DIGITAL SCHOOL LIBRARIES IN THE 21ST CENTURY: MYTHS OR REALITY IN NIGERIA

By

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Abstract

The paper examined a call-to-arms in the community among School librarians in Nigeria to meet the knowledge challenges of practitioners in the bid to transit school libraries from: traditional to technological; manual to mechanical; analogue to digital and physical to electronic. In the attempt to recognize these challenges clearly, the researcher gave clarifications on digital Library concepts, challenges and suggestion for a new focus in the pursuit of digital school libraries and renewed roles for school librarians in the digital era and beyond.

Key Words: Digital libraries, Myths, School Library.

Introduction

According to Omekwu (2011), the digital technology of the 20th century has radically redefined information production, processing, procurement and provision creating a paradigm shift in information handling and achievements in digital technology in the past few decades. These changes have been sufficiently unprecedented and have attracted an enduring group of businesses to shift their activities to the digital frontier. He went further to state that the paradigm shift is dominant, diverse and dynamic. Consequently knowledge practitioners cannot reasonably stick to old practices but must prefer new methodologies which provide better and broader latitude for transactions in the digital economy.

Kuny & Cleveland, (1998) posited that, technology has changed *how* libraries do their work, not *why* and the most profound of all the technological developments is the connection of computer to computer in an unbroken chain around the world. Technology according to him has indeed altered the fundamental concept of the library in the twenty-first century and he concluded however that technology has not altered 'why librarians' which is connecting people to information. For school librarians and information professionals to remain relevant in the 21st century, a clarification of the myths surrounding effective "digital library" for school library services and the challenges to its development will be increasingly important in a country like ours.

An increasingly complex technological, social, legal, and economic environment defines many boundaries within which "digital library" services evolve. School Librarians may discover that "libraries-without-walls" are actually only libraries with new walls which are technologically bounded, legally restricted, and administratively hamstrung.(Kuny & Cleveland, 1998)

The Concept of Digital Library

Digital libraries (DL's) are emerging as an important area of research and education for information science, computer science and a number of other related disciplines. There are many different views in the literature on what digital libraries are. (Jang, 2005) The term "digital library" means different things to different people. There is considerable experimentation underway regarding the technical, economic, and organizational supports necessary for such distributed arrangements. One sometimes hears the Internet characterized as the world's library for the digital age. This description does not stand up under even casual examination. The Internet- and particularly its collection of multimedia resources known as the www was not designed to support the organized publication and retrieval of information as libraries are (Vijayakumar & Vijayakumar, 2002).

The digital library concept requires that librarians should be information architects in order to build effective information service in this digital millennium. The Characteristics of a digital library are summarized in figure 1.

| **CUSTOMIZATION** | **CONVIENIENCE** |
| *Allowing users to assemble their own slices of information* | *Information delivered at the point of need, ie in a library or office or even at the home* |

