Edulib 14(1) (2024) 47-54

EDULIB

Journal of Library and Information Science

Journal homepage: http://ejournal.upi.edu/index.php/edulib/index

Perception of Librarians in Agricultural Research Institutes towards the Use of Big Data for Library Operations and Services in Kwara State, Nigeria

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ABSTRACT

This study examined the perception of use associated with big data in agricultural research institutes' libraries. This research applies a descriptive design with thematic analysis. Data collection was obtained through key informant interviews. The population of this study consists of two librarians from each of the agricultural research institutes' libraries. In the study, four research questions were addressed. The results showed librarians believe big data assists them in providing clear and straightforward information that will quickly aid the demands of the researchers in the institutes. The study also revealed how big data helps librarians better understand how they can meet the information demands of researchers. There are several barriers to the use of big data in agricultural research libraries in Kwara State, Nigeria, stemming from incompetent personnel, insufficient funding, irregular electricity supply, slow internet connectivity, and the cost of training and retraining on big data. In conclusion, the perception of the use of big data in agricultural research libraries allows librarians to streamline operations and services to exactly what the researcher wants. Based on the findings, the study recommends ensuring the effectiveness of big data, agricultural research libraries should recruit more data analyst experts to manage big data in their libraries and ensure alternative power generation such as solar systems, inverters or standby generating machines are made available.

ARTICLE INFO

Article History:
Submitted/Received 12 Feb 2024
First Revised 09 Mar 2024
Accepted 11 May 2024
First Available online 18 May 2024
Publication Date 31 May 2024

Keyword:
Big data,
Big data analytics,
Agricultural research libraries,
Researchers,
Big data benefit.

1. INTRODUCTION

Big data in particular have been gradually incorporated into library management and services. As big data has gained popularity, and drawn the attention of businesses and organizations of all sizes. Its widespread use in various activities and decision-making procedures in recent years has greatly facilitated the development of libraries globally. Big data is attracting interest from various academic institutions, government, public administration, and scientific research because of the potential benefits it may provide in various scientific disciplines (Hamad et al., 2020; Favaretto et al., 2020; Sestino et al., 2020).

In 2001, industrial analyst Doug Laney coined the phrase "big data." He went on to explain that big data is a type of data that is huge, quick, complex, and challenging to analyse using conventional techniques. According to Naeem et al. (2022), the *three Vs* Volume, Velocity, and Variety accounted for a major portion of the Big Data. The volume is the accumulation of data from various sources, including videos, industrial equipment, social media, smart IoT devices, and business transactions. The velocity of data has become difficult to manage in the Internet age due to its unparalleled pace. Smart metres, RFID tags, and sensors are illustrative. Variety refers to the shapes or formats of data that can be found in both structured and unstructured forms, including emails, audio, video, and financial transactions, among other things. Big Data has been categorized into three basic formats: structured, unstructured, and semi-structured (Rawat & Yadav, 2021; Alwan & Ku-Mahamud, 2020; Saeed & Husamaldin, 2020) .

Big Data's importance does not depend on how much data you have or what you do with it; Rather, it depends on how much of it can be used to cut costs, speed up processes, or aid in the development of new products and services. Big Data is a useful tool for making smart choices and assists with activities related to an organization (Goyal et al., 2020). Meanwhile, big data can be used by a librarian to purchase better utilities. Other analytics about libraries can also be tracked. Big Data is used by libraries to improve choices and services. Big data can be used by a librarian to purchase better utilities. Other analytics about libraries can also be tracked. Big Data is used by libraries to improve choices and services. Academic libraries work with a lot of primary and secondary material and want to give users as much information as possible. Big Data technologies are thought of as effective instruments for social and macro-level operations and can benefit libraries by contributing value. Due to new technology and information-seeking trends, libraries' significance in the twenty-first century remains trivialized (Ylipulli & Luusua , 2019; Li et al., 2019; Na & Lee, 2018).

