DIGITAL TOOLS FOR THE SUPPORT OF DIGITAL SCHOLARSHIP IN KASHIM IBRAHIM LIBRARY, AHMADU BELLO UNIVERSITY, ZARIA, NIGERIA.

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Abstract
This article assessed the digital tools available in the Information Communication Technology (ICT) division in Kashim Ibrahim Library (KIL), Ahmadu Bello University (ABU) that can help support digital scholarship. Two research questions were raised to guide the research; i) What are the digital tools available for the support of Digital Scholarship in KIL, ABU, Zaria, Nigeria? ii) What challenges are encountered by the librarians in the use of these digital tools for the support of digital scholarship in KIL, ABU, Zaria, Nigeria? Quantitative method was adopted using the descriptive survey research design. 27 librarians in the ICT division, served as the target population and questionnaire as instrument for data collection was administered. The analysis was done using descriptive statistics analysis; measures of frequency. The findings show that Institutional repository is the digital tool with the highest frequency and inadequate training on digital scholarship as the major challenge. It concludes and recommends that though there are some digital tools available, they are not adequate to fully support digital scholarship within the University community, therefore the University library Management should endeavor to make available the digital tools that are necessary for the support of digital scholarship by directly purchasing, upgrading or by giving the ICT unit, monetary allocations to handle accordingly and also encourage the librarians involved in digital services by funding both external and in house trainings on digital scholarship.

Keywords: **Digital Scholarship, Digital tools, Support, library**

Introduction
Digital Scholarship (DS), though an emerging trend, is gradually making impressions within the academic environment; both in the Sciences and Humanities. Adedokun, (2022) states that DS encapsulates emerging practices such as scholarly communication, open scholarship (Open access, open data, open educational resources), data science, metadata generation and digital rights management, among others. As a new phenomenon, it is noted to have made positive impacts on some aspects of research lifecycle; such as researchers' collaboration, which has led to the increase in such collaborations, expansion and increase in the use of large datasets and the skills traditionally associated with research to include facets such as bibliometrics in a digitally networked environment. (Borgman, 2010; Weller, 2011; Mackenzie & Martin, 2016; O'Brien (2017).

The digitally networked environment in this context is the University library and it is saddled with the mandate to use its resources and services to support all forms of teaching, learning and research. One of such areas to provide support for within the University library is Digital Scholarship. Adedokun (2022) sees Digital scholarship as a necessary vehicle to the

improvement and sustainability of digital contents that are made available by academics and for academic research through the use of digital tools and provision of digital services. This indicates that DS requires some digital tools for the benefit of students and faculty with research needs, who come to the library for collaboration, teaching and learning, thereby making the availability and use of digital tools expedient in a university library. Furthermore, the available digital tools need to be commensurate with the demands that come with digital scholarship (DS). Since DS is an emerging trend in the 21st century, and keeps unfolding, so also the digital tools need to be regularly ungraded to keep up with what unfolds within this context, in order for it to be a sustainable concept or initiative within the university library.

Statement of Problem

Digital tools are platforms used to help support digital scholarship activities. These digital tools have become paramount for the purpose of teaching, learning and research within the University library space, due to the increase in the growth of digital contents. Weller (2011) suggested that for the university library to meet the emerging research needs within the University, it has to incubate research, by supporting Digital scholarship(DS) to improve and transform the digital environment of academics or researchers by defining new forms of academics' professional practices linked to the changing cultural, social and working context of the digital age, by providing necessary skills, space, facilities/tools, services for digital scholarship's promotion, discussion and practical activities, particularly in the fields of data service, visualization and digital publishing.

The mandate of the University library is to basically serve the university community, by providing relevant information to answer their research quest, one of which is achieved by ensuring that there are relevant and interactive digital contents and services available. Supporting this assertion, Miller (2017) posited that DS can be library-centered, or developed in information technology (IT) or academic departments. When developed within the library, it is expected that the library would have the necessary digital tools for the support of digital scholarship. The University library is noted to be an 'incubator' for digital scholarship, and these incubators are expected to create innovative-virtual-shared spaces that supply learning, discovery at different scales, knowledge of key skills, tools, and strategies for digital scholarship which are not yet widespread within these libraries. (Educause, 2014; Koehl, 2019). Does this translate to inadequate tools in the libraries?

