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Awareness, Acceptance and Readiness to Use Blockchain Technology for Library Services in Academic Libraries in Nigeria

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ABSTRACT

This research examined the awareness, acceptance and readiness to use blockchain technology by librarians in carrying out library service provision among university libraries in Nigeria. The survey research design was used. The instrument of data collection is the questionnaire with questions drawn in line with the objectives of the study and the research questions. The population of the study are librarians in Nigerian academic libraries. The questionnaire was designed with google forms and administered through online professional whatsapp group platforms and mailing groups with response being 105 librarians from 38 higher institutions in Nigeria. The data gathered was analysed using descriptive and inferential statistics. The findings revealed that librarians were aware of blockchain technology. And majority of the librarians accepted and were willing to use blockchain technology for service delivery. The study shows a significant relationship between librarians' awareness and acceptance of blockchain technology and the readiness to use blockchain technology with correlation coefficient of 0.515 and 0.794 respectively, ($r = 0.515$; $r = 0.794$). The regression analysis also indicated that there is a joint significant effect of librarians' awareness and acceptance of blockchain technology on the readiness to use blockchain technology ($p < 0.05$). Which shows that librarians' awareness and acceptance of blockchain technology informed their readiness to use blockchain technology. However, the study revealed that technophobia, issue of competence among librarians, lack of technical infrastructure, erratic power supply and poor internet connectivity are possible challenges that may impinge the adoption of blockchain technology among Nigerian libraries. The study therefore concludes that librarians' readiness to use blockchain technology for library operations, is a welcome development. And tapping into the potential of blockchain technology has the potential to revolutionize library services by enhancing their efficiency.

Keywords: Blockchain technology, Awareness, Acceptance, Library services, Academic libraries

INTRODUCTION

The traditional perception of users of the library has always been that of a custodian of knowledge. The library has over the years been performing this function through the selection, acquisition, organisation, storage and dissemination of information resources. A look at the history of libraries shows the various transitions the library has had to pass through in order to effectively and efficiently carry out these functions. From the medieval times when it was through the cuneiform, which then progressed to the use of papyrus and then parchments to the invention of the printing press by Johannes Guttenberg, leading to the explosion in information. Simply put, the library has had to evolve through the years in making sure it discharges its duties to users effectively. Through the years, disruptive technologies have evolved and this has also affected how the library carries out its functions (Waral, 2018).

Disruptive technologies have the ability to shake up the industry and create new ways of doing things. Unlike sustaining technologies, disruptive technologies are new and usually appeal to fewer people because they do not understand how it works. An example of a disruptive technology is the blockchain technology which has impacted on so many aspects of human endeavour and is even still impacting on many more yet to be discovered. Blockchain technology being a relatively new technology forms the core system for bitcoin which is a crytocurrency that first came into the limelight in 2008 by Satashi Nakamoto (Hoy, 2017). The original use of the blockchain technology was in its use of bitcoin as a currency. Blockchain is a series of data blocks which is generated by cryptography. This is a type of "distributed ledger" or "distributed ledger technology". The bitcoin blockchain is therefore a set of blocks strung together in which bitcoin transactions are recorded. The application of blockchain technology has however spread into other human fields of endeavour such as academics, medicine, and business among others. Literature abounds on use of blockchain technology in the library (Chen, Xu, Lu, & Chen, 2018 and Hoy, 2017).

Certain characteristics of the blockchain technology have made it attractive to be used in several fields of endeavour. Chang (2019) posited that four characteristics have made it attractive for use.

1. Decentralization: The most appealing and distinguishing aspect of blockchain technology is the fact that it does not depend on any third-party entity for its administration. And this less prone to fraud or any form of alteration
2. Immutability: this entails that once a block of information has been added to the chain, it is almost impossible to be changed since changes to it involves so many complexities.
3. Security: Because each chain is connected to the one before it, data stored on a blockchain is tamper-proof and traceable. All preceding blocks will change if one block is changed.
4. Reliability: with blockchains there is a public history of transaction and this transparency makes it difficult for corruption to take place except in minimal exceptions.

