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Towards the digital library:

findings of an investigation to establish the current status of university libraries in Africa

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Abstract

The term digital library is used to refer to a library where some or all of the holdings are available in electronic form, and the services of the library are also made available electronically – frequently over the Internet. Over the past fifteen years libraries worldwide have increased their holdings of electronic information and automated their operations, but within Africa digital development has been uneven. The philosophy of the academic library as a passive repository has taken longer to change, and librarians have not had the opportunities to critically reflect on what has been developed, and what their priorities are for the future. In 2004 INASP commissioned a survey of the current status of digital libraries in sub-Saharan Anglophone Africa, so as to draw conclusions on where future developments and investments might be made, and what can be learnt from the implementation of digital libraries within the continent.

Introduction

The university environment in Africa is changing. There is renewed recognition of the role that universities play as drivers of national development. Their transformation has included much investment in terms of electronic infrastructure and connectivity as well as attention to e-learning and related approaches as key tools to enhance the quality of higher education and make it more accessible. University libraries are an important part of this transformation, with the potential to become leaders and standard-bearers of what can be done with the new ICTs.

The term digital library is used to refer to a library where some or all of the holdings are available in electronic form, and the services of the library are also made available electronically – frequently over the Internet so that users can access them remotely.
However digital libraries are not created overnight. Various stages along the road towards developing a digital library can be identified. Information held in electronic format listing the contents of a discreet collection may be the start. Developing an electronic catalogue of all library materials is another. Networking this catalogue, so that users not only in the library but also from elsewhere can access it, goes a step further. Offering full electronic text of journals and books on CD or online marks a further stage. Then there is the digitisation of locally produced information and the establishment of institutional repositories, to provide access to the scholarly material produced by members of the university. Perhaps most important is the value added to purchased resources by the library to optimise their use: training for staff and students in information literacy; development of 'middleware' to enable seamless searching and access to information; partnerships with academic departments in delivering e-content in flexible learning environments; developing e-services that meet user needs, etc. For many, the endgame is one where academic staff and students can interact electronically with the library's – and ultimately the world's – scholarly content without actually visiting the library. In practice few libraries have reached this status and most are at some intermediate stage.

Over the last five years, enormous progress has been made in ensuring that staff and students in universities in Africa can access the growing quantities of information resources now produced in electronic format. Support has been provided in setting up the necessary networked infrastructure and providing the requisite hardware and software. Negotiation with publishers has resulted in journals and databases being made available free or at heavily discounted prices through programmes like AGORA, eIFL, HINARI and PERI, and much training has taken place.

Despite all the plethora of actions and projects, it is surprisingly difficult to obtain a good overview of the status of electronic and digital initiatives in African higher education. Such evidence as there is suggests that progress made by libraries is very uneven, both between and within countries. Some university libraries have embraced the new mediums and made them available to users, others do not have the necessary infrastructure to access those e-resources now available on countrywide licences. Some libraries are fully automated, others remain manually organised. Libraries which automated some years ago have not been able to migrate or upgrade to new systems, so offer only limited services.

Those libraries that have advanced down the digital road do not yet appear to have explored user needs in the digital world and the possibilities of a more dynamic interaction with ICTs. The philosophy of the academic library as a passive repository

remains dominant. The necessary changes in service provision and staffing structures have not taken place.

Librarians themselves have not had the opportunities to critically reflect on what has already been developed and express their priorities for the future with regard to digital libraries.

In 2004, therefore, INASP commissioned a survey of university libraries in English-speaking Africa. It aimed to provide an overview of the progress made in establishing digital libraries, and identify where and what support is required.

Scope, purpose and methodology

Aims

In the context of the creation of digital libraries, the investigation aimed to:

- establish progress that has been made by African universities;
- explore the current priorities and plans of African university libraries;
- ascertain which support interventions have worked best; and
- identify the nature of the support that is now required.

Coverage

Data was gathered from publicly funded university libraries in sub-Saharan Anglophone Africa, excluding South Africa. (Private university libraries were not included; neither were research libraries.) All libraries within a country were targeted and within a university all individual libraries, whether they were designated main, branch or site libraries.

Digital library development has moved at a different pace and in different directions in South Africa, but, for comparative purposes, it was decided to collect data from a small sample of leading libraries. For the same reason, one leading library in Francophone Africa was also included.

Methodology

A questionnaire was designed and piloted for completion by libraries (Appendix 1). It covered all aspects of digital librarianship including library automation, ICT facilities, electronic and digital resources, local content, electronic resources, finances, management and training, user education and future plans. The questionnaire was sent to 107 libraries in 20 countries of Anglophone Africa. In addition four libraries in South Africa and one in Senegal were invited to complete questionnaires for comparative purposes.

Data received from the questionnaires was augmented by on-site visits, discussions and interviews with university libraries in Ghana, Malawi, Tanzania, Uganda and Zimbabwe.

In November, a focus group discussion took place in Oxford with librarians from Kenya, Malawi, Uganda and Zimbabwe. This covered digital library perceptions, challenges, priorities, types of support wanted and sustainability.

Time scale

On-site visits and discussions took place between September and December 2004. The questionnaires were distributed in mid-November. An initial return date of end of December was extended to mid-January to allow for the Christmas break. Questionnaires continued to be received until the end of January 2005. Analysis started in February.

Data collection

Of the 107 questionnaires sent out to Anglophone Africa, excluding South Africa and Senegal, 13 came back undelivered. Sixty-eight completed questionnaires were returned, giving an overall response rate of 72%. Returns came from 18 of the 20 countries surveyed. Only Mauritius and Rwanda are absent. Three of the returned questionnaires

supplemented information already provided by one library, and three arrived too late to be included in the statistical analysis. Sixty-five libraries (within 50 library systems) are covered by the survey, with data from 62 analysed in the statistics. The names of the libraries returning questionnaires are listed in Appendix 2.

Table 1: Number of responses to questionnaire.

Country	Number of responses		
	Total	**Main**	**Branch/site**
Botswana	1	1	0
Cameroon	3	3	0
Eritrea	1	1	0
Ethiopia	2	2	0
Ghana	11	5	6
Kenya	8	6	2
Lesotho	1	1	0
Malawi	5	2	3
Mozambique	1	1	0
Namibia	2	1	1
Nigeria	13	13	0
Sierra Leone	2	0	2
Sudan	1	0	1
Tanzania	4	2	2
Uganda	4	2	2
Zambia	3	1	2
Zimbabwe	6	5	1
Sub-total	**68**	**46**	**22**
Senegal	1	1	0
South Africa	1	1	0
Total	**70**	**48**	**22**

Carrying out an Email survey of African libraries is not without problems. Addresses change rapidly and even when Email messages were not returned as undelivered, there is evidence to suggest that they were not received, perhaps because of system malfunction, power failures, etc. Attempts were made to establish a list of accurate Email addresses through personal contacts in each of the countries – but even this had limited success. The timescale of the survey did not allow for any follow-up through the postal services.

The survey aimed to investigate the state of all university libraries, so data was requested not just from the main library of a university but also from those branches serving separate sites or faculties. Where the addresses of site or branch librarians were known, questionnaires were sent directly. Otherwise the university librarian was asked to distribute copies of the questionnaire to the relevant branch or site librarians. Unfortunately this met with limited success. Only 22 branch libraries submitted separate returns although the majority of libraries (36/78%) were multi-site operations, compared to 10 single site libraries (22%). The returns revealed that 14 (30%) of the university libraries were responsible for 1–5 branch libraries, 13 (28%) for 6–10 and 9 (20%) for more than 10. The survey is therefore stronger on data for main university libraries and does not reveal as much as would have been liked on the state of branch and site libraries.

This survey only covers public university libraries in Anglophone Africa (excluding South Africa). The one return received from South Africa (University of Western Cape) indicates that major libraries in that country are further along the road to establishing digital libraries, especially in cooperative projects and e-services, but it is a difference of degree rather than kind. The University of Dakar is at the same stage as the more advanced libraries in Anglophone Africa. It is a leading library in Francophone Africa and therefore likely to be well ahead of other libraries in the French-speaking countries. However for a full picture of the state of digital libraries in Africa, it would be necessary to carry out further surveys in South Africa, Francophone and Lusophone Africa and to include the growing number of private universities and other research libraries in all countries.