Digital library

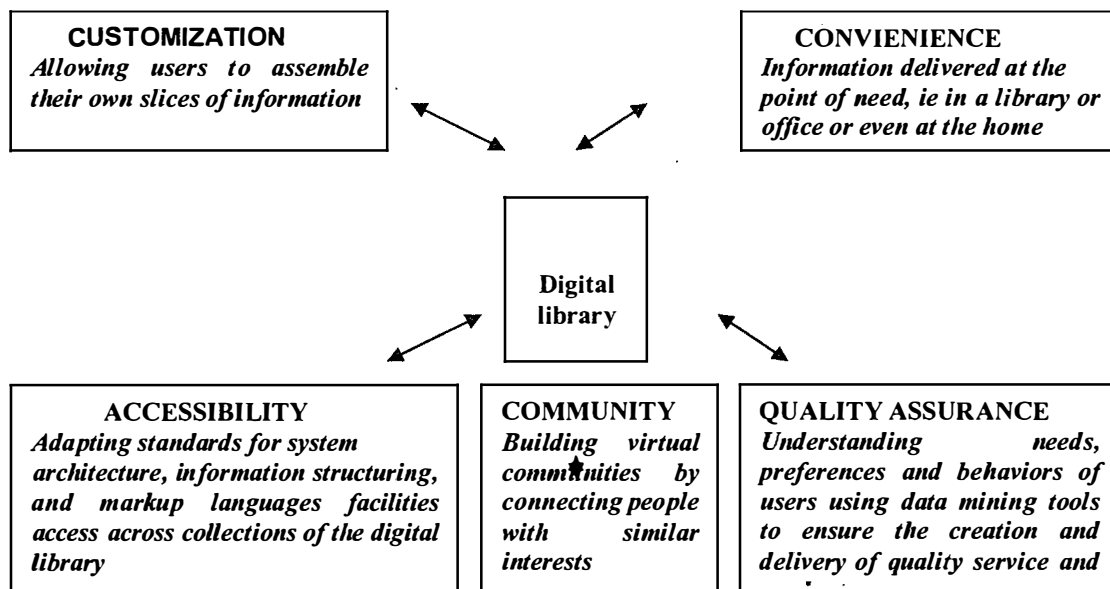| **ACCESSIBILITY** | **COMMUNITY** | **QUALITY ASSURANCE** |
| *Adapting standards for system architecture, information structuring, and markup languages facilities access across collections of the digital library* | *Building virtual communities by connecting people with similar interests* | *Understanding needs, preferences and behaviors of users using data mining tools to ensure the creation and delivery of quality service and* |

Fig 1: Digital Library Conceptual Model

Source: Vijayakumar & Vijayakumar (2002)

From the figure 1 above, digital Libraries are characterized to be customized, convenient, and accessible; community oriented and above has quality assurance.

CLARIFICATIONS

The term "Digital Library" may be understood in different ways and named differently. According to Vijayakumar& Vijayakumar (2002) terms used, synonymously includes the under listed:

Conventional/Real Library

Conventional Libraries are typical libraries which are commonly found around us. Here in a developing nation like Nigeria, its holdings are in hard copy form and there is no type of computerization, in terms of products, services or anything.

Virtual Library/Library Without Walls/Libraries for the Future

These are libraries without resources but simply collection of web sources with access. They are libraries with little or no physical presence of books, periodicals, reading space or support staff, but one that disseminates information directly to the distributed users, usually electronically. For example, Access Science, Access Medicine and Emergency surgery, Access Pharmacy and Digital Engineering
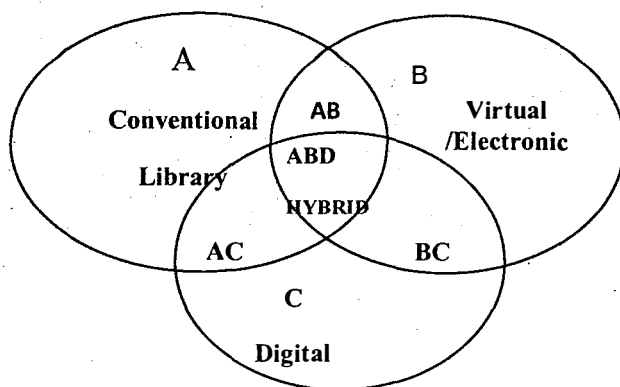
Electronic Library

These are libraries that have physical place and space, where users can access digital resources one at a time. Its resources are available in both electronic and conventional form, fully automated with CD-ROM/DVDROM networking. The electronic resources are selected, acquired and made available for access and searching in very much the same way as traditional resources. The e-library as it is called indicates a rather limited approach to the digital library, simply indicating the provision of a range of material in digitized form, within the framework of traditional library provision. For example, E-ebrary, Ebscohost, eGranary, Questia, among others.

Hybrid Library / Gateway Library / Complex Library

A Library with electronic and paper-based sources used along side one another. Hybrid library may be viewed as a transitional stage towards a truly digital library. The challenge of hybrid library is to integrate the access of sources in a variety of formats, and from both local and remote sources. A hybrid or gateway library provides services which are partly physical and partly virtual or in a complex (libraries) way. That is libraries covering all those systems and services having some degree of digitization, thereby preserving the general concept of the traditional library as a place. Sreenivasulu, (2000)

Digital Libraries

Here the services are fully automated and all resources are in Digital form. A Library / information service, located either in a physical or virtual space, or a combination of both, in which a significant proportion of the resources are available to users of that service only in digital form, even through remote access. It enables users to interact effectively with information distributed across a network. It could be based on a subject discipline, a vocation or profession, a region or a nation. The figure 2 below summarizes the relationship within traditional, electronic hybrid and digital libraries.

