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Information and Communication Technology and the Dynamics of Library and Information Service Delivery

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Abstract
The paper provides an overview of Information and Communication Technology in the 21st century library and information service delivery. It highlights the various dynamics in today's library and information service delivery associated with ICTs use - the resultant changes in the library and information landscape and the future of library and information professionals in the digital age. Upon these, recommendations were put forward with regards to repositioning the library and information profession in Nigeria.

Keywords: Information and communication Technology (ICT), information professionals, digital age.

Introduction

In keeping with the Information and Communication Technologies (ICTs) complex nature and multiple applications, they may be viewed in different ways. ICT can be defined as "the set of activities which facilitate by electronic means the processing, transmission and display of information" (Rodriguez & Wilson, 2000). ICTs can be described as a complex varied set of goods, applications and services used for producing, distributing, processing, transforming information-(including) telecoms, TV and radio broadcasting, hardware and software, computer services and electronic media" (Marcelle, 2000). ICTs represent a cluster of associated technologies defined by their functional usage in information access and communication, of which one embodiment is the Internet.

The advances in the sciences especially Information and Communication Technologies (ICTs), have continued to have positive impact in Library and Information Science profession affecting methodologies of library and information service delivery, education and training of information service providers as well as the information needs and seeking behaviours of the information seekers and users (Mohammed, 2008). This leads to a shift of paradigm from the traditional (closed) model of librarianship to the contemporary (open) model of librarianship characterized by client-oriented (user-centred) professionalism and services where library and information services, education, training, skills and clientele are dynamically interwoven with the changing needs of the environment and the society at large (Mohammed, 2008). Mohammed further stated that, the contemporary model of library and information systems and services and by extension the profession, education and training is being propelled today by amongst others, the dynamics of:

a) Media technology which has affected the contents of libraries to include both print and electronic media. This has led to the transformation of libraries into media centres, information resource centres in private and public institutions, learning resources centres or library common in academic institutions, and instructional resources centres in schools. Analogue and digital (cabled) television systems and services are now common features of modern libraries.

b) Computer technology which has facilitated the automation of library and information systems, operations, services and digitization of its collections/resources for easy access and use, especially in real-time regime using network technologies, without limitation to time and space. Simply put, the computer technology has removed library and information systems, operations and services from manual and mechanical regimes to electronic/automated regime where time and space are not issues of concern. We now have digital/virtual libraries. This has some consequences on the education, training and research in library and information service.

The foregoing forces of change suggest that librarianship, library

systems, operation, services, as well as library education and training must be constantly transformed to cope with the dynamics of the 21st century model of librarianship and professionalism conceived to be open, user-centred, dynamic and receptive to constant change for the good of the server and the served. Thus, libraries, information centres and the Library and Information Science (LIS) schools must devise viable means of getting the best cream of professionals that will ensure the survival and advancement of the 21st century contemporary model of digital librarianship, library and information systems and services, as well as education and training.

ICT and the Paradigm Shift in LIS Education

With the advancement in Information and Communication Technologies (ICTs), the nature of information and information environment is changing dramatically. It is without doubt that information is considered as the bedrock of societal development particularly in this 21st century (Abubakar & Hassan, 2010). The increase need for information, as well as the changing situation in the LIS field has therefore necessitated that LIS Schools worldwide should devise new approaches in order to be responsive to the changing needs and demands. Thus, there is the need for new skills and training for LIS practitioners which is expected to be reflected in the curriculum of LIS Schools in order to accommodate the changes. LIS curriculum is the mirror to all LIS programmes offered in an institution; as such it is expected to be dynamic. Rehman (2003) has noted that Library and Information studies (LIS) has undergone major changes during the last couple of decades whereby changes in the names of schools, degree titles, and program offerings have become a common trend. In a similar situation, Beheshti (1999) has reported that in the past decade, more than 50% of LIS programs in the United States and Canada have completely revised their curricula.

