

DIGITAL LIBRARY ROLES IN EDUCATIONAL AND CULTURAL DEVELOPMENT: CHALLENGES AND THE WAY FORWARD

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ABSTRACT

Digital library is understood to be an electronic collection of real or virtual resources which are hitherto available elsewhere. They may appear in form of whole work which can be accessed holistically through cognitive or affective engagement. Digital libraries provide opportunities for widespread dissemination of information in a timely fashion. With this development, access to information in a networked world is now concerned of many people. If this is true, what then is the role of digital libraries especially as far as educational and cultural developments are concerned and what challenges are faced by digital libraries. These are the questions answered in this paper. Hence, the paper examined digital libraries and considers its roles in educational and cultural development, the services offered by digital libraries, the types of today's digital libraries, the challenges it's currently facing and the possible way forward.

Keywords: Digital library, Educational development, cultural development, Information access, information dissemination, digital scholarship, digital commons.

INTRODUCTION

Digital library is understood to be an electronic collection of real or virtual resources which are hitherto available elsewhere. They may appear in form of whole work which can be accessed holistically through cognitive or affective engagement. Through the digital library, online or offline access to the materials organised and housed including multimedia and multilingual data is allowed. Digital libraries provide opportunities for widespread dissemination of information in a timely fashion. There are numerous definitions of "digital library" but a consistent characteristic across all definitions according to Fox, Hussein, Madalli and Cassel (2003) "is an integration of technology and policy. This integration provides a framework for modern digital

library systems to manage and provide mechanisms for access to information resources. This involves a degree of complexity that is evident whether considering: the collection of materials presented through a digital library; the services needed to address requirements of the user community; or the underlying systems needed to store and access the materials, provide the services, and meet the needs of patrons”.

Access to information in a networked world is now concerned of many people. As Borgman (2000) emphasised, access to information is basic for constructing a global information infrastructure, the digital library. This author goes on to state that Information resources are essential for all manner human activities such as commerce, education, research, participatory democracy, government policy and even leisure activities. Access to information based on all these is at the centre of the discontinuity-continuity debates. It has been argued that computer networks, digital libraries, electronic publishing, and similar development will result in a radically different form of information access. The technologies that create, distribute and preserves will experience dramatic change, so also is information institutions including the libraries, archives, museums, schools and universities. Already, digital libraries are now the global information infrastructure that is making access to information easier. If this is true, what then is the role of digital libraries especially as far as educational and cultural developments are concerned and what challenges are faced by digital libraries. These are the questions answered in this paper. Hence, the paper examined digital libraries and considers its roles in educational and cultural development, the services offered by digital libraries, the types of today’s digital libraries, the challenges it’s currently faced and the possible way forward.

LITERATURE REVIEW

The digital library is dependent on the Internet and the intranet. The Internet ensures the connection of the digital library to other networks around the world. The intranet is an internal network serving the organisation or institution including educational institutions such as colleges, polytechnics and universities. The Internet and intranet use networks, computers software and hardware to function. Therefore, ‘digital libraries are characterised by globally distributed, interoperable, content rich systems’ (Griffin, 1998). It should be noted that libraries function as information centres, learning centres, training centres, and publication centres. This environment requires special services such as storage and organisation, search capabilities, retrieval, virtual references, security, digital scholarship, etc. Furthermore, a digital library may be construed as a managed collection of information linked with services where information is stored in electronic cum digital formats which are accessible over a network. It could be noted from this definition that the information managed. Therefore, a continuous flow of data sent from a satellite to the world is not a library.