The growth of research and digital contents, calls for the University libraries to do more than institutional repositories (IRs) been the major digital tool in tertiary institutions libraries used for making institutional resources available and visible as stated by (Akintunde & Anjo, 2012; Umar, Musa & Abdulkadir, 2014). They should be able to provide digital scholarship tools and spaces, which will in turn help focus more on discussions and collaboration. Therefore, the researchers sought to identify the digital tools available for the support of digital scholarship in Kashim Ibrahim Library, Ahmadu Bello University (ABU), Zaria and identify the challenges encountered by the librarians in the use of these digital tools, so that digital scholarship is fully embraced and commensurate results attained.

Research Questions
The following research questions guides the research:
1. What are the digital tools available for the support of Digital Scholarship in Kashim Ibrahim library, ABU, Zaria, Nigeria?
2. What challenges are encountered by the librarians in the use of these digital tools for the support of digital scholarship in Kashim Ibrahim library, ABU, Zaria, Nigeria?

Literature Review
Digital Tools for Digital Scholarship

For Digital Scholarship to be achieved in an organization, especially in the case of a university library and for the benefit of scholars, the availability of some digital tools are inevitable. These digital tools are required to drive home the digital contents before it can be useful for research. This is explained by McCullough, (2014) that though the term digital scholarship is fluid and may offer many interpretations depending on a particular university's culture, institutional organization, environment, and the strategy, services and tools may not be the same, it is important to understand that some tools are needed to be available for the success and sustainability of digital scholarship. This means that part of the success and results obtained from digital scholarship is hinged on the digital tools that are available for use.

The place or value of digital tools is seen in the definition of digital scholarship by Miller (2017), who describes digital scholarship as the use of digital tools to create, analyze, and disseminate scholarly products. These tools make it possible to unfurl scrolls, move through building, zoom-in on details, overlay different states of an etching, track the build-up of a painting, animate structural forces, navigate 3-D objects, and so on (Gold, 2012). He further iterates that these digital tools are yielding new perspectives on the objects and themes of digital scholarship. Some of which are for; visualization, text analysis, 3D objects, bibliographic data analysis e.g., Zotero, Mendeley, deep encoding, web-based text analysis and quantitative and qualitative data analysis. The digital tools and services for digital scholarship may slightly differ in individual University libraries and also described in such manner by different authors. It is important to note that, most authors and University libraries, explain the digital tools and services alongside each other, and at times are used interchangeably.

For example, the New York University Libraries developed a four-tiered model of sustainable and scalable services through standardization employing reusable digital tools and platforms: (1) enterprise academic and administrative tools that include wikis, e-mail, and file storage; (2) standard research services, such as institutional repositories, data analysis tools, and Web exhibits; (3) enhanced research services, which are custom designed for the project; and (4) applied research and development (R&D)-grant funded services. The top five digital tools or methods used in research were (1) online texts or databases, (2) digital versions of archival material, (3) online indices or concordances, (4) text analysis, and (5) online media criticism. The above definition and opinion give and understanding that there cannot be any creation, analyzing, and dissemination of scholarly products without the help of digital tools. They are the medium/ conduit pipes through which librarians can provide the services required to achieve digital scholarship.

Pham, (2017) in his write up, summarizes some of the digital tools as follows: Academic blogs, Web Archives, Open-source web-publishing platforms (e.g., Islandora, Omeka), Collaborative mind-mapping tools (Coggle, Exobrain), social media Analytic tools and Computing Analytic tools (used for Natural Language Processing, Web Archiving & Social Media Analysis, Structured Data). According to Mitchem and Rice (2017), in their report on Appalachian University's digital scholarship center, five digital tools or methods were indicated to be used in teaching;
(1) video/audio production, (2) online text resources, (3) text analysis (4) data/ information visualization, and (5) online authoring tools (for example, blogs) or GIS (geographic information system) mapping. While the services are (1) digital imaging and reformatting; (2) preservation, data curation, and Web harvesting for the university; (3) text analysis; (4)

consultations on project management, preservation, curation, and project development; (5) workshops and training; (6) grant-writing assistance related to digital projects; (7) hosting speakers and workshops; (8) scholarly communications and intellectual property rights consultation and education; (9) electronic records management; (10) publishing. It suffices to say that these digital tools differ from one university library to another and also have different nomenclature as the case maybe. The important thing is that services are provided to satisfy the increasing research needs in relation to digital contents as situation demands.

