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EMERGING TOOLS IN ACADEMIC LIBRARIES AND THEIR IMPACT ON KNOWLEDGE MANAGEMENT

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ABSTRACT

Advancement in new technologies in academic libraries are really impacting the daily routines of the academic libraries worldwide; with the emerging tools like Web 3.0, electronic mail, web page design, wiki, blog and the use of internet resources at the forefront. Many academic libraries in Nigeria are beginning to experience the impact of these tools as they enhance and promote effective and efficient knowledge management in libraries. This is made possible by integrating the services of these tools into their web presence, library instruction programs, reference services, etc. The implementation of these services has great implications for how libraries now and in the future will stay relevant in the information society. This study therefore examines the emerging tools in academic libraries and their impact in knowledge management. It explores the concepts of emerging tools, academic libraries and knowledge management. It also looks at the emerging tools in academic libraries, the role of emerging tools in knowledge management and the impact of emerging tools in knowledge management. It goes on to conclude by presenting a framework of the emerging tools and how they impact knowledge management in academic

libraries, thus calling on the parent institutions of the academic libraries to provide adequate funds to enhance the availability, sustainability, and effective functionality of these tools, and also to train and retrain their staff and users to be responsive and responsible so as to promote the effective use of these emerging tools in their libraries.

Keywords: Web 3.0, electronic mail, Blog, Information Management, Knowledge capturing, Knowledge Management

1. Introduction

Libraries, from the inception existed to acquire information resources, organize, process, store and disseminate them to potential users, and the traditional domain of librarians and libraries has always been associated with printed word. The great services of the library were solely performed manually by its staff. The imperatives of library and information services then had always been on the delivery of library held information resources to the clients. But the story has changed as today's library experience tremendous change. There is a gradual and/or an obvious movement from the traditional process of information services provision to modern approaches. This paradigm shift from the traditional libraries with site specific collection to virtual or digital libraries where information and knowledge sources have no geographical boundaries seems to expand the services of library and information profession in various organizations (Okoro and Ekere, 2008).According to Onwubiko (2006), the printed word and the provision of their information to the clientele are at the crossroad due to the emergence of the hi-tech information systems and the challenges they pose to meek and apologetic traditional orientation of librarianship. Numerous technologies especially the computer has brought about changes in the library services delivery. Several systems have been developed for their various house-keeping routines such as acquisition, organization, serial control, circulation control, bibliographic control, or selective dissemination of information (SDI) (Ogunsola, 2004).

Omekwu (2002) opined that the concepts of virtual libraries and digital libraries, paperless systems, electronic books (e-book), CD ROMsand information communication technology" are all suggesting to libraries and librarians that it can no longer be the era of meek and apologetic librarians rather the era of "aggressive and active librarianship. It is pertinent to note that the unprecedented change introduced by ICT and related tools in library and information services has really impacted and helped librarians in knowledge management. Since they are more concerned with managing

explicit knowledge, that is recorded information (codified knowledge) in publications, documents technical reports, audio visual materials, theses, dissertations and electronic information sources. Knowledge is a very important resource in any institution whether it is academic, research, business or industrial organization. Effective knowledge management is the key to institutional or organizational growth. To achieve this, the application of the new innovative technologies is very essential in order to meet up with the information needs of the clientele.

2. Concept of Emerging Tools

Emerging tools refers, in this context, to innovative technologies that come into existence to enhance effectiveness and efficiency in the Information Science sector. Today, the world is witnessing the emergence of the Internet as the largest repository of information and knowledge, changed role of library and information science professionals from intermediary to facilitator, new tools for dissemination of information and shift from physical to virtual services environment and extinction of some conventional information services and emergence of new and innovative web based technology (Krubu and Osawaru, 2011).This has been the global trends in both the concept and practice of information acquisition, storage and dissemination. Significantly, new tools are emerging to shape library operations and services. Some prominent emerging toolswhich are to be considered in this work are:Web 3.0, electronic mail, web page design, wiki, blog and the use of internet resources.

