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**Service Quality of Digital Libraries and Users Satisfaction**

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**ABSTRACT**

*This paper considered the service quality of digital libraries and user's satisfaction. Digital libraries are electronic library, virtual library, and a library without walls, it is not confined to a particular location or so called building. It is virtually distributed all over the world. Likewise, this paper reviewed some of the advantages of digital library such as: no physical boundary, round the clock availability multiple accesses etc, and some of its disadvantages of including: copyright, speed of access, bandwidth, efficiency etc. With the important features of DL services, the simplicity of accessing online information and the performance of DL utilities have become of paramount importance. The advent of DL services, the quality of service (QoS) has become crucial in assessing the efficacy of service delivery. Much of literatures have showed that the level of QoS provided by digital service providers directly affects the perception and satisfaction of end-users. Conclusively, within the DL background, user's satisfaction is closely linked to their experience with DL services. Thus, one of the recommendations made in this paper was that considering how the interfaces of DLs can support different users to accomplish their tasks is important. The DLs management should have a global approach in which all users are presented with the same interface, regardless the diversity of users' preferences.*

**KEYWORDS: Digital Libraries, Service Quality and Users Satisfaction**

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**Introduction**

The network is of great importance to libraries to tackle today's burning issues, such as knowledge overload, user diversity, and financial crunch, whereby digital service subscription depends on consortia broader access to digital services at a consequently lower cost (Sinha and Deb, 2015). The term electronic library resources define the information processed and digitally driven using hardware and software that offer information that can be accessed by digital electronic users through remote information provider networks or mounted locally by digital library (DL) managers. In reality, it transfers the citadel of historically getting information to a personalized, adaptable, and synergistic culture based on information, communication, and technology {ICT} (Eze, Chinedu-Eze and Bello, 2018). Digital libraries are mainly designed to solve specific library problems. The online collection includes DL e-books, e-newsletters, e-references, theses, and dissertations (Salvador, Bezerril, Mariz, Fernande, Martins and Santos, 2017). The factors affecting user satisfaction in a DL context can be categorized as ease of access, few download exceptions, and limitations, simplicity of the DL interface design, quality of interaction process, Internet performance, quality assurance service, and ease in communication provided for by a social network (Dukic' and Stri'skovic', 2015).

Libraries worldwide are quickly transforming due to the ongoing growth and application of ICT (Masrek and Gaskin, 2016). It is important to note that while the barriers to accessing DL resources may be similar in different societies, there are more in developing countries than in developed ones. The notable obstacles in literature are poor information and digital literacy skills, poor Internet connectivity, poor ICT infrastructure, information overload, vast amounts of irrelevant information, licensing limitations on access to the DL collection, lack of generic e-resource portal interfaces, preference for print assets over electronic resources, discouraging e-resource use by academic staff, user authentication, download delay, lack of comprehensive ICT and searching skills among library staff, high cost of affordable online access, and low organizational budget for library departments (Adams and Bonk, 2014). Most library users prefer popular web search engines to library-driven systems; consequently, most library services continue to be underused. Librarians, therefore, need to adjust what they learn, how they function, and their effectiveness (Hong, Thong, Wong and Tam, 2001). Nonetheless, the absence of training for staff and other library users is a limiting factor in the accessibility and use of e-resources as users face difficulties in assessing services and the staff may lack adequate expertise to assist the users (Agaba, Kigogo-Bukenya and Nyumba, 2011).

