ASSESSMENT OF THE STEPS IN DESIGNING A WEB BASE DIGITAL LIBRARY MANAGEMENT SYSTEM FOR SCHOOLS, OPPORTUNITIES AND CHALLENGES

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ABSTRACT

A Web-based library management system is seen as a collection of online databases of digital objects that can include text, still images, audio, video, digital documents, or other digital media formats accessible through the internet. The paper provided the concept of a library management system, noting that it implies software that is designed to manage all the functions of a library. It also explained the concept of library; the benefits of designing library management systems, and the concept of library management, etc. However, the paper saw fit to conclude that a web-based library management system can safely be determined that the system is efficient, usable, and reliable. It is working properly and adequately meets the minimum expectations that were proposed initially. One of the recommendations was that it is obvious that it becomes increasingly difficult to store, manage the large number of documents and find relevant documents requested by users as the number of documents in a digital library grows. Hence, a Web-based Library Management System is recommended in order to create an unlimited quantity of information and make it available to the world in parallel.

KEYWORDS: Web Base Digital Library Management Systems, Schools, Opportunities and Challenges

Introduction

A web-based library management system for schools is a collection of online databases of digital objects that can include text, still images, audio, video, digital documents, or other digital media formats accessible through the internet. Ben-Zvi (2000) stated that the increasingly advanced mindset of society has led to the development of the use of technology in all areas of life, one of which is educational institutions. With the existence of information technology in the world of education, it is hoped that it can help educational institutions work more effectively. A website-based library management system is proposed to support library services and be more effective. The system offers an automatic barcode generator for cataloguing and processing books; digital lending services; digital data management; and automatic digital reports (Dina, Annisya, & Juniarta, 2021). A Web-based library management system is a service that allows students to access and borrow books from the library without physically visiting the library. It allows library staff to manage student activity in the library and

create digital catalogues without using the manual, bulky file system. It also makes the accessibility of library resources easy for students and lecturers alike.

A web-based library management system is an automated library system that handles the various functions of the library. It provides a complete solution to library management software. The online Library Management System is classified into two parts: The Bar Code System and the RFID System. According to Tochukwu, Nwachukwu-Nwokeafor & Henrieta (2015), the web is becoming an ubiquitous source of information, giving an illusion of depth and comprehensiveness that leads to a questioning of the value of libraries and their collections. A Web-based library management system was designed for the purpose of creating an unlimited quantity of digital information and making it available to the world in parallel. The web-based library management system helps deal with daily book transactions. The system will store information such as books being borrowed, books being reserved, books left, and the user's information. It can increase the productivity of the librarians because they can simply find all the useful information in the web-based library management system and hence save time. Apart from time-saving, the online library management system allows users to self-assess through the internet (Raymond, 2005). They can take advantage of the functions in the web-based library management system to facilitate their reading and save time on book searching, i.e., keyword searching. Also, they can do some transactions at anytime and anywhere, such as reservations and renewals.

Concept of Library

A library is a collection of resources in a variety of formats that are organised by information professionals or other experts who provide convenient physical, digital, bibliographic, or intellectual access and offer targeted services and programmes with the mission of educating, informing, or entertaining a variety of audiences and the goal of stimulating individual learning and advancing society as a whole (American Library Association, 2019). A "library" refers to the collection of books or a building where a collection of books, periodicals, musical scores, music, and film recordings are stored. A library is a place in which literary, musical, artistic, or reference materials (such as books, manuscripts, recordings, or films) are kept for use but not for sale (Merriam-Webster, 2021). A library is a collection of formats that are organised by information professionals or other experts who provide convenient physical, digital, bibliographic, or intellectual access and offer targeted services and programmes with the mission of educating, informing, or entertaining a variety of audiences and the goal of stimulating individual learning and advancing society as a whole (Eberhart, 2010). Library refers to a growing area of interactive and social tools on the web that create and share dynamic content. According to Achebe, (2008), a library is defined as a collection of books and other non-book materials housed, organized, and interpreted to meet the yearning needs of people for information, knowledge, recreation, aesthetics, research, and enjoyment. A library is a collection of materials, books, or media that are easily accessible for use and not just for display purposes. It is responsible for housing updated information in order to meet the user's needs on a daily basis. A library is a physical location, a virtual space, or both that provides physical (hard copy documents) or digital access (soft copies) materials (Wikipedia, 2022). A library's collection can include printed materials and other physical resources in many formats, such as DVDs, CDs, and cassettes, as well as access to information, music, or other content

held in bibliographic databases. FRN (2004) stated that the library is the pivot of the educational enterprise, which gives the platform for the sharing of knowledge aimed at rejuvenating Nigerian schools through the provision of current books and journals. All these definitions have one thing in common; they all say that a library is an organised collection of books and other non-book materials stored for use by library patrons.