Researchers in Library and Information Science have proposed that the blockchain technology can also be applied to library services especially in circulations, cataloguing, preservation and conservation of library materials, apart from the traditional role of financial transaction. Zhang (2019) noted, that the application of blockchain technology is expanding and changing quickly. The possibilities, advantages, and hazards of blockchain must be understood by

librarians. With this information, we can investigate potential uses for this ground-breaking technology and educate library patrons about blockchain.

However, considering how far libraries in Nigeria have come in using technology for library services in lieu of the attendant challenges of power, internet connectivity, personnel acceptance of technology just to mention a few, one is tempted to ask the question, are Nigerian libraries ready to embrace the blockchain technology for use?. This question becomes pertinent when one takes into consideration the number of libraries that have adopted and have functional Library Management Software (LMS), and institutional repositories. For instance, Adam & Kaur (2019) discovered that twenty-three (23) Nigerian institutions registered their repositories on OpenDOAR (Directory of Open Access Repositories), and most of the repositories are either not functioning or working twenty-four (24) hours.

The question then needs to be asked about whether or not librarians are aware of blockchain technology, can they accept it and how ready are they to adopt the technology to provide library services. Reading about these new technologies and how they are being used for service provision in libraries in western climes is good but how ready are Nigerian libraries to implement it? The answer to these questions is what this research sets out to find out.

Objectives of the study

The main objective of this research is to find out the level of awareness, acceptance and readiness to use blockchain technology for provision of library services by librarians in Nigerian universities. The specific objectives of the study are:

a) To find out the level of awareness of blockchain technology for provision of library services by librarians
b) To find out the level of acceptance of blockchain technology for provision of library services by librarians
c) To find out the readiness to use blockchain technology for service provision by librarians in Nigerian university libraries
d) To find out the relationship between librarians awareness, acceptance the readiness to use blockchain technology
e) To ascertain the challenges to the adoption of blockchain technology for provision of library services in Nigerian university libraries

Research questions

The following research questions will be used to guide the conduct of this study

a) What is the level of awareness of blockchain technology by librarians in Nigerian universities
b) What is the level of acceptance of blockchain technology for provision of library services by librarians in Nigerian universities?
c) What is the level of readiness to use blockchain technology for provision of library services by librarians in Nigerian university libraries?
d) What is the relationship between librarians' awareness, acceptance and readiness to use blockchain technology?

e) What are the challenges to the adoption of blockchain technology for provision of library services in Nigerian university libraries

Hypothesis

The following hypotheses guided the conduct of this study. And were tested on 0.05 level of significance:

H_{01}: there is no significant relationship between librarians' awareness of blockchain technology and the readiness to use blockchain technology

H_{02}: there is no significant relationship between librarians' acceptance of blockchain technology and the readiness to use blockchain technology

H_{13}: there is no joint significant effect of librarians' awareness and acceptance of blockchain technology on the readiness to use blockchain technology

METHODOLOGY

A survey research method was adopted in the conduct of this study. The population of the study includes all academic libraries in Nigeria. Convenience sampling technique was adopted to select the respondents for the study. The instrument used for data collection was a self-developed questionnaire. To collect data from participants, an electronic version of the questionnaire was designed on (http://forms.google.com), which is an online platform for designing and distributing forms. The questionnaire was distributed electronically through various media such as professional WhatsApp group platform, email, discussion forums and a direct link to the participants. Electronic distribution was adopted due to the dispersed nature of the respondents. The questionnaire items consisted of a short answer question, choice questions, and a four-point Likert-scale, which was used to measure items on awareness, acceptance and readiness to use blockchain technology in libraries. The four-point Likert-scale ranges from (4) Fully Aware / strongly agree to (1) Note Aware / strongly disagree. Data was collected from the participants between 14th October, 2022 to May 30th, 2023. 105 participants from 38 institutions took part in this survey. All responses were valid, and were therefore used for the data analysis. The responding institutions include Federal, State, and privately-owned institutions across Nigeria. The list of institutions that participated in the survey are presented in table 1.

