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Interpreting the Roles, Competencies and Challenges of the Library and Information Science Professional in Knowledge Management.

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Abstract

Knowledge Management (KM) is an ubiquitous phenomenon that manifests in different branches of learning and fields of human activity. This multi-disciplinary attribute is party, responsible for the claims to its ownership by various professional groups. Notwithstanding the foregoing, there is no gainsaying the fact that the Library and Information Practitioners (LIP) are major players in KM. This desk research clarifies the major roles of the Library and Information Science (LIS) professional in KM and highlights some of the emerging changes which its introduction has brought on job titles in Librarianship. The paper also identifies the aspects of the competencies expected of the LIS professionals and pin-points some of the challenges which must be overcome to sustain the relevance of the LIS professional in the emergent KM era. Practical recommendations were advanced to enable the LIS professional overcome the challenges associated with KM.

Introduction

Knowledge Management (KM) is an emergent aspect of both management and scholarship. It is an activity that involves with the creation, description, packaging, organization, storage and sharing of the knowledge assets that exists and thrives within an organization. KM is therefore a process designed to identify and harness the skills, expertise, experience, talents and intellect of various cadres of personnel in order to help the organization achieve its stated goals, reduce/eliminate wastages and gain advantage in an increasingly competitive environment. The other major focus of KM is the establishment of defined parameters for leveraging the organization's internal and external knowledge assets. Rajurika (2011:5) reports that the concept of KM was popularized and formalized in the business world during the last two decades of the 20th Century. This phenomenon has generated a lot of controversies amongst scholars of diverse backgrounds in academic circles across the globe. In fact, Business Administration, LIS, Computer Science, Management Science, Artificial Science, Cognitive Science, Economics, Public Health and Public Policy are amongst the several branches of knowledge claiming ownership of KM (Kakabdase,, Kakabdase and Kouzmin, 2003; Ndwandwe and Onyancha, 2011). Perhaps, amongst the positive results of these professional contestations about the origin and ownership of KM is the fore its multi-disciplinary nature.

As various disciplines tussle over the ownership of KM, it is trite to note Jan's (2009) reminder that 'the force behind the introduction of KM was the information explosion in which every organization generates large amounts of data and information. Without effective management of this information, it is difficult to identify and locate the information required in a specific situation. The claim of LIS to the ownership of KM is thus strengthened by the fact that its professionals manages this information, especially, it's, largely, recorded/documented format. A lot has already been written on the impact of KM on librarianship and Library Science. In this regard, the contributions of Chase, (1998), Rowley (1999), Shanhong (2000), Townley (2001), Al-Hawamedeh, (2002), Roknuzzaman and Umemoto (2004) and Yaacob, Jamaluddin and Jusoff (2010) readily comes to mind. Also worthy of mention is the cerebral work of Sarrafzadeh, *et. al.* (2010) which noted the increased awareness among LIS professionals of their potential contributions to KM with a high level of positive implications for the profession. Notwithstanding the foregoing, there seems to exist a gap in the absence of a research reports on the distinct role of the LIS professional in the art of KM, the competences expected of them, as well as, the challenges which these professionals have to surmount in their involvement in KM. These issues which form the thrust of this paper are highlighted and addressed in the succeeding sub-sections.

Role Library and Information Professionals in Knowledge Management.

It was Michele Sinotte who once asked: 'where do librarians and information professionals fit into the extremely dynamic and complex picture that is KM?" (Sinotte, 2004:195). This question or its variant, often heard from many a librarian underlines a profession's unrelenting cravefor sustained relevance in an era of innovations and competition. As one of the claimants of KM, there is no doubt that the LIS professional has definite responsibilities in KM. Although these roles manifest clearly in their job specifications and duty schedules in information/bibliographic various agencies (libraries, archives. museums. records centres. communication/broadcasting outfits, etc), they also find distinct expression in other establishments that are not directly information-related. Since "every organization generates large amounts of data, in line with information explosion" (Jain, 2009), identification and retrieval of needed information would be difficult without the specialized expertise of the LIS professional and other persons with information-handing skills. The major roles of the LIS professional in KM are explained in the following paragraphs:

