

# Information Explosion and University Libraries: Current Trends and Strategies for Intervention

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**Abstract:** This study examines the causes and effects of information explosion as well as strategies for intervention in university libraries. It identifies the following as causes of information explosion: the invention of printing in the mid-15<sup>th</sup> century, the growth of literacy among the middle classes in the 17<sup>th</sup> and 18<sup>th</sup> centuries, the increasing relationship between information and the competitive economic advantages of nations, and the advent of information and communication technology (ICT). It also examines the effects of information explosion on library users, such as damaged health, bad judgments, and information anxiety. Information explosion also poses challenges to acquisition, cataloguing and classification, and reference services in university libraries. It recognizes that information explosion provides users with an opportunity to select from a wide range of resources. The paper suggests subject specialization among librarians, library cooperation, outsourcing, and use of ICT as strategies for intervention.

## I. Introduction

Information entails data, facts, imaginations, ideas, opinions, and cultural values in a variety of media, including print, audio-visual materials, and electronic formats. In the library context, information includes personal knowledge and external sources such as referrals, interlibrary loan and data banks (Olowu, 2004). The importance of information, especially in the 21<sup>st</sup> century, cannot be over emphasized.

The increasing relationship between information and the competitive economic advantage of nations and multinationals has given rise to the insatiable need for information. Indeed, in modern economy, some factors of production are tied around information or knowledge: knowledge assets (what people know and put into use) and collaboration assets (whom people interact with to create value) (Wikipedia, 2008). According to Berezi as cited by Onu (2005), information is the fifth factor of production. He maintains that “increasing the information component of the input factor mix

definitely improves productivity”. He further asserts the need for adequate, timely, and up-to-date information in making both personal and corporate decisions.

In an academic environment like a university, lecturers want to be abreast with discoveries in their fields of study. They have researches to do and lectures to deliver. Students have a quest for academic excellence. All these need information. Meeting such information needs adequately is a challenge for the university library.

### *1. Information Explosion: Causes*

Information explosion is a term that describes the rapidly increasing amount of published information and the effects of this abundance of data (Wikipedia, 2008). As the amount of available data grows, managing information becomes more difficult.

Information in this context maybe examined on two fronts: flowing information and stored information. Flowing information is that which is transmitted over the airwaves, on the Internet and via the telephone. Stored information is that which is printed on paper, film, and other physical media. The study estimates that almost 800 megabytes of stored information are produced per person per year (Lyman & Varian, 2003).

Katz (2002) reports that the invention of printing in the mid-15<sup>th</sup> century, the wide distribution of books by the 16<sup>th</sup> century, the growth of literacy among the middle classes in the 17<sup>th</sup> and 18<sup>th</sup> centuries, and the 19<sup>th</sup> century’s mass education movement increased both the amount and the demand for information. The invention of electronic media, especially the Internet, has contributed immensely to the information explosion. Information and communication technology (ICT) has played a pivotal role for the emergence of information explosion. If the invention of printing has prompted an increase in information generation, ICT has multiplied it.

To put it in perspective, Katz (2002) further asserts that as early as the mid-18<sup>th</sup> century, people were complaining that there was simply too much to read, too much to know.

### *2. Information Explosion: Effects*

This information explosion has implications to the environment in which we live, to the work place, the academic world, and our own peace of mind. Christian et al. (2003) agrees that as a result of information explosion, we are experiencing a state of “information overload”. When there is too much information to digest, a person is unable to locate and make use of the information one needs. Information overload can therefore be seen as a state in which the volume of information available hinders its usefulness to the individual.

Information overload has adverse effects on the individual. Winkle (1998) has identified the following problems associated with information overload:

- Damaged health
- Bad judgment
- Information anxiety

According to Winkle (1998), studies have linked both decreased vision and cardiovascular stress to information overload. Besides, overconfidence in information sources or the opposite has resulted in bad judgment or “paralysis of analysis”, not being able to discern truth from fact. Moreover, information anxiety is produced by the ever widening gap between what one understands and what one thinks one should understand. It happens when information does not tell one what one wants or needs to know (Wurman, 1989).

However, it is important to note that information explosion is not all negative on users. It provides an opportunity to select needed information from a wide range of resources.

## **II. Information Explosion: a 21<sup>ST</sup> Century Reality**

It is a cliché that people are drowning in too much information. Researchers have tried to quantify the size of the problem. There is abundant statistics, often with no firm basis, but nevertheless, scary. The following statements taken from various websites and articles assert this reality:

- “As much new information will be available in the next decade as has been discovered in the whole human history.”
- “It is estimated that it would take seven centuries to read a year’s chemical literature.”

