Awareness and Utilization of Z39.50 Protocol among Academic Librarians in Federal and State Universities in South-South, Nigeria

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Abstract
Z39.50 protocol plays a crucial role in enhancing library operations, particularly in cataloguing and resource sharing among libraries. Despite its significance, the level of awareness and utilization among academic librarians remain a subject of inquiry, especially in South-South, Nigeria. This study therefore, examined the awareness and extent of utilization of the Z39.50 protocol among academic librarians in federal and state universities in South-South, Nigeria. This study adopted descriptive survey research design. The population of this study was 262 academic librarians, made up of 97 academic librarians from Federal universities and 159 academic librarians from the State university libraries in South-South Nigeria. The study used census sampling technique and therefore used all the 262 academic librarians that constituted the population of the study because the number was manageable. A self-structured questionnaire was used for data collection. Data obtained from the study was analysed using descriptive statistics of mean scores and standard deviation, while the corresponding null hypotheses were tested using independent sample t-test. The study revealed that while academic librarians in federal and state universities in South-South, Nigeria have a moderate awareness of the Z39.50 protocol and utilized it for cataloguing and resource-sharing, there is no significant difference in their level of awareness and utilization across the two categories of institutions. The study therefore, recommended that academic librarians should be exposed to trainings in this respect, in order to enable them grasp the knowledge of the application and use of Z39.50 protocol in cataloguing operations. The library administration should foster the implementation of specialized technological education and training, as well as establish mentorship initiatives to foster more equitable utilization of requisite technology in library operations and services among academic librarians.

Keywords: Z39.50 Protocol, Awareness, Utilization, Cataloguing, Information Sharing, University Library

Introduction
Libraries irrespective of their types are meant to select, order, acquire, organize, store and disseminate relevant information resources to their clientele thus improving access which is a major driving force for libraries. Academic library is a type of library that is found in institutions of higher learning such as polytechnics, colleges of education and universities. They are equipped with a rich and balanced collection of resources that can support and enhance the

institution's teaching and learning activities, as well as the research that its faculty, staff and students conduct.

These academic libraries are regarded as a hub of educational institutions, and their services support a variety of academic activities, including teaching and research (Bala & Bala, 2022). Thus, every academic library's main duty is to meet the information needs of its parent institution. University libraries as an academic library is the focus of this study. University libraries are libraries found in every university which may be federal, state or private universities. The research is limited to federal and state university libraries which are owned and sponsored by the government.

Federal and state owned university libraries are essential to tertiary institutions' research, teaching, and learning. These libraries are designed to support curriculum provisions across departments, offer personal help by making available condusive environment and information resources. The federal government is responsible for the funding, infrastructural development and administration of the federal universities in Nigeria, while their state counterparts are owned and funded by the respective state governments.

In an educational environment that is changing very quickly, university libraries need more time and staff resources to meet the needs of faculty and students. They are also looking for tools that shine a light on their vital contributions toward the success of the academic institutions through the provision of library resources. Library resources are essentially information resources in the library which consist of books, journals, newspapers and other editorials, and encyclopedias as well as digital resources. However, providing these resources can only be justified if they are processed and utilized by the users for which they are meant to serve. Discovering the resources is paramount if the libraries must remain relevant, hence the libraries are up scaling in their efforts to make information resources more discoverable through classification and cataloguing ,indexing and by adopting technology in the operations. According to Babu and Krishnamurthy (2013), academic libraries are advancing at a fully automated medium of hi-tech grounds for resource discovery, propelled by technology improvements, with widespread computer applications and its' role could become more valuable as more services are offered while conventional services are being repurposed as digital services. Igere(2022) remarked that all information resources should be planned, produced, and structured for access and retrieval since the true value of a library is measured by its usefulness to library users, not by its size or collection or the beauty of its architecture.

Consequently, academic librarians who are professionals with a degree and/or master's degree in librarianship who work in academic libraries have the primary responsibility of ensuring that the library's resources/ collections are accessible to users by describing them in a standardized manner, that enables users to easily retrieve them from the library's catalogue. (which may be thought of as a key or index to the entries of each resource in the library). Simply having access to the information resources in the library is insufficient; what matters most is that these resources are accessible to those who need them and at the right time with little efforts. Librarians are able to achieve this by cataloguing the resources acquired by the libraries.

