

Developments *in the* Digital Age

Issues and Themes in Library and
Information Science

UNIVERSITY OF IBADAN LIBRARY

Developments in the Digital Age

*Issues and Themes in Library
&
Information Science*

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Gaaf Building, 110-112 Oyo Road,
Orogun, Off University of Ibadan,
Second Gate, Ibadan, Oyo State,
Nigeria.
Phone: 08023519154
stirlinghorden@ymail.com
www.stirlinghorden.com

University Post Office
Box 20984
Ibadan
Oyo State, Nigeria.

Saint Andrews Venue
Venus Quarters
Mechanic Workshops, Sabo
Jattu-Uzairue
Edo State, Nigeria.

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Published 2016

ISBN 978-978-032-593-0

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Stirling-Horden Publishers Ltd.
Lagos, Ibadan, Benin City, Jattu-Uzairue.

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Global Knowledge Economy and Emerging Trends in Library and Information Service Delivery

Oseghale Osagie

Introduction

Many advanced nations of the world acknowledge the place of library and information in national development. They value highly, the materials of knowledge that are either housed in a purpose building infrastructure or electronically and systematically organised and made available for use as vital requirements for daily survival. The materials can broaden knowledge as well as sharpen and upgrade skills. They are a means of investigating past events with a view to finding solutions to current problems of keeping abreast of current developments as well as serving as the repositories of the heritage and civilisation of the people. According to Human Development Report (1995), "Human development has two sides. One is the formation of human capabilities – such as improved health, knowledge and skills. The other is the use people make of their acquired capabilities – for productive purposes..." (UNDP, 1995: 11). The principal mechanism for developing human capabilities, knowledge and skill is information. Consequently, in the modern societies, information has attained an unprecedented economic importance as a source of knowledge, skills, competencies, scientific research, inventions and technological innovations. Therefore, library and information professionals have constantly challenging roles to play in enhancing societies' effective participation in the global knowledge economy. This chapter examines globalisation as a concept and the emerging trends in the global knowledge economy. It discusses the activities and driving force of the knowledge economy. It highlights the challenges and key competencies required for success in the global knowledge economy. It stresses the need for the globalisation of library services and the expected roles of library and information professionals in enhancing the capacity of individuals in developing countries to participate effectively in the inevitable global knowledge economy.

The Concept of 'Globalisation'

Wikipedia defines globalisation thus: Globalisation in a literal sense simply means International integration, that is, a process by which the people of the world are unified into a single society and functioning together. This process is a combination of economic, technological, sociocultural and political forces. Globalisation, as a term, is very often used to refer to economic globalisation, that is, integration of national economies into the international economy through trade, foreign direct investment, capital flows, migration and spread of technology.

Globalisation is also defined as internationalism; however, such usage is typically incorrect as “global” implies one world as a single unit, while “international” (between nations) recognises that different peoples, cultures, languages, nations, borders, economies and eco-system exist. Obilade (2003) defines globalisation as the transformation of a domestic matter to a matter of international concern or regulation. However, the common trend in the various literature on globalisation is the fact that Information and Communications Technology (ICT), which has shrunk the world to a global village, leading to interconnected and interdependent world is an important driving force of globalisation (Salawu, 2008). Furthermore, globalisation is a broad term with several dimensions. For instance, it is common to hear such terms as economic globalisation, globalisation of education, globalisation of sporting events and most importantly global knowledge economy, which is the focus of this paper.

Globalisation is usually recognised as being driven by a combination of economic, technological, sociocultural, political and biological factors. It embodies the transnational circulation of ideas, languages or popular culture. It is, in fact, a combination of the free exchange of goods, services and capital. Hallak (1998) notes that the phenomenon dates far back to the development of international trade (the ‘silk road’, the ‘cities-world’ of the middle ages). During the second half of the nineteenth century, this phenomenon was highlighted by industrial revolution as a result of colonial exploitation. The continuous modernisation of international exchange process during the twentieth century and its ratification through international agreements (The General Agreement on Tariffs and Trade GATT in 1974) maintained and placed emphasis on the globalisation of societies.

However, to meet the challenges of globalisation, Hallak (1998) believes it would be necessary to prepare individuals for a workplace where responsibilities are constantly changing, where vertical management is replaced by networking, where information passes through multiple and former channels, where initiative-taking is more important than obedience, and where strategies are complex because of the expansion of markets beyond national borders. Therefore, education must help individuals to perform tasks for which they were not originally trained, to prepare for a non-linear career path, to improve their team skills, to use information independently and develop their capacity for improvisation, creativity and lay the basis of complex thinking linked to the harsh realities of practical life. Therefore, society must aim to allow every individual to develop freely. According to Hallak (1998), the individuals will have to find their points of reference in society of constant change that generates short-lived values.