Finally, Gold (2012), puts it in simple terms that digital tools convert the data or information, and help convey the knowledge the way a theory would, only that it is in a digital format and work a lot faster. These digital tools are used in the University library, to help get work done faster and assist the University community in research development.

Challenges

Digital scholarship comes with a lot of responsibility thereby putting so much pressure on the staff to meet up with the expectations of different scholars at different times since it is seen to be much more than just merely building high-tech incubators in our libraries, but to understand their intrinsic importance. Enough has not been done to demonstrate the exciting and important work being done on campuses in the area of dynamic and generative scholarship (Sinclair, 2014).

Digital tools require some level of digital competence by the librarians supporting digital scholarship, which makes it an area of concern. Cox (2016), explains that to communicate the shift in digital competencies in relation to DS can be challenging, especially as digital scholarship is a new field with many players whose activities on campus can be disjointed. Borgman (2007) in his study indicated that making massive amounts of scholarly output accessible via institutional or disciplinary repositories requires better tools for indexing, markup, and description at the time of input, and better retrieval mechanisms at the point of output, invariably there will be a need for librarians with digital competencies commensurate to the tasks at hand. Borgman (2007) further stated that Preservation and management of digital content are probably the most difficult challenges to be addressed in building an advanced information infrastructure for scholarly applications and relatively few disciplines have data repositories, and many of those are funded on fixed-term research contracts. Rarely are they established as permanent institutions on a par with libraries and archives, and charged with responsibility for the historical record. (Long-Lived Digital Data Collections, 2005; Lord & Macdonald 2003).

Considering it from the aspect of preservation and curation Brown, Keene, Bruce & Lynch (2016) states that curation is often confused with, and equated to, long-term preservation. Curation is not just the process of keeping data, but preparing them for re-use as appropriate, and defining and managing the life cycle. It was further stated that, there is still a serious problem with the creation and support of the infrastructure that will deal with genuinely long-term preservation, leading to a growing realization that it is likely not possible to curate all the data produced by the research sector and that both general and disciplinary level models need to be developed to identify which data need not be kept and which data has a limited life span in terms of its usefulness and can be deleted after a period of time. One of the key challenges for institutions in dealing with data curation is how to reasonably accommodate disciplinary differences.

Methodology

The research adopted a Quantitative methodology and utilized descriptive survey research design, which is favorable for generalization according to Osuala (2001). The instrument used for data collection was questionnaire, administered to 27 selected librarians (who work in the IT Division) who served as the target population within Kashim Ibrahim library, Ahmadu Bello University, Zaria. The data collected were analyzed using frequency count and percentages.

Findings and Discussion

Table 1: Response Rate

Instruments	Frequency	%Percentage
Questionnaire Administered	**27**	**100**
Questionnaire Returned	**27**	**100**
Questionnaire found usable	**23**	**85.16**

(Source: Field Data, 2022)

Table 1 depicts the response rate of the respondents in the area under study, Kashim Ibrahim Library, ABU, Zaria with 27(100%) Questionnaire administered. 23 (85.16%) copies of questionnaires out of 27(100%) were correctly filled and found usable, as some of the questionnaires had a number of unanswered questions.

Table 2: Available Digital Tools

Digital Tools	Frequency	%Percentage
Interactive Database	12	15.79
Institutional Repository	20	26.32
Data Repository	8	10.53
Data Visualization wall	4	5.26
Collaborative mind-mapping	4	5.26
3D Scanners	8	10.53
Dedicated Systems for Database	4	5.26
Geographic Information Systems	2	2.63
Web Archives	4	5.26
Open-Source Web Publishing	9	11.84
3D Printers	1	1.32
3D Cameras		
Others		

N=76

In table 2, the data collected from the respondents indicate the types of digital tools available for the support of Digital Scholarship in Kashim Ibrahim library, ABU, Zaria.