Cataloguing as stated by Igere (2022), is the act of describing information resources so that they may be found readily while Fajiwe, Subair; Enamudu, Omonagbe and Ogungbemile (2023) describe cataloguing as the process of describing information resources in a unique way using certain distinctive characteristics, like the author, title, publication location, date, and publishers. They continued by describing it as a job responsibility carried out by academic librarians, but one that may be accomplished with the aid of technology. Standards such as

Machine-Readable Cataloging (MARC), the *Anglo-American Cataloguing Rules 2nd* ed., (AACR2), Resource Description and Access (RDA) and the International Standard Bibliographic Description (ISBD) are frequently used for a cataloguing process. The process of cataloguing is a labor intensive task that demands careful attention to details and thorough investigation. Contemporary library software and systems have been engineered to seamlessly incorporate compliant protocols for cataloguing. The utilization of these software for cataloguing expedites the cataloguing process by granting librarians the ability to import accurate and comprehensive bibliographic records from reputable databases or library networks. She reiterates that this integration simplifies the process, diminishes the likelihood of errors, and bolsters the wider technological infrastructure of the library.

The technologically enhanced library environment is heterogeneous; it houses a wide range of technologies, different types of data, numerous applications, and other networked resources. There has to be a mechanism to connect various library systems even if libraries utilize the same automation systems and cataloguing standards. As a result, a single catalogue is required to enable simultaneous searches for the relevant information across all libraries irrespective of the library system in use in the individual libraries. The Z39.50 protocol was established to meet that demand. A protocol is described as a set of guidelines or standards developed to regulate the transmission of information between two entities seeking to communicate (Jayant, 2018)

Z39.50, an international standard protocol developed by the National Information Standards Organization (NISO) and approved by the American Standards Institute (ANSI) for use by networked computer systems for information retrieval (NISO, 2002) emerged as a protocol used to enhance library services. It is maintained by the United States Library of Congress (LC), widely used in library environments and frequently deployed in personal bibliographic reference software and integrated library systems (Jayant, 2018). The protocol grew out of the linked system project (LSP), which sought to standardize searching of the major bibliographic databases of the Online Computer Library Centre (OCLC), the Library of Congress (LC), the Washington (Western) Library Network (WLN), and the Research Libraries Information Network of the Research Libraries Group. The protocol starts the process of initiating and establishing connection between initiating client applications for the bibliographic records of another library (the server), checks the database or databases of the responding servers, and retrieves the specific data that the client has requested.

In addition, Z39.50 provides numerous benefits to libraries when used for cataloguing. It enhances library access to catalogues from multiple institutions, reducing search time and allowing more patron support. Z39.50 streamlines the cataloguing workflows by importing bibliographic records directly into library systems, reducing manual data entry and cataloguing errors which ultimately benefits both cataloguers and library users. The protocol enhances library record accuracy, simplifies operations, and is suitable for various settings, including small libraries and large-scale information systems, by automating processes, making it a valuable choice for libraries that are looking for innovative methods to support the needs of their libraries and its users.

The researcher's exposure to the Mortenson Center for International Library Program, at the University of Illinois, USA where this protocol is effectively used to catalogue library materials stemmed the researcher's interest in seeking ways to eliminate or reduce the quantity of library materials awaiting cataloguing for extended periods of time. However, for Z39.50 protocol to achieve its goal, the people it is meant to serve must be aware of its existence in order

to utilize it and to the best of the researcher's knowledge, there is no certainty about the awareness and use of Z39.50 protocol in South-South Nigeria.

