
IT diffusion in Sub-Saharan Africa: implications for developing and managing digital libraries

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Abstract

This paper is a spin off of a keynote address that was delivered by the author at the IFLA-Africa section workshop on "developing and managing digital libraries" that was held in Gaborone Botswana from 23-27 February 2004. The author points out that libraries in Sub-Saharan Africa like their counterparts in the rest of the world are continuing to experience a period of rapid change as they prepare to participate in the global information society. In this endeavour, the libraries face various challenges of economic, technological, content, and information literacy nature. In a global information society, there is need to democratize access to information using ICTs, provide adequate and relevant local content to users and equip them with requisite information literacy skills to efficiently find their way in a maze of information networks. This paper discusses the patterns of ICTs diffusion within libraries in Sub-Saharan Africa and the implications for the development and management of digital libraries.

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Introduction

Librarians are known to have been some of the early entrants in the use of computers (Martin, 1986). Library automation activities started during the 1950s and 1960s in the US and the UK respectively. During that period, library systems were developed locally on mainframe computers of parent organizations using local programming language expertise. At the same time, database producers such as Chemical Abstracts, National Library of Medicine, and Institute of Scientific Information developed extensive mechanization programs that led to online information retrieval systems. The National Library of Medicine in Bethesda in the US is known to have used computers as early as 1964 in photo composition or computer type setting in the production of Index Medicus. Computer applications to specialist forms of information processing such as chemical structure handling soon followed (Bawden and Blakeman, 1990). During the late 1960s and 1970s library cooperative schemes emerged in the UK and US as viable means of sharing costs associated with automation among several libraries. Notable among such cooperatives included OCLC in the US and Birmingham Libraries Computerization Mechanization Project (BLCMP) in Britain. The library cooperative schemes provided automated services such as facilitating access to shared union catalogue, circulation services, cataloguing data, etc. Library automation world-wide has had a steady evolutionary path. Tedd (1997) points out that library automation evolved through three phases. The first phase was experimental during the 1960s and was largely characterized by in-house developed systems. The second phase was in the 1970s when the off the shelf turnkey systems were introduced. This phase was enhanced by the development of micro computer technology which propelled computing into the public domain due to lowered costs. During this period library cooperative schemes consolidated their position in the automated library market place. The third phase started in the 1980s which saw the emergence of the off-the-shelf integrated systems offering circulation, acquisitions, serials control, cataloguing and online public access with all modules sharing a common database. At the same time, cooperative library schemes continued to offer automated library services though at reduced level because of competition from off-the-shelf systems.

Review of various literature shows that the emergence of the Internet during 1990s added various options for libraries to automate. During the later part of 1990s, library systems have been

developed increasingly as gateways to external databases. For example Millennium Interfaces (Innopac) has gateway facility to provide access to other portals or library information networks (University of Botswana, 1999; Innovative Interfaces, 2002). On the part of library cooperative schemes, they have reinvented themselves to start offering automation systems, consultancy and training to remain relevant in volatile competitive market (Mutula, 2000a; Cibbarelli, 1996).

Developments in information technology have enhanced openness of the library systems to Internet and occasioned evolution of digital libraries across the world. The concept of digital libraries is used interchangeably with electronic, virtual library or library without walls in literature (RAU Law Library, 2004). However, review of evolution of digital library shows progression on a continuum. The digital library has evolved from the conventional poly-media library characterized by the collections being in various formats with little automation. The electronic library on the other hand has core processes of acquisition, cataloguing and circulation automated although the information resources do not necessarily have to be in digital format. Alternatively, the digital library has all information resources in digital form and access to such resources is through digital technologies. Finally, the so-called virtual library has all information resources in digital formats and is accessed remotely over a network. The implementation of digital libraries brings about added benefits to the user such as: portability of content, efficiency of access, democratic access to information, flexibility, and availability, etc. Digital libraries also occasion several challenges of infrastructure, content, literacy and economic nature (Law and Nicholson, 2001; Ojedokun, 2000).