### **Concept of Digital Libraries**

Digital Library also known as online library, internet library, digital repository, or a digital collection is a special library with a focused collection of digital objects that can include text, visual material, audio material, video material, stored as electronic media formats (Mora, 2013), along with means for organizing, storing, and retrieving the files and media contained in the library collection through the internet (Lanagan and Smeaton, 2012). It electronic content may be stored locally, or accessed remotely through computer networks. The first published use of the term digital libraries was in 1988 report to the Corporation for National Research Initiatives. The term was first popularized by the NSF/DARPA/NASA Digital Libraries Initiative in 1994 (Trivedi, 2010). Digital libraries can vary immensely in size and scope, and can be maintained by individuals, organizations, or affiliated with established physical library buildings or institutions, or with academic institutions. There are a numerous definitions of digital libraries. According to Digital Library Federation in 1998 defined digital libraries as organizations that provide the resources, including the specialized staff, to select, structure, offer intellectual access to, interpret, distribute, preserve the integrity of, and ensure the persistence over time of collections of digital works so that they are readily available for use by a defined community or set of communities (Shiri, 2003). The DELOS Digital Library Reference Model in 1997 defined a digital library as an organization, which might be virtual, that comprehensively collects, manages and preserves for the long term rich digital content, and offers to its user communities specialized functionality on that content, of measurable quality and according to codified policies. (Trivedi, 2010)

With the assumption that digital libraries are electronic library, virtual library, library without walls, its characteristics have been gleaned from various discussions about digital libraries, both online and in print (Arms, 2005; Graham, 2005a; Chepesuik, 2007) as:

- ❖ Digital libraries are the digital face of traditional libraries that include both digital collections and traditional, fixed media collections. So they encompass both electronic and paper materials.

- ❖ Digital libraries also include digital materials that exist outside the physical and administrative bounds of any one digital library.
- ❖ Digital libraries include all the processes and services that are the backbone and nervous system of libraries. However, such traditional processes, though forming the basis digital library work, will have to be revised and enhanced to accommodate the differences between new digital media and traditional fixed media (Cleveland, 2008).
- ❖ Digital libraries ideally provide a coherent view of all of the information contained within a library, no matter its form or format
- ❖ Digital libraries serve particular communities or constituencies, as traditional libraries do now, though those communities may be widely dispersed throughout the network.
- ❖ Digital libraries require both the skills of librarians and well as those of computer scientists to be viable.

For librarians, this definition of a digital library, and these characteristics, are the most logical because it expands and extends the traditional library, preserves the valuable work that they do, while integrating new technologies, new processes, and new media (Cleveland, 2008).

### **The Quality of Service in Digital Libraries**

With the advent of DL services, the quality of service (QoS) has become crucial in assessing the efficacy of service delivery. Diverse models and structures have been suggested to analyze the QoS in DL systems (Ahmad and Abawajy, 2014). Nevertheless, the prevalent concentration of work in QoS for the DL is about the extent of the user experience perspective. Ahmad and Abawajy (2014) addressed different dimensions that are from the perspective of digital service providers. The model shows that the level of QoS provided by digital service providers directly affects the perception and satisfaction of end-users. The other hypothesis of the design of electronic libraries was suggested by DeLone and McLean (2004) to investigate how the reliability of the process and data provided affected the satisfaction of users. Wixom and Todd (2005) also established that information and device reliability, perceived utility, ease of use, and application behavior of data storage systems affect user satisfaction. Moreover, the work by Zhang (2010) indicates that the system and quality of information are key determinants of the happiness and sense of community of social networking users. Tu and Hwang (2018) addressed the role of sensing technologies and learning strategies in library-associated mobile learning. The study aimed at investigating issues like the type of sensing or location-based technologies and learning strategies employed in library-supported mobile learning. The results showed that advancement and popularity of mobile, wireless network, and sensing technologies have further provided a more convenient and effective environment for accessing library facilities and resources.

A study conducted at the University of Houston Libraries by Guajardo, Brett and Young (2017) conveyed the evolution of discovery systems in academic libraries. The authors concluded that, for several years, libraries have adopted discovery systems to provide search experiences that reflect user expectations and improve access to e-resources. The University of Houston Libraries has kept pace with this evolving trend by pursuing other discovery options which include an open-source tool, a federated search product, and a two-index-based discovery system. The

important criteria for assessing discovery systems and valuable lessons that may be applied in future system-evaluation processes and implementations should be identified in pursuit of better options for users and improved access to e-resources. A recent study by Oh and Colon-Aguirre (2019) on the perceptions for use of Google Scholar and academic library discovery systems reveals that the perceived comprehensiveness, subjective norm, loyalty, and intended use of academic library discovery systems are higher than Google scholar, while at the same time, the perceived ease of use, satisfaction, and system quality of Google Scholar were higher than those of academic library discovery systems, implying that users' satisfaction with the DL is the key indicator for the quality of DL services.