Awareness is the capacity to understand or acknowledge the presence of something. It is the act of knowing that something exists. It is described by Nwankwo et al., (2019) as an understanding of a situation or issue at the present time based on knowledge or experience. It is therefore, imperative that the knowledge and recognition of the existence of Z39.50 protocol by academic librarians for library services is crucial for resource discovery and use. Hiding this heterogeneity from users becomes a problem if users (librarians) are not familiar with the different system interfaces used to communicate, seek information, and carry out other tasks efficiently. Utilization, on the other hand, is merely the act of using something. A utilizer or user is someone who uses something somewhere for their own objectives. In the same perspective, it is possible to define users as those who utilize the protocol for their libraries. This implies that there will be no use of Z39.50 protocol if academic librarians are not aware of it. In other words, utilization is sparked by awareness. The research intended to seek the state of awareness and utilization of Z39.50 protocol by academic librarians in federal universities.

Statement of the Problem

The Z39.50 protocol known as a standard for information retrieval that facilitates seamless communication between different library systems, enabling efficient cataloguing and resource sharing. It allows libraries to search and retrieve bibliographic records from remote databases, thereby improving access to diverse information resources. By enhancing interoperability, the protocol plays a crucial role in modern library operations, particularly in academic institutions where resource accessibility and collaboration are essential for effective service delivery. Despite its significance, the state of awareness and utilization of the Z39.50 protocol among academic librarians remains a subject of inquiry, particularly in South-South, Nigeria where the adoption of emerging library technologies varies across institutions. While the protocol offers numerous benefits, its effectiveness depends largely on the knowledge and competence of librarians in leveraging its functionalities. Understanding the extent to which academic librarians in federal and state universities in South-South, Nigeria are aware of and utilize the protocol is crucial for identifying gaps in knowledge, infrastructure, and implementation. This study, therefore, seeks to examine the state of awareness and extent of utilization of the Z39.50 protocol among academic librarians in federal and state universities in South-South, Nigeria. By assessing these factors, the study aims to provide insights that will guide strategic interventions, capacity-building initiatives, and policy recommendations to enhance the adoption and efficient use of the protocol in academic libraries.

Purpose of the Study

The purpose of this study is to assess the level of awareness and utilisation of Z39.50 protocol among academic librarians in federal and state universities in South-South, Nigeria. The specific objectives are to:

1. Discover the level of awareness of Z39.50 protocol by academic librarians of federal and state university libraries in South-South, Nigeria.
2. Determine the extent of utilization of the Z39.50 protocol by academic librarians of federal and state university libraries in South-South, Nigeria.

Research Questions

The following research questions were formulated to guide the study:

1. What is the level of awareness of the Z39.50 protocol among academic librarians in federal and state university libraries in South-South, Nigeria?
2. To what extent do academic librarians utilize the Z39.50 protocol in federal and state university libraries in South-South, Nigeria,

Null Hypotheses

The following null hypothesis were tested at 0.05 level of significance.

H_{01}. There is no significant difference in the level of awareness of Z39.50 protocol by academic librarians in federal and state universities in South-South, Nigeria.

H_{02}. There is no significant difference in the extent of utilization of the Z39.50 protocol by academic librarians in federal and state universities in South-South, Nigeria.

Review of related Literature

The National Information Standards Organization (NISO) (2002), defined Z39.50 protocol as an international standard that allows two computer systems connected to a network to communicate with one other in order to retrieve information. Moen (2000), defined Z39.50 as a communication protocol that, at its most basic level, allows two systems to exchange messages for the purpose of information retrieval which according to Ward and Wood (1995), gives a client a flexible framework to carry out information retrieval tasks on databases that are available through an information server. In addition, Jhamb (2024) describes Z39.50 protocol as a process when a client machine (referred to as an "origin") may search databases on a server system (referred to as a "target") and obtain records that are recognized as a result of such a search, which specifies data structures and exchange rules. Technology advancements have made it possible to design a variety of computer systems for categorizing materials, such as MARC (Machine-Readable Cataloging), which established a standard framework for cataloging documents in libraries.

Considering the emergence of technologies and protocols and its use in operations in academic libraries, academic librarians may not view Z39.50 awareness as a pressing concern. There could also be an assumption that librarians are already knowledgeable about this protocol due to its relevance, which may lead to overlooking potential knowledge gaps. Addressing this gap is important because academic librarians play a role in facilitating information retrieval and knowledge sharing. Ketheeswaren et al. (2023) is of the opinion that insufficient understanding of the Z39.50 protocol could hinder decision making and the quality of services offered to library users. Therefore, by exploring awareness, librarians can gain an understanding of training needs, potential system improvements and strategies for enhancing user experiences.

