

**LIBRARIANS COMPETENCIES AND PERCEPTIONS IN THE USE OF Z39.50
PROTOCOL FOR CATALOGUING ROUTINES IN UNIVERSITY LIBRARIES IN EDO
AND DELTA STATES, NIGERIA**

By

DR. OGOCHUKWU T. EMIRI

Abstract

The research looked at the competencies and perceptions of librarians on the Z39.50 protocol's application to cataloging in university libraries in Edo and Delta States, Nigeria. Four research questions and objectives guided the research. Descriptive survey research design was adopted with a population of 183 librarians in the university libraries in Edo and Delta States, Nigeria. Total enumeration sampling technique was adopted while a Questionnaire was used for data collection. Descriptive analysis was conducted using the elicited data. The questionnaire was circulated in 183 copies; 178 of those copies were retrieved. The librarians working at the university libraries in Delta States, Nigeria and Edo, Nigeria, lacked the competencies required to utilize the Z39.50 Protocol for cataloging. The librarians working in the understudied universities had a positive perception of Z39.50 Protocol for cataloging. The results also demonstrate that the librarians were aware of the advantages of the Z39.50 protocol for optimizing the effectiveness of their cataloguing practices. The results showed that the obstacles preventing university libraries from using the Z39.50 Protocol for cataloguing encompasses the protocol's inherent complexity, its slowness when handling complex queries, the lack of organized training for librarians on its use and implementation, and incompatibility problems, among others. The researchers recommended that frequent training programs be held to increase librarians' proficiency in implementing the Z39.50 protocol and appropriate plans and policies be developed to direct the protocol's installation and upkeep in university libraries.

**Keywords: Librarians; Competencies; Perception; Z39.50 Use; Cataloguing; University
Libraries**

Introduction

The emergence of various technologies has affected several aspects of library services and routines in this digital age. Libraries in this 21st century are now automating every aspect of their services and routines for effective service delivery to their users (Moruf & Olaojo, 2020).

Notably, Halder and Halder (2023) affirmed that the online public access catalogue is now been used for optimising search results using various search strategies like author's names, year of publication, subject, and title to mention a few. The charging and discharging of library books are managed with the circulation module of automation software; serials are managed by the serial management module and the same with the acquisition routines (Halder & Halder, 2023). One revolutionary innovation that has impacted university library technical services is the introduction of the Z39.50 Protocol. A computer-to-computer assisted communication protocol called Z39.50 is designed to facilitate information search and retrieval in a networked dispersed system setting (The Online Computer Library Center (OCLC), 2024).

The Z39.50 emanated from the Linked Systems Project (LSP), a project in the 1980s to assist in the standardization of bibliographic database searches of the Washington Library Network, Library of Congress, Research Libraries Information Network of the Research Library Group and the OCLC (National Information Standards Organization, 2002). Currently, the Z39.50 can be referred to as two information standards, first is the International Standard (ISO 23950) for informational retrieval and the American standard (NISO/ ANSI Z39.50) (The Online Computer Library Center (OCLC), 2024). The Z39.50 Protocol is applied in the library environment for catalogue search between libraries and for loaning information materials, which is often integrated into integrated library systems, and social media, among others (Mandal & Malik, 2020). The Z39.50 is trendy and has propelled access to bibliographic data which has made cataloguing of library materials seamless and swift through copying bibliographic information from other libraries thereby providing global access to data via the Web-OPAC (Waris et al., 2020).

This innovation made the concept of copy cataloguing prominent within the library environment saving the time of librarians; and enabling users to get speedy access to information resources, resulting in consistency and accuracy in the cataloguing of library information materials (Waris et al., 2020). For librarians to accept and adopt this innovation for improving the efficiency of their cataloguing routines, they need to have the requisite competencies. The adoption and usage of technology in university libraries has been shown to need a set of

competencies (Lola & Gbaje, 2022). The way librarians see the Z39.50 protocol is another essential component that may improve library adoption of the protocol. Yoon et al. (2021) claim that librarians' perceptions often indicate whether or not they would accept or employ a technology tool in their academic library.

It is against this context that the research explores the competences and perception of librarians about the Z39.50 Protocol for successful cataloging in university libraries of Edo and Delta States, Nigeria.

