International Journal of Business and Quality Research
https://e-journal.citakonsultindo.or.id/index.php/IJBQR

E-ISSN: 2985-9468

Unveiling the Potential of Big Data for Agricultural Research Libraries: Perspectives from Nigeria

[1]Adewojo, Akinade Adebowale, [2]Olubiyi, Timilehin Olasoji, PhD, [3]Hamzat, Saheed Abiola PhD, [4]Ayodeji Yusuf Ajani, [5]Aderinola Ololade Dunmade PhD

[1]Senior Librarian https://orcid.org/0000-0002-2921-8500 NSPRI E-Library, Nigerian Stored Products Research Institute Ilorin Nigeria
[2]Department of Business Administration & Marketing, School of Management Sciences, Babcock University, Ilishan-Remo, Ogun State, Nigeria. https://orcid.org/0000-0003-0690-7722
[3] Senior Lecturer, Head of Department https://orcid.org/0000-0001-9238-8628 Adeleke University, Ede, Osun State, Nigeria
[4] Department of Library & Information Science, University of Ilorin, Ilorin, Nigeria
[5]Centre for Open and Distance Learning, University of Ilorin, Nigeria Computer Services and Information Technology (COMSIT) Directorate, University of Ilorin, Ilorin, Nigeria
https://orcid.org/0000-0002-7745-0494

Email: akinadewojo@nspri.gov.ng, drtimiolubiyi@gmail.com, Saheed.abiola@adelekeuniversity.edu.ng, trustusouph@gmail.com, derin_d@unilorin.edu.ng

Abstract

This study examined the perception of use associated with big data in agricultural research institutes' libraries. A descriptive design was employed, and thematic analysis was done on the information 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. The difficulties associated with the use of big data in agricultural research libraries in Kwara State, Nigeria, stem from the presence of incompetent personnel, insufficient funds, irregular electricity supply, sluggish internet connectivity, and the

Copyright to the author of some rights reserved This work is licensed under aCreative Commons Attribution-ShareAlike 4.0 International License.

International Journal of Business and Quality Research
https://e-journal.citakonsultindo.or.id/index.php/IJBQR

E-ISSN: 2985-9468

expense 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.

Keywords: Agricultural research libraries, Big data, Big data analytics,Big data benefits Kwara State

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, recently, and as it has become a ubiquitous term in many activities and decision-making processes, it has significantly aided the global development of libraries. In general, libraries enhance the quality of life in the surrounding communities. Scientific research, public administration, academic institutions, and governments are among the fields of study interested in big data due to the benefits it may offer in a vast array of fields (Chen& Zhang, 2014; Chen et al., 2015). Big data has had enormous effects across many areas and has altered how people think. In modern culture, a large amount of data that has been expanding exponentially for a while now is referred to as "Big Data" and the development and deployment of technologies that give the user the appropriate information at the appropriate moment (Riahi & Riahi, 2018).

The phrase "big data" refers to data sets that are so enormous or complicated that they cannot be handled by conventional data processing application software (Singh, 2020). For better insight and decision-making, According to the Gartner Glossary (2020), which was added to the definitions, massive volume, velocity, and variety of information assets require cost-effective, cutting-edge forms of information processing. In reality, the dataset is large in terms of volume, velocity, and/or diversity, necessitating a scalable architecture for efficient data processing, storage, and analysis.

According to a McKinsey report, big data is primarily used in five industries: global manufacturing, retail, healthcare and medical, government, and personal life. All research findings demonstrate that big data contributes to the expansion of the global economy and enhances healthcare and government administration (Olubiyi*, et al*., 2023; James *et al.,* 2011; Chen and Zhang, 2014). There is no doubt that we are currently experiencing a

Copyright to the author of some rights reserved This work is licensed under aCreative Commons Attribution-ShareAlike 4.0 International License.

data deluge even if there is no precise estimate of how much data is produced every day. According to Favaretto et al. (2020), "Big Data" is a word that is frequently used to express a variety of ideas, including the gathering and aggregation of enormous volumes of data, using a multitude of cutting-edge digital tools intended to uncover trends in human behavior. Only 0.5% of the data collected worldwide has been examined as of yet. There are still many chances to participate in big data projects (Mikalei, Krogstiellias, & Pavlou, 2020). In and out of libraries, a lot of data is transferred. For usage by academics, organizations, and users, this data must be turned into information and knowledge. Libraries' primary function is to facilitate access to information while simultaneously fostering the generation of new knowledge; yet, to do this, libraries must be able to process, analyze, and present data.