The data collected for the study were presented and analyzed using descriptive statistics such as percentage counts, mean analysis, and standard deviation. The decision rule for the mean analysis was to accept any item with score of 2.50 and above which would be considered significant. This means that any item with a mean score lower than 2.50 was rejected and therefore not significant. In addition, Chi-Square and Regression analysis were used to test the relationship between variables and the effect on each other.

REVIEW OF LITERATURE

The technologically evolving environment is swiftly propelling us into the next phase of high-tech or smart libraries. Libraries now employ the use of technological innovations to provide their users vis-à-vis researchers, faculty members, and students with access to twenty-first century library and information services and resources, as well as to fast-track library operations and services. One of such innovations disrupting the technological space for improved operations and services across all disciplines is *blockchain technology* (Conoscenti et al., 2016; Yli-Huumo et al., 2016). Libraries are also not left behind in keying in into this innovative idea and harnessing the benefits blockchain technology is bringing into the library and information science space (Suman & Patel, 2021). The focus of this study is to examine the awareness, acceptance and readiness to use blockchain technology for library operations and services. This section of the study reviews available literature on the construct of this study. Gleaning through the available literature, and to the best of the researchers' knowledge, there seems to a dearth of empirical research focusing on blockchain technology within the library and information science discipline particularly in Nigeria, this study will therefore contribute to the existing empirical researches on blockchain technology in the field of library science.

Overview of blockchain technology

Blockchain technology (BT) is been employed in various areas of human endeavour, including businesses, agriculture, Banking / financial management, health and academic institutions among others.

Literature abound on the concept and features of blockchain, describing it as a distributed or shared network of users' digital records, events, or transactions that are authenticated, cryptographically hashed, and kept up to date using a group consensus procedure. (Tella, Amuda & Ajani, 2022; Oyelude, 2019; Karafiloski and Mishev, 2017; Conoscenti et al., 2016; Yli-Huumo et al., 2016). Kumar, et al., (2020) asserted that a blockchain is a distributed or shared network of users' digital records, events, or transactions that are authenticated, cryptographically hashed, and kept up to date using a group consensus procedure. Blockchain technology (BT) is a network-based method for securely storing data indefinitely. The data in a block chain can be verified by the general public, but only authorized users are able to read it. Simple ledgers to complex contracts can all be stored in online containers called "blocks" in a block chain. The data is then transformed into an original "hash"—a string of letters and numbers—by encrypting these blocks. To create the hash, a certain encryption key is employed. Only those in possession of the key are able to read the data. The blocks are then connected after that. Each block's metadata contains the hash of the previous block in the chain, as well as a time stamp (Hussaini, Haruna & Shrivastava, 2022).

Ahmad, et al., (2021) posited that blockchain technology is a way to store data so that it is challenging or impossible to alter, forge, or cheat the records in a blockchain system. This technology is mostly used in digital currency and online banking systems. The blockchain, which is used to prevent hacking, is simply a digital log of transactions that is duplicated and scattered over the whole network of computer systems.

Adoption of Blockchain Technology in Libraries

With blockchain technology, library services could be transformed as it offers improved security, transparency, and effectiveness. Existing literature points to some areas in which blockchain technology could be adopted in library and information services.

Digital preservation: Blockchain technology can help libraries in managing their existing records in a secure framework and digital format. Digital material that has been submitted to a blockchain is stored there permanently and is impossible to alter or hack (Masenya, 2020). The implication of this, is that, it will be possible to ensure that these materials are saved for use by future generations and are accessible to anybody who has the required permits. This is why Lemieux (2016) argued that public libraries should consider implementing blockchain technology, especially for the security of their digital records since it is impossible to change information using this technology without leaving a digital trail. Meth (2019) noted that blockchain technology could be applied in library acquisitions system, particularly in the management of contract between libraries and vendors and using cryptocurrencies to make payment.