3. Concept of Academic Libraries and Knowledge Management (KM)

KM is a process encompassing knowledge creation, knowledge acquisition, knowledge packaging and application or re-use. It is an emerging field, much tooted or hyped since late 1990s. According to Srinivasan as cited in **Raja**, **Ahmad** & **Sinha** (2009), *knowledge management refers to a collection of process, technologies and principles that serve to promote a learning environment supportive of the search community goal.* It is also the process of capturing value, knowledge and understanding of corporate information using Information Technology tools in order to maintain and re-use that knowledge. Knowledge management simply has to do with the processes of converting data to information, information to knowledge and knowledge to wisdom. The chart below shows the concept of KM:

Data ⟶ Information ⟶ Knowledge ⟶ Wisdom

For knowledge to be transferred to wisdom it will involve systematic process of finding, selecting, organizing, distilling and presenting

information in a way that improves the users' comprehension. This justifies **Raja**, **Ahmad** & **Sinha** (2009) claims that knowledge management is the systematic, explicit and deliberate building renewal and application of knowledge related effectiveness and returns from its knowledge assets. Similarly,KM is the way to keep the product of human experience (knowledge) growing through sharing and adequate dissemination to promote use.

Libraries are the backbone of information dissemination. Their main aim is to provide the right information to the right user at the right time. Thus, librarians become essential in the development of processes and policies that harness an organization's knowledge base. Librarians act as keepers and disseminators of information within organizations and make substantial contributions to the successful implementation of KM. Academic libraries are information reservoir established to support the mission of their parent institutions to generate knowledge, acquire, process, organize, store and disseminate information. They as well keep people equipped with knowledge in order to serve the society and advance the intellectual well-being of mankind. In the digital age, academic libraries play extra role than just the conventional role of library and information professionals which was restricted to collecting, processing, disseminating, storing and utilizing information to provide multidisciplinary services to the personal and professional needs of the library users. They now play a major role in KM programmes which involve identifying, acquiring, developing, resolving, storing and sharing of knowledge. Implementation of KM in academic libraries goes a long way to promote their traditional functions which include acquisition, cataloguing, classification, abstracting and indexing. So important is this that faculty and students purchase and build their own portals to meet their academic and research needs. Suffice it to say that the implementation of KM in academic libraries is mostly driven by its mission than by the competition from Internet-based reference services or electronic books. This implies that KM has been inculcated into the mission of every academic library and they are no longer restricted to mere information management.

KM has created new grounds in the field of library and information science. Librarians are now expected to have knowledge about information resources in the library, where they are stored, their usage, and also have knowledge about their users who are using these sources and how to increase its uses. Additionally, librarians are expected to manage relationships and negotiate with external providers of information and knowledge.

In particular, for academic libraries to function well in KM, librarians must be creative and have ability to learn and adapt new technologies to provide better services to their clients and ability to create, share, harness and utilize knowledge. Additionally, librarians in academic libraries should have understanding of knowledge creation process and impact of knowledge, information literacy skills and understanding of the principles of Organization of Knowledge. The traditional tools that existed in libraries may not really help here, hence the emerging tools which are designed with special features that can make libraries to function well in KM.

4. Emerging Tools in Academic Libraries

Libraries are undergoing significant changes as technology evolvesin information services delivery. Libraries are experiencing a paradigm shift from traditional library to digital, virtual and electronic library. Numerous technologies have brought great changes in library services delivery. Several tools have been developed for their various house-keeping routines. This include technologies that are designed to handle any of the library processes like acquisitions, cataloguing, serials control, circulation control, bibliographic control, or selective Dissemination of Information (SDI) (Ogunsola, 2004). The trend is largely moderated by information and communication technology (ICT). The new tools of library practice are basically digital. These tools have introduced unprecedented change in library and information service in the generation and transmission of data for research, information, recreation and education, and have indeed given a new impetus and promise for librarians and other information providers. The concepts of virtual libraries, digital libraries, paperless systems, electronic books (e-books), CD ROMS and information communication technology are symptomatic of new best practices in the library.

Significantly, some tools have emerged with distinct features capable of making academic libraries function well in the aspect of KM. These tools includeelectronic mail, web page design, wiki, blog and the use of internet resources, with Web 3.0 at the forefront. These tools have gone a long way to enhance the process of identifying, acquiring, developing, resolving, storing and sharing of knowledge in academic libraries. In this era where students and other users of the academic library expect and are becoming more dependent on web-based information resources, the academic libraries are expected to exploit the importance of these tools to manage knowledge. This includes getting to share knowledge with their users in a format and through the media they love so much.It also involves creating, acquiring, developing, storing and sharing information with these tools.

Students get the chance of interacting online, sending their queries and getting replies online via e-mails, wiki or the library blog. These tools, specifically Web 3.0, is used to facilitate a more socially connected Web where everyone is able to communicate, participate, collaborate, add to or edit content (Anderson, 2007; Pachler & Daly, 2009). This technology allows its users to go beyond the static web page structures to more interactive co-created platforms which enhance knowledge sharing.