Findings

Library automation

The acquisition, organisation and circulation by electronic means of library materials are a primary feature of a digital library. This is accomplished by use of a specialised library management system or software, with modules for cataloguing, acquisition, loans, serials, OPAC, etc.

From the survey, library automation began in the early 1990s. However the majority – 40 libraries (65%) – have still to complete the process. Most began with cataloguing, but have neither finished that nor moved onwards to other processes. Thirteen libraries (21%) have not yet started any automation and only 9 (15%) consider that they are fully automated.

Table 2: Library automation systems currently in use.

Name of system software	No. of libraries	Countries where used	Date first used
Adlib	3	Eritrea, Tanzania	1998
Alice for Windows	3	Nigeria	2001
Ansyltec; Koha	1	Nigeria	1997
Bibliofile	4	Ghana	1994
Cardmaster Plus	1	Uganda	2003
CDS/ISIS; WINISIS	8	Ghana, Kenya, Nigeria, Uganda, Zimbabwe	1992
Dynix	1	Zambia	1992
Graphical & Library Application Software	2	Nigeria	1995
Innopac Innovative Innopac Millenium	7	Botswana, Lesotho, Mozambique, Namibia, Zimbabwe	1999
ITS for Windows	1	Nigeria	2001
Library Solutions	5	Malawi	1993
Mikro	1	Tanzania	2003
Stylis	1	Zambia	1995
TinLib	2	Kenya, Nigeria	1998
Urica	1	Namibia	1999
Virtua-ILS	3	Uganda	2003
Vubis	2	Kenya	2001
Winnebago Spectrum	1	Ghana	2002
Xlib	2	Nigeria	2002
In-house system	1	Malawi	2003

Libraries that started the process of automation early are not necessarily those that have successfully completed the process. Unless one could afford to migrate onto new and updated systems, the early start could be a disadvantage. The fully automated libraries are those that either started late with donor assistance (e.g. University of Dar es Salaam Main Library which began automation in 1998) or have secured funds to migrate to up to date systems (e.g. University of Botswana from TinLib to Innopac; University of Namibia from Urica in 1990 to Innopac in 2004/5; and University of Lesotho from Stylis in 1995 to ITS in 1996 to Innopac in 2005). Libraries which became fully automated in the 1990s but cannot afford to migrate find their current software very limiting, e.g. the

Copperbelt University Library in Zambia, using Stylis, and the University of Zambia Library, which wants to upgrade its UNIX-based Dynix to the Web-based Horizon. None of the libraries that began (self-financed) automation with CDS/ISIS have progressed beyond partial cataloguing of library materials.

The 50 libraries that reported automation at one level or another use 20 different library management systems. In general libraries belonging to one university used the same system – but this was not always the case. Within countries, a variety of different systems are in use, as shown in Table 2.

ICT facilities

An adequate ICT infrastructure with a sufficient number of networked and Internet-connected workstations is essential if a library is to offer access to e-resources and develop e-services.

Table 3 shows the number of computers provided by each library for public use, as a ratio of the fulltime equivalent (FTE) students served by that library. Eighty-five per cent of the libraries in the survey provide less than one computer for every 100 FTE students and 36% provide less than one computer for every 500 FTE students.

Table 3: Computers provided per FTE students.

Computers: FTE students	% (no.) libraries
Up to 1:49	10% (6)
1:50 to 1:99	5% (3)
1:100 to 1:499	31% (19)
1:500 to 1:999	11% (7)
1:1,000 onwards	23% (14)
No computers	3% (2)
No data provided	18% (11)

A good proportion of the computers, both for public and staff use, were in working order at the time of the survey, indicating either good maintenance or, in most cases, recent acquisition of the hardware. However the proportion of library computers connected to the Internet is much lower. Only 35% of libraries have 75% or over of their computers connected to the Internet, whilst 15% are not connected at all.

Table 4: Status of computer equipment and access within survey libraries.

Computers	% (no.) libraries with computers:	
	In working order	Internet-connected
100%	40% (25)	19% (12)
75% to 99%	34% (21)	16% (10)
50% to 74%	8% (5)	15% (9)
1% to 49%	5% (3)	23% (14)
0%	0% (0)	15% (9)
No data provided	13% (8)	13% (8)

Of the libraries which answered questions on the nature of Internet connectivity (53), about half (24) stated that connectivity was poor (slow speeds infringing on the usefulness of the connection) or very poor (the slow network speeds and reliability being real barriers to using e-resources). Table 5 shows the method of connection used and the ratings given by the libraries. Normally the method of connectivity used was shared with the whole university.

VSATs are currently the most popular method of connectivity and that favoured by funders, perhaps because it is the cheapest and is often the only available one. An OSIWA project in Nigeria is connecting libraries by VSAT and the library consortium in Malawi has just bought a number. Libraries with older established connectivity tend to use leased lines, which connect to VSATs eventually. Speed – with 'computers grinding to a halt' especially in the afternoons – was said to be more of a problem than reliability, although the latter was severely hampered by power cuts in some countries. The survey

included a question on amount of bandwidth, but replies showed no correlation between the method, the amount of bandwidth and the level of rating it was accorded by the library –a VSAT offering 2 or more Mbps was rated both excellent and poor, the same with leased lines. The number of computers connected, the amount of traffic and how the bandwidth was used were more important factors than the method of connectivity and the amount of bandwidth provided.

Table 5: Status of Internet connectivity.

	Total % (no.)	Excellent % (no.)	Good % (no.)	Adequate % (no.)	Poor % (no.)	Very poor % (no.)
VSAT	35% (22)	3% (2)	9% (6)	11% (7)	9% (6)	2% (1)
Leased line	29% (18)	0% (0)	2% (1)	13% (8)	11% (7)	3% (2)
Wireless/ Radio	11% (7)	0% (0)	2% (1)	3% (2)	3% (2)	3% (2)
Dial-up	9% (6)	0% (0)	0% (0)	3% (2)	6% (4)	0% (0)
None	14% (9)	–	–	–	–	–
No data provided	2% (1)	–	–	–	–	–
Totals:		**3% (2)**	**12% (8)**	**30% (19)**	**30% (19)**	**8% (5)**

The ideal situation for a digital library is to be connected to a campus backbone, so that library resources can be accessed not only from within the library but from anywhere on the campus. Focus group librarians considered the lack of university-wide networks to be a major challenge and would also have liked countrywide networks of all universities to exist. As shown in Table 6, only 31% were connected to university-wide networks and a significant number were not networked at all.

Table 6: Network status of participating libraries.

Network	% (no.) libraries
University-wide	31% (19)
Library and site	16% (10)
Library only	23% (14)
No network	16% (10)
No data provided	14% (9)

E-resources

It used to be said that Africa's problem was lack of e-resources to fill the networks. That is no longer the case now that there are available a number of journal support programmes offering discounted or free access to bundled publisher packages. The PERI programme offers access to over 14,000 journal titles from 11 publishers plus approximately 20 databases, with country licences available in nine of the 18 countries included in the survey (Ethiopia, Ghana, Kenya, Malawi, Mozambique, Tanzania, Uganda, Zambia and Zimbabwe). All countries have access to African Journals Online (AJOL), which hosts the tables of contents and abstracts of more than 200 journals, with links to full text of over 80 titles. The HINARI (health journals) and AGORA (agricultural journals) programmes are available in all countries, whilst the eIFL programme includes some journal packages, in particular EBSCO with over 10,000 titles. Only six out of the 62 libraries (10%) said that they did not offer access to e-journals (some like University of Development Studies in Ghana indicated that they provided passwords, where internet access was not available in the library). Although some libraries started offering access to CD-ROMs in the 1990s, half only started offering this after 2000, so access to e-resources is a recent development in most libraries.