Academic libraries may be able to improve their current services or add new ones with the use of big data analysis. To enable more effective data display and interchange, it also improves marketing strategies and develops new data formats for library (Ball, 2019). Additionally, effective big data analysis may help libraries stay current with trends and find solutions to issues that might affect their users and clients (Manaseer et al., 2019). Through data resources and data technology, big data analytics also raises the value of user data, facilitating the advancement of service innovation for libraries and new research directions for library users (Yan, 2017). Big data's worth is mostly related to decisions about purchasing resources, individualised reader services, hot spot analysis, and the development of collaborative learning environments (Li et al., 2019).

The Nigerian Stored Products Research Institute (NSPRI) was founded in 1948 as the West African Stored Products Research Unit (WASPRU) to evaluate the quality of exportable commodities from Nigeria, Ghana, Sierra Leone, and the Gambia to the United Kingdom during the colonial era. With the assistance of a loan from the World Bank, the Agricultural and Rural Management Training Institute (ARMTI) was established to train and develop the

DOI: https://doi.org/10.17509/edulib.v14i1.60576
p- ISSN 2089-6549 e- ISSN 2582-2182

required manpower to manage the numerous existing and planned agricultural and rural development projects. This became a necessity following Nigeria's independence in 1960, at which time it was renamed the Nigerian Stored Products Research Institute. The National Centre for Agricultural Mechanization's (NCAM) historical roots date back to 1974, when the Federal Ministry of Agriculture and Natural Resources recognised Nigeria's need to achieve food and fibre self-sufficiency. The Federal Government was persuaded that agricultural mechanisation was indispensable to Nigeria's food and fibre self-sufficiency. The National Centre for Agricultural Mechanization (NCAM) was established by Decree No. 35 of 1990 (now an Act of the National Assembly) with the overall goal of accelerating the pace of mechanisation in the agricultural sector of the Nigerian economy in order to increase the quantity and quality of agricultural products in Nigeria, they are all parastatals organisations under the Federal Ministry of Agriculture and Rural Development of the Federal Government of Nigeria.

These institutions have patrons and use library resources, which results in the production of a significant amount of big data. It is possible to harness and mine the produced data, which is a genuine goldmine of jumbled information encompassing different staff patterns. If the relevant specialists are well-informed of its importance and how to use it efficiently, the mining of this data will provide knowledge that will be helpful for future use. According to the literature, there haven't been many studies on big data research in underdeveloped countries, especially when it comes to agricultural research libraries in Nigeria. The present investigation was thus required to close the discovered gap. It is on this note that this study examined the perception of the use of big data in agricultural research libraries in Kwara state.

Regarding the aforementioned, it is acknowledged that big data can be optimised for the delivery of information services in academic libraries, however, there are just a few empirical studies about big data in research libraries in Nigeria. Although it is clear from the literature that libraries all over the world are highly aware of the potential of big data but only to a very limited extent in Nigeria, there may still be certain obstacles and difficulties limiting libraries from fully utilising big data.

The main objective of the study was to examine the perception of librarians' use and challenges associated with big data in libraries in agricultural research institutes in Kwara state, Nigeria. The study had the following specific objectives: (i) investigate the perception of librarians in agricultural research institutes on the use of big data for library operations and services in Kwara state, Nigeria; (ii) determine the perception of librarians in agricultural research institutes on the benefits of using big data for library operations and services in Kwara state, Nigeria; (iii) investigate the perception of librarians in agricultural research institutes on the relevance of using big data for library operations and services in Kwara state, Nigeria; and (iv) examine the challenges of librarians in agricultural research institutes associated with using big data for library operations and services in Kwara state, Nigeria.

2. METHODS

A descriptive design was employed for the study. This study used a qualitative approach. The qualitative approach focuses on gathering information through free-flowing dialogue. According to respondents' responses, qualitative approaches typically allow for more in-depth and follow-up questions, during which the interviewee and/or researcher seeking to understand the respondents' motivations and feelings. It will be easier to conclude the study if you know how the survey's respondents; in this context, librarians in agricultural research institutes perceive big data, the potential it presents, and the problems it raises in agricultural

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p- ISSN 2089-6549 e- ISSN 2582-2182

research libraries. The study's focus is on the use, benefits, relevance and hindrances of big data applications in libraries, hence a qualitative approach was used to explain how librarians at agricultural research libraries perceive these issues. Key informant interview was embarked upon because it is one of the most common qualitative research methods. It enables opportunities to collect detailed in-depth information from the respondents.