The data in question, when organised systematically become a digital library collection. (Arms, 2000). In terms of features, digital libraries consist of numerous collections of information used by various users. Digital libraries vary in size from small to large. They can use any form of computing gadget and any suitable software. The underpinning theme is that information is arranged on computers and available over a network with procedures to select the materials in the collections, to arrange it, make it available to users, and to achieve it. Digital libraries are different from the traditional libraries, however, there are some similarities between them. Sifting from traditional libraries to digital libraries is not merely based on technological changes but the change in paradigm by which people access and interact with information. Going by the position of Reedy, Ager, Chellappa, Croft, Davis-Brown, Mendel, and Shamos

(1999), a traditional library is characterized by “its emphasis on storage and preservation of physical items, particularly books and periodicals, cataloguing at a high level rather the detail bibliometric information such as author and subject indexes as against to full texts, browsing based on physical proximity if related materials e.g., books on sociology are near one another on the shelves and passivity; information is arranged in one place; users must travel to the library to learn what is there and make use of it. In contrast, a digital library differs from all of these. It has emphasis on access to digitized materials wherever they are existing and can be located, with digitalization eliminating the need to own or share a physical items, cataloguing down to individual words, browsing based on hyperlinks, keywords, or any defined measure of relatedness; materials on the same subject do not need to be near one another in any physical sense., broadcast technology; user need not visit a digital except through remote access. As Reedy et al (1999) indicated, the library exists anywhere they can be accessed such as home, school, office, or in a car.

As emphasised by Arms (2000), “people do not change because new technology is invented. They invent information that has to be arranged, stored, and distributed. They still need to find information that others have created and use for study, reference, or entertainment. However, the form in which the information is expressed and the methods are used to manage it are greatly influenced by technology and this creates transformation. Every year, the quantity and variety of collections available in digital forms grow, while the supplementary technology continues to improve. Consequently, these changes are facilitating fundamental alterations on how people create information and how they use it’. In the following sections, the paper will be looking at global information infrastructure as digital libraries, the opportunities and potentials offered by digital libraries, the role of digital libraries in educational development, the challenges of digital libraries and the possible way forward.

Now that digital libraries are common place around the world, the essential question to ask is that; of what potentials are these libraries to the users and patrons at large? The next section below provides an answer to this question. Arms (2000) highlighted the potential benefits of digital libraries. These are bringing library to the user, the use of computer power for searching and browsing, opportunities for information sharing, easy way of keeping information current, readily available information, and possibility of new form of information. These are now discussed in detail as follows:

The opportunity of the digital library in bringing the library to the user: Digital libraries house different collections of information used by many various users. All people anywhere anytime can use any Internet-connected digital device to search all of human knowledge. Via the Internet, they can access knowledge in digital collections created by traditional libraries, museums, archives, universities, government agencies, specialized organizations, and even individuals around the world. Digital library now makes information accessible to the users either at work or in the home thereby making it easier to use. The availability of digital library on the desktop of users has reduced the necessity of visiting the library building. Wherever there is personal computer connected to the network, access becomes unlimited.

Using computer power for searching and browsing: It is easy to search and browse using the computer. Print documents are easy to read, but finding information stored on paper can be a daunting task. Instead of looking through all form of catalogue before locating information one is searching, computer is now making it easy to locate information within a twinkle of an eye. One thing that is noted about digital libraries is that there is availability of useful materials that

readers can discover by coincidence. Mostly, computer systems are better in finding information than manual method. However, they are not as easier as everybody like them to be, however, there is improvement in terms of becoming more user-friendly than before. Computers are useful for reference work that involves repeated leap from source of information to the other.

Sharing of information: Digital libraries now making sharing of information possible. Digital libraries provide opportunities for widespread dissemination of information in a timely fashion. Putting digital information on a network makes it feasible for everyone. Most digital libraries or electronic publications are managed at a single central site though with a few duplicate copies technically stored around the world. There is a considerable improvement over quality physical duplication of used materials or the difficulties of unique material that not accessible without travelling to the location where they are stored.