Provision of e-books is a different matter. Seventy-two per cent recorded no access to e-books at all. Four libraries stated that they subscribed to NetLibrary, one through AVU (University of Botswana, Gulu University, Uganda and two libraries of University of

Zimbabwe); three libraries used eGranary (in Nigeria and Uganda), and one library used eBooks (University of Dar es Salaam). The latter had purchased 370 titles with another 400 on order, covering all disciplines. Another eight used free sites, like Humanities Library, Free Books for Doctors and the World Bank. Only one library mentioned the African Digital Library. Downloading was said to be a major problem. However several libraries stated that, given the problems they faced in funding the purchase of print books, they would like to move more towards using e-books.

Although 41 libraries (66%) said they stocked CD-ROMs, these were not seen as a primary means of accessing information. Most of the CDs came free with books or other services like EBSCO and TEEAL. Outside the CABI databases funded through PERI, there were very few current subscriptions and many of the CDs were now out-of-date. The evidence suggests that in Africa, as in the rest of the world, CDs are being supplanted with online resources.

As shown in Table 7, most of the libraries received their e-resources either from funded programmes or free of charge (open access, accompanying other material, etc.). The chief donors were listed as INASP through PERI, eIFL, WHO, FAO, CTA, TEEAL. (The funders of PERI include DFID, NORAD, Royal Danish Ministry of Foreign Affairs and Sida.)

Table 7: Method of acquisition of e-resources.

Primary method of acquisition	% (no.) libraries
Funded programme and free	58% (36)
Funded programme/free and subscription	19% (12)
Subscription	6% (4)
None	10% (6)
No data provided	6% (4)

The four libraries that relied mostly on subscription from institutional funds (and which tended to purchase single titles rather than packages) were University of Botswana, two libraries of the University of Namibia and the University of Jos, Nigeria.

There was also a movement towards self-reliance and away from total donor dependency. Ten libraries were now paying for a portion of their subscriptions, whereas until 2003 they had been totally reliant on donor money. This development appeared to be due to the formation of library consortia and the collection of contributions from participating libraries. Kenya now pays for over 50% of their journal subscriptions and Malawi and Zimbabwe are following. In Nigeria, the Nigerian University Libraries Consortium has negotiated with the Education Tax Fund to pay for the subscription to EBSCO for all higher education institutions in Nigeria from 2005 onwards.

E-local content

University libraries in Africa have always collected materials published locally as well as those published elsewhere which relate to their particular country. These have included what has been produced within the institution, e.g. theses and dissertations, research reports, papers presented at conferences and journal articles written by members of the academic staff, as well as what has been more formally published. Such materials, in some cases acquired through legal deposit, are usually collected together in special local collections. As part of the survey, librarians were asked whether they had produced electronic databases (either indexes or full text) of such materials and if such databases were being made available to users. Over the last two years, there has emerged a global trend to set up university-based digital institutional repositories (IRs), designed to capture the scholarly output of an institution, e.g. journal reprints, theses, dissertations and other digital research material. This survey also included questions to establish the existence of IRs.

Fourteen libraries had created e-indexes to local materials, the majority being indexes to theses, student projects, local newspapers and health literature. Only University of Dar es Salaam and University of Namibia reported the existence of several such databases on

various subject areas, with some of these at University of Namibia being full text. For most of these databases access was on request, with a minority on the library local area network (LAN) or CD-ROM. Only University of Namibia offered direct Web access, although the College of Medicine Library at University Malawi had loaded references to Malawiana health on a NISC database, so this was also accessible on the Web.

Six libraries reported preparing databases of theses (abstracts only), and two more were working on such projects. Of the six, four submitted records to the Database of African Theses and Dissertations (DATAD) and these were then Web accessible. The University of Nairobi had cooperated with the Kenya Information Preservation Society to produce a union list of theses held in Kenyan universities on CD-ROM. The other library (University of Gezira) had mounted its database on the library LAN.

Libraries in Africa have not therefore progressed very far in making local content available electronically. Digitisation of full text and the establishment of IRs are even less common. Five libraries have full text collections of past examination papers. Four of these were available through the library LAN and one on the Internet. Two libraries – Makerere University and University of Namibia – had set up IRs, both using DSpace. The IR in Makerere was set up by University of Bergen and was in its infancy.

Several of the libraries expressed an interest in full text digitisation and IRs and several African librarians had attended a number of workshops. The use that could be made of electronic databases and full text digitisation to increase the availability of local materials was recognised. The University of Zimbabwe already has a pilot project in operation for theses and dissertations and had moved quite a long way towards setting up an IR: administrative approval had been given and software evaluated. At University of Botswana an IR was in the planning stage. The University of Malawi stated its intention to start digitising the full text of its Malawiana Collection and University of Zambia saw digitisation as a way to preserve local publications in danger of disintegration. Bayero University was currently digitising Arabic materials, local journals and theses.

E-services

As libraries embrace the digital environment, their most crucial role is not that of providing e-resources, but of establishing services that facilitate access to the information available. A library will be rated according to the usefulness of the extra value it adds to the purchased products. Libraries were therefore asked about what e-services they provided for their users. The answers, detailed in Table 8, show that very little has been developed in this area. Just over a third of the libraries had Web pages describing facilities and services and whilst 45% had developed online public access catalogues (OPACS), only 16% of these were accessible from the Web and therefore from terminals outside of the library. The three libraries that offered combined searching at the title level of all electronic resources were University of Botswana and two libraries in University of Zimbabwe, using software like EBSCO A-Z and MetaLib. Makerere University had a pilot project using ELIN underway to allow searching at the article level. University of Namibia, University of Dar es Salaam and University of Zimbabwe had started delivering course materials as part of virtual learning environments (VLEs) – although these were small and/or pilot projects with that of Namibia not yet online – whilst the Universities of Jos and Lagos reported developing such activities. The University of Zimbabwe was working on setting up a single search tool through its automated library management system, Innopac.

Although the returns indicated that most African university libraries have a long way to go in developing e-services, additional comments show that many libraries had already taken first steps in that direction. Several reported that they intended to have a Web-enabled OPAC in operation in the near future and were in process of designing their own Web pages.

The University of Dar es Salaam Library had gone a step further by setting up a Virtual Library. This NORAD-funded project started in 2003 and aims to integrate the provision

of and access to digital information resources and promote their use through an organised programme so that the university user community will be enabled to access information from various points and localities.

Table 8: Electronic services offered by participating libraries.

E-service	% (no.) libraries
Library Web page	35% (22)
OPAC	
library LAN	29% (18)
Web	16% (10)
Web-based searching of library catalogue and other databases by local or remote users	21% (13)
Combined searching of all electronic resources	5% (3)
Single search tool for all resources (physical, electronic, in-house, regional, etc.)	0% (0)
Web-based and distributed enquiry or reference service	0% (0)
SDI (but most replies referred to manual sending of Email alerts)	18% (11)
Library e-bulletin	8% (5)
E-content delivery through VLEs	5% (3)
Online training packages for library users	
'commercial', e.g. HINARI, TEEAL, PERI, RDN	8% (5)
developed in-house	3% (2)
interactive	0% (0)

Finance

The survey wanted to find out how much of the ICT facilities and resources had been purchased from institutional as opposed to external funds and what sort of measures for future sustainability were in place.

As shown in Table 9 below, it was more likely for an institution to meet or contribute to the cost of ICT facilities (network, computers, etc.) than pay the subscription costs of e-resources. Even so, everywhere there was a heavy dependence on external funding. Only ten libraries reported purchasing 100% of ICT facilities (and this number included libraries with minimum hardware) and only two libraries purchased 100% of their e-resources. Twenty-nine libraries purchased less than 10% of their ICT facilities and 38 less than 10% of their e-resources.

Table 9: Per cent (no.) of libraries purchasing facilities or resources from institutional funds.

	ICT facilities	E-resources
100%	16% (10)	3% (2)
75% to 94%	8% (5)	5% (3)
50% to 74%	6% (4)	3% (2)
25% to 49%	5% (3)	2% (1)
10% to 24%	8% (5)	6% (4)
5% to 9%	8% (5)	8% (5)
1% to 4%	8% (5)	11% (7)
0%	26% (16)	42% (26)
Not known	14% (9)	19% (12)

Thirty-four international funding agencies were mentioned as contributing funds either to facilities or e-resources. Local donors were limited to Ghana (e.g. the Ghana Educational Tax Fund), Nigeria (e.g. Education Tax Fund and ELF) and Uganda (Uganda Telecom).