From the list of digital tools, the librarians were asked to select the digital tools available for the provision of digital scholarship. The respondents indicated that Institutional repository, Interactive database and open-source web publishing are available with a good response of 20(26.32%), 12(15.79%) and 9(11.84%) respectively. The researchers had to probe about the response to the data repository 8(10.53%) and 3D scanners 8(10.53%) to ensure the response was correct. It was discovered that some of the respondents ticked the 3D scanners since flatbed scanners were available for use in the library while they equated the IR to be the same as the data repository, while some others made the researchers understand that the data repository they have is more like an archive for internal use within the library and not for data sets from research outputs that will serve as a tool for digital scholarship. This is against the

submissions of Rumsey, (2011) and Mulligan (2016), that DS has factored in digital evidence, tools, method, digital authoring, digital publishing, digital curation and preservation and digital use and reuse of scholarship. This implies that data use and re-use cannot be achieved without a data repository to store large data sets. There were also low responses on Geographical information systems 2 (2.63%), 3D printers 1(1.32%) and 3D cameras with no responses indicated. This is not in agreement with the findings of Mitchem and Rice (2017) that digital tools for digital scholarship are for video/audio production, online text resources, text analysis, data/ information visualization, online authoring or GIS mapping and to create polished and media-rich services in order to share media content through streaming media platforms (Gold, 2012 and Vinopal & McCormick, 2013). The implications of these inadequate and lack of digital tools is that the librarians will not be able to provide any support in line with these digital tools in order to assist users of the library.

Table 3: Challenges to facilitation of Digital Scholarship

Challenges	Frequency	%Percentage
Poor understanding of Digital Scholarship as a concept	11	20.37
Inadequate digital tools	11	20.37
Inadequate Competencies	8	13.56
Inadequate trainings	13	24.07
Overstretched budget	6	11.11
All of the above	3	0.56
Other option: Non-Challant attitude of students	1	0.19
Other option: Inadequate plan for adequate IP services	1	0.19

N=54
(Source: Field Data, 2021)

The respondents indicated that inadequate training was the major challenge experienced, indicated by 13(24.07%). This is in conjunction with what Hoodless & Pinfield (2016) said that problems can be solved with appropriate training and skills development even if the problem is originating from unclear policies. This implies that when a new trend in technology emerges, one of the crucial things to tackle is the aspect of training and re-training, so that the librarians can be adequately competent for the challenges ahead. This is closely followed by respondents indicating poor understanding of the concept of digital scholarship 11(20.37%) and Inadequate digital tools, also indicated as 11(20.37%). Cox (2016) supports this assertion by explaining that a new shift can be a challenge, been that it is a new field with many players within the academics. The poor understanding of this digital scholarship does not come as a surprise, because it is still unfolding in many aspects and this is what happens when there is an emerging trend, it takes a lot of personal commitment to keep up with all the emerging trends in technology.1(0.19%) of the respondents were the least, and both were indicated under the option of "others". Of particular interest, is the option of all of the above, indicated by 3(0.56%), though not the major or the least challenge, it shows clearly that some of the respondents are of the opinion that all the listed challenges are experienced and are likely not exhaustive.

Findings of the Study

The summary of the findings are as follows:
1. The available digital tools for digital scholarship KIL, ABU, Zaria are as follows (in the order of highest to lowest frequency): Institutional repository, Interactive

database, open-source web publishing, Data repository and 3D scanners, Data-Visualization walls, Collaborative mind-mapping, dedicated systems for databases, and web archives, GIS, 3D Printers, No 3D cameras.

2. The major challenge encountered by the librarians is inadequate trainings, while other challenges worthy of note are inadequate digital tools and poor understanding of the concept of Digital scholarship.

Conclusion

The study concludes that KIL, ABU Zaria no doubt has some digital tools that can support digital scholarship; however, for the library to support digital scholarship as it keeps emerging, it is of paramount importance for there to be adequate digital tools like data repository, GIS, 3D Printers, and 3D cameras and so on. With the challenges encountered by the librarians, though not exhaustive, there is the need for the University libraries to address the issue so that the impact of these digital tools would bring about a robust result in digital scholarship activities within the University library.

Recommendations

The following recommendations were made:

1. The University library Management should endeavor to make available the digital tools that are necessary for the support of digital scholarship by directly purchasing, upgrading or giving the ICT unit, monetary allocations to handle it.
2. The University library Management should encourage the librarians involved in the use of digital tools for the support of digital scholarship, by funding both external and in house trainings that will help them better understand what digital scholarship entails and how to use the tools for better support.

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