Financing of education in Africa: implications for developing and managing digital libraries

In Africa, when most countries emerged from colonial yoke on attainment of independence during the 1960s, there was heavy investment in education at all levels in order to develop adequate manpower for national development and address issues of poverty eradication, illiteracy and disease. Consequently higher budgets were allocated to the education sector to realise these goals. In Kenya for example, the recurrent expenditure on education at all levels rose at independence in 1963/1964 from 22.5 percent of the national recurrent budget to 37.5 percent in 1987/1988

with the university education taking 19 percent of this allocation (Central Bureau of Statistics, 1993). This pattern of financing education was similar in most countries of Africa. During the 1990s, however, the donor community put in place a wider global programme to bring about decreased government involvement in the financing of education in developing countries (Johnstone et al., 1993). Consequently budgets from governments for most universities have continued to reduce. At the University of Zimbabwe for example, students' support was reduced by 50 percent (Hadebe, 2000). Similarly in Kenya, public universities were in 2001 under-funded by 40 percent (Kamotho, 2001).

Libraries in Sub-Saharan Africa largely depend on grants from national governments for most of their recurrent and capital budgets and are consequently hard hit during times of budgets cuts. For example, at the University of Zambia, for more than five years, the library did not receive any funding and as a result services suffered and staff turnover increased (Simui and Kanyango, 2000). At the University of Zimbabwe as result of budget cuts, photocopying has increased with little recourse to copyright laws. There is heavy reliance on donations, gifts and exchange materials. The University has since frozen employment of staff and instead relies on students to do some work of professionals at nominal payment to augment their fees (Hadebe, 2000). Despite decreased funding to libraries, some libraries in Africa do not exhaust their meager budgets that they are allocated and this becomes a reason for further cuts (Ubogu, 2003).

The problems of funding that face most of African information environment has not spared countries that have been seen as well resourced. In Botswana during the 2004/2005 national budget for example, the finance minister announced a reduction in budget for the University of Botswana and consequently the university was not allocated any capital budget (Gaolathe, 2004). In South Africa, many universities and technikons are being merged under a government strategy to reduce costs and enhance quality of education (Jobbins, 2001). These changes within the education environment have affected funding to the libraries. For example in 1996, a study by the African Association of Universities (AAU), established that libraries within the university environments in Africa had remained strangely neglected and that universities had witnessed a lot of changes from the changing economic climate and changing government policies (Assigbley, 2000). Rosenberg and Raseroka (2000) in a study to look vividly into the financing situation in number of universities in Sub-Saharan Africa, established that the library

portion of the total budget of the parent institution was on average 4 percent compared with the international figure of 6 percent. Westra (1993) points out that decreasing of funding to libraries has had the effect of low development of digital library and information services. In addition Internet access in libraries is restricted because of the high costs of providing the services and computer equipment.

The challenges of decreased funding for library services cannot be overstated. Digital libraries usually exist within the economic frameworks of libraries or their wider organizations, and consequently funding that is provided to libraries is not necessarily separate from the amount the library is often allocated by the parent organization.

Digital divide and digital libraries in Africa

The question of digital divide has appeared in library and information science literature frequently as impacting negatively on the provision of library and information services. The digital divide, a disparity in access to ICTs between countries and communities is currently high on the global agenda and has received the attention of such institutions as the Digital Opportunity Task Force of the G8 countries (DOT Force, 2001), the World Summit on Information Society (WSIS) and New Partnership for Africa's Development (NEPAD).

The causes of digital divide include, but are not limited to, inadequate infrastructure, high cost of access, inappropriate or weak policy regimes, inefficiency in the provision of telecommunication network, language divides, and lack of locally created content. The divide creates an environment where the disadvantaged groups in society are unable to contribute and benefit from the information age and global communities created by the Internet. In most countries of Sub-Saharan Africa, the high cost of access to telecommunication services, is an impediment to access to ICTs. This is exacerbated by the fact that IT has not effectively been integrated in the development agenda of most countries as reflected in the lack of ICT policies. In Africa only one in every 100 Africans has access to a PC and less than 1 percent of the 750 million has actually gone online (United Nations, Division for Public Economics and Public Administration, 2002).

The question of digital divide phenomenon and its implications for the provision of information services should concern information professionals regarding how it should be addressed. The digital divide, if it is not addressed, has the negative

impact on the provision of information services, under-utilization of information resources, and information sharing. It is for these reasons that at international, regional, and national levels, there are discernible efforts to bridge the divide. In Africa, national initiatives such as the South African government's e-government strategy (Ngobeni, 2001), Botswana's schools computerisation strategy aimed at equipping all schools with computers, and Namibia's Schoolnet initiative aimed at collecting old computers from industry and refurbishing them to be distributed to schools are cases in point (Jensen, 2001). It is important that at institutional level, efforts should be made to address the divide phenomenon through programmes that dovetail into the national and regional programs.

