibliographic details of information materials

in the library, either through the Internet in the library building or somewhere else. This and other cogent reasons serve as the premise for this study to be investigating the prospects and challenges of cataloguing in the digital age.

Problem Statement

The technological supports the digital age offers to cataloguers have simplified the processes of cataloguing of information resources. Among the simplification that digital age brings to cataloguing are saving time in the physical descriptions of information materials, increasing the efficiency of cataloguers in cataloguing, reducing the numbers of backlogs of unclassified information resources, showcasing the level of competencies of cataloguers and contributing to the qualities of a library's services.

However, studies have revealed that interest in cataloguing in the digital age is waning. Technology from Sage (2023) reported that cataloguing is rated the 17th skills out of the 32 contemporary skills of librarians. Cataloguing in digital age is more challenging in most Nigerian libraries because of many factors including poor Internet bandwidth, inadequate digital skills of library personnel, technological anxiety, wrong perceptions of impact of technology on library activities, inadequate ICT infrastructure and technological obsolescence. It is the bid to address these problems that necessitates structuring this study to investigate the challenges and prospects of cataloguing in the digital age.

Objectives of the Study

The main objective of this study is to investigate the challenges and prospects of cataloguing in the digital age.

The specific objectives are to:

1. explore the relationships between digital age and cataloguing,
2. identify the elements of digital cataloguing,
3. identify the digital tools used for cataloguing,
4. identify the prospects of digital cataloguing, and;
5. identify the challenges of digital cataloguing.

Methodology

This paper adopts a conceptual approach to explore the available literature on digital age and its impact on cataloguing of information materials. Jaakkola (2020) opines that a typology paper provides a more consistent, coherent and explanatory set of types (Cornelissen, 2017) and accurate understanding of a phenomenon or concept, pinpointing and justifying key dimensions that distinguish the variants. The typology approach helps this paper in logically and causally discussing the nexus between cataloguing and digital age, prospects and challenges of digital age to cataloguing and makes appropriate recommendations based on the opinions and assertions of the existing studies.

Cataloguing and Digital Age

Information resources are information bearing entities enabling people to easily have access to documented information and utilised the information for people's desired purposes, ranging from educational, research, entertainment, financial, health and medical, etc. (Ajani, Amzat, James & Sulyman, 2023). The varieties of information resources call for proper descriptions which would make them to be easily identified, located and retrieved. These descriptions in Librarianship are known as cataloguing.

Ekere and Mole (2014) opined that cataloguing encompasses full bibliographic description of information resources acquired by the library, adhering to the established rules of the practices. Ensuring that the digital age impacts cataloguing and classification practices through computerization/automation of cataloguing practices has become a necessity (Akidi & Omekwu, 2019) so as to ensure that information resources are promptly and properly processed and made available for use nationally and globally.

Igere (2022) opined that the digital era/age has simplified the proper management of information resources in libraries which has culminated in efficiency in meeting the information needs of patrons. This responds to the assertion of Akidi and Omekwu (2019) that the digital age calls for the cataloguing community to implement the new set of rules known as Resource Description and Access (RDA), which was designed to improve flexibility in rules for dealing with the changing landscape in describing information resources and enhancing their accessibility.

New technologies require new skills. The digital age requires cataloguers to develop a new mindset to deal with the increasing complexity in cataloguing. Cataloguers must keep pace with the changing environments, managing materials in new formats, manipulating different metadata schemes and cataloguing for diverse user environments and audiences. The digital age cataloguers have to be multi-skilled, computer literate, able to operate different in-house library systems and able to use the online packages such as MARC 21 standard online, Web Dewey, Web LC and search interfaces (Obiozor-Ekeze, 2015; David-West & Wali, 2020).

