Design and Implementation of a University Library Website

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Abstract: Some years back, the use of Information Technology (IT) in African university libraries was a novelty and the use of telecommunications for information access was virtually unheard of. But nowadays, many university libraries in Africa are now at varying stages of computerization. In spite of these various steps towards computerization and advancement in technology, some University libraries still carry out some, if not all of their operations manually. This study focuses on designing and implementing a Web site for the Federal University of Technology, Akure (FUTA), Nigeria Library. The system was designed using HTML for authoring the web pages, JAVA for writing animation applets, JavaScript for handling client side processing of form input and data validation and MySQL and PHP to support the database. It makes available to people within and outside the university, the sections and operations of the library, hence making the existence of FUTA known through the graphical, distributed and hypertext-based information system on the Internet. It also renders some additional services like registration and loan to local users. It also provides useful, innovative and interactive services and products. Additionally, it gives some form of identity and encourage repeat visitation to some other libraries around while holding the interest of users and simplifying their tasks.

Key words: Libraries, website, online information, university

INTRODUCTION

The library is a communication system whose primary function, like that of the University, is to preserve, transmit and increase human knowledge[1]. It can be referred to as the heart of the university; no other single non-human factor is so closely related to the quality of graduate education. While each of these factors has its unique qualities, university libraries share many characteristics in terms of goals and objectives, collections, size and growth, cooperative activities, physical facilities, services, organizations and particularly the increasingly unmanageable quantity of information hence making them to be faced with challenges to utilize the available sophisticated technology for advancement and effectiveness.

The University's library collections support the undergraduate teaching programmes, the advanced instruction of graduate students and research by members of the faculty and research staff. There are special collections of scarce or unique books and manuscripts in some university libraries that are of national or even broader importance in preserving and making available the primary records of civilization. The modern university library is not simply a warehouse for the storage of books. Its combination of collections (books, journals, films etc.), staff and physical facilities makes it a complex instrument for the active promotion of teaching and research.

Some years back, the use of Information Technology (IT) in African university libraries was a novelty and the use of telecommunications for information access was virtually unheard of. But nowadays, the use of personal computers for developing local databases and for literature searching is common. Libraries now use e-mail for international linkage, the use of network now features in their operations and some libraries are embarking on retrospective conversion of their card catalogues to machine-readable form while a number of them are now hooked to the Internet. Many university libraries in Africa are now at varying stages of computerization[2].

In spite of these various steps towards computerization and advancement in technology, some University libraries still carry out some, if not all of their operations manually. Such operations include, admission of users into the library, acquisition of collections, cataloguing (organization of materials), reference activities, registration of users, borrowing and returning of materials and general administration of the library. While some have computerized most activities, they have not been looking into the area of providing online access to information and materials and this have led to a lot of lapses and setbacks in this dynamic information age.

In an increasingly technological society, providing Internet access should be seen by many as a natural extension of the library's duty to provide information, educational and leisure services to users.

The World Wide Web opens up enormous possibilities for the development and delivery of these services. It also offers an intuitive and increasingly familiar computing environment through which to deliver existing services and a channel for developing new ones[3]. Today, the proliferation of Web-based resources has greatly increased the information that libraries can deliver to their users' desktops. Libraries want to make their collections available not only to those who come into the library but also to remote users who need to have access to library resources from their homes or offices[4,5]. Offering publicly available Web sites makes this possible. Actually, the utilization of the increasingly dynamic computer technologies in various libraries today is changing the services they provide and how they operate. Regional and state networks have been formed to provide their members such services as shared cataloguing and access to materials in other libraries[2-5].

A library Web site is its virtual public face – the quasi equivalent of the front door, signage, pathfinders, collections, services and, to an extent, its people[6]. It is (or will be) a complex application integrating access to and interaction with a diverse set of information products and services and with people. A library Web site is much more than the compilation of HTML code and good visual design. It is not just the presentation of content but, in fact, is a gateway to many types of content.

With the advent of the Internet, the need for supply of timely information in a fast, precise, clear, accurate and attractive (interactive) form cannot be overemphasized. Some other factors that motivated this research work include the need to project the image of The Federal University of Technology, Akure, Nigeria to the outside world, the need to promote research activities among academic libraries and the essential need of providing additional flexibility and convenience, hence simplifying the tasks of library users. This research work focuses on designing and implementing a Website that provides online information and services to the users and staff of the Federal University of Technology, Akure (FUTA) library.