Libraries indicated that future sustainability is an issue that still needs to be addressed. Fourteen libraries preferred to rely on institutional budgets; a further three said that they intended to lobby for more money from this source.

Twenty-nine libraries (47%) charged fees for Internet access, whilst 24 (39%) offered the service free of charge. Eight of the libraries reported that these fees were an

important part of their sustainability strategy and a further six said that they intended to introduce a fee or raise the amount charged, once their facilities had been upgraded. Fee-based access was most common in the countries of West Africa. However both universities in Malawi and one in Zambia charged fees. The value of such fees was considerable. One library noted that the funds generated paid for its Internet service provider (ISP), toner and paper. Another said that fees met 30% of the connectivity charges. Interestingly, the University of Asmara, which only started offering e-resources very recently, chose to charge fees. The downside of fees – that they discourage use – was acknowledged. The University of Malawi offered Internet access free during scheduled hours early in the morning, and five universities preferred for the ICT fee to be included in the general student fee.

Eight libraries, in Ghana, Kenya, Lesotho, Malawi, Zambia and Zimbabwe, mentioned the establishment of a country consortium (through which individual libraries contribute towards the annual cost of e-resources) as their main sustainability strategy. Doing things together has a greater impact and brings more pressure on funding bodies. Although it is too early to assess how successful they will be, at the moment consortia are working well in Kenya, Malawi and Zimbabwe. One library in Ethiopia was not optimistic that much would come out of its consortium.

Management

Questions were asked to ascertain who managed e-resources and e-services; whether a separate section of the library had been set up for this purpose, where the services were physically located within the library, what training library staff had received and what sort of monitoring and evaluation of use there was.

Thirty-six of the libraries managed e-resources and services within the existing organisation of the library. Librarians within Technical Services, Reader Services, Serials or subject-based services were responsible and were given no special nomenclature. But as many as 20 libraries had set up separate sections with appropriately named staff in charge. For example: Electronic Services Resource Centre, E-Resources Department, E-Support Unit, E-Documentation Service, Automation Unit, Computer and Information Retrieval Centre, Digital and Research Library, Computer-Assisted Learning Department, Systems Unit.

Regarding the location of computers for public use within the library, the results are given in Table 10. Countries, universities and libraries had different practices. Where the e-resources and e-services were considered integral to the library support for learning and research – and where no separate department had been set up – computers were scattered throughout the buildings (in the entrance, the reference section, on subject floors and laboratories) alongside print materials and other services.

Where libraries had set up separate departments, and where payment for Internet access was the policy or where security was an issue, the trend was for computers to be separated into separate laboratories, either inside or outside of the library. In Nigeria, the tendency to date had been to place computers for public use in campus Internet cafes, although different systems were being investigated.

Table 10: The location of computers for public use.

	% (no.) libraries
Public areas	34% (21)
Laboratory in library	21% (13)
Mixed (laboratory/public areas)	10% (6)
Outside of library	6% (4)
Staff offices	6% (4)
No data provided (including no computers for public use)	23% (14)

In University of Namibia, in 2004, the management of all computers accessible to users was taken over by the Computer Centre and Interactive Multimedia Services. This meant

that all non-OPAC and training computers were removed from the library and placed in a separate laboratory (albeit in what had been the ground floor of the library). The library has since found the need to set up two computers for user access within its premises.

Monitoring and evaluation was in its infancy in all libraries. Four libraries collected log-in data, seven libraries used the user statistics provided by publishers and 26 libraries manually collected user data, generally of a fairly basic nature – e.g. who used the computers, how many searches were carried out and for what purpose. Only one library said it asked about relevance of search findings. None of the libraries had developed any performance measures against which to evaluate usage. University of Dar es Salaam said that it wanted to introduce such measures in the future.

The survey asked about the training given to staff in the management of e-resources. Rather than answer this question, most libraries provided information on all ICT-related training received and much of this was on the Internet in general, on specific software and databases, on Web design, etc. At least one member of staff in all but seven libraries had attended at least one ICT-related short course. Most of these short courses were externally facilitated but five libraries stressed the importance of in-house training of staff. Training in management was limited to a few PERI and eIFL workshops and not widespread. Those librarians who did answer the question said that enhancement of skills was mostly achieved through self-training on the job and not carried out systematically.

In the focus groups, the issue of professional training for librarians was raised. Although it was recognised that the need for continuing education of staff would continue, university libraries expected to be able to recruit new staff that already had requisite e-knowledge and e-skills. However, this is not happening. It was felt that library school curricula were out of date and there was a need for them to take account of what was wanted by practitioners in the field. A country like Malawi, which did not have its own library school, was even more disadvantaged.

User education

The survey attempted to find out the nature of the training offered to users, who delivered it and whether library staff had been given any special training to teach such courses.

Only three libraries reported that they offered academic staff an integrated user education/bibliographic instruction course and two offered an initial orientation to the library session. These included ICT-related training. Four offered one-to-one training on request. The greatest number (32/52%) mounted special one-off workshops in ICT-related subjects, such as online search skills, subject gateways, PERI databases, use of the Internet, computer applications, etc. The remaining 21 (34%) offered no training to academic staff at all. Some respondents commented that such training was not very effective: ‘the faculty sessions are not successful’ (Lesotho), ‘academic staff are reluctant to attend’ (Namibia), ‘ many staff do not attend’ (Makerere).

Ten (16%) libraries in Botswana, Kenya, Namibia, Nigeria, Zambia and Zimbabwe supported integrated information literacy programmes for undergraduates, in which training about e-resource use was taught alongside other information skills required for successful learning. Such programmes were part of the formal education programme of the university and, in the case of Botswana and Kenya, part of other credit bearing first year courses in communication skills and general education. The University of Namibia Library also carried on the information literacy teaching to subject-based courses in later years. Thirteen (21%) libraries said that any user education was restricted to an orientation session; four gave one-to-one sessions on request; whilst 22 (35%) libraries concentrated on giving special one-off workshops on basic computer literacy, search skills, IT skills and use of the Internet. Thirteen (21%) libraries offered no training to students.

In general it was the professional staff of the library that trained users. Only in five cases was it indicated that staff from the university's computer centre or systems unit were involved in such training. However only four of the libraries said that the members of staff who undertook the teaching had received special training in pedagogical skills. This was at University of Botswana, at Ahmadu Bello University (where a train-the-trainer group had been set up in the library), at University of Zimbabwe (where the library organised in-house training in course development and lesson presentation), and the librarian at University of Sierra Leone had received training whilst on attachment to a link library in UK. None of the other librarians had received any relevant training in how to teach, and several stressed the 'need for proper training'.

Achievements/challenges

Libraries were asked to identify up to three areas where they felt that they had been most successful in their provision of e-resources and services and three most important challenges faced. Table 11 presents the responses.

Table 11: Areas of main achievement in the provision of e-resources and e-services.

Main achievement	% (no.) libraries
Provision of e-resources, online and CD-ROM	47% (29)
Raising Internet awareness and training users	35% (22)
Provision of ICT infrastructure and computers	21% (13)
Provision of Internet access	21% (13)
Library automation (begun or completed)	13% (8)
Training of library staff in Internet and e-resource use	13% (8)
Provision of Web OPAC and library Web site	13% (8)
Lobbying for computers and connectivity	2% (1)
Contributing to the cost of e-resources	2% (1)

Although 10 (16%) libraries felt that they had barely embarked on the digital journey and had nothing to report, there was a fair consensus on what was considered a 'success story', even allowing for the varied levels of digital development among the respondents.

The main challenges faced by libraries were also shared and are presented in Table 11.

Table 11: Main challenges faced by libraries in providing e-resources and e-services.