It is, therefore, imperative that the individual succeeds in delivering himself from set of types of stereotypical activity, both psychologically and economically, and discovers a taste for improvisation, invention and discovery. Schools must give the pupils the capacity to acquire the relevant knowledge and interpret new values that will, in turn, guarantee them the ability to remain up-to-date with evolution of their environment. Hallak (1998) warns, however, that if concerted effort is not made to strengthen the individual, then human integrity is under threat by several influences which are now replacing traditional standards. Thus, the under-educated is fast becoming unproductive and an economic liability.

The Global Knowledge Economy

Defining the knowledge economy is challenging precisely because the commodity it rests on – knowledge – is itself hard to pin down with any precision (Brinkley, 2006). However, World bodies have conceptualised Knowledge economy and knowledge society in their own ways (Kashyap *et al.*, 2010). The term “knowledge-based economy” results from a fuller recognition of

the role of knowledge and technology in economic growth. Knowledge, as embodied in human beings (as “human capital”) and in technology, has always been central to economic development. But only over the last few years has its relative importance been recognised, just as that importance is growing (OECD, 1996). Knowledge-intensive service sectors, such as education, communications and information, are growing even faster. Indeed, it is estimated that more than 50 per cent of Gross Domestic Product (GDP) in the major OECD economies is now knowledge-based.

The World Bank Institute offers a formal definition of a knowledge economy as one that creates, disseminates and uses knowledge to enhance its growth and development. A knowledge economy uses data as its raw material and transforms it using technology, analysis tools and human intelligence into knowledge and expertise. DTI Competitiveness White Paper (1998) defines knowledge economy as one in which the generation and exploitation of knowledge has come to play the predominant part in the creation of wealth. According to the White Paper, ‘It is not simply about pushing back the frontiers of knowledge; it is also about the most effective use and exploitation of all types of knowledge in all manner of economic activity.’ Leadbeater *et al.* (1999) report that the idea of the knowledge-driven economy is not just a description of high tech industry but it describes a set of new sources of competitive advantage which can apply to all sectors, all companies and all regions, from agriculture and retailing to software and biotechnology.

Knowledge-based economy relies primarily on the use of ideas rather than physical abilities and on the application of technology rather than the transformation of raw materials or the exploitation of cheap labour. It implies that knowledge is being developed and applied in new ways. Product cycles are shorter and the need for innovation greater. Trade is expanding worldwide, increasing competitive demands on producers. The global knowledge economy is transforming the demands of the labour market throughout the world and placing new demands on citizens, who need more skills and knowledge to be able to function in their day-to-day lives.

Knowledge economy is an information-driven economy in which information constitutes the backbone of economic, social and cultural development. The level of individual well-being is contingent on the amount of relevant information the individual is able to access, the reliability of information tools and technique available and his capacity to identify the means of accessibility, adaptability and usability of information. As a global concept, knowledge economies pose serious challenges to both individuals and the society. For the individual, there is the challenge of skill acquisition, information capacity, information accessibility, information-seeking behaviour, reading habit and enabling environment, while for the society, there is the need to acknowledge the role that information plays in enhancing socio-economic development, social security and educational development of individual and invest in information products and services.

In knowledge economy, “economic success is increasingly based on the effective utilisation of intangible assets such as knowledge, skills and innovative potential as key resources for competitive advantage. The term ‘knowledge economy’ is used to describe this emerging economic structure” (ESRC, 2005). Put more prosaically, we can say the knowledge economy is what you get when firms bring together powerful computers and well educated minds to create wealth (Brinkley, 2006). Considering the importance of knowledge acquisition in the inevitable knowledge economy, the World Bank declares that:

The emergence of the global knowledge economy has put a premium on learning throughout the world. Ideas and know-how as sources of economic growth and development, along with the application of new technologies, have important implications for how people learn and apply knowledge throughout their lives (World Bank, 2003).

The individual human being, like any other organism, is defined by the problems he confronts. The human is unique by virtue of the fact that he must, as a matter of necessity confront problems that arise from his unique biological and emotional needs. Since he is constantly in a state of becoming (wanting to be something), he is decisive. The maintenance of that state of his humanity, and indeed, of his survival, depends crucially on his ability and his potential to generate ideas and to seek information, knowledge and understanding. This is further enhanced by effective communication, freedom and unfettered access to relevant knowledge and information. Knowledge as a basic form of capital can either be codified or Written down, or tacit and in people's heads (World Bank, 1998), accumulation of which Economic growth is driven (Romer, 1986; 1990). In a knowledge-based economy, knowledge is created, captured, acquired, transmitted and used more effectively by individuals, enterprises, organisations and communities to promote economic and social development (World Bank, 1998).

