

DIGITAL LIBRARIES IN THE DEVELOPING COUNTRIES

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ABSTRACT

Digital libraries (DL) are seen as a hope to developing countries in their struggle for accessing bibliographic resources, especially in a context where the traditional distribution mechanisms failed tragically. Several difficulties are however faced by these countries to build and use digital libraries, due mainly to its high development costs and to the poor existing ICT resources in these countries. This paper discusses the importance of digital libraries for developing countries and introduces the main challenges they face in building and using such libraries. The current alternatives and major initiatives for making digital information accessible to developing countries are also addressed.

KEYWORDS

Digital Library, Developing Country, Digital Divide

1. INTRODUCTION

The Online Digital Libraries have the great advantage of making bibliographic resources, including the most recent publications, accessible anytime and anywhere as far as a computer with Internet access is available. This fact is considerably important for developing countries where the traditional mechanism for distribution such resources failed tragically (Witten, 2004). These libraries are therefore a very good alternative especially for regions and countries where there are difficulties in accessing bibliographic resources. Institutions and researchers in the developing countries frequently have no access to the research literature published in the developed countries due mainly to the high costs and inadequacy of the distributions mechanisms (Arunachalam, 2003). A study conducted in 2003 concluded that 56% of the institutions in the countries with less than US\$1000 GDP per capita, have had no international journal subscription for the last 5 years and that 21% had only 2 subscriptions. The costs of building digital libraries are however high. Nevertheless, a considerable amount of money has been invested in such projects around the world. For example the Library of Congress invested initially US\$60 million in the development of the American National Digital Library!¹ US 24 million were awarded in the ambit of the First Digital Library Initiative and over US 50 million² in the Second. The high building costs might hinder the construction of digital libraries in developing countries since the decision makers prefer to put their scarce resources in addressing the existing basic needs such as drinking water, health, sanitation, nutrition etc.

However, apart from minimizing the problem of accessing the bibliographic resources in developing countries, DL can even assist the human development. (Witten et al., 2001) identify 4 areas where DL can contribute to ameliorate the human development level: Dissemination of humanitarian information, disaster

¹ http://hul.harvard.edu/ldi/html/ldi_origins.html, February 19, 2007

² <http://www.dli2.nsf.gov/projects.html>, February 19, 2007

relief when providing the proper information, creating information collection locally and creating new opportunities to enter global marketplace.

2. CHALANGES

Apart from the cost of building Digital libraries, the developing countries face several other problems related to having operational DL services. Internet connection in these countries is expensive and slow. According to the ITU 2004³ “*there are more than twice as many Internet users in Germany than on the entire African continent*”. On the other hand a study conducted recently by the African Virtual University, concluded that African Universities pay 50 times more for their bandwidth than other similar institutions in the rest of the world (Fritz, 2005). Cliff Missen, director of Widernet project (which mitigates the third world’s digital communication problems) states that the majority of Internet connections in Africa are made via satellite which is many times more expensive to install and maintain (Fritz, 2005). For example, the 28.000 students of the University of Iowa share a 150Mbps Internet connection. On the other hand, the University of Jos, one of the better-connected Universities in Nigeria share a 128Kbs connection, between his 13.000 students (Miner and Missen, 2005)! These countries also have to overcome the basic literacy problems on one hand, and to resolve the information illiteracy problem on the other, giving the people the necessary skills to explore the potentialities of Digital Libraries. (Chowdhury, 2002) identifies a group of problem typically faced by developing countries in their effort to build and maintain digital library systems: Low library budgets which brings serious difficulties in maintaining the basic level of services; lack of financial support for DL; Inexistence of a fully developed and updated OPAC as well as little access to online information resources such as e-journals, online database etc.; poor ICT infrastructures; poor facilities for ICT access; lack of trained manpower and poor information literacy rate.