In the present dispensation of the digital age, a librarian's awareness of technology such as Z39.50 is crucial to providing quality services to patrons. Academic librarians must be familiar with a wide range of technologies, from basic computer applications to complex database systems. This allows them to assist patrons in research, provide access to digital resources, and facilitate learning opportunities. Acording to Nwankwo et al., (2019) “awareness” is when someone is informed about something and thus is said, to be aware. Akem et al. (2019) noted that awareness does not guarantee utilization. In addition, Gupta and Shrivastava (2019),

conducted a survey on the awareness of discovery tool among library professionals in India and noted that library professionals need to be aware about the newest technologies used in federated searching, discovery tools, next-generation catalogues, and web-scale discovery tools as professionals are unaware of the fundamental ideas behind facet searching and the discovery tool.

According to Adetomiwa (2020), utilization simply means to use, and using something implies to put it into action or make it available to others. Okore and Anaehobi (2014) sees utilization as the act of doing something or rendering a service that can be useful to someone. According to Syukur et al. (2016), libraries have been utilizing the Z39.50 protocol to facilitate the process of copying and cataloguing English book collections from the Library of Congress server. This has greatly simplified the library's cataloguing process, although, certain fields needs editing by library personnel. Jhamb (2024) also observed that the Z39.50 protocol introduces a methodology for achieving uniformity in information retrieval within the context of expansive network systems, specifically those designated as Wide Area Networks (WAN) by utilizing the ANSI/NISO Z39.50 protocol. The author also affirmed that the protocol facilitates the process of distributed searching in library-based applications by providing distinct parameters for the behavior of both the Z39.50 client and server in relation to searching and retrieving information from online library catalogues. In the same vein, Fox (2024) opined that the protocol, which is essential for facilitating smooth connectivity between various library systems, is well understood by librarians as it improves resource discovery across full-text and bibliographic databases by promoting interoperability, giving users access to a greater variety of scholarly content. Since it improves the general usability, accessibility, and effectiveness of library services, this protocol is generally acknowledged as a major benefit in creating increased retrieval and use of information resources.

Oguchere (2023) noted that Z39.50 protocol is used to enable users conduct searches, find information, communicate, and carry out other tasks in a useful and meaningful manner. Al-Jaradat and Alsamraie (2012), carried out a study to determine how widely the Z39.50 standard protocol was used in Jordanian university libraries to assess the degree of comprehension and acquaintance of the research participants with regards to the Z39.50 protocol. Therefore, the potential of Z39.50 to promote new means of data creation and exchange within library networks which expounds on the Search/Retrieve Webservice (SRW), as utilized in commercial communications cannot be overemphasized. Librarians can easily share their resources with one another using the Z39.50 protocol. Regardless of the underlying software or system, librarians can search and get data from numerous databases using the Z39.50 protocol. Singh (2016), remarked that since the user's query is converted into Z39.50 standard by the computers and the matched results are delivered to users in a chosen format, Z39.50 makes the compilation/creation of bibliographic entries possible. The review of literature revealed that there is a dearth of empirical studies explicitly examining academic librarians' knowledge and use of the Z39.50 protocol.

Methodology

This study utilized descriptive survey research design. The population of this study was 262 academic librarians, made up of 97 academic librarians from federal universities and 159 academic librarians from the state university libraries. The study used census sampling technique to sample all the 262 academic librarians that constitute the population of the study. A self-structured questionnaire titled “Awareness and Utilization of Z39.50 Protocol Scale” (AUZPS)

was used for data collection. Data obtained from the study was analysed using descriptive statistics of mean scores and standard deviation, while the corresponding null hypotheses were tested using independent sample t-test.

Results

Research Question One: What is the level of awareness of the Z39.50 protocol among academic librarians of federal and state university libraries in South-South Nigeria?