Local content and digital libraries

The rapid development in IT has focused more attention on issues of infrastructure deployment than local content. Local content refers to the expression of the locally owned and adapted knowledge of a community (Ballantyne, 2002). Examples of local content would include information of relevancy to communities relating to business, education, employment, and health to mention a few. In African context, such local content would also constitute traditional medical technology, information about community theatre, songs, dances and cultural practices. The problem of inadequate local content is more evident in Africa than the rest of the world. For example during the year 2000, African-produced content accounted for less than 0.05 percent of globalWeb content (Taylor, 2002).

The question of local content has become a topical issue especially in international and regional forums and institutions, such as Digital Opportunity Task Force for bridging the digital divide, World Summit on Information Society and New Partnership for Africa's Development (NEPAD). In Africa, local content development has been hampered for various reasons. For example in school, colleges and universities, the language of delivery is largely English language, and local languages hardly feature. Similarly, the curriculum used in universities and schools is largely imported. Consequently, there is little local content available and people therefore resort to content generated from outside Africa that is pushed to them in formats and contains values that are peculiar to their cultural practices. Research carried out in Burkina Faso showed that those school children who had studied education in their mother tongue performed on average better than

the graduate of standard primary schools (Sahelian Languages, 1999). The local content issue in Africa is exacerbated by the fact that despite the dearth of books, little effort is made to use the few books that are available as course texts in schools and universities. Though Africa is rich in songs and cultural artefacts, one hardly finds any songs for example that have been collated and repackaged on libraries' shelves. Similarly there are hardly any elaborate special or community information collections.

There are various reasons why there is now increasing focus on local content development in Africa. To start with, the publishing output in Africa is quite low. For example of the 900,000 book titles estimated to be published every year in the world, only 1.5 percent is published in Africa (Sopova, 2003). Within Africa, local content in the form of indigenous knowledge (IK) has been widely used in different parts of Sub-Saharan Africa to improve, for example, agriculture practices, environmental conservation and traditional medical practice. In Uganda for example, IK is being applied for cultural management of the Matoke crop to reduce harmful effect of Sigatoka disease. IK efficacy is also reflected in traditional birth attendants who, according to the World Bank, deliver 95 percent of babies in rural areas (Naur, 2001). African multimedia content is being overshadowed by Western iconography such as movies and pop music, which have become stronger in the wake of rapid advancements in new technology (Ford, 2001). There is realisation that absence of local content can lead to capital flight in terms of goods and services purchased from abroad. For example in Nigeria, the National Committee on Local Content Development noted that local content of goods and services in the oil and gas sector in Nigeria is less than 5 percent, and about 95 percent of the yearly expenditure of about US\$8 billion (Naira 880 billion) flow out of the country through technical services and goods procured from outside the country (Ugwuanyi, 2003). Local content draws on local resources and makes people less dependent on outside supplies, which may be costly, scarce and irregularly available. Africa's local content, especially the indigenous knowledge has for a long time been exploited by the developed world more so in the area of environment and biodiversity at the expense of local people. Today, increasingly, the pharmaceutical industry is becoming interested in reducing the costs of research and fast tracking of experimentation on therapeutic agents, on the basis of knowledge of medicinal use of known plants by local communities.

Development of digital libraries provides a great opportunity for Africa to create local content and make it available locally and to the international community.

Information literacy and digital libraries in Africa

The emerging information society demands the ability on the part of the user to identify, locate, evaluate and apply information. Several studies have shown that lack of information literacy is partly the cause of underutilization of existing ICTs and information resources. Adam and Wood (1999), in their study of utilization of ICTs in African libraries, established among other factors the problem of lack of information literacy. Whereas in developed countries information literacy has largely been included in the curriculum, in Africa, many students at various levels of education are unfamiliar with variety of information sources and services within and outside the library. This is largely exacerbated by the lack of libraries at school level, reading materials and qualified staff. In addition user education in universities within Africa is not comprehensive enough for the required skills (Lwehabura, 1999). In Nigeria for example, user education in universities has been summarized in Adeyemi (2002) as uncoordinated, purely introductory and non-examinable. This scenario is replicated in most universities and other education institutions across Africa. Consequently the meager information resources that one finds in libraries are grossly under-utilized.