The easy way of keeping information current: On this point, Arms (2000) emphasised that important information needs to be made available continually. The author pointed out that materials are difficult to update because the entire documents must be reprinted; all copies of the dated version must be tracked and substituted. Making information current is less tedious when the original version is electronic format and stored on central computer. One of the advantages of the digital libraries is currency, i.e. the information is up to date. Currency is dependent on resources for maintenance. Apparently, it is important that dates of creation and revision are carried on digital library documents. However, users tend to regard digital information as being current, which poses an extra responsibility for the creators of digital libraries while users of print-based library are prepared to accept a 3-year-old reference work for what it is, and accept that it may not have information on recent changes in the field; in the digital environment a resource that had not been updated for 3 years would be dismissed as out of date. Most libraries make provision for online text of reference works such as directories, encyclopedias whenever revised editions are received from the publishers, they are installed on the library's computer. The new versions are available instantly. The Library of Congress has an online collection called Thomas that contains the latest drafts of legislation currently before the US Congress: This change continually.

Readily availability of information: Available information resources must be differentiated from the accessible ones. Availability of information sources means ensuring their presence in libraries for immediate use. In the case of traditional libraries, information materials may be available, meaning that the library has acquired them, but they may not be accessible to those who need them for whatever reason. The reverse is the case for digital libraries. Information in any format is readily available. The gate of the digital library is never closed but rather remain open 24/7. Arms (2000) in a report of a study at a British University, revealed that about half of the usage of a library's digital collection has been used when the library buildings were closed. However, it was emphasised that computer system are not perfect but can fail and network may be slow or unreliable. Compare to traditional library, information is much more likely to be available when and where the users want them.

Possibilities of New forms of information: Utilising new technology opens up new possibilities. Libraries can be not only more but also better than in the past. We see this first and foremost in the collections, in the services offered and in the collaboration with other sectors in the community. With new digital libraries technology, it is much easier to integrate different collections and to give the user access to new, virtual collections. The individual library's

service to the user is less dependent upon having everything in the stock itself since now the user can search through many libraries. These virtual collections will appear more complete to the user and the reform also seem better in quality. Digital libraries also create the conditions for user-directed services, specially designed for a particular type of user in a given context. It is easy to appreciate that a historian would require a different interface with a photographic collection on the Internet than would a school pupil. Arms (2000) explained that most of the information stored in conventional library is printed on paper, yet print is not always the best way to record and disseminate information. The author suggested that databases may be the best way to store census data for instance, so that it can be analysed by computer, satellite data can be rendered in many different ways. For instance, mathematics information can store mathematics expression, not as ink marks on paper but as computer symbols to be manipulated by program such as Mathematical or Maple.

The role of digital libraries in educational development

In this rapid changing world, digital libraries offer many facilities to education in general and to higher education in particular (Pavani, 2007). Of course, digital libraries are playing many roles in educational development and other aspects. However, the discussion in this section is only limited to the role played by digital libraries in educational development.

Slater (2005) identified the role of digital libraries in education to include the fact that it enables users to have better control over their electronic documents, a new first-tier knowledge resource for users with access to large digital libraries, opportunity of browsing more often than others, one environment for academic work and inspiration of project for publication, etc.

Jayaprakash and Venkatramana (2006) emphasised that part of the rationales for using digital libraries in e-learning is because it has the capacity to store and manage a large number of digital contents including full text, course materials, bibliographies, catalogues, images and audio clips. These make it provide an environment where collections are brought together, services and people in support of the full life cycle of creation, dissemination, and preservation of data, information and knowledge.

One other reason for using digital libraries is that it provides an opportunity for using various electronic tools available in which learners can search text materials and images easily and quickly. This is applying broadly across all kinds of institutions. Advance intercommunication technology, sophisticated search engines and affordable cost, huge storage facility of digital contents are the other reasons to implement and integrate a digital library in education. Other role digital libraries played in education as emphasised by (Jayaprakash and Venkatramana (2006) are opportunities for learners to use electronic resources from anywhere without even knowing where it is stored geographically. It should be noted that based on this, study materials can never go out of print, and new editions can easily be created and added. One can access several titles at once on a portable reader and, over time, build a personal library. It produces current information that assists in research work. In coping with the advancement in technology, and production of information, multidimensional forms make it become essential for users to pursue additional knowledge at all times in order to be up-to-date in their field of interest. The virtual conferences, collaborative work on projects shared among institutions, exchange of useful materials and experiences among teachers, provision of up to date information for researches are some of the factors directed towards learning.

