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SUSTAINING DIGITAL COLLECTIONS: QUALITATIVE PERSPECTIVES FROM NIGERIAN UNIVERSITY LIBRARIES

By

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Abstract

This study explores the sustainability of digital collections in the Nigerian academic library context and recommends measures that consider best practices based on the qualitative perspectives of practising librarians. This study uses a multiple data-gathering method that included interviews and focus groups using a purposeful election procedure of 25 skilled librarians and ICT staff involved in the management of digital collections. Qualitative data was analysed via a thematic analysis method with the assistance of NVivo. The findings reveal the Nigerian librarians' practices of sustainability of digital collections based on six main sustainability constructs: access, user community, content, organisational, technological and cultural. This study extends the digital library sustainability model to encompass the SDC from an in-depth perspective of practising librarians and ICT personnel in a developing country facing numerous challenges in the acquisition, providing access and maintenance of digital collections.

Keywords: Sustainability, Digital collections, Digital library, Librarians, Nigeria

Introduction

Conventional librarianships are progressively replaced digitally whereby resources are transformed to an alphanumeric set-up by means of technologyand made accessible via networks. ICT in libraries has increased the cost of infrastructure that always affect the library budget, which is then passed onto users (Loach, Rowley &Griffiths, 2017). This cost poses challenges to sustainability (Baker, 2016). However, Khalid, Farid & Mahmood (2021) conclude that sustainable development in LISis relatively a new area, which needs further emphasis on policy and methodological developments. The main components of sustainability: economic, social, environmental (Chowdhury, 2014) and more recently

cultural (Loach & Rowley, 2022), are in need of further investigation with respect to resources and services.

Sustainability is the process of continued development and non-disruption of a particular event or action. It is an uncompromised determination to achieve a set of goals. Tsang & Gelfand (2016)opine that 'Sustainability is the ability to continue a defined behaviour indefinitely'. In the context of libraries, Chowdhury (2016) defines sustainable information as resources that facilitate the integration of all the three aspects of sustainable development: social, economic, and environmental.

Problem Statement

Nigeria as a developing nation is facing economic downturn; grappled with devaluation of its currency in the world market, inflation of essential commodities, digitisation of local contents, special collections, subscription to online databases and their sustainability (Samuel et al., 2018). Its university libraries have embraced digital collections alongside conventional resources and services to establish hybrid libraries. However, little is known on how digital collections (DC) are sustainability of digital collections is practised among the studied academic libraries with respect to economic, social, environmental and cultural. This research is conducted to fill the missing gaps. Three sampled university libraries from North-west Nigeria namely: Federal University Dutsin-Ma (Katsina State), Bayero University, Kano (Kano State), and Ahmadu Bello University, Zaria (Kaduna State), participated to provide insight into the practices of Nigerian academic libraries in sustaining their digital collections.

Research Objectives/ Question and Methodology

The goal of this paper is to provide an in-depth understanding of how SDC is practised in terms of economic, social, environmental, and cultural (ESEC) context in Nigerian university libraries with the intention of offering recommendations that may assist these efforts. The research question is how is sustainability of digital collections practised in Nigerian universities with respect to economic, social, environmental and cultural perspective?

Literature Review

Eschenfelder *et al.* (2016) investigated the concept of Sustainability and discoverd that the concept of sustainability was not considered as a prominent subject among the LIS scholars as the discourse focused on surface level. However, recent literature reviews (Kamińska, Opaliński and Wyciślik, 2022; Khalid, Farid & Mahmood, 2021) agree that the concept of sustainability, though relatively new in LIS, is now gaining worthwhile attention. Technological and digital advances are said to be prominent influences on SDC. Yakubu, Noorhidawati and Kiran (2022) reveal six criteria, namely: expertise, training, earmarked responsibilities, facilities, financing, and upkeep, for the sustainability of Nigerian universities' DC.