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 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 dates back to 1974, when the Federal Ministry of Agriculture and Natural Resources recognised Nigeria's need to achieve food and fiber 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

Copyright to the author of some rights reserved This work is licensed under aCreative Commons Attribution-ShareAlike 4.0 International License.

International Journal of Business and Quality Research
https://e-journal.citakonsultindo.or.id/index.php/IJBQR

E-ISSN: 2985-9468

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 Nigeria.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.

LITERATURE REVIEW

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, Jamal, Diaz-Martinez, Butt, Montesano, Tariq, and De-La-Hoz-Valdiris (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. Managing the storage of this type of data used to be a laborious task, but now it is easier thanks to less expensive platforms like data storage and the open-source programme Hadoop. The velocity of data has become difficult to manage in the Internet age due to its unparalleled pace. It becomes a pipe dream to try to arrange them sequentially. 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, according to Rawat and Yadav (2021).

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, Goyal, Rekha, Malik & Tyagi, 2020). There are several sources for big data, but the most popular ones include streaming data, the internet of things, and comparable gadgets like smart automobiles, machinery, and medical equipment. When they arrive, one can evaluate whether to keep them or not. Social media, according to Ikegwu, Nweke, Anikwe, Alo, and Okonkwo (2022), is another source of Big Data. It deals with a lot of data in a variety of formats, such as videos, photographs, texts, and sounds, and can be a valuable tool for marketing, sales, and other business-related tasks. Facebook, YouTube, Instagram, and more suitable instances come to mind. The Nigerian Government, The National Population Commission's open data portal, the CIA World Factbook, and other publicly accessible data sources are further sources of big data.

Copyright to the author of some rights reserved This work is licensed under aCreative Commons Attribution-ShareAlike 4.0 International License.

International Journal of Business and Quality Research
https://e-journal.citakonsultindo.or.id/index.php/IJBQR

E-ISSN: 2985-9468

Big Data is linked with many technologies including smart cities, artificial intelligence, and the internet of things in emerging technology, according to Zhong, Chen, Dan, and Rezaeipanah (2022). These tools have connections to numerous industries, including location monitoring, precision medicine, fraud handling, advertising, media and entertainment, weather tracking, etc. Big data in the education sector may boost student performance, customise programmes, lower dropout rates, and target foreign hiring, among other things. Sharma (2019) highlighted the fact that the library deals with data and has a long history of putting a multifaceted focus on gathering, organising, archiving, and granting access to information in traditional as well as digital formats, including both printed and electronic content. People of all ages want access to a wealth of information, and libraries have emerged as the centre of research activity across the globe. In the era of information technology, data is everything, and consumer demand is rising quickly. Libraries can leverage big data for a variety of purposes, including better decision-making, better service creation, GIS mapping to learn more about library users, learning where non-users reside, etc (Hamad, Fakhuri & Abdel Jabbar, 2022).

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. As was previously noted, libraries deal with such diversity, volumes, and velocities while Big Data consists of high velocity, high variety, and large volume information. The digitization process, which delivers services in numerous formats such as texts, photographs, videos, audio and other resources, is something that modern libraries are moving towards. Big Data can assist them to improve their insight and decision-making because these resources require expensive technologies (Li, Jiao, Zhang & Xu, 2019). 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).

The materials held and maintained by libraries have been diligently catalogued and recorded (Teets & Goldner, 2013). For the purpose of providing researchers and general users with access to information resources, they have compiled books, research articles, and reports in both physical and electronic formats. Moreover, libraries maintain records of each user's interactions with their services. There are numerous formats and the volume of this data increases over time if it is not properly managed. This may have an effect on library services and levels of performance (Wang, 2015). Therefore, libraries must develop methods for utilising these data, as well as techniques for data extraction and big data. For instance, Zhang (2016) identifies libraries as the primary locations

Copyright to the author of some rights reserved This work is licensed under aCreative Commons Attribution-ShareAlike 4.0 International License.

where human knowledge is accumulated and preserved, with the quantity and diversity of big data continuously increasing. To improve library services, it is now essential to completely integrate and utilise external big data. It is a consensus among libraries and librarians that big data technology facilitates the management of massive datasets, the linking of exclusive datasets, the discovery of patterns in real-time, the adoption of dynamic risk scoring, and the testing of hypotheses by transforming data into useful knowledge or information (AlBarashdi, & Al-Karousi, 2019).