The foremost responsibility of the LIS professional is, perhaps, the *provision of leadership* in the midst of other professional groupings that lay claim to KM. In fact, as the primary group of experts in information-handling, leading or directing the nascent KM movement is something that seems natural to the LIS professionals. This is because, irrespective of the fancy novel names given to the process, the major professional pre-occupation of the LIS professional entails managing both information and the format (books, serials, non-book materials, etc.) in which the information is presented. While other disciplines merely scratch at peripheral aspects of KM, the LIS professional contends with the core of this phenomenon in the course of daily professional activities. More often than not, KM is actually initiated and driven by the LIS professional and its success in such organizations depends on their specialized skills. Through such professional engagements like acquisition, cataloguing, classification, shelving, shelf-reading, indexing, abstracting, reference, etc, LIS practitioners contribute immensely in knowledge- tracking. There is no gainsaying the fact that the experience garnered over the long period of association with information-handling has amply prepared the LIS professional to lead the charge for KM.

One important role of the LIS professional in KM is *organization of knowledge*. This is especially so in its various recorded formats. No other professional group can do this better. This submission is supported by the fact that the curriculum of LIS contains courses designed to imbue the would-be professional with the competencies for information-handling, documentation, preservation, as well as, organization of knowledge. It is only when knowledge is properly organized (whether in its tacit or explicit forms) that access, retrieval and use becomes guaranteed. This LIS professional has been organizing records in the traditional bibliographic centres and has continued same in the nascent automated systems. The insights gained remain relevant in the emergent KM era.

The LIS professional *facilitates easy access to knowledge* anywhere and anytime through the provision of relevant bibliographic tools and information services. Successful KM requires the ability to access information in various physical formats to enhance the exploitation of the knowledge of workers. The expertise needed for the discharge these duties, writes Blair (2002), flows from the ability to evaluate the validity and reliability of information obtained from unfamiliar or unconventional sources. This assignment can best be handled by the LIS professional since it provides the opportunity for them to showcase their understanding of information literacy. The importance of their role lies in the fact that access engenders retrieval and promotes use of such knowledge if and when accessed.

It is necessary to point out the contributions of the LIS professionals in *training and mentorship*. In addition to injecting value by managing organizational knowledge in the most efficient and sustanable manner (Jain, 2009), they impart the necessary skills to future professionals through educational programmes and on-the-job mentoring sessions. These roles find expression in both theory (teaching) and practice. While the LIS educator drives innovations through academic and research activities, the practicing librarian possess, according to Milne (2000:147), 'an ability to offer the value-added service of analyzing and repackaging information to meet specific client needs'.

The LIS professionals have the responsibility to *market and share their competences* to those who could make good use of them as the scope of KM expands. These skills, which come though rigorous exposure to specialist training, should be brought to the attention of potential and actual users. KM, therefore, offers the LIS professionals "the perfect opportunity to get out of the box of the library and information centre and into the strategy area of organization (Balcombe, 1999:91) where information and its management are used on regular basis.

The LIS professional play a pivotal role in *championing ethical and legal issues in information handling*. This is in line with the submission of Abel, *et. al.* (2008) that the LIS professionals should help to define and implement various standards for the ethical and appropriate use of information. In fact, such issues like copyright, intellectual freedom, fair use, piracy, plagiarism, etc are championed by the LIS profession. It is

part of the role of the LIS professional to leverage this advantage to engender the much-needed professional respect.

Other areas exist for the LIS professionals to show their relevance and indispensability in the KM field. These include, the continuing need for expertise in information management, and high levels of support for teams engaged in innovative pursuits (Cheng, 2001, St. Clair, 2001). The LIS professional also brings to KM, a client-focused view point, where technology is important though not dominant. Through reference interview skills, the LIS professional understands the most convenient way of discovering the information being sought upon which he marshals out workable search strategies for its access, dissemination and use.

Emerging Job Title for the LIS Professional

The phenomenon called KM comes with both innovations and positive multiplier effects. These have impacted on the practice of librarianship and other aspects of the information profession. KM reflects the increasing indispensability of computers in contemporary information work. It expands the spheres of influential of the LIS professional beyond the conventional library chores (of acquisition, cataloguing, classification, indexing, abstracting, reference, circulation, etc). As librarianship moves from its original custodian role towards information activism, new roles are created through a conscious re-interpretation of existing ones and adaptation of novel ideas from related professions. This paradigm shift requires job title that reflect the expansion of emphasis.