A knowledge-driven economy, therefore, is one in which the generation and exploitation of knowledge play the predominant part in the creation of wealth (United Kingdom Department of Trade and Industry, 1998). Knowledge, therefore, has become the third factor of production in leading economies (Romer, 1986; 1990). In industrial countries, where knowledge-based industries are expanding rapidly, labour market demands are changing accordingly. Technology and knowledge are now the key factors of production. Where new technologies have been introduced, demand for high-skilled workers, particularly high-skilled Information and Communications Technology (ICT) workers, has increased tremendously. At the same time, demand for lower-skilled workers has declined (OECD, 2001).

Investment is thus being directed to high-technology goods and services, particularly Information and Communications Technology. Computers and related equipment are the fastest-growing components of tangible investments. Equally important are more intangible investments in research and development (R&D), the training of the labour force, computer software and technical expertise (OCED, 1996). Knowledge-based jobs in service sectors are also growing strongly. Indeed, non-production or "*knowledge*" workers – those who do not engage in the output of physical products – are the employees in most demand in a wide range of activities, from computer technicians, through physical therapists to marketing specialists. The use of new technologies, which are the engine of longer-term gains in productivity and employment, generally improves the "*skills base*" of the labour force in both manufacturing and services. And it is largely because of technology that employers now pay more for knowledge than for manual work.

Emerging Trends in Knowledge and Economics

These trends are leading to revisions in economic theories and models, as analysis follows reality. Economists continue to search for the foundations of economic growth. Traditional "production functions" focus on labour, capital, materials and energy; knowledge and technology are external influences on production. Now, analytical approaches are being developed so that knowledge can be included more directly in production functions. Investments in knowledge can increase the productive capacity of the other factors of production as well as transform them into new products and processes. And since these knowledge investments are characterised by increasing (rather than decreasing) returns, they are the key to long-term economic growth.

Incorporating knowledge into standard economic production functions is not an easy task, as this factor defies some fundamental economic principles, such as that of scarcity. Knowledge and information tend to be abundant; what is scarce is the capacity to use them in meaningful ways. Nor is knowledge easily transformed into the object of standard economic transactions. To buy

knowledge and information is difficult because, by definition, information about the characteristics of what is sold is asymmetrically distributed between the seller and the buyer. Some kinds of knowledge can be easily reproduced and distributed at low cost to a broad set of users; and this tends to undermine private ownership. Other kinds of knowledge cannot be transferred from one organisation to another or between individuals without establishing intricate linkages in terms of network and apprenticeship relationships or investing substantial resources in the codification and transformation into information.

Knowledge Codification

In order to facilitate economic analysis, distinctions can be made between different kinds of knowledge which are important in the knowledge-based economy: know-what, know-why, knowhow and know-who. Knowledge is a much broader concept than information, which is generally the “*know-what*” and “*know-why*” components of knowledge. These are also the types of knowledge which come closest to being market commodities or economic resources to be fitted into economic production functions. Other types of knowledge – particularly know-how and know-who – are more “*tacit knowledge*” and are more difficult to codify and measure (Lundvall & Johnson, 1994).

Know-what refers to knowledge about “*facts*”. How many people live in New York? What are the ingredients in pancakes? And when was the battle of Waterloo? are examples of this kind of knowledge. Here, knowledge is close to what is normally called information – it can be broken down into bits. In some complex areas, experts must have a lot of this kind of knowledge in order to fulfil their jobs. Practitioners of law and medicine belong to this category.

Know-why refers to scientific knowledge of the principles and laws of nature. This kind of knowledge underlies technological development and product and process advances in most industries. The production and reproduction of know-why is often organised in specialised organisations such as research laboratories and universities. To get access to this kind of knowledge, firms have to interact with these organisations either through recruiting scientifically-trained labour or directly through contacts and joint activities.

Know-how refers to skills or the capability to do something. Businessmen judging market prospects for a new product or a personnel manager selecting and training staff have to use their know-how. The same is true for the skilled worker operating complicated machine tools. Know-how is typically a kind of knowledge developed and kept within the border of an individual firm. One of the most important reasons for the formation of industrial networks is the need for firms to be able to share and combine elements of know-how.

know-who becomes increasingly important. Know-who involves information about who knows what and who knows how to do what. It involves the formation of special social relationships which make it possible to get access to experts and use their knowledge efficiently. It is significant in economies where skills are widely dispersed because of a highly developed division of labour among organisations and experts. For the modern manager and organisation, it is important to use this kind of knowledge in response to the acceleration in the rate of change. The know-who kind of knowledge is internal to the organisation to a higher degree than any other kind of knowledge.

Learning to master the four kinds of knowledge takes place through different channels. While know-what and know-why can be obtained through reading books, attending lectures and accessing databases, the other two kinds of knowledge are rooted primarily in practical experience. Know-how will typically be learnt in situations where an apprentice follows a master and relies upon him as the authority. Know-who is learnt in social practice and sometimes in specialised educational environments (OCDE/GD, 96). It also develops in day-to-day dealings with customers, sub-contractors and independent institutes. One reason why firms engage in basic research is to acquire access to networks of academic experts crucial for their innovative capabilities. Know-who is socially embedded knowledge which cannot easily be transferred through formal channels of information (OCDE/GD, 96).