Concept of Library Management System

A library management system is software that is designed to manage all the functions of a library. It helps librarians maintain the database of new books and the books that are borrowed by members along with their due dates (Master-Soft, 2021). This system completely automates all your library's activities. The best way to maintain, organize, and handle countless books systematically is to implement library management software. A library management system is used to maintain library records. It tracks the records of the number of books in the library, how many books are issued, how many books have been returned or renewed, late fine charges, etc. A library management system is software built to handle the primary housekeeping functions of a library. Libraries rely on library management systems to manage asset collections as well as relationships with their members (Educative, 2019). Library management systems help libraries keep track of the books and their checkouts, as well as members' subscriptions and profiles. Library management systems also involve maintaining a database for entering new books and recording books that have been borrowed with their respective due dates.

A library management system refers to the adaptation of principles and techniques of management to the library situation. It includes decision-making and getting the work done by others. The purpose of a library management system is to operate a library with efficiency and at reduced costs. The system's being entirely automated streamlines all the tasks involved in the operations of the library (Anurag, 2020). The activities of book purchasing, cataloging, indexing, circulation recording, and stock checking are done by the software. Such software eliminates the need for repetitive manual work and minimises the chances of errors. The library management system refers to the overarching database for the library service containing book stock and library membership records (Law Insider, 2021). The library management system software helps in reducing operational costs. Managing a library manually is labor-intensive, and an immense amount of paperwork is involved. An automated system reduces the need for manpower and stationery. This leads to lower operational costs. Anurag (2020) stated that the library management system software makes the library a smart one by organising the books systematically by author, title, and subject. This enables users to search for books quickly and effortlessly.

Concept of Web Based Library System

The Web-based library system is actually an extension of the computerised system, which makes it possible to access the data on the Internet. According to deBem & Coelho (2013), the introduced service is a great help for readers, saving time and energy. He further explained that having introduced this system is a step forward in the library's history and is motivating to readers of the library. However, their library system is more about public content because of their public library, which gives service to the community. The Library System is a fast-growing database for information retrieval, which targets developing computerised systems to preserve

the daily work of the library. Well, a computerised library will be a benefit for users with fast and prompt services. Their library system denotes to the computerised systematisation of library maintenance and activities. Their work has many structures that are mostly not available in manual LMS, like the facility of user login. In addition to the similarity of their work, we also proposed a digital archive, which can store the electronic files. This newly developed system has the capability of an admin login through which the admin can monitor the whole system. A data base is developed and built for the records and other facilities for the computer application. To provide numerous search selections to check the convenience of books in the library to generate the list of books.

Advantages of Designing Library Management Systems

Computerisation is a solution, and it can help maintain the transaction data. Computerization can only solve the problems of too much reliance on manpower, transaction records in disorder and decentralisation of transaction records. Even in designing a library management system, computerization is very vital. However, other big problems, such as how inconvenient it is to get information from the library and a lack of a platform to share book reviews, cannot be solved. That is the main reason for choosing web-based computerization instead of mere computerization. Using Web-based software gives you the most flexible solution for running a lifelong learning organization. Having your registration system be entirely online allows you to identify and respond to customer needs quickly and creatively. The Web-based library management system is actually an extension of the computerised system, which makes it possible to access the data on the internet.

Web-based software offers a huge benefit when it comes to getting your customers involved in your business. Students can see their individual profile online, up-to-date class transcripts, and receipts and invoices from classes they paid for last year, or a minute ago. All your customers' information is updated instantly and accessible at any time. Web-based systems also give instructors better communication with their students. Instructors can log into your site, view the roster for an upcoming class, and send out an email to each student in the class, telling them important information for the next class meeting. Instructors can also access their own profiles, including any payment they have received from you for teaching. The following are the major advantages of designing a library management system.

- ❖ It offers 24*7 access to the library resources
- ❖ Provides functionalities like acquisition, cataloguing, serial control, etc
- ❖ Highly secure and efficient library database management
- ❖ Provides greater efficiency of work processes & saves time of librarian
- ❖ Cost-effective software for library and can be configured as per requirements

Web Base Library Management System

In software engineering, a system development methodology refers to the framework that is used to structure, plan, and control the process of developing an information system. Software development methodologies define the processes we use to build software. These methodologies are also referred to as Software Development Process Models. Each methodology follows a series of steps unique to its type, to ensure success in the process of software development. A software process is a set of related activities that lead to the production of a software product.

- Specification
- Development
- Validation
- Evolution

These are fundamental to software engineering. A wide variety of Software Development methodology has evolved over the years. Each of these methodologies has its own recognized strengths and weaknesses. The following are the most widely used methodologies for software development.

Waterfall Method: The waterfall model is a sequential approach, where each fundamental activity of a process is represented as a separate phase, arranged in linear order. This model requires planning and scheduling activities before starting work on them; it is plan-driven. A plan-driven process is one in which all the activities are first planned, and then each step is measured against the plan. The Agile process, on the other hand, involves planning incrementally and it is much easier to change the processes to reflect a change in requirements.

Incremental Method: The incremental method of development is based on the idea of developing an initial implementation and exposing this model to users to receive feedback. This model evolves in the form of versions as the requirements change until an acceptable system has been developed.

Spiral Method: The spiral model is a risk-driven method where the process is represented as a spiral rather than a sequence of activities, and it includes the best features from the waterfall and prototyping models. In addition, it introduces a new component called "risk-assessment." Each loop in the spiral represents a phase, so the first loop might be concerned with system feasibility. The next loop might be concerned with requirements definition, and the next with system design, and the like.