The instrument of data collection was a key informant interview, which examined how librarians in agricultural research institutes perceived big data. An interview guide with questions about the study's four objectives was also created for the respondents to have a clear knowledge of what big data is, the guide included directions on how to react to the guide as well as a definition of it. The researcher performed the phone interviews, recorded them electronically, sorted, compiled, and transcribed the responses, and then reported accordingly. Each respondent enthusiastically declared their desire and willingness to participate in the study after being asked for their informed consent. Similarly, participants were free to stop taking part if they believed it could be counterproductive. The population for the study comprised librarians in agricultural research institutes in Kwara state. The study did not extend beyond these agricultural research institutes because of the geographical scope of the study. The study targeted key librarians in those institutes. The selected respondents were library directors and system librarians directly responsible for the use of information and communication technologies (ICT) and data management

3. RESULTS AND DISCUSSION

3.1 Perception of librarians in agricultural research institutes on the use of big data

The opinions of librarians working at agricultural research institutions were solicited. According to the majority of respondents to the interview, several of the librarians at agricultural research institutions are unfamiliar with big data. The majority of the respondents acknowledged that agricultural research libraries are one of the contemporary sectors of librarianship, and they also mentioned how the new technology known as big data is assisting them in storing and managing their data. One respondent brought up the following:

> *"Librarians find the idea of big data to be fascinating as it is a new technology, especially those who work in agricultural research institutes. Research libraries benefit from being able to provide clear and straightforward information that will quickly aid the demands of the researchers in the institutes."*

> *"Big data is an advanced technology that is capable of sharpening the decision making of an organization which isn't only limited to libraries in agricultural research institutes, its impact extends to other organizations such as aviation, finance, museum, and information centers."*

From the findings of this study on librarians in agricultural research institutes perceptions of big data, it is evident that librarians in agricultural research institutes view it as new technology that can help agricultural research libraries manage their data, allow researchers To swiftly retrieve required information from the library, promptly meet the information needs of researchers, and aid in making precise decisions.

This result is in agreement with Zhan and Widen's (2019) investigation of big data in librarianship and its definition. The authors claimed that there were very few definitions that could be studied, thus methods of content analysis were combined. The authors were able to clarify librarians' perceptions of libraries about big data through the summary of the five

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p- ISSN 2089-6549 e- ISSN 2582-2182

various elements based on an examination of the gathered definitions. The findings correspond with Ahmad et al. (2019a, 2019b) conclusion that LIS professionals have a strong awareness of big data in terms of data privacy, data literacy, data organization, and data availability.

3.2 Perception of librarians in agricultural research institutes on the benefits of using big data

The agricultural research institutes' librarians were asked to describe the benefits and/or opportunities of big data in their libraries. According to respondents, the benefits of big data for agricultural research libraries differ depending on the mandate, vision and mission statement of the research institute, stating how the libraries have to work in line with their governing body. A respondent explained that another benefit of big data is how big data has challenged some members of the library to improve their skills, the same respondent explained that:

> *"Big data has made effective service delivery possible to researchers in the institute in congruence with Ranganathan rule of saving the time of library user."*

> *"The benefit of the adoption of big data in my library allows me to streamline our operations and services to exactly what the researcher wants."*

The benefits of big data reported in this study are corroborated by Li et al. (2017), who identified five opportunities: promotion of the interlibrary loan service, personalized knowledge service, enrichment of the library database, and development of librarians' skills. All of these bolster the research on the benefits of big data for libraries.