According to Wang (2015), big data in digital libraries consists primarily of electronic and document resources, user and borrower information, browsing history, and other information progressively accumulated through library information services. Due to the increasing use of linked data on the web, the quantity of data that digital libraries are exposed to and must manage has increased dramatically, (Hamad, Fakhuri & Abdel Jabbar, 2022). To do input-output analyses, Fister (2015) reported that certain libraries have started using big data technologies for decision assistance. Additionally, the development and improvement of the services and procedures of an academic library may be hampered by the major problem of massive data management. It improves a library's strategic planning and decision-making (Manaseer, Alawneh, & Asoudi, 2019). Given that this application includes both positive and negative aspects, starting a big data operation in practice can present several difficulties. Due to its openness, big data promotes open access to a variety of information, which compromises data security.

As a result, Big Data first causes problems, yet due to their experience, library practitioners play a crucial role. Before diving into big data, libraries need to develop corresponding and wide capabilities. In this way, librarians may be important in managing huge datasets. With the use of Big Data, libraries can effectively manage the number and variety of data, which are both considerably expanding (Owolabi, Adeleke, Tella & Mudasiru, 2021). Professional librarians must make sure that the end-users of these activities have access to high-quality data. IT and technical abilities are now essential for all professions. Before diving into big data, it may be helpful to keep in mind the four V's of big data: Volume, Velocity, Variety, and Veracity. Big data management is a complicated task, and to succeed, one must first take their professional background and work environment into consideration.

MIT Experimental Learning (2016) estimates that by 2020, each of the world's 7.7 billion people will generate 1.7 megabytes of new information every second of every day, while only 0.5% of all data is ever processed and used. Similarly, Khan, Yaqoob, Hashem, Inayat, Mahmoud Ali, Alam, and Gani (2014) reported that more than 2 billion persons worldwide have Internet access and more than 5 billion own mobile phones. Khan et al. anticipate that 50 billion devices will be connected to the Internet by 2030. When data is

Copyright to the author of some rights reserved This work is licensed under aCreative Commons Attribution-ShareAlike 4.0 International License.

transmitted and shared at the current rate, the volume of data and the rate of market growth will increase drastically across wireless and optical networks, the authors continued. The quick increase of data, transmission speed, different data, and security are just a few of the issues that arise despite the enormous amount of data's increasing growth rate. According to Hamad et al, (2022), Big Data is an opportunity for libraries rather than a threat. Users now require greater access to datasets than in the past, which are collections of data about numerous distinct individuals, organisations, or events.

Empirical Studies

Tang and Hu (2019) reported a survey of international research on research data management (RDM). A survey describing the roles of libraries, their levels of preparedness to provide research data management services, the obstacles they face, and the knowledge and skills necessary and essential to advance research data management practice was completed by 240 librarians for the study. The study's conclusions showed that the RDM services and tools available vary depending on the geography and organisational structure. The effect of the degree of growth and readiness in RDM jobs on the kinds of services offered was also made clear. A sizable portion of the respondents acknowledged the RDM's significance and expressed a need for greater training. They did, however, voice concern about big data's lack of capacity or bandwidth. It was stated that data librarians need to be developed, mentored, and given more training to improve the RDM services. The study suggested the creation of a global community of practice where data librarians may collaborate, share ideas, support one another's development, and work together to promote RDM on a global scale.

Ahmad, JianMing, and Rafi (2019) confirmed a link between the abilities and competencies needed for librarians to adopt Big Data analytics in university libraries. Additionally, their analysis shows that respondents had a high level of familiarity with the idea of big data analytics. They confirmed that their libraries can employ big data for a variety of library tasks, such as data collecting, preservation, curation, and analysis. Furthermore, Yuhong (2018) notes that big data's quick processing and high-value features offer a more convenient route for using digital resources, saving users' time from having to find and borrow them. In other words, big data increased the effectiveness of how university libraries used their digital resources. In agreement with the studies by Al Shawabkeh (2018) and Hamad, Hamarsha, and Al Khalaila (2018), their findings showed a high understanding of the idea of big data and its traits and problems in the setting of academic libraries among universities of Jordan employees. Al Shawabkeh (2018) also noted that workers with specialisations in computer science or library and information are more familiar with the idea, traits, and difficulties of big data.