The development of information technology may be regarded as a response to the need for handling the know-what and know-why portions of knowledge more effectively. Conversely, the existence of information technology and communications infrastructures gives a strong impetus to the process of codifying certain types of knowledge. All knowledge which can be codified and reduced to information can now be transmitted over long distances with very limited costs. It is the increasing codification of some elements of knowledge which have led the current era to be characterised as “*the information society*” – a society where a majority of workers will soon be producing, handling and distributing information or codified knowledge.

The digital revolution has intensified the move towards knowledge codification and altered the share of codified vs. tacit knowledge in the knowledge stock of the economy. Electronic networks now connect a vast array of public and private information sources, including digitised reference volumes, books, scientific journals, libraries of working papers, images, video clips, sound and voice recordings, graphical displays as well as electronic mails. These information resources, connected through various communications networks, represent the components of an emerging, universally accessible digital library. Due to codification, knowledge is acquiring more of the properties of a commodity. Market transactions are facilitated by codification, and diffusion of knowledge is accelerated. In addition, codification is reducing the importance of additional investments to acquire further knowledge. It is creating bridges between fields and areas of competence and reducing the “dispersion” of knowledge. These developments promise an acceleration of the rate of growth of stocks of accessible knowledge, with positive implications for economic growth. They also imply increased change in the knowledge stock due to higher rates of scrapping and obsolescence, which will put greater burdens on the economy’s adjustment abilities. While information technologies are speeding up the codification of knowledge and stimulating growth in the knowledge-based economy, they have implications for the labour force.

Knowledge and Learning

While information technologies may be moving the border between tacit and codified knowledge, they are also increasing the importance of acquiring a range of skills or types of knowledge. In the emerging information society, a large and growing proportion of the labour force is engaged in handling information as opposed to more tangible factors of production. Computer literacy and access to network facilities tend to become more important than literacy in the traditional sense. Although the knowledge-based economy is affected by the increasing use of information technologies, it is not synonymous with the information society. The knowledge-based economy is characterised by the need for continuous learning of both codified information and the competencies to use this information.

As access to information becomes easier and less expensive, the skills and competencies relating to the selection and efficient use of information become more crucial. Tacit knowledge in the form of skills needed to handle codified knowledge is more important than ever in labour markets. Codified knowledge might be considered as the material to be transformed, and tacit knowledge, particularly know-how, as the tool for handling this material. Capabilities for selecting relevant and disregarding irrelevant information, recognising patterns in information, interpreting and decoding information as well as learning new and forgetting old skills are in increasing demand. The accumulation of tacit knowledge needed to derive maximum benefit from knowledge codified through information technologies can only be done through learning. Without investments oriented towards both codified and tacit skill development, informational constraints may be a significant factor degrading and prohibiting economic development. Workers will require both formal education and the ability to acquire and apply new theoretical and analytical knowledge; they will increasingly be paid for their codified and tacit knowledge skills rather than for manual work. Education will be the centre of the knowledge-based economy and learning the tool of individual and organisational advancement. This process of learning is more than just acquiring formal education. In the knowledge-based economy, "learning-by-doing" is paramount. A fundamental aspect of learning is the transformation of tacit into codified knowledge and the movement back to practice where new kinds of tacit knowledge are developed. Training and learning in non-formal settings, increasingly possible due to information technologies, are more common. Firms themselves face the need to become learning organisations, continuously adapting management, organisation and skills to accommodate new technologies. They are also joined in networks, where interactive learning involving producers and users in experimentation and exchange of information is the driver of innovation (EIMS, 1994).

Knowledge Networks

The knowledge-based economy places great importance on the diffusion and use of information and knowledge as well as its creation. The determinants of success of enterprises, and of national economies as a whole, is ever more reliant upon their effectiveness in gathering and utilising knowledge. Strategic know-how and competence are being developed interactively and shared within sub-groups and networks, where know-who is significant. The economy becomes a hierarchy of networks, driven by the acceleration in the rate of change and the rate of learning. What is created is a network society, where the opportunity and capability to get access to and join knowledge- and learning-intensive relations determines the socio-economic position of individuals and firms (David & Foray, 1995).