The emerging information society is characterized by the rapid growth and use of information and the widespread exploitation of varied information sources. In an information society, people have multi-sectoral needs and the manner in which they find information is crucial for their advancement. It is important for them to know and appreciate their information needs, where to get the information, how to get the information, and in the end, how to use it critically. Lack of information literacy inevitably hampers effective survival in an information society environment.

The problem of information illiteracy is well researched and documented. A study by the Department of Library and Information Studies of the University of Botswana to determine the level of integration of information literacy within its academic programs revealed among other things that most of the students (Mutula et al., 2004):

Were ill-equipped with requisite information literacy skills such as ability to identify, locate,

review, select and apply information needed for their studies and in the work environment; had difficulties in finding information resources needed to undertake their studies; had difficulties in using the relevant tools to locate information and knowledge; had difficulties in critically evaluating, analysing, and examining the information coming their way, etc.

Similarly, Underwood (2001) in a report to the Department of Library and Information Studies at the University of Botswana noted that though the academic programmes offered an interesting appropriate range of specializations, preparing students well for the challenges of policy development and service administration at middle to senior management level, there were weaknesses related to such information literacy as:

- candidates tending to state facts or cite opinions from literature but not going on to develop and use such material. Thus an essay or an answer consists of “disparate slabs” of information with the reader having to form the connections;
- referencing techniques were poor with respect to electronic resources; and
- candidates lacked the ability to draw a conclusion and then present a critique of it.

A study at the University of Zambia to determine usage of the campus Intranet and the Internet among academic staff revealed that those who were not using the facility cited, among other reasons, lack of guidance on how to use the intranet, lack of technical know-how, and lack of useful content. In addition many staff still preferred using the manual catalogue, citing service problems of slow network (Chifwepa, 2003). Similarly Yeboah (1999), in a study of the management of information literacy skills program for science undergraduates at the University of Botswana, established that the teaching of information literacy was constrained by large student numbers and heavy workloads for librarians. Adeyemi (2002) observes that many Nigerian libraries face serious automation problems due to lack of management and technical expertise. Subair and Kgankenna (2002) in a study on the information knowledge and skills of agricultural researchers in Botswana established that whereas the researchers placed high value on IT in agriculture, they lacked sufficient skills of software and general use of ICT.

Library automation environment in Africa

Africa did not have much to show in the first and second evolutionary stages of automation. This was largely due to the fact that costs of systems were high and it was difficult to justify such

systems. Additionally, automated library technology had not pervaded the world least of all Africa. Similarly there was lack of awareness and digital literacy. Meaningful library automation in Africa commenced in the 1980s driven by a number of factors. During that period, IT departments or computer centers were largely responsible for automation of libraries using local programming expertise. They used libraries to justify higher budgets from their parent organizations (Mutula, 2000a). Other library automation initiatives that were visible in Africa were those of the international organizations such as United States Information Services and British Council mainly because such organizations were well funded. However, during the late 1980s, CDS/ISIS library software from UNESCO became available and was largely given free to libraries. Consequently, many libraries in government, public and private sector including international organizations that had computers were able to automate using CDS/ISIS. CDS/ISIS facilitated development of in-house databases mainly of local collections. Similarly CD-ROM databases became increasingly available to libraries through donor agencies. Donor funded CDROM databases and CDS/ISIS can be said to have influenced significantly library automation on desk tops in Africa.

Following the first multi-party elections of South Africa in 1994 that ushered in a democratically elected government, the country opened up its doors to the international community. Consequently many libraries in Eastern and Southern Africa were able to gain access to the rich automation market in that country. National and academic libraries in Kenya, Zimbabwe, Lesotho, Namibia, Botswana, and Zambia to mention a few have been automated using systems procured from South Africa. South Africa has several vendors of several systems such as STYLIS, ITS, URICA, ERUDITE and small library systems suitable for schools such as Libwin, Papyrus, etc. (Mutula, 2000b). On the other hand, the use of consortia to automate library functions has become increasing popular especially in each of the South Africa's nine provinces. For example, Western Cape Province, under the auspices of Cape Library Cooperative (CALICO), has Aleph 500 from Ex Libris shared by the libraries of Cape Technikon, Pensula Technikon, University of Cape Town, University of Stellenbosch and University of Western Cape. Under CALICO a single Western Cape library collection is housed in different locations and draws on the resources of the libraries of the five tertiary institutions (Department of Communications, University of Cape Town, 1998). Similarly in Eastern Cape

Province, the automation of academic libraries is being spear-headed through the South East Academic Libraries System (SEALS). SEALS brings into a consortium seven tertiary institutions namely; Border Technikon, Eastern Cape Technikon, University of Fort Hare, Port Elizabeth Technikon, Rhodes University, University of Port Elizabeth and the University of Transkei (Millennium at South African Libraries Consortium, 2001).

