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# CONSCIOUSNESS AND USE OF EMERGING TECHNOLOGIES FOR ACTUAL SERVICES IN CERTAIN FEDERAL UNIVERSITY LIBRARIES IN NORTHEASTERN NIGERIA

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***Keywords:***
*Consciousness, Use, University libraries, emerging technologies, Actual services.*

***ABSTRACT:***
*This study examines the extent of Consciousness and use of emerging technologies for actual services in selected federal university libraries in Northeastern, Nigeria. Four research questions guided the study. The study adopted a descriptive survey research design to study a target population of 429 library staff from three selected federal university libraries in Northeastern, Nigeria. A proportionate stratified random sampling technique was used to select a sample size of 215. The study employed questionnaire for gathering data, which was administered through Google Forms on staff WhatsApp platforms. A total of 136 responses were collected and analyzed using frequency count, mean, and standard deviation. The study's findings revealed that library staff in the study areas are conscious of the emerging technologies in libraries with an overall mean score of 2.91. However, the mean score of 2.43 on the extent of utilization implies that most of the emerging technologies are not adequately utilized. Some of the identified challenges to inadequate utilization of emerging technologies in the study areas were lack of skilled personnel ( =3.44), poor staff training ( =3.34) and poor bandwidth and internet connectivity ( =3.27). The study recommends sensitization campaigns, training and re-training of library staff, provision of reliable power sources, robust internet connectivity and increased bandwidth to improve consciousness and utilization of emerging technologies among staff and students of the studied area. The study also recommends that government and other relevant stakeholders should prioritize budget allocations for technology adoption and usage in libraries.*

## Introduction

Conventionally, university libraries have been engaging in the role of knowledge gate keepers, curators, custodians of printed collections, and guides to navigating the various sections and information resources in university libraries. University libraries are those libraries in universities, which caters for information needs of institutional members. In universities, libraries are vital not only to continuing education and self- development, but also to research activities. They are indispensable because they are the nerve centre of all teaching, learning and research activities in the institutions. The main goal of university library is to acquire information resources in different formats, in various disciplines of human knowledge and to process, organize, disseminate and provide access to them and to use the resources for the provision of library services to the library users (Akanbi and Ali, 2022). However, the dynamic landscape of university

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libraries is constantly evolving, shaped by rapid technological advancements, changing user expectations, and the growing shift toward digital resources. University libraries, which were traditionally seen as repositories of books, are presently evolving to self-motivated centers for information, education, cultural enrichment, and social connections owing to the advancement of information and communication technologies. Currently university libraries are dynamic, smart and proactive in providing multifunctional spaces that support teaching, learning, collaboration, and access to a wide range of digital and multimedia contents (Mittal, 2017). The digital transformation in libraries precisely university libraries require the integration of emerging technologies to create dynamic platforms to meet the evolving and changing information needs of digital savvy users. Yusuf, Adebayo, Bello and Kayode (2022) opined that adoption of emerging technologies is now necessary for libraries to provide emerging library services effectively.

Emerging technologies, according to Rao (2014), are those technical innovations which represent progressive developments within a field for competitive advantage. Emerging technologies in libraries refer to innovative tools, systems, and platforms that are revolutionizing traditional library services, making them more dynamic, digital, and user-centric. These technologies include artificial intelligence (AI), virtual reality (VR), augmented reality (AR), blockchain, Internet of Things (IoT), digital makerspaces, and cloud computing, among others. Their integration into libraries has made information professionals sometimes referred to the library as „smart libraries" (Baryshev et al. 2018; Cao et al. 2018; Gul & Bano, 2019) or „Intelligent library" (Cox et al. 2018), digital library, virtual library, paperless library, library without a wall (Makwana, 2021). Mittal (2017) advocates that the term „libraries" in this digital era has been used interchangeably as digital libraries, virtual libraries, hybrid libraries, library without walls and Library 2.0.

Presently, emerging technologies are gradually but constantly transforming libraries into multifunctional, tech-savvy spaces that meet the changing needs of users in the current digital library environment. Their integration in libraries advance traditional library services, induce the provision of digital resources, personalized user experiences, and interactive tools such as artificial intelligence, virtual reality for cloud-based services. In addition to enhancing access to information resources, emerging technologies also aid libraries to fostering new ways of learning, collaboration, and community engagement in a rapidly changing digital world. The application of AI and other emerging technologies to perform library tasks and services will reduce human errors incurred due to the repetitiveness of library tasks (Ajani, et al., 2022). Despite these glaring potentials of emerging technologies in libraries, it seems that the level of awareness and utilization of the technologies is insignificant in Nigerian libraries precisely in university libraries in south east Nigeria. Southeast is one of the six geopolitical zones in Nigeria. Like other geopolitical zones in the country, southeast is a home of several universities with their corresponding libraries.