Pavani (2007) identified the role of digital libraries in courseware. The author explained that reading materials including books and other items are kept and distributed by the university libraries. Therefore, class notes, simulations, spreadsheets, and other materials created by faculty are made available by their authors through copies distributed in an informal situation. The utilisation of information communication technology tools has transformed the informal distribution to computer and networked-based solutions. As a result, a large number of contents became available from computers lacking the necessary identification and access control. However, this identification is important for the search and retrieval actions by the users.

Pavani (2007) added that digital libraries are essential tools to manage courseware and additional reference items used in the classrooms. Reasons given include: management of documents in all formation and in a unified manner, access control, content sharing, interactivity, customisation and reuse, cross institutions cooperation, and students' opportunity to study anytime, anyplace, different hours of the day, any day of the week are all significant when distance learning is considered. As Pavani (2007) indicated, there have been some experiences in the use of digital libraries in the management of courseware. The results so far have been satisfactory in terms of access and sharing. According to Cardoso and Pavani (2000), the Maxwell System allows five access level and four sharing levels, and this has given the faculty reasonable flexibility in the use of contents thereby resulting in a fair quantity of reuse of basic contents.

Using digital libraries as sources of reference is also worth mentioning. Students visit the libraries to look for materials where they can get additional materials beyond the course contents. They look for additional books, journals theses and dissertations, technical reports and other items that facilitate their learning process. This becomes important especially at the undergraduate and graduate levels, Research involves lots of searching, retrieving and reading. Therefore, libraries must make available relevant collections to fulfil this purpose and need. Examples of traditional activities of the libraries include subscriptions to scientific journals and conference proceedings. Digital libraries just like their traditional libraries counterparts can hold reference materials in the context of software and made them available 24/7.

In terms of scholarly publication, universities have played their role. The availability of personal computers connected to the Internet has allowed researchers to report results through these systems in addition to the traditional printed journals. Van de Sompel and Lagoze (2000), Lagoze and Van de Sempel (2001) indicated that the fast pace of research results in the sciences have required alternative forms of publication to conquer the latency times of traditional peer-reviewed journals. In the same vein, the increasing costs of journals subscription have also required the need for alternative ways of publishing.

The role digital libraries played in creating Open Access cannot also be overlooked. Pavani (2007) maintained that 'the world over, intellectual property right (IPR) are protected by law. This is essential in view of the fact that IPR is a basic right of democracy and stimulus for intellectual creation. At the same time, authors may intend to share their works, especially in academia. This is the rationale behind the Creative Commons, a non-governmental organization created in 2002. The goal of the organization is to help authors share their works under the idea of "some rights reserved" instead of "all right reserved". They neither suggest that authors' rights be violated or that copyright be abandoned; except that works be shared in the extent find suitable by the authors. On their websites, the motto is "share, reuse and remix

legally” This motto contains ideas that can easily be implemented if digital libraries are used to manage digital contents.

Now, worldwide efforts towards open access are ongoing. Notable events to facilitate this process include but not limited to: Budapest Open Access Initiative (Budapest Open Access, nd*). The second is the Berlin Declaration on Open Access to Knowledge in the Sciences and it was signed during the Conference on Open Access to Knowledge in the Sciences and Humanities in 2003. The third action is that of Humboldt University (2006) in Berlin. The senate in this university approved the Open Access Declaration that encouraging her scientists to publish in open access journals and make the publications available through technological infrastructure.