According to Kavulya (2007), recent trends in ICT have witnessed developments in internet and multimedia technology which is the key to the vastly increasing speed and quantity of information transfer across the global networks. This led to proliferation of electronic resources such as e-journals, e-databases, e-archives and digital libraries. The adoption of a wide range of ICTs calls for training that enables graduates to develop information systems which will help people to meet their information needs efficiently.

The contemporary information arena in which ICTs serves as a driving force has meant that the LIS field has to take advantage of the emerging technologies i.e. the Internet, Intranet and other new technologies for training of future information professionals to assume their expected roles. Minishi-Majanja (2003) has noted that the rapid development of ICTs, has meant that LIS curriculum and structures have to be reorganized, infusing greater ICT knowledge and skills into courses and providing more hands-on practice. Also Lim (1999) opined that the emergence of the concept of the virtual library provides the opportunity for library schools to restructure their curricula and to make them more relevant to the needs of the profession in the 21st century. In other words the curriculum should be built around the virtual library model. Thus, it is now a common practice to

find LIS Schools struggling to infuse ICT related courses in their curriculum which is expected to give them new lease of life in the training of their students in the 21st century.

Due to developments in ICTs, information professionals whose fundamental mission is to collect, organize, store, retrieve and disseminate information are facing new challenges, because of the change in the nature of information. Malekabadizadeh, Shokraneh and Hosseini (2009), observes that the essential role of librarians and information scientists in providing access to information for development means that LIS departments must provide dynamic educational system which necessitates basic changes in the curriculum. In addition, the curricula should include skills related to designing, consulting, and improving information systems. Mohammed (2008) concluded that due to the need for new competencies expected in the information/digital age, LIS schools should continually review their curriculum to fit the contemporary age expectations.

According to Abubakar and Hassan (2010), going by the current scenario in the LIS field at the global level, the need for integrating IT in Nigerian LIS curriculum in the 21st century cannot be over emphasized. Noting that, although IT development in Nigeria is moving very slowly, it has become extremely necessary for Nigerian LIS schools to adopt these ICTs and incorporate them into their curriculum if they are to succeed in the contemporary information environment. Diso and Njoku (2007), observes that the library of the 21st century has been appropriately termed as a digital library. However, the library in the 21st century Nigeria will have to combine the digital and traditional library elements because of low ICT literacy. They also pointed out that training of the information professionals of the 21st century Nigeria should focus more on the aspect of digital libraries which the curriculum is expected to reflect.

Kavulya (2007) has noted that the term "digital library" generally implies digitization of library services and making the contents of any repository accessible across electronic networks. Also the nature of the digital libraries envisions LIS education that will impart new skills, competencies, attitudes and values that will enable the professionals to manage digital information systems. Nigerian LIS Schools are therefore expected to build their curriculum around the virtual or digital library model whereby future LIS professionals will be able to cope and function well in the 21st century. Abubakar (2009), stressed that there is the need for diversification of courses in Nigerian LIS Schools to include new subjects such as knowledge management, IT skills (networking, internet skills, database management, websites designs, online reference chart), publishing, multimedia applications, etc. in order to make the training more relevant to the emerging market in Nigeria.

Similarly, another very promising and emerging technology that ought to be integrated into the Nigerian LIS education is the internet, which provides access to global networked resources. The present day LIS services demands that internet needs to be exploited as a very important source of information that is required in the collection development strategy as well as information service delivery.

Consequently, in view of the expected benefits of the internet in the global educational system, it is expected that the potential information professionals to be produced by the library schools would be able to operate it effectively for service delivery, hence the need for its inclusion in the LIS curriculum. Additionally, the use of the Internet will be of immense benefits to the teaching and learning process in the LIS schools. Igwe (2005) noted that an appropriate hybrid of teaching and learning methods through the use of the Internet will provide meaningful learning environment in library schools in Nigeria. Also it would be achieved by steady connection to the information super-highway which would enhance the schools capacity to respond to the new challenges in information processing and dissemination.