Source: Adapted from Omekwu, 2011

Figure 2: The Relationship within Traditional, Electronic/ Virtual & Digital

Libraries in Diagram

From the figure 2 above, the conventional Library 'A' overlaps and is interrelated with the Virtual Library at 'AB" and with the Digital at 'AC'. The three overlaps and are independently related at 'ABC', forming the Hybrid Library which developing nations like Nigeria must adopt. The three are interrelated in both content and services and with time as a result of technological development will diffuse into each other.

Characteristics

The digital library concept requires that librarians be information architects in order to build effective information service in this digital millennium. The characteristics of a digital library are summarized from the aforementioned clarification of terms to the obvious facts that there exist multifarious understanding, definitions, descriptions, and modeling of digital libraries (Zhu, Gonclaves, Shen & Fox (2002). However, 'many definitions no matter how ambiguous usually specify key characteristics elements of DLs.

Vijayakumar& Vijayakumar (2002), corroborating and quoting the US Association of Research Libraries (1995) identified five elements common to all the definitions given by many researchers in their definitions of the digital library stating that: The digital library is not a single entity; The digital library requires technology to link the resources; Linkages between digital libraries and information services are transparent to users; Universal access to digital libraries is a goal and Digital library collections are not restricted to document surrogates but include digital artifacts that have no printed equivalent. Therefore, in a broader sense Vijayakumar& Vijayakumar (2002), defined digital libraries as organizations that provide the resources, including the specialized staff, to select, structure, offer intellectual access to, interpret, distribute, preserve the integrity of, and ensure the persistence over time of collections of digital works so that they are readily and economically available for use by a defined community or set of communities. To him, digital Libraries offer such benefits as equitable access, reduced barriers of distance, timeliness, shared resources and content delivery.

From the aforementioned, a digital library can best be described as a library or information service, located either in a physical or virtual space, or a combination of both, with significant proportion of its resources available to patrons in digital form. According to Kuny & Cleveland (1998) there exist myths that permeate the popular research reporting about digital libraries. These myths set the stage for a closer examination of the significant challenges to "digital school library" development in a developing country like Nigeria. Therefore, these Myths are discussed as follows.

Myth 1:   The Internet Is the Digital Library.

A fairly spectacular example of what many people consider to be a digital library today is the World Wide Web. The Web is a gathering of thousands and thousands of documents. Many would call this huge collection of documents a "digital library" because they can read and use whatever they wish by accessing the Web, just as one can use technology to do banking in a "digital bank" or buy compact discs in a "digital record store". But is this a "digital library"? However, in reality, the Internet and the World Wide Web are not digital libraries. They are to libraries what a flea market is to the Library of Congress. For many common library requests, locating information on the Internet remains highly inefficient compared to traditional library sources, especially for unfamiliar users. Finding information is difficult; the quality of the information is quite variable, and unreliable. Therefore,   professional assistance for the confused and the lost is lacking. (Kuny & Cleveland, 1998)

What Challenges Emerge

There is no coherence and user-friendliness; these diverse networked electronic resources that are scattered and highly distributed on the www need to be discovered, retrieved and managed by professionals' who can develop infrastructures to manage such information needs and uses .An often repeated quote among librarians is that the Internet is the place to find an answer in 3 days for a query that would take 3 hours in a library. There remains much work to be done before the Internet will have the coherence and user-friendliness of a library.

Myth 2:   The Myth of A Single Digital Library Or One-Window View Of
       Digital Library Collections.

According to the technology visionary, inventor and thinker Nicholas Negroponte (1995), while pushing the edge of information revolution, he stated in his book 'Being Digital' that twenty million people will be able to access a digital Library electronically and be able to withdraw its contents at no cost. He went further to call the U.S. Congress to pass a "digital deposit" act to change the Library of Congress from a "depository" to a "retrievatory". His vision of the library is one where citizens can get electronic access to a library -without- walls where information anywhere and anytime. [Kuny and Cleveland, 2002, Negroponte, 1995].