In this study emphasis will be on the designated federal university libraries which include Abubakar Tafawa Balewa University Library Bauchi, Bauchi State, Ramat Library University of Maiduguri, Borno State and Library of Federal University of Kashere, Gombe State. Owing to the inadequate funding, the reformation from physical to digital space is yet to be fully observed in the libraries and other libraries in the country. According to Ejikeme and Ezema (2019), university libraries in Nigeria have not yet taken advantage of certain

emerging technologies such as institutional repositories which enhance the visibility of research outputs within the global academic community. According to the Directory of Open Access Repositories (See http://v2.sherpa.ac.uk), only 31 out of 192 Nigerian universities have contributed to the global repository directory, which represents just 15.6% of the expected repositories in the country. Research studies indicate that many Nigerian universities are relatively inactive in developing institutional repositories, and this limits the global reach of their research outputs (Christian, 2009; Ezema & Okafor, 2016; Ezema & Eze, 2024). The scenario is seriously affecting the impact of the universities in the country; and therefore, calls for urgent attention. Existing studies (Urhiewhu et al., 2015; Otunla, 2016; Emiri, 2019; Oluwole & Adeyinka, 2020) primarily consist of reviews or opinion studies that do not provide comprehensive data-driven analyses of technology adoption in Nigerian libraries. Notable exceptions, such as Omosor (2014); Chukwueke and Onuoha (2019), offered generalized insights but lack detailed empirical investigation into the current state of technology utilization. Recent calls for the adoption of these technologies by scholars like Amogu and Okezie (2019) have not resulted in measurable changes within academic library practices. Given these gaps in knowledge, it is pertinent to investigate the current level of awareness regarding emerging technologies among librarians in Nigerian academic institutions and the extent to which these technologies are utilized.

**Statement of the problem**

Academic libraries are crucial in the dissemination of knowledge and providing access to information. However, they are confronting significant challenges as information technologies evolve quickly, and is changing the information-seeking behaviors of users. As a result, the traditional library service model is being reshaped by the growing use of remote information access platforms like Google, as well as the integration of emerging technologies such as Artificial Intelligence (AI), cloud computing, and social networking tools to improve library operations. While libraries in developed countries are successfully adapting to change by incorporating emerging technologies to enhance user experience and service delivery, libraries in developing nations, particularly in Nigeria, have been slow to embrace technology integration. This lag has contributed to a knowledge gap between scholars in developed and developing countries, highlighting the need for urgent attention. Given the limited empirical research on the awareness and use of emerging technologies in Nigerian academic libraries, this paper aims to address this issue and improve the responsiveness of Nigerian academic libraries to technological advancements.

**Purpose of the study**

Generally, the study investigates the consciousness and use of emerging technologies for actual services in certain academic libraries in Northeastern Nigeria. The specific purposes are to:

1. Evaluate the level of consciousness among library patrons regarding emerging technologies available for enhancing library services.
2. Investigate the extent to which emerging technologies are utilized in academic libraries for service delivery and user engagement.
3. Assess the impact of emerging technologies on the efficiency of library services provided in certain institutions.
4. Identify the challenges faced by university libraries in Northeastern Nigeria in adopting and utilizing emerging technologies.

**Literature review**

Advances in information and communication technologies (ICTs) have greatly revolutionized the world. There are currently great leaps in

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emerging technologies with innovative, disruptive, progressive, transformative and competitive advantages in all walks of life. Emerging technologies could be referred to as new, innovative, cutting-edge and rapidly evolving technologies that are in their early stages of development, adoption or integration; and have the potential to drive significant changes in the way we live, work, communicate, and solve problems. Montoro, Colón, Moreno and Steffens (2019) referred to them as those technologies that are being continuously developed or will be developed in the next five or ten years. According to Rathna and Divyananda (2018) they are those technologies that have the potential to address issues and provide new opportunities for advancement in various disciplines. The technologies include but are not limited to artificial intelligence, cloud computing, Internet of Things, virtual, augmented reality (VR/AR), machine learning and blockchain technology etc. As observed Rotolo, Hicks and Martin (2015) stated that emerging technologies are characterized by radical novelty, relatively fast growth, coherence, prominent impact, uncertainty and ambiguity. They have the potential to alter social and economic elements of society as well as open up new opportunities for organizations.

