Perception, Competency and Use of Big Data Analytics among Librarians from University Libraries in Osun State

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ABSTRACT

This study investigated librarians' perception towards the use of Big Data Analytics (BDA). It also ascertained the librarians' competency level in carrying out BDA and the extent of BDA use. The study employed a descriptive survey research design. The population of the study consisted of all librarians from the twelve National Universities Commission's (NUC) approved universities in Osun State. A multistage sampling technique was employed to obtain a representative sample of 36 librarians from the three sampled universities. Quantitative data was collected using a researcher-designed questionnaire titled "Perception, Competency and Use of big data analytics among University Libraries (PCUBDAUL)." The data collected was analysed using percentage distribution, mean, and standard deviation, to answer the four research questions. The result showed that librarians in universities in Osun state have a high level of awareness of BDA; hold a positive perception of BDA; possess a high level of competence in carrying out big data analytics and have high extent of use of BDA. The study recommended that; since the librarians in the study area have high positive perception and high level of awareness, it is important that librarians receive training from time to time on emerging issues in BDA.

Keywords: Big data analytics; Big data, Perceptions; Level of Competency, Librarians

BACKGROUND TO THE STUDY

Over the last twenty years, there has been a rise in advancement across various sectors, attributed to the strides made in information and communication technology. In recent times, the adoption of big data analytics has gained popularity within academic libraries. This has been driven by the need to improve library services and to better address the needs of the expanding user base. The increasing focus on providing library services customized to the evolving needs of users has been influenced by various factors. One important factor is the rise in the number of library users and the necessity to adapt to their evolving requirements and expectations. This has been reflected in the increased focus on user-centred library services, including offering an expanded array of digital resources, improved access to information, and the adoption of new technologies (Farkas, 2017).

The need to respond to an increasingly digital world has also been a key driver of innovation in library services (Rosenberg, Tierney, & Robinson, 2016). The use of technology has enabled libraries to offer more efficient and effective services, such as automated systems for borrowing, cataloguing and returning books (Almahdi et al, 2018). Furthermore, the need to respond to budget constraints has also driven the

development of more cost-effective library services like big data analytics (Rosenberg *et al.*, 2016).

Big data analytics represents one of the many cost-effective librarian service applications. It is a service that allows swift and accurate analysis of extensive datasets which helps them to make informed decisions quickly. It involves scrutinizing vast quantities of data to reveal patterns, correlations, market trends, and other valuable information. Big data analytics can provide insights into library user behaviour, preferences and usage patterns which can help libraries to better understand and serve their user communities (Elzinga, Pansera, & Van den Berg, 2019; Zhang & Boonstra, 2017). Through the analysis of large and diverse datasets, libraries can gain insights into the types of resources users are accessing, the frequency of usage, and the library services that are being used (Gardner, Geller, & Westra,, 2018). This information can be used to inform library decision-making and provide evidence-based solutions to better meet the needs of library users (Ku, Li, & Yu, 2016). Librarians can identify trends, patterns, and opportunities to improve services and enhance users' experience by analysing user data (Ma, Peng, & Liu, 2017). Data analytics enables libraries to monitor the utilization of digital resources, such as e-books and electronic journals, and to monitor changes in user behaviour over time (Sun *et al.*, 2018). Harnessing the capabilities of big data analytics, libraries can develop strategies to better understand and serve their user communities.

Research has shown that libraries that successfully implement big data analytics can improve user satisfaction and optimise library resources (Oladokun, Oyeleke, & Adebowale, 2020). Big data analytics empowers libraries to analyse substantial volumes of data, including user preferences, book loans and usage, library visits and more. If librarians can understand users' behaviour and preferences, they can provide customised services and resources that best meet the needs of their users. Libraries can use big data analytics to identify demand for certain types of books and materials, allowing them to purchase the right items and better serve their patrons. Big data analytics also enable libraries optimise their resources, such as staffing, training, operating hours, updating policies and library programs. Libraries can use analytics to identify areas where they need to update their services, such as increasing staff strength or offering more online services.