Khan et al. (2022) examined the adoption of blockchain technology for accessing digital library resources. The study showed some indices that could drive the adoption of blockchain technology for accessing electronic resources include: optimism, informativeness, perceived usefulness, and perceived ease of use among others. The study further revealed that the adaption blockchain technology in electronic libraries is an important factor improved service provision, infrastructure and resources. Gul (2019) examined smart libraries: an emerging and innovative technological habitat of 21st century and affirmed that the adoption of emerging smart technology like blockchain in libraries has closed the gap between library services and the growing needs of patrons.

The timestamped, verifiable creation of journal articles is another possible application of blockchain in libraries. The blockchain could also be used as a digital rights management (DRM) tool in libraries. A balance between libraries and publishers could be achieved by managing digital items so that they can be uniquely identified, regulated, and transferred (Hoy, 2017). Blockchain technology might be used to create community-based collections of items, tools, and services in libraries. gigital preservation and monitoring, international financial transactions information literacy scheme, checking patron's credentials, maintaining archives and special collections, and using intellectual property for research and development, interlibrary loan, reference services, are notable areas blockchain could be adopted in libraries (Oyelude, 2019; Hasan, 2020; Abid, 2021; Verma, 2021)

Acceptance and Readiness to Use Blockchain Technology

Rivière (2018) investigated the benefits and acceptance of blockchain technology in governments and legislations, the respondents agreed in their opinion that the implementation of blockchain technology would depend mainly on its acceptance by the industry. This may indicate that there must be an institutional framework that encourages the adoption of new technology.

Yusof, et al., (2018) examined the behavioral intention to adopt blockchain technology among banking institutions in Malaysia and reported that performance expectancy, social influence and facilitating condition are conditions that will influence the behavioral intention of Malaysian bankers in adopting blockchain technology among the bankers. According to the findings, Performance Expectancy is when the bank employees believed that this technology is helpful in performing their daily activities and enhancing work performance, while, social influence indicated that blockchain technology is recommended by the staff's peers, co-workers and those who are close to them.

On the other hand, the staff felt that the enabling condition was that banking institutions had the necessary organizational and technical infrastructure to embrace or deploy blockchain technology. Similarly, in a study conducted by Nuryyev, et al., (2020) on blockchain technology adoption behavior, they found that the effect of social influence, strategic orientation and individual characteristics have a significance on the behavioural intention to adopt blockchain technology. In the same vein, the study of Nazim, Razis & Hatta (2021) on the behavioural intention to adopt blockchain technology revealed, that effort expectancy, social influence, and facilitating condition have a positive effect on behavioural intention to adopt blockchain technology in the Malaysia Islamic financial system. Lengoatha & Seymour (2020) examined the determinant factors of intention to adopt blockchain technology across academic libraries. The study's findings revealed technological, organisational, environmental and interorganizational context positively influences the adoption of blockchain technology in academic libraries.

Ferri, Genesti & Theodosopoulos (2020) identified performance expectancy, social influence, and effort expectancy as reliable predictors of auditors' intentions to use blockchain technology. Lee, Kriscenski & Lim (2019) provided an empirical evidence on the behavioural intention to use blockchain technology. The evidence showed that perceived operational usefulness and ease of use have a positive influence on blockchain. The evidence further showed that younger generations and IT professionals are the early adoption agents, indicating a potential for growth of blockchain acceptance. Alazab, Alhyari, Awajan & Abdallah (2020) studied the factors affecting user acceptance of blockchain technology in supply chain. The study showed that inter-organisational trust has a significant effect on the intention to adopt blockchain technology. However, the study of Lu, et al., (2020) on consumers' intentions to adopt blockchain-based personal health records and data sharing shows, that health care consumers were not strongly motivated to adopt blockchain to share personal health data because they were concerned about the danger of losing private data to a third party that could access their data through the blockchain system. This findings is in line with the argument of Golosova & Romanovs (2018) and Niranjanamurthy, Nithya, & Jagannatha (2018), that blockchain can be attacked by the different threats, which are connecting with the point of work and point of stake protocols noting that before the general public will trust a blockchain solution with their personal data, there are still issues with cyber security that need to be resolved.