Prototyping Method: A prototype is a version of a system or part of the system that's developed quickly to check the customer's requirements or the feasibility of some design decisions. Prototypes are useful when a customer or the developer is not sure of the requirements, the efficiency of the algorithms, some business rules, or even response time.

According to Tochukwu, et al. (2015), there are a lot of system design:

Design Specifications: Specifications are necessary in the design of a Web-based digital library. The proposed system will be built with the Java Programming Language and managed by the institution's administration, with data provided by the Library Systems Office (LSO). The Web-Based Digital Library Management System and LSO staff, along with designated representatives from selected collection providers (e.g., a staff member from the institution), will have maintenance privileges, and the database will otherwise be publicly inaccessible. The system will use annotated URLs to provide authorization data to the browser. Users will be able to use a password and user identity generated by this system; new users must also create an account in order to login (Cirillo, Cozzolino, DeSanto, Marsella, & Salerno, 2000).

In addition, the user/client inputs the required search query into the "search and browse" input interface, the system performs the operation, and generates an output with respect to the input query. The user sends in a query to the digital library database, then the query is being decoded, processed, and the required output/result is being sent to the user's interface for his digestion. This enables the user or client to have easy access to all the research and materials available in the institution's web-based digital library management system.

Web Access Subsystem: The main purpose of this system is to allow users to upload and view research materials and other library resources via the Internet. This web interface will provide the users with a facility to view the library materials located in the remote storage area. Users will be provided with facilities to upload acquired research material (admin) and search for particular books in the collection (students). They will provide some textual description that will be matched with the description of each book, and the matching books will be displayed. Users will be able to access the information using the Internet browser. If the information contains the map data, the information will be in PDF format, TXT format, etc.

Data Base: This is where information and data are stored. It is classified into two: the collection and the user database.

Collection Database: The collection database will contain all discretely accessible Web-based digital library management system collections, entered and maintained by admin staff. The collection database will contain all relevant information about the collection for the purposes of this application, including: collection identifier (locally invented, but perhaps derived from cataloguing information), collection name (as catalogued or as supplied by publisher), collection source (i.e., frequently publisher, but including any contributors), collection "class" and so on.

The user database: The user database will contain all relevant information about the user for the purposes of this application. The information includes: user name (in discrete fields for last name, first name, etc.), e-mail address, institutional affiliation (if applicable), etc.

According to Tochukwu et al. (2015), the following is the practical process of designing a web-based digital library management system for schools, starting from the block diagram of proposed system:

Block Diagram of Proposed system: The block diagram of the proposed Web Based Digital Library Management System is as shownin figure 1.
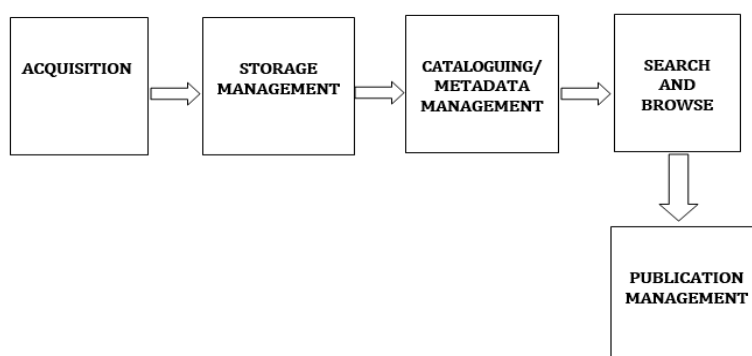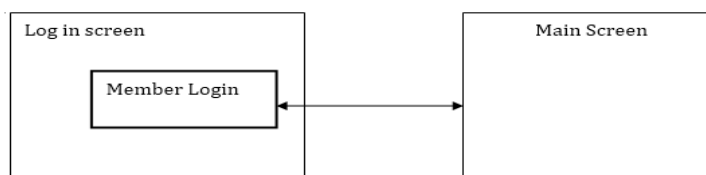

Fig. 1: Block diagram of the web based digital library management system.

User Interface Design: All interactions between users (administrators, and read-only users) and the database should be possible through standard web browsers, preferably using standard HTML and SSL.

Data Structure of DLMS

Fig. 2: proposed login page of a web browser

As stated by Tochukwu et al. (2015), it is obvious that to meet the need for parallelization, one designs the parallel and extendable logical data structure as shown in Fig 3 below, which is made up of three hierarchies: Client, Mediator, and Server. There are two kinds of users: end users and system managers. Any user connected to the Web can access the web pages of DLMS through a URL. These users are called end users. End users submit queries through the query interface and wait for the corresponding query results from the system. The system manager accesses the system over the local area network. Only the system manager can authorise system creation and maintenance. Regardless of whether the query operation is submitted by the end user or the system manager, the client accepts the operation, transmits it to MYSQL (DLMS' query language), sends it to the Mediator, and accepts the query results returned from the server and displays them to the user. In Figure 3, Mediator is in the middle layer of the DLMS architecture. It is the Web Server of the digital library. The Mediator accepts requests from clients, analyses the requests, divides each request into sub-commands, creates the query execution plan, determines which servers to execute these subcommands, sends the commands to corresponding servers, and provides the results to the client. The Mediator coordinates all the servers to work together to execute any operation from the client.

