
Information Networking and its Application in the Digital Era with Illustration from the University of Port Harcourt Library

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ARTICLE INFO

Article history:

Received 11 March 2019

Revised 02 June 2019

Accepted 10 June 2019

Keywords:

Network,
Library information network,
consortia,
information,
internet

ABSTRACT

This paper discussed the factors that necessitated information networking, types of networks, benefits of information networking, library information networking and the University of Port Harcourt library network initiatives. Information networking is a process of communication, exchange of ideas, resource sharing and collaboration between individuals, organizations, institutions and libraries and it is facilitated by ICTs and the internet for improved accessibility. It has been brought about by information explosion, rapid advancement in information communication technologies, inadequate funding and increased demand for quality information. Networks can be classified into local, national, regional, and international networks and are formed to serve different categories of user communities. Benefits of information networking include resource sharing, on-line conferences and participation in programmes at distant centers, collaboration among scholars in different countries. Communication flow through the internet, social media, and electronic mail. Library information networking started with the interlibrary loan which has metamorphosed into library consortia in which groups of libraries partner to coordinate activities, share resources and combine expertise. The University of Port Harcourt Library network initiatives started with an e-granary (a CD ROM) and the establishment of a local area network. The library subscribes to more than 10 electronic databases. Information networking has greatly improved the sharing of resources in acquisition and dissemination of information resources since no single institution can acquire the overwhelming number of information resources in their various formats.

1. Introduction

The internet/web and its array of information resources have created the impression that every information is on the internet, implying a comprehensive, organized, universally accessible, and free virtual library. Information and communication technologies, to a great extent, have impacted on every sphere of life including information availability such that users feel self-sufficient in information search, access, and sharing. The innovations of internet/web and communication technologies

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International Journal of Knowledge Content Development & Technology, 9(2): 33-44, 2019.
<http://dx.doi.org/10.5865/IJKCT.2019.9.2.033>

has led to information explosion but there is a mismatch of what is needed and what is available. This explains the great desire by information providers to exploit this opportunity to ensure improved access to information for their clientele. Lynch (2000) observed this as a compelling vision which is particularly seductive for higher education executives besieged by demand for increase library budgets and new library buildings. Libraries are, therefore, facing a new generation of online users who are technologically savvy and integrate information access and use in all spheres of their lives to an unprecedented degree (Thomas & McDonald, 2005). Akparobore (2015) opined that if information is the raw materials for both knowledge management and the information profession, then technology promotes them by facilitating the creation, storage and distribution of information. Knowledge management and the use of ICTs can bring positive change in the library operations. Haber (2011) posited that, while providing books was a standalone function for libraries throughout the last few centuries, their offerings have evolved with the digital age to meet the changing needs of their patrons. Consequently, the use of ICTs to facilitate the search, use, and sharing of information among information users has necessitated information networking. Emasealu and Umeozor (2018) asserted that the evolution of Information Communication Technology (ICT), brought about a paradigm shift from traditional method of operations to automated approach because technology offers people more convenient and faster ways to search, retrieve, communicate, and share information.

The concept of information networking is a process of communication, exchange of ideas, resource sharing, and collaboration between individuals, organizations, institutions, and libraries, facilitated by ICT's and the internet. Generally, resource sharing, information networking and library cooperation are used interchangeably in the digital age to mean sharing of resources of a library or institution with the users of other libraries or institutions. The global information on the internet/web is available to those who have the required infrastructural capacity to tap and utilize. Communication is what got us, humans, to where we are today: culture, science and technology are all products of communication, sharing the experience of others, adding something to it, improving it (UNESCO, 1994). The underlying philosophy of networking is cooperation or sharing of ideas, resources, costs, expert personnel, and communication exchange. Thus, networking is a two-way activity.