What are the Challenges to This Vision?

Despite the utopianism of Negroponte's view, even modest moves towards increasing digital collections and services will be strongly affected by future copyright and licensing regimes, as well as prohibitive costs for digitization and support of

technical infrastructure. (Rao K.2004). But more importantly, the digital future will be an unruly one composed of multiplicity of competing information providers. Libraries will be only one source of information. "Prime" information resources will probably be locked into proprietary collections essentially "private digital libraries" which are accessible on a subscription or pay-per use basis. Developing standards for locating and retrieving information in this highly distributed and heterogeneous environment will be a considerable challenge in their own right.

Myth 3: Digital Libraries Will Provide More Equitable Access, Anywhere, Any Time.

A great deal of work must be done to turn this myth into reality. We can assume that a global computer networks the internet or some descendant will be the primary delivery mechanism for digital information. Equitable access is currently compromised by the fact that the internet is not as ubiquitous as the computing press would have us believe. There are relatively few connections outside the more populated centers; the costs of access can remain high, and for the vast majority of the world's population in developing countries, having widespread Internet access may be the equivalent of walking on the moon.

Challenges

Furthermore, the connections that do exist for most people are slow. For a digital library to provide equitable access to information, it is imperative that the same universal availability that is a characteristic of the telephone system is also a characteristic of the network. In the future, complex multimedia resources and services may have specialized hardware and software requirements such that only a limited number of workstations can actually access the information. Limits of network bandwidth and slow transmission speeds may make the effective access to information problematic for many users.

Given the immense technical and legal hurdles involved, the prospects for equitable access to digital collection and services seem increasingly problematic. Copyright reform will be a slow process and has the potential to derail the very idea of "digital libraries". The technologies on the desktop, between computers, and for storing and processing information are dynamic variables. What is certain is that the management of technology for digital libraries is more complex as is the administration of licenses and user access. The impact upon equitable access could be considerable. (Kuny & Cleveland, 1998)

Myth 4:   Digital Libraries Will Be Cheaper Than Print Libraries.

A common assumption among technology reporters about the costs of "digital libraries" is that digital is cheaper than paper. This contention is far from established fact or practice. Although many libraries project savings, especially when substitution strategies are used to replace selected serials titles with document delivery services, the cost/benefit analysis of making this switch remains unclear. In some cases, the switch to electronic serials may save the library money by offsetting the cost to users who must pick up the charge for document delivery. Furthermore, the costs of "being digital" are substantive ones. Many libraries now devote significant resources for hardware and software infrastructure. These expenses will increase; new hardware will be required;

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more licenses to software; increased infrastructure, administration and training. ((Rao, 1996)

What Challenge

Those institutions that aspire to the development of digital collections and services can expect all of the above plus extensive design, digitization, and implementation costs. Are digital library budgets evolving at the expense of decreasing acquisitions budgets? At the end of the day, how many libraries can afford the effort? And at what cost to the valuable existing services will libraries perform?

THE ROLES OF SCHOOL LIBRARIANS TRANSFORMING INTO THAT OF A DIGITAL LIBRARIAN

The digital librarian, who is imbued with an ethic of equitable access, will function well as trained intermediaries in a heterogeneous information environment. The knowledge that a digital librarian bring to this knowledge environment would make sense of a multiplicity of digital collections and resources, provide access to a network of key contacts, identify cost-effective strategies for information retrieval, and assist users in the publication and creation of new knowledge(Sreenivasulu,2000)

Thus, it can be concluded from the aforementioned that the digital Librarian of the 21st century must possess an over all digital information system management competencies (knowledge, know-how, skills and attitudes) necessary to create, store, analyze, organize, retrieve and disseminate digital information (text, images, sounds).In digital libraries or any type of information retrievatory. Sreenivasulu, (2000), described the roles of the digital librarian using the following concepts as itemised below

Guardian of Information Superhighway (ISH)

The information superhighway is a vision or a metaphor. It envisions a fusion of the two-way wired and wireless capabilities of telephones and networked computers with a cable TV's capacity to transmit hundreds of programs. Sreenivasulu, 2000, went further to explain that infrastructure that provides band width-on demand and information-on-demand services are also called information superhighway.