Equally, Oladokun and Kolawole (2018) examined the sustainability of Library Open Source Software (KOHA) and discovered that it is much recognised in Nigeria due to its consistency and community involvement even though it lacks institutional support. Similarly, the findings of Bangani and Dube (2023) show that South Africa academic libraries' societal involvement strategies can be harmonised into various subjects. In the context of libraries, Chowdhury (2016) defines sustainable information as resources that facilitate the integration of all the three aspects of sustainable development: social, economic, and environmental. Chowdhury (2016; 2014; 2013) details the environment, economic and social aspects of digital libraries and related services and stress that the objective of ecological sustenance is to ensure decrease in the environmental impact of digital information systems and technological facilities.

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Social SDC revolves around providing unbiased contact to digital information resources to create a learned and healthy society via ease of access and usage theories aimed at users' profile(Chowdhury, 2014). Liew & Chowdhury (2016) state that a collection is socially justifiable if proper measures are on ground to cater for everybody's need by giving them sense of belongingness. Impliedly, conversion of information resources and free admittance is a welcome development for the imbalance and relegation of local contents of certain members in a society (Seele, 2016). Chigbu, Njoku and Uzoagba (2016) reveal that some academic libraries in Nigeria have access to limited OA such as AGORA, HINARI, OARE, EBSCOhost databases and in terms of publishing, several librarians acknowledged gold and green itineraries but unconscious of diamond. Further, the study of Adam and Kiran (2019) show that out of 25 IRs membership with Directory of Open Access Repository (OpenDOAR) and Registry of Open Access Repositories (ROAR) in Nigeria, 16 were active partakers with theses and dissertations, journal articles, conference papers as chunk of information resources uploaded on the repositories.

Cultural sustainability has been acknowledged as the fourth component of sustainability (Hawkes, 2001). It concerns the zeal to persistently digitising heritage and providing access to them. Traditions disclose to humanity a sense of permanence, tracing one's background, and beliefs (Redweik *et al.*, 2017). Loach, Rowley, & Griffiths (2017) and Loach & Rowley (2022) argue that cultural sustainability be considered same as economic, social, and environmental while recent investigation resulted in a proposed conceptual framework for the relationship between internal organisations versus external cultural sustainability in libraries.

Cox (2016) proposes that librarians should be proactive to win intervention from benefactors so as to uphold lasting monetary SDC. Cloud computingas another technique used to sustain DC economically, is seen as an integrated system purposively created to give access to designated information packaging (Harris, 2014). Adegbilero-Iwa and Hamzat (2017) opine that cloud computing is premeditated to ameliorate ILS/LMS' shortcomings. Pionke (2016) posits that libraries should elaborate their horizon of sustainability agenda to integrate access of users with deformity, to tangible structure, instead of adopting one dimension tactics for all categories. Relatedly, in the social justice of archival collections, Punzalan and Caswell (2016) stated that human beings have equal and incalculable values that are eligible to collective principles of sovereignty, fairness and adoration. Missingham (2021) appraise Australian library resources and services from the parameter on concept of adjustment and unravel the worth of libraries beyond the scope of institution.

Method

The study obtained consent and approval letters from the Universiti Malaya (UM) and three university libraries prior to the interview sessions. The participants were selected by means of these standards: (i) university librarians who man the libraries, (ii) digital librarians in charge of digital library department/unit, and (iii) ICT and other personnel in digital library section (DLS) who are knowledgeable in the practices of SDC with credible work experiences. The interviews were twofold, face-to-face with four primary participants and seven focus group (FG) participants from each university library (n=21). Each session ranged between 45-60 minutes, the interactive sessions were voice-taped and transcribed verbatim for analyses. After each interview and transcription, the researcher returned the transcripts to each participant for re-evaluation vis-à-vis their verbatim statements for verification.

Thematic analysis (TA) was conducted using NVivo. Sub-themes were generated by transcribing, coding, condensing, interpreting, and presenting the findings in an explicit manner. Figure 1 depicts the outline of the ethical consideration protocol. These comprise

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consent letters, approval letters from UM's Board of Ethics, and use of informed consent

forms for confidentiality and privacy protection.



Figure 1: Ethical consideration protocols

A total of 25 participants from three university libraries partook in the interviews.