Emerging technologies have transformed various sectors, including libraries, by introducing innovative tools that enhance service delivery, operational efficiency and user engagement. This concedes with Omosor, (2014) that the integration of technology-based services in academic libraries has significantly enhanced service delivery, making it faster and more accurate. The influx of emerging technology and web-enabled services has significantly improved the working environment in libraries, especially in university institutions, enhancing service delivery and operational efficiency, (Chukwueke & Onuoha, 2019). Ajiboye, Bokoh, Bello and Idowu (2023) stated that most library services such as inter- library loan, indexing and abstracting service, current awareness, library tour, library instructions, book selection, reservation, advisory services, literature searches, document delivery and circulation services has greatly improved with the aid of emerging technology. Emerging technologies can help libraries to create collaborative and participative environment that is necessary to deliver user-centric library services and to create new resources and build-upon existing ones using collective intelligence of users (Ayo-Olafare, 2020).

Incorporating emerging technologies such as AI in library operations helps to automate repetitive operations like cataloging and circulation, dissemination of information to enable librarians utilize more of their time on providing individualized user experience (Ajiboye, 2020). AI enhances library operations and service delivery within the virtual workplace ecosystem, leading to seamless digital information flow that supports innovative services tailored to meet evolving user needs (Tshabalala & Dube, 2024). According to Ehoniyotan and Ahmzat (2023) AI can be used for a variety of operations including filing, sorting, and replacing books on the shelf, taking inventory, welcoming and directing guests and users to different locations of the library, and answering frequently asked questions among others.

Furthermore, Ehoniyotan and Ahmzat (2023) revealed that machine learning is another promising technology for libraries in the digital era. This is because the technology according to the authors can be used to analyse user behavior and preferences thereby enabling librarians to utilize its algorithms to suggest relevant resources, such as books, articles, or research materials to users. Virtual reality on its own part has the potential to develop immersive learning environments and collaboration spaces in libraries (Onyancha, 2021). Libraries may provide virtual tours, interactive exhibitions, and

simulations that improve information retrieval, research, and teaching by incorporating virtual reality technology (Aina, 2019). Libraries can also create VR exhibitions that allow students to explore rare books, manuscripts, historical artifacts, and valuable archives that are too delicate or fragile for regular handling. VR training simulations that help students develop technical skills relevant to their fields, such as medical simulations for healthcare students or architectural walkthroughs for design students can equally be provided by libraries. This coincide with the opinion of Solomon, Ahiauzu, Esuru and Nyemezu (2019) that VR can be used to provide interactive tutorials on library resources, such as databases or research methods, allowing students to explore library services in a simulated, hands-on way. Through VR, students can explore how to locate resources, use library technology, or understand the layout of different library sections without needing to navigate the space physically (Ofori, &Arthur 2024)

In addition, the potentials of blockchain technology in securing documents, ensuring its transparency and legitimacy cannot be over emphasized. Adetimirin (2019) is of the opinion that security and validity of digital materials could be improved with blockchain technology while ensuring transparent and unchangeable transactions of such materials in the library systems. The use of blockchain for metadata and networking of libraries will go a long way in improving information services (Hoy, 2017). In the views of Neogi and Partap (2019), blockchain technologies boost libraries' capability to provide better and faster services, promote the library's and librarians' creativity, problem-solving skills; encourage innovations that bring values to existing operations and services, and as well offer opportunities for the future.