Definitions of information networking abound. For Omekwu (2004), information networking is a system which effectively integrates institutions such as libraries/information centers into coordinated whole to provide a community of users with relevant data irrespective of its origin, format or physical location. Information networking activities have always been one of the major important concern of information providers globally. Feather (1999) and Abubakar (2010) observed that information networking is essential in the provision of information since no single individual provider, agency, or institution can be self-sufficient in the provision of information resources to their user community. Ashikuzzaman (2016) stated that a network is defined by the National Commission on Libraries and Information Science (NCLIS), USA as two or more libraries and/or other organizations engaged in a common pattern of information exchange, through communications, for some functional purpose. Information, as an important resource, has occupied a central stage in the contemporary knowledge society. According to Nwokoji (2001), information today means power and wealth, and the control of it determines to a large extent the swaggers among nations or saunters behind in the contemporary world order. The needs of the users are diverse and growing daily. Thus, the

aim of every library is to provide information resources and services for her patrons. Library information networking according to Onwuchekwa (2015) does not merely mean mutual sharing of information resources among libraries but utilizing information resources of one library for generating services of another library. The aim of this paper is to discuss the factors that necessitated information networking, types of networks, benefits of information networking, library information networking and University of Port Harcourt Library network initiatives.

2. Factors that necessitated information networking

Factors responsible for the evolution of information networking include information explosion, rapid advancement in information and communication technology, inadequate funds, and increased demand for quality information.

2.1 Information explosion

Information explosion, which is variously referred to as information overload, information glut, information smog, and infobog among others, is an abstract concept used to describe the overwhelming speed at which information is being generated and distributed in various formats. Increased quest for knowledge has led to more publications in various subject disciplines. Aguolu and Aguolu (2002), observed that advancement in knowledge is made possible through specialized investigations in the universities, research institutes, business, and industrial establishments which are multiplying both in the developed and developing countries. This notwithstanding, Information and communication technology have equally revolutionized publishing, making it possible for anyone with a web server to publish and distribute information at will. In effect knowledge explosion has led to information explosion. Omekwu (2004) observed that, in the light of this global information trend, no institutions or their libraries can afford to sit on the fence.

2.2 Rapid advancement in Information Communication Technologies (ICTs)

The advancement in ICT has contributed immensely to information networking. It has made connectivity possible and enables users to have access to global information available on the internet. Information and communication technology is the basic requirement for effective networking. Thus, recent advancement in this area has led to wide spread information networking activities (particularly in the developed countries). Information technology concentrates on information acquisition, processing, storage, retrieval and dissemination, while the telecommunication component is concerned with the connectivity aspect of networking. Hence, ICT facilities enhance networking which in turn makes access to wide range of global information possible. Ajidahun (2010) opined that the emerging global trend in information technology and its incontestable relevance to the information retrieval systems have decisively propelled and compelled libraries worldwide to critically consider information technologies to enhance provision of efficient services and improve productivity. This has influenced

information search and access behaviour of users.

2.3 Inadequate fund

This is another factor that stimulates wide interest in networking activities. It is almost impossible for any single information industry (e.g. Library) can afford to purchase the overwhelming amount of information resources in their various formats. Information networking, thus, becomes the best viable alternative. Omekwu (2004), pointed out that networking enables the participants in the network to acquire all their funds could allow them to and still have access to what their users need which they could not afford to acquire. Daniel (2002), equally observed that networking ensures members (participants) make up for the shortfall from the strength of others. He further stressed that collections that are not available in a given library (for example) can be accessed from another having such collection within the framework of a network. According to him, “in unity they stand but in division they fall in offering good quality library services”. Electronic information is costly, and thus, by forming consortia, small colleges and universities may gain access to extensive body of additional materials at a reduced cost, since the actual reduction will be tied to consortia bulk, licensing agreements, and multi-year contracts (Lynch, 2000).

2.4 Increased demand for quality information services

In this knowledge-based society, people and organizations are increasingly aware of the importance of timely, accurate, current, and reliable information for decision making, learning, teaching, and research activities. The 21st century is marked with tremendous technological advancement and increased demand for information (Bashir, Mahmood, & Shafique, 2008). However, there is a mismatch between information needed and that which is available. To meet this demand, information providing organizations and professionals ensure that networking process and provision can enable institutions to maximally exploit the awesome dimension of networked resources for the benefit of their clientele. Information networking also provides the platform to belong to a cyberspace to ensure access to information in remote databases.