It is crucial for librarians possess the competence to interpret and analyse data accurately for the successful implementation of big data analytics (Hafeez, Asif, & Hameed, 2018). Staying informed about the latest advancements and trends in big data analytics is crucial for librarians. It can be achieved by attending workshops and conferences, reading relevant publications and blogs, and participating actively in effective use and manage big data analytics; data science, statistical analysis, and data visualisation. They should also be familiar with relevant software tools, such as Python, and Tableau. Librarians should be knowledgeable about the specific data resources available in their library and the data governance policies in place. Library management must also ensure that they have the necessary infrastructure, such as software and hardware, to facilitate the adoption and implementation of big data analytics (Oladokun *et al.*, 2020). This may include investing in powerful computers and servers, as well as specialised software to manage and analyse large datasets. Library management should ensure they have a team of trained staff with the necessary skills to effectively use and interpret the results of big data analytics, and they must ensure compliance with data privacy regulations and have appropriate protocols in place to protect the data they collect and analyse. This involves comprehending the pertinent laws and regulations governing data privacy, along with establishing systems and processes to ensure the lawful collection and utilisation of data.

STATEMENT OF THE PROBLEM

The proliferation of big data has significantly transformed various sectors, including library. University libraries, as critical knowledge repositories, have begun to leverage big data analytics to enhance their services, optimize resource management, and improve user experience. In Osun State, Nigeria, where

educational resources are crucial for academic success, university librarians are increasingly expected to adopt and integrate big data analytics into their operations. Understanding how these librarians perceive, are competent in, and utilize big data analytics is essential for developing strategies to support their professional growth and enhance library services.

Despite the recognised potential of big data analytics in revolutionizing library services, there is limited research on its adoption among university librarians in Osun State. This gap in research creates uncertainty about the librarians' readiness and capability to harness big data for improving library operations. It also raises questions about the extent to which librarians are trained and supported in utilizing these advanced tools. Addressing this gap is crucial for fostering an environment where big data can be effectively used to meet the evolving needs of library users, hence this study.

OBJECTIVES OF THE STUDY

The primary focus of this study is the assessment of perception, competency, and use of big data analytics among librarians in universities in Osun State. The specific objectives of the study are to:

1. determine the librarians' level of awareness of big data analytics (BDA);
2. assess the perceived usefulness of big data analytics among librarians from university libraries in Osun State;
3. evaluate the competency levels of librarians in using big data analytics; and
4. investigate the extent of use of big data analytics in university libraries within Osun State.

RESEARCH QUESTIONS

The following research questions were answered during this study.

1. What is the level of librarians' awareness of big data analytics (BDA)?
2. What are the perceived usefulness of big data analytics among librarians from university libraries in Osun State?
3. How competent are the librarians from university libraries in Osun State in utilizing big data analytics tools?
4. To what extent are big data analytics currently being used in university libraries in Osun State?

LITERATURE REVIEW

The use of big data analytics in university libraries represents a significant shift in how libraries manage information, enhance user experiences, and improve operational efficiencies. This literature review examines existing research on the perception, competency, and use of big data analytics among university librarians, with a focus on various global contexts and, where available, specific insights from Nigeria and other developing regions.

Big data analytics (BDA) is a sophisticated approach to data management that utilises machine learning and deep learning approaches to leverage collected data (Raeesi & Majidian, 2020). In the digital age, the sheer amount of potential information in every transaction has overwhelmed industries and markets. Knowing the value of the data and taking advantage of its hidden potential has changed the power dynamics of businesses, allowing organisations to become more agile and reach their goals.

Big data analytics (BDA) enables companies to identify, diagnose, forecast, prescribe, and recognise growth opportunities to gain a competitive edge (Sun *et al.*, 2018). This process requires advanced algorithms to

process and analyse real-time data, which can be achieved through machine and deep learning (Raeesi & Majidian, 2020).

Big data analytics (BDA) is defined as the process of examining large and complex data sets to uncover hidden patterns, unknown correlations, market trends, customer preferences, and other useful business information (Gantz & Reinsel, 2011). BDA is used to identify patterns, trends, and correlations in data sets to help businesses make better decisions and gain insight into their customers and markets. The library ncan adopt this emerging technology to gain insight into library users' behaviour, trends of use of library resources, and operational efficiencies (Bashar, 2020). Big data technology can also be used to uncover hidden relationships and uncover previously unknown opportunities. With the help of BDA, library as an organisations can make informed decisions, develop more efficient and cost-effective processes, and gain a competitive advantage through a better understanding of their clientele/library users (Bashar, 2020).