In spite of the outstanding relevance of emerging technologies, and it‟s increasing awareness among library staff as noted by Zubairu and Adeleke (2021), and Majhi, Meher, and Maharana (2015) usage of the technologies is still minimal in most developing countries such as Nigeria. Aliyu, Abdulrahaman, and Yusuf (2019), discovered that implementation and use of emerging technologies in Nigerian academic libraries is moving too slowly. A study on awareness and adoption of cloud computing in Nigeria libraries by Zubairu and Adeleke (2021) discovered that emerging technologies are mainly use for storing personal photos and videos then providing library services. This advocates with Majhi, Meher, and Maharana (2015) whose study revealed that usage of cloud computing technology in library operations and services was not significant. Odeyemi (2019) asserted that even though Nigerian libraries are fully prepared to accept emerging technologies like robotics into the library service delivery system, a few factors like technophobia militate against this possibility. Otunla (2016) opined that lack of funding, lack of ICT staff, and insufficient power supply are some of the challenges with using emerging technologies like library management software. Other significant barriers that hinder the effective use of technology resources in Nigerian libraries include a lack of search skills, insufficient budgets, unreliable power supplies, and inadequate management training along with staff retraining (Bichi, 2021). Ehoniyotan and Basirat (2023) also revealed that the adoption of new technologies is further obstructed by limited funding, a lack of capacity, and erratic power supply. Saibakumo (2021) identified the primary obstacles to adopting new technology as insufficient funding, power shortages, and inadequate maintenance. The challenges associated with implementing and utilizing emerging technologies in Nigerian libraries have been highlighted by Oghenetega, Umeji, and Obue (2014) as well as Okojie and Okiy (2019) to include lack of funding, unstable power supply, insufficiently trained staff, and

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restrictive government policies, among others.

**Methods**

A descriptive survey design was employed to investigate a target population of four hundred and twenty-nine (429) library staff from three selected federal university libraries in Northeastern Nigeria. The population comprises one hundred and ninety-two (192) staff from Abubakar Tafawa Balewa University Library (ATBU), one hundred and seven (107) from Ramat Library University of Maiduguri (Uni. Maid), and one hundred and thirty (130) from the Federal University of Kashere, Gombe State (FUK). A proportionate stratified random sampling technique was used to select a sample size of two hundred and fifteen (215), representing 50% of the population. The sample size comprises 96 participants from ATBU Library, 54 from Ramat Library, and 65 from FUK Library. The choice of the design and sampling technique was due to the large and the diverse nature of the research population. Descriptive survey design is employed when data collection depend on direct contact with those persons or a sample of those whose characteristics, behaviours or attitudes are relevant to a specific investigation (Cooper & Schinder, 2011). Whereas Elifil and Negida (2017) is of the opinion that when a population is divided into several smaller, more homogeneous subpopulations a proportionate stratified random sampling technique is commonly used to create a representative sample.

A self-structured questionnaire titled "Consciousness and Use of Emerging Technologies for Actual Services Questionnaire (CUETASQ)" was used for data collection. The CUETASQ consisted of two sections, A and B. Section A was designed to elicit demographic information of the respondents; while section B was designed

**Table 1: Respondents responses on the level of consciousness on the potentials of emerging technology in Libraries** N = 136

| S/N | Emerging technology | HA | A | LA | N A | Mean | Std. | Dec |
|---|---|---|---|---|---|---|---|---|
| 1. | Artificial intelligence | 54 | 42 | 22 | 18 | 2.97 | 1.05 | A |
| 2. | Social media tools | 70 | 32 | 21 | 13 | 3.17 | 1.02 | A |
| 3. | Virtual reality (VR) and augmented reality (AR) | 40 | 23 | 31 | 42 | 2.45 | 1.21 | LA |
| 4. | Internet of Things (IoT) | 61 | 23 | 45 | 7 | 3.01 | 0.99 | A |
| .5. | Maker space | 87 | 41 | 3 | 5 | 3.54 | 0.72 | HA |
| 6. | Big data and data mining | 32 | 68 | 22 | 14 | 2.87 | 0.89 | A |
| 7. | Voice-activated technology | 19 | 34 | 46 | 37 | 2.26 | 1.01 | LA |
| 8 | Library guide app | 45 | 21 | 47 | 23 | 2.65 | 1.11 | A |
| 9. | Radio Frequency Identification (RFID) | 88 | 24 | 16 | 8 | 3.41 | 0.91 | A |
| 10. | Web OPAC | 110 | 21 | 0 | 5 | 3.74 | 0.65 | HA |
| 11. | Cloud computing technology | 53 | 61 | 12 | 10 | 3.15 | 0.87 | A |
| 12. | Integrated library management system (ILMS) | 57 | 51 | 16 | 12 | 3.13 | 0.94 | A |
| 13. | Robotics and automation | 14 | 26 | 43 | 53 | 2.01 | 0.99 | LA |
| 14. | Blockchain technology | 17 | 42 | 44 | 33 | 2.32 | 0.98 | LA |
| | **Grand mean** | | | | | **2.91** | **1.08** | **A** |

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Key: HA = Highly Aware, A= Aware, LA = Less Aware, NA = Not Aware
Decision rule: Highly Aware = 3.51 – 4.0, Aware = 2.51 – 3.50, Less Aware = 1.51 – 2.50, Not Aware 1.00 – 1.50.