3. Types of networks

Networks are usually categorized based on the community of users served and the extent of coverage. It can be classified into local, national, regional, and international networks. It could be established based on Local Area Network (LAN) or Metropolitan Area Network (MAN) or Wide Area Network (WAN). Networks are formed to serve different categories of user communities such as National networks, medical library networks, national agricultural information network, African scientists' network, library network, international network among others. Omeku (2004) observed that effective national network is a pre-requisite for effective participation in international network. This is because national network brings into the international networking its information resources

and services. In the same vein, local networks are pre-requisites for national network.

3.1 Benefits of information networking

Resource sharing is a major benefit of information networking and has been one of the driving forces behind information networking. According to Odiini (1991), resource sharing is the process whereby the resource of a group of network libraries is made available to all the persons entitled to use any of those libraries. Lynch (2000) observed that effective relationship between information providing organizations such as universities and other educational institutions are growing in importance. Information technology has enabled these institutions to form communities of users to share ideas, expertise, costs, and more importantly, information resources. It is on this bases that the Federal Government of Nigeria through the Federal Ministry of Education (2001) established the Virtual Library Project.

The mission of the project is “to provide an equitable and cost-effective manner, enhance access to national and international library and information resources and for sharing locally available resources with libraries all over the world using digital technology”. The specific objectives of the first phase for the benefit of Federal University Libraries are to:

- 1) improve the quality of teaching and research in institutions of higher learning in Nigeria through the provision of current books, journals, and other library resources;
- 2) enhance access to academic libraries serving the educational community in Nigeria to global library and information resources;
- 3) enhance scholarship, research, and lifelong learning through the establishment of permanent access to shared digital archival collections;
- 4) provide guidance for academic libraries on applying appropriate technologies used in the production of digital library resources, and;
- 5) advance the use and usability of globally distributed network of library resources.

This project is entitled Information Networking in Nigeria. Exploiting the opportunities in the virtual space requires effective networked environments.

Other benefits of information networking include easier and fast communication by enhancing the location and downloading of materials from the internet as well as locating information on available goods and services through the internet network system popularly referred to as electronic business (e-business). Information networking also enhances writing of documents, reports, newsletters, and sending them to as many people as possible and also receiving the same via the network. It enables people to conduct on-line conferences and seminars (webinars) and partake in a programme of study at a distant center making it possible for students to receive and submit assignments and interact with the lecturers through the network. Information networking enables collaboration among peers or scholars in distant lands thereby creating and strengthening communication of common interests. This engenders exchange of ideas and information that otherwise would not have taken place.

Additional benefit of information networking is the significant enhancement of communication flow through the internet, social media, and electronic mail.

- 1) **The Internet:** This is the mother of all networks. It is a computer based global information system. The internet is made up of interconnected computer networks. Each network may link tens, hundreds, or even thousands of computers, enabling them to share information and processing power, thus, making it possible for people all over the world to communicate with one another effectively and inexpensively (Comer, 2005). This high level of connectivity fosters collaboration, resource sharing, and information access. Internet has tremendous amount of information and data that can be accessed and transferred with ease. It has grown rapidly since its inception in the late 1970s. From few computer linkages to over 400 million of computers being currently connected to it worldwide (Ombu, 2000; Comer, 2005).
 - 2) **Social media:** Social media are mainly components of web 2.0 - the democratic web, which is user-centered, interactive, collaborative, content rich, and social in nature. Social media are web-based applications and sites that are primarily used for online interaction between one another. The advent of these web-based applications transformed the former linear direction of information creation and use to an interactive one such that individuals can create and seek information concurrently. Social media has extensively changed the way people seek, use, share, and communicate information. The flexibility of these media allows users to access and use information contents through communication technologies independent of time, space and location, such that the tendency of self-sufficient in information search and retrieval in users is on the increase. However, the many arrays of information in the web shared through communication technologies are mixed with just anything and consequently, there is a mismatch with what is available and what is needed. The implication of this is that the intricacies of social media do not replace the traditional role of library in information management.
 - 3) **Electronic mail:** Electronic mail (e-mail) is a widely used internet application that enables individuals or groups of individuals to quickly exchange messages even if they are separated by long distances. It is a fast, easy and inexpensive way to communicate with other internet users around the world. Networking enables computers that are connected to exchange messages at a very high speed irrespective of the distance between the computers. The speed is much faster compared with other forms of currently available information transfer systems such as postal mails, fax, telex, etc. (Oketunji, 2001; Comer, 2005). Another advantage of e-mail, as observed by Ombu (2000), is that e-mail message can be received any time irrespective of whether the receiving computer is on or not; if the receiving computer is not on, the message is saved in "virtual memory" in the network of the service provider. The message is automatically transferred to the receiving computer as soon as it is switched on and the appropriate e-mail software is accessed.
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4. Library information networking