Chase (1998) and Jain (2009) listed some of the emerging job titles for the LIS professions as follows:

- *Knowledge/Engineers:* For those involved in manipulating tacit and explicit knowledge to enable its classification and dissemination
- *Knowledge Mappers:* People who identify where gaps exist in knowledge
- Knowledge Gatekeepers: Act as subject experts and are very conversant with evolving vocabulary (taxonomies, metadata, metatags, filtering, etc).
- * *Knowledge Editors:* Repackaging knowledge into the most assessable and appropriate formats.
- Knowledge Brokers: Also called *net-workers*, have good network of contacts within and outside the organization. Their services are, largely, fee-based.
- *Web Designers* reflects the influence of computers in librarianship and displays and shares knowledge in eye-catching ways
- Knowledge Programmers: Refers to those who customize their instructions and services according to their customer's needs
- Knowledge/Information Disseminator: Champions the distribution and exchange of information rather than remaining glued to their customer's
- Knowledge Researcher: Has the responsibility of providing up-to-date assistance to patrons for their personal and professional development.
- *Knowledge Consultants* provides expert advice at a fee on how to package, process and handle knowledge
- *Metadata Specialists* describe and dictates management and presentation strategies for digital information.

*Knowledge Asset Managers i*dentifies, evaluates, advices upon and manages a portfolio of knowledge assets such as copyrights, patents, trademarks, etc.

Furthermore, other title names for LIS professionals include:

- Knowledge Analyst
- Knowledge Architect
- Knowledge Integrator
- Knowledge Management Librarian
- Knowledge Manager
- Knowledge Network Specialist
- Knowledge Resource Specialist

KM Competencies for LIS Professionals

For the LIS professional to effectively assume the new roles which will facilitate the practice of KM, they need to equip themselves with new sets of competencies. Such personal competencies refer to valuable skills that enable the practitioners to work effectively and contribute positively to organizational success. The LIS professional needs much more than exposure to the orthodox training in librarianship can offer, especially, in the ever-changing information-um-knowledge environment as evidenced in KM. Some of these major unique skills expected of the LIS expert to fit into the contemporary KM era are highlighted below:

For the LIS professional to excel and remain relevant in the unfolding KM era, there is need for *a sharp and analytical mind*. This is one special attribute that will enable the LIS professional think clearly and quickly in the midst of a deluge/plethora of information sources brought about by information-cum-publication explosion, as well as, the multiplicity of user demands which they contend with in the course of their daily engagement. Success depends on the ability to, literally, think on the feet, in order to provide fast and correct answers to user's enquiries. This is only possible when the mind is able to accept and process information and deliver the result at optimal speed.

Ability to understand knowledge taxonomy is of the essence, if the LIS professional is to make his mark in KM. Taxonomy of knowledge, which mean the organization or classification of knowledge, has been described as the defining characteristic of libraries and allied information centres over the decades (Igwe and Olanipekun, 2012:110). As a core competence, ability to organize and classify information and records gives the LIS professional a distinct advantage over other participants in KM from other subject/professional backgrounds. This is on the understanding that, in the absence of the traditional classification schemes (DDC, LC, UDC, etc), the LIS professional can develop or improvise functional schemes that can serve the peculiar needs of specific organizations/establishments. This competence is acquired through the classification courses taught in LIS schools.

A direct corollary to the above is *document description skills* like cataloguing, indexing and abstracting. These competencies, which lead to multiple navigational and retrieval points, are of utmost importance in KM. As the modern library relies on the ability to describe knowledge and create several routes to the organized physical records, Ferriera, *et. al.* (2007) points out that the special skills of the librarian, records manager, archivists and other LIS professionals will help them maintain their relevance in an ever-changing and knowledge-intensive world. Additionally, designing and manipulating a large number of terms for indexing, sorting and searching enquiries require specific knowledge about the way language works, both symbolically on a morphological level and in the minds of knowledge providers and seekers (Igwe and Olanipekun, 2012).

There is need for *proficiency in the conduct of the interviews sessions*. As the mediator between the universe of information materials and information seekers from diverse personal and professional backgrounds, the LIS professionals should have excellent interviewing skills. They should understand the psychology of each patron and use their experience, generated through courses in reference services, to dissect and understand the thinking of the information seeker and provide matching information materials from within or outside the organization. Once the needed information material is identified, access to it becomes easier. This often entails constructive engagement and interaction between the librarian and his client which is where proficiency in the conduct of interviews is of the essence.