RESULTS

Table I: Demographic Characteristics of Respondents

Qualification	**Frequency**	**Percentage (%)**
BLIS	16	15.2
HNDLIS	10	9.5
MLIS	57	54.3
PGDLIS	1	1.0
Phd	21	20.0
Total	105	100.0
Job Title		
Librarian	80	76.2
Library Officer	18	17.1
System Analyst	7	6.7
Total	105	100.0
Years of Work Experience		
0-5	23	21.9
6-10	31	29.5
11-15	29	27.6
16-20	5	4.8
Above 20	17	16.2
Total	105	100.0
Gender		
Female	36	34.3
Male	69	65.7
Total	105	100.0

The demographic characteristics of the respondents is presented in Table 2. Out of the one hundred and five (105) respondents, 20% (21) have Doctorate degree, 54.3% (57) have Masters Degrees, 15.2% (16) holds Bachelor degrees while 9.5% (10) and 1.0% (1) holds Higher National Diploma (HND) and Postgraduate (PGD) respectively. Findings also show that 76.2% (80) are in the Professional Librarian cadre; 17.1% (18) are in the Library Officer while 6.7% (7) are System Analysts. An analysis of the respondent's work experience shows that 29.5% (31) and 27.6% (29) of the respondents have between 6 – 10 and 11 – 15 years of work experience. Others have between 0 – 5 (21.9%); 16 – 20 (4.8%) and above 20 (16.2%) years of work experience respective Analysis of the gender revealed more male 65.7% (69) than female 34.3% (36)

Table II: Awareness of blockchain technology

	Fully Aware	Aware	Moderately Aware	Not Aware	Mean	Std. Dev.
Blockchain technology is an emerging technology	33.3% (35)	45.78% (48)	17.1% (18)	3.8% (4)	3.09	.810
Blockchain is related to cyptocurrency	36.2% (38)	41.9% (44)	17.1% (18)	4.8% (5)	3.10	.849
Blockchain is a series of data blocks generated by cryptography	25.7% (27)	50.5% (53)	18.1% (19)	5.7% (6)	2.96	.820
Blockchain is a form of distributed ledger technology	27.6% (29)	41.9% (44)	25.7% (27)	4.8% (5)	2.92	.851
Blockchain is the underlying technology of bitcoin	21.9% (23)	49.5% (52)	23.8% (25)	4.8% (5)	2.89	.800
Blockchain is a transaction devoid of middleman interference	25.7% (27)	47.6% (50)	20.0% (21)	6.7% (7)	2.92	.851
The bitcoin blockchain is a set of blocks strung together that record bitcoin transactions	25.7% (27)	43.8% (46)	22.9% (24)	7.6% (8)	2.88	.885
A characteristic of the blockchain technology is its immutability	24.8% (26)	41.0% (43)	25.7% (27)	8.6% (9)	2.82	.907
Information on a blockchain cannot be changed	24.8% (26)	41.0% (43)	26.7% (28)	7.6% (8)	2.82	.890
Data stored on a blockchain is traceable and tamper-proof	33.3% (35)	32.4% (34)	25.7% (27)	8.6% (9)	2.90	.966
Blockchain transactions have a very high level of security	20.0% (21)	48.6% (51)	24.8% (26)	6.7% (7)	2.82	.830
Blockchain technology does not rely on any third party management entities or hardware facilities`	24.8% (26)	42.9% (45)	25.7% (27)	6.7% (7)	2.86	.871

Table 2 revealed the level of awareness of the respondents about blockchain technology in the library. Based on the decision rule for mean analysis, all the items in table 3 are significant and are therefore accepted because they have mean score higher than 2.50. This means the respondents are aware of blockchain technology.