Main challenge	% (no.) libraries
Lack of funds for purchase and maintenance of hardware and e-resources	63% (39)
Lack of or retention of trained library staff	63% (39)
Lack of computers	58% (56)
Speed and reliability of Internet connection	42% (26)
Low levels of ICT literacy/e-resource use among users	23% (14)
Need to start complete library automation	10% (6)
Frequent power cuts (Ghana, Nigeria)	8% (5)
Limited library space	5% (3)
Security of computers	3% (2)

Library staff were felt to be particularly lacking in knowledge of teaching skills (for user education), e-resource management (e.g. subscription negotiating skills) and e-services development.

The low level of ICT literacy among university administrative and academic staff was felt to impinge on other areas such as library funding. Unless their mindset changed, the university authorities would not be convinced to provide money for ICT maintenance and replacement in the library's recurrent budget.

Plans for the future and external support

Libraries were asked about their future plans for the next three years and the areas where they needed external support, if these plans were to come to fruition, and the responses are recorded in Table 12.

Table 12: Future plans.

Plans	% (no.) libraries
Maintain subscriptions to and acquire more e-resources	47% (29)
Train library staff	45% (28)
Acquire more computers	42% (26)
Improve speed and reliability of Internet connection	37% (23)
Complete or upgrade automation, extend to branch libraries	34% (21)
Improve user training programme	31% (19)
Digitise local publications and establish IR	26% (16)
Enhance and extend e-services	15% (9)
Set up national and regional networks	5% (3)
New library building	2% (1)

All the libraries, even those that were comparatively advanced in their use of e-resources, stressed the need for continued external support, both financial and in the provision of expertise. 'To fulfil our dreams of providing digital information services, we need more financial resources. Sustainability is not yet realised' (University of Dar es Salaam). 'We need help to guide us in the provision of better services. Guidance on best practice is needed' (Makerere Education Library). 'There must be a phased pull-out of subscription to e-resources' (Copperbelt University). 'The library is still in its infancy stages, a lot of support is needed from external supporters' (Masvingo University). 'Financial constraints hinder our efforts to acquire and use IT' (Gezira University). Not surprisingly, given the library plans, support was most requested in the broad areas of funding and training. However more specialised areas, like automation and digitisation, were also highlighted (Table 13).

Libraries (50/81%) were very clear on how this support should be delivered – directly to the library concerned (that is, not through the government or the parent university and, in the case of branch libraries, not through the main library) or through library consortia. Several gave examples of support never reaching the library and of librarians never being consulted when ICT support was on offer. Branch librarians felt that their libraries had suffered by not being given the same opportunities for development as the main library. The support was acceptable in cash or kind, but some libraries specified that subscriptions for e-resources were best paid direct by the funder to the publisher.

Table 13: Areas of external support required by libraries.

External support	% (no.) libraries
Funds for purchase of computers and e-resources	73% (45)
Training of library staff	65% (40)
Purchase of library management software and library automation	21% (13)
Improve Internet connectivity and bandwidth	15% (9)
Digitisation and institutional repositories	6% (4)
New library building	2% (1)

Assistance in training was also preferred if delivered directly to the library concerned. Up-country and newer universities felt that they had not had the same training opportunities as the older established libraries; the same for branch libraries vis à vis main libraries. A variety of training methods were requested, according to the area of training: workshops, attachments to other libraries, exchanges between libraries, link programmes between libraries, on-site visits by consultants and experts, distance education. On-site workshops were preferred, with national and regional workshops being more appropriate in specialised areas. Scholarships for full time professional courses were also requested.

A preference was also expressed to deal with one funding agency rather than many. Assistance from several donors at the same time could result in interventions being needlessly duplicated, in undue pressure being exerted on a limited number of staff and in excessive report writing and individual assessments of impact.

Discussion

Different libraries/different needs

A hypothesis underlying this survey was that university libraries in Africa have progressed towards establishing digital services at very different speeds and levels. This hypothesis was confirmed by the findings of this survey.

The number of libraries that can make effective use of the e-resources that are now generally available to them is small. For Africa, it is sometimes recommended that libraries provide one computer for every 25 students (taking into account access through university and faculty laboratories and the low level of personal PC ownership). Yet only 15% of libraries provide more than one computer for every 100 FTE students and in over half of the libraries, less than 75% of the computers are Internet connected. Only 45% of the libraries consider their Internet connectivity to be adequate or above in speed and reliability. Only 31% of libraries are connected to university-wide networks. Conversely a few libraries – examples being Botswana, Dar es Salaam, Namibia, Zimbabwe – are moving towards the establishment of e-services. Ten libraries have developed a Web-based OPAC, three offer combined searching of all e-resources and three have started e-content delivery through VLEs.

It is up-country and newer university libraries and branch libraries that generally lag behind. These recorded low availability of ICT facilities and little ICT training either of library staff or users. It is indicative that only the university libraries of Swaziland and Zimbabwe felt that it was worth recording as an achievement that they had managed to provide all libraries in the system with the same level of ICT. Twenty-one main libraries included the need to extend automation and connectivity to their branch libraries. But others failed to mention this as a problem, although the returns from branch libraries did.

Libraries which have fully automated systems or are well on the way to full automation of library processes and procedures are also those which have the best levels of ICT facilities, trained staff, user education programmes and e-services. Those libraries that have started but not completed library automation have, in general, not moved successfully onwards into other areas. The acquisition and implementation of a library management system would appear to be an essential building block in the construction of a digital library – yet only nine libraries considered themselves fully automated.

University libraries in Africa therefore have different immediate needs and ambitions. These must always be taken into account. Blanket support programmes are unlikely to work. For that reason, librarians were very clear that any external support should be delivered directly to the library concerned, after consultation has taken place with that library.

Funding

Advances made in the provision of computers and purchase of e-resources are heavily dependent on external funding, and libraries consider that they will remain that way for some time to come. Sixty-three per cent of the libraries stated that lack of funds for the purchase and maintenance of hardware and e-resources was a major challenge for the future and 73% said that external support for the purchase of computers and e-resources was crucial. Successful automation projects have generally been dependent on external funding, which is sourced from as many as 34 international funding agencies, with just a few libraries raising funds in-country.

The request for external funds comes not only from those libraries that have barely started to build digital collections but also from those that are dependent on this support to update and replace ageing hardware and maintain e-subscriptions. Comments included a plea to phase out support for the purchase of e-resources very gradually (Zambia) and for staggered donations of computers, so that they do not all wear out at the same time (Malawi).

The heavy dependence on external funding and the fact that this tends to be concentrated on just a few libraries in certain countries (often rather disparagingly termed 'donor babies') was remarked by many librarians as causing the disparities in levels of development. The development community was called upon to give fair attention to the needs of all libraries. Because of burdens arising from report writing and the danger of duplication, libraries also preferred one major funder rather than many.

One of the ways of reducing donor dependence is to share costs through library consortia. However in some cases the funds for the purchase of e-resources have been raised from external sources, so it is still donor dependence at one remove. In Uganda, the consortium has stressed the need to first ensure that all university libraries in the country have the basic ICT facilities to access the available e-resources – without this prerequisite, raising sufficient funds to buy e-resources through a consortium is unlikely to work.

The main hope for sustainability lies in libraries increasing their share of the institutional budget. That this can be done is exemplified by the University of Zimbabwe where 100% of the library's ICT facilities have been paid for out of institutional funds: it is fully automated, with workstations for public use in both the main and all branch libraries with all computers connected to the Internet and to a university-wide network, plus an annual increase in the number of workstations. Although e-resources are donated, a contribution is being made from institutional funds to the consortia and the University Librarian has obtained the support of Senate to ensure that the cost of running the library is accepted as being part of the cost of running the university.

Training of library staff

Noted by two-thirds of the libraries, the lack of, or retention of, trained library staff was considered an equal challenge to that of lack of funding. Although all staff had attended at least one ICT-related short course, this had not necessarily been relevant to the needs of the library at that time and overall it was felt that skills in e-resource management, e-services development and teaching were particularly lacking.

There were several requests, reinforced during visits and discussions, for training methods to be diversified and made more appropriate to the area of training and the needs of individual libraries. Some libraries require help in library automation: others have crossed that bridge and are moving into the use of VLEs. Not all require the same sort of help. In particular, more working attachments to other more experienced libraries and more on-site visits by experts who could troubleshoot and train staff on the job, were requested.