Copyright to the author of some rights reserved This work is licensed under aCreative Commons Attribution-ShareAlike 4.0 International License.

International Journal of Business and Quality Research
https://e-journal.citakonsultindo.or.id/index.php/IJBQR

E-ISSN: 2985-9468

Academic libraries may be able to improve their current services or add new ones with the use of big data analysis. Additionally, it enhances marketing strategies and creates new data formats for library data for more efficient data display and exchange (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, Alawneh & Asoudi, 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, Jiao, Zhang & Xu, 2019). In Jordanian academic libraries, Manaseer, Alawneh and Asoudi (2019) showed how Hadoop may be used as an analytical tool. It has the advantages of lower cost, comparatively little storage space required, and parallel processing. It is capable of storing, analysing, and managing vast data resources.

User behaviour analysis is yet another essential application of big data (Ball, 2019). For example, ProQuest conducted usability testing to analyse patron behaviour and actual library service usage. Utilizing big data analytics, they collected and analysed user data. They conducted an analysis of big data through a usability study and discovered that users typically begin with broad, topical search phrases before narrowing their results by adding more terms, utilising filters, and utilising aspects. Accepted Manuscript incorporated a number of enhancements to the search and retrieval experience for users, as a result of ProQuest's response to these observations (ProQuest, 2013). Libraries can do thorough and reliable analyses of patron reading preferences, resource usage patterns, and network usage by studying user data (Li, *et. al.,* 2019).

Li, Lu, Dou and Wang (2017) conducted a study that was primarily concerned with introducing the idea of big data and providing readers with a thorough overview of big data applications in libraries. To comprehend the idea of big data and to summarise the difficulties and prospects of implementing a big data framework in libraries, a combination of text and inductive analysis was used. Questionnaires were utilised in the study to gather information from librarians. According to the study's findings, big data applications in libraries face several difficulties, including those related to data accuracy, big data processing systems and technologies, compression, and data confidentiality and security. The study demonstrated that some libraries are capable of implementing a big data application architecture. However, there are additional difficulties related to it, such as a lack of professionals and a poor degree of IT expertise. On the other side, opportunities have been recognised for promoting the interlibrary loan service, providing individualised knowledge services, enhancing the library database, and

Copyright to the author of some rights reserved This work is licensed under aCreative Commons Attribution-ShareAlike 4.0 International License.

improving the abilities of librarians. According to the study's findings, a big data application framework may be seen from the following five angles: technological support, infrastructure development, service innovation, and human resources.

Wang, Gunasekaran, Ngai, and Papadopoulos (2016) conducted a survey of the literature on the application of big data technologies in libraries in order to provide the groundwork for future research. They learned that libraries consume a lot of data and that this data has to be managed and analysed properly. They came to the conclusion that big data may help libraries create creative, cost-effective judgements or recommendations for users. They also came to the conclusion that by learning more about how users engage with the library's services, a library can improve their overall enjoyment and experience. Nevertheless, they also found that handling enormous amounts of data in libraries might provide a number of challenges, which libraries should carefully evaluate. The need for data scientists who are knowledgeable with databases, the Internet, analytics, visualisation, and data curation is one of these difficulties. Additional challenges include a lack of skilled workers, a persistent lack of infrastructure, technological challenges (related to tools and data formats), data privacy concerns, and financial challenges (Ball, 2019). The research by Obasola (2019) confirmed that libraries are crucial to handling large data for the provision of data services. However, for a successful big data application, employee expertise should be taken into account. As technology advances, so do the information-seeking habits and requirements of users. The utilisation of current big data resources and examination of the characteristics of current users' needs based on their data might result in more useful suggestions and techniques for enhancing the library's current services (Na, & Lee, 2018). For instance, the personalization of services, which are adapted to the demands of the user to provide user-oriented services, is a crucial component of today's services (Li et al., 2019). Academic libraries are concentrating on identifying usage patterns and how they relate to student performance to offer services that will raise students' achievement and happiness (Jantti, 2016). Big Accepted Manuscript data in academic libraries, according to Xiao-yan (2015), in order to migrate from information services to data services, knowledge services, and intelligence services, academic libraries need to broaden the scope of their creative services. The library community has the opportunity to move away from the traditional mass service paradigm and towards a personalised service model thanks to big data technology. Libraries may considerably improve the diversity of user services and link users with important information resources by delivering personalised services, which also reduces the expenses associated with organising library materials and user time. (Li, et. al., 2019).