4.1 Web 3.0

Web 3.0 is an upgrade of Web 2.0. Its affordances surpass that of Web 2.0 which was so famous in the past few years. Web 2.0 refers to a perceived second generation of community-driven Web services such as social networking sites, blogs and wikis, among others, which facilitate a more socially connected Web where everyone is able to communicate, participate, collaborate, add to or edit content (Anderson, 2007 and Pachler & Daly, 2009). In a work entitled Wikis, blogs and Web 2.0 carried out by the University of Melbourne copy right office, Web 2.0 is seen as a variety of web sites and applications that allow people to create and share online information or material they have created. With this technology, the user does not require any web design or publishing skills to use it. Thus, making it easy for people to create and publish or share their works to the world. In addition, it is a viable means of disseminating information to either a selected group of people or to a wider audience. Now, Web 2.0 is probably on its way out the door. It was very good at making users to be able to share information quickly with others, which has been developed into the phenomenon that we call social media but the focus was just on the users' interaction with others while Web 3.0 focuses more on the users themselves.

Web 3.0 is a phrase coined by John Markoff of the New York Times in 2006. It refers to a supposed third generation of Internet-based services that collectively comprise what might be called 'the intelligent Web' — such as those using semantic web, microformats, natural language search, data-mining, machine learning, recommendation agents, and artificial intelligence technologies — which emphasize machine-facilitated understanding of information in order to provide a more productive and intuitive user experience (Lifeboat, 2016). Web 3.0 is being referred to by experts as the semantic web. 'Semantic' meaning that, it is data driven. The data will come from the user and the web will essentially adjust to meet the needs of the user (1stwebdesigner,2017). For example, if you do a lot of searching in a particular area, you'll receive more advertisements related to

that area. A most outstanding benefit of Web 3.0 is the move towards being able to access data from anywhere. Heavy usage of smart phones and cloud applications are considered the main forces behind this. The whole intension of Web 3.0 is to make sure that the user can access as much data as possible from anywhere, not just their home. This technological expansion will allow TV's to pick up on user data, and allow smart phones to access data on your computer.

Gichora and Kwanya (2014) asserted that Web 2.0 can play a key role in facilitating effective information sharing, collaboration, and communication among library users, librarians and users in academic environments. This denotes that with the better features of Web 3.0, it can play a more efficient role in knowledge management. The affordances of Web 3.0 holds great benefits for libraries and their users as their main functions centers around information utilization.

4.2 The Electronic Mail (e-mail)

Electronic mailis a medium that is used with internet facilities to send and receive mails. It is popularly known as e-mail. It can also be seen as one of the social media through which individuals, organizations and institutions send and receive messages via internet resources. It is usually used to exchange messages and data files in which each user is assigned an electronic mailbox. An electronic mail system can deliver copies of a message to all individuals listed in a certain file. Electronic mail (e-mail) is one among the emerging tools and its integration into library and information service holds great benefits. It is obvious that libraries are definitely going to be irrelevant if they refuse to exploit the wonderful potentials of the hi-tech information super-highway systems. According to Abidoye, Aderele and Adelokun (2011), the uses and potentials of e-mail in libraries are both internal and external communication. He further added that e-mail can be used to activate and sustain a discussion list service, a Usenet News Group, and to connect the internet; explaining that it is probably the most sought after and used facility of any electronic network.

AudLamvik (2009) gave a testimony of the impact of use of e-mail in a Technical University Library of Norway (NTUB). He clearly stated that electronic mail systems are used for the following in the library:

i. Ordering photocopies and loans from our library.
ii. Downloading and disseminating online search results to clients.
iii. Handling various information requests from users.
iv. Distributing newsletters (electronically).
v. Sending manuscripts and information to groups of users.

vi. Accessing library catalogues and databases all over the world

With the above uses, its popularity and ease of use, the email has highly impacted knowledge management.

4.3 Web page Design and Use of Internet Resources

Theuse of Information and Communication Technology (ICT) as an emerging tool in the provision of library and information services involves the World Wide Web (WWW). This, according to Onwubiko (2006), enables the information browser to see documents in richly formatted text and pictures. The web is obviously a popular medium for sharing information globally. The information seeker will easily browse or surf a large amount of information by just clicking the mouse. Debbie (1997) postulated that the World Wide Web is the universe of network accessible information, an embodiment of human knowledge. With this technology, human knowledge is easily accessible and available to everyone irrespective of geographical location.