Library automation in Africa has also been influenced by individual libraries' efforts such as the Campbell Collections of the University of Natal in Durban in South Africa which is involved in the preservation and conservation of the various media comprising of library, archival, museum and digital collections. Similarly, the Digital Imaging South Africa (DISA) is involved in investigating and implementing digital technologies to enable scholars and researchers from around the world to access South African material of high sociopolitical interest that would otherwise be difficult to locate and use (Peters and Pickover, 2001). Furthermore, Rhodes University in South Africa has an on-going project of publishing electronic theses and dissertations (ETD). This project undertakes the digitisation of doctoral dissertations and makes them available on the university intranet. The University of Botswana, through its Millennium INNOPAC system, has extensively automated its housekeeping services including provision of web-based catalogue. Through its OPAC, the university library provides access to several full-text journals. The university has also digitised its past examination papers and made them available over the Web OPAC. Within the special libraries arena, librarians in Botswana during 2002 formed a consortium to facilitate the digitisation of their libraries resources to make them widely accessible among other objectives (Mutshehwa and Rao, 2000).

From the experience of the author working at the University of Nairobi in Kenya, most libraries, especially universities, schools, private organisations and low funded organisations, are using CDS/ISIS library software. CDS/ISIS is largely used for maintaining databases. For example, using CDS/ISIS, the University of Nairobi maintains a list of theses in Kenyan universities and a list of periodicals held in libraries in Kenya. In contrast most libraries in schools, colleges, universities or private organisation that have access to funding have implemented commercial library systems such as: Mandarin, Erudite, Data Trek, Adlib, Winlib, VUBIS, and In-magic to mention a few. In Moi University, for example, the library was automated in 1993 using Tinlib system that was funded by the UK Overseas

Development Agency. Furthermore, the University of Nairobi through a partnership with Free State University of Brussels in Belgium in 2001, received a donation of library integrated software, VUBIS which is being used to automate the library's collection.

At the University of Zambia, through a project known as Computers for Academic Management and Administrative Support (CAMAS), donor funding was secured and the library was able to install 200 computers throughout the university that were, amongst other things, used to facilitate access to the library catalogue by students and staff (Chifwepa, 2003, p. 121). Similarly through donor funding, Copper Belt University and University of Zambia have acquired and installed Dynix and Styliis systems respectively. In Makerere university in Uganda, the library has benefited from donor funding through the African Virtual University library initiative of the World Bank to equip the library with computers and installed an Internet connectivity that facilitates access to local and remote databases. In Mozambique, libraries in universities, such as Catholic University of Mozambique, Instituto Superior Politecnico Universitario, and Instituto Superior de Ciencias e Tecnologias de Mozambique (ISCTM), and Universidade Eduardo Mondlane (UEM) are automated using Winnebago software. In other libraries outside the university environments in Mozambique, the automation is quite low (Sairosse, 2004).

University libraries are also benefiting from the Program for the Enhancement of Research of Information (PERI) under the sponsorship of the International Network for the Availability of Scientific Publications (INASP). Through PERI, donors have paid subscription on behalf of libraries in Africa to access web-based journals (Chifwepa, 2003, p. 122). Other than donor funded automated projects in Africa, some organisations through funding from their parent organisations have made progress in deploying ICTs in their libraries. For example, among those libraries that have automated without seeking donor funding, are the Botswana National Library Services and the National Library of South Africa, University of Botswana, university of Lesotho, University of Namibia and several universities in South Africa. In public schools within most countries in Sub-Saharan Africa there is little meaningful library automation. In contrast private schools are making considerable efforts in automating their libraries. For example in Botswana most of the English medium schools (private schools) are automated using variety of systems, such as Mandarin, Papyrus, and L4U. In addition, the government of Botswana has equipped secondary

schools with computers as part of its e-government strategy to make Botswana an information society by the year 2016. Additionally, in Botswana through a government initiative, the colleges of education libraries in Botswana are automated using Mandarin system that was acquired under a special offer to government of Botswana. Similarly, in Tanzania and Kenya respectively some private schools such as the International School and the Aga Khan education Centre use Mandarin system (Achora, 2004).

