THE AFRICAN DIGITAL LIBRARY: CONCEPT AND PRACTICE

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Introduction

This account is about how, around a technologically-based concept, a proposal was developed which attracted funding - so that, today, the African Digital Library is in place and functioning. This article explains how and where the resources are gathered, kept, maintained, serviced, augmented, and made available to users. The article invites further support, by way of sponsorship and association-building; and encourages replication of the project by other readers.

The African Digital Library (ADL) was opened on 1 November 1999 with close to 3,000 e-books and has subsequently grown to over 8,000 e-books. The library is a project of the Centre for Lifelong Learning, Technikon SA, and has been created in the spirit of the African Renaissance. Digital e-books can either be downloaded from the Internet using an off-line reader or read directly on the Internet. Any resident of Africa is able to access books in the library at no cost, provided they have access to the Internet.

The ADL represents a collection of books which is available across the entire African continent of 54 countries and serves as a back-up to all physical libraries.

The Concept, Project, and Practice:

The African Digital Library's Mission was stated thus:

To provide digitized, full-text resources to learners in Africa via the Internet, thereby contributing to the revitalization of education and lifelong learning on the continent, the expansion of business and the alleviation of poverty.

The African Digital Library provides a core collection of digitised, full-text e-books in support of lifelong learning in Africa. The collection covers 52 subject areas and is available in 54 countries of Africa.

The ADL strives to provide its services to scholars and learners throughout the region, via existing institutions and to individuals. Access is free of charge, providing the user has access to the Internet. The ADL strives to provide a range of materials in support of existing facilities. Any existing library can increase its physical offerings to clients instantly, by providing one or more Internet-enabled computers.

The ADL works in co-operation with netLibrary, a Colorado, USA-based company, to provide the services that are required. e-Books are hosted on the Internet on server farms at physical positions that are secure and not from particular countries. The location of the server farms is critical in ensuring the fastest possible access to all countries. Internet access in African countries is primarily received from the USA, with some European and other countries also being used. Peering points to access information between African countries normally takes place off-continent. The hosting of server farms to support the African Digital Library needs to take place at sites close to normal peering points to maximize delivery speed of e-book pages.

The partners in establishing the ADL were:

- Technikon SA, South Africa;
- The Association of African Universities; and
- netLibrary, U.S.A.

An application was made to the World Bank's Development Marketplace in February 2000 and the project won a $US90,000 grant. This grant enabled the collection to be expanded by approximately 2,800 e-books. NetLibrary contributed to the project by way of discounted storage fees and programming. The collection, as at the end of 2000, had grown to approximately 8,000 e-books. Digital books are now gaining popularity - but tend to remain in the early-adaptor section of the market. Many people still prefer the printed equivalent. The ADL provides access to books that users would not otherwise be able to access in local libraries.

ADL is clearly a developmental project, aimed at assisting a less-developed region of the world, where basic access to books is comparatively limited in contrast to what one finds, for example, in North America and Europe.

As mentioned, the ADL was created by a joint venture project between the Centre for Lifelong Learning of Technikon SA, The Association of African Universities and netLibrary, a Colorado based US Company. NetLibrary has more than 500 publishers signed up to provide books in e-book format to netLibrary's online customers. Online libraries normally provide access to specific members of that library or institution and this restricts the access, preventing some people from gaining access to e-books. ADL does not operate on this principle.

The ADL purchases one copy of each book for the central collection. These books may be borrowed by a single user at one time and carry a two-hour loan time - after which the book may be borrowed

for a further two hours. Books that are downloaded to a user's PC are re-encrypted after two hours of off-line use and simultaneously become available again in the central collection for somebody else to borrow. If a user wishes to re-borrow a book that has been downloaded and has not expired, the user simply goes online for a short period of time to check out the book once more. e-Books that have expired do not have to be downloaded a second or third time, but can simply be made available again by going online and re-borrowing it in this way.

When books are used online via a Web browser, a dictionary is available for checking the meaning of words. Additional search and magnification facilities are also available in the offline reader. This facility makes it possible to use e-books even with slow Internet links and dial-up connections. The off-line reader offers the users several additional facilities, such as, the ability to:

- make notes;

- highlight text, input bookmarks;

- search the full text of the book; and

- copy and paste bibliographic information and limited amounts of text.

Intellectual property

e-Books are protected with regard to their intellectual property, through an encryption mechanism that is built into every e-book. Books are received by netLibrary from the original print publisher and are encrypted into this format before being made available for sale to existing e-libraries hosted by netLibrary. The ADL, being one of these libraries, is able to view a list of over 39,000 e-books from which it can make purchases. Recommendations for the purchase of books are received from individuals within Africa and specialist library staff at netLibrary.