SYSTEMS ANALYSIS AND DESIGN

Facts about the kind and flow of information within and outside the University library were obtained. The kind of information that interested visitors to the library would like to see were also ascertained and collected. The methods of data collection include Observation, which was done by studying the activities of the library staff and the conduct of the library users, Interviews which were conducted with the University Librarian, the

Principal Librarian, the Reference Librarian and some of the Circulation Section Staff in order to obtain relevant information about the operations of the library and using written documents such as Library Guide, foreword from the Librarian among others. Having obtained the needed information, a critical analysis of these information was carried out in order to figure out the things that the Web site should offer. The analysis created room for a regular update of some of these information. This is necessary in order to enhance the growth, relevance and authenticity of the information made available.

The Target Audience of the Website include:

- FUTA Students and Students in other institutions
- Academics within and outside FUTA
- Other people who may want to get information from and about the library.

Systems design

Design specification and tools: The specification of pages and other elements of the site are as follows:

- There is the same background for every page making all the pages to have the same look and feel.
- On every page, there is a navigation bar that allows the user to make navigation selection for the home page and other pages on some. This prevents a user from losing his way out in the process of surfing.
- Most of the colours used reflect the colour of the University – purple and blue. In addition, the colours are not blaring but are muted and subtle, meant to gain the users' attention through functionality
- Alternate texts are provided for all images. This allows non-graphical browsers to use the site.

The tools used in developing FUTA Virtual Library are:

Hardware: A full multimedia, Pentium III 500MMX Computer. Pictures were scanned using a Genius Color Page Vivid 3X Scanner.

Software: These include Windows Notepad for editing the HTML pages, Coreldraw, Corel Photopaint and Corel Scan for the production and editing of pictures and images, Java for creating animations, JavaScript for data validation, Microsoft paint to design navigation buttons, MySQL to create the table in the database and PHP to write CGI scripts to support the database. The browser and web server used were Netscape Communicator and Apache respectively, while the Web presentation was designed in Windows '98 Operating System environment.

Fig.1: The Site's Home Page

Fig. 3: The library's departments

- Library Mission/Objectives
- Library Guide and Regulations
- Staff Directory
- Library Departments

Library guide and regulations: This section, which is an option under about FUTA library hyperlink, contains:

- Opening hours
- General information
- Admission
- Loans
- Fines
- Discipline
- Other Information

Fig. 2: About FUTA Library

Design overview: The Web site provides hyperlinks to the following information on the Home Page (Fig.1):

- Welcome Page with a foreword from the University Librarian
- General information about FUTA library
- Library guide and regulations
- Library services
- Links to other university libraries
- Training on how to use the internet and current information on the library
- Guest book
- Web master
- Site map

About FUTA library: Clicking on this hyperlinks takes the user to another page where the following information are found (Fig. 2):

- The Library Organizational Structure
- The Library Location including location maps and routes

Library services: This level provides services to the staff of the library and interested users through the Library Database System

Other libraries: In this level, interested users can be linked to some Universities libraries around. This is actually one of the major components of a Virtual library. The Libraries of any of the following Nigerian Universities can be accessed upon clicking any of the hyperlinks:

- Ondo State University, Akungba.
- University of Ado – Ekiti.
- Obafemi Awolowo University, Ile-Ife.
- University of Ibadan.
- Ladoke Akintola University of Technology, Ogbomosho.
- Olabisi Onabanjo University, Ago-Iwoye.
- University of Agriculture, Abeokuta.