Copyright to the author of some rights reserved This work is licensed under aCreative Commons Attribution-ShareAlike 4.0 International License.

International Journal of Business and Quality Research
https://e-journal.citakonsultindo.or.id/index.php/IJBQR

E-ISSN: 2985-9468

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. This study aims to shed light on the perceptions of research librarians towards the use of big data in a research library in order to investigate the value of big data in libraries in general, special libraries in particular, and from the perspective of librarians with information technology background. It's crucial to look into how these libraries see large data and what worries them about it.

Design and method

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 perceived big data, the potential it presents, and the problems it raises in agricultural 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.

Instrument

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. See a sample of the interview guide in Appendix 1.

Ethical consideration

Copyright to the author of some rights reserved This work is licensed under aCreative Commons Attribution-ShareAlike 4.0 International License.

International Journal of Business and Quality Research
https://e-journal.citakonsultindo.or.id/index.php/IJBQR

E-ISSN: 2985-9468

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.

Population and sample

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.

RESULTS AND DISCUSSION

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."

Another respondent added:
"Big data is an advanced technology that is capable of sharpening the decision making of an organisation which isn't only limited to libraries in agricultural research institutes, its impact extends to other organisations such as aviation, finance, museum, and information centres."

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

Copyright to the author of some rights reserved This work is licensed under aCreative Commons Attribution-ShareAlike 4.0 International License.

International Journal of Business and Quality Research
https://e-journal.citakonsultindo.or.id/index.php/IJBQR

E-ISSN: 2985-9468

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 various elements based on an examination of the gathered definitions. The findings correspond with Ahmad, JianMing, and Rafi's (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.

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.”

Another respondent also said that:
“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, personalised 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.

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

Copyright to the author of some rights reserved This work is licensed under aCreative Commons Attribution-ShareAlike 4.0 International License.

International Journal of Business and Quality Research
https://e-journal.citakonsultindo.or.id/index.php/IJBQR

E-ISSN: 2985-9468

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), who asserted that big data adoption is advantageous and permits efficiencies in terms of cost, productivity, and creativity. In addition, it is claimed that big data has allowed librarians to play crucial roles in the management of big data because they have the knowledge, skills, and service skill set to assist all patrons and clientele regardless of their discipline. Data are processed with advanced tools to reveal meaningful information.

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..

Copyright to the author of some rights reserved This work is licensed under aCreative Commons Attribution-ShareAlike 4.0 International License.

International Journal of Business and Quality Research
https://e-journal.citakonsultindo.or.id/index.php/IJBQR

E-ISSN: 2985-9468

A respondent explained that:
"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."

Bogoro (2021), Dunmade and Hamzat (2022), and Chen et al. (2015) discussed the challenges created by low funding in big data management in libraries. Furthermore, the fast growth rate of Big Data creates a management problem, as does the heterogeneous nature of datasets that necessitate different data management technologies and the difficulty in dealing with unstructured data, all of which agree with Rouhani and Rotbei (2021), who stated that rapid data growth, transfer speed, diverse data, and security are some of the challenges encountered in the collection and analysis of Big Data. Also, Cave et al (2020) and Zhu (2020) noted that the varied character of the datasets increases data complexity and makes big data analysis challenging. 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.

CONCLUSION

The use of big data for library operations and services is perceived by librarians in agricultural research institutes in Kwara State Nigeria 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

Copyright to the author of some rights reserved This work is licensed under aCreative Commons Attribution-ShareAlike 4.0 International License.

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 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.

Implications of the study

Libraries in agricultural research institutes would gain greatly from implementing a vast big data program because it would boost the effectiveness of the services the library provides. Also, Librarianship in the country will be more relevant as a result of the availability of suitable capabilities in this cutting-edge technology. This is because no kind of outsourcing will be necessary for the storage of information.