Changes in Library and Information Service Landscape

In a fast changing, expanding diverse global digital information environment, libraries are facing a variety of complex challenges from multiple sectors of the knowledge society in the 21st Century. The major challenges as opined by Mullins, Ferguson and Houghton 2000 are as follow:

Changing Technology Landscape

Technology is highly dynamic and changing at a very fast pace. What is latest today will become outdated tomorrow. Rapid advances in ICT are constantly changing so fast that it is becoming increasingly difficult for LIS Professionals to keep track and pace with the emerging technologies. Information technologies today are characterized by their very dynamic development and increasing complexity. The new technologies allow completely new solutions to old problems, and consequently old services are displaced by new services. In the current turbulent phase of information technological development, this process of displacement of old solutions by new ones is particularly difficult to steer (Hofmann, 1995).

Technological changes have been of such magnitude that it is difficult for individuals and often institutions to follow them. In several technological sectors such as the information sector, more changes have occurred in the last few decades than in the previous few thousand years (Pritchett, 1994). The following are some of important items of new technologies on which LIS professionals need to improve their competencies for their effective delivery of high quality information services to the user community (Pritchett, 1994);

- ICT Trends
- Metadata Standards
- Web Technology
- Search Technology
- Digital Information Resources
- Subject Gateways
- Information Portals
- E-learning (online learning)
- Online information services
- Digital rights management
- Wi-Fi and RFID Technology

Changing Information Environment

Today, information has been recognized as a powerful key resource by all sectors in knowledge based society. Information Management has gained an immense interest and importance stimulated by new technology**.** ICT has changed the whole nature of publication, storage, transmission, delivery and use of

information. The web has utterly transformed the information access behavior of users.

LIS Professionals are facing many major paradigm shifts creating a new information environment, which really dictates the increased importance of professional competencies (Mullins, Ferguson & Houghton, 2000);

• Technology applications in library operations & services
• Transition from paper based resources to digital and multimedia resources
• Shift from acquisition to accessing the resources
• Emphasis on information rather than the documents
• User demands information access facilities at their desktops.

According to Stuart (2010), the focus until now has been primarily on the concept of document. If librarians are to continue being relevant in the age of Google and Google Scholar, the need to move beyond the document environment and facilitate access to the increasing amounts of data that is being made available on the web. A very important function of any library is the ability to facilitate quick access to her holdings. During the analogue era, access depended on the efficient maintenance of the library's catalogue. Today, there is a paradigm shift in the practice of providing access. This shift is ushered in by the digital environment. Digitization has proved to be possible for nearly every format and medium presently held by libraries (Smith, 1999). Digitization is the conversion of analogue signals to machine readable formats. Many universities in the developed countries have digitized their library holdings (Smith, 1999). It is also gaining momentum in Nigeria, to the extent that University libraries of Jos, Obafemi Awolowo and Ahmadu Bellow University have digitized their theses and dissertation's (Bozimo, 2006). The issue of digitized resources is having more access through the metadata than catalogues has been affirmed by digital librarians. Marcum (2007) observed that "digital librarians are amazed at the extent to which some materials, once put on line, gets visited more than it ever did on library shelves. More and more are being made accessible on the web, where it is discoverable, and in many cases searchable, not through library catalogues but through electronic search boxes" (Marcum, 2007). Through digitization, bibliographic searching has become simplified. With the click of a button a researcher can pick full texts of public domain works from databases thereby gaining access with minimum time. Digitization has made many users to ignore library catalogues for full texts (Okojie, 2007).

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Changing Libraries

Rapid revolutionary advances in ICT have now transformed the way information is gathered, processed, organized, accessed and disseminated to the user community (Mullins, Ferguson & Houghton, 2000). The pressure on libraries to modernize the way of delivering their services is now intense and more demanding. The user expectations on libraries to deliver high quality, comprehensive, user-friendly new generation services have grown tremendously in recent years. The survival demands change, updating and modernization. Libraries need to change quite dramatically to modernize almost every aspect of their operations, information resources and services in order to meet the rising users

expectations of the modern world. As the world advances, the library must also evolve and redesign their activities in order to deliver highly quality, need based, value-added services according to the expectations of today's library users (Chad & Paul, 2005). The concept of library recently has been severally described in different terms such as automated library, computerized library, electronic library, digital library, cybrary, virtual library, library without walls, transformed library, complex library, hybrid library, internet library, future library and so on.