3.3 Perception of librarians in agricultural research institute on the relevance of using big data

It was sought of librarians in agricultural research institutes whether big data is pertinent to their libraries. According to the results, respondents concur that big data is highly pertinent to agricultural research libraries. Several respondents opined that the technology is applicable to agricultural research libraries because it will allow them to reduce costs and continue to actively meet user requirements, be relevant in terms of spending wisely, and evaluate data and information from researchers, one respondent stressed that:

> *"The analysis of my library's data holdings and patrons helps me to better understand how I can meet the information demands of researchers."*

One respondent added: "Big data is significant because the researchers' needs for information are continual, and with the use of big data, information retrieval might be more effective and efficient." Several respondents said that it is relevant because it is beneficial. This shows that the participants are in agreement that big data is pertinent to agricultural research libraries in a number of ways.

The findings are in line with some previous study that was discovered in the literature and claimed that libraries accepted big data due to its applicability. For instance, Li et al. (2017) claimed that five aspects, including human resources, service innovation, infrastructure development, literature resource, and technological support, may be used to assess the framework's applicability. The application framework of the framework, they said, is viable and workable in libraries. The relevance was also supported by Dunmade and Hamzat (2022),

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p- ISSN 2089-6549 e- ISSN 2582-2182

who claimed that the use of big data is beneficial and allows for cost, productivity, and creative efficiencies. Furthermore, it is asserted that librarians, with their knowledge, expertise, and service skill set, have made significant contributions to the management of big data because they can help all clients and patrons, regardless of their field. Advanced tools are used to process data and disclose relevant information.

3.4 Challenges of librarians in agricultural research institutes associated with using big data

According to the literature on the use of technologies in libraries, there are connected challenges. The purpose of this study was to determine whether the adoption of big data by agricultural research libraries is fraught with difficulties. The respondents were asked to identify the barriers to big data adoption in their respective libraries, as well as the issues they face while using big data. The comments draw attention to prevalent issues such a lack of funding for big data technology maintenance in libraries and a shortage of professionals or expertise to manage big data in agricultural research libraries. In addition, challenges including poor internet access and sporadic power supply, which are prevalent in developing countries, have been observed.

> *"At the moment, our library is struggling to finance, support technology infrastructure development, and educate staff to handle large data. Although being a cost-effective service, big data requires a lot of costly equipment, therefore the cost of early adoption is unaffordable for the majority of agricultural research libraries. insufficient technological expertise Together with other factors, there is the problem of staff training and retraining."*

This demonstrates that, regardless of where agricultural research libraries are located, the use of big data usually comes with obstacles. According to the interviewees, another difficulty with the use of various data sources and online resources is that there is a significant disparity between the amount spent on the procurement of various e-resources and online databases and the actual usage of these materials.

4. CONCLUSION

The use of big data for library operations and services is perceived by librarians in agricultural research institutes in Kwara State as a new technology that is assisting them in data management, allowing users to quickly access vital information from the library, quickly satisfying user information requests, and assisting agricultural research libraries in decision-making. Regarding advantages, using big data in agricultural research libraries enables efficient service delivery to customers, leading to cost savings since most agricultural research libraries now save money by utilising big data, and providing information to customers in the quickest amount of time possible. Big data is considered significant by librarians because it helps agricultural research libraries provide services including assessing data holdings and supporting researchers with huge data sets. Blummer and Kenton's (2018) claim that "big data may also be leveraged for constructing library collections" is supported by this, monitoring how frequently people use the materials in the libraries, and so on." Librarians may use big data in a variety of ways to improve library management, user satisfaction, and information retrieval in the shortest time".

Many obstacles to big data adoption in agricultural research libraries in Nigeria have been identified. Inadequate finance, lethargic internet access, a lack of infrastructure, and a

DOI: https://doi.org/10.17509/edulib.v14i1.60576
p- ISSN 2089-6549 e- ISSN 2582-2182

shortage of experienced personnel are among them. Regardless of these difficulties, big data technologies are here to stay and have a lot to offer agricultural research libraries looking to improve service in Nigeria. Nonetheless, the case study given here, as well as the literature reviews carried out, clearly indicate the immense potential for agricultural research libraries that big data provides.

5. AUTHORS' NOTE

The authors declare that there is no conflict of interest regarding the publication of this article. Authors confirmed that the paper was free of plagiarism.

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p- ISSN 2089-6549 e- ISSN 2582-2182