Good communication and interpersonal skills are required of the LIS professional in KM. In line with this, Abel and Oxbrow (1999) explained that communication is at heart of the knowledge management environment, as verbal, written and presentation skills are needed in order to influence, persuade, negotiate and share knowledge. This means that the librarian should not only be knowledgeable in the current trends in his profession but must have the ability to express and transfer this knowledge to his clients in the most meaningful, positive and efficient manner including oral and written competences. There is also a need for such strong interpersonal qualities as problem-solving skills, resilience, attention to details, ability to work under dynamic situations, honesty, as well as, willingness to learn and adapt.

The LIS professional should have a *high-level of IT literacy, or digital literacy.* They are expected to learn, acquire and apply appropriate ICT skills to capture, catalogue and disseminate information and knowledge to the array of clients irrespective of time and location. Added to this is the ability to know how to undertake retrospective conversion and create a central database for employees and patrons of the organization to access. Where the required ICT literacy and skill are lacking, manipulation and maintenance of new technologies will be problematic and this will, ultimately, hamper the transfer and sharing of knowledge.

According to Umeji, Efe and Lucky(2013) digital literacy is the ability to effectively and critically navigate, evaluate and create information using a range of digital technologies. Digital literacy is a means for ascertaining the computer skills competency of an individual to function in the workplace. Kapitzke (2003) seeks to widen the concept of digital literacy to *hyper literacy* and stated that —this term hyper literacy encapsulates the notion of being literate about literacy, and refers to critique of the information process itself, as students are provided opportunity to consider their positioning as information users and producers. It requires one "to recognize and use that power, to manipulate and transform digital media, to distribute pervasively, and to easily adapt them to new forms". Digital literacy does not replace traditional forms of literacy. It builds upon the foundation of traditional forms of literacy (Jenkins, 2009). Digital literacy is the marrying of the two terms digital and literacy; however, it is much more than a combination of the two terms. Digital information is a symbolic representation of data, and literacy refers to the ability to read for knowledge, write coherently, and think critically about the written word(Warschwer & Tina 2010)

Digital literacy researchers/professionals explore a wide variety of topics, including how people find, use, summarize, evaluate, create, and communicate information while using digital technologies. Research also encompasses a variety of hardware platforms, such as computer hardware, cell phones and other mobile devices and software or applications, including web search or Internet applications more broadly. As a result, the area is concerned with much more than how people learn to use computers(Gui & Argentin, 2011).

LIS Professional Soft Skills for Knowledge Management

In the cybertic age professional degrees in library and information science is not sufficient unlike in the past. There is demand for LIS professional having multidimensional aptitude in the areas of technical work, administrative work and also in providing user oriented services along with soft skills. Like any other profession, the soft skills are required in day-to-day working for carrying out routine jobs more effectively. The LIS professional working in large organizations like corporate offices are already practicing these skills through by experience or training. It is unfortunately in academic environment especially in Nigeria most of LIS professional are not aware of these soft skills that they can use to meet patrons information needs quickly and also manage information within the library or office. One may learn these soft skills easily provided they are aware what these are. In lines with this Bhakti (2008) identified the following soft skills required to become a successful library professional:

- Listening skills: The library professionals must have good listening skills as he/she has to interact with different types of users all the time. By carefully listening to users' he/she can identify the exact requirement and then provide the service accordingly.
- Communications skills: Command on language especially English and also regional one will improve the communication. Good communication skills also require understanding people, self-confidence. With this one can achieve lot and solve problems too.
- Interpersonal skills: Librarians have to deal with all levels of people like Management, users, colleagues in library, vendors etc. To deal with each one on them in rightful manner requires interpersonal skills. When you work in large organization, it is most important to build rapport with all departments, which helps in managing the library and providing better services to everyone.
- Public relations: One needs to use PR very effectively to attract users in libraries through various ways. It also helps to bond with users and vendors too. Also gives ability to work with other professionals.
- Customer service: Customer is library user and to satisfy his information needs is customer service. The librarians are always giving attention to their users and providing services through CAS, SDI or other specialized services. The customer service emphasizes the customer satisfaction, which guarantees that user will always come back to library.
- Leadership skills & Teamwork: Library management especially the big library is team exercise. Hence it is required to have leadership skills to manage and guiding the team time to time, as every subordinate is important for carrying out their work efficiently for smooth running of library.
- Negotiating skills: These skills are required on special occasions such as handling bulk purchases, specialized databases subscription with vendors etc. Also some times in delicate situations like library committee meetings or avoiding undue requirements from arrogant users
- Writing skills: The librarians are sometimes asked to submit/help in writing research proposal/ business proposal/project report, which requires good writing skills. Today there are many library professionals who are contributing to various publications even in-house or even by blogging for sharing their experiences and helping users.
- Project management skills: In corporate sector many times, librarians are part of some project team and assigned specialized jobs such as knowledge management or digital institutional repository. These require dedication, understanding of the project, time management for completion of work, teamwork and reporting back the results etc.
- Presentation skills: The presentation skills are required in report writing, library committee meetings and even in daily work which represents the library management overall for users. It not only emphasizes the individual skills but also from library presentation by means of its decoration, users guides, and library ambience.
- Teaching skills: This is essential for new user orientations or in case new service is introduced such as online database searching. It also includes motivating reading habits in users.