Table 1: Level of Awareness of the Z39.50 Protocol among Academic Librarians in Federal and State University Libraries in South-South Nigeria

S/N		Federal (*N* = 97)			State (*N* = 159)		
	I am aware that Z39.50 protocol:	Mean	*SD*	Remark	Mean	*SD*	Remark
1	Allows connectivity of two computers to share content	3.11	1.08	MA	3.11	.98	MA
2	Supports the initialization process of how information retrieval queries are processed.	2.91	.99	MA	3.04	.83	MA
3	Is a client-server that serves as a standard language for all devices	2.91	1.07	MA	2.90	.92	MA
4	Can be used in cataloguing activities	3.08	.96	MA	3.15	.95	MA
5	Translates a query into appropriate syntax.	2.70	1.04	MA	2.87	.99	MA
6	Offers one interface to access many systems.	2.86	.97	MA	2.90	1.02	MA
7	Enables a client to ask a server to search databases for records.	2.99	.91	MA	2.96	.92	MA
8	Developed for the electronic searching and retrieval of bibliographic data	3.10	.92	MA	2.99	.89	MA
9	Does not distinguish between different software and hardware.	2.57	1.08	MA	2.48	1.03	A
10	Standardizes the messages that clients and servers need to communicate to achieve interoperability.	2.57	1.06	MA	2.73	.93	MA
	Total	2.88	1.01	MA	2.91	.85	MA

Note: ***Highly Aware (HA), Moderately Aware (MA) Aware (A), and Not Aware (NA)***

Table 1 shows the mean responses on the level of awareness of Z39.50 among academic librarians in federal and state university libraries in South-South, Nigeria. The table showed that academic librarians of both federal and state universities were moderately aware that Z39.50 protocol is developed for the electronic searching and retrieval of bibliographic data, can be used in cataloguing activities, is a client-server that serves as a standard language for all devices, supports the initialization process of how information retrieval queries are processed and enables

a client to ask a server to search databases for records.

Librarians in federal universities obtained a much higher standard deviation than those in state universities (federal: ± = 0.77 ≥ state ± = 0.62). The table further shows that the librarians in federal universities are moderately aware that Z39.50 protocol does not distinguish between different software and hardware and standardizes the messages that clients and servers need to communicate to achieve interoperability; whereas those in state universities were only aware that the protocol does not distinguish between different software and hardware.

Null Hypothesis 1: There is no significant difference in the level of awareness of Z39.50 protocol by academic librarians in federal and state universities in South-South, Nigeria.

Table 2: *T-test* Analysis on the Level of Awareness of the Z39.50 Protocol among Academic Librarians in Federal and State University Libraries in South-South Nigeria

Variable	*N*	Mean	*SD*	t-value	*Df*	p-value	α-level	Remark
Federal	97	2.88	.77	-.426	253	.670		
State	158	2.91	.62				0.05	Not Significant

Table 2 shows that librarians in federal universities (M = 2.88, SD = .77) have a lower mean score, that is non-significant on the level of awareness of the Z39.50 protocol than librarians in state universities (M = 2.91, SD = .62), t (253) = -.426, p > .05. Hence, the first null hypothesis is upheld. The level of awareness of Z39.50 protocol by academic librarians in federal and state universities in South-South, Nigeria do not differ significantly.

Research Question Two: To what extent do academic librarians of federal and state university libraries in South-South Nigeria utilize the Z39.50 protocol?

Table 3: Mean Responses on the Extent of Utilization of Z39.50 Protocol by Academic Librarians of Federal and State University Libraries in South-South Nigeria

S/N	**In my University Library, Z39.50 is utilized for:**	Federal (N = 97)			State (N =159)		
		Mean	*SD*	Remarks	Mean	*SD*	Remark
11	Library's cataloguing processes	3.04	1.10	ME	2.95	1.19	ME
12	Inter-library resource sharing	2.77	1.10	ME	2.69	1.09	ME
13	Accessing and retrieving of bibliographic records from other libraries or databases	3.04	1.03	ME	2.62	1.06	ME
14	Cross-referencing	2.69	1.07	ME	2.51	1.09	ME
15	Collaboration with other libraries	2.69	.98	ME	2.83	1.11	ME
16	Provide accurate and comprehensive descriptions of library materials	2.83	1.06	ME	3.00	1.10	ME
17	Searching and retrieving resources in our library catalogue	2.81	1.05	ME	2.74	1.12	ME
18	Improving accessibility of library materials	2.75	1.11	ME	2.88	1.16	ME