Server: Servers are composed of two kinds of processors, namely Query Processor and Data Collector.
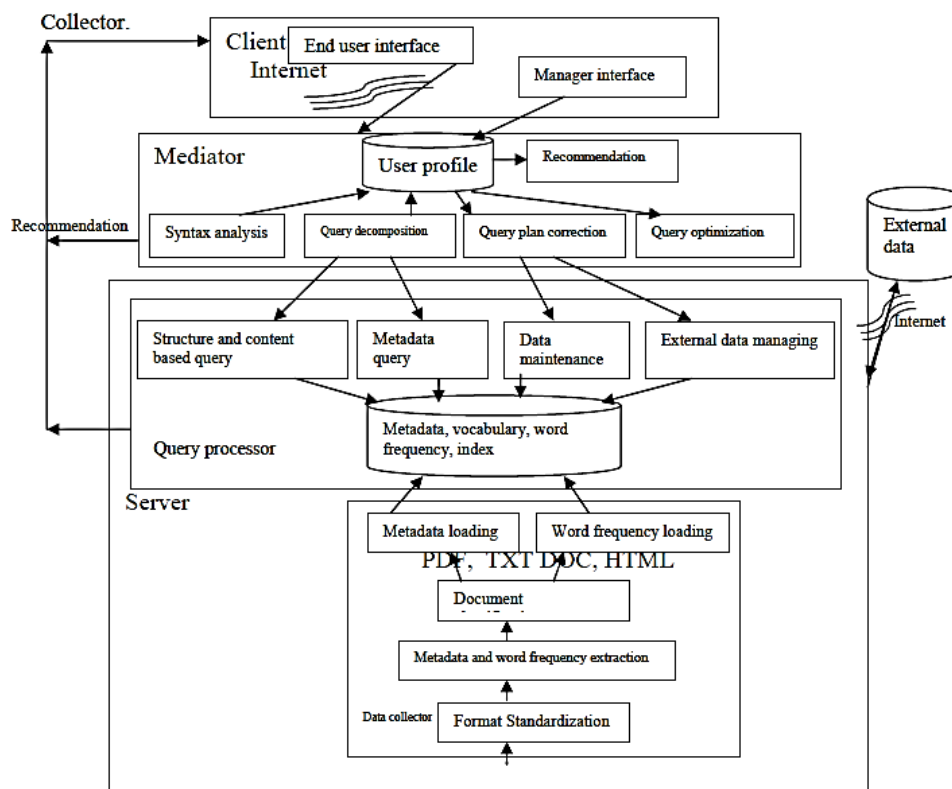

Fig. 3: The Server

Each piece of data in the digital library, including the original documents, the index file, and the metadata extracted, executes queries on the stored data and returns the query results to the end user or manager (Tochukwu et al., 2015).

A data collector is simply named a collector. Collectors are personal computers on which the documents that need to be added to the digital library are stored. The Collectors run on the Windows operating system and are controlled by the Mediator. They collect documents, extract relevant information, create classifiers, classify documents, and load all the data into corresponding query processors.

Portal Design: A portal is a website which involves a collection of web pages (documents that are accessed through the Internet). A web page is what you see on the screen when you type in a web address, click on a link, or put a query into a search engine. The name used in the design is https://localhost/digital_library. The name can be modified. A web page can contain any type of information and can include text, color, graphics, animation, and sound. Many web pages can be in blue, white, or other colours for an easier and brighter view. On the web page for the digital library, the following features are available: home page, organogram, uploads, repository, online gateway, and feedback. A programming language (MYSQL) is used for the design of all these web applications. The web design features are discussed below (Tochukwu, et al., 2015).

Home Page: This is the main page in the web design; it contains all the information and guides on the site. It contains all the other information, including the heading, title, background, vision, and mission of the website design. The block diagram design is as shown below:
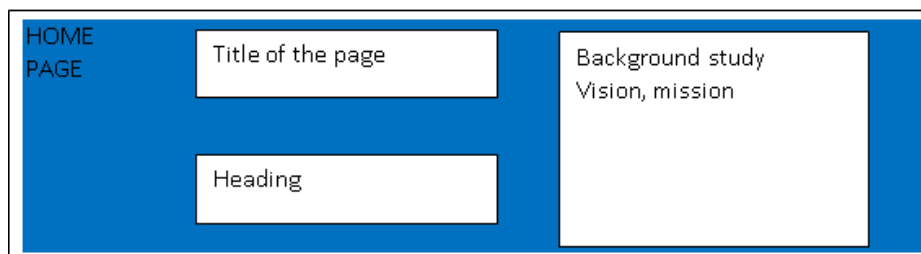

Fig. 4: Home Page

Uploads: Uploads as the name applies is used for acquisition of materials. All digital data that is being stored in the data bank are added in the upload interface. When a data or material is converted or acquired, it will be stored in the system disk. These digital data stored in the system disk can be made available to the users in their remote systems by uploading them in the server through the upload link in the website. This can only be done by authorized and registered admin/staff in the institution (Tochukwu, et al., 2015).