Challenges to the LIS Professional

Notwithstanding the inherent benefits, there is no shortage of challenges for the LIS professionals wishing to inject KM practices into their places of work. Foremost of these is, perhaps, the issue of resistance to charge. People are often hesitant to embrace and try-out new innovations for fear of the unknown, especially, costly failures. This is true of the information professional, to which the concept of Knowledge Management is still largely new (Jain, 2009) notwithstanding that they have been practicing aspects of it for years. Most of them are even indifferent to KM due to lack of understanding of the roles expected of them, as well as, inability to appreciate the opportunities inherent in KM.

The unwillingness of most LIS professional to share knowledge affects KM. It is a truism that the skills, expertise or knowledge of a worker gives him/her an edge over his/her peers. As such, over the years and continuing in the present, knowledge is power and relinquishing such power can put individuals or groups in vulnerable positions (Sinotte, 2004:194). And because they do not want to give-up the privileged and benefit their knowledge confers on them, most experienced older LIS professionals are reluctant to share their knowledge with colleagues. This ultimately affects the efficiency of KM as there is a scarcity of reference points in times of confusion.

A good number of LIS professionals do not have a full graph of what KM entails. As such, many are yet unaware of its extensions. The challenge associated with this point draws attention to a number of potential deficits in the skills of information professionals. This skills gap is capable of inhibiting their maximum contribution to the KM initiatives. The spread of KM is far-reaching because it goes beyond mere acquisition, organization and dissemination of knowledge as it involves the development and exploitation of the knowledge assets of an organization in order to further achieve corporate objectives. As pointed out by Ndwandwe and Onyamcha (2011), limited understanding of KM is a challenge to the LIS professional because if inhibits the extent to which the concept is applied in the discharge of their primary professional functions.

The above point, inadvertently, exposes another challenge which confronts the LIS professional in KM in Nigeria. It has been severally reported that most LIS schools in Nigeria do not have KM in their curriculum at all levels. (Edegbo, 2011: Idoko, 2012 and Igwe and Olanipekun, 2012). As a result, these LIS professionals have not been exposed to the finer aspects and intricacies of KM. This largely, explains the knowledge-gap in KM amongst LIS professionals mentioned in the proceeding paragraph. These LIS professionals are, therefore, compelled to practice without the skills and competences relevant to their work. Even the LIS educator contends with this same challenge. It is a clear irony that the proposed review of LIS curriculum (Idoko, 2012) might force these LIS educators to teach KM skills which they have not, in their turn, had the opportunity to learn or practice. The challenge inherent in this scenario is obvious.

The growing awareness of the importance of knowledge is complicated by the difficulty of capturing knowledge, especially, the tacit variant. This is because, as explained by Sinotte (2004:193), 'while information is relatively easy to capture and store, knowledge is not'. The difficulty being referred to stems from the fact that tacit knowledge is essentially unrecorded as it is embedded in the experiences of the individual. Since such undocumented expertise or skills, learned over the years, reside in the brains and memory of people, it is not easy to quantify - which affects and complicates its management. The point remains that, despite the recognition of the value of knowledge, few objective methods correctly exist to quantify it (Sinotte, 2004).

Although technology facilitates KM, the problems arising from its application must not be over-looked. The cost of acquiring these pieces of machinery and retraining staff, particularly librarians, for their use is often beyond the reach of most libraries in developing countries. In some instances, there is a glaring disconnect between IT expenditure and the organizational performance (Lang, 2001). Aside from the rising cost of these KM technologies (like computer, internet, social media, chartrooms, etc.), Blair (2002) reports that earlier technology focused IT-solutions failed to live up to their claims. These technology-related issues create problems for the LIS professional who needs to convince their management and financiers to embrace the concept of KM and allocate more funds for its implementation.