Statement of the Problem

The evolving demands of information service delivery in university libraries necessitate the adoption of efficient cataloguing systems that ensure quick and accurate access to library resources. One such system is the Z39.50 protocol, a standard designed to facilitate seamless information retrieval and resource sharing among libraries. In many developed countries, this protocol has been widely embraced, contributing to improved cataloguing accuracy and faster access to information materials.

However, despite its potential, the Z39.50 protocol appears to be underutilized in university libraries within Edo and Delta States, Nigeria. Preliminary interactions with librarians in these regions suggest that limited awareness, technical competence, and perception towards the protocol may be influencing its adoption. This gap highlights a need to understand the extent to which librarians are prepared in terms of competencies and perception to implement and benefit from such cataloguing innovations. The compelling factor that necessitates this study is the urgent need to explore how librarians' competencies and perceptions affect the adoption of Z39.50 protocol in university libraries in Edo and Delta States. Addressing this gap is essential to improving cataloguing practices, enhancing access to library materials, and ultimately, supporting academic and research activities in these institutions. This is also paucity of current studies carried out on the competences and perception of librarians about the Z39.50 Protocol for

successful cataloging in university libraries of Edo and Delta States, Nigeria which prompted the need for the present study.

Research Questions

The following critical questions were raised to give the study a focus:

- 1. What is the extent of librarians’ competencies with the Z39.50 Protocol for cataloging in Nigerian university libraries in Edo and Delta States?
- 2. What is the perception of librarians regarding the Z39.50 Protocol for effective cataloguing in university libraries of Edo and Delta States, Nigeria?
- 3. What are the prospects of the Z39.50 Protocol for efficient cataloging in Nigeria's Edo and Delta State university libraries?
- 4. What are the challenges to Z39.50 Protocol deployment for cataloging in Edo and Delta State university libraries?

Literature Review

Conceptual Framework

The conceptual framework shows the relationship between the variables in the study. Below is the diagram depicting the conceptual framework:

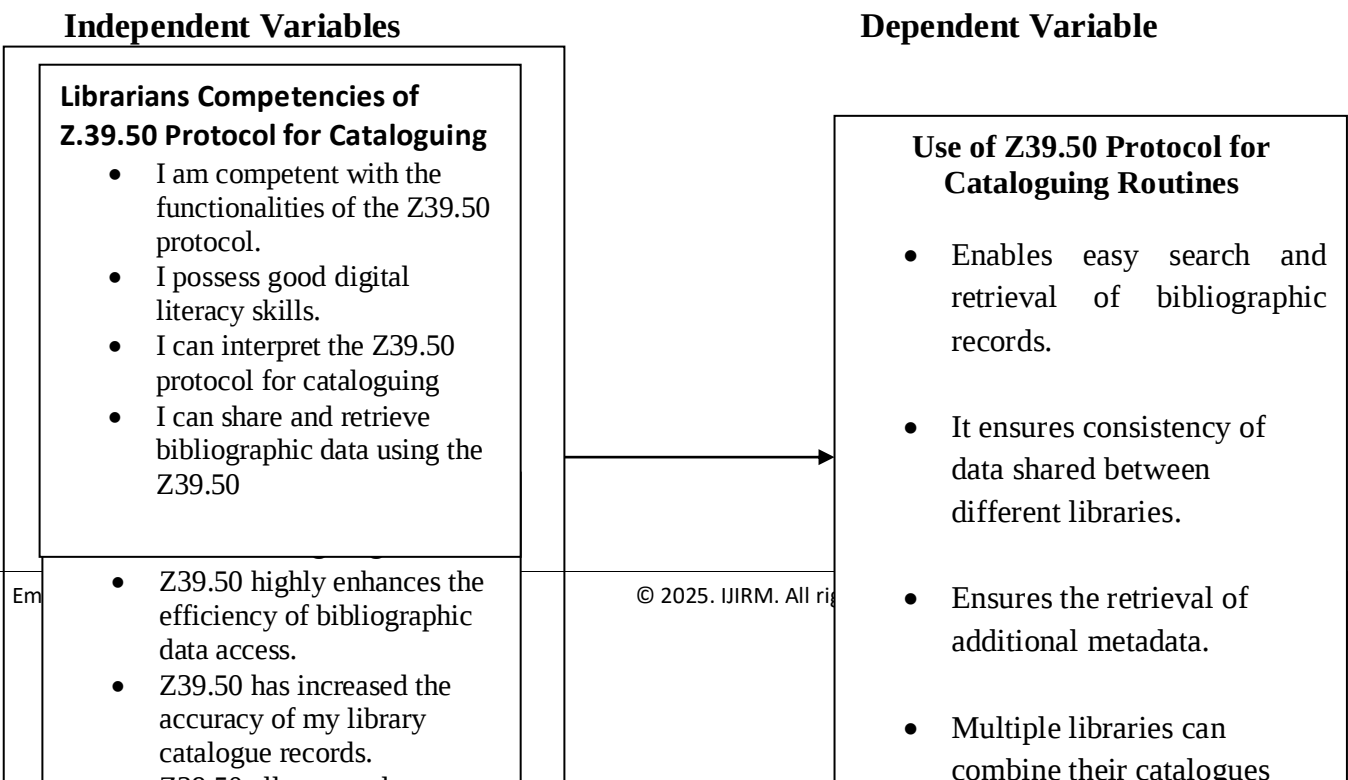


Figure 1: Conceptual Model: Librarians Competencies and Perceptions of the Use of Z39.50 Protocol for Cataloguing Routines Model

The conceptual framework in Fig 1 shows the relationships that exist between librarians' competencies, perception (independent variables), and the the Use of Z39.50 Protocol for Cataloguing Routines (dependent variable) in university libraries. From the conceptual framework, it is glaring that if librarians have the requisite competencies and a positive perception of the use of Z39.50 protocol, they will embrace the concept for undertaking their cataloguing routines effectively. Overall, the model shows how the competencies and perceptions of librarians can influence their use of Z39.50 protocol for effective cataloguing routines in the university libraries.

Theoretical Underpinning of the Study

The Technology Acceptance Model developed by Davis in 1989 serves as the foundation for this investigation (Davis, 1989). The Technology adoption Model sheds light on the fundamental elements that affect and forecast an individual's adoption of a new technology advance. According to Davis (1989), people's intentions to embrace new technologies are often

impacted by how beneficial and simple they are considered to be. According to Davis (1989), perceived usefulness refers to an individual's belief that using the technology would enhance their overall performance. Regarding the current research, perception is a key factor in determining whether new technologies are adopted by libraries; if librarians believe that the Z39.50 Protocol would improve their cataloguing procedures, they are likely to use it. According to Davis (1989), perceived ease of use refers to how easy prospective users consider a new technology to be while using them. If librarians have the competencies to deploy the Z39.50 Protocol, the use of technology for cataloguing routines would be effortless enhancing the likelihood of its adoption in university libraries. The diagram below shows the variables of the adopted model:

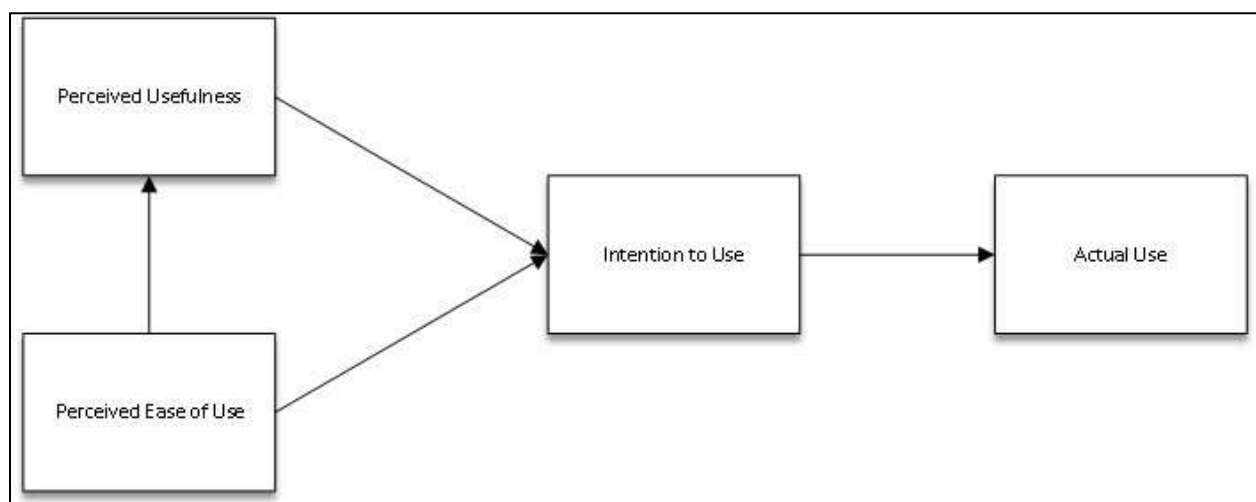


Figure 2: Technological Acceptance Model by Davis, 1989

According to the Technology Acceptance Model, the Z39.50 Protocol's adoption for efficient cataloging at Edo and Delta State university libraries may be influenced by factors such as perceived usefulness and simplicity of use.

Empirical Review

Librarians' competencies of Z39.50 protocol for effective cataloguing in university libraries

Mercy and Etido (2018) looked at ways to use information communication technology at the Uyo University Library to better classify information materials. According to the study's findings, one of the main obstacles to the use of technology instruments for improving cataloging procedures in the library under investigation is a lack of the necessary competencies. Ketheeswaren et al (2023) did a feasibility study of implementing Metadata service to catalogue in Tamil libraries. The findings indicated that the librarians lack the needed computer literacy to implement metadata services for improving their cataloguing routines in Tamil libraries. Cakmak (2018) examined the cataloguing processes at the Turkey University libraries, pointing out the trends. The findings revealed that the librarians are moderately skilled in the deployment of Z39.50 as a novel trend in cataloguing information materials in the university libraries in Turkey explored. In a similar research, Omosokejimi et al (2022) looked at cataloguers knowledge, competencies and deployment of Resources Description and Access (RDA) in South-South university libraries. The findings showed glaringly that the librarians lack the necessary information communication skills to use RDA for effective cataloguing routines. In a study of librarians working in Pakistani university libraries, Khan and Bhatti (2016) investigated digital abilities for the creation and administration of digital libraries. The results showed that the digital competencies needed to manage digital libraries could be divided into three categories: those needed to develop digital libraries, those needed to manage digital libraries, and those needed to manage digital contents. Additionally, the results showed that university librarians in Pakistan had the fundamental digital skills needed to establish and run digital libraries.

The perception of librarians regarding the Z39.50 Protocol for effective cataloguing in university libraries

Various research have led to differing perception among librarians on the Z39.50 Protocol for cataloging in university libraries. The use of Z39.50 at the FAH library has facilitated copy cataloguing from the Library of Congress server since 2015, although some fields require manual editing by staff (Syukur et al., 2016). In Turkey, university libraries implement various cataloguing processes, with librarians preferring to transfer catalogue records from trusted sources for clarity and comprehensibility (Cakmak, 2018). Asim and Mairaj (2019) investigated how Punjab, Pakistani librarians perceived the installation and use of the Koha integrated library

system. The librarians perceived Koha to be valuable for their library operation particularly due to its features for cataloguing like the MARC 21 and the Z39.50 protocol. The federal university of Oye-Ekiti served as the case study for Olawale and Akanmu's (2020) investigation of library automation in academic libraries. The findings revealed that the librarians possessed a positive perception of automating their routines, as the respondents feel that it will help boost efficiency, swift service delivery and ensure swift information retrieval. With a focus on the cataloguing function of integrated library systems, Jayarathna and Herath (2024) investigated how librarians perceived their usage and implementation. The findings revealed that the librarians have a positive perception of Koha as an integrated library system due to its cataloguing features using the Z39.50 and MARC 21 for seamless cataloguing of their information materials.