However, this is only possible when these Universities have libraries that are connected to the Internet.
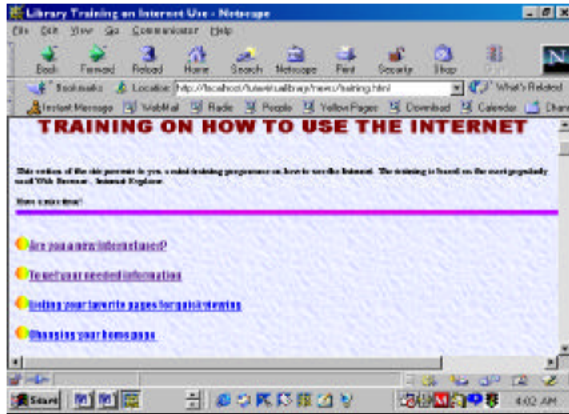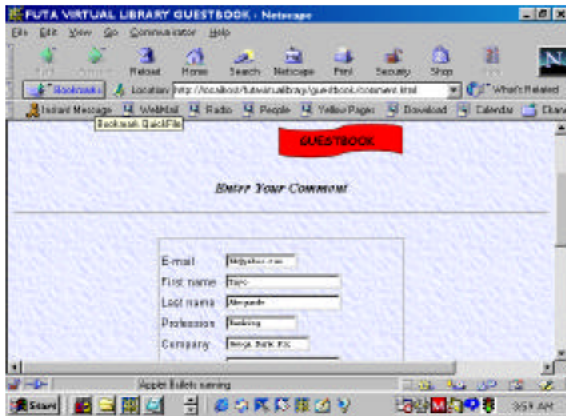
Fig. 4: Library training on internet use

Fig. 5: Guestbook

News/Training: This level is divided into the following:

* News
* Current Acquisition
* Training
* Other Information

The first displays any library news. The second provides information on recent acquisitions in the library. The third provides links to other Internet resources and training on how to use the Internet while the last displays the courses run by the University and the University Calendar every session and any other relevant information. It is worthy of note that the information in this level has to be updated from time to time (Fig. 4).

Guest book: In this level, there are some forms that the users are allowed to fill to make requests, enquiries and suggestions (Fig. 5). A database is created for storage of such information and later upload by library staff.

Web master: Clicking on this, the user of the system gets information about the designer of the site.

Site map: This is a map of the scope of the site. It presents at a glance all the information the Web site provides and would serve as a good navigation aid for impatient surfers of the site.

SYSTEMS IMPLEMENTATION

Outlined below are the requirements for the implementation of FUTA Virtual library.

Hardware requirements: For the implementation of this system, a full multimedia computer system with a minimum of the following requirements was used at the server end:

Pentium processor with a speed of 500MHz, 64MB RAM, 10.2 GB Hard disk space, SVGA Monitor, Modem (28.8Kbs), ISDN line, ISP for Internet access and Peripheral equipment like UPS and stabilizer. Low cost complete computer systems are sufficient to operate at the client sides.

Software requirements: The Software used include Windows NT (at the server side), Windows '98 (at the client sides), Apache Web Server, Netscape Navigator and MySQL 2.0. Server.

Choice of programming languages: The following languages were used for the reasons outlined:

* HTML was used because it is the standard for authoring web pages and supported by a wide variety of browsers (both graphical and non-graphical).
* JAVA was used for writing animation applets because it is platform independent, that is, it can be downloaded and executed on any kind of machine.
* Javascript was used for validating the entries made on the client side because it is supported by the two most popular browsers – Internet Explorer and Netscape Navigator.
* MySQL server was used as the database server because it is a light weight relational database management system designed to suite web application development in that it provides rapid access to data sets with as little system overhead as possible. It has a back-end database that supports critical functions on the web.

- PHP abbreviation for Hypertext Preprocessor was used to write CGI (Common Gateway Interface) scripts to support the database because it has tightly integrated database capabilities and it is extensive in that it offers compatibility with several database servers.

System testing: The system was designed, coded and tested in order to ensure that its requirements and the design goals of the application are met.
The testing procedures include:

- ensuring the correctness of the HTML tags.
- ensuring that the links work and are properly made.
- ensuring the usability of the web pages even after testing for technical correctness.

CONCLUSIONS

The World Wide Web opens up enormous possibilities for the development and delivery of Library services as providing information about it to the outside world. Information available in libraries' web sites has contributed to reduced cost for research and better communication within and among University libraries.

This study was aimed at designing and implementing a Website (for FUTA library) which will make available the library services on the web, hence helping to magnify the benefit of improved access to information, foster the search for knowledge and understanding in the University and the wider community and also reduce the cost of the library operations.

The web pages provide users online access to information about the library's collections, location, services, regulations, current acquisitions and staff. It also links up users with neighbouring University libraries.

The study will help to promote easy acquisition and sharing of knowledge and dissemination of information among the intellectual world and enable the University Community to keep abreast of the latest development in the Information technology world.

Further research can be done in the area of digitizing the library volumes and making them available online. The implementation of the interconnection of regional libraries is also an important aspect that can be properly improved upon in the future. Additionally, the issue of library and distance learning can also be considered for further research.

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