



**Twenty-First Century Academic Libraries: An Access to Digital Information Resources  
and Services to Enhance Teaching, Learning and Research**

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**Abstract**

*This paper explores 21st-century academic libraries as a means of accessing digital information resources and services to enhance teaching, learning, and research. Twenty-first-century academic libraries are considered the world of opportunities for digital technologies, digital and traditional learning spaces, to provide access to digital information resources, physical information resources, innovative information services, and to adapt to any technological and conventional opportunity to enhance teaching, learning, and research. Different kinds of digital information resources, such as E-books, E-journals, Databases, CDs/DVDs, E-conference proceedings, E-Reports, E-Maps, E-Pictures/Photographs, E-Manuscripts, E-Theses, E-Newspaper, Internet/Websites - Listservs, Newsgroups, Subject Gateways, etc., were explored. Similarly, Innovative digital information services to enhance teaching, learning, and research in twenty-first-century academic libraries embrace the use of social media applications such as YouTube, WhatsApp, Instagram, WeChat, TikTok, Telegram, Snapchat, Douyin, Kuaishou, X (formerly Twitter), Sina Weibo, QQ, Pinterest, Qzone, Reddit, Tieba, LinkedIn, Quora, Stack Exchange, Viber, imo, LINE, Picsart, Likee, Discord, Twitch were highlighted. The digital library will provide enhanced access to the digital information resources, and users can access the digital content beyond time and space boundaries. The paper concluded that the 21st century has contributed to the emergence of digital information resources, providing academic libraries with the opportunity to subscribe to scholarly online databases and digitize their traditional collections to offer access to digital information resources and services. And finally recommended that academic libraries in the twenty-first century must be provided with Adequate funds that will assist in subscription to scholarly online databases, internet bandwidth, and procurement of other digital library materials that will support academic library users to achieve their academic activities.*

**Keywords:** Twenty-First Century, Academic Libraries, Digital Information Resources, Digital Information Service Teaching, Learning, Research.

## Introduction

Libraries in all parts of the world are established with a responsibility to acquire, process, organise, preserve, and disseminate information resources in both physical and digital formats; and to design information services that provide access to information and help meet users' information needs. According to Alumona and Azolo (2020), if the library is a growing organism, its services will grow and improve with the changing times; its information resources and services will be tailored to meet the varying needs of its users. Libraries are profoundly affected by the latest innovations. Information technologies, including computing, communication, and large-scale data storage, continuously alter how we can access, retrieve, store, manage, and share information through libraries (B, Bala Sankar, 2022). The 21st century has contributed to the emergence of digital information resources, providing the opportunity for academic libraries to subscribe to scholarly online databases and digitise their traditional collections to offer access to digital information resources and services that support teaching, learning, and research. Nowadays, the acquisition, processing, organisation, preservation, and dissemination of information resources and services are increasingly carried out digitally in twenty-first-century academic libraries.

Academic libraries in the 21st century could be termed as hybrid libraries, providing access to electronic resources and services while maintaining and supporting the use of physical collections housed in the library building (Adamu, Aliyu, and Yahaya, 2016). Berg, Hoffman and Dawson (2010), with the rapid growth and penetration of the internet in the 21st century, students and faculty members now have access to a vast amount of information resources online with just a click of the mouse. According to Nwaohiri and Emezie (2015). Showed that in the 21st-century academic library, the emergence of ICT has redefined the library 's role. Print materials are no longer sufficient to store information. CD-ROM databases, electronic document delivery, automated cataloguing, circulation systems, and online information retrieval (OPAC) have become the order of the day. Academic libraries now acquire and integrate ICT into library sections and services, as no aspect of modern librarianship/library is not ICT inclined, be it technical, reference, or bibliographic services. For example, in the collection development unit, ICT are used to select, subscribe, order, pay and acquire information resources through online, mobile library services, and digitization of theses and dissertations; and is carried out through ICT (Abdullahi and Saka, 2016; Saka et al., 2021). Academic libraries in the 21<sup>st</sup> century spend a huge amount on information and communication technology devices (ICT) to digitize their physical resources, create institutional digital repositories, and subscribe to scholarly databases to provide access to digital information resources and services to academics, non-academics, students and other members of the university community; to enhance teaching, learning and research. Therefore, this paper explored the twenty-first-century academic library as a means of access to digital information resources and services to enhance teaching, learning, and research.

## **Methodology**

This paper is based on secondary sources of data, including journal articles, books, theses, dissertations, and other relevant literature.