Table 1 presents the mean response of the respondents on the level of awareness on the potentials of emerging technology in libraries. Out of the fourteen emerging technologies listed, the respondents showed positive response in the statements. Data on the table showed that, the respondents were highly aware of Web OPAC and Maker space with a mean score of 3.74 and 3.54 respectively. At the lowest ebb is robotics and automation which has mean score of 2.01. However, the data generated an overall mean score of 2.91 indicating a high positive response which reveals that respondents are aware of the potentials of most of the emerging technologies in library. Similarly, the standard deviation of 1.08 indicates moderate variability in the respondents‟ responses.

**Research question two:** To what extent do you utilize the following technologies in providing services in your library? The respondents‟ responses presented in Table 2 address this research question.

Result in Table 2 revealed the extent to which librarians utilize emerging technologies for effective library services.

The result showed that Social media tools were the only emerging technologies used at a very high extent, this has mean score of 3.65; five listed types of emerging technologies including artificial intelligence ($\bar{x}$=2.63), cloud computing technology ($\bar{x}$=2.59), Integrated Library Management System (ILMS) ($\bar{x}$ = 2.55), Web OPAC ($\bar{x}$=2.54), and Internet of Things (IoT) ($\bar{x}$ =2.52) were utilized at high extent; while remaining eight listed items were utilize at a low extent. The grand mean of 2.43 is an indication that the emerging technologies are utilized by the librarians to a low extent. This implies that despite the fact that the librarians were aware of the potentials of emerging technologies for effective service delivery in library, majority of these technologies were rarely put into use.

**Research question three:** What are the benefits of integrating emerging technologies in university libraries?

The responses of the participants in Table 3 provide answer to this research question.

Table 3 presents the mean response of the respondents on the benefits of emerging technology in university libraries. The result revealed that encouraging digitization and preservation of library collections ($\bar{x}$=3.78) and promoting efficiency in library services and operations ($\bar{x}$=3.54) are the most excellent benefits of emerging technologies the respondents strongly agreed on. The respondents also agree on all other items listed on the table except for item no.8 which generates a mean score of 2.33. This implies that the respondents did not agree that emerging technology discourages collection development policy by enhancing inter- library loan services among libraries. Data on the table generates a grand mean score of 3.12 and standard deviation of 0.98. The implication of the grand mean of 3.12 shows that majority of librarians in the study area considered emerging technologies beneficial to library functions.

**Research question four:** What are the challenges of utilizing emerging technologies in university libraries?

The responses presented in Table 4 address this research question.

**Table 2: The extent of utilizing emerging technologies for effective library services N=136**

| S/N | Items | VHE | HE | LE | VLE | Mean | Std. | Dec |
|---|---|---|---|---|---|---|---|---|
| 1. | Artificial Intelligence | 22 | 62 | 32 | 20 | 2.63 | 0.93 | HE |
| 2. | Social media tools | 94 | 37 | 5 | 0 | 3.65 | 0.55 | VHE |

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| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 3. | Virtual Reality (VR) and Augmented Reality (AR) | 21 | 19 | 65 | 31 | 2.22 | 0.97 | LE |
| 4. | Internet of Things (IoT) | 28 | 50 | 23 | 35 | 2.52 | 1.09 | HE |
| 5 | Maker space | 23 | 30 | 49 | 34 | 2.31 | 1.03 | LE |
| 6. | Big Data and Data Mining | 26 | 36 | 29 | 45 | 2.32 | 1.13 | LE |
| 7. | Voice-Activated Technology | 20 | 10 | 50 | 56 | 1.96 | 1.04 | LE |
| 8. | Library Guide App | 23 | 30 | 49 | 34 | 2.31 | 1.03 | LE |
| 9. | Radio Frequency Identification (RFID) | 20 | 18 | 54 | 44 | 2.1 | 1.02 | LE |
| 10 | Web OPAC | 23 | 47 | 46 | 20 | 2.54 | 0.94 | HE |
| 11. | Cloud Computing technology | 31 | 45 | 33 | 27 | 2.59 | 1.05 | HE |
| 12. | Integrated Library Management System (ILMS) | 40 | 33 | 25 | 38 | 2.55 | 1.19 | HE |
| 13. | Robotics and automation | 13 | 24 | 56 | 43 | 2.05 | 0.94 | LE |
| 14. | Blockchain Technology | 17 | 32 | 55 | 32 | 2.25 | 0.96 | LE |
| | **Grand mean** | | | | | **2.43** | **1.07** | **LE** |