- “There are 550 billion web-connected documents.”
- “Fifty thousand new book titles appear annually, with 1.5 million books now in print from 20,000 different publishers.”
- “People could read 24 hours per day, 365 days per year and never catch up with what is written.”
- “Almost 800mb of new recorded information is produced per person each year. It would take about 30 feet of books to store the equivalent of 800mb of information on paper.”

Jungwirth (2002) posits that around 1,000 books (beside journals) are published internationally everyday and that the total of all printed knowledge doubles every five years. More information is estimated to have been produced in the last 30 years than in the previous 5,000. The size of the Internet, the World Wide Web in particular, often illustrates the information at the disposal of library users today.

So great is the volume of information today that Wurman and Bradford (1996) called it “information tsunami”. They assert that:

There is a tsunami of data that is crashing onto the beaches of the civilized world. This is a tidal wave of unrelated, growing data formed in bits and bytes, coming in an unorganized, controlled, incoherent cacophony of foam. It is filled with the floatsam and jetsam. It is filled with the sticks and bones and shells of inanimate and animate life. The tsunami is a well of data – data produced at greater and greater speed, greater and greater amounts to store in memory, on tape, on disks, on paper, sent by streams of light faster, more and more and more.

This tsunami of data appears to be on the increase by the day, from the developed world of Europe and America to Asia and Africa.

### **III. Implications for University Libraries**

A university library is part of a university setup. Therefore, it exists to serve the objectives of its parent organization. According to Kumar (2006), a university is supposed to perform the following functions:

- Teaching
- Research

- Publication
- Conservation of knowledge and ideas
- Extension services

According to Wilson and Tauber as cited by Kumar (2006), a well-administered university library directs its activities towards the fulfillment of the university objectives.

Ogunsola (2004) admits that university libraries have long been recognized as the “heart” of their universities. University libraries are different from other types of libraries because of the peculiar academic needs of the clientele they serve. Its users include professors, other cadres of lecturers, undergraduate and postgraduate students, etc. The university library’s collections, organization, and services are geared towards meeting the research and academic needs of the members of its community.

To fulfill their mission of supporting the educational objectives of their parent bodies, university libraries carry out the following functions:

- Selection and acquisition of learning resources (both print and non print)
- Organization of acquired resources (cataloguing and classification)
- Reference and information services
- Documentation and bibliographical services
- User education programs, including Readers’ advisory service
- Orientation courses and lectures
- Research support
- Consultancy service
- Administration and management

Information explosion has implications for some of the above-listed functions, especially selection and acquisition of learning resources, organization of acquired resources, and reference services, because university libraries have limited funding and high user expectations. Ogunsola (2004) observes that since the onset of the current recession, the grants universities have received from governments are not commensurate with the rapid growth of faculties, departments, staff, and

students. It must be pointed that university libraries have not been isolated from the financial problems of their parent bodies.

*1. Information Explosion and Collection Development in University Libraries*

American Library Association (ALA) has defined “library” in its *Glossary of Library and Information Science* (1983) as:

A collection of materials organized to provide physical, bibliographic and intellectual access to a target group, with a staff that is trained to provide services and programs related to the information needs of the target group.

“collection” is a key word in the above definition of “library”. Without it, the library will be “toothless”. Chen (1998) asserts that a library’s collection development is a continuous process and responds to the needs and goals of its users. It includes not just the policy of collection development itself but also the procedures of selection, acquisition and evaluation.

In the world of academics in which the library serves, latest and right information is the key for personal and professional development. In the face of information explosion, selecting and acquiring the latest and right information becomes an uphill task for the acquisition librarian.

The amount of material that is available for purchase has increased more than the library’s ability to purchase.

The following table further illustrates this fact:

<b>Year</b>	<b># of Serial Titles Published as reported by Ulrich</b>
1986	103,700
2002	164,000

(Source: Association of Research libraries)

In the above table, the percentage change in the number of serials published in 1986 and 2002 is 58%.

Another change in journal publishing is the growing number of titles available online. There were 27,083 electronic titles in 1991 and 110,000 in 2002 according to the *Directory of Electronic Journals, Newsletters and Academic Discussion Lists* maintained by the Association of Research Libraries (ARL, 2003).

Book publishing shows a similar dramatic increase in volume. The Association of Research Libraries (ARL) quoted UNESCO as saying that over 850,000 books were published worldwide in 1996. Data from the top 15 producing countries reveals that book production increased 50% between 1985 and 1996.