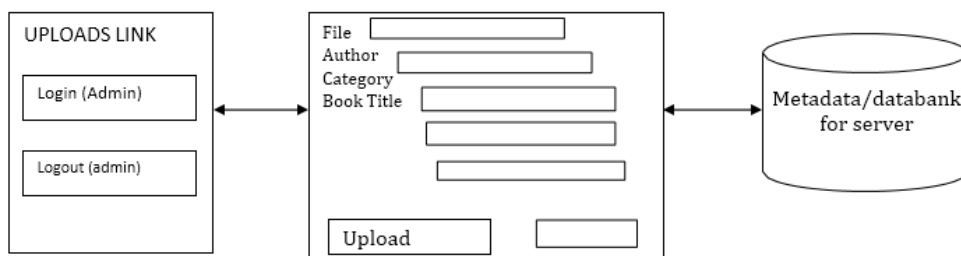It has these features: Login/out, File, Browse, Author, Book Title, Book Category, Description etc.

Fig.5: Data Upload Design

Online Gateway: The online gateway gives the link to all online research materials. This serves to advance search for digital information which is not found in the institutions' database. The gateway will always give access to the world's best research material (Tochukwu et al., 2015).

Repository: As stated by Tochukwu et al. (2015), this is the key aspect of the whole design. It gives the link where all digital data can be found. It is the access link to all digital information and research materials. In the repository, the books are classified according to discipline and departments. It also has a search and browse link where the user can type in their query and wait for publication. The diagram is as shown in figure 6a.
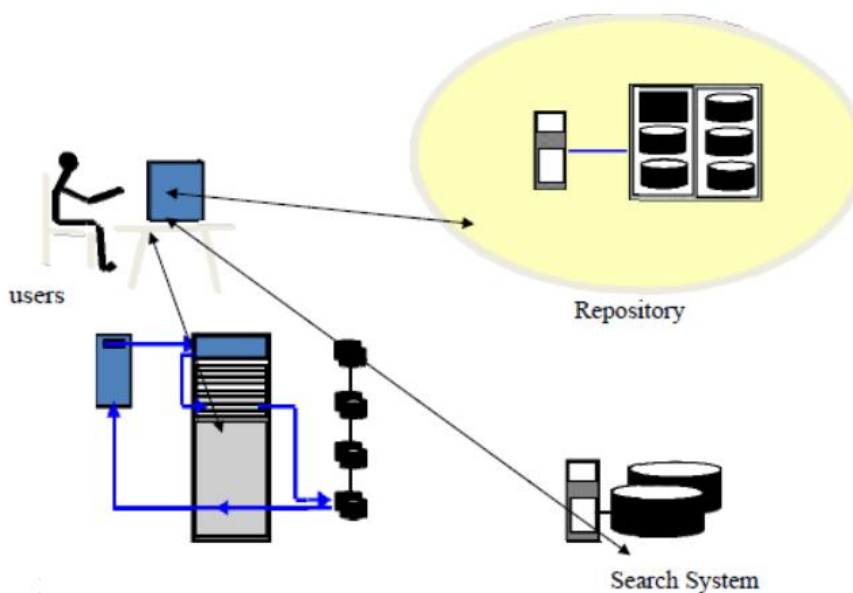

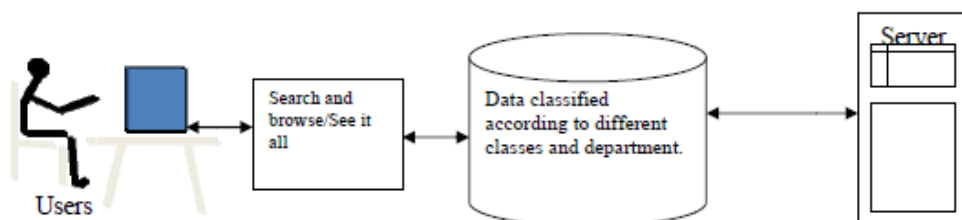
Fig.6a: Identification System

Fig.6b: Repository design diagram

Input and Output Design

Inputs: Inputs are carefully and correctly added to ensure accuracy and to enforce security. All inputs to the digital library management system are checked using the inbuilt validation

module. The purpose of this is to ensure that incorrect data is not allowed in, and with this, the database receives only queries from correct input data (Tochukwu et al., 2015). The input to the login design diagram is as shown fig.7.

MEMBER LOGIN
Username

Password

Create new account.

Login

Fig. 7: Input to login diagram

As stated by Tochukwu et al. (2015), in the "create new account" window, one will have a column for email address, first name, last name, password, password confirmation, and submit. This enables the student to create an account and register with the digital library. The design format is as shown in fig. 8.

Email address:

Last name:

First name:

Password:

Repeat password:

Submit

Fig. 8: Create new account form.