A web page (or webpage) is a web document that is suitable for the World Wide Web and the web browser. A web browser displays this web page on a monitor or mobile device. Web browsers coordinate the various web resource elements for the written web page, such as style sheets, scripts and images, to present the web page. Typical web pages provide hypertext that includes a navigation bar or a sidebar menu to other web pages via hyperlinks, often referred to as links. On a network, a web browser can retrieve a web page from a remote web server. On a higher level, the web server may restrict access to only a private network such as a corporate intranet or it provides access to the World Wide Web. On a lower level, the web browser uses the Hypertext Transfer Protocol (HTTP) to make such requests. A web browser can have a Graphical User Interface, like Internet Explorer, Mozilla Firefox, Chrome and Opera, or can be text-based, like Lynx or Links (Wikipedia). Perry (2000) particularly pointed out that all categories of information seekers should be directed to the most prominent search engines like *http://google.com/*or*www.google.com*, *http://www.altavista.com/*, *http://directhit.com/*and so on. He further stated that it is worthwhile to compare search engines so as to have a thorough knowledge and awareness of their capabilities.

Browsing, however, is normal in the World Wide Web (WWW) but there is great need for the understanding of the language of the Internet. Internet language for now, according to Onu (2004) is the Hyper Text Markup Language (HTML). She further explained that information is transported to the user's system using a transport protocol called the Hyper Text Transport

Protocol (Http), and the information is displayed on the computer using a normal browser like Netscape Navigator or Internet Explorer. Most libraries, just like business market of the world and other organizations, necessarily have to develop their own website. Websites are designed in HTML. On websites, as Onwubiko (2006) stated, multimedia presentation of organizations – including human and material resources can be made, usually with feedback mechanisms. In this context, the libraries will reach out to their users with similar information needs online, striving over other information service provider to gain their clients confidence and remain relevance. Every library that wishes to gain effective passage to www is expected to develop its respective intranet.

Library and information professionals in the era are to view themselves as librarian and information providers on the web if they must remain relevant. It then becomes imperative for librarians to understand their main tool which is the digital instrument. Some of the resources that have become normal tools of practice today include databases, CD-ROMs, CD-RWs and floppy diskettes (Onwubiko, 2006). Libraries also host their database which is a collection of data on particular disciplines which can be accessed both online and offline. The library's databases hold variety of information like: periodical literatures, bibliographic database, index of articles; government documents, theses, dissertations, projects and books. In some libraries, access to their contents pages and full text access of articles is based on subscription. Users are required to subscribe with fees to access the contents of the database. This innovation where users can stay at the confines of their home to know the resources of a library or better make demands for information resources through their feedback mechanisms is very attractive and gaining users' interest. This took Onwubiko (2006) to the conclusion that "as long as the on-line and off-line, World Wide Web, and the Internet continue to exist, there is every tendency that the manual processes of the provision of library and information services to clientele will fizzle out before the end of the 21st century. Hence, the dire need for libraries to explore the benefits of this famous tool and get on board with the provision of excellent library services.

4.4 Wiki

A wiki is a collaborative website that anyone within the community of users can contribute to or edit. It is a website which allows collaborative modification of its content and structure directly from the web browser. A wiki can be open to a global audience or can be restricted to a select network or community. Wikis can cover a specific topic or subject area. They also make it easy to search or browse for information. It is run using

wiki software also known as a wiki engine. There are dozens of different wiki engines in use, both standalone and part of other software, such as bug tracking systems. Some wiki engines are open source, whereas others are proprietary. Some permit control over different functions (levels of access); for example, editing rights may permit changing, adding or removing material. Others may permit access without enforcing access control. Other rules may also be imposed to organize content. A wiki engine is a type of content management system, but it differs from most other such systems, including blog software, in that the content is created without any defined owner or leader, and wikis have little implicit structure, allowing structure to emerge according to the needs of the users. Although primarily wikis are involved with text, they can also include images, sound recordings & films. Wikipedia http://en.wikipedia.org the free internet encyclopedia is the most well-known wiki that supports particularly students and faculty research, especially in technical area.Academic libraries can take advantage of this collaborative websites (wiki) to perform better in knowledge management.

4.5 Blogs

A blog is a contraction of the words *web log*. Blogs usually provide commentary or information on a particular issue, event or topic. In some cases, blogs can be about a particular person's online public personal diary. It is usually maintained by a single person or a small group of contributors. Blogs allow collegial interaction and feedback from interested visitors who read posts, comments or responses on entries made by other users. Blogs are primarily text but can also be the form of photos or other images, sounds, or films. This inturn enhances effective dissemination of information by the academic library (Udofia, 2008). Some popular blogs include viviangist.com, lindaikejablog.com.