The impact of information explosion on collection development in university libraries is even more telling due to the inflation rate and limited library budget in comparison with the increase in resources that need to be acquired. According to the Association of Research libraries (2005), between 1986 and 2005:

- The consumer price index increased 78%
- Monograph unit costs increased 81%; Library expenditures for monographs increased 59%; and actual numbers of monographs purchased decreased 7%
- Serials unit costs increased by 167%; Library expenditures for serials increased a whopping 302%; and actual number of serials purchased increased by only 42%

From the above analysis, it is clear that the challenge of information explosion with regards to collection development is enormous. The acquisition librarian is faced with the challenge of what to select from the ever-increasing avalanche of information in different formats.

## *2. Information Explosion and Reference Services*

Reference service consists of professional personnel, assisting individual library users in pursuit of information (Olanlokun, 2003). In university libraries, students need assistance in finding materials for their term papers and assignments whereas teachers and researchers need assistance in finding materials for their research. Lawal (2002) maintained that in general, reference departments serve as the link between the library and its immediate clientele. The main aim is to provide a wide range of

services and facilities which will enhance exploitative use of the literature through the concepts of assistance and self-direction.

Since the first reference librarian came into being in Sumer about 5,000 years ago, the day's activities at the reference desk have been shaped by questions. The librarian, from the early "keeper of tablets" to the modern "information scientist", is expected to provide precise answers to sometimes sloppy queries (Katz, 2002). How and where to get the right answers for these sloppy queries in an age of information explosion is a challenge for the reference librarian in the 21<sup>st</sup> century.

Katz (2002) submits that it is becoming increasingly apparent that finding specific bits of data among the mass of undifferentiated information is a great challenge. And who will meet that challenge? Well, for one, the reference librarian. Reference Librarians get answers to questions from information sources. Less than a decade ago, information sources were synonymous with printed books. Today, the definition is turned on its electronic head. There is one to three billion online websites which may or may not contain useful information. Indeed, the organization of these various media coupled with the management of facilities so as to promote document delivery constitutes one of the new challenges facing the reference librarian in this era (Abioye, 2004).

### *3. The Challenge of Cataloguing*

With the rate of information generation and acquisition, the cataloguer is faced with the challenge of meeting the demand of the job. Aside from this, the Internet is a "chaotic library" because it displays no discernible order, classification, or categorization. It, therefore, poses a problem for cataloguers. As opposed to "classical libraries", no one has invented a cataloguing standard (such as DDC or LC) for information accessed through the Internet.

## **IV. Strategies for Intervention**

### *1. The Role of the Librarian*

Librarians are generally very skilled in obtaining information but less inclined to pass judgment on it. That is, the evaluative role of the librarian has been neglected in past years. The role of the



librarian, then, must change from that of a locator, to an information evaluator. Included in this is the instructional role of the librarian. The American Library Association (ALA, 2004) recognizes this fact in its guideline statement:

With increase in the availability of information, user expectations have risen substantially. Librarians are increasingly expected to assist users in evaluating the information they receive. This change evinces an evolving role for librarians, one that suggests a closer partnership with users and a great responsibility for the educational process.

With the challenges of information explosion and ICT, there is a shift from the traditional process of providing information to modern approaches to library and documentation services. The concepts of virtual libraries, digital libraries, paperless systems, electronic books (e-books), CD ROMs and ICT all suggest to libraries and librarians that it can no longer be the era of meek and apologetic librarianship as before but the new era of aggressive and active librarianship (Onwubiko, 2006).

Also, the librarian should be willing to teach information seekers how to evaluate sources themselves. Ezzo and Perez (2003) outline the following as ways through which librarians can help users in dealing with information explosion:

- Get out from behind the desk and interact with patrons.
- Help users understand the search process.
- Teach users critical thinking and evaluative skills.
- Beware of the diversity and needs of the library patrons.
- Choose quality of resources over quantity.

For the librarian to be able to carry out these functions, he or she must be qualified academically. Kumar (1998) advocates that due to the nature of work and functions performed, a librarian in a university library is expected to possess high academic and professional qualifications. In an era of information explosion, many have called for librarians to train as subject specialists. In this regard, Kumar insists that a librarian in a university must possess a master's degree in a discipline other than library and information science and a first degree in library and information science. However, a first degree in a subject area and master's in librarianship is acceptable. According to Katz (2002), this is particularly important for reference librarians, who need not only skilled appreciation of reference sources in general but understanding better than anyone else how to dig out data from a given

subject field. Specialization in a specific subject area has become particularly important for librarians in the 21<sup>st</sup> century.

## *2. Subject Specialization in a University Library*

Ogundipe (2005) defines subject specialization system as one in which the working arrangement in a university library is along subject lines as against the functional lines of the traditional practice. The specialist librarian has considerable specialized knowledge and a strong clientele orientation.