Recommendations

1. In facilitating the use of big data, libraries in agricultural research institutes in Nigeria need to have a database of collections as well as a reliable way to store the data. The libraries can discover a way to extract the data and process it when the need arises whenever the data is been delivered.
2. Big data is beneficial to organizations because more data may lead to more accurate analysis, which in turn can result in precise choices. Libraries in agricultural research libraries are among the institutions that find it difficult to take use of big data potential.
3. In order to enhance service delivery, libraries in Nigerian agricultural research institutes must continually retrain their librarians or make funds available for the education and retraining of the available employees on big data. This can be done through seminars, conferences, short courses, and partnerships with research institutes both inside and outside of Nigeria. Also, recruit more data analyst experts to manage big data in their libraries.
4. Big data cannot work without power or energy, hence alternative power production methods like solar systems, inverters, or standby producing units should be made accessible. Also, a powerful and dependable internet service provider should be able to give extremely strong internet connection. This would

Copyright to the author of some rights reserved This work is licensed under aCreative Commons Attribution-ShareAlike 4.0 International License.

make it possible for Nigerian agricultural research institute libraries to use big data effectively.

REFERENCES

Ahmad, K., JianMing, Z., & Rafi, M. (2019). An analysis of academic librarians competencies and skills for implementation of big data analytics in libraries: a correlational study. Data Technologies and Applications.

Al Shawabkeh, Y. (2018, March). Awareness of the concept of big data for academic librarians: A case study of the University of Jordan Library. In 24th annual conference and exhibition of the Special Library Association, Arabian Gulf Chapter, Muscat, Oman (pp. 6-8).

Al-Barashdi, H., & Al-Karousi, R. (2019). Big Data in academic libraries: literature review and future research directions. Journal of Information Studies & Technology (JIS&T), 2018(2), 13.

Ball, R. (2019). Big data and its impact on libraries. American Journal of Information Science and Technology, 3(1), 1-9.

Dunmade, A. O., & Hamzat, S. A. (2022). Relevance of Big Data Analytics in Nigerian Academic Libraries: University of Ilorin Library Experience. Mousaion: South African Journal of Information Studies, 40(1), 1-13.

Garoufallou, E., & Gaitanou, P. (2021). Big data: opportunities and challenges in libraries, a systematic literature review. College & Research Libraries, 82(3), 410.

Goyal, D., Goyal, R., Rekha, G., Malik, S., & Tyagi, A. K. (2020, February). Emerging Trends and Challenges in Data Science and Big Data Analytics. In 2020 International Conference on Emerging Trends in Information Technology and Engineering (ic-ETITE), 1-8. IEEE.

Hamad, F., Fakhuri, H., & Abdel Jabbar, S. (2022). Big data opportunities and challenges for analytics strategies in Jordanian Academic Libraries. New Review of Academic Librarianship, 28(1), 37-60.

Hamad, F., Fakhuri, H., & Abdel Jabbar, S. (2022). Big data opportunities and challenges for analytics strategies in Jordanian Academic Libraries. New Review of Academic Librarianship, 28(1), 37-60.

Hamad, F., Hamarsha, A., & Al Khalaila, M. (2018, March). Big data and analytics strategies in academic libraries: Opportunities and challenges, the case of the University of Jordan Library. In the 24th annual conference and exhibition of the Special Library Association, Arabian Gulf Chapter, Muscat, Oman 6-8.

Copyright to the author of some rights reserved This work is licensed under aCreative Commons Attribution-ShareAlike 4.0 International License.

Ikegwu, A. C., Nweke, H. F., Anikwe, C. V., Alo, U. R., & Okonkwo, O. R. (2022). Big data analytics for data-driven industry: a review of data sources, tools, challenges, solutions, and research directions. Cluster Computing, 1-45.

Jantti, M. (2016). Libraries and big data: A new view on impact and effect. In Quality and the Academic Library (pp. 267-273). Chandos Publishing.

Khan, N., Yaqoob, I., Hashem, I. A. T., Inayat, Z., Mahmoud Ali, W. K., Alam, M., ... & Gani, A. (2014). Big data: survey, technologies, opportunities, and challenges. The scientific world journal, 2014.

Li, J., Lu, M., Dou, G., & Wang, S. (2017). Big data application framework and its feasibility analysis in the library. Information Discovery and Delivery, 45(4), 161–168. doi:10.1108/IDD-03-2017-0024

Li, S., Jiao, F., Zhang, Y., & Xu, X. (2019). Problems and changes in digital libraries in the age of big data from the perspective of user services. The Journal of Academic Librarianship, 45(1), 22-30.