BDA involves various steps such as data collection, data preparation, data analysis, and data visualisation. During the data collection step, organisations, library inclusive gather large datasets from various sources such as transactional systems, weblogs, social media, and sensors. In the data preparation step, data is formatted, cleaned, and organised so that it can be analysed and interpreted. During the data analysis step, analytical techniques such as descriptive, predictive, and prescriptive analytics are used to identify patterns and relationships between data points (Chen & Chiang, 2020).

During the data visualisation step, data is presented in graphical or tabular format to make it easier to understand and interpret. BDA is a powerful tool that enables organisations to better understand their data and make informed decisions.

The literature indicates that while the potential benefits of big data analytics in university libraries are significant, several challenges need to be addressed to achieve widespread adoption. Understan-ding librarians' perceptions, enhancing their competencies, and addressing infrastructural and ethical issues are crucial steps towards leveraging big data analytics to improve library services. In the context of Osun State, Nigeria, targeted strategies focusing on training, infrastructure, and policy development can facilitate the effective use of big data analytics in university libraries.

METHODOLOGY

This study employed descriptive survey research designs. The population for this study consisted of all librarians from the twelve university libraries from the twelve National Universities Commission (NUC) approved universities in Osun State. In the state, there are 2 federal, 2 state and 8 private universities (NUC, 2023). A multistage sampling technique was employed to obtain a representative sample. The universities in Osun State were stratified based on ownership (Federal, State, and Private). From each stratum, one university was selected using simple random sampling technique, resulting in a total of three universities. The sample included a total of 36 librarians using total enumeration sampling technique consisting of the census of all the librarians from the three selected universities.

The instruments used for data collection include a questionnaire and an interview guide. The questionnaire was titled ''Perception, Competency, and Use of Big data analytics among University Librarians (PCUBDAUL). The questionnaire was structured in such a way that the respondents were required to tick in correspondence to the applicable responses. Cronbach's alpha test was done and the result of the Cronbach's alpha gives coefficient of 0.866. The rule of thumb on Cronbach's alpha coefficient indicated that the instrument is adjudged "very good reliability ($\alpha = 0.866$)." Descriptive statistics was used to summarise and interpret quantitative data; percentage distribution, mean, and standard deviation were used to answer the

four research questions in this research

ANALYSIS OF DATA

*Research Question 1***:** What is the level of awareness of librarians about the big data analytics (BDA) tools?

Table 1 shows the Descriptive Statistics of Librarians' Awareness of Big data analytics (BDA) tools.

KEY: FA= Fully Aware (4); A= Aware (3); NA= Not Aware (2); FNA= Fully Not Aware (1);

Item	How would you rate your level of awareness of Big data analytics Tools	FA (%)	A (%)	NA (%)	FNA (%)	mean	Std Dev
A	Librarians' Awareness about Big data analytics (BDA) Tools						
1	Atlas.ti	13(36.1)	14(38.9)	7(19.4)	2(5.6)	3.06	0.89
2	Zoho Analytics	7(19.4)	23(63.9)	5(13.9)	1(2.8)	3.00	0.68
3	Microsoft HDInsight	14(38.9)	18(50.0)	2(5.6)	2(5.6)	3.22	0.80
4	Skytree	13(36.1)	11(30.6)	11(30.6)	1(2.8)	3.00	0.89
5	Talend	7(19.4)	16(44.4)	10(27.8)	3(8.3)	2.75	0.87
6	Splice Machine	13(36.1)	14(38.9)	9(25.0)	0(0.0)	3.11	0.78
7	Spark	15(41.7)	11(30.6)	8(22.2)	2(5.6)	3.08	0.94
	Librarians' Awareness about Big data analytics (BDA) Tools					**3.03**	**0.84**

Table 1 shows the descriptive statistics of librarians' level of awareness of big data analytics (BDA) Tools. Items one to seven on the questionnaire gathered information about librarians' level awareness of big data analytics (BDA) Tools. Responses from respondents to each item on the questionnaire were scored with "Fully Not Aware" scored 1, "Not Aware" scored 2, "Aware" scored 3, and "Fully Aware" scored 4. The mean score of librarians' level of awareness of big data analytics (BDA) tools was 3.03 of four point Likert scale. Table two below interprets table 1 further

Table 2: Librarians' Level of Awareness about Big data analytics (BDA) Tool N = 36