Although he or she may be located in one or another library department, his or her combination of activities – collection development service and interest in bibliographical control, carries him or her across departmental lines. One of the advantages claimed for the system of subject specialization is that it provides an integrated approach to library work as selection, classification and reference work for a particular subject, all of which are handled by the same person.

Hoolbrook (1972) avers that a subject specialist librarian may be seen as a member of library staff appointed to organize library services in a particular subject field. He further asserts that increasing and growing bibliographic output, the interdisciplinary nature of subjects and information explosion are creating greater needs for dissemination of information by subject specialists.

Departmentalizing the university libraries along the line of subject specialization is not common in Africa. Ogundipe (2005) states that the libraries of the universities in Zambia and Benin have practiced a form of this system at various times. In West Africa, particularly Nigeria, some library schools run their undergraduate library science programmes with provision for subject specialization. Examples include Bayero University Library School, Kano; Nnamdi Azikiwe University Library School, Awka; and University of Nigeria Library School, Nsukka.

The future of subject librarianship is being challenged by technological advances and funding pressures (Hardy & Corral, 2007). However, it has a significant and expanded role to play in contemporary higher education with acknowledgement of the key role of librarians in supporting information literacy development (Pinfield, 2001).

## *3. Resource Sharing*

In a review of the library and information cooperation, the APT Partnership (1995) in Britain defines library cooperation as:

The creation and operation of equitable, that is “fair”, collaborative arrangements between libraries and information providers which enhance the common good through making information available to all potential users (without obstacle to access by reason of cost) which is more extensive or more valuable to the user and/or is of lower cost to the collaborating providers.

In handling information explosion and overload, libraries must cooperate and collaborate with each other. Library cooperation helps to reduce costs, as it enhances users’ accessibility to more materials at little or no cost to the library. This is made possible either through computer networking or referral services. Users also have access to the expertise of personnel who may not necessarily be staff of their own libraries.

A commendable effort at library cooperation to help libraries in dealing with information explosion is the creation of the Online Computer Library Centre (OCLC) based in Ohio, United States of America. OCLC is “a nonprofit, membership, computer library service and research organization” (OCLC, 2010). Since its founding in 1967 by university presidents in Ohio, OCLC’s mission has been to further access to the World’s information and reduce library costs. As of April 2005, more than 52,000 libraries participate in a worldwide co-operative that extends to 95 countries (Wikipedia, 2008). Libraries use OCLC services to help manage their collections and provide reference services to end-users.

More cooperation needs to be encouraged and established among libraries, especially in the third world countries where economic crisis is hampering academic activities in universities and their libraries as well.

Library consortium is a form of library cooperation. The basic premise of consortia is that by working through consortial arrangements, libraries can achieve more than could be achieved individually.

#### *4. Outsourcing*

Outsourcing is the term given to the practice of contracting the services of a company outside the local library. Bordeianu and Benand (1998) describe outsourcing as a new name for the old practice of “contracting out” for services that organizations choose not or may not be able to provide internally. Organizations contracted by libraries carry out services or provide services for use by library users. Subscribing to online databases is a form of outsourcing. Adeyemi (2008) outlines these databases to include Journal storage (JSTOR), EBSCO, OARE, Science Direct, etc. These databases give subscribing libraries access to millions of articles and abstracts in journals. Though the subscription prices for these databases appear high, it is cheaper than subscribing to these journals directly from the publishers.

### *5. Use of ICT*

Use of ICT can help university libraries cope with the challenges of information explosion. For instance, the reference librarian can attend to the queries of numerous users through the electronic mail. The availability and accessibility of electronic information resources is made possible through ICT. Such resources as online journals, e-books, CD-ROMs are now accessible to library users. Hundreds of thousands of journals and e-books are available online through such databases as EBSCO, JSTOR, AJOL, etc., thus helping acquisitions librarians keep track of published materials as well as conserving space in the library where hard copies of such materials would have been kept.

Through ICT, cataloguers can now make use of online catalogues of other libraries as well as online classification schemes. This makes their jobs more effective.

However, ICT has its own challenges. It is capital intensive. Facilities such as computers and software have to be acquired and installed. Trained personnel may need to be employed. Librarians may need retraining. There is need for stable electricity. All these demand financial resources. For libraries with small budgets, it will be a hard decision whether to embrace ICT or not.

## **V. Conclusion**

Information explosion is indeed a 21<sup>st</sup> century reality. Its impact on library services and costs is enormous. University libraries are affected in the variety of services they provide to the users.

Libraries must, therefore, have strategies in place to effectively manage the consequences of information explosion. They must also take full advantage of ICTs, providing users with access to a wide range of resources on any subject and opportunity to retrieve relevant information. Part of the strategy must be the training of librarians to be subject specialists, who will help users to filter “chaff” from “substance”.

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