## **Concept of Library**

The word ‘library’ derives from ‘liber’, the Latin word for “book”. A library is a collection of books and other informational materials made available to students for reading, studying and reference (Akpan et al., 2018). This also indicates that libraries can acquire physical information resources, process, organize and disseminate to satisfy library users' information needs for teaching, learning and research. However, from another perspective, further clarifying that a library is a place for storing data material, print and electronic, and that it offers access to an intended interest group to utilize these materials for their own use (Adeniran, 2017). The tasks of Libraries in the twenty-first century are extended, not merely to enhance access to print information resources, but to subscribe to digital resources that will enable users to access a broad digital collection of different formats with the aim of supporting and achieving academic activities. In a similar view as stated by Van Wezel and Berkouwer (2017) described a library as a collection of tools in a variety of formats assembled by information professionals or other experts, providing convenient physical, digital, bibliographic, or intellectual access, as well as targeted services and programmes designed to educate, inform, or entertain a variety of audiences, with the goal of stimulating individual teaching and learning. Providing accurate guides on locating, searching, and using both physical and digital information resources is the task of information professionals in libraries through orientation programs and individual coaching of library users

“A library serves as a wealth of resources for researchers: a research scholar may never be able to successfully conduct their investigations and research without the help of library resources, either in a digital form or otherwise. Similarly, libraries often provide quiet areas for studying, and they also offer common areas to facilitate group study and collaboration, hence providing a conducive environment for learning and research (Amadi, Ukwangwa, Bamidele, and Omeluzor, 2013). Omehia (2019). Achieving the objectives of establishing Libraries to support academic activities, providing adequate information resources, convenient physical and digital spaces and information services is necessary. This will help library users to satisfy their information and research needs. However, according to the International Federation of Library Associations and Institutions (IFLA, 2003). Stated that these libraries are principally concerned with the collection, processing, storage and dissemination of recorded information for use. There is a huge variety of other kinds of libraries, fulfilling different purposes and serving different client groups. They exist in every country in the world.

## **Twenty-First Century Academic Library**

Libraries in the 21st century can be described as an institution or source that provides unhindered access to information and information services that satisfy the clientele’s actual and

potential information needs (Ngozi, 2010). Twenty-first-century academic libraries are considered as the world of opportunities for digital technologies, digital and traditional learning spaces, to provide access to digital information resources, physical information resources, and innovative information services, and also adapting to any technological and conventional opportunity to enhance teaching, learning and research. However, from the perspectives of Eden (2015) described the 21st-century academic libraries as emerging positions that require technological skills capable of engaging in online learning, data management, digital collections such as institutional repositories, and other technologies to provide new services. For the academic in the Twenty-first-century to satisfy the information and research needs of its users, information and communication technologies for searching and retrieval of digital collections and provision of digital services need to render adequate attention. Similarly, as in the twenty-first century, academic libraries can provide access to digital information resources and services for the purpose of enhancing teaching, learning and research to achieve the objectives of the institutions. This is in line with Sejane, (2017), understanding that academic libraries are adapting to the electronic information age by providing improved access to electronic resources. Academic Libraries now provide users with access to networked information such as databases, electronic scholarly journals, and other publications from various publishers

Twenty-first-century academic libraries focus on building a digital library, digitizing conventional information resources, creating an institutional digital repository, subscribing to scholarly databases, and designing innovative information services to enhance access to digital information resources and services for teaching and non-teaching staff, and students to support teaching, learning, and research. However, according to Nwaohiri and Nkeiru (2013). Stated that, academic libraries in the 21st century are gradually changing to fit into their clients' seeking patterns. The situation has brought about the establishment of digital libraries to complement traditional ones. This is evidenced in the attempt to digitize library resources to cater to the information needs of new generation users, that is, the 21st century library users who exhibit much dexterity in using new sources and new technologies. Academic library users of the twenty-first century are focused more on and required to use digital collections and services to satisfy their actual learning and research needs with the aid of technological devices.

## **Digital Information Resources in 21st Century Academic Libraries to Enhance Teaching, Learning, and Research**

Academic libraries in the twenty-first century focus on providing access to digital information resources to suit the information needs of their users with the aim of enhancing teaching, learning, and research. As stated by Mohammed, Osimetha, and Ekwueme (2020), digital information resources are information resources that were in print form (hard copy) but have been converted into non-print form (soft copy) and are accessible through computer machines and other corresponding ICT tools. Twenty-first-century academic libraries provide a wide range of digital information resources to their users for the purpose of enhancing teaching, learning, and research. However, According to Kenchakkanavar (2014). Stated that, the different types of digital

information resources are E-books, E-journals, Databases, CDs/DVDs, E-conference proceedings, E-Reports, E-Maps, E-Pictures/Photographs, E-Manuscripts, E-Theses, E-Newspaper, Internet/Websites - Listservs, Newsgroups, Subject Gateways, USENET, FAQs, etc. But in a similar understanding by Iguehi Onoimiuko & Clementina (2020). Indicated clearly that digital information resources (DIRs) are information content in electronic format, such as databases, e-books, e-journals, amongst others, accessible through internet-connected technologies, which aids academic activities like teaching, learning, and research. Adequate digital information resources that can be used by the twenty-first century academic library users help more for building confidence in achieving their academic activities.