Guardian of the Global Digital Library

The digital library is really a transitory phase towards the universal digital library, a vast distributed information and active repository accessible from anywhere with increasing improved indexing, extraction and summarization techniques. It will be a library without walls or national boundaries.

Digital Librarian Acts As Symbiotic Human-Machine Guru

The digital librarian acts as an intermediary in the task of massive digitization of information, its storage, dissemination, managing the archive, and making available digitized networked information to the end users. Digital librarians and computers depend on each other for processing and dissemination of digital information and both are interrelated.

Navigation, Browsing And Filtering

The navigation of the future would tend to integrate with the human-assisted information retrieval from the networked universe and would support rapid information navigation and precision retrieval. The digital librarian is an expert in navigation, browsing and filtering, digital reference services and electronic information services from the digital information sources.

Multimedia Search and Indexing

A multimedia digital library requires not just standard indexing and retrieval but also sub-document indexing and summarization techniques i.e more than that of paper documents.

Knowledge and Data Mining

The digital librarian will require a limited knowledge of data mining discovery of knowledge from digital libraries to extract unmet information needs of users. For this purpose, unsupervised learning techniques such as clustering, and composite term discovery techniques etc., are useful.

Search and Retrieval Co-Ordination

This requires comprehensive knowledge of the retrieval engines and indexing structure so that the digital librarian can achieve the goal of creating information queries with respect to the search system.

Digital Librarian's Interface Functions

Another fundamental role of a DL in digital school libraries is to act as an intermediary who brings together users and information. Digital library access tools are the right set of tools used in novel ways to tackle a plethora of challenges and opportunities for information access technology and faster access.

Digital Information Access

There is a variety of information retrieval techniques, including metadata searching, full-text document searching. In knowing what can or cannot be retrieved from the digital library information sources, the digital librarian acts as an expert in the acquisition of digital information.

Accessing and Retrieval of Digital Information through Digital Library Access Tools

The method used to store, find and retrieve digital information from DSI's is called the access method. The technology used to access information digitally provides navigation paths or digital library access tools through the digital information system (DIS).

Mobile Information Access: a Vision of Tomorrow

The ability to access information on demand at any location confers competitive advantage on Librarians in an increasingly mobile world. The data from shared file systems; relational databases, object-oriented
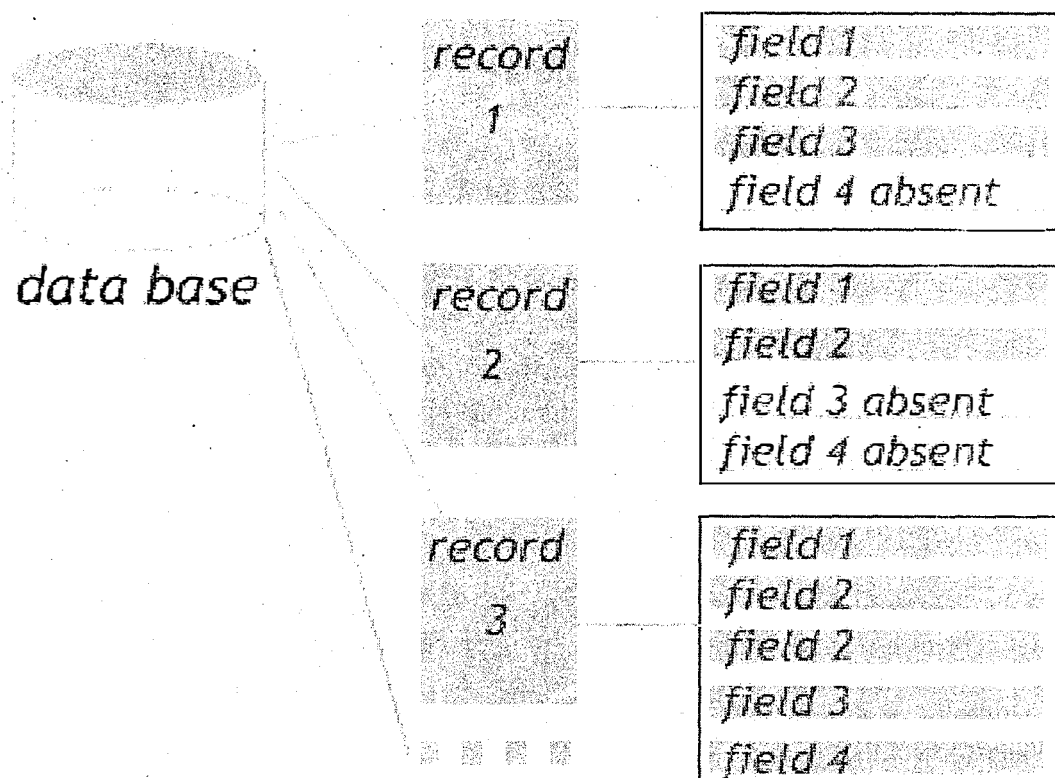
- organising collections of media (including online resources) and equipment for easy access.
- circulating media and equipment,
- arranging flexible schedules that provide accessibility,
- handling repair procedures,
- preparing procedural manuals for the centre,
- promoting the centre within and outside the school,
- instructing in the location and use of media and equipment both print and online,
- offering reading, viewing, and listening guidance,
- providing access to the Internet and other databases,
- training students and teachers in the use of the Internet,
- training student and staff in the operations of the centre,
- collaborating with teachers, administrators, and students,
- troubleshooting technology problems and
- providing links to Internet web sites.