Both participants and institutions were coded for confidentiality, privacy, and anonymity.

Table 2 presents a brief overview of the participants.

Table 2: 1	Demographic	attributes of	the	participants
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Rank	Qualifications		
University Librarian	INT1A (PhD); INT3B (PhD); INT4C (PhD)		
Digital Content Librarian	INT2A (M)		
Digital Librarian	FG1A (M)		
Technical Librarian (FDL)	FG2A (M)		
Senior Library Officer	FG3A (M)		
Higher Library Officer	FG4A (B); FG5A (B); FG6A (B)		
Senior Library Assistant	FG7A (D)		
H.O.D Automation	FG1B (B)		
System analyst	FG2B (M)		
Digital Librarian	FG3B (B)		
Multimedia Librarian	FG4B (B)		
System Analyst	FG5B (B); FG6B (B); FG7B (B)		
Librarian I	FG1C (PhD); FG2C (M)		
Librarian II	FG3C (B) ; FG4C (M)		
Senior Library Officer	FG5C (M)		
Assistant Operations Manager	FG6C (B); FG7C (B)		

PhD: Doctor of Philosophy; M: Master's Degree; B: Bachelor's degree; D: Diploma. A, B and C represent the universities.

INT = *Interview session*

FG = Focus group session

Results and Discussion

The thematic analysis resulted in identifying six main themes as parameters of DC sustainability. Each of the six parameters are discussed in the following section with evidences from the participants' narrations.

Access sustainability

A key factor in ensuring continued access is funding. When enquired on source of funding SDC, the participants confirmed that: "*DCs are funded by the Federal Government* (*subvention*) and *TETFund interventions*. We are also getting intervention from NGOs and philanthropists for sustaining DCs" (INT1A, INT3B, and INT4C). Federal Government of Nigeria establishes TETFund and saddles it with the tasks of supervising the activities and monetary obligations of Nigerian higher education. It is evident that the studied academic libraries are yet to strategise any other sources of fund aside what they receive from the aforementioned. These corroborate with the studies of Godwin, 2017; Irenoa, Emilian and Eru, 2019, who suggest an alternative funding models for SDC and academic libraries.

Registration fees are another avenue for funding. Users, especially the students, have access to digital collections via login after the payment of registration fees in which library and ICT fees are included:

On how DC is sustained with respect to subscription, the participants indicate that they dwell into library consortium. Investigation also shows that these libraries rely heavily on OA and OSS. This study is in consonant with the findings of Jurchen, 2020 and Chigbu, Njoku & Uzoagba (2016) on the types of OA as well as Bangani and Dube, 2023; Awamleh and Hamad, 2021)on collaboration.

User Community Sustainability

User community sustainability refers to how impartial access to DC can be sustained for library patrons. In terms of how users access DC, there are divergent opinions as some partakers testify to providing fair access viaregistering (authorisation) plus giving login details (authentication): "Studentsusually go to the management information system (MIS) workplace, enrol and receive wireless password" (FG3C).

Participants express that there are digital platforms created in which users can access DC from their devices: *"The software connected are mobile responsive that accommodate any device you use to access our repositories"* (INT2A). FG6A, FG4C, FG7B, FG6C, and FG7C confirmed the use of digital platforms such as Facebook, Skype, visits, Twitter, blogs, and emailaddresses of staff and students.

On the types of training, the participants confirm that staff are undergoing series of trainings to address user's needs. INT1A stipulated that the staff are allowed to go for development. INT2B categorises the up-skill into in-house, workshop, train-the-trainee, and conferences:.

The participants stressed that majority of the prescribed databases come with in-built software that spontaneously records, creates, and tracks number of visits in terms of contacts, transfers or copies. "An elementin KOHA known as query and exhibit can give you everything". "How many users consult a particular title, time of use" (FG4A, FG5A). According to participants, subscribers such as EBSCOHOST and Science-Direct often tell them that their usage is below expectations. This finding coincides with Oladokun and Kolawole (2018) that KOHA, Ubuntu are recognised and utilised by Nigerian academic libraries.