Mohammed, Osimetha, and Ekwueme (2020) explained further that, these digital information resources (DIR) include published journals and books, pictures, music, cartographic materials, games, stories, articles from magazines, encyclopedias, pamphlets, and other published resources that are in hard copies but are converted in electronic format using the digital information systems devices make it to be accessible through the web. Providing access to e-resources is a service to help library users to find e-Databases, e-Journals, e-Magazines, e-Books/ e-Audio/ e-Images, Data/ GIS, Digital Library Projects, Electronic Exhibitions, e-Subject Guide, e-newsletters, E-conferences proceedings, and Web search tools on a range of topics (Kenchakkanavar, 2014). Providing access to all these available different kinds of digital information resources in 21st-century academic libraries is for the purpose of achieving the academic institutions' objectives for teaching, learning and research. Enhancing teaching, learning and research in academic institutions, the twenty-first-century academic libraries must provide access to all forms of digital information resources to meet the needs of users in the academic environment.

## **Digital Information Service in 21st Century Academic Libraries to enhance Teaching, Learning and Research**

Library services in the 21st century are mostly done with the aid of Information and Communication Technology (Adamu, Aliyu, Yahaya, 2016). However, another understanding stated that this is an era when people need to access timely information with ease, and this can only be done through the application of ICT to library services. (Adeniran, Odunola, and Yakub, 2018). Digital information services are the provision of information services to library users, regardless of time and place. (Mohammed, Osimetha, and Ekwueme 2020). Provision of digital services to support the academic activities of the twenty-first century academic library users, location and time, is not a matter. Similarly, in view of this, digital information services embrace all the information services provided by the library to its patrons, and can be accessed through any information and communication technology application. This enables the academic libraries in the first century to design and provide access to suitable digital information services that will help to meet the needs of users to enhance teaching, learning and research. Providing access to digital information resources to enhance teaching, learning and research, academic libraries in the twenty-

first century utilized information and communication technology devices to provide digital information services to the academic library users.

Academic libraries in twenty first century offered digital reference service, electronic mail services, Online Public Access Catalogue (OPAC), Short Message Service (SMS) Notification, Library Websites, Library Virtual/ Audio Tours, Quick Response Codes QR codes into library services, as digital information service to enhance teaching, learning, and research to achieve the objectives of an academic institution. However, as further stated by Jones and Watson (2017), many libraries provide personalised assistance through virtual reference services, allowing patrons to seek help remotely. Quick Response Codes QR codes into library services for the provision of quick access to information (Omehia 2019). This is in line with the understanding of Ashford (2010), QR codes are very adaptable to the library environment and users, because of the two-dimensional (2D) matrix barcodes that are readable, scanned using exploitation-sensitive and web-smart phones to access the website address and details. Today's web-based information services include personal web pages developing into blogs, encyclopaedia developing into wikis, text-based tutorials, and email customer support infrastructures into information services (O'Reilly, 2006).

Twenty-first-century academic libraries designed innovative information services to provide access to digital information services to enhance teaching, learning and research of academic institutions. Arumuru (2020) explained that Innovative library services have to do with the introduction of new library services, the application of modern technologies in rendering library services, the development/ advancement of a library service to be in tune with the modern realities, or library services created to address the information-seeking behaviour of library users. With the help in designing and adopting different categories of Innovative digital information services by academic libraries in twenty-first-century it buttressed more in achieving the users' information and research needs. Similarly, this innovative digital information service to enhance teaching, learning, and research in twenty-first-century academic libraries embraces the use of social media applications such as YouTube, WhatsApp, Instagram, WeChat, TikTok, Telegram, Snapchat, Douyin, Kuaishou, X (formerly Twitter), Sina Weibo, QQ, Pinterest, Qzone, Reddit, Tieba, LinkedIn, Quora, Stack Exchange, Viber, imo, LINE, Picsart, Likee, Discord, Twitch. But Chen, Chu and Xu (2012) pointed that social network site such as Friendster, LinkedIn, Myspace, Facebook and so on are innovative and effective way of rendering added effective and convenient services to users especially in 21st century emphasized the need to reposition libraries in the 21st Century by engaging in innovative or modern library services such as: Really Simple Syndicate (RSS) services, Instant Messaging (IM) services, streaming media services, weblogs services, OPAC-tags services, social network services (that is, the use of facebook, twitter, whatsapp, linkedin, etc.) and reference services via mobile phones as way of constantly updating library users on the current happenings in the library.