In order to be able to carryout some of these functions effectively school library media centres especially in Nigeria need to embrace the technologies that will do the job and yield the desired results. As a start, any school library media centre could take advantage of open source library softwares that are readily available and downloadable and useable via the Internet. The two that will be discussed in the paper are the CDS/ISIS and the LibraryThing internet application.

CDS/ISIS

CDS/ISIS is an acronym that stands for Computerized Documentation System-Integrated Set for Information Systems (Acronym Finder: 2011). It was developed by The United Nations Educational Scientific and Cultural Organization (UNESCO) (UNESCO: 2010a). The software which was originally based on the Mainframe version of CDS/ISIS, started in the late '60s. About twenty-five years ago, the DOS version of the software was developed by UNESCO (Hopkinson: 2011). Since then, the software has migrated to the windows platform. Micro CDS/ISIS is an advanced non-numerical information storage and retrieval software developed by UNESCO to satisfy the need expressed by many institutions, especially in developing countries, to be able to streamline their information processing activities by using modern (and relatively inexpensive) technologies. Many libraries in developing countries have accepted the CDS/ISIS package as a standard software for information system development. CDS/ISIS is one of the software packages for database management developed by UNESCO. It is a generalised Information Storage and Retrieval system (UNESCO:2010b) The Windows version may run on a single computer or in a local area network.

Fig 1: Example of the database structure graphically explained

CDS/ISIS is capable of doing the following task highlighted below:

* define many databases each of which may have different data elements,
* enter new records into a given database,
* modify, correct or delete existing records,
* automatically build and maintain fast access files for each database in order to maximise retrieval speed,
* retrieve records by their contents, through a sophisticated search language,
* display the records or portions thereof according to your requirements,
* sort the records in any sequence desired,
* print partial or full catalogues and/or indexes, and
* develop specialised applications using the CDS\ISIS integrated programming facility,

Other capabilities include:
* easy access to multimedia content i.e. web links, e-mails, document and image files,
* data Entry control options - Pick list; Improved record validations,
* import/Export Options - ISO 2709; XML,
* dictionary capabilities - Dumping of terms to printer or file; Prefix management,
* erase database option, and
* plug-in ready - External 32-bits plus-ins,

The minimum and recommended hardware requirements for running the CDS/ISIS application are:

- Intel Pentium processor 100 Mhz or higher
- At least 16 MB of RAM
- 10 MB hard disk (free)
- 3½ inch floppy disk drive
- VGA 640x480 colour screen (super VGA 800x600 or higher recommended)
- Windows 3.1x or Windows 95/98/Me/NT/2000/XP
- 1 printer (optional)
- Multimedia (optional)
- Internet (optional)

One of the major advantages offered by the generalized design of the system is that CDS/ISIS is able to manipulate an unlimited number of databases, each of which may consist of completely different data elements. The CDS/ISIS user is therefore freed from the expensive task of having to design and write computer programs, each time a new project requires the use of information retrieval techniques. Although some features of CDS/ISIS require some knowledge of and experience with computerized information systems, once an application has been designed, persons having little or no prior computer experience may use the system.