Cataloging in the digital age encompasses the process of organizing and describing information resources in a digital environment. Traditionally, cataloging involved creating records for physical resources within libraries (Ivwhighrehweta, 2023). In the digital age, cataloguing has expanded to cover the description of digital resources such as e-books, online databases, websites, and multimedia content. Abdul, Usman, Ibrahim and Moh'd (2020) emphasized that it is indisputable that the digital age has substantially transformed cataloguing, due to changes in the formats of information resources and ICT environment. Abdul et al (2020) also argued that the creation of new types of information resources as well as new forms of communication as a result of digitization has a major impact on cataloguing.

Elements of Digital Cataloging:

1. **Metadata Creation:** Metadata, which includes information about the content, context, and structure of digital resources, is vital in digital cataloging. This can involve various types of metadata: descriptive (title, author), structural (chapters, sections), administrative (ownership, access rights), and even preservation metadata (format, long-term accessibility).
2. **Standardization:** Cataloging rules such as Resource Description and Access (RDA), Dublin Core, and Metadata Object Description Schema (MODS) are used for consistency and interoperability between different systems and platforms. These standards ensure that data is structured uniformly across different digital collections.

3. **Semantic Web and Linked Data:** Semantic technologies are increasingly utilized in digital cataloging to enhance the web of data. This involves making information more machine-readable, allowing for the development of linked data and the Semantic Web, where systems can better interpret and connect diverse data.
4. **Automation:** Tools and software are used for automating the cataloging process. Machine learning, natural language processing, and artificial intelligence assist in data extraction, matching, and even suggesting metadata for digital resources.

Digital Tools Used for Cataloguing

Digital technologies have redefined the traditional processes of cataloguing of information materials. Akidi (2017) and Kamba (2020) identified the following digital tools used for cataloguing:

1. **Computer Systems:** Computers are electronic device capable of accepting data (input) in the form of coded electronic signal, storing the data and applying prescribed processes to such data on the basis of a set of predetermined instructions called programs (Igwe, 2011). Igwe (2011) posited that computer accepts cataloguing and classification data fed into it using any of the input devices, such as keyboards, scanners, punch cards, etc., processes such data with amazing speed with a set of programs called instructions and supply the resulting new information in line with user's needs.
2. **The Internet:** This is the heart of the Information Age. It is called "the mother of all networks." It is a large computer network available to everyone with a microcomputer and a means to connect it. It is a worldwide computer network that connects hundreds of thousands of smaller networks. The network is made up of wires, cables, and satellites. Internet is used by cataloguers to connect with computers in different locations and access information resources on the web for physical description and subject analysis of information materials housed in other libraries.
3. **World-Wide-Web (www):** This is the multimedia aspect of the internet. It is often called the 'web'. It is the media inter-connected system of internet computers (called servers) that support specially formatted documents in multimedia form. The www is used by cataloguers and classifiers to access the websites or webpages of libraries and other

information centers, to evaluate or copy the catalogued or classified information materials housed in other libraries or cataloguing and classification services providers. Some webs used for cataloguing and classification include www.oclc.com, www.catalog2.loc.gov and others.

4. **Networking Technology:** Cataloguers used network to interconnect computers and other communication devices so that cataloguing and classification data can be transferred from one location to another instantly. This allows many catalogued and classified information materials to be accessed by users through the online public access catalogues (OPACs) or web-based online public access catalogue (WebPACs) held by a library or group of libraries.
5. **Library Management Software:** Software consists of the step-by-step instructions that tell the computer what to do. In a University Library, the most common computer software used are library automation software or Corel Draw. Many software packages for various applications in the field of library & information services and management are CDS/ISIS, SOUL, LIBSYS, KOHA and others are used for automation purposes and have cataloguing and classification modules.
6. **Open Source Software (OSS):** Open Source Software or the OSS is freely available computer software, which allows altering the source code and customizing the software to anyone and for cataloguing and classification purposes. In the last few years, we have seen the development of a number of ILS products in the open-source world such as Integrated Library Systems (ILSs) like Koha; Digital library software, like Greenstone; Digital Repository Software, like DSpace, etc.
7. **Printing Technology:** A printer is a device that converts computer output into printed images. There are a number of different kinds of printers used for catalogue cards such as Dot Matrix Printers, Laser printer, Inkjet, Bubble-Jet and others (Kamba, 2020).
8. **Barcode Readers:** These are optical scanners that can read printed barcodes, decode the data contained in the barcode to a computer. They can capture and translate barcodes into numbers and/or letters for translation by computer. Barcode scanners can be connected to a computer through a serial port, keyboard port or interface device called a wedge (Gómez, Mendez & Hernández-Pérez, 2016).