5. Impacts of Emerging Tools on Knowledge Management (KM)

The emerging tools in academic libraries play fast roles in KM. They emerge mainly to make KM easy for libraries. Being that KM entails the process that encompasses knowledge creation, knowledge acquisition, knowledge packaging and application or reuse, the emerging tools which are digital tools are very useful. They are supper tools for information creation, acquisition and sharing. These tools are very effective in the process of capturing value, knowledge and understanding of corporate information in order to maintain and re-use that knowledge. They help to transform the library into a more efficient knowledge sharing organization

Jantz (2001). One of the major objectives of KM which Kim (1999) pointed out was that knowledge management practices aim to draw out the tacit knowledge people have. The emerging tools are the best tools to draw out this knowledge and harvest the tacit and explicit knowledge from the library to the advantage of faculty and students researches. These tools function in knowledge creation, knowledge capturing and knowledge sharing.

i. ***Knowledge Creation***: The emerging tools help in knowledge creation. The key objective of academic libraries is to provide information resources and information services to support the university community and the core resource that is required is knowledge. The tools will make it possible for the knowledge of the library's operation, library users and their needs, the library collections, and of library facilities and technologies available to be put together so that new knowledge is created. Knowledge creation is actually the outcome of an interactive process that will involve a number of individuals in a library setting. For that reason, it is only where there is interaction and communication that there can be a comparison of each person's ideas and experiences with others. Knowledge creation is particularly an important strategies and process of knowledge management. It focuses on the development of new skills, new products, better ideas and more efficient processes. The collaboration and interaction that is made possible by web 3.0 will definitely originate novel and useful ideas and solutions. **Raja**, **Ahmad** & **Sinha** (2009) *stated that* knowledge in the context of academic libraries can be created through understanding the user needs and requirements as well as the university's curricula. This understanding can be achieved from the open sites such as wiki, blogs or via any of the web 3.0 sites. These tools are capable of facilitating effective information sharing, collaboration, and communication among library users, librarians and between librarians and users in academic settings hence the understanding that will lead to further knowledge creating.

ii. ***Knowledge Sharing***: *Each of the emerging tools is a viable media for knowledge sharing. They are not only useful in information sharing; they fast track information sharing.* In many academic libraries, a great deal of knowledge sharing is entirely uncoordinated and any sharing of information and knowledge has been on an informal basis and usually based on conversation. The emerging tools can break this gene as collaboration and interaction in the sites will make information to be easily shared devoid of either bureaucracy or obstacle.

iii. ***Knowledge Capturing/Acquisition***: The emerging tools are excellent tools for information capturing/acquisition. Information or knowledge shared via the technology can easily be captured. Acquisition process in the library will become more effective as the collaboration enhanced by the technologies will allow users to contribute to effective acquisition of information resources and knowledge. The tools will also help academic libraries to identify the expertise and the skills of staff and capture it. This is the surest way to avoid collective loss of organizational memory and a key strategy of knowledge management. The web 3.0 technology is a viable media to identify people's expertise and a place where the knowledge will be shared. The type of enquiries that are commonly received at the reference and circulation lending desks or asked via the tools can be captured and that will enable librarians not only to provide an in-depth customized reference service but also to become knowledgeable about handling different enquiries.

iv. ***Knowledge Networking***: Librarians have been dealing with inter-library loan, and in-service training of employees in other libraries for a long time. These tools can help them out with searching online databases and web archiving of e-resources for their clients. More also, they can collaborate with other libraries online to augment what they have and meet their users' satisfaction. They can as well use web-based resources to boost their collection. The emerging tools also make networking with other libraries and their users very easy as they can reach out to them either via e-mail, wiki, blogs, or any of the web 3.0 sites.

The impacts of emerging tools in knowledge management cannot be over emphasized. The nature of the tools makes them very useful for knowledge management in libraries. Their core features are in tandem with the basics of knowledge management, hence they become the best tools for knowledge management in libraries.

6. Conclusion

Knowledge management has created new grounds in the field of library and information science. Thus librarians are expected to have knowledge about the information resources in the library, where they are stored, their usage, and also have knowledge about their users and their needs in order to satisfy them. To this end, librarians must learn new skills and application of emerging technologies since the hope and relevance of libraries in this digital age is dependent on their recognition and careful adaptation of global initiatives in the provision of library and information services.

7. Recommendations

The following recommendations are made:

1. Academic libraries in Nigeria should provide emerging technology tools to enhance information access and retrieval.
2. University management should make funds available for acquisition and installation of emerging technology tools.
3. The concept of e-library should be revitalized in academic libraries.
4. Library staff should be trained on use of these technologies to facilitate effective service delivery
5. Library management should create awareness to students and other library users on the availability of these technologies for improved information access.

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