For advanced users, having access to computer professionals, CDS/ISIS offers an integrated programming facility allowing the development of specialized applications and/or the functional extension of the software as originally provided. CDS/ISIS is not a relational database system, although it does provide some relational facilities. CDS/ISIS was written in C++ and Visual Basic.

It should be noted that CDS/ISIS has some system restrictions, they include the following:

- Maximum number of databases: Unlimited
- Maximum record size: 32000 characters*(*Records larger than 8000 characters may not be used with the MSDOS version of CDS/ISIS)
- Maximum field size: 32000 characters
- Maximum number of fields (defined in a FDT): 200
- Maximum number of FST lines: 600
- Maximum number of stopwords: 799
- Maximum size of a display format: 10000 characters
- Maximum size of a display buffer: 64000 characters

LibraryThing

LibraryThing web application   was developed in 2005 by Tim Spalding, a web developer and web publisher. As of April 2011 it has over 1,300,000 users and more than 61 million books catalogued. LibraryThing is a web 2.0 based application which can be efficiently harnessed for personal and Professional use by school library media specialist.

LibraryThing is, a great way for library media specialists to keep track of the books that are read. The LibraryThing account is free for the first 200 books, and thereafter for a token of twenty-five dollars the subscriber can have a life-time subscription. LibraryThing allows the user to create a personal library, give tags to books, choose book covers, give star ratings, generate citations (MLA, APA, Chicago), and review books. The user can also connect to other readers and see their reviews. Entries made on LibraryThing can be seen by anyone or made private if the user does not want to share. The tags, which can be sorted alphabetically, are useful for remembering book topics and themes. When a tag is clicked, all of the books in the library tagged with that subject are displayed. (Sibley: 2009; Squidoo: 2011). Users can even view their books on a virtual shelf and add widgets to display titles that exist in their catalogue. This kind of web 2.0 technology development is well suited for students (Scott:2008;Parkes & Walton:2010). *LibraryThing* is an innovative, well-designed and very popular resource.

Things to consider when using Web 2.0 tools.

In harnessing a web 2.0 tool such as the LibraryThing, certain important considerations are necessary. According to Stowe and Teeuwsen (2008) the user of these tools should ask some salient questions: firstly, does the purpose of the tool assist in fulfilling the library's mandate? Secondly, how beneficial will it be to patrons, and staff when it is implemented? For instance will it create more visibility for the library's collection? Thirdly, what are the cost implications on a short and long term basis? How much daily time will it demand from staff that will be working with it? Finally, introducing a web 2.0.tool such as LibraryThing, will mean networking with other users on a highly interactive social networking platform. How comfortable will the library be in this kind of environment?

Conclusion and Recommendations

School libraries in Nigeria will need to look more closely on these relatively less expensive ways to provide cutting edge services for their user communities by making use of what is freely available on the web such as the CDS/ISIS and LibraryThing. Most children in this knowledge age can relate well with digital devices and platforms and as such, school library information provision services can migrate to these digital platforms as well in order to add more value to the traditional information services they provide.