Table III: Librarians acceptance of blockchain technology for library services

	SA	A	D	SD	Mean	Std. Dev.
Using of blockchain technology would improve provision of library services	15.2% (16)	61.0% (64)	22.9% (24)	1.0% (1)	2.90	.643
Blockchain technology will facilitate easy tracking of books on loan, particularly over-due books	33.3% (35)	49.5% (52)	15.2% (16)	1.0% (1)	3.16	.712
Using blockchain technology for library services would lead to faster accomplishment of tasks	16.2% (17)	58.1% (61)	24.8% (26)	15.2% (16)	2.90	.664
I would find the blockchain technology useful for provision of library services	22.9% (24)	54.3% (57)	21.0% (22)	1.9% (2)	2.98	.720
Using blockchain technology would enhance the effectiveness of library service provision	21.0% (22)	55.2% (58)	21.9% (23)	1.9% (2)	2.95	.712
Learning to use the blockchain technology would be easy for me	14.3% (15)	61.9% (65)	21.9% (23)	1.9% (2)	2.89	.655
It would be easy for me to become skillful in the use of blockchain technology for library service provision	18.1% (19)	53.3% (56)	27.6% (29)	1.0% (1)	2.89	.698
Blockchain technology is clear and understandable to use	15.2% (16)	52.4% (55)	30.5% (32)	1.9% (2)	2.81	.708
I would find it easy to get blockchain technology to do what I want it to do.	13.3% (14)	52.4% (55)	31.4% (33)	2.9% (3)	2.76	.714
Learning to operate new technology is easy for me	21.0% (22)	51.4% (54)	24.8% (26)	2.9% (3)	2.90	.754

Table 3 shows that librarians accepted blockchain technology as a tool that enhance effective and efficient library services if adopted. The respondents noted that Blockchain technology will facilitate easy tracking of books on loan, particularly over-due books (Mean score = 3.16) and useful for provision of library services (Mean score = 2.98).

Table IV: Readiness to use blockchain technology for library operations

	SA	A	D	SD	Mean	Std. Dev.
I intend to use blockchain technology for library operations in the future	25.7% (27)	57.1% (60)	16.2% (17)	1.0% (1)	3.08	.675
I would use the blockchain technology for library operations in the future	26.7% (28)	54.3% (57)	17.1% (18)	1.0% (1)	2.80	.713
I will strongly recommend others to use blockchain technology for library operations	26.7% (28)	54.3% (57)	17.1% (18)	1.9% (2)	3.06	.718
I will use Blockchain technology to track information resources on open circulation shelves	20.0% (21)	54.3% (57)	23.8% (25)	1.9% (2)	2.94	.694
I will use Blockchain technology to keep and track records of registered users	27.6% (29)	51.4% (54)	17.1% (18)	3.8% (4)	3.03	.778
I will use blockchain technology for storing records of information resources on reservation	21.0% (22)	48.6% (51)	27.6% (29)	2.9% (3)	2.88	.768
I will use Blockchain technology in tracking information resources that are overdue for return	21.9% (23)	60.0% (63)	13.3% (14)	4.8% (5)	2.99	.740
I will use Blockchain technology in keeping records and tracking information resources on loan	20.0% (21)	50.5% (53)	24.8% (26)	4.8% (5)	2.86	.790
I will use Blockchain technology in sharing details of registered users with overdue books for easy tracking	20.0% (21)	50.5% (53)	24.8% (26)	4.8% (5)	2.92	.768
I will use Blockchain technology in keeping records of the daily transactions in the	21.9% (23)	52.4% (55)	21.9% (23)	3.8% (4)	2.90	.803

circulation section of the university library						
I will use Blockchain technology in keeping records of user's request for reservation of books	22.9% (24)	49.5% (52)	22.9% (24)	4.8% (5)	2.94	.782
I will use Blockchain technology in sharing records of information resources between cooperating libraries for inter library loan	22.9% (24)	53.3% (56)	19.0% (20)	4.8% (5)	2.89	.751
I will use Blockchain technology in the process of charging and discharging of books in the university library	19.0% (20)	54.3% (57)	22.9% (24)	3.8% (4)	2.90	.746