Information networking is a household name in libraries in this digital dispensation. It serves as a means of bridging the information gap between libraries, institutions, and countries. As emphasized by Odi (1991), resource sharing activities are paramount to libraries as no library can ever be self-sufficient with its collections to suit the information need of users. The basic function, as a dynamic institution, is the provision of adequate resources and the matching of those resources with the needs of its users. This warrants the coming together of libraries to form library networks or consortia. Omeku (2004) defined library network as a cooperative arrangement between several libraries, for lending book or an electronic network within a library or interconnecting different libraries. Library networks, according to Abubakar (2010), is an omnibus expression to cover cooperation, coordination, interlibrary loans, cooperative acquisition, cooperative storage and processing. Similarly, resource sharing in the digital age "comprises of transactions which a library makes of its materials available to the clientele of another library upon request" (Blakes, 2006). Information networking in libraries serves two important objectives for libraries, especially those in the developing regions which are:

- a. to provide cheap and easy access to needed information across the globe in order to serve the information needs of information users, and
- b. to ensure cost-effective means of managing the library.

The application of information and communication technology (ICT) in resource sharing activities is widely practised. However, resource sharing can be conveniently undertaken with an operational digital library with effective network system.

Historically, information networking before the popularity of computer network in libraries was known as interlibrary loan - a service whereby a patron of one library can borrow limited information resources that are owned by another library. Academic libraries all over the world participate in a cooperative effort to provide articles, books, and other materials to researchers, students, and others. It is meant to augment the library's information resources which is judiciously selected to unquestionably bring value to the work of the university community. However, this practice is inadequate in bridging the gap in information search and retrieval process, as some materials are difficult to obtain, textbook requests are not accepted, and borrowing from other libraries is hindered by distance such that usually it is only libraries in the same location that are in the network of interlibrary loan. With the introduction of computer network into the library, library consortium was formed. According to Singh and Rao (2008), the concept came first from academic libraries for the primary purpose of sharing printed materials. Recently, academic libraries are having consortia to provide common access to electronic resources across the Internet and they are forming these consortia on a state-wide basis. This task is very difficult for a single library. However, by forming a consortium among libraries, it becomes possible to purchase information in stabilized and reasonable prices.

A library consortium is a group of libraries who partner to coordinate activities, share resources,

and combine expertise. These network of libraries metamorphized into a larger array of networks not bounded by distance and expanding the content of services shared through networked arena such as collaborative purchase, resource sharing, expertise among professionals and non-professionals. Library consortia offer significant advantages such as the sharing of resources, and collaboration on shared goals often to enable libraries to deliver higher quality services than they would be able to deliver on their own (Wikipedia, 2018). More importantly, libraries in developing countries could network with those in developed countries granting access to advance research information materials. Consortia have the capacity to grow into something that covers a much larger ground than a simple inter-library loan agreement. As observed in the United States, many consortia have ventured further and developed collaborative integrated library systems. In Nigeria, such was observed in four university libraries of Bayero University, Ahmadu Bello University, University of Ibadan, and University of Port Harcourt. The four Nigerian universities identified their common goal in library services and acquired a library management system called VIRTUA. Consortia are usually between libraries that have common missions, goals and clients and act on those commonalities.