Li, S., Jiao, F., Zhang, Y., & Xu, X. (2019). Problems and changes in digital libraries in the age of big data from the perspective of user services. The Journal of Academic Librarianship, 45(1), 22-30.

Manaseer, S., Alawneh, A. R., & Asoudi, D. (2019). Big data investment and knowledge integration in academic libraries. Journal of Information Studies & Technology (JIS&T), 2019(1), 3.

Manaseer, S., Alawneh, A. R., & Asoudi, D. (2019). Big data investment and knowledge integration in academic libraries. Journal of Information Studies & Technology (JIS&T), 2019(1), 3.

MIT Experimental Learning. (2016). (\\chenas03.cadmus.com\SmartEdit\WatchFolder\ XML_Signal_to_CCE_High_Speed_WF\ESA\IN\INPROCESS\27). The big deal with big data isn't (just) the data. MIT experimental learning in collaboration with GetSmarter. Retrieved from https://www.technologyreview.com/2016/08/11/158359/the-big-deal-withbig-data-isnt-just-the-data/.

Na, K., & Lee, J. (2018). Trends of South Korea's Informatization and Libraries' Role Based on Newspaper Big Data. The Journal of the Korea Contents Association, 18(9), 14-33.

Naeem, M., Jamal, T., Diaz-Martinez, J., Butt, S. A., Montesano, N., Tariq, M. I., ... & De-La-Hoz-Valdiris, E. (2022). Trends and future perspective challenges in big data. In Advances in intelligent data analysis and applications (pp. 309-325). Springer, Singapore.

Copyright to the author of some rights reserved This work is licensed under aCreative Commons Attribution-ShareAlike 4.0 International License.

Obasola, O. (2019). Big Data and the Emerging Role of Libraries. Department of Library, Archival and Information Studies, University of Ibadan, Nigeria

Olubiyi, T. O., Adeoye, O. O., Jubril, B., Adeyemi , O. S., & Eyanuku, J. P. (2023). Measuring Inequality in Sub-Saharan Africa Post-Pandemic: Correlation Results for Workplace Inequalities and Implication for Sustainable Development Goal ten. International Journal of Professional Business Review, 8(4),e01405. https://doi.org/10.26668/businessreview/2023.v8i4.1405

Olubiyi, O., Lawal, A. T., & Adeoye, O. O. (2022). Succession Planning and Family Business Continuity: Perspectives from Lagos State, Nigeria. Organization and Human Capital Development, 1(1), 40-52.

Olubiyi, T.O. (2020). Knowledge management practices and family business profitability: Evidence from Lagos State, Nigeria, Arabian Journal of Business and Management Review (Nigerian Chapter),6(1) 23-32.

Olubiyi, T. O., Egwakhe, A. J., & Egwuonwu, T. K. (2019). Managerial roles and competitive advantage: SMEs perspective from Lagos State, Nigeria. International Journal of Small Business and Entrepreneurship Research, 7(3), 1-14.

Owolabi, K. A., Adeleke, O. A., Tella, A., & Mudasiru, Y. A. (2021). A Structural Equation Modeling Approach to Evaluating Library Personnel Intention to Adopt Big Data Technology in Nigerian Academic Libraries. Internet Reference Services Quarterly, 25(4), 145-167.

ProQuest (2013) Data mining “Big Data”: A strategy for improving library discovery. Available at: http://www.proquest.com/blog/2013/241902501.html (accessed 15 November 2018).

Rawat, R., & Yadav, R. (2021). Big data: Big data analysis, issues and challenges and technologies. In IOP Conference Series: Materials Science and Engineering (Vol. 1022, No. 1, p. 012014). IOP Publishing.

Sharma, A. K. (2019). Knowledge management and a new generation of libraries information services: concepts. African Journal of Library and Information Science, ISSN, 001-007.

Tang, R., & Hu, Z. (2019). Providing research data management (RDM) services in libraries: preparedness, roles, challenges, and training for RDM practice. Data and Information Management, 3(2), 84-101.

Teets, M., & Goldner, M. (2013). Libraries’ role in curating and exposing big data. Future Internet, 5(3), 429-438.