On the whole, the use of ICTs is improving across the Africa continent. Chisenga (1998), in a study of use of university libraries home pages, established that there are fairly advanced library information technology in South Africa, Namibia, Botswana, and Zambia. Furthermore, Muswazi (2000), in a study of the digital library and information services in Southern Africa comprising 22 public, 20 academic and five special libraries, found that 10 academic, five special and five public libraries have official home pages. Libraries surveyed in Botswana, Namibia, South Africa, Swaziland and Zambia had OPACS on the World Wide Web, while other libraries in Botswana, Lesotho, Mozambique, Namibia, Zambia and Zimbabwe had extensive links to other resources on the Web (Muswazi, 2000).

Challenges of deploying ICTs in libraries in Africa

The library automation environment in Africa is improving but there are several challenges to be addressed. For example, although the Internet is becoming widespread, its use is dominated with e-mail use, small in-house databases or use of donated CDROM databases (Chisenga, 1998). In addition, in some institutions where the Internet is available, restrictions are put in place to restrict its use on account of cost, policy, etc. (Martey, 2001). Nkhoma (2003), in a critical analysis of library computerisation at Copper Belt University in Zambia, laments that the library has had problems arising from a number of factors namely that there was initially inaccurate costing of the project and because it was accomplished at the expense of the book budget. He notes that mistakes were made in selecting a costly system that has proved unsustainable. There is only a single PC for Internet access and another PC assigned for CDROM databases.

Libraries with access to funding in Africa have changed or have plans to migrate to new systems in such places as University of Botswana, University of Namibia, National University of Lesotho, Copper Belt University and several universities in

South Africa. Though it is normal to change systems largely because of obsolescence, reasons that have been given indicate that most libraries are not happy with the performance of the systems, because of lack of adequate information relating to automated systems market place (Mutshewa and Rao, 2000; Mutula, 2002). The University of Zimbabwe automated using Erudite system in the late 1990s, but soon after had technical problems with the system of technical and sustainability nature. Consequently the system was replaced with INNOPAC Millennium system. However, the University of Namibia with its Urica system is considering migrating to a new automation system because of poor support from the vendor. Similarly in Lesotho, the National University migrated from Stylis to ITS system.

Sairosse and Mutula (2003), in a study of economic impact of cyber cafes in Gaborone Botswana, found that majority of users were students from the University of Botswana. The dominance of university of Botswana was partly attributed to lack of adequate resources at the university. Achora (2004) discussing the implementation of automated system at the Aga Khan Education Centre in Tanzania noted that they faced problems of installing and using the system adequately. In addition, training was offered online but with poor telecommunication infrastructure, there were several challenges to cope with such as lack of connectivity. The other problems facing libraries in Sub-Saharan Africa is lack of automation policies. Muswazi (2000) points out that in Botswana, Malawi, Namibia, South Africa and Zimbabwe most university libraries do not have policies on access to OPACS, CDROM, databases, etc. Other problems facing libraries in Africa include high cost of access to electronic databases although it is very difficult to measure the usage of such databases in order to justify such high costs. Eaton (2002) points out that, despite the proliferation of networked electronic information services over the past decade, there has been persistent lack of agreement over how to record their usage. How can these expensive resources be justified in the era of budget cuts? Is it acceptable to spend money on electronic services if their usage and relative value for money cannot be quantified? It is also important that issues relating to copyright of digital objects be addressed (Deegan, 2002).

Conclusion

There are many variations in Africa's library automation environment with various libraries at different stages of deploying ICTs. It is important

that the libraries reassess the environment in which they are operating, i.e. whether poly-media, electronic, digital or virtual, in order for them to determine the effort needed to bring about desired change through digitization or other means to enhance access to electronic resources within these libraries. There are a number of means at the disposal of the libraries to achieve this. They could do nothing about it and risk becoming irrelevant in the emerging global information society. Alternatively they could consolidate, in which case build on their strengths while seeking new opportunities to offer a more effective service. In this scenario they can fit within the emerging information society but must have the necessary resources to achieve and sustain this. Finally, libraries may decide to become entrepreneurial, in which case they transform to become business oriented to generate money that in turn helps them offer an effective and sustainable service. However, they have to deal with the issue of free access to information versus charging. Perhaps a good approach would be to consolidate and at the same time become entrepreneurial. This must be preceded by creating awareness among users about the need for them to make a contribution towards making library service more effective through paying some charge. There is nothing for free anymore.

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