Total	2.83	1.06	ME	2.78	1.12	ME

Note: ***High Extent (HE), Moderate Extent (ME), Low Extent (LE), and No Extent (NE)***

Table 3 shows mean responses on the extent of utilization of Z39.50 protocol by academic librarians in Federal and State universities in South-South, Nigeria. Item by item mean scores indicate that academic librarians in both federal and state universities utilize the protocol to a moderate extent in all the listed items. Those in federal universities scored higher in items 11, 12, 13, 14, and 17 whereas those in state universities scored higher in items15 and 18. Overall, academic librarians in federal universities had higher total mean score on the extent of utilization of Z39.50 than librarians from state universities. The table also shows that the variability on utilization among librarians in federal and state universities is higher among librarians in state universities since they obtained a standard deviation that is less clustered around the mean score unlike those in federal universities with a standard deviation score relatively clustered around the mean score.

Null Hypothesis 2: There is no significant difference in the level of utilization of the Z39.50 protocol by academic librarians in federal and state universities in south-south Nigeria.

Table 4: *T-test Analysis on Mean Responses on the Utilization of the Z39.50 Protocol among Academic Librarians in Federal and State University Libraries in South-South, Nigeria*

Variable	*N*	Mean	*SD*	t-value	*Df*	p-value	α-level	Remark
Federal	96	2.83	.86	.429	250	.668		
State	156	2.78	.93				0.05	Not Significant

Table 4 shows that librarians in federal universities (M = 2.83, SD = .86) have a higher mean score that is non-significant on the utilization of the Z39.50 protocol than librarians in state universities (M = 2.78, SD = .93), t (250) = .429, $p > .05$. Hence, the hypothesis that states that there is no significant difference in the level of utilization of the Z39.50 protocol by academic librarians in federal and state universities in South-South, Nigeria is not rejected.

Discussion of Findings

Awareness of Z39.50 protocol by academic librarians of federal and s tate university libraries in South- South, Nigeria.

The study revealed that academic librarians in federal and state university libraries in South-South Nigeria are moderately aware that the Z39.50 protocol is used to connect two computers to share content, can be used for cataloguing activities, translate a query into appropriate syntax, offers one interface to access many systems, enables a client to ask a server to search databases for records, developed for the electronic searching and retrieval of bibliographic data and standardizes the messages that clients and servers need to communicate to achieve interoperability. This finding aligns with the assertion of Joshi (2003), which noted that many academic librarians recognize Z39.50 as a standard for client/server frameworks that enable seamless searches across multiple databases through a single interface. Similarly, a study by Idahosa and Eireyi-Edewede (2023), conducted in South-South, Nigeria confirmed that while librarians generally had a positive attitude towards technology, their awareness of specific

standards needs to be improved because they are only moderately aware, there is need for increased sensitization. This highlights the need for targeted training programs and workshops on developing the capacity y for use and application of these standards.

The study showed that there is no significant difference in the level of awareness of Z39.50 protocol by academic librarians in federal and state universities in South-South Nigeria. The finding of this study is in agreement with Fox (2024) which affirms that librarians are familiar with the protocol which facilitates inter-system connectivity, improving resource discovery via bibliographic and full-text databases, which is regarded as advantageous for the functionality of library services. These studies showed that the prevailing degree of technological awareness among academic librarians within Federal and State universities in Nigeria is significantly elevated, especially in relation to diverse technological instruments and innovations. Nonetheless, obstacles persist in the proficient incorporation and application of these technologies.