Frequency	Percent	Level of Awareness
6	16.7	Very High
22	61.1	High
8	22.2	Low

To determine the level of awareness of the librarians about big data analytics (BDA) tools, the responses were categorized into three as shown in Table 2. 16.7% of the librarians had a very high level of awareness of big data analytics (BDA) tools. 61.1% had high and 22.2% had low levels of awareness. Hence, it is evident that most of the librarians were aware of big data analytics (BDA) tools. Consequently, applying the majority rule, it can be concluded that the librarians exhibited a high level of awareness regarding big data analytics (BDA) tools. This corresponds to high level of awareness on the scale. Thus, it can be deduced that librarians have an high level of awareness of big data analytics (BDA) tools. This finding corroborates earlier findings by Ahmed, Ismail, & Ali, (2017) who observed that librarians recognise the potential of big

data analytics to offer insights into library operations, and services that were previously unavailable, they recognise the potential for big data analytics to provide more personalised and tailored services for library users. Siddiqui and Afzal (2018) also emphasized librarians' awareness in terms of the potential for big data analytics to improve library operations and to optimise resources, as well as the potential for big data analytics to improve library services, such as collection development and resource discovery.

Research Question 2: What are the perceptions of university librarians in Osun State towards the usefulness of big data analytics in the library?

Table 3: Descriptive Statistics of Librarians' Perception of Big data analytics (BDA) Usefulness in the library

KEY: Strongly Disagree" (1), "Disagree" (2), "Agree" (3) and "Strongly Agree" (4).

Item	How would you rate your perceived usefulness of big data analytics in the library?	SA (%)	A (%)	D (%)	SD (%)	Mean	Std. Dev
	Librarians' Perception of Big data analytics (BDA)						
B1	Big data analytics (BDA) can be used to uncover patterns, trends, and correlations in large sets of data	19 (52.8)	14 (38.9)	1 (2.8)	2 (5.6)	3.39	0.80
B2	BDA is relatively easy to use in analysing library resource usage and users' data when compared with traditional methods of analysis like descriptive statistics, inferential statistics, and regression analysis.	21 (58.3)	14 (38.9)	0 (0.0)	1 (2.8)	3.53	0.65
B3	BDA can be used to uncover hidden patterns, correlations, and insights into library users' behaviours	26 (72.2)	9 (25.0)	1 (2.8)	0 (0.0)	3.69	0.52
B4	BDA can help detect users' preferences in the use of library resources	19 (52.8)	15 (41.7)	2 (5.6)	0 (0.0)	3.47	0.61
B5	I find it relatively easy to integrate the following BDA tools with existing library resources						
B5.1	Atlas.ti	17 (47.2)	18 (50.0)	1 (2.8)	0 (0.0)	3.44	0.56
B5.2	Turnitin	9 (25.0)	17 (47.2)	2 (5.6)	8 (22.2)	2.75	1.08
B5.3	Zoho Analytics	22 (61.1)	14 (38.9)	0 (0.0)	0 (0.0)	3.61	0.49
B5.4	Microsoft HDInsight	13 (36.1)	17 (47.2)	2 (5.6)	4 (11.1)	3.08	0.94

B5.5	Skytree	10 (27.8)	20 (55.6)	3 (8.3)	3 (8.3)	3.02	0.84
B5.6	Talend	16 (44.4)	15 (41.7)	3 (8.3)	2 (5.6)	3.25	0.84
B5.7	Splice Machine	10 (27.8)	20 (55.6)	3 (8.3)	3 (8.3)	3.03	0.84
B5.8	Spark	16 (44.4)	15 (41.7)	3 (8.3)	2 (5.6)	3.25	0.84
	Perception					3.18	0.80

Table 3 shows the descriptive statistics of librarians' perception of big data analytics (BDA) usefulness in the library. Items B1 to B5 on the questionnaire elicited information on librarians' perception of big data analytics (BDA) usefulness in the library. Responses from respondents to each item on the questionnaire were scored and recorded

Table 3 shows the frequency, percentage, mean and standard deviation of the responses to each of the items. 19 (52.8%) strongly agreed that Big data analytics (BDA) can be used to uncover patterns, trends, and correlations in large sets of data. 21 (58.3%) strongly agreed that BDA is relatively easy to use in analysing library resource usage and users' data when compared with traditional methods of analysis like descriptive statistics, inferential statistics, and regression analysis. 26 (72.2%) strongly agreed BDA can be used to uncover hidden patterns, correlations, and insights into library users' behaviours while 19 (52.8%) strongly agreed that BDA can help detect users' preference in the use of library resources. 18 (50.0%), 17 (47.2%), 17 (47.2%), 20 (55.6%), 20 (55.6%) agreed that they find it relatively easy to integrate Atlas.ti, Turnitin, Microsoft HDInsight, Skytree, and Splice Machine respectively with existing library resources. 22 (61.1%), 16 (44.4%) and 16 (44.4%) strongly agreed that they find it relatively easy to integrate Zoho Analytics, Talend and Spark respectively with existing library resources.