Where a conventional, physical-campus institution needs to have multiple copies of the same book available for simultaneous access by more than one student, multiple copies of the book must be purchased. The ADL purchases just one copy of every title and does not purchase multiple copies of the same book. Normal intellectual property rights exist in all e-books and it is every institution's responsibility to observe these.

When using a book online or in the off-line reader, the user may copy and paste small amounts of text into a word processor file. This is the digital version of photocopying a page or two for study purposes. The e-book reader however, also has a facility called "Robocop", which monitors the user's behaviour and will advise the user if it determines that an excessive amount of text has been copied. This facility provides an greater level of security for publishers than is traditionally available. Should a user continue to copy and paste excessive amounts of text after being warned by Robocop, the user's account may be suspended. While the printing of an e-book over a number of days or weeks may be

possible, this would cost the user more than the price of buying the higher quality, original print version from the publisher. This monitoring facility operates in both the online and offline methodologies of using e-books.

Some e-books are provided in a public domain collection (e.g. Shakespeare's works) and different restrictions apply to these books. For instance, these books are not copyright protected in the same way as the regular e-books. Multiple users may use these books at one time and larger amounts of text may be copied.

Strategic Objectives and Library Operation

Conventional library rules have been adapted to enable a single collection of e-books to be usable, practically, on a continental basis. Records reflect that e-books are being borrowed up to 20 times per month - showing a much higher level of productivity than the physical equivalent, which may be borrowed for six weeks at a time. In a typical library, such borrowing removes any possibility of another borrower gaining access for that period.

The ADL now has a broad collection of e-books. The next phase of development should see the refinement and enrichment of the collection in such areas as:

- Science;
- Technology;
- Computer programming;
- General health care;
- Treatment and control of disease (e.g. HIV/AIDS, TB, Hepatitis);
- Corporate governance;
- Corruption;
- Public sector management;
- Business development and management;
- Food production and security; and
- Animal husbandry and care

Categories of membership

Individual users

All people who are resident in Africa may use the ADL by going to **http://africaeducation.org/adl**/. Registering to use the library is free of charge for African residents and intending users take a link titled "register to use the library" on the first visit. At this time a specially written programme attempts to determine the location of the user, by determining the top-level country domain in the IP address of the user. The top-level domain is compared to the over 50 top-level domains of Africa and should it

be found in this list, the user is taken directly to a registration page.

A number of Internet service providers in Africa use the top level domain of .com, .org or .net and these appear to come from parts of the world other than Africa. While a user who was identified as being from an African country is immediately registered as a member of ADL, a user who uses one of these domains or is for some other reason not identified as an African resident, is referred to a different registration page. The second registration page requests similar information and then e-mails this to a staff member of the ADL in Johannesburg, where the application is manually checked and the user registered, provided they are found to be from an African country. Most of the above routing is done by hyper-linking and automated processes that are transparent to the user.

Once users have got a user name and password for the ADL, they return to the same URL given above and then take the option titled "use the library". After taking this link, a web page is briefly flashed with the sponsor's names and then the user is taken to the logon page. At this point they enter their login name, password and proceed to using the library.

Associated institutions

Where institutions wish to associate themselves with the ADL and are able to provide the fixed Internet Protocol (IP) address, they may have their own logo displayed on the library for their own patrons to see - this may be done in collaboration with ADL management. Associated institutions also have access to their own private extranet site, which gives further information and statistics on how e-books are being used by their own users.

Each associated library may use the entire collection of the ADL for their members, free of charge. They may in addition to the central ADL collection, build a private collection of books, at their own cost, which can be restricted for use to their own members. When users of an associated library login to the ADL, they will see the collection of books available from the central ADL collection, as well as the additional books purchased by the associated institution, while other users will not be able to see the books purchased for restricted use by that associated institution. The usual entry level for a new library is at least 500 purchased e-books, which typically costs in the vicinity of US$60,000. Associated institutions may start their own collection at very much smaller amounts than this, for example $US1,500. Where an associated institution or donor wishes to place books in the central collection, these books become available to users across the rest of the continent.

Purchasing of e-books: Business Model and Sustainability

e-Book collections may be sponsored. Collections may be tailored to the size of sponsorship, with the average cost of an e-book, including storage and use in perpetuity, being US$75. Prices of individual

books vary within the range of about US$12 to US$250.

e-Books cost approximately the same as their printed equivalent and storage must be paid in addition to this purchase price. The cost of storage is equivalent to paying for the physical library building, cataloguing programmes, library staff, time, etc. Storage fees may be paid in one instalment or paid off over a number of years. The ADL pays a once-off storage fee of 50% of the price of the book. This fee enables the ADL to have the book in its collection, in perpetuity, and without any ongoing expenses.