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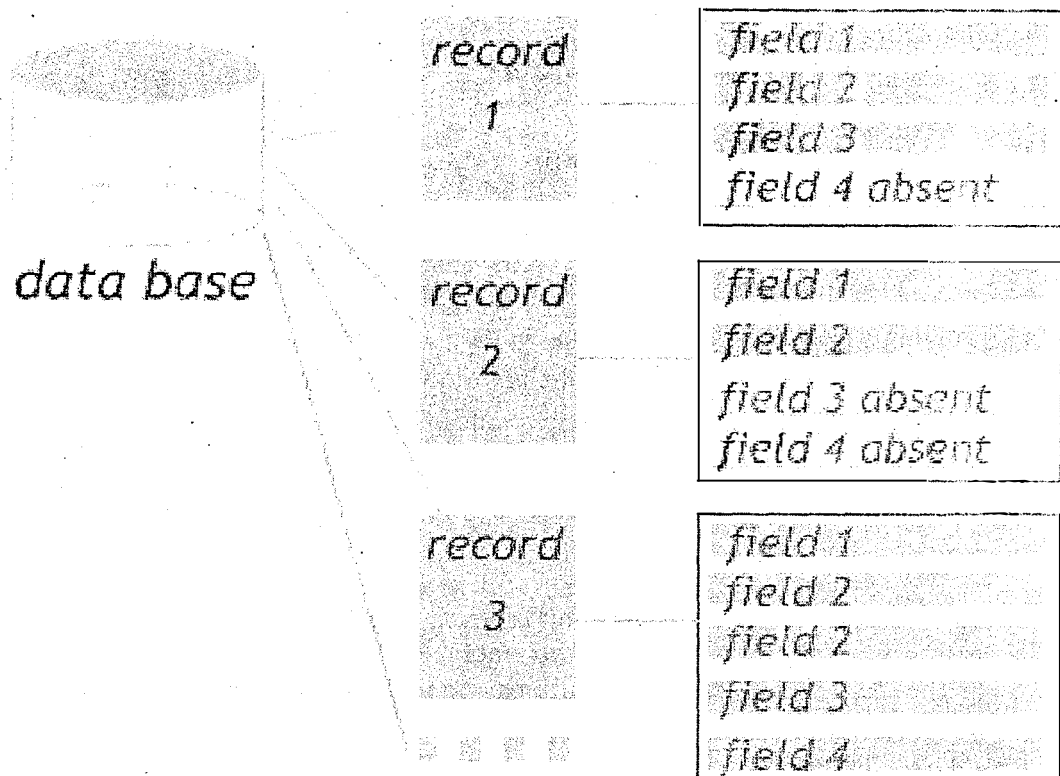
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LibraryThing is, a great way for library media specialists to keep track of the books that are read. The LibraryThing account is free for the first 200 books, and thereafter for a token of twenty-five dollars the subscriber can have a life-time subscription. LibraryThing allows the user to create a personal library, give tags to books , choose book covers, give star ratings, generate citations (MLA, APA, Chicago), and review books. The user can also connect to other readers and see their reviews. Entries made on LibraryThing can be seen by anyone or made private if the user does not want to share. The tags, which can be sorted alphabetically, are useful for remembering book topics and themes. When a tag is clicked, all of the books in the library tagged with that subject are displayed. (Sibley: 2009; Squidoo: 2011). Users can even view their books on a virtual shelf and add widgets to display titles that exist in their catalogue. This kind of web 2.0 technology development is well suited for students (Scott:2008;Parkes & Walton:2010). *LibraryThing* is an innovative, well-designed and very popular resource.

Things to consider when using Web 2.0 tools.

In harnessing a web 2.0 tool such as the LibraryThing, certain important considerations are necessary. According to Stowe and Teeuwsen (2008) the user of these tools should ask some salient questions: firstly, does the purpose of the tool assist in fulfilling the library's mandate? Secondly, how beneficial will it be to patrons, and staff when it is implemented? For instance will it create more visibility for the library's collection? Thirdly, what are the cost implications on a short and long term basis? How much daily time will it demand from staff that will be working with it? Finally, introducing a web 2.0.tool such as LibraryThing, will mean networking with other users on a highly interactive social networking platform. How comfortable will the library be in this kind of environment?

Conclusion and Recommendations

School libraries in Nigeria will need to look more closely on these relatively less expensive ways to provide cutting edge services for their user communities by making use of what is freely available on the web such as the CDS/ISIS and LibraryThing. Most children in this knowledge age can relate well with digital devices and platforms and as such, school library information provision services can migrate to these digital platforms as well in order to add more value to the traditional information services they provide.

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