Prospects of Digital Age to Cataloguing

Universally, cataloguers have taken the advantage of the digital age to improve their cataloguing. Akidi (2017) affirmed that the impact of digital tools on cataloguing stems from the computerization of subject cataloguing, cataloguing-in-publication (CIP), data copying; online cataloguing; cataloguing on the web; and searching thesaurus online, which is another system of technology-based subject cataloguing. Nwosu (2013) submitted that in today's cataloguing, digital tools have changed the profile of what cataloguers and classifiers do, as well as their environments.

Digital age has allowed new features integrated into the cataloguing of information resources in libraries. Arinola, Adigun, Oladeji and Adekunjo (2012) also stressed the benefits of technological applications on cataloguing and classification by noting that it has brought a lasting relief to the stress of manual classification and cataloguing, which is prone to human error. Onuoha and Chukwueke (2022) posited that one of the prospects of digital tools to cataloguing is about efficiency and effectiveness in resource sharing, easy and increased accessibility, reliable storage, accuracy, resource availability, reduced duplication of efforts, cost-effectiveness (Arinola, Adigun, Oladeji & Adekunjo, 2012).

The digital age has also led to increased work productivity among cataloguers. Alabi (2018) stated that digital cataloguing in the University of Jos, Plateau State, Nigeria, have proven useful in increasing the number of books processed in the Cataloguing and Classification Section from as low as 5% to 50%. It has also empowered cataloguers to embark on integrated operations and resource sharing.

Onuoha and Chukwueke (2022) specifically identified resource sharing as an important prospect of digital cataloguing. They stressed that through technology-based resource sharing, cataloguing records are now readily available, and there is a serious reduction in effort duplication among cataloguers. Akidi and Okezie (2018) on their part affirmed that digital tools enhance effective bibliographic control of information resources, which can equally be seen in the areas of online

cataloguing, copy cataloguing, use of online public access catalogue (OPAC), production and use of machine-readable catalogue, among others.

Digital age has been an invaluable catalyst to the processes of describing the physical components of information materials in libraries. Among the prospects found in literature include:

1. **Seamless sharing of bibliographic data:** Digital age has significantly impacted the distribution of bibliographic data among libraries and cataloguers. For example, RDA systems can be redesigned for today's technical environment, moving libraries into linked data information discovery and navigation systems in the Internet environment (Abdul et al., 2020).
2. **Creating timely and high-quality records:** Digital age has facilitated the creation of bibliographic data without wasting the precious time of cataloguers. Not only that, the quality of bibliographic data is also ensured. The implication of this is that digital age has helped cataloguers overcome the problem of creating sub-standard bibliographic records of information resources (Obiozor-Ekeze, 2015).
3. **Movement of bibliographic data to the web for use and reuse:** Digital age has simplified the exchange and transferring of bibliographic details of information resources being catalogued. This has resulted in the efficient use and reuse of bibliographic data (Akidi & Omekwu, 2019).
4. **Enhancing conformity with standards:** Digital age has made it easy and possible for cataloguers to strictly follow the internationally acceptable rules in the bibliographic descriptions and access to bibliographic data (Abdul et al., 2020). Some of the standards are: Online Information Exchange (ONIX), Dublin Core, Functional Requirement for Bibliographic Record (FRBR), Resource Description and Access (RDA), Resource Description Framework (RDF), Z39.50, etc (Abdul et al., 2020).
5. **Enhancing uniformity in the format of information resources:** Digital age has made it possible for cataloguers to be describing the bibliographic details of information resources of the same or similar formats in tandem with the stipulated standards for such a format of the information resource (Abdul et al., 2020).