Utilization of the Z39.50 protocol by academic librarians of federal and state university libraries in South-South, Nigeria

Academic librarians of federal and state university libraries utilized Z39.50 protocol for their library's cataloguing processes, provide accurate and comprehensive descriptions of their library materials improve accessibility of their library materials and collaborate with other libraries. It could be deduced from the results that academic librarians employ the Z39.50 protocol predominantly for the streamlined searching and retrieval of information from a variety of databases as the protocol enhances interoperability among library systems, thereby allowing librarians to perform intricate searches with ease. In support of this finding, Syukur et al., (2016) noted that academic librarians utilize the Z39.50 protocol for the purpose of copy cataloguing, particularly drawing upon reputable databases such as the Library of Congress, thereby augmenting their endeavours in collection development. They also affirm that the protocol facilitates concurrent inquiries across various databases, thereby optimizing the information retrieval methodology and enhancing the overall user experience.

The study further revealed that there is no significant difference in the level of utilization of the Z39.50 protocol by academic librarians in federal and state university libraries in South-South, Nigeria. Joel and Ibrahim (2021), study on librarians' digital competencies and its influence on their utilization of emerging educational technologies showed that librarians as information professionals, are anticipated to exhibit digital proficiencies to succeed within the digital paradigm and to proactively and robustly steer the procurement, acquisition, application, utilization, and implementation of contemporary technologies aimed at enhancing library and information services. This is not surprising as the internet revolution, which resulted in the use of technology to improve the workflow in libraries, may be responsible for the current state of affairs as academic librarians in Nigeria are progressively employing computing technologies such as OCLC and Google Docs to optimize the efficiency of service provision (Isiaka et al., 2024; Emmanuel and Ordu, 2024). Although academic librarians of federal and state university libraries in South-South, Nigeria demonstrate an affirmative disposition toward information and communication technology (ICT), their practical involvement with sophisticated protocols such as Z39.50 continues to be minimal. The deployment of the Z39.50 protocol by academic librarians in the Southern regions of Nigeria is constrained, and is mainly attributable to infrastructural deficiencies as well as absence of adequate training in the use of these technologies.

Conclusion

The Z39.50 protocol is an international standard for information retrieval that allows different computer systems to communicate and share bibliographic data seamlessly. It plays a crucial role in enhancing library operations, particularly in cataloguing and resource sharing among libraries. By facilitating interoperability between library management systems, the protocol enables academic libraries to improve access to their collections and collaborate with other institutions.

Despite its significance, the level of awareness and utilization of the Z39.50 protocol among academic librarians remains a subject of inquiry, especially in Nigeria, where the extent of technology adoption in library operations varies across institutions. This study examines the awareness and extent of utilization of the Z39.50 protocol among academic librarians in federal and state universities in South-South, Nigeria. It was revealed that academic librarians in federal and state university libraries in South-South, Nigeria are moderately aware that the Z39.50 protocol is used to connect two computers to share content, can be used for cataloguing activities, translate a query into appropriate syntax, offers one interface to access many systems, enables a client to ask a server to search databases for records, developed for the electronic searching and retrieval of bibliographic data and standardizes the messages that clients and servers need to communicate to achieve interoperability. The study showed that there is no significant difference in the level of awareness of Z39.50 protocol by academic librarians in Federal and State universities in South-South Nigeria. Academic librarians of federal and state university libraries utilized Z39.50 protocol for their library's cataloguing processes, provide accurate and comprehensive descriptions of their library materials, improve accessibility of their library materials and collaborate with other libraries. There is no significant difference in the level of utilization of the Z39.50 protocol by academic librarians in federal and state university libraries in South-South, Nigeria. The study concludes that while academic librarians in federal and state universities in South-South Nigeria have a moderate awareness of the Z39.50 protocol and utilize it for cataloguing and resource-sharing, there is no significant difference in their level of awareness and utilization across the two categories of institutions.

Recommendations

1. Academic librarians should be exposed to trainings in order increase awareness of librarians about the intricacies of Z39.50 protocol and its application.
2. Library management should foster the implementation of specialized technological facilities provision in university libraries, establish mentorship initiatives on the job to foster more equitable utilization of technology among academic librarians.

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