Key: VHE = Very High Extent, HE = High Extent, LE = Low Extent, VLE = Very Low Extent. Decision rule: Very High Extent, = 3.51 – 4.0, High Extent, = 2.51 – 3.50, Low Extent = 1.51 – 2.50, Very Low Extent =1.00 – 1.50.

**Table 3: The benefits of integrating emerging technologies in university libraries N =136**

| S/N | Emerging technologies | SA | A | D | SD | Mean | | Dec |
|---|---|---|---|---|---|---|---|---|
| 1 | Enhance access to information resource | 32 | 67 | 26 | 11 | 2.88 | | A |
| 2 | Promote collaboration among library staff | 76 | 44 | 2 | 14 | 3.34 | 0.94 | A |
| 3 | Encourage Gamification and Interactive Learning among users | 47 | 72 | 12 | 5 | 3.18 | | A |
| 4 | Improve research support by facilitating research data management | 63 | 36 | 19 | 18 | 3.06 | 1.07 | A |
| 5 | Promote efficiency in library services and Operations | 82 | 49 | 1 | 4 | 3.54 | 0.67 | SA |
| 6 | It encourages digitization and preservation of library collections | 92 | 44 | 0 | 0 | 3.78 | 0.48 | SA |
| 7 | Emerging technologies can personalize users' | 74 | 35 | 14 | 13 | 3.25 | 0.99 | A |

Key: SA = Strongly Agree, A = Agree, D = Disagree, SD =Strongly Disagree.
Decision rule: Strongly Agree, = 3.51 – 4.0, Agree, = 2.51 – 3.50, Disagree = 1.51 – 2.50, Strongly Disagree =1.00 – 1.50.

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**Table 4: The challenges associated with the utilization of emerging technologies in university libraries in Northeast Nigeria**

| S/N | Challenges of Utilizing Emerging Technologies in Libraries | SA | A | D | SD | Mean | Std. | Dec |
|---|---|---|---|---|---|---|---|---|
| 1. | Poor funding of academic libraries | 50 | 60 | 20 | 6 | 3.13 | 0.82 | A |
| 2. | Lack of proper planning for application of emerging technologies | 51 | 66 | 6 | 13 | 3.14 | 0.89 | A |
| 3. | High cost of computer hardware and software | 64 | 52 | 10 | 10 | 3.25 | 0.88 | A |
| 4. | Librarians Resistance to Change | 22 | 31 | 49 | 34 | 2.3 | 1.02 | D |
| 5. | Poor electricity supply | 20 | 60 | 50 | 6 | 2.69 | 0.77 | A |
| 6. | Poor staff training | 65 | 57 | 9 | 5 | 3.34 | 0.76 | A |
| 7. | Poor maintenance culture | 19 | 15 | 82 | 20 | 2.24 | 0.87 | D |
| 8. | Poor bandwidth and internet connectivity | 71 | 45 | 6 | 14 | 3.27 | 0.95 | A |
| 9 | lack of Skilled Personnel | 74 | 52 | 6 | 4 | 3.44 | 0.72 | A |
| 10 | Poor Data Security and Privacy Concerns | 30 | 76 | 10 | 20 | 2.85 | 0.93 | A |
| 11 | Copyright and Licensing Issues | 50 | 60 | 20 | 6 | 3.13 | 0.82 | A |
| 12 | Data Management Complexity | 20 | 56 | 40 | 20 | 2.56 | 0.92 | A |
| | **Grand mean** | | | | | **2.95** | **0.95** | **A** |

Key: SA = Strongly Agree, A = Agree, D = Disagree, SD =Strongly Disagree. Decision rule: Strongly Agree, = 3.51 – 4.0, Agree, = 2.51 – 3.50, Disagree = 1.51 – 2.50, strongly Disagree =1.00 – 1.50.