It was felt that one area of training – that of professional training in librarianship – has not been sufficiently addressed. Most countries in Africa have their own library schools training at the undergraduate and postgraduate levels. University librarians therefore expect graduates to be able to work in the e-environment – but this is not the case. Library school curricula have not been updated and little notice is taken of the needs of practitioners. Ideally library schools should also be taking a lead in providing continuing education, through workshops and seminars, so increasing the sustainability of programmes that are at present externally led. For countries without library schools help is needed to establish them. Without effective library schools (and with the dearth of scholarships to train outside the country), the profession is unable to adapt to the new skill requirements and there is a danger of it dying out and nobody being left to take advances forward.

This problem is one that has been recognised by the IFLA/Africa Section. One of it goals in its 2006–2008 plan is 'to promote competent education and training for a self-renewing library and information profession in Africa'. A workshop to review curricula to accommodate development in ICTs is proposed, together with encouragement of library schools to support continuing ICT education. However it may also be necessary to first facilitate the updating of library school staff in digital library developments, so that they can contribute effectively to both curriculum review and the teaching of new courses. Curriculum review is also an area identified by the proposed network of library schools in the Eastern, Central and Southern Africa.

User education

To quote one of the librarians: 'training of users is highly important. It has practical (getting the resources used) and political (winning support within the university) implications'.

The majority of libraries undertake ICT training at the undergraduate level in one form or another. However only 10 (16%) support integrated information literacy programmes as part of the formal education programmes of their university. ICT training alone improves a student's ability to use computers but does not make him or her an independent user of information. So although 35% of libraries saw training of users as one of their main achievements, most need to investigate their training programmes at a deeper level. In 2004, the Standing Conference of National and University Libraries in Eastern, Central and Southern Africa (SCANUL-ECS) conference had as its theme *User Information Literacy* and, after discussion, resolved to examine in more detail what was provided on the ground in this area. Twenty-one libraries have been invited to write case studies and these will be published in April 2005. It is hoped that a proposal for further action will arise from this publication.

End-user training for postgraduates and academic staff is more of a challenge. The norm is for libraries to offer one-off workshops in ICT-related subjects. But attendance is poor and low levels of ICT literacy and e-resource knowledge remains a problem area. It could be that the methods of the training offered are unsuited to the audience. Further investigation is needed.

Perhaps the best way of improving user education is to recognise that the library staff undertaking the teaching have development needs themselves. They must understand how to develop learning objectives, how to prepare instructional documentation, theories of learning, personality and learning, modes of learning.

Bandwidth

Almost half of the libraries regarded the speed and reliability of their Internet connection as a major challenge and 23% planned to improve it in the next three years. These figures belie the magnitude of the problem: it is those libraries that have the facilities to use e-resources to any great extent that have the problem. If all the libraries had reached the same level of e-resource use, then it is likely that this would have been a challenge for 100% of the libraries.

A number of international agencies have recognised and made a commitment to improving bandwidth in the African educational sector. A survey of Internet connectivity needs in tertiary institutions across Africa, commissioned by the AVU, was completed in late 2004. INASP, supported by VLIR and IDRC, is designing and running a series of bandwidth optimisation and management training workshops, targeting executive management, senior management, information intermediaries and IT staff at national and institutional levels, starting in 2005 and lasting for at least two years.

Local information and digitisation

For many libraries, the possibility of preserving local content and making it more visible and available through full text digitisation is attractive as it is believed to generate more research and encourage growth of African scholarship – one of a library's primary objectives. Therefore it is into the areas of electronic theses and dissertations and digitisation of local collections that African university libraries are moving, rather than in the direction of setting up full-scale information repositories – although information repositories may be the end result. Sixteen libraries (26%) have digitisation of local publications in their plans for the next three years and four libraries (those that have already embarked on the process) are asking for external support – seeking information about costs, funding, guidance in selecting hardware and software, assistance in setting up units and training in techniques.

E-services

The findings show that libraries have as yet done little to develop services that add value to the e-products purchased. There is a tendency to automate what was previously done manually. There are few signs of services or applications that were not present in the pre-digitisation/automation era.

This is not surprising given that only 10 libraries (16%) have achieved a Web-based OPAC. It is difficult to move forwards when the basic building blocks of a digital library are not yet in place. It is therefore understandable that for many countries the dream scenario is an OPAC. On the other hand, nine libraries did indicate that enhancing and extending e-services was one of their aims and would welcome guidance and help in their development.

Management issues

There are a number of e-management areas, where practices varied among the libraries surveyed and more research as to best practice is required.

Standards

Libraries would have liked the availability of appropriate published standards, which could guide them in their work and allow them to judge whether resources or services were reaching an accepted norm. Examples mentioned included: the ratio of computers per user (taking into account the numbers of computers available elsewhere in the university for public use and the percentage of personal ownership), and targets for assessing the use and impact of e-resources. None of the libraries in the survey had established performance indicators for e-resource use or mechanisms for establishing cost benefits and cost effectiveness.

Staffing structures/location of e-services

Thirty-six of the libraries managed e-resources within the existing organisation of the library, twenty had set up separate departments with appropriately named staff. In the former, where e-resources and e-services are seen as just one of the ways a library supports teaching and research, computers are scattered throughout the service areas; in the latter they tend to be confined to laboratories.

It would be interesting to find out which structure has the most impact.

Fee or free?

Opinion is also strongly divided as to whether Internet access should be free to users (as it is in 39% of the libraries) or charged (47%), with more libraries moving in the fee-paying direction. Those who favour fee, say it is essential to maintain the service. Others say that it is tantamount to charging for every book or journal loaned and discourages use.

Use of library space

Only three of the libraries saw space as a challenge and just one expressed a wish for a new library building, designed to accommodate the new e-environment. However during library visits, it was obvious that librarians need help in re-designing their physical space, so as to accommodate the shift to e-resources. Too often, computers were hidden away in separate and crowded inner rooms, whilst little-used catalogue cabinets, reference sections with out-of-date books, and periodical sections with yards of empty shelves dominated. This physical separation prevented the integration of the new e-formats into overall library services.

Cooperative electronic networks

A conclusion from the findings is that many libraries – especially those that have not been fortunate enough to receive external support – flounder as to what step to take next. Help and guidance at the country level is not readily available. During the focus group discussion, librarians complained that it was not easy to convince IT experts of their particular needs. The University of Nairobi Library felt that their experience of automating a multi-site library could be valuably shared with others in the country – but there was no easy mechanism to do this. The fact that there are so many different library management systems being used by African university libraries is a sign of this lack of cooperation. There is a trend towards stand-alone systems for each institution with few, if any, joint projects (outside of South Africa) leading to shared catalogues and cost savings. Three libraries did express the need to set up national and regional networks in the future.

In other countries, national umbrella bodies have done much to further the acceptance and adoption of e-resources in libraries. In UK there is SCONUL and JISC's e-library programme, with its funded research projects. In India, there is INFLIBNET, which acts as a consortium for higher education libraries in the purchase of licences for e-resources and has also provided connectivity, developed library management software and organised training.

The National Universities Commission in Nigeria, which employs a librarian, is perhaps the nearest that African countries have got to establishing something similar to INFLIBNET. A Nigerian Digital Library is underway, with a lot of local resources digitised and put on the website and there are plans to establish a National Virtual Library. One of the librarians suggested that external support for libraries should be channelled through the NUC.

However, in most African countries at the present time, it is possibly only consortia that could carry out this cooperation and counselling role. With membership open to all libraries, they could ensure that some libraries were not neglected at the expense of others. Consortia in South Africa have certainly taken on roles wider than cooperative purchase of e-resource licences. They have organised purchase of common library management software, established union catalogues, provided training and designed a common information literacy course for students. However consortia in other African countries are in their infancy. They would require a lot of support and the funding of paid rather than voluntary staff, if they were to expand their role. But consortia are trusted and librarians gave them as an alternative to giving external support directly to individual libraries.