The output: This includes the feedback and the server's responses to the user's request. It is typically based on the users' request for a particular book, journal, article, thesis, etc. This is generally known as publication. It gives out searched items according to the input query (Tochukwu et al., 2015). Figure 9 describes the Data Flow Diagram (DFD), while the System Flow Chart of a Web Based Digital Library Management System is shown in Figure 10.

Dataflow Diagram of a Web Based Digital Library Management System.

This shows how data flows in and out in digital library management system. It describes how information flows from the client to admin, and other components that make up the digital library management system. The diagram is as shown below:

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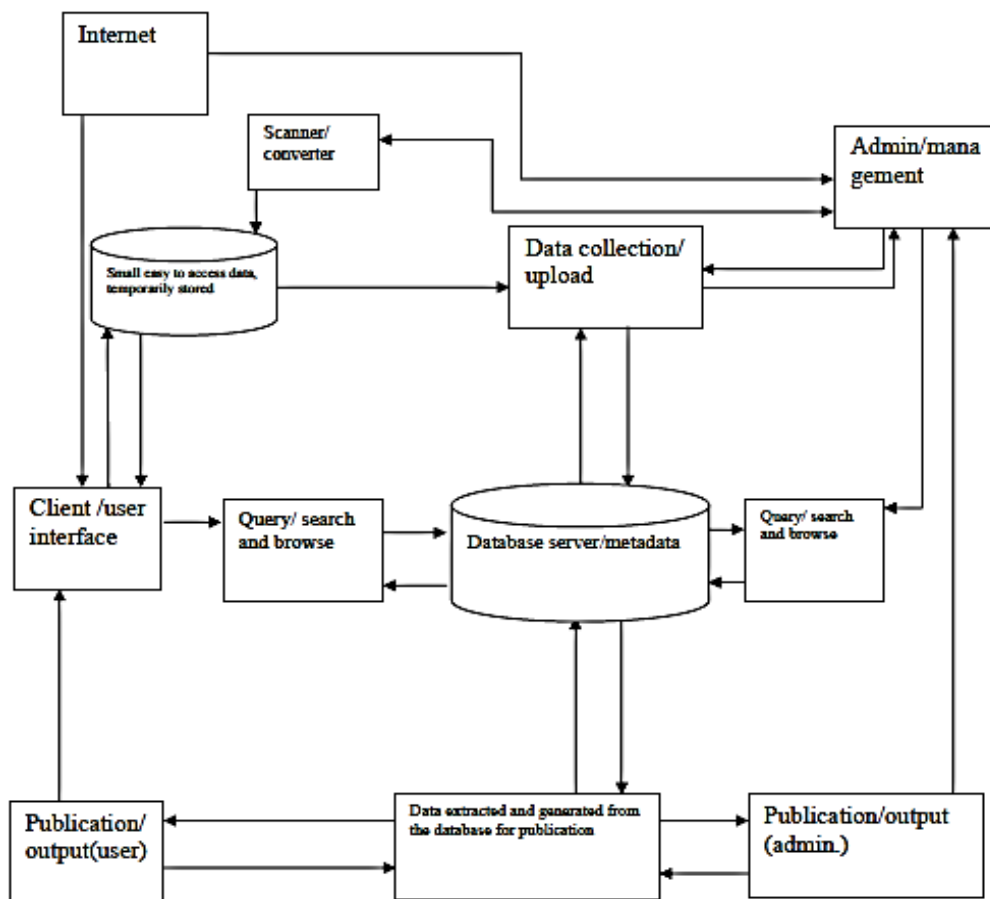
Fig 9: The data flow diagram of a web based digital library management system.

Pseudo Code Algorithm of a Web Based Digital Library Management System.

Start
(Initialize the computer system)
Input username and password
IF password ok, THEN
Display page   System Algorithm and Flow Chart
ELSE
Input username and password Upload/book query
IF query is ok THEN Perform operation ELSE
Display page LO
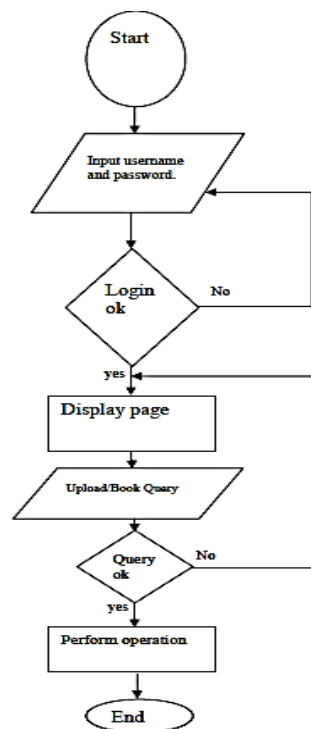
Fig. 10: The Flow Chart of Web Based DLMS

Hardware Specification:

The hardware requirement of this design is a computer system with at least this configuration: Pentium IV computer system or IBM compatible, 1.8GHZ processor speed, 1GB RAM memory capacity, 10 GB free Hard disk space for the installation of the necessary software, Large Hard Disk space on the database is required to contain the library data and metadata, Internet/intranet connectivity hardware, Security Implementation Hardware such as firewall and so on.