6. **Enhances collaborations among libraries and cataloguers:** Digital age has enabled the creation of different platforms such as websites, email groups or social media where cataloguers can work cooperatively on cataloguing trends and practices. Some of the platforms enabling collaborations include: OCLC, the Research Libraries Group, the Consortium of European Research and others (Obiozor-Ekeze, 2015; Abdul et al., 2020).

Challenges of Cataloguing in the Digital Age

Studies have revealed that digital cataloguing has been hindered by several factors. Adebayo (2013) found lack of ICT skills of cataloguers and classifiers, insufficient number of professional cataloguers and lack of knowledge of computer language such as the MARC and Dublin Core are the factors inhibiting digital cataloguing. Obiozor-Ekeze (2016) also found similar factors such as poor automation of libraries, under-staffing which slows down the pace of working at the cataloguing and classification department, lack of knowledge of current trends of digital tools in cataloguing practices and problem of irregular power supply.

Nwosu (2013) asserted that the introduction of digital tools into cataloguing has opened a new vista of challenges for cataloguers. The challenges involved difficulty in accommodating the technological innovation with data created using the old rules. He further stressed that the rapid change in information materials from print to digital and electronic formats challenges cataloguers on learning how to work in broader digital environments such as digital repositories. Eze (2016) on his own part sees lack of fund in libraries, lack of ICT and other infrastructural facilities, inadequate number of professionals and lack of ICT skills and training as the banes of applications of technologies for cataloguing and classification.

Orbin and Aina (2014) took the factors from practical perspective by noting that the use of archaic cataloguing tools, inadequate knowledge of cataloguing rules in digital environment, poor knowledge of application of digital tools to cataloguing, shortage of trained professional staff are also hindrances to digital cataloguing. Also, Ntsiko (2013) agreed that inadequate continuous skills development and acquisition in technology-oriented cataloguing hamper the adoption of digital tools to cataloguing in libraries.

Akidi and Okezie (2018) found inadequate funding, lack of adequate infrastructural facilities, incessant power outage, lack of Internet facility, inadequate bandwidth, lack of vendor technical support, lack of encouragement from the management, lack of maintenance culture, lack of digitally savvy cataloguers, lack of adequate staff training and staff indifference/technophobia and staff's rejection of library software package adopted as the challenges to digital cataloguing. Inyang and Agwunobi (2016) opined that lack of technological facilities, technological obsolescence, lack of skilled staff, insufficient/lack of training and denial of best practices by library staff are the main constraints to digital cataloguing.

Onuoha and Chukwueke (2022) maintained the views that poor funding of library technical operations, inadequate technological facilities, inadequate technology-savvy cataloguers and classifiers in libraries, inadequate digital infrastructure, unstable power supply, frequent changes in technology, inadequate technical support, poor maintenance culture of technological facilities, changes in software applications in libraries, low Internet bandwidth, management problems and lack of continual training of cataloguers are some factors mitigating the application of technologies for cataloguing and classification in libraries.

Conclusion

The digital age has redefined the modus operandi of many library's activities with the aims of simplifying the processes of performing those activities by librarians, making information readily available to users and enhancing the productivity of libraries. This paper has justified that the digital age has enormous opportunities to be unraveled to transform the cataloguing process in libraries. The digital age has unbundled the restrictions of availability of bibliographic records of information resources beyond the four-walls of libraries, which has driven cooperations and collaborations among libraries. However, this paper noted that the enormous potentials of cataloguing in the digital age haven't been fully tapped because of some problems.

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