Conclusions

External support programmes

Advances made in the provision of computers and purchase of e-resources has been heavily dependent on external funding. Libraries considered that this situation would continue, with lack of institutional funds being a major challenge to the further development of digital libraries. At the same time, libraries are at very different stages of digital development, with very different needs. It is up-country and newer university libraries and, in multi-site libraries, branch libraries that generally lag behind, with fewer ICT facilities and little training either of staff or users.

Programmes that assume all libraries within a region or country have the same needs and aspirations are unlikely to be successful. The immediate needs of each library must be taken into account and support delivered directly to that library or through a country consortia/network, where each library has a voice. Funders were also urged to give fair attention to the needs of all libraries rather than concentrate on a few. Libraries preferred one major funder rather than many. Coordination through one major funder was identified as preferable to many within one library.

The broad areas where support is most needed are funding and training.

Better institutional funding is the long-term solution. Convincing university authorities also depends on ensuring that library staff have the skills to provide good services and that users have the competencies to make good use of the services provided.

Minimum ICT levels for all

Full and effective use of e-resources and e-services (and subsequent institutional contribution to their shared cost) depends on all university libraries in a country and all libraries within a university library network acquiring and maintaining the basic building blocks of a digital library – automation of library systems, sufficient ICT facilities (computers, networks) and adequate connectivity.

At the present time, most public university libraries in Africa have not attained these basic levels and others are struggling to maintain them. Libraries which have fully automated systems or are well on the way to full automation of library processes and procedures are also those which have the best levels of ICT facilities, trained staff, user education programmes and e-services. Support for the instigation and completion of library automation projects should be given high priority.

Continuing education for library staff

Upgrading skills and retraining library staff is a priority, particularly in the areas of e-resources management, e-services development and teaching skills.

Regional and national workshops are the usual chosen modality for training. There is a call for training methods to be diversified, so that the method is appropriate for the subject area. In particular, attachments to libraries where the required expertise is being practised, or visits to libraries by experts – both of which incorporate learning by doing.

Mirroring the message that different libraries have different needs, training given at the institutional level was also required.

Some training areas like bandwidth are already being addressed, and the PERI programme is preparing workshops on e-resource marketing and monitoring and evaluation. There are immediate needs for support in full text digitisation and in training of library staff in educational theory and practice. The latter will help in the development of more effective user education programmes and in cooperation with academic staff in the implementation of VLEs.

Library schools

The future quality of university libraries relies on the quality of new library staff graduating from the various library schools in the countries concerned. It is short sighted to ignore library schools and concentrate training support only on university libraries. Short course one-off training needs to be considered in the overall context of professional librarianship education available in the relevant countries.

At the moment new graduates from library schools do not have the knowledge and skills required by university libraries. Curricula have not kept up with the needs of the new e-environment. Those teaching these subjects also need opportunities to upgrade their knowledge and skills, prior to designing and teaching the new courses.

Library schools also need to be able to contribute to continuing education programmes, so as to assist in the sustainability of in-country training.

User education

Ensuring that users have the competencies to make good use of the e-resources and services is also a way of convincing the authorities to include such costs in institutional budgets. Most libraries undertake some sort of training at the undergraduate level, but few support integrated information literacy programmes. Proposals arising from the SCANUL-ECS initiatives in information literacy should be supported. Training of academic staff and researchers is acknowledged as a continuing challenge, that requires new and more innovative approaches.

Guidance and inspiration

Libraries lack advice as to where to go next. Those wishing to automate lack guidance on how to choose the best system for their needs. Those that have established adequate infrastructures are failing to develop holistic e-services. Mechanisms for sharing in-country experiences are not widely available. There is a need for country level bodies which understand the requirements of libraries and which can drive forward digital development. This could be within government or become a role of country consortia. The latter would need considerable support, such as full time secretariats, if they were to take on such added responsibilities.

One way of encouraging the development of extra-value services might be to grant fund a series of research and demonstration projects in individual libraries that are ready and eager to move forwards into areas like digitisation of local collections, course content delivery through VLEs and e-reference services. They could also be funded to investigate further areas like standards, performance indicators, staffing structures and library re-design. Grants would need to include training for staff and project costs. The end result would be the implementation of a working service and documented experience to be used by other libraries embarking on the same service provision.

Existing regional bodies like SCANUL-ECS and the Standing Conference of African University Libraries, Western Area (SCAULWA), which already publish case studies on library developments, could be used to disseminate the research findings.

Further research

The present survey was limited to publicly funded university libraries in sub-Saharan Anglophone Africa. A similar survey of university libraries in Francophone/Lusophone Africa, of the growing number of private university libraries and of other research libraries throughout the continent would complete the picture of digital library development presented in this report.

Proposed areas for action

- The survey covered Anglophone Africa well, but to gain a more complete picture it is suggested that a similar survey is undertaken:
    - in Francophone/ Lusophone Africa
    - in private universities and other academic and research environments.
- The findings should be validated through meetings/workshops to identify library, country and/or region-specific needs and actions.
- Working with funders, ensure that programmes aimed at supporting digital library development are sufficiently inclusive and flexible to directly support the differing needs and levels of expertise of each individual library.
- Encourage and support institutions and countries to formulate plans and actions for all university libraries to obtain the basic building blocks of a digital library.
- Support a number of research and demonstration projects in e-services and e-resource management and disseminate the experiences learned.
- Support curriculum improvements in library schools to prepare new professionals for the digital environment.
- Best practice in user education for the digital environment should be summarised and disseminated to ensure efficient use of digital library services.
- Working with partners, develop and support continuing education and training programmes for librarians using a variety of approaches and methodologies.
- Support consortia to build strong networks and expertise within their countries/regions, so enabling them to take on wider coordination and advisory roles and to foster collaboration among libraries involved.

Acronyms and sources

- AGORA (Access to Global Online Research in Agriculture), see www.aginternetwork.org/en/
- AVU (African Virtual University), see www.avu.org/
- CTA (Technical Centre for Agricultural and Rural Cooperation ACP-EU), see www.cta.int/
- DFID (UK Department for International Development), see www.dfid.gov.uk/
- DSpace, see www.dspace.org/
- EBooks, see www.ebooks.com/
- EBSCO, see www.ebsco.com/home/
- EGranary, see www.widernet.org/digitalLibrary/
- EIFL (Electronic Information for Libraries), see www.eifl.net/
- ELIN (The Electronic Library Information Navigator), see www.inasp.info/peri/elin/
- FAO (Food and Agriculture Organization), see www.fao.org/
- HINARI (Health InterNetwork Access to Research Initiative), see www.healthinternetwork.org/
- IDRC (International Development Research Centre), see www.idrc.ca/
- IFLA (The International Federation of Library Associations and Institutions), see www.ifla.org
- INASP (International Network for the Availability of Scientific Publications), see www.inasp.info
- INFLIBNET (Information and Library Network Centre), see www.inflibnet.ac.in
- JISC (Joint Information Systems Committee), see www.jisc.ac.uk/
- MetaLib, see www.exlibrisgroup.com/metalib.htm
- NetLibrary, see www.netlibrary.com/Gateway.aspx
- NISC, see www.nisc.co.za
- NORAD (Norwegian Agency for Development Cooperation), see www.norad.no
- OSIWA (Open Society Initiative for West Africa), see www.osiwa.org/en/node
- PERI (Programme for the Enhancement of Scientific Publications), see http://www.inasp.info/peri
- RDN (Resource Discovery Network), see www.rdn.ac.uk/
- SCONUL (Society of College, National and University Libraries), see www.sconul.ac.uk/intro/
- Sida (Swedish International Development Cooperation Agency), see www.sida.se
- TEEAL (The Essential Electronic Agricultural Library), see http://teeal.cornell.edu/
- VLIR (Flemish Interuniversity Council), see www.vlir.be/
- VSAT (acronym for Very Small Aperture Terminal, an earthbound station used in satellite communications of data, voice and video signals, excluding broadcast television)
- WHO (World Health Organization), see www.who.int/en/

Appendix One: Survey questionnaire sent to all libraries with a covering letter

Towards the digital library — a questionnaire

Name of [Main/Site/Branch] Library.....