Conclusion and Recommendation

Notwithstanding the claims to knowledge management by different disciplines, there is no doubt that LIS professionals remain its major stakeholders. As managers of the universe of documents and other recorded information sources, they are, inevitably, involved in KM in varying degrees. This imposes a role on these professionals that goes beyond the traditional document-handling to 'cybrarianship' and information literacy. These literacy aspects of knowledge management professional/ librarians or cybrarians in the digital age must be in line with what happening in the workplace. Through this literacy professional can bring out their relevance in any organizations all over world. In the 21st century also weakness various name librarians can called themselves as a professional re-interprets and appreciate their role in an era of sweeping changes, the resultant paradigm shift also reflects in new-fangled titles. It is, therefore, not surprising that the emergence of KM entails the acquisition of specialized competencies on the part of the LIS professional. In addition, LIS professional soft skills that will

enable them to become successful librarians are also discussed. Although the benefits accruing to the LIS professional from KM are numerous, there is no shortage of constraints. The recommendations presented in the following numbered paragraphs are meant to address some of the challenges which confront the LIS professional as a result of KM.

1. There is need for increased publicity of the concept of KM amongst LIS professionals. This suggestion is on the understanding that KM is new which is why a good number of people, including LIS professionals, are yet unaware of what the phenomenon is all about. Therefore, planned and targeted publicity programmes through conferences, symposia, seminars, research reports, dedicated journals and textbooks, more awareness would be created on the relevance and place of the LIS professional in the emergent KM scene. This will bring about understanding which will make the issue of resistance to change a thing of the past.

2. The curriculum of LIS schools should be revised and updated to include courses in KM. The multiple beneficial innovations brought upon information work as a result of KM requires that practitioners and trainees be exposed to KM and its extentions. Besides the increasing volume of articles and books written on KM since its emergence in the 1980's makes it clear that the phenomenon is much more than a fad, as some writers earlier thought (Ajiferuke, 2003 and Sinotte, 2004). Efforts should, therefore, be made to incorporate KM studies at all levels of LIS professional's education either as elective or compulsory courses.

3. The above recommendation is, at best, a take-off point. The destination is actually the eventual mounting of distinct programmes aimed at awarding certificates in KM at diploma, bachelor, masters and doctoral levels. This would lead to the production of competent and specialized professionals that will fill the gap in the information profession and take advantage of the emerging KM opportunities in information based institutions and other establishments.

4. LIS professionals should imbibe the habit of sharing knowledge. Such transfer of know-how and other experiences garnered over the years in the course of professional engagements and interactions will facilitate understanding of KM. The fear of losing the perceived privileges which skills and expertise confer on individuals is counter-balanced by the immense benefits which knowledge-sharing produces. The LIS professional should, therefore, maximize the opportunities presented during conversations, workshops, seminars and meetings to exchange information on KM in order to achieve personal and corporate objectives.

5. LIS professionals should improve on their information roles. This includes going the extra mile to update their KM competencies. As changes continue to unravel due to the introduction of new technologies in information work, the LIS professional must strive to remain competent navigators of each medium of information preservation and communication. These would make them better placed to understand the needs of the contemporary information users, as well as, assume active roles in the search for workable solutions to emergent information-based challenges.

6. Since KM is amendable to technological innovations and applications, there is need to ensure that relevant pieces of technology or machinery are made available to the LIS professional. This will reduce the drudgery of manual processes. Besides, such KM technologies like computers, internet, chat-rooms, etc would enhance efficiency and speed in KM. In line with this, ample funds should be made available to the LIS professional in KM. In addition to procurement of relevant technologies, such funds would go a long way in financing the training and re-training of LIS professional to equip and prepare them for the challenges brought about by KM.

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Acknowledgement: The researchers acknowledge all the authors that have gone ahead to write work on this area of Knowledge Management. Their work creates great helps to produce this wonderful article which have contributed to knowledge. Thank you all. We also Dr Ifeka E. Okeke who is a mentor to Chuma, O. N and Lucky, O. U. He contributed financially and academically in this work. Finally, we acknowledge all the editors of International institute for Science, Technology & Education Accelerating Global Knowledge Creation and Sharing for their effort to read through various articles on daily basis.

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