The role of Digital Libraries in Cultural Development

The fact that Digital libraries are playing significant roles in cultural development in our contemporary world cannot be overemphasised. The first important role played by digital libraries in cultural development is the preservation of cultural heritage. The purpose of preservation is to protect information of enduring value for access by the present and generation to come (Conway, 1994). Libraries and archives have served as the central institutional focus for preservation, and both types of institutions include preservation as one of their core functions. Many major libraries and archives have now established formal preservation programs for traditional materials in paper, microform, photographic and to lesser degree audiovisual formats” (Griffin, 1998). Through preservation and propagation of indigenous culture, the relevant information is readily available locally in contrast to the preceding scenarios, which disseminate within developing countries information originating in the developed world.

Supporting digitization, access and preservation of scientific and cultural heritage is also worth mentioning. Equity of access and preservation of the scientific and cultural heritage of mankind is everybody’s right and helps in facilitating learning and understanding the richness and diversity in the world, not for present generation alone but as well for the incoming generations. As a means of recording and providing access to our cultural memory, digital libraries have numerous advantages and may help relieve the traditional conflict between preservation and access. Users operate on materials digitally stored on the exact images of the original works stored in their local computers thereby separating usage from the original. This affords digital technology multiple, simultaneous uses from a single original in ways that are simply impossible for materials stored in different format. Digital technology also yields additional, effective means of access. In full-text documents, a reader can retrieve needed information by searching for words, combinations of words, phrases or ideas. Readers can also manipulate the display of digital materials by choosing whether to view digital materials on a screen, store them on their computer or external media, or to print them.

Digital libraries make accessibility to cultural information possible to all those who wish to make use of them. Through Digital libraries, artefacts of culture are being put in a central, accessible, nonprofit place. Digital libraries have the facilities to send out photocopies, users also have opportunities of exploring digitization options so that scholars who cannot physically get there can still have access to materials. Digital libraries open up a broad knowledge and information connecting to cultures across geographical and social territories. The transformation of libraries as builders and hosts of digital libraries facilitates the spreading of

skills in information and communications technology. This underpins the literacy, personal development and scientific knowledge required for social and economic change.

Digital Libraries Services

As stated earlier, the digital library environment requires special services such as storage and organisation, search capabilities, retrieval, virtual references, security, digital scholarship, etc. These services are examined in turn as follows:

Storage and Organization: Physical libraries are well known for storing information and organizing information. Digital libraries have so far exceeded the capacity of storage in a physical library, by offering space-saving techniques for storing and displaying data electronically in the form of; Library catalogues; Text-based e-resources, e.g. Databases, books and periodicals; Digitized rare and special collections; Multimedia collections, e.g. video, sound, film, graphics, pictures, maps etc. Services for acquiring and organizing library information resources are also inclusive.

Search and Browsing Capabilities: A very good outstanding technique about digital libraries is the capability to search it without any physical or time constraints. Examples are; Library catalogue search, i.e. OPAC; Searching for rare and preserved sources; Searching for national repositories (e.g. national archives) through an online portal and cross-domain searching; Searching for a variety of e-resources within one portal; Browsing the entire range of resources in the DL.

Retrieval: Retrieval depends on the manipulation service availed by the DL. It is heavily influenced by Interface and interaction with the system, e.g. how search results are displayed and what graphic user interfaces are used to deliver quality web-based library user services. Architecture, navigation, and overall design concerned how users can search and navigate around the DL.

Virtual References: This involves the use of instant messaging service including using electronic Inter-Library Loans System; access to all electronic resources for all, e-reserves for all popular teaching materials. Self-Issue and Return facilities to enable users to issue renew and return books and journals without the need to queue at a busy Service Desk. Online Reference Services; e.g. ask a librarian, Instant messaging (IM) A federated one-stop search engine for all library catalogues and databases (including the IRs).

Security: This is yet another important service in a digital environment. The users of a DL enter their personal details, these need to be secure. The DL carries copyrighted materials, there needs to be secure from manipulation by the wrong people. The nature of digital material makes it vulnerable to hackers and virus attacks, this call for security. The DL, at its inception, must have a policy on security and publishing.