Content sustainability

Enquired on the types of DC, institutions A and C disclosed that they had established institutional repositories (IR) in which contents from scholars based on permission, undergraduate and postgraduate write-ups are digitised and uploaded into their homepage: *"Write-ups by scholars like undergraduate and higher degrees work are deposited on IRs"* (INT2A); *"We have before and after-copy publications, seminarreports, e-resources, hard* *disk, occasions, discourses, natives, scarce and special collections in our repositories*" (FG7B, FG4B). This coincides with the studies of Adam &Kiran (2019) on IRs.

Enquired on what measures taken in order not to infringe oncopyright law, FG1C, FG6B and FG3C states that: *"We normally uploadthe research work of PG students in our DSPACE networks." "We do not breach copyright law"* Based on the participants' responses, accessibility to majority of the digital information resources is restricted to the institution. One of the interviewees highlighted that information resources are usually stored, retrieved from the portal and read by means of LAN to avoid trespassing on copyright's law. The findings of Adu& Van der Walt(2021) support this result that there should be awareness and understanding to avoid violation of copyright law.

Participants reveal that the SDC written policy to guide the execution of its tasks has not been endorsed by the constituted authority, whereasinitiation of digital library/collection was on the directive of tertiary education monitoring agent: "*There is a written statement awaiting the approval of the university management*" (INT1A). INT3B and INT4C respectively confirmed these results. It shows that two out of the three studied have designed a statement.Interestingly, the findings of Rafiq, Rafiq&Arif (2023) and Khalid, Farid&Mahmood (2021) tally with this investigation on the lack of SDC policy while Adam and Kiran (2019) recommend execution of policy statements.

Organisational sustainability

Queried on how DC are preserved, the participants avowthat hardware and software are storedlocally for long term usage. INT2A reveals: "Hard discs are cautiously preserved in a file, we have anti-virus to ensure that our audio, video, and other materials are not corrupted". As for techniques of local storage adopted, FG6B discloses: "We have servers.... We upgrade them to the latest technology by transferring from one server to another like backups". FG7C and FG1C elaborated on how the system is maintained through backups in case there is failure in one, they can fall back on the other while DCare preserved on CD ROM, microfilm and microfiche. According to partakers, another step is to preserve DCdistantly by keeping the networks elsewhere, known as reservoir or image: *"We have software packages like Linux, windows operating systems and Ubuntu. "We reserve idle servers in case of attack or vulnerability. The servers interconnect daily to avoid being crashed"* (FG7A).According to FG7B, Ubuntu works for hours, free of virus threats, very strong and reliable compared to window operating systemsexcept when there is a power failure (FG2C, FG6C).

Participants demonstrated how the systems are maintained. "Air-blower is used for dusting and blowing the accumulated sulphur from the motherboard; there is a maintenance service on regular basis" (FG6C); "We make sure the environment is conducive, repairing and dusting of the hardware, providing standing air-conditions' (INT1A). This is a practical experience which Beutelspacher&Meschede (2020) stress that SDC required concerted efforts.

Technological sustainability

The sustainability of hardware and software components involves upgrades and updates, power supply and adequate digital facilities.Enquired on tactics deployed in sustaining the technology, participants attest that: *"Hardware components, networks, laptops and desktops are upgraded either annually, once in every two or three years, subject to its form"* (INT2B).On the same note, INT1A states that: *"DSPACE is the software used for locally generated digital contents"*.This finding is congruent with Oladokun&Kolawole (2018) concerning software used in Nigerian academic libraries.

Participants posit that another technique adopted in technological wherewithal is to procure modifiable computers to lessen the adverse effects of carbon monoxide, lead and sulphur: "Our systems are not producing smoke, hence they are new computers using x-ray

and beta-ray" (FG3A); "We do not have the equipment to quantify the extent of smoke, which is the reason for making our buildings well ventilated as well as buying an environmentally friendly system" (FG5A).