Prospects of the Z39.50 Protocol for effective cataloguing in university libraries

In a study, Odunola et al. (2019) assessed an automated cataloging system at Oyo State, Nigeria's university libraries. The results showed that librarians thought automated cataloging was a good thing as it made the process of cataloging information items easier and quicker. According to Nascimento (2024), data search and retrieval from databases and library catalogues is accomplished via the Z39.50 protocol. Users can search across many library networks using one interface, which facilitates collaboration between libraries. To maintain compatibility across many systems, the protocol lays out guidelines for communication between client and server applications (Nascimento, 2024). For libraries, the initial cataloguing process was expensive and time-consuming. Sakkaravarth (2013) argued in a study that because the Z39.50 protocol allows for easy record comparison and simultaneous searches across various sources, the process of finding and downloading bibliographic entries has been made simpler and more efficient. Initially, proprietary software and service agreements associated with particular bibliographic utilities have placed limitations on libraries (Sakkaravarth, 2013). Instead of penalizing users for interacting with a wide variety of sources, the Z39.50 protocol increases flexibility and decreases reliance on individual providers (Sakkaravarth, 2013). Waris et al (2020) asserted that Z39.50 protocol serves as intermediary saving cost, time and effort duplication ensuring library cataloguing routines are carried out efficiently and seamlessly.

The challenges affecting the implementation of the Z39.50 Protocol for effective cataloguing in university libraries

Ajani and Sulyman (2023) in a study listed the challenges affecting cataloguing in the digital age to include lack of information communication skills, accomodating technical innovation complexities, indadequate infrastructural facilities, erratic power supply, poor encouragement, and inadequate training, among others. The expense of implementing copy cataloging in university libraries was brought up by DeZelar-Tiedman et al. (2020). The research suggested using more innovative tactics to enhance the effectiveness of technical services cataloging procedures. Z39.50 offers advantages, but it also has a few major drawbacks that can make it less effective. Due to its complex network and software setups, regular changes, and technical skill requirements, implementing and maintaining the Z39.50 protocol requires significant resources (Lynch, 2018). In addition, the Z39.50 protocol is not user-friendly and has a steep learning curve. To design queries and analyze results efficiently, users must get familiar with a particular syntax and vocabulary (Mubarak, 2009). Z39.50 has compatibility and consistency problems which occur from the possibility that various servers employ distinct data schemas and formats, support different protocol versions or profiles, or both (Ding, 2006). Nwosu and Obiano (2021) investigated the obstacles and driving forces behind the Federal University of Technology Library's automation of library services in Owerri, Imo State. The findings revealed that the challenges militating against the implementation of automation include inadequate staff training, poor funding, poor management support, and inadequate automation facilities for service delivery. Additionally, Bwango and Mubofu (2019) looked at the institutional experience of adult education, the enabling variables driving automation processes, and the mitigating factors impacting the automation of services. The results showed that, among other things, inadequate management support, an epileptic power supply, inadequate planning, and poor communication between stakeholders were identified as the problems impeding the use of automation software in the institution library.

Research Methodology

Employing a descriptive survey research design, the study embraced a quantitative research methodology. The researchers' sample consists of librarians working in Edo and Delta State, Nigeria's State, Federal, and Private university libraries. In Edo and Delta States, Nigeria, university libraries engage 183 librarians as the study's specific population. The complete population was sampled for the study using the total enumeration sampling approach, which was used for the research. A structured questionnaire created by the researchers is the tool used to gather data. The questionnaire was titled "Competencies and Perceptions of Librarians regarding the Z39.50 Protocol for Effective Cataloguing in University Libraries Questionnaire (CPLRZPECULQ). With the assistance of three research assistants who had received the necessary briefing on how to approach participants and obtain the necessary data to complete the study, the instrument was handed to the participants. One month was dedicated to the data collecting phase. The frequency count, percentage, and mean were used in the descriptive statistics approach of data analysis.

Result and Discussion

The result of the study will be discussed under the questionnaire response rate, demographic distribution and key findings of the study.

Questionnaire Response Rate

Table 1: Questionnaire Response Rate		
Number of Questionnaire Distributed	Number of Questionnaire Returned	Percentage of Return
183	178	97%

Table 1 showed that a 97% response rate was obtained from the 183 copies of the survey questionnaire that were given to the respondents and the 178 copies that were correctly retrieved.