System Implementation:

System implementation is an important phase in software development life cycle. Web based digital library management system(DLMS) is implemented on Windows operating systems. In system implementation stage, the newly developed system is delivered to the users, organization after proper and adequate testing. System implementation encompasses series of stages and each of these stages are essential to the successful implementation of any system.

Implementation: The implementation stage is carried out in the following aspects:

- ❖ Home page interface implementation.
- ❖ Input/login interface implementation.
- ❖ Acquisition/Upload interface implementation.
- ❖ Repository interface implementation.

Home Page Interface Implementation:

The home page is the key aspect of the project, because it gives the basic user interface stand for a web based digital library management system. It comprises of; Project title, the header, background Study, Vision, Mission, Login interface.

Project Title: This is the basic part of the project implementation and programming. It defines the name of the project designed. This gives one the direction on where to base the programming. For instance, the title of this project design is "Web Based Digital Library Management System".

The implementation is based on programming language, which transforms every design into codes. The programming codes for the title is as shown below:

```
<title>Web Based Digital Library Management System:::Home</title>
<style type="text/css">
<!--
.style1 {color: #FFFFFF}
-->
</style>
<link href="style.css" rel="stylesheet" type="text/css" />
<style type="text/css">
<!--a:link {</style>
```

Login Interface: This is another important feature displayed in the homepage. It is where authorization is being managed. It grants the user access to the page. All these mentioned above is being controlled by programming codes which are in turn transformed into real features. According to Tochukwu et al., (2015), the programming codes is as shown below:

```
<! DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Transitional//EN"
"http://www.w3.org/TR/xhtml1/DTD/xhtml1-transitional.dtd">
<html xmlns="http://www.w3.org/1999/xhtml">
<head>
<meta http-equiv="Content-Type" content="text/html; charset=iso-8859-1" />
<meta name= "Description" content="Festus Aghagbo Nwako digital library is an Anex Anex
and equally a unit of the main Nnamdi Azikiwe University library.it is responsible for all digital
operations and services in the library. ">
<meta name="Keywords" content="Nau library,unizi e-library,Nnamdi Azikiwe University
digital library,School Library,Libraries in Nigeria,Nnamdi Azikiwe University Law library,Nnamdi
Azikiwe University Medical library,Nnamdi Azikiwe University Pharmarceutical library">
<title>Web Based Digital Library Management System:::Home</title>
<style type="text/css">
<!--.style1 {color: #FFFFFF}
--></style>
<link href="style.css" rel="stylesheet" type="text/css" />
<style type="text/css"> style>
<script type="text/javascript">
function MM_CheckFlashVersion(reqVerStr,msg){ with(navigator){
var isIE = (appVersion.indexOf("MSIE") != -1 && userAgent.indexOf("Opera") == -1); var isWin
= (appVersion.toLowerCase().indexOf("win") != -1);
if (!isIE || !isWin){ var flashVer = -1;
if (plugins && plugins.length > 0){
var desc = plugins["Shockwave Flash"] ? plugins["Shockwave Flash"].description : " ";
desc = plugins["Shockwave Flash 2.0"] ? plugins["Shockwave Flash 2.0"].description : desc;
if (desc == " ") flashVer = -1;
```

Challenges and Opportunities

According to Sharma & Chauhan (2019), in the digital environment, there are so many tools through which a digital library can be made through networks to operate, such as e-mails, news groups, mailing lists, web forms, bulletin boards, SMS, chat, video conferences, and virtual worlds. For digital libraries, establishing different hardware such as workstations, network, power backup, storage devices, and software such as D-space, Greenstone, Fedora, E-Print, etc., is required to integrate for deployment to access vast numbers of collections in digital form. The technical aspect has become more important and highly critical as the whole digital library is built upon software that fulfils all objectives of the digital library project. Conclaves and others (2007) mentioned that a good digital library is based on 5S, i.e., steams, structures, spaces, scenarios, and societies. They proposed a quality model for digital libraries by mentioning quality indicators enveloped by digital library concepts. Table 1 highlights the broad areas of opportunities and challenges of digital libraries.

Table 1 – Digital libraries – opportunities and challenges

OPPORTUNITIES	CHALLENGES
Libraries are becoming technology hubs	Demonstrating the value of libraries
Expanded access through information sharing	Preserving the material on a digital scale
Libraries have strong role in the communities	Making services engaging to users
Libraries are being shaped by cuts the budget	Subject matter expertise
Printed materials still dominate reading, despite the growth of contents	Becoming familiar with wide range of digital contents.

Information retrieval: According to Fox, Goncalves and Kipp (2002), information retrieval (IR) is the core issue for the success of any digital library. They further stated that indexing codes are also essential for the retrieval of information. Therefore, evaluation of any digital library with respect to its utilisation by users must be done regularly. Gella Okojie and Olaniyi (2018), cited in Sharma and Chauhan (2019), emphasised the use of semantic web and social networking technologies to improve digital library utilization. According to them, the bookmarking facility in a digital library can bring impactful changes in the world of digital libraries.