Digital Scholarship Services: Digital scholarship has been associated with academic libraries. The term has been commonly used for the application of modern technology to carry out teaching, learning and research activities These are services that support users' digital scholarship from the inception of a task until the completion. At task inception, the user searches for relevant information using all the services mentioned so far (interface, navigation, searching, manipulation etc.). After successfully getting the information, to complete the task, the user might want to: Annotate the sources used, summarize sources consulted, create new

information by combining text and multimedia sources across all available information. The digital scholarship encourages the manipulation and use of information in a nontraditional way.

Digital Libraries of Today

The digital libraries of today vary in types and design. These include the under-listed.

1. The digital library of today includes the one tagged Patron-augmented digital libraries (PADLs): a type of digital libraries designed to support digital scholarship. Examples services rendered by digital libraries are facilities for search and retrieval, augmenting the library's collection with annotations, and original compositions and access to digitized multimedia and associated textual transcripts.

2. Knowledge Commons: Knowledge Commons is another type of DL characterized by:

- a) Storage of a large variety of information object types
- b) Information objects composed of several multi-type and multimedia components aggregated in an unlimited number of formats.

Knowledge Commons is offering services such as general utilities, (annotations, summaries, etc.) and audience specific functions like map processing, analysis of images etc. (Castelli, 2006). Examples of software that enhance digital libraries are Synchrony for synchronized mixed text and video presentations and publications (Goh, 2001). DSpace Digital Repository: an open-source software platform that enables institutions to capture and describe digital works (e.g. www.dspace.org) and the Digital Library Infrastructure on Grid Enabled Technology (DILIGENT) (Castelli, 2006).

Challenges of digital libraries and way forward

As pointed out by (Pavani, 2007) digital libraries do encounter many challenges. These according to him include interoperability, 24/7 operation, multi-language, and multi-culture issues and multi-legislation situation, multiple information types and ever-changing digital formats, information asset security, digital preservation; and intellectual property rights (IPRs).

Preservation challenge – In terms of meaning, libraries collect information on both the current and future needs of the users. However, there are some systemic efforts put in place to ensure continuous access to digital collections on the Internet. Most of the information on the internet are ephemerals and presents considerable challenges for archiving. It is important that preservation ensure resources are intact because unauthorised tampering with the content of electronic resources could have grave implications for its continued value. Technological security will aid the preservation in terms of preventing corruption or destruction of information resources and ensuring their authenticity.

There are special cases of preservation challenges. These are related to born-digital contents. These are contents that have not existed on other media. Perfect examples are the case of computer-based simulators, online interactive exercise and animations which are important learning objects. Other sets of born-digital contents are present in online interaction in companies or between companies and business partners or clients (e-business and e-commerce) and in government actions (e-government). These are areas where archives and archivists are very active as a result of the mission to preserve institutional and government archival documents. The problems are encountered as higher education migrates from traditional media

to the digital formats. For instance, when theses and dissertations written on papers are no longer used and ETDS became the only available format, archival problems are experienced particularly when it comes to long term preservation of this information or documents.

Preservation of born-digital objects has become an issue of concern particularly as a result product that is no longer exists. Preservation of access is another great challenge. In 2003, a news release by Ascribe in an article written by Dellavalle, Hester, Heilig, Drake, Kuntzman, Graber and Schilling, (nd*), showed that the results authors obtained after searching internet-based reference on medical publications is quite surprising. The internet references accounted for 2.6% of all references on more than 1,000 articles published on three medical journals from 2000 to 2003 - New Journal of Medicine. The journal of the American Medical Association and science. In addition, 13% of the internet references were list for articles that 27 months old or lesser.

With the above, Pavani (2007) raised a question that if digital technology is splendid, what is stopping libraries from becoming entirely digital immediately? Answering the question, Pavani noted that digital libraries technology is still immature, but the challenge is heavier than technology. An equal challenge is the ability of individuals and organisations to version a means of using technology effectively to absorb the inevitable changes and to create the required social frameworks. Pavani further explained that the new world of information is like a large machine with many participants each contributing their experience, expertise and resources. Making fundamental changes in the system needs interrelated shifts in the economic, social and legal relations among the stakeholders.