Demographic Distribution of the Respondents

Educational Qualification of the Respondents

Table 2: Educational Qualification of Respondents

Educational Qualification	Frequency	Percentage
B.Sc., B.LIS, B.Ed.	88	49.4%
MLS, M.Sc., M.Ed	68	38.2%
Ph.D.	22	12.4%
Total	178	100%

Based on Table 2, it was found that 88 (49%) of the respondents had a bachelor's degree, 68 (38%) had a master's degree, and 22 (12%) had a doctorate. It was evident from the results that more participants in the study had a B.Sc.

Gender Distribution of the Respondents

Table 3: Gender Distribution of the Respondents

Gender	Frequency	Percentage
Male	92	52%
Female	86	48%
Total	178	100%

Table 3 data shows that 86 (48%) of the respondents were female and 92 (52%) of the respondents were male, implying that more male respondents participated in the research.

Key Findings of the Study

The Competencies of Librarians in the Use of Z39.50 Protocol for Cataloguing in University Libraries

Table 4: Competencies of Librarians in the use of Z39.50 Protocol for Cataloguing

Key: VHE: Very High Extent; HE: High Extent; LE: Low Extent; VLE: Very Low Extent

Librarians Competencies Statement	VHE	HE	LE	VLE	Mean
I know how to edit imported records to meet the library's cataloguing standards.	12	22	42	102	1.69
I can browse the internet independently.	152	12	08	06	3.74
I can electronically share and retrieve bibliographic data using the Z39.50 Protocol.	62	12	18	86	2.28
I can use the Z39.50 Protocol for cataloguing routines.	72	22	38	46	2.67
I have the skills required for cross-referencing.	44	24	74	36	2.43
I can manage and set up a Z39.50 server to provide access to the library's catalogue.	48	26	64	40	2.46
I can use Z39.50 for collaborating with other libraries.	24	62	26	66	2.25
I am competent with the functionalities of the Z39.50 protocol.	82	12	44	40	2.76
I can effectively use Z39.50 to update and maintain the accuracy of the library's cataloguing bibliographic records	52	38	62	26	2.65
I am capable of providing support and resolving issues related to Z39.50 search and data retrieval.	36	20	28	94	1.99
Aggregate Mean					2.49
Criterion Mean					2.50

The aggregate mean of 2.49 in Table 1's data is less than the 2.50 criteria mean, indicating a clear deficiency in the librarians' competences to apply the Z39.50 Protocol for

cataloging in university libraries. The result is consistent with a research by Ketheeswaren et al. (2023), which shows that librarians in Tamil libraries lack the computer literacy necessary to use metadata services to enhance their cataloging practices. This result is also consistent with Omosekejimi et al (2022) study which showed glaringly that the librarians lack the necessary information communication skills to use RDA for effective cataloguing routines.

The perception of librarians regarding the Z39.50 Protocol for effective cataloguing in university libraries

Table 5: The perception of librarians regarding the Z39.50 Protocol for effective cataloguing

Key: SA: Strongly Agree; A: Agree; D: Disagree; Strongly Disagree

Librarians Perception Statement	SA	A	D	SD	Mean
I feel Z39.50 highly enhances the efficiency of bibliographic data access and retrieval for cataloguing purposes.	112	38	12	16	3.38
I believe that the deployment of Z39.50 has increased the accuracy of my library catalogue records.	98	12	48	20	3.06
I feel Z39.50 allows cataloguers to access a wide range of bibliographic data useful for their cataloguing routines.	78	28	46	26	2.89
The quality of data retrieved using Z39.50 meets my library's cataloguing standards.	84	32	20	42	2.89
Z39.50 has a user-friendly interface and is easy to incorporate into my library's existing cataloguing system.	58	36	44	40	2.63
I think troubleshooting and resolving issues using the Z39.50 is seamless and requires little technical knowledge.	62	24	42	50	2.55
The use of Z39.50 reduces the amount of time spent on manual cataloguing routines.	74	33	17	54	2.71
I believe that Z39.50 reduces the labour required in cataloguing library materials	64	34	48	32	2.73
Z39.50 reduces the need to duplicate efforts while cataloguing materials.	54	34	46	44	2.55
I feel confident in my abilities to train others in the deployment of Z39.50 for cataloguing library materials.	32	48	32	66	2.26
Z39.50 is a vital tool for my library	62	36	28	52	2.61