5. University of Port Harcourt Library Network Initiatives

The library of the University of Port Harcourt started her network activities with an e-granary (a CD Rom). This CD Rom was stored in a server in a room in the main library. By networking all the key offices, about 15 points, some staff could access the e-granary resources in their various offices. Before the networking initiative, anyone who wished to access the CD Rom must go to the computer room where the server was housed. Those connected also received notice of meeting, report, announcement, etc. in the virtual space. That is, University of Port Harcourt library's local area network enabled each user on the network to see what was on the other user's computers through his own computer. He could also send whatever information he had on his computer and wanted to share with others connected to the network. As this library waited to be connected to the campus wide network, she established a computer laboratory with about fifteen computers. University of Port Harcourt library then boasted of internet access with a dial-up internet connection with Retell telephone system to which only three computers were connected. This was grossly inadequate for the student and staff populations. Consequently, the library management planned an expansion through a dedicated internet service and a retrospective conversion of her records in anticipation of virtual library management software through the MacArthur Foundation.

Consequently, the University of Port Harcourt library can boast of her own dedicated internet with an expanded bandwidth and a robust website linked to the institutional portal and devoted to library services. The library is currently subscribed to more than 10 electronic databases for staff and students, some of which can be remotely accessed from any of the three campuses and others from the library only. The library has also transited from Card Catalog to Online Public Access Catalog (OPAC), using MARC. Through MacArthur Foundation, the library acquired more ICT equipment, manages her operations and services with Virtua management software, and trained some staff in the aspect of automated library services. Presently, the library has transited from

Virtua to KOHA Library Management System and has updated to include automated circulation and cataloguing services, with other aspects of the library in partial automated state.

6. Implication

Information is power through which the bane of ignorance can be forestalled. More so, the evolving and dynamic nature of information makes it imperative to constantly learn, unlearn, relearn, update, replace, adopt or improve upon previously acquired knowledge. Such knowledge transcends the information resources bounded in any university library. Thus, there is a need for a synergy of libraries across countries. The implication is that other libraries should set up a comprehensive network that would enable them to collaborate with other libraries and numerous databases to provide information resources that is not bounded by bricks and mortar. This highlights knowledge sharing. Worldwide, knowledge sharing is perceived as one of the most convenient and effective way to obtain knowledge (Akparobore, 2015). Fayose and Nwalo (2000), Alegbeleye (2010), and Etim (2010) affirmed that for any university library to perform its functions of supporting research and teaching effectively, there must be basic amenities such as information and communication technologies, automation, networking, and internet among others. Considering the evolved information need of the 21st century, libraries are more valuable than ever owing to the vast knowledge, expertise, community relations skills, found therein. University libraries are, therefore, expected to use technology to network processes to facilitate growth and development of libraries. It is expected that such initiatives would encourage global knowledge sharing to improve mass literacy, enhance quality decision-making, facilitate social changes and serve as an instrument for societal development.

7. Conclusion

Information networking has resulted in better information procession and management. It is necessitated by information explosion which is used to describe the overwhelming speed at which information is being generated and distributed in several formats. It is also brought about by inadequate funds which makes it almost impossible for any single information outfit to acquire every information resource in its various formats as well as increased demand for quality information. Information networking has significantly enhanced information acquisition and dissemination because through it, individuals and institutions are able to share information resources, write documents, reports and newsletters and forward to people connected to the network and receive a feedback. It enables people to conduct on-line conferences and participate in distant learning programmes. It also enables collaboration among scholars in different countries and greatly enhances the flow of information through the internet, social media and electronic mail. In libraries, information networking started as interlibrary loan which has transformed into library consortia in which groups of libraries partners to coordinate activities, share resources and combine expertise. Thus, information networking has contributed immensely in turning the world into a global village.

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