Wang, G., Gunasekaran, A., Ngai, E.W., & Papadopoulos, T. (2016). Big data analytics in logistics and supply chain management: Certain investigations for research and

Copyright to the author of some rights reserved This work is licensed under aCreative Commons Attribution-ShareAlike 4.0 International License.

applications. International Journal of Production Economics, 176 (4), 98–110. doi:10.1016/j. ijpe.2016.03.014

Wang, X. Y. (2015). Analysis of and reflection on the application of big data in university libraries. Journal of Academic Library and Information Science, 33(1), 55-60.

Xiao-yan, W. A. N. G. (2015). Analysis of and reflection on the application of big data in university libraries. Journal of Academic Library and Information Science, (1), 12.

Ylipulli, J., & Luusua, A. (2019, June). Without libraries what have we? Public libraries as nodes for technological empowerment in the era of smart cities, AI and big data. In Proceedings of the 9th International Conference on Communities & Technologies-Transforming Communities (pp. 92-101).

Yuhong, X. I. E. (2018). Utilization and reconstruction of digital resources in university libraries in the perspective of Big Data—Based on the statistics of digital resources utilization in the Changbei University alliance library. Modern Information Technology, 6, 61.

Zhang, H. (2016). Analysis of the present situation of big data research in university libraries in China. Library Work and Study, 7, 46-50.

Zhong, Y., Chen, L., Dan, C., & Rezaeipanah, A. (2022). A systematic survey of data mining and big data analysis in the internet of things. The Journal of Supercomputing, 1-49.

APPENDIX 1

An open-ended survey on the usage of and difficulties in using big data in libraries at agricultural research institutes,

Hello, colleagues

This survey was designed to learn more about how you see the application, advantages, applicability, and drawbacks of big data in agricultural research libraries. Only research-related data will be gathered using the scale. You must thus be at ease and respond to each issue in an open and sincere manner. An introduction to Big Data will be provided. Before replying to the stuff, go over it and familiarise yourself with it. Your answer will be kept completely private, you can be sure of that.

Many thanks in advance.

Introduction to big data

A significant amount of organised and unstructured data that is so enormous that it is challenging to analyse using conventional database and software approaches is referred to as "big data," a wide phrase. These are very big data sets that may be computationally examined to find patterns, trends, and relationships, particularly those that relate to interactions and behaviour of people. Data sets that are so large

Copyright to the author of some rights reserved This work is licensed under aCreative Commons Attribution-ShareAlike 4.0 International License.

or intricate that standard data processing application software cannot manage them are referred to as big data. Cost-effective, unique methods of information processing are needed for better insight and decision-making due to the vast volume, velocity, and variety of information assets. A scalable architecture is required for efficient storage, processing, and analysis of this huge dataset because of its volume, velocity, and/or diversity of properties. Big data helps us to better understand our customers, hence it is hypothesised that big data and open source will have an effect on nearly every industry, including libraries. Additionally, it has been predicted that organisations (including libraries) who do not seize the opportunity presented by big data would fall behind their more data-savvy counterparts as they rise to higher heights. Nowadays, libraries, museums, and archives all contain big data. More and more academics are keen to analyse data and organise knowledge in creative ways using collections as a whole. As a consequence, many libraries have been involved in the big data sector for some time, although sometimes without realising it. The following are some reasons why big data is important, particularly for agricultural research libraries:

Big data has a direct influence on libraries since they may utilize big data techniques to evaluate their enormous data holdings to better understand their consumers and hence provide new or enhanced services.

Big data has an indirect impact on researchers in society as they increasingly rely on big data in their study.

Big data may also contribute to cost savings, automation, and faster and better judgments for research, administrative and economic reasons.

Analyzing large data is crucial and provides opportunities. Not just for libraries alone but for other functions in larger organisations. This brief introduction is to prepare you for the interview questions.

Interview Questions

What is your perception of 'Big data'?

Do you see any benefit from implementing big data in your library?

Do you believe that big data is pertinent or useful for libraries?

What are the expected advantages of big data, assuming your library starts using it?

What do you think about librarians in Kwara State, Nigeria, who work in agricultural research libraries knowing about big data?

What will you consider as challenges and hindrances should your library decide to start the application of big data?

We appreciate your willingness to take part in the study.

Copyright to the author of some rights reserved This work is licensed under aCreative Commons Attribution-ShareAlike 4.0 International License.