A respondent reveals that their institution is working towards greening because their generators are replaced by solar energy: "We use solar in replacement of generators that produce smoke" (FG1A); "As long as there is a cooling system, carbon monoxide will be reduced and moreover, nowadays systems do not consume much power like before" (INT3B). The above verbatim statements depict that studied libraries are working towards greening via replacement of its generator with solar energy. This concurs to the findings of Awamleh&Hamad, 2021; Beutelspacher&Meschede, 2020, on the need for digital preservation.

The participants were queried on whether they have the knowledge ofcloud computing. They avow: "*Cloud computing is a preservative measure for DC to prevent loss or damage*" (FG1A); "*We subscribe to cloud computing*" (FG3A).Participants FG3B and FG5C mentioned cloud computing, Facebook, Twitter, mail, blogs, Google drives, and the use of social networks as part of sustaining DC.This study is in conformity with Fedorowicz-Kruszewska (2021)who was canvassing for green technology in academic libraries.

Cultural sustainability

To determine how cultural heritage is digitised and sustained, the participants were queried on measures taken to digitise cultural heritage and make them accessible. The participants disclose: *"We take photographs of cultural artefacts viaalphanumeric tools, store as pictures and create a link"* (INT2B). Based on the participants, these include music, drama, and still pictures of prominent leaders of the nation, strategic locations, and institution'sevents, and preserve them as archival collections (INT3B). *"ArewaHouseis*"

responsible for digitisation of cultural heritage but still under the supervision of the library" (INT4C).

University C has its cultural heritage housed elsewhere: "Arewa Houseis in charge of ancientmonuments and research outputs of the institution for accessibility. There are archival materials of Hausa culture, structures, tie and dye, Arabic essays, etc., like galleries, entice travellers from different part of the world"(INT4C).



Figure 2: A summary of sustainability of digital collection in Nigerian University Libraries.

Enquired on how they handle sensitive information, partakers disclose that they are aware of their different origins, customs and ethics and therefore, censor some sites, essays and displays for fear of jeopardising the peaceful co-existence in the society: "*Anything that is against the ethics of the society is expunged or restricted, for instance, nude locations*" (INT2A); "There is an application we install called cyber lock that blocks some sites" (FG6A).

Based on responses, the studied libraries' digital contents pass series of evaluation prior to distribution onto portals to avoid going against the ethics of society. The above findings corroborate with Loach and Rowley (2022);Loach, Rowley& Griffiths (2017) on cultural SDC. Figure 2 below illustrates the overall practices revealed in this study.Figure 2: A summary of sustainability of digital collection in Nigerian University Libraries.

Recommendations

The following recommendations are made, based on findings of the study:

1. Adequate plan and strategic policy should be on ground for any capital intensive project in Nigerian academic libraries.

2. Alternative business models should be designed to generate revenue via bindery and reprographic services, organising conferences, workshop, fund raising, sale of publications, etc.

3. Collaboration should be given top priority with regards to subscription.

4. There should be sufficient bandwidth for sharing of networks to different locations.

5. There is need for provision of abundant hardware computers and their accessories, uninterruptible power supply (UPS), cable wire, fibre optics, Ethernet, 24/7 power supply, combustible engine; solar energy, grid and panel; inverter, sine-wave, modern scanners, printers, photocopiers, digital cameras, cryptographic and other facilities required for SDC.

6. There is need for constant training of staff and users to keep them abreast of the latest technology and innovation.

7. The studied university libraries should lend a leaf from developed nations and test-run for five years to measure its usefulness and possible onward adaptation. There should be constant appraising of the library resources and services for upward review

Conclusion

This study demonstrated the scenarios of SDC in Nigerian university libraries hitherto unknown to the immediate and global community as per the degree of its practicability. It established practices of access, user community, content, organisational, technological, and cultural SDC in selected Nigerian university libraries. These discoveries can be useful for other universities in the country, with similar circumstances in various contexts. The study focused mainly on public university libraries, while private and state university libraries were not considered, thus limiting the generalisability of these findings to such context. Further studies should include public, state and private librarians' perspectives to increase the comprehensiveness of the proposed SDC model.Figure 2 illustrates the overall practices revealed in this study.

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