Name of [Main/Site/Branch] Librarian.....

Email contact.....

Name of University .....

Number of libraries serving the wider university system (faculties, schools, campuses etc).....

1. BACKGROUND INFORMATION

1.1 Number of library staff
- Professionals.....
- Paraprofessionals .....
- Non-professionals .....

1.2 Number of academic staff (in faculties/departments served by the library).....

1.3 Number of students (in faculties/departments served by the library)
- Postgraduate.....
- Undergraduate

2. LIBRARY AUTOMATION

2.1 Which functions (e.g. cataloguing, loans, acquisitions) have been automated?

2.2 What automation package/library management system(s) is used?

2.3 Which year did automation start?

2.4 When was automation completed / what still needs to be completed?

2.5 What functions do you plan to automate or upgrade in the coming three years?

3. ICT FACILITIES

3.1 Computer workstations
- How many in the library?
- How many are in working order today?
- How many connected to the Internet?
- How many reserved for library staff only?
- Where are workstations for users located?

3.2 Are these computer workstations and the resources offered:
- Part of a local library network?
- Part of a site network?
- Part of a network accessible by all libraries in the university system?
- Part of a university-wide network?

3.3 Connectivity
- How is the library connected to the Internet (e.g. dial-up, leased line, VSAT, etc.)
- What is the bandwidth connectivity for the library?

- How would you describe the speed and status of the connectivity for the library?
  - Excellent – fast and reliable

Good – quick and reliable
Adequate – acceptable speeds and reliability
Poor – generally the slow speeds infringe on the usefulness of the connectivity
Very poor – the slow network speeds and reliability are real barriers to connectivity

4. ELECTRONIC AND DIGITAL RESOURCES

4.1 Name the e-journals or e-journal / database packages to which the library offers access:

4.2 Name the e-books or e-book services to which the library offers access:

4.3 Name the CD-ROMs to which the library offers access:

4.4 When did the library begin offering access to e-resources?

4.5 How do you pay for or obtain access to these e-resources?

5. LOCAL CONTENT

5.1 Has the library produced any databases of local content or digitized the full text of local publications or local collections? Give details.

5.2 How are these databases or full text content made accessible to users?

5.3 Does the library manage an institutional or regional repository for local publications?

6. ELECTRONIC SERVICES

Which electronic services have been developed or are delivered by the library for its users? Give brief details:

6.1 OPAC

6.2 Library Web page (give URL)

6.2 Web based searching of the library catalogue and other databases by local or remote users

6.3 Combined searching of all electronic resources

6.4 Single search tool for all resources (whether physical, in-house, regional or virtual)

6.5 Web-based and distributed enquiry or reference service

6.6 SDI

6.7 Library e-bulletin

6.8 E-content delivery through virtual learning environments

6.9 Online training packages for library users

6.10 Other (please specify)

7. FINANCES

7.1 What approximate percentage (%) of ICT facilities (e.g. network, computers, etc.) have been purchased from institutional funds?

7.2 What approximate percentage (%) of e-resources (e-journals, e-books, etc.) have been purchased from institutional funds?

7.3 Name the donors who have assisted in your acquisition of e-facilities and e-resources:

7.4 Is Internet access free or fee-based?

7.4 What measures are in place to ensure the sustainability of e-services?

8. LIBRARY STAFF / MANAGEMENT

8.1 Name the job titles of library staff who manage e-resources:

8.2 Is the management of e-resources and services within the library undertaken in a separate library department?

8.3 What training in the management of e-resources has library staff received? How many have been trained in each area?

9. USER EDUCATION

9.1 What information skills courses or other training are offered to:

academic staff?

students?

9.2 Who on the library staff teaches these courses?

9.3 Have the library staff been given any special training to teach these courses?

10. EVALUATION

10.1 What statistics are collected in relation to the use of e-resources?

10.2 Has the library adopted performance measures for evaluating e-service delivery

11. ACHIEVEMENTS

Name three areas in which the library has been successful in its provision of e-facilities and e-resources:

12. CHALLENGES

Name the three most important challenges that the library faces in its provision of e-facilities and e-resources:

13. WHAT NEXT?

Which three areas of e-facilities and e-resource provision do you intend to address in the next three years?

14. EXTERNAL SUPPORT

14.1 In what areas is external support most needed in order for you to fulfil your plans?

14.2 In what ways would you like this external support delivered?

15. ANY OTHER COMMENTS?

Appendix Two: Names of university libraries returning questionnaires

Botswana
University of Botswana Library

Cameroon
University of Buea Library
University of Douala. Central Library
University of Ngaoundere. Central Library

Eritrea
University of Asmara Library

Ethiopia
Addis Ababa University Libraries. Main Library
Debub University Libraries. Main Library

Ghana
Kwame Nkrumah University of Science and Technology Library
University of Cape Coast Library
University of Development Studies
- Navrongo Campus Library
- Nyanpala Campus Library
- Wa Campus Library

University of Education Winneba Library
University of Ghana
- Balme Library
- City Campus Library
- College of Agriculture and Consumer Sciences Library
- Faculty of Law Library
- Medical School Library

Kenya
Egerton University Library
Jomo Kenyatta University of Agriculture and Technology Library
Kenyatta University. Moi Library
University of Nairobi
- Chiromo Library
- Jomo Kenyatta Memorial Library
- Lower Kabete Library

Lesotho
National University of Lesotho. Thomas Mofolo Library

Malawi
Mzuzu University Library and Learning Resources Centre
University of Malawi
- Bunda College of Agriculture Library
- Central Library Services
- College of Medicine Library
- Kamuzu College of Nursing Library

Mozambique
University Eduardo Mondlane. Directorate of Documentation Services

Namibia
University of Namibia
- Main Library
- Northern Campus Library

Nigeria
Ahmadu Bello University. Kashim Ibrahim Library
Ambrose Alli University. Main Library
Babcock University. Adekunle Alalade Library
Bayero University. Main Library
Federal University of Technology. Akure Library
Imo State University Library
Ladoke Akintola University of Technology Library
Obafemi Awolowo University. Hezekiah Oluwasanmi Library
Rivers State University of Science and Technology. Central Library
University of Jos Library
University of Lagos Library
University of Nigeria, Nsukka. Nnamdi Azikiwe Library
Usmanu Danfodiyo University. Abdullahi Fodiyo Library Complex
University of Calabar Library

Sierra Leone
University of Sierra Leone
- College of Medicine and Allied Health Sciences Library
- Njala University College Library

Sudan
University of Gezira. Neshishiba Library

Swaziland
University of Swaziland. Kwaluseni Library

Tanzania
Mzumbe University Library
Open University of Tanzania. Main Library
University of Dar es Salaam
- Main Library
- Muhimbili University College of Health Sciences Library
- University College of Lands and Architectural Studies Library

Uganda
Gulu University. Main Library
Kyambogo University Library
Makerere University
- East African School of Library and Information Sciences Library
- School of Education Library

Zambia
Copperbelt University Library
University of Zambia
- Medical Library
- Veterinary Medicine Library

Zimbabwe
Masvingo State University Library
Midlands State University Main Library
National University of Science and Technology Library
University of Zimbabwe
- Main Library
- College of Health Sciences Library

Senegal
University Cheikh Anta Diop, Dakar. Central Library

South Africa
University of Western Cape Library

About INASP

Enabling worldwide access to information and knowledge

The mission of INASP is to enable worldwide access to information and knowledge with particular emphasis on the needs of developing and transitional countries. Established in 1992, we work with partners around the world to encourage the creation and production of information, to promote sustainable and equitable access to information, to foster collaboration and networking and to strengthen local capacities to manage and use information and knowledge.

We act as an enabler, connecting worldwide information and expertise. Working through networks of partners, we aim to strengthen the ability of people in developing and transitional countries to access and contribute information, ideas and knowledge. In particular we seek to:

● improve access to scientific and scholarly information ● catalyse and support local publication and information exchange ● strengthen local capacities to manage and use information and knowledge ● foster in-country, regional and international cooperation and networking ● advise local organisations and agencies on ways to utilise information and publishing to achieve development goals.

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