The present age is that of knowledge revolution. Knowledge-driven economy is the prerequisite of development. Efficient utilisation of existing knowledge can create comprehensive wealth for the nation. Knowledge society has a component of societal transformation and wealth generation. The societal transformation has to be through large-scale development in agricultural and rural sector. These in turn will lead to employment generation and high productivity leading to rural prosperity. A vibrant and dynamic knowledge society has to touch every member of the society, including the farmers. Every stratum of the society should become a consumer of knowledge, which will make them efficient in harvesting the fruits of development. The basic constituents of the knowledge society would be the knowledge workers who create quality knowledge products and the enlightened citizens who consume the profit (Kashyap *et al.*, 2010). But in the traditional paradigm of information divide and trickle down, can we expect to easily establish a knowledge society with

uniform and equal access and distribution of knowledge and information from top to bottom? Can there be some legislative tools of information strengthening at grassroots through which a common citizen may insist to get the required information for his betterment? Right to Information Act has emerged as that much-sought weapon for the deprived sections.

Implications of Knowledge Economy

In the emerging global knowledge economy, a country's ability to build and mobilise knowledge capital is equally essential for sustainable development as the availability of physical and financial capital (World Bank, 1997). Hence, the features of the knowledge economy have important implications for libraries and information science. First of all, knowledge is being developed and applied in new ways. The information revolution has expanded networks and provided new opportunities for access to information. It has also created new opportunities for generating and transferring information. Knowledge networks and sharing of information have expedited innovation and adaptation capacity. Changes in ICT have revolutionised the transmission of information. Semiconductors are getting faster, computer memories are expanding, and bandwidth is growing, and Internet hosts are expanding and multiplying. Cellular phone usage is growing worldwide, adding to the pace of and capacity for change and innovation (World Bank, 2003).

Small and medium-size enterprises in the service sector are becoming increasingly important players in terms of both economic growth and employment. Trade is increasing worldwide, increasing competitive demands on producers. This implies that countries that are able to integrate into the world economy may be able to achieve higher economic growth and improve health and education outcomes (World Bank, 2002). Unlike the slow, gradual evolution of human labour in the past generation, present-day changes are occurring rapidly and with little or no warning. Unless society members anticipate these effects and prepare to cope with them mentally and in practice, job dislocations and forced geographical relocations may prove traumatic and imminent for employees and their families.

Generally, managing knowledge in the organisation requires that one locates where a certain kind of knowledge is, retrieve and store the knowledge, and then make it accessible to other employees. However, knowledge management also refers to the information that resides in the minds of employees. Ideally, employees are expected to share what they know with one another. In daily work, employees are required to draw upon a variety of knowledge to accomplish their jobs. The knowledge they need is not always found in their area of expertise. In this case, they have to learn what they need to know from some other sources. The information source can be a book, the Internet or some other person. Learning from some other person who is trusted and who is also an expert in the area in a face-to-face situation is a very efficient and practical way to learn (Davenport & Prusak, 1998: 94, 95, 100). Creating an atmosphere that encourages face-to-face meeting and discussion allows knowledge to be passed around and enhanced. Knowledge sharing, however, is still an ideal goal that many corporate organisations are now trying to reach. It is, however, the heart of knowledge management.

Skills and Competencies Needed in the Knowledge Economy

Operating successfully in the knowledge economy requires mastering a set of knowledge and competencies. Three categories of competencies are needed (Rychen & Salganik, 2001; OECD, 2002a). These include:

Acting Autonomously

Building and exercising a sense of self-making choices and acting in the context of a larger picture, being oriented towards the future, being aware of the environment, understanding how one fits in exercising one's rights and responsibilities, determining and executing a life plan and planning and carrying out personal projects.

Using Tools Interactively

Using tools interactively as instrument for active dialogue; being aware of, and responding to the potential of new tools; and being able to use language, text, symbols, information and knowledge, and technology interactively to accomplish goals.

Functioning in Socially Heterogeneous Groups

Being able to interact effectively with other people, including those from different backgrounds; recognising the social embeddedness of individuals; creating social capital; and being able to relate well to others and cooperate and manage to resolve conflicts.

The concept of competency has several features. It is strongly related to context, as it combines interrelated abilities and values. It is teachable (although it can be acquired outside the formal education system) and exists on a continuum. Possession of the key competencies contributes to a higher quality of life across all areas (World Bank, 2003). Performing in the global society requires mastery of technical, interpersonal and methodological skills. Technical skills include literacy, foreign language, mathematics, and science, problem solving and analytical skills. Interpersonal skills include teamwork, leadership and communication skills. Methodological skills include the ability to learn on one's own, to pursue lifelong learning and to cope with risks and challenges. These competencies are needed because of the rapid proliferation of scientific and practical knowledge, the shortening of the useful life of knowledge because of continuous production of knowledge, and the growing influence of science and technology, which profoundly change the organisation of jobs and lives. The consequences of these changes cannot be reliably foreseen (OECD, 1996). However, a knowledge economy rests on four pillars (World Bank Institute, 2001):

- a supportive economic and institutional regime to provide incentives for the efficient use of existing and new knowledge and the flourishing of entrepreneurship;
- educated and skilled populations to create share and use knowledge;
- a dynamic information infrastructure to facilitate the effective communication, dissemination and processing of information; and
- an efficient innovation system of firms, research centres, universities, consultants, and other organisations to tap into the growing stock of global knowledge, assimilate and adapt it to local needs and create new technology.