Table 4 presents the mean response of the respondents on twelve challenging factors associated with the utilization of emerging technology in libraries. Data on the table showed that the respondents react negatively on librarians‟ resistance to change ($\bar{X}$= 2.4) and Poor maintenance culture ($\bar{X}$=2.24) indicating that the two factors are not major hindrance to utilization of emerging technology in the study area. However, the respondents‟ positive responses which ranges from ($\bar{X}$ =2.56 to$\bar{X}$=3.44) on the other ten factors indicate that utilization of emerging technology in the study area is weighed down. The data on the table generated a grand mean of 2.95 indicating the respondents‟ agreement to all the items expect for items nos.4 and 7 as detrimental factors to effective utilization of emerging technologies in the study area. The data also showed a standard deviation of 0.95 indicating relatively low variability in the respondents‟ responses. The low variability of the standard deviation suggests a high level of consensus in the respondents‟ opinion.

**Discussion**

Data presented in Table 1 generated an overall mean score of 2.91 indicating a high positive response which reveals that respondents are aware of the potentials of most of the emerging technologies in library. This finding agrees with the findings of Zubairu and Adeleke (2021), and Majhi, Meher, and Maharana (2015) who in their studies confirmed that library staff are aware of emerging technologies. However, this finding contradicts the results of Pillai and Seena (2018), whose study on the application and awareness of cloud computing technology at Kerala University revealed a low level of awareness among library staff.

Table 2 illustrates the extent to which emerging technology is utilized in the study area. The data

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produced a grand mean of 2.43, indicating that emerging technologies are used by librarians to a low extent. This suggests that, although librarians are aware of the potential of emerging technologies to enhance library service delivery, most of these technologies are infrequently utilized. The finding coincides with the findings of Aliyu, Abdulrahaman, and Yusuf (2019) that implementation and use of emerging technologies in Nigerian academic libraries is moving too slowly. It also agrees with the findings of Zubairu and Adeleke (2021) that the use of emerging technologies for providing library services is very poor as most staff mainly use the technologies for storing personal photos and videos.

The data presented in Table 3 yielded a grand mean score of 3.12, indicating that most librarians in the study area perceive emerging technologies as beneficial to library functions. Some of the advantages highlighted in the table include encouraging digitization and preservation of library collections, enhancing efficiency in library services and operations, and fostering collaboration among library staff. The findings correspond with the findings of Ajiboye, Bokoh, Bello and Idowu (2023) that most library services have greatly improved with the aid of emerging technology. The study's findings also concur with the findings of Ayo-Olafare, 2020) that emerging technologies can help libraries to create collaborative and participative environment that is necessary to deliver user-centric library services and to create new resources and build-upon existing ones.

Despite the numerous benefits of emerging technologies in library services, the study in Table 4 identified several challenges, including a lack of skilled personnel, insufficient staff training, high costs of computer hardware and software, and limited library budgets, all of which hinder the effective use of these technologies in the study area. The grand mean of 2.95 derived from the data in the table indicates that the respondents agree that these factors largely hinder the effective utilization of emerging technologies in the study area. The findings agree with Ehoniyotan and Basirat (2023) that the adoption of new technologies is obstructed by limited funding, a lack of human capacity building, and erratic power supply. It also supports the findings of Okojie and Okiy (2019) that lack of funding, unstable power supply, insufficient trained staff, and restrictive government policies, among others are impeding effective utilization of emerging technologies in Nigerian libraries.

**Conclusion**

Based on the study's findings, it is concluded that despite librarians' awareness of the potential benefits of emerging technologies for library services, these technologies are underutilized in the study area. Additionally, several challenges were found to hinder the effective adoption and use of these technologies in the surveyed area. Therefore, to promote the use of emerging. Technologies in the study area, the study recommends:

1. Library management should improve training and skill development programmes, regardless of librarians' consciousness of the potential of emerging technologies in libraries. This would enhance librarians' technical skills, allowing them to actually utilize emerging technologies.
2. Libraries should allocate more resources to obtaining the essential hardware, software, and infrastructure. This would facilitate the gradual integration and use of these technologies in their daily operations.
3. Library management should create platforms for collaboration and sharing best practices to help librarians explore additional benefits and maximize the use of technologies.
4. Workshops, webinars, and conferences can offer opportunities for librarians to exchange ideas, tackle challenges, and develop solutions to enhance technology usage.

5. Libraries should seek external funding and form partnerships, as this could offer financial support for acquiring necessary tools and resources, which would help address various challenges and maximize the use of these technologies.

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