

COURSE GUIDE

LIS 404 WEB TECHNOLOGIES

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INTRODUCTION

LIS 404: Web technologies is a two-credit-unit first-semester course that will last at least one semester. This course is required of all undergraduate students in the Department of Library and Information Science of the National Open University of Nigeria. This guide is useful for library students who want to learn about web technologies and libraries. It focuses on the definition, concept, and scope of web technologies, introduction to different emerging web technologies in library and information science (LIS) and other domains; introduction to open source software (OSS); social media and emerging technologies such as wikis, blogs, social networking and social bookmarking; issues and challenges related to different evolving technologies

COURSE AIMS

The goal of this course is to provide you with a basic understanding of database design and management. This will involve a thorough understanding of database systems' application and concepts, which are critical success elements for information professionals who are being trained to assume leadership roles in information systems initiatives. The course provides you with the opportunity to learn the traditional principles of database design, implementation, management, and usage in great detail. There are fourteen study units in this course. In the course, you will also learn about the definition, concept, and scope of web technologies; introduction to different emerging and evolving web technologies in library and information science (LIS) and other domains; introduction to open source software (OSS); social media and emerging technologies such as wikis, blogs, social networking and social bookmarking; issues and challenges related to different evolving technologies. Good knowledge and grasping of the contents of the topics in this guide will permit and allow you to the functions, duties, and responsibilities of a database manager in the library and information centre.

COURSE OBJECTIVES

Upon successful completion of the course, you should be able to:

- i. Define the concept of web technologies
- ii. Describe the scope of web technologies;
- iii. Explain the introduction to different emerging and evolving web technologies in library and information science (LIS) and other domains; describe open source software (OSS);
- iv. Identify and