The mean of the perception was 3.18 and the standard deviation was 0.80, while the perception rate of Librarians towards the use of big data analytics in the library is calculated to be 79.5%. Therefore, it is apparent that librarians hold a positive perception regarding the usefulness of big data analytics in library operations. The librarians see BDA potential in uncovering patterns, trends, and correlations in large sets of data, and view it as relatively easy to use compared to traditional methods. They also believe that BDA can be effective in uncovering hidden patterns and correlations in library user behaviour, as well as helping to detect user preferences in the use of library resources. These findings align with the findings of a study by Shahid and Siddiqui (2021) on "Big data analytics in Public Sector University Libraries in Pakistan" who concluded that librarians are acquainted with the concept of big data and big data analytics tools, however, acquiring the necessary skills to adapt to this shift is essential for their survival in the era of information (Shahid & Siddiqui, 2021).

Research Question 3: How competent are the librarians in Carrying out Big data analytics, tools and techniques?

Table 4: Descriptive Statistics of Librarians' Competence in Carrying out Big data analytics tools and techniques

Key: VH=Very High (4), H=High (3), L=Low (2) and VL=Very Low (1)

Item	How would you rate your Competency Level in Carrying out Big data analytics tools and techniques	VH (%)	H (%)	L (%)	VL(%)	Mean	StdDev
	Librarians' Competence in Carrying out Big data analytics (BDA)						
C1	Data management planning	7 (19.4)	24 (66.7)	1 (2.8)	4 (11.1)	2.94	0.83
C2	Data preservation, curation, or stewardship	13 (36.1)	17 (47.2)	2 (5.6)	4 (11.1)	3.08	0.94
C3	Applying or developing ontologies or metadata	19 (52.8)	14 (38.9)	1 (2.8)	2 (5.6)	3.39	0.80
C4	Support for data resources	21 (58.3)	14 (38.9)	0 (0.0)	1 (2.8)	3.53	0.65
C5	Support for general data management	26 (9.0)	9 (25.0)	1 (2.8)	0 (0.0)	3.69	0.53
C6	Support for data use and analysis	19 (52.8)	15 (41.7)	2 (5.6)	0 (0.0)	3.47	0.61
C7	Support for institutional repository	17 (47.2)	18 (50.0)	1 (2.8)	0 (0.0)	3.44	0.56
C8	Development of data services competence	14 (38.9)	16 (44.4)	5 (13.9)	1 (2.8)	3.19	0.79
						3.34	**0.71**

Table 4 shows the descriptive statistics of librarians' competence in carrying out big data analytics (BDA). Responses from respondents to each item on the questionnaire were scored with "Very Poor" scored 1, "Poor" scored 2, "Good" scored 3, and "Very Good" scored 4. Items C1 to C8 on the questionnaire elicited information on librarians' competence in carrying out big data analytics (BDA).

Table 4 shows the frequency, percentage, mean and standard deviation of the responses to each of the items. 24 (66.7%), 17 (47.2%), 18 (50.0%) and 16 (44.4%) showed librarians' Competence in

Carrying out Big data analytics (BDA) for Data management planning, Data preservation, curation, or stewardship, Support for institutional repository and Development of data services respectively was good. 19 (52.8%), 21 (58.3%), 26 (9.0%), 19 (52.8) Librarians' Competence in Carrying out Big data analytics (BDA) for Developing ontologies or metadata, data resources, general data management and data use and analysis respectively was very good.