Relationship between Knowledge, Information and People

Quality information becomes a powerful resource that can be assimilated by people. Knowledge workers and quality information provide the potential for information to have value. A database without knowledge workers using it produces as much value as a product warehouse without ordering customers. Knowledge is not just information known, it is *information in context*. Knowledge means understanding the *significance* of the information. Knowledge is applied information and may be represented as a formula: **Knowledge = f (People + Information + Significance)**.

Knowledge is the value added to information by people who have the experience and acumen to understand its real potential. With the continuing evolution of information technology, organisations are now able to capture knowledge electronically, organise its storage, and make it sharable across the enterprise. The advances in the Internet, intranet, the World Wide Web, and data mining are expanding the horizons of sharable data in both data warehouses and in operational databases. It is possible, however, to have a wealth of enterprise knowledge but still see an enterprise fail. Knowledge has value only to the extent that people are empowered to act based on that knowledge. In other words, knowledge has value only when acted on.

Globalisation of Library Services

One important implication of globalisation (Salawu, 2008) is the evolution of global standards for library services. Libraries in developing countries have to cope with global standards in library organisations. This includes application of ICT in library and information services delivery, provision of current awareness services including selective dissemination of information (SDI), access of users to libraries through electronic access cards and regular survey of users preferably through electronic access cards to obtain statistics of library users (Obilade, 2003).

Following the application of Information and Communications Technology, co-operation and collaboration of libraries through interlibrary loan system as well as formation of consortium has become a global reality. Thus, librarianship is now a global issue. The application of ICT in libraries has widened the scope of librarianship and conferred new roles on libraries. This situation has placed more demand on the ability of librarians. In a consortium, member libraries are linked together through electronic information network. This reduces the costs of acquisition of information materials and still allows users of individual library to have access to a great number of information materials that ordinarily one library may not possess.

In order to create an 'information workforce' one that is professionally skilled, well-educated and well-informed of worldwide condition, Salawu (2008) supports the 1995 Cveljo's proposal that library and information science curriculum be revised to include global issues including information activities of UNESCO and the organisation's effort in bringing education to appropriate level worldwide, including education and training for library and information professionals, as well as information on communication, and behavioural aspects of the Third World countries that determines the production, distribution and utilisation of graphic and non-graphic records in contrast to those of western society.

What is important about this proposal is the need for countries all over the world to revise their library and information science programmes in order to produce competent highly skilled and knowledgeable information professionals that will be able to cope with the challenge of the knowledge economy. According to Obilade (2003), compliance with the present minimum global standards may form the major criterion and requirement for course accreditation in library schools.

The direct consequence of globalisation and the information age in which the global community finds itself is the need for conscious re-examination and redirection of library services in order to serve the global community.

Librarianship under the influence of the Information and Communications Technology has witnessed transformation. Library services now cut across geographical boundaries. The emergence of the virtual library system in the 21st century, in the words of Atkinson (1990), is redefining and extending the traditional definition of library and has rendered the definition of a library with respect to a particular 'locality', or 'particular institution' or 'geographical region' inappropriate. There is need for libraries to rise to the challenges of the new age in order to sustain their relevance in the scheme of things. They need to contribute more effectively to nation building through provision of access to global information as well as contribution to global wealth of information. However, a lot of opportunities await them if they are able to adjust to the new epoch.

The library and information profession has traditionally been considered the primary access point to new knowledge, emanating largely from basic research at universities and government laboratories. This new knowledge is generally termed "science" and has traditionally been distinguished from knowledge generated by more applied or commercial research, which is closer to the market and the "technology" end of the spectrum (OCED, 1996). In the knowledge-based economy, the distinction between basic and applied research and between science and technology has become somewhat blurred.

One sure way of responding to the challenge of globalisation is provision of virtual library services. This can be achieved in two ways: group of libraries can combine efforts and resources for this purpose, for example, formation of a consortium; secondly, provision of facilities to access various virtual libraries within and outside the country. This implies strong emphasis on the application of ICTs in libraries.

It is obvious that librarians need more than basic ICT skills to be able to cope with the challenge of globalisation. This has placed greater demand on their ability and they need to rise to this challenge. Nurse (2001) lists skills required for the operation of a virtual library as: Introduction to Personal Computers, Windows 98, PowerPoint, Spreadsheet, Electronicmail, Advanced Internet Searching, Skills, Scanners, Basic Imaging Technology and CD-ROMs. Equally important are digitisation, electronic cataloguing and maintenance of computer networks skills. Furthermore, apart from ICT skills, management skills (in planning, negotiating and persuading) as well as ability to analyse, practise and synthesise new concepts are very essential. This brings to the fore the issue of subject background as a prerequisite for a career in librarianship. Librarians need to be well-grounded in disciplines other than librarianship. Therefore, Library and Information Science programmes need to be expanded to include courses in management, information science, archival studies, economics, international relations and so on.