Digital libraries depend on people and cannot be introduced faster than what people and organisations can adapt and cope with. The creators, users and the professionals who support them have to be considered. The link between these groups is changing. With digital libraries, readers are more likely to go directly to information without visiting a library building or having any contact with a professional intermediary. Authors carry out more of the preparation of manuscript. Professionals need as well need new skills and training to support new relationships. Some of the skills are absorbed acquired through experience, while others can be taught. Since librarians have a career path centred on schools or librarianship, the schools are adopting these into their curriculum, but it will take many years before the changes materialise. Other challenges of digital library worth mentioning are the following:

Challenge of Economic Infrastructure – Lippincott (1997) emphasised that numerous internet site are opened free of charge. An increasing number of sites are restricting access to subscribers or fee payers while some digital library projects that have been developed in academic institutions are now searching for continued funding and are considering licensing arrangements or user fees. The challenge of economic infrastructure now makes many digital libraries to introduce new and uncertain economic realities and relationship into libraries where the costs of accessing information are once hidden to patron; compared to the digital era which requires customer who will pay fees for access to digital services and collection. However, the question is, how many users can afford to pay the services offered by the libraries? Will the technology provide access to digital information massively and not end up restricting it only to the very few who can pay the fees?

Moreover, it understood that the global economic recession is having implications on digital libraries in terms of digital collection development where huge amount costs for

implementation, licensing, training, promotion, and the development and support of technical infrastructure are required. Lastly, economic modalities for making the digital library work in terms of real costs and benefits, have neither been clearly established.

Searchability challenge - It is not an easy task finding and using materials on the Internet. Digital documents can exist in different formats, precisely in numerous versions, in an unfixed location. For example, a document or resource may exist in one network location today and may not be there again tomorrow. Search engine services such as Alta Vista, YAHOO, GOOGLE and other WWW services are rapidly gaining pace. Lippincott (1997) explains that developing more sophisticated search engine is a method; another is developing filtering devices based on individual profiles and knowbots that search the internet on the users' behalf. Lippincott added that researcher and experts are looking for information that requires to be integrated or added to network information in order for the search systems to be very effective. In light of this, it is recommended that material or document or website should have information pertaining to itself and should be built in a standardised format (metadata) that will enable the search engines to retrieve information effectively.

Service challenge –There is no doubt about the fact internet user's operation in a self-service model, but not out of choice as observed by Lippincott (1997). The author pointed out that limited digital libraries have built services into their stocks or collections. What some users need is just assistance on how to interpret and manipulate the information or assistance on the best way use available Internet search engines. The way out of this challenge is for the digital libraries to have built-in services where it will be possible for users to ask questions and where guidelines can be provided. This can be in form of frequently asked questions (FAQ).

CONCLUSION

This paper has so far examined the digital libraries in terms of its role in educational and cultural development, the services it offers, its types in today's world, its software and the challenges it's currently faced. This is considered a contribution to the review of literature in this area as the extant literature has shown that there are few papers and research that consider the issue. Moreover, while researches have considered the role played by digital libraries in higher education institutions, there is little effort in the area of the contribution of digital libraries to educational and cultural development. In addition to this, researchers have identified various challenges facing digital libraries but little efforts have been made so far to deal with these challenges. These are a vital research area for future direction. In light of this, the paper concluded that digital libraries have contributed lots to the educational and cultural development globally. However, the fact remains that the challenges facing it need to be eradicated so that further opportunities are provided for more global access to information by the users.

REFERENCES

- Arms, J. (2000). Digital libraries. India. MIT Press.
- AScribe (2003). The Public Interest Newswire. Available: <http://www.ascribe.org/cgi-bin/spew4th.pl?ascribeid=20031030.103204&time=16%25> [accessed 6 April 2010].