Table 4 indicated the readiness of the respondents to use blockchain technology for library operations and services. Findings revealed that the respondents intend to use blockchain technology for library operations in the future, (Mean score = 3.08), particularly to keep and track records of registered users (Mean score = 3.03), and information resources that are overdue for return (Mean score = 2.99).

Table V: Test of Hypotheses on Librarians' Awareness on Blockchain Technology and their Readiness to Use Blockchain Technology

H_{01}: there is no significant relationship between librarians' awareness of blockchain technology and their readiness to use blockchain technology

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	48.563[a]	9	.000
Likelihood Ratio	38.396	9	.000
Linear-by-Linear Association	27.627	1	.000
N of Valid Cases	105		
a. 10 cells (62.5%) have expected count less than 5. The minimum expected count is .02.			
Symmetric Measures			

		Value	Asymp. Std. Error[a]	Approx. T[b]	Approx. Sig.
Interval by Interval	Pearson's R	.515	.082	6.104	.000[c]
Ordinal by Ordinal	Spearman Correlation	.501	.084	5.870	.000[c]
N of Valid Cases		105			
a. Not assuming the null hypothesis.					
b. Using the asymptotic standard error assuming the null hypothesis.					
c. Based on normal approximation.					

Table 5 shows that there is a significant relationship between librarians' awareness of blockchain technology and their readiness to use blockchain technology with correlation coefficient of 0.515 i.e. r = 0.515 and the p value (0.000)

Table VI: Test of Hypotheses on Librarians' Acceptance on Blockchain Technology and their Readiness to Use Blockchain Technology

H_{02}: there is no significant relationship between librarians' acceptance of blockchain technology and their readiness to use blockchain technology

Chi-Square Tests					
		Value	df	Asymp. Sig. (2-sided)	
Pearson Chi-Square		1.110E2[a]	6	.000	
Likelihood Ratio		95.015	6	.000	
Linear-by-Linear Association		65.497	1	.000	
N of Valid Cases		105			
a. 4 cells (33.3%) have expected count less than 5. The minimum expected count is .12.					
Symmetric Measures					
		Value	Asymp. Std. Error[a]	Approx. T[b]	Approx. Sig.
Interval by Interval	Pearson's R	.794	.044	13.237	.000[c]
Ordinal by Ordinal	Spearman Correlation	.777	.051	12.513	.000[c]
N of Valid Cases		105			
a. Not assuming the null hypothesis.					
b. Using the asymptotic standard error assuming the null hypothesis.					
c. Based on normal approximation.					

Table 6 shows that there is a significant relationship between librarians' awareness of blockchain technology and their readiness to use blockchain technology with correlation coefficient of 0.794 (r = 0.794) and the p value (0.000)

Table VII: Regression Analysis on the joint effect of librarians' awareness and acceptance of blockchain technology on the readiness to use blockchain technology

H_{03}: There is no joint significant effect of librarians' awareness and acceptance of blockchain technology on the readiness to use blockchain technology

ANOVA[b]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	33.521	2	16.760	92.228	.000[a]
	Residual	18.536	102	.182		
	Total	52.057	104			
a. Predictors: (Constant), awareness and acceptance of blockchain technology						
b. Dependent Variable: Readiness to use blockchain technology						

Since the $p < 0.05$, the H_0 was therefore rejected, and the H_1 was upheld, indicating, that there is a joint significant effect of librarians' awareness and acceptance of blockchain technology on the readiness to use blockchain technology