Knowledge Transmission and Transfer

The library and information professional is a crucial element in knowledge transmission, particularly in education and training of scientists and engineers. In the knowledge-based economy, learning becomes extremely important in determining the fate of individuals, firms and national economies. Human capabilities for learning new skills and applying them are key to absorbing and using new technologies. Properly-trained researchers and technicians are essential for producing and applying both scientific and technological knowledge. The library and information professional, especially in

universities, is central to educating and training the research workforce for the knowledge-based economy.

The library and information professional is thus facing challenges in reconciling its knowledge production role, even more important in the knowledge-based economy, and its knowledge transmission or educational function. Many people believe that the primary mission of the university is educational, reproducing and expanding the stock of individuals that embody the accumulated knowledge and problem-solving skills needed in modern societies. The fact that universities are, to varying degrees, also involved in the creation of new knowledge may be seen as a by-product or joint product of their educational mission. In practice, the educational missions of universities shape their approaches to conducting research through the assignment of important research roles for students and their participation in technical activities. As universities attempt to find ways around fiscal limitations, there may be substantial variety in the extent to which they maintain the primacy of their educational missions. Resource constraints make it more difficult to maintain the necessary linkages and balance between research and education (OCED, 1996).

The library and information professional plays an important role in transferring and disseminating knowledge throughout the economy. One of the hallmarks of the knowledge-based economy is the recognition that the diffusion of knowledge is just as significant as its creation, leading to increased attention to “knowledge distribution networks” and “national systems of innovation”. Library cooperation provides structures which support the acquisition, storage, dissemination and use of knowledge in the economy and the linkages between them. Libraries are crucial to the capacity of a country to diffuse innovations and to absorb and maximise the contribution of technology to production processes and product development.

In this environment, the library and information professional has a major role to play in enabling knowledge for technological progress and for developing a common cultural basis for the exchange of information. Economies are characterised by different degrees of “distribution power” in their ability to transfer knowledge within and across networks of scientific researchers and research institutions. The distribution power of an economy depends partly on the incentives and existence of institutions, such as those of higher education, for distributing knowledge. Effective distribution of knowledge, however, also depends upon investing in the skills for finding and adapting knowledge for use and in developing bridging units or centres. There are thus choices to be made between investments in the production of, and in the capabilities for diffusing and using, scientific knowledge.

In the knowledge-based economy, the library and information profession must balance not only its roles of knowledge production (research) and knowledge transmission (education and training) but also the third function of transferring knowledge to economic and social actors, especially enterprises, whose role is to exploit such knowledge. They provide a means both for the efficient transfer of economically useful knowledge and for advanced training in skills required by industry.

Emerging Trends in Library and Information Service Delivery

With the introduction of ICT in libraries, librarians, as information providers, now have opportunity to use modern tools to provide quicker, more sophisticated services to the users. Databases and reference sources can be queried via the Internet and World Wide Web; remote library catalogues are available on desktops; newsgroups and mailing lists provide a wonderful opportunity to discuss mutual concerns and electronic mail allows librarians to find out and contact those who might be able to help in providing information.

In the prevailing situation, the librarian is called upon to assume new roles and perform tasks like guiding, facilitating, citing information resources and preserving access to information. Rao and Babu (2001) have addressed the question of role of librarians in the new environment of exponentially growing Internet and World Wide Web. On one hand, it has been postulated that librarians would play a more dynamic role in this new environment as guides to information seekers in an explosive universe of information. The rise of digitised information has also given opportunity to elevate the role of librarians, hence the emergence of a new breed of librarians referred to as “Cyber librarian”, a specialist in locating information on the Internet (Hathorn, 1997).

In order to thrive and remain vital in today’s rapidly changing information environment, librarians must continually reposition themselves through proactive response to information explosion and changing information needs of their patrons occasioned by information technologies. Hathorn (1997) has rightly declared that librarians should seize the opportunity to expand their roles by:

- taking the library to users’ point of needs;
- developing evidence-based skills necessary for effective information delivery;
- becoming key players in user education programmes; and
- designing and managing electronic information systems.