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- Borgman, C. L. (2000). *From Gutenberg to the global information infrastructure: Access to information in the networked world*. Cambridge, MA, London, England: The MIT Press.
- Cardoso, R. M. & Pavani, A. M. B. (2000). Sharing course contents: a case study. Proceedings of the 2000 ICEE – International Conference on Engineering Education, Taiwan.
- Creative Commons (n.d*). Available: <http://creativecommons.org/> [accessed 6 April 2010].
- Castelli, D. (2006). Digital libraries of the future – and the role of libraries. *ISTI-CNR, Pisa, Italy*.
- Conway, P. (1994). The Implications of Digital Imaging for Preservation. In *Preservation of Library and Archival Materials*, 2nd ed. Edited by Sherelyn Ogden. Andover, MA: Northeast Document Conservation Center.
- Dellavalle, R., Hester, E., Heilig, L., Drake, A., Kuntzman, J. Graber, M. & Schilling, L., (nd*). Going, Going, Gone: The Lost Internet References”, *Science*, Vol 302, No 5646, abstract. Available: <http://www.sciencemag.org/cgi/content/summary/302/5646/787> [accessed 6 April 2010].
- Fox, E. A; Hussein, S., Madalli, D., & Cassel, L. (2003). Digital libraries. Practical Handbook of Internet Computing. CRC Press.
- Goh, D. H. (2001). PADLs: Supporting digital scholarship in digital libraries. *Aslib Proceedings*, 53(8), 325-337.
- Griffin, S. M. (1998). NSF/DARPA/NASA Digital Libraries Initiative: A Program Manager's Perspective. *D-Lib Magazine* July/August. [doi:10.1045/july98-griffin](https://doi.org/10.1045/july98-griffin). Accessed 6 April 2010].
- Humboldt Universität zu Berlin (2006). Available: <http://edoc.hu-berlin.de/> [accessed 6 April 2010].
- Jayaprakash, A. & Venkatramana, R. (2006). The role of digital libraries in e-learning. Paper Presented in DRTC Conference on ICT for Digital Learning Environment 11th – 13th January, DRTC, Bangalore.
- Lagoze, C. & Van de Sompel, H. (2001). The Open Archives Initiative: Building a low-barrier interoperability framework”, presented at the *JCDL 2001 – Joint Conference on Digital Libraries*, United States, 2001, available <http://www.openarchives.org/documents/jcdl2001-oai.pdf> [accessed 6 April 2010].
- Lippincott, J. K. (1997). Challenges of digital libraries. *Educom Review* 32 (3). Available: <http://net.educause.edu/apps/er/review/reviewArticles/32356.html> [accessed 10 April 2010].
- Maxwell System (nd*). Available <http://www.maxwell.lambda.ele.puc-rio.br/> [accessed 6 April 2010].
- Budapest Open Access Declaration of the Humboldt University Berlin. Available http://edoc.hu-berlin.de/e_info_en/oa-declaration.php [accessed 6 April 2010].

- Pavani, A. M. B. (2007). The role of digital libraries in Higher education. Paper presented at the International Conference on Engineering Education – ICEE, September 3-7, Coimbra, Portugal.
- Reedy, J., Ager, T, Chellappa, R, Croft, W. B, Davis-Brown, B, Mendel, J. M. & Shamos, M. I. (1999). Digital information organisation in Japan. Available: <http://www.wtec.org/loyola/digilibs/toc.htm> [accessed 6 April 2010].
- Slater, M. D. (2005). The role of digital libraries. JCDL Doctoral Consortium, Department of Computer Science, University of California, Santa Cruz. June 7.
- Van de Sompel, H. & Lagoze, C. (2000). The Safe Convention of the Open Archives Initiative. *D-Lib Magazine*, Vol 6, No 2, February. Available: <http://www.dlib.org/> [accessed 6 April 2010].