cataloguing routines	
Aggregate Mean	2.75
Criterion Mean	2.50

It is evident from Table 5 that librarians had a favorable perception of the Z39.50 Protocol for efficient cataloging in university libraries in Edo and Delta States, Nigeria, since the aggregate mean of 2.75 is significantly higher than the criteria mean of 2.50. The results are consistent with a research by Olawale and Akanmu (2020), which shows that librarians had a favorable opinion of automating regular tasks because they believed it would increase productivity, provide prompt service, and guarantee quick information retrieval. This result is also consistent with a research by Asim and Mairaj (2019), which found that the librarians thought Koha was useful for running their libraries, especially because of its cataloging tools, such as MARC 21 and the Z39.50 protocol.

Benefits of the Z39.50 Protocol for effective cataloguing in university libraries

Table 6: Benefits of the Z39.50 Protocol for effective cataloguing in university libraries

Key: SA: Strongly Agree; A: Agree; D: Disagree; Strongly Disagree

Benefit of Z39.50 Protocol Statements	SA	A	D	SD	Mean
Z39.50 facilitates resource sharing and collaboration between university libraries.	60	50	23	45	2.70
Z39.50 allows librarians to search and retrieve data from multiple databases and sources.	55	50	45	28	2.74
Z39.50 automates the retrieval of bibliographic records reducing the time librarians spend on cataloguing routines.	52	48	33	45	2.60
Z39.50 ensures consistency in bibliographic records since data are retrieved from authoritative sources.	90	30	28	30	3.01
Z39.50 is highly compatible with most integrated library systems allowing seamless integration.	74	44	22	38	2.87
It offers advanced search capabilities which allows librarians to carry out productive searches.	68	36	40	34	2.78

Z39.50 helps mitigate duplication of efforts by permitting the reuse of existing bibliographic records.	72	34	38	34	2.81
Since it ensures the accuracy of the library catalogue, it contributes to user satisfaction.	54	44	20	60	2.52
Z39.50 reduces the cost associated with manual cataloguing since it deploys the use of shared resources.	66	37	32	43	2.71
Encourages networking and collaboration between university libraries.	82	28	50	18	2.98
Provides accurate and detailed metadata enhancing the quality of catalogue records.	54	32	45	47	2.52
Aggregate Mean					2.75
Criterion Mean					2.50

It is clear from Table 6 above that librarians believe the Z39.50 Protocol will help with cataloging resources in their university libraries since the aggregate mean of 2.75 is greater than the criteria mean of 2.50. The results are consistent with the research of Olawale and Akanmu (2020), which shows that librarians had a favorable opinion of automating their routines because they believed it would increase productivity, guarantee quick service, and facilitate quick information retrieval. The finding also aligns with the study of Nascimento (2024) which revealed the Z39.50 offers benefits as users can search across many library networks using one interface, which facilitates collaboration between libraries.

The challenges affecting the implementation of the Z39.50 Protocol for effective cataloguing in university libraries

Table 7: The challenges affecting the implementation of the Z39.50 Protocol for effective cataloguing

Challenges Statements	Agree/%	Disagree/%	Total/%
Inadequate skills to exhaustively deploy the Z39.50 for retrieving bibliographic records for cataloguing materials.	148(83%)	30(17%)	178(100%)
No internet access/ low bandwidth in my university library.	76(43%)	102(57%)	178(100%)