Taking the Library to Users’ Point of Needs

Developing and maintaining a proactive disposition in library and information work is the direction of the information profession. Librarians need to embark on aggressive awareness programmes that will alert the various users of new information products and services. This can be achieved through print and electronic newsletters, handbooks and handbills. Moreover, libraries can render personalised information services such as Selective Dissemination of Information (SDI) to their patrons. SDI is a deliberate attempt by librarians to conduct searches on behalf of users based on their research profiles. The search results are then routed to recipients via e-mail either on intranet or on the internet. A number of libraries now host websites where they place information about their libraries on bulletin boards and provide e-mail alerts to patrons. Another proactive approach at rendering qualitative library and information services in the new web environment is emphasis on liaison with users. Librarians should emphasise more on ‘getting out there’ rather than expecting users to come to the library. Librarians should be the first to know about the introduction of new information products and services on the Web and be instant at circulating it to appropriate users, thereby reinforcing our position as ‘information gate-keeper’. Liaison with users will help in the selection of e-resources, curriculum enrichment and information literacy programmes.

Developing Evidence-based Skills in Information Technology

The core skills associated with information professionals include information handling skills, training and facilitating skills, evaluation skills and concern for customer, which are all still relevant. However, librarians must change and adapt to the new information environment by learning about new technologies, especially the Internet and the Web, and be aware of their strengths and weaknesses. The availability of electronic documents on the Internet and the support extended by World Wide Web to access these documents have increased tremendously. In this scenario, it is imperative for librarians to acquire necessary skills in effective use of modern tools and associated software to locate and retrieve the widely dispersed information in the cyberspace.

Librarians need to acquaint themselves and gain a degree of proficiency to effectively guide and train information seekers in their usage. Thus, librarians have to play the role of facilitator in identifying, gathering and arranging information infrastructure such as network access, software access, licences and passwords to use and charged resources like EBSCO Host, Science Direct, HINARI-OARE-AGORA and so on. Librarians should develop the Internet search skills that will place them in better position to perform more complex searches than their patrons. Librarians should be found to be more efficient and more effective than end-users are at performing their own information searching activities (Griffiths, 1995). Therefore, librarians should develop evidence-based skills that will enable them to retain and improve upon this position. Knowledge of search engines, online databases, Boolean operators and similar search methodologies should suffice.

Becoming Key Players in the User Education

Librarians have a critical role to play in the present digital library era as educators or end-user trainers. No matter how sophisticated interfaces and search engines are, people would still need to be educated regarding their usage. Users will need to possess an understanding of essential information gathering skills and tools, and only professionals can do this. The areas in which the librarian gives training include use of electronic journals from different publishers, use of abstracts and indexing databases, databanks, CD-ROM publications and document delivery services.

Designing and Managing Electronic Information Systems

As mentioned earlier, librarians are in competition with the World Wide Web. In order to gain competitive advantage, librarians should not only use technology but also be involved in the design and management of library information systems. It is not compulsory that librarians should be computer-literate, but it is necessary to participate in decisions that concern the selection of hardware and software that would be applied to their operations. Many efforts at designing electronic information systems in Africa failed because of apathy to computer on the part of librarians. Moreover, we should not regard the Internet as an external source but as part of our collection so we can work with IT specialists to maximise its use to the advantage of our patrons. As asserted by Strong (1996), the Internet, though can provide some answers and facts quicker and more accurately, is not the answer to reference questions from users.

Librarians must lend their traditional skills in locating, evaluating and organising information in the creation, development and content filling of a website for their parent institutions and the libraries. The role of the librarian while creating a webpage is to deliver information about the library and its services like hours of services, details of library staff, library policies and an interface to the library online public access catalogue (OPAC). Librarians should not see themselves as inferior to computer specialists but as collaborates in progress.

Conclusion

In the words of Gregory (2005), 'Librarianship is and will continue to be a profession devoted to bringing users and information together as effectively and efficiently as possible.' The library and information professional is a crucial element in knowledge transmission, particularly in education and training of scientists and engineers. In the knowledge-based economy, learning becomes extremely important in determining the fate of individuals, firms and national economies. Human capabilities for learning new skills and applying them are key to absorbing and using new technologies. Properly-trained researchers and technicians are essential for producing and applying both scientific

and technological knowledge. The library and information professional, especially in universities, should be central to educating and training the research workforce for the knowledge-based economy.

Recommendations

1. Libraries should maintain hybrid collections in order to satisfy the user community.
2. Virtual library projects should be well-funded to ensure their success.
3. For libraries to reap the benefit of information globalisation, there is the need for inter-connectivity of libraries to facilitate resource sharing and exchange of information. Formation of consortium is also desirable. All libraries should be networked with the National Library towards the formation of National Information Network. Governments should finance libraries in this respect. Financial support from national and international organisations should be solicited.
4. Libraries should subscribe to databases of digital materials, which have their origins in print format.
5. Furthermore, libraries should seek legal backing of the government to digitise their resources for wider access.
6. Universal standards in building and designing libraries, especially school, academic and public libraries, should be observed by concerned education authorities.
7. Standards in quality library personnel recruitment should not be compromised by education management at all levels of the educational system in Nigeria.
8. For the new trends (ICT) in library operations to succeed in Nigerian schools at all levels, the Nigerian government should seriously address the deteriorating power situation.

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