The worst scenario for the ADL is that the collection growth may slow due to a shortage of funds. But, since there are no subsequent charges in future years, there can never be a cash flow shortage in the ADL.

e-Books cannot be lost, damaged or stolen, since the original copy always remains secure on the server hosted by the netLibrary. If any corruption occurs in a local file, the same page or e-book is simply downloaded again.

The main staffing posts of the ADL do not require full-time employees. The roles are partly voluntary by both the individuals and the organisations involved in the project. Costs can therefore be contained to an absolute minimum.

The ADL is negotiating with an African publisher to digitize works of African origin and to make these available for sale via netLibrary and digital book vendors (e.g. Amazon.com). This is expected to make African works more visible and available internationally and to generate a revenue stream by way of royalties back to the continent. This will be shared between the owners of the intellectual property, the digital publisher, and the ADL.

Potential Sponsorships

- The African Digital Library may be sponsored in the following ways:

  - e-Book collections (US$75 to US$2m);
  - Sponsorship of the central office (US$60,000 annually);
  - Travel and subsistence to support an annual meeting of representatives from all sub-regions of Africa, to help co-ordinate e-book selection and promotion (US$25,000); and
  - Travel and subsistence to support an annual meeting of management members of the ADL to govern the African Digital Library.

Sponsors may expect recognition in a few ways:

  - On the flash page that users see when they enter the library

(**http://AfricaEducation.org/adl/** then take "Use the library";

- Sponsors may be included in a roll of honour, hosted on **www.AfricaEducation.org**, accessible from the ADL;
- Sponsors will be recognized in presentations at conferences and meetings, as having supported education in Africa;
- A later development may include sponsor labels in individual e-books;
- Should a sponsor wish to remain anonymous, this will be respected by the ADL; and
- A section 501[c]3 registered company in the USA is able to issue tax certificates in that country, while Technikon SA can issue tax certificates in South Africa.

The Future and Expected Outcomes

- The African Digital Library currently:

    - Has over 2,000 registered users (African scholars and lifelong learners);
    - Has over 8,000 e-books;
    - Has 20 associated libraries; and
    - Is available to 54 African countries

- The objectives for 2001 are to grow the services of the African Digital Library:

    - To 4,000 registered users (African scholars and lifelong learners);
    - To 12,000 e-books;
    - With 25 associated libraries; and
    - In 54 African countries

Over the next five years, the African Digital Library will strive to reach at least 30,000 users in Africa's 54 countries, with a collection of at least 50, 000 e-book titles.

The improvement in the quality of computer screens over the past years and expected improvements during the next three to five years is likely to make books more user-friendly and easier to read on screen. New type fonts such as the "Clear Type" font and the digital book reader developed by Microsoft is another example of how characters can be made to be more legible on the computer screen. e-Books can be downloaded onto palmtop PCs, such as the Palm Pilot, for more portable use while travelling. Other e-book readers are under development and are expected to become available during the next few years.

Capacity building in Africa

The ADL would like to assist institutions in Africa to convert the full text of theses, dissertation and

research papers into e-book format, so that these may become more visible to other researchers on the continent. Where theses material s are available in e-book format they are then also available for sale to other libraries around the world. This has two benefits: first, a revenue stream is created and, secondly, African research papers, not otherwise readily available, become accessible to the rest of the world.

Additional study material might be made available on a broader public basis by this same mechanism. This would include public domain material on topics such as agriculture, entrepreneurship, health, information technology, and food production.

Funding

The ADL's central collection provides support to institutions and individuals in more than 50 countries across a very large and poor continent. The central collection needs to be sponsored by grants and donations to ensure continued growth. When funds cease to exist, the **expansion** of the library ceases, through the availability of existing books continues without any interruption.

The ADL can accommodate sponsorships from $75, being the average price of one e-book and the 50% storage fee, to $2m for a very substantial collection of e-books.

- Sponsors of this collection will benefit from the following:

    - The sponsor organisation's name will be displayed every time a user enters the library (if the sponsor wants this);
    - e-Books that are sponsored will be available for the benefit of lifelong learners in 54 countries;
    - e-Books can never be lost, damaged or stolen - the collection remains safe at all times; and
    - Sponsors of the ADL may be seen to be playing a supportive role in the revitalisation of education in Africa - a continent that is in desperate need of accelerated development.

Conclusion

The use of e-books is beginning to gain acceptance across the majority of countries in Africa. The ADL represents an example of how e-books can be used to support the development of hundreds of organisations and tens of thousands of lifelong learners, in a continent that has very limited resources. The future of projects such as this depends on the availability of project funding by forward thinking global organisations who are serious about the development of the continent. The project has developed successfully so far.

References

African Digital Library: **http://africaeducation.org/adl**

AfricaEducation.org: **http://AfricaEducation.org/**

Paul G. West: **http://pgw.org/pw/**