Changing Role of Library & Information Service Professionals

In the Modern World, the role of the LIS professionals is adapting to changing technologies, information environment and customers expectations. Library professionals are increasingly responsible not only to provide traditional library information services but also to deliver online information services according to the actual user needs. Librarians need to keep up with their users' expectations to survive and service them. Librarians need to become information knowledge navigators who distill data into usable information.

In the 21st century, everyone is going through many occupational changes to face the future challenges. Information and Communication Technology has transformed the role of not only libraries but also library professionals in the changing environment in which they now work. Library professionals are functioning under great pressure to become more efficient to deliver more effective services to the users. As the role of LIS professionals is changing to face the new challenges posed by ICT, they must be keen to stay at the forefront of innovation in the library world. LIS professionals need to be confident and competent that they can prepare for new challenges, deal with emerging technologies, manage change effectively and claim new professional roles. A well-informed competent and creative LIS professional shall play multiple evolving roles in the 21st century.

As the information industry has changed, the expectations of information users have soared and librarians have come to fear for their positions and profession. As we race into the future, librarians should begin to think about the position of the library in the new environment. LIS professionals are functioning under great pressure to keep pace with the constantly changing technological environment.

Today, Librarians have to play multiple evolving and expanding roles to face many new challenges in the dynamic technological environment. A librarian must be a professional expert, techno literate, web usability expert, knowledge manager, navigator, trainer, educator, marketer, service provider and many more.

Future of Library Professionals

Information Technology is rapidly changing the whole world, creating new challenges and opportunities. Library professionals have to face many complex challenges, make use of the technological opportunities and respond to all these changes positively. LIS professionals with latest technological competencies are in great demand. They have great opportunities and bright career prospects as long as they improve their professional and

technological competencies and grab them. Otherwise, it becomes even difficult to survive in the modern libraries. Those professionals that anticipate and embrace change constructively, creatively and intelligently will be the ones, who are most likely to survive, prosper, develop and succeed rather than decline and suffer in the future. LIS professionals need vision for modern professional skills and technological competencies in order to have bright future in the 21st Century.

Conclusion

Library and information science professionals face complex challenges posed by rapid revolutionary advances in ICT. Libraries have to redesign their positions to meet evolving needs. Librarians need to implement new practices and new technologies, manage change, and improve performance and competencies to face future challenges of knowledge society. They need to develop professional competencies to adapt changing technologies in order to deliver timely, value added quality content and world-class services to the users from their desktop.

Library and information science professionals have to recognize the expanding nature of the technological changes and professional challenges that they face in the modern world and realize to improve the range of professional competencies required to adapt and mange the changing technology successfully. The challenges represented by these competencies must be seized and acted upon today in order to ensure that librarians have better future in the twenty first century. LIS professionals must strive, struggle and improve new skills and knowledge about new technologies that will be needed to provide responsive Library and Information Services to the users in the twenty first century.

Recommendations

In view of the foregoing, the following are recommendations made:

- There is the need for urgent reappraisal and increase the ICT content of LIS curriculum in all higher institutions training library and information professionals.
- There is the need to train library and information professionals in ICTs and as such repositioning them to cope with the changing profession and environment.
- Interest in the information profession should be geared towards the 21st century scenario "digitization".
- Data sharing among the various libraries and information centres in Nigeria should be encouraged. This will provide a basis for the setting up of a national information base with the capabilities facilitating international data exchange. And will facilitate collaboration and uniformity in the skill and technological growth in the various and diverse information centres and institution nationwide.

There is the need to complement the existing traditional systems with modern and industry wide accepted systems. This will undoubtedly enhance uniformity and interoperability with global systems.

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