3. ALTERNATIVES

In this contest of several problems faced by developing countries in building using and maintaining sustainable digital libraries, what are the alternatives developing countries have? There are several services and facilities available that can be used for free or for a small fee such as information through subject gateways and Virtual Libraries; digital references and information services (the majority of these services are for free); electronic texts books, journals, thesis; freely available online digital libraries; e-print; Open Archive Initiative, etc. (Chowdhury, 2002).

There are two strategies of providing open access to scientific research: Open Access Archiving (OAA) of published research, and development of Online Archiving of Journals (OAJ) where the costs of the publication are met by the author’s institute or funding bodies (Chan and Costa, 2005). The Open Access movement aims at promoting free and unrestricted online access to research publications. Apart from that, there has been number of initiative intending to provide free or reduced cost access to research materials to the developing countries based largely on the consortia purchasing, national site licensing and donor’s subsidies. They frequently involve access to bundled journals rather than individual titles. Some examples of these undertakings are Health InterNetwork Access to Research Initiative (HINARI), Global Online Research in Agriculture (AGORA), Scientific Electronic Library Online (SciELO), Bioline International, etc.

“*Computers are not as hard to come by in developing countries as one might think*” (Witten, 2006). Their rate of obsolescence is very high and there is a great desire for having always the latest technology in developed world. These facts make such computers available to the developing world for almost a null cost. There are several programs and institutions devoted to bringing used computer devices into the developing countries and this might be a good alternative in bringing ICT resources into these countries.

To ameliorate Internet access in the developing countries, (Marsden et al., 2002) propose an access mechanism through mobile devices such as mobile phone which are more spread over the population of many developing countries than personal computer. Such solution permits WAP (Wireless Application Protocol) devices to have Internet access and use an open source Digital Library system. This is a way of

³ <http://www.itu.int/wsis/tunis/newsroom/stats/> , February 19, 2007

overcoming the Internet and ICT access difficulties for using digital libraries since it is much cheaper than through the traditional personal computer, and has been widely used in many parts of the World.

An alternative for providing an information delivery system which is economically and technologically appropriate for developing countries is eGranary (Miner and Missen, 2005). It creates large digital collection through mirroring and moving information in digital format into Local Area Network. Thus, the users can have access to information without connecting the Internet and in a much faster speed than they would have, through Internet access. Such resources would not be accessible to students and lecturers due to limited bandwidth or inexistence of Internet access for all the members of the academic community. EGranary Digital Library contains currently more than 5 million resources, which are updated regularly.

Since the building of a digital library is normally a very expensive process, the usage of free open source software in the developing countries context is a must (Witten, 2006). Several free open source digital library systems are available which permits a faster and cheaper development of a DL and institutional repositories: Greenstone, Archimede, ARNO, CDSware, DSpace, Eprints, Fedora, i-tor, My-CoRe, OPUS, etc, are examples of such softwares. A comprehensive comparative analysis of many of these tools is presented by (Crow, 2004). Apart from making collections available online, some of these tools, permit the DL distribution in other medias such as CD-ROM, which is very suitable in areas where Internet access is a problem. Each organization chooses the system which is more adequate to the requirements of its project.

In developing countries, University students struggle to have access to ICT resources. A project of building a digital library in such environments is a good opportunity to recruit volunteer intern students who would work in such undertaking as an opportunity to enlarge their ICT experience and knowledge.

4. CONCLUSION

Digital libraries are important mechanisms for developing countries in their struggle to overcome their difficulties in accessing bibliographic resources, with the failure of the traditional distribution mechanisms. With basic needs to address, these countries have however serious difficulties in putting their scarce resources in building DL. Apart from the lack of financial resources, developing countries face several other problems in building and using DL, such as poor Internet connectivity low ICT resources and infrastructures, etc. However, there are several alternative technologies and services providing good support for building and using digital libraries in these environments. Freely available online digital libraries, ebooks, e-journals, etc, Open Access Movement, eGranary Digital Library, free open source digital library systems, DL distribution through Medias such as CD-ROM and mobile Internet access, volunteer work, etc, are example of such alternatives.

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