## Access to Digital Information Resources in 21st Century Academic Libraries

A digital library is one that really helps the user to get access to the digital resources directly on the screen of their computer (Athiya, 2022). The digital library will provide enhanced access to the electronic information source, and users can access the digital content beyond time and space boundaries. In view of this, the mission of the e-library is to provide both information services and resources that are capable of meeting the research, teaching and learning needs of the faculty and students. (Hirsh, 2014). For an effective access and retrieval of digital information resources in 21st-century academic libraries, for effective teaching, learning and research, the lecturers, students and any other twenty first century academic library users require information search strategies to use and obtain appropriate digital information resources. According to Achanso, Olaewe, and Akinoso (2019). Highlighted some important points that will assist any kind of academic library users to understand the nature and ways of accessing digital information resources as follows:

**No physical boundary:** people from all over the world can gain access to the same information as long as an internet connection is available.

**Round-the-clock availability:** A major advantage of digital libraries is that people can gain access 24/7 to the information.

**Multiple access:** The same resource can be used simultaneously by a number of institutions and patrons. This may not be the case for copyrighted materials; a library may have a license for “lending out” only one copy at a time. This is achieved with a system of digital rights management, where a resource can become inaccessible after expiration of the lending period or after the lender chooses to make it inaccessible (equivalent to returning the source).

**Information retrieval:** The user is able to use any search term (word, phrase, title, name, or subject) to search the entire collection. Digital libraries can provide very user-friendly interfaces, giving clickable access to their resources.

**Preservation and conservation:** digitalization is not a long-term preservation solution for physical collection, but does succeed in providing access copies for materials that would otherwise fall to degradation from repeated use. Digitized collections and born-digital objects pose many preservations and conservation concerns that analogue materials do not.

**Space:** Whereas traditional libraries are limited by storage space, digital libraries have the potential to store much more information, simply because digital information requires very little physical space to contain it, and media storage technologies are more affordable than ever before.

### Conclusion

These digital information resources include e-books, e-journals, databases, CDs/DVDs, e-conference proceedings, e-reports, e-maps, e-pictures/photographs, e-manuscripts, e-theses, e-newspapers, internet/websites - listservs, newsgroups, subject gateways, USENET, FAQs, etc., to

support the academic institutions' objectives for teaching, learning and research. Academic libraries in the twenty-first century utilise information and communication technology devices to provide digital information services to academic library users. These digital information services in the twenty-first century Academic libraries included digital reference services, electronic mail services, Online Public Access Catalogue (OPAC), Short Message Service (SMS) notifications, library websites, library virtual/audio tours, and Quick Response Codes (QR codes). And also the use of social media applications such as YouTube, WhatsApp, Instagram, WeChat, TikTok, Telegram, Snapchat, Douyin, Kuaishou, X (formerly Twitter), Sina Weibo, QQ, Pinterest, Qzone, Reddit, Tieba, LinkedIn, Quora, Stack Exchange, Viber, imo, LINE, Picsart, Likee, Discord, Twitch as an Innovative digital information service to enhance access to digital information resources and support teaching, learning and research in twenty-first-century academic libraries.

## **Recommendation**

To ensure effective access to digital information resources and services in twenty-first-century academic libraries that support teaching, learning, and research, the following recommendations were proposed in this paper:

1. Academic libraries in the twenty-first century must be provided with Adequate funds that will assist in subscription to scholarly online databases, internet bandwidth, and procurement of other digital library materials that will support academic library users to achieve their academic activities.
2. Academic libraries in the twenty-first century must adopt and utilize social media platforms as an innovative way to deliver information services, regardless of the location of the academic library users, with the aim of buttressing learning and research.
3. Academic libraries in the twenty-first century should invest adequately in information and communication technology devices (ICT), which will help to ensure permanent access to all content of their digital information resources.
4. Academic libraries of the twenty-first century should let library users be aware of the available subscribed databases and ensure proper orientation on searching digital resources to satisfy their information needs and support teaching, learning, and research.

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- Halder (2009) continued to recount that "libraries have shifted to Library 2.0 and therefore academic libraries across the world are presently installing servers, creating repositories and databases to deliver digital contents, e-resources and research outputs across the world.