Planning: The Digital Library requires a significant investment in order to digitise their existing collection and acquire digital resources (Bhattacharya, 2013). There are many issues (challenges) that need to be addressed while developing any digital library. Figure 11 highlights some of the core challenges that should be properly assessed before developing a digital library. The library professionals have to identify the objectives of developing digital libraries, which software will be most suited to the objectives, what are the resources that need to be digitised, what are the technical aspects of software to provide seamless access to the digital library and how one can secure the content uploaded to the digital library. Library professionals should be aware of the copyright (IPR) issues involved in the digitization of content and must understand the user-friendly aspect of a digital library with respect to its accessibility.

Figure 11: Challenges to Digital Library Development (Sharma & Chauhan, 2019)

Accessibility: Users may face many hindrances while accessing digital libraries. These hindrances could be because of information overload, poorly designed interface, misleading information provided by the digital library or inability to access the digital resources. Due to the explosive growth of information, the collection of digital libraries is growing with each passing minute. On the one hand, it is more confusing to retrieve relevant pieces of data from this huge information storage, and on the other hand, no search engine can index the whole information on the web to retrieve particular data. It has become a challenging task for users to retrieve their needed data or documents. Most of the publishers are providing their contents online, and users may have the option to access the full-text of their needs by paying some amount. At this stage, the user needs a librarian's help to obtain the required information. Due to existing budgetary constraints in the libraries, it is very difficult to access online fee-based repository information. In particular, in developing countries, libraries are discouraged from accessing that information due to the high cost involved. Therefore, budgetary constraints can limit users' access to relevant scholarly communication. Therefore, libraries need to address this challenge to facilitate users with pinpointed information by developing coordination or policy to subscribe to resources at any point of time.

Preservation and conversion of information: Sharma and Vishwanathan (2001) highlighted some challenges being faced while creating digital libraries. Some of these challenges are conversion from tradition to digital; maintenance of tools involved in the digitization process; use of standards, cods, and information exchange related protocols; content written in local language or other than English may also pose a challenge; prevention of unauthorised use; and up-gradation of new technology. According to Hedstrom (1997), cited by Sharma & Chauhan (2019), who stated that digital preservation presented a new set of challenges to libraries and archives, He further specified that without standards, digital preservation has to face various constraints. Therefore, codes and standards are essential to incorporate before planning any digital library project. Shiri (2003) put across some key challenges associated with digital library creation. Identifying content that needed to be converted into digital format was one of them. Another key issue was the use of standards and protocols with respect to digital library architectures, collections, metadata formats, interoperability, indexing, etc., that are required to create a digital library.

Innovative aspect: Goodspeed and Khillalia (2019) filed a patent on behalf of Amazon Technologies for working on a sharing digital library concept in which a user of a first digital library can request content being used by a user of a second digital library, and a user of the second library can also make a similar request. In this case, one may read or view a portion of the current book or page that a selected person is reading along with any highlights, notes, bookmarks, or comments etc. The portion may be 5% of the book would be available to view/read and the user needs to purchase the book if he/she wants to read the complete book. Vrana (2017) examined the presence of digital libraries for e-learning concepts, which has been playing an important role around the globe. He stated that e-learning is not possible without the learning materials and is very well supported by the digital libraries as an aid to e-learning. The digital libraries provide access to quality information resources to students as per their requirements. In most countries, digital libraries are open to the public, which offers many possibilities for formal and informal learning to the public.

Assessment or Evaluation: Adamou and Ntoka (2017) explored the satisfaction level of library users of Panteion University library and TIE of Athens in Greek. They found out that users were more satisfied with the digital collections being available in both the libraries. However, they pointed out that users were not satisfied with the technical infrastructure available to them for accessing online and digital information, as well as the incompetency of library staff to help them. Saracvic (2000) also highlighted that digital library interests exploded globally during the 1990s. Many projects are started not only in developed countries but in the developing world as well. However, the evolution of digital libraries was encouraging, but only limited efforts were made to evaluate digital library projects. He suggested that evaluation of digital libraries is a key aspect of libraries since it involves manpower, funds, and technology. That means evaluation of digital libraries has become an important part of understanding the purpose and utilisation of any library project. Ball and Bothma (2017) stated that it is not easy for any digital library to use advanced technologies that could provide user-friendly searching of needed information. Therefore, it is essential to evaluate a digital library with respect to its usability and information literacy.

Conclusion

In conclusion, from a proper assessment of the designed system, it is safely determined that the system is an efficient, usable, and reliable LMS. It is working properly and adequately meets the minimum expectations that were proposed initially. The innovative system is expected to be a benefit to the users and staff in terms of efficiency in the usage of the library system. Although this system addresses all the drawbacks of the physical library in terms of information storage of the members in the database, it will provide fast generation of the member's report, and using this database, any files can be added, adjusted, or deleted at any time. This computerised system performs the most sophisticated way to give access to the users in different forms, although it provides electronic records via Wi-Fi and the users can read an unlimited number of e-books at a time.

Recommendations

1. It is obvious that it becomes increasingly difficult to store, manage the large number of documents and find relevant documents requested by users as the number of documents in a digital library grows. Hence, a Web-based Library Management System is recommended in order to create an unlimited quantity of information and make it available to the world in parallel.

2. The system should be designed to acquire research materials for the institution and then publish it to users in their remote area.

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