Table 5: Competency Level of Librarians in Carrying out Big data analytics (BDA) (N = 36)

Frequency	Percent	Competency Level
5	13.9	Very High
23	63.9	High
8	22.2	Low

To determine the competency level of librarians in carrying out big data analytics (BDA), the responses were categorized into three as shown in Table 5. Respondents with aggregate scores of 24 and below were categorized as having low level of competence. Those from 24.1 to 28.9 were categorized as having high level of competence while those from 29 and above were categorized as having very high competence level, while respondents with aggregate scores between 24 and 29 were categorized as high. 13.9% of the librarians had a very high level of competence in carrying out big data analytics (BDA). 63.9% had a high and 22.2% had a low level of competence. It can therefore be concluded using majority rule as 77.8% of the respondents, the librarians of universities in Osun state competency level in carrying out big data analytics (BDA) was high. This findings support the conclusion that the level of use of Big Data Analytics (BDA) by university libraries is high. Sugimoto, Ding, & Thelwall, (2012) in their study also maintained that "some libraries are currently providing research data-related services, including, data collection, curation, data archiving and management planning, all of which are elements of BDA. The extent of services offered is restricted based on users' requirements and the present state of the library or organization (Sugimoto *et al.*, 2012).

Research Question 4: To what extent are big data analytics currently being used in university libraries in Osun State?

Table 6: Descriptive Statistics of Extent of Use of Big data analytics (BDA) by University Libraries

Key: A=Always (4), O=Occasionally (3), R=Rarely (2) and N=Never Used (1)

Item	How would you rate the extent of use of big data analytics (BDA) in your library?	A (%)	O (%)	R (%)	N(%)	Mean	StdDev
D1	Data visualization	19 (52.8)	14 (38.9)	1 (2.8)	2 (5.6)	3.39	0.80
D2	Developing and maintaining websites	21 (58.3)	14 (38.9)	0 (0.0)	1 (14.0)	3.52	0.65

D3	GIS software and data	26 (72.2)	9 (25.0)	1 (2.8)	0 (0.0)	3.69	0.52
D4	Scientific programming (such as R, Python, JavaScript, etc.)	19 (52.8)	15 (41.7)	2 (5.6)	0 (0.0)	3.47	0.61
D5	Statistical software (such as SAS, SPSS, etc.)	17 (47.2)	18 (50.0)	1 (2.8)	0 (0.0)	3.44	0.56
	Extent of Use					3.50	0.63

Table 6 shows the descriptive statistics of the extent of use of big data analytics (BDA) by University Libraries. Responses from respondents to each item on the questionnaire were scored such that "Never" was scored 1, "Rarely" was scored 2, "Often" was scored 3 and "Always" was scored 4. Items D1 to D5 on the questionnaire elicited information on the extent of use of big data analytics (BDA) by University Libraries.

Table 6 shows the frequency, percentage, mean and standard deviation of the responses to each of the items. The mean score for the extent of use of big data analytics (BDA) by University Libraries was 3.50. This corresponds to "High" on the scale. Thus, it can be deduced that the extent of use of big data analytics (BDA) by University Libraries was high.

To determine the extent of use of big data analytics (BDA) by University Libraries, the responses were categorized into three as shown in Table 7.

Table 7: Level of the Extent of Use of Big data analytics (BDA) by University Libraries

(N = 36)

Frequency	Percent	Level of the Extent of Use
3	8.3	Very High
29	80.6	High
4	11.1	Low

Aggregate scores of 16 and below were categorized as low level in the extent of use. Those from 19 and above were categorized as very high while aggregate scores between 16 and 19 were categorized as high. It can therefore be concluded using the majority rule (80.6%) that the majority of the respondents (8.3% + 80.6% =88.9%) agreed that their extent of use of big data analytics (BDA) in carrying out Libraries operation was high.

CONCLUSIONS

The study concludes that while there is a foundational awareness of Big Data Analytics among librarians in Osun State university libraries, significant gaps exist in their competency and actual use of these tools. The limited adoption of BDA can be attributed to various challenges, including insufficient training, inadequate infrastructure, and lack of institutional support. Addressing these issues is crucial for leveraging the potential

of Big Data Analytics to enhance library services and operations.

RECOMMENDATIONS

Based on the findings, the following recommendations are proposed:

1. Implement regular training programs and workshops to enhance librarians' skills in Big Data Analytics
2. Invest in modern technological infrastructure to support the use of BDA tools and software in university libraries.
3. Ensure reliable internet access and necessary hardware to facilitate data analysis activities.
4. Develop and implement institutional policies that promote the adoption and integration of Big Data Analytics in library operations.
5. Allocate sufficient funding and resources to support BDA initiatives in university libraries.
6. Encourage partnerships with external organizations and vendors to access advanced BDA tools and training opportunities.

By addressing these recommendations, university libraries in Osun State can enhance their capacity to effectively utilize Big Data Analytics, ultimately improving their services and contributing to the advancement of library and information science in the digital age.

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