## **Advantages and Disadvantages of Digital Library**

### **Advantages of the Digital Library:**

A digital library service is a new alternative to improve the services that have in library by using new technology. The using of technology will help to make all facilities and services that have in library become more advanced and progressive for this era technology. Although a digital library is not confined to a particular location or so called building it is virtually distributed all over the world. The user can get his/her information on his own computer screen by using the Internet. Actually it is a network of multimedia system, which provides fingertip access. Thus, Digital Library (2018) highlighted the following major advantages of digital libraries.

**No physical boundary:** The user of a digital library need not to go to the library physically, people from all over the world could gain access to the same information, as long as an Internet connection is available.

**Round the clock availability:** Digital libraries can be accessed at any time. 24 hours a day and 365 days of the year

**Multiple accesses:** The same resources can be used at the same time by a number of users.

**Structured approach:** Digital library provides access to much richer content in a more structured manner i.e. we can easily move from the catalog to the particular book then to a particular chapter and so on.

**Information retrieval:** The user is able to use any search term bellowing to the word or phrase of the entire collection. Digital library will provide very user friendly interfaces, giving click able access to its resources.

**Preservation and conservation:** An exact copy of the original can be made any number of times without any degradation in quality.

**Space:** Whereas traditional libraries are limited by storage space. Digital libraries have the potential to store much more information, simply because digital information requires very little physical space to contain them. When the library had no space for extension digitization is the only solution.

**Networking:** A particular digital library can provide the link to any other resources of other digital library very easily thus a seamlessly integrated resource sharing can be achieved.

**Cost:** The cost of maintaining a digital library is much lower than that of a traditional library. A traditional library must spend large sums of money paying for staff, book maintains, rent, and additional books. Although digital libraries do away with these fees, it has since been found that digital libraries can be no less expensive in their own way to operate (Warr and Hangsing, 2009).

### **Disadvantages of the Digital Library**

The computer viruses, lack of standardization for digitized information, quick degrading properties of digitized material, different display standard of digital product and its associated problem, health hazard nature of the radiation from monitor etc. makes digital libraries at times handicap. Although new technology has brought many advantages for digital library, but simultaneously it also has certain disadvantage (Jadhav, 2011) as:

**Copyright:** Many book authors do not want to sell their books in digital form. It happens because of the copyrights issue problems. Digital library materials will be very vulnerable to copyright infringement problems. If there is no system that protects the digital collection, copyright infringement will be very easy to do for example by copying the file. In addition, data in digital form will be easier to expose to plagiarism if not protected.

**Speed of access:** As more and more computers are connected to the Internet its speed of access reasonably decreasing. If new technology will not evolve to solve the problem, then in near future Internet will be full of error messages.

**Initial cost is high:** The infrastructure cost of digital library i.e. the cost of hardware, software; leasing communication circuit is generally very high.

**Bandwidth:** Digital library will need high band for transfer of multimedia resources but the band width is decreasing day by day due to its over utilization

**Efficiency:** With the much larger volume of digital information, finding the right material for a specific task becomes increasingly difficult.

**Environment:** Digital libraries cannot reproduce the environment of a traditional library. Many people also find reading printed material to be easier than reading material on a computer screen.

**Preservation:** Due to technological developments, a digital library can rapidly become out-of-date and its data may become inaccessible.

### **The Satisfaction of Users with Digital Library Systems**

User satisfaction assessment and preservation is an essential part of library quality management. Within the DL background, satisfaction refers to “feeling happy with the DL in helping to complete a task” (Ojakaa, Benard and Dulle, 2014). Consumers’ DL satisfaction is closely linked to their experience with DL services. Identifying the typical standards of DL providers requires (i) comprehensiveness, including everything; (ii) accessibility, everything available immediately; (iii) instant-gratification, response speed; (iv) software capacity, seamless; (v) user- friendliness, single interface; and (vi) various formats, wording, images, and audio (Maczynska, 2017). On

the other hand, when assessing DL, user satisfaction focusing on the interface and functionality offered by the DL is very important (Masrek and Gaskin, 2016).