Table VIII: Challenges associated with use of blockchain technology

	SA	A	D	SD	Mean	Std. Dev.
Lack of awareness of blockchain technology among librarians	34.3% (36)	30.0% (42)	24.8% (26)	1.0% (1)	3.08	.793
Technophobia	32.4% (34)	49.5% (52)	14.3% (15)	3.8% (4)	3.10	.784
Inadequate skills and competence to use blockchain technology among librarians	33.3% (35)	44.8% (47)	19.0% (20)	2.9% (3)	3.09	.798
Inadequate technological facilities for utilizing blockchain technology in university libraries	34.3% (36)	44.8% (47)	17.1% (18)	3.8% (4)	3.10	.815
Erratic electric power supply in university libraries	34.3% (36)	43.8% (46)	19.0% (20)	2.9% (3)	3.10	.803
Lack of institutional policy on use of new technologies in university libraries	36.2% (38)	41.9% (44)	19.0% (20)	2.9% (3)	3.11	.812
Inadequate internet connectivity in university libraries	35.2% (37)	39.0% (41)	21.9% (23)	3.8% (4)	3.06	.853

Table 8 outlines the challenges associated with the use blockchain technology. All of the Challenges indicated by the respondents' ranges from technophobia, issue of competence among librarians, lack of technical infrastructure, erratic power supply to poor internet connectivity, since all have mean score above 2.50.

DISCUSSION OF FINDINGS

The main objective of this research is to find out the level of awareness, acceptance and readiness to use blockchain technology for provision of library services by librarians in Nigerian universities. The study's findings revealed that librarians are aware of blockchain technology as indicated in table 3. This findings tallies with that of Tella, et al. (2022) when they examined the relevance of blockchain technology and the management of libraries and archives in the 4IR. The study revealed that the level of awareness of blockchain technology of most librarians is high. This also corroborates the study of Gu (2019) on information about smart libraries and adoption of technology for library functioning.

One's understanding or views about a concept or phenomenon is improved by awareness. Awareness provides one with information that enables good decision-making and take action in order to deepen understanding of the phenomenon or idea. The significant mean score for all the items in table 3 indicated that librarians are fully aware of blockchain technology. Their awareness in table 3 may have informed their acceptance of blockchain technology as shown in table 4 where librarians accepted blockchain as a veritable tool that could impact library services. It was also acknowledged that they will use blockchain technology for library and information services in table 5. This findings shows that librarians understands blockchain technology and are ready to adopt it for library operations and services in view of their acceptance and readiness to use. This is in line with the findings of Rivière (2018) when he revealed that the implementation of blockchain technology would depend mainly on its acceptance by the industry.

CONCLUSION

Libraries as service-oriented organisations must be abreast of the trends that the users are vying towards. In this wise, librarians awareness and readiness to use blockchain technology for library operations, especially charging and discharging of information materials to meet user needs is a welcome development. User preferences also determine how the library goes about with delivery of its services. In the light of this, using blockchain technology for service delivery means that the library is proactive enough to provide information in the way and manner that her users want it. What could influence implementation is acceptance and since the study has shown that majority of librarians accept the use of blockchain technology for service delivery, then usage should not be difficult. As tapping into the potential of blockchain technology has the potential to revolutionize library services by enhancing their efficiency, security, and transparency.

RECOMMENDATIONS

Based on the findings of the study, the following recommendations are made;

1. Library management should conduct comprehensive training programs for library staff to enhance their awareness and understanding of blockchain technology, including its applications and potential benefits in library services.
2. Library management should foster a culture of openness and experimentation within the library community by encouraging librarians to explore and experiment with blockchain-based solutions in their respective libraries, while providing necessary support and resources
3. Modalities that will make adoption of blockchain technologies in libraries feasible, such as uninterrupted electricity supply and internet connectivity should be put in place.
4. Collaborate with blockchain experts and technology professionals to develop tailored workshops and seminars specifically designed for librarians, focusing on practical use cases and implementation strategies

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