Erratic power supply affects the use of the Z39.50 protocol in my university library.	84(47%)	94(53%)	178(100%)
Cost implication of Z39.50 implementation and maintenance.	104(58%)	74(42%)	178(100%)
Technophobia among librarians in implementing technologies in university libraries.	154(87%)	24(13%)	178(100%)
Limited training among librarians on the implementation and use of Z39.50.	162(91%)	16(9%)	178(100%)
Incompatibility issues affect the implementation of Z39.50 in my university library	158(89%)	20(11%)	178(100%)
Security issues associated with data retrieval and transfer	144(81%)	34(19%)	178(100%)
Inadequate facilities required to implement Z39.50 in university libraries	148(83%)	30(17%)	178(100%)
Lack of support to resolve and troubleshoot issues associated with the use of Z39.50 for cataloguing routines.	122(69%)	56(31%)	178(100%)
Z39.50 is very complex to implement due to its extensive features.	178(100%)	-	178(100%)
Z39.50 protocol is slow when dealing with complex queries.	168(94%)	10(6%)	178(100%)
Poor planning before implementing the Z39.50 protocol in university libraries.	98(55%)	80(45%)	178(100%)

Table 7 demonstrated the difficulties in putting the Z39.50 protocol for cataloguing in the university libraries understudy include complexities inherent in the implementation of the Z39.50 for cataloguing purposes as indicated by 178(100%) of the responses, Z39.50 protocol is slow when dealing with complex queries as indicated by 168(94%) of the responses, limited training organised for librarians on the implementation and use of Z39.50 as indicated by 162(91%) of the responses, incompatibility issues as indicated by 158(89%) of the responses, technophobia among librarians as indicated by 154(87%) of the responses, inadequate skills and facilities as indicated by 148(83%) of the responses, security issues associated with data retrieval as indicated by 144(81%) of the responses, lack of support to resolve and troubleshoot issues as indicated by 122(69%) of the responses, cost implication of implementation and maintenance as indicated by 104(58%) of the responses, poor planning before implementation as indicated by 98(55%) of the responses, erratic power supply as indicated by 84(47%) of the responses and no

internet access/ low bandwidth as indicated by 76(43%) of the responses. However, this finding aligns with the study of Lynch (2018) which indicates that the complex network and software setup makes it difficult to implement Z39.50 for cataloguing in libraries. The research also confirms the results of Nwosu and Obiano (2021), who found that the main obstacles to the introduction of automation services in university libraries are insufficient automation equipment, limited finance, inadequate management support, and inadequate staff training.

Recommendations

To improve the Z39.50 protocol's implementation and boost the effectiveness of cataloguing procedures in Edo and Delta States, Nigeria university libraries, the following recommendations are made:

- ✓ Regular training should be organised to boost the competencies of librarians in the deployment of the Z39.50 protocol for cataloguing routines.
- ✓ Investment should be made to make available the needed infrastructure which encompasses a stable power supply, reliable internet access and facilities needed to implement Z39.50 protocol.
- ✓ Support systems should be provided within university libraries to resolve and troubleshoot problems associated with the Z39.50 protocol.
- ✓ University libraries should encourage collaborations with other libraries to share best practices, standards, resources, and experiences related to the use of the protocol.
- ✓ Appropriate planning and policies should be developed to oversee the execution and upkeep of the Z39.50 protocol in university libraries.

Conclusion

The research evaluated the abilities, viewpoint, advantages, and difficulties associated with Z39.50 implementation by librarians working in university libraries in Edo and Delta States, Nigeria. It is evident that the librarians working in the university libraries in Edo and Delta States, Nigeria, lack the necessary skills to fully implement Z39.50 to improve their cataloguing

procedures. This may act as a barrier to the technology's adoption, explaining why the majority of university libraries in the states under study still rely heavily on manual cataloguing procedures.

According to the survey, librarians see the Z39.50 protocol favorably for efficient cataloging in university libraries because they believe it may improve accuracy, streamline bibliographic data access, and satisfy their library's standardized requirements. The university libraries in Edo and Delta States have librarians who are aware of the advantages of the Z39.50 protocol for improving the effectiveness of their cataloging practices. The integration of the Z39.50 protocol for cataloging in university libraries presents unique obstacles, as does the deployment of innovations and technology in these settings. The study identified several significant challenges, including the inherent complexity of implementing Z39.50 for cataloguing purposes, the slowness of the Z39.50 protocol when handling complex queries, the lack of organized training for librarians on Z39.50 implementation and use, compatibility problems, librarians' aversion to technology, inadequate facilities and skills, and security concerns related to data retrieval, among others. These challenges need to be mitigated to enhance the implementation of Z39.50 for cataloguing in the university libraries.

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