**Information Quality:** Several academicians and re- searchers have recognized the importance of data reliability as a key component in the analysis of an effective computer- based data system. Information quality is essential in DL's point of view to support information needs. As a result, its attributes are usually associated with consistency, design, timeliness, currency, reliability, completeness, accuracy, and significance (Balog, 2011). Therefore, the quality of information significantly affects the satisfaction of DL users.

**System Quality:** System quality affects the perception of users of the performance of a DL in knowledge assortment and delivery. In the development of information systems, the quality cycle of the systems is a strong determinant for user satisfaction in various contexts. Accessibility, accuracy, reliability, and quality are the key attributes of DLs performance measurement systems (Vinagre, Pinto and Ochoa, 2011). Quality, accessibility, and consistency ensure the DL requires remote access to the infrastructure to access information wherever and whenever. This also ensures that the DL is accurate and functionally usable over time. When using the DL to search for information, effectiveness is associated with the quality, accuracy, and completeness of users. Considering the findings of Masrek and Gaskin (2016), the quality performance of the DL's software dramatically affects satisfaction.

**Service Quality:** User perception of the performance of a DL in the processing and distribution of information is characterized by service quality. As with information quality and applications, earlier studies show strong support for the contribution of the QoS to user satisfaction with DL. Different service quality models have been developed by scholars to test the DL. For example, DigiQUAL's (Kyrillidou and Giersch, 2005) and LibEval (Balog, 2011) designs are available. Other authors investigated DL service quality attributes or measurements in addition to these models (Vinagre, Pinto and Ochoa, 2011). One of the prominent qualities of digital service performance is accession, reliability, accessibility, and responsiveness. Digital library's service quality factor is very usefulness influences in the acceptance of DLs by users (Ramayah and Lee, 2012). Other studies have however shown that the perceived value is a strong indicator of satisfaction (Lwoga, 2013).

**Perceived Ease of Use:** The perceived ease of use is defined as the degree to which an individual believes that it would be effortless to use a particular system (Davis, 2009). In this context, user-friendliness indicates a belief that using DL would require minimal effort. Literature also indicates that accessibility is sometimes related to ease of use (Kuzma and Moscicka, 2019). Where it is difficult to access a DL, users tend to consider it difficult to use and on the other hand, users are more likely to see it as user-friendly when it is readily available (Jeong, 2011). Other library researchers found that online public access catalog (OPAC) satisfaction was related to ease of use (Xu and Du, 2018). Based on these findings, the perceived ease of use is thought to have a positive effect on satisfaction.

## Conclusion

This paper intended to review the user's satisfaction of the digital libraries service quality. The review showed that the digital libraries are electronic library, virtual library, and a library without walls. It focuses on the collection of digital objects that includes text, visual material,

audio material, video material, stored as electronic media formats, in which its content can be stored locally, or accessed remotely through computer networks. Nonetheless, user's satisfaction assessment and preservation is an essential part of library quality management. Within the DL background, user's satisfaction is the feeling of happiness with the DL in helping to complete a task. Thus, consumers' DL satisfaction is closely linked to their experience with DL services. Therefore, library user's dimension plays the most significant role in DL systems improvement.

### **Recommendations**

Based on the review of this paper, it was deemed necessary to recommend that:

1. Considering how the interfaces of DLs can support different users to accomplish their tasks is important. The DLs management should have a global approach in which all users are presented with the same interface, regardless the diversity of users' preferences.
2. Digital library managements have a responsibility to accommodate all users' needs, thus they should provide the necessary help to support users' information needs and minimize the cost of fees in assessing information.
3. Digital library managements should increase on their efficiency due to the fact that much larger volume of digital library users increases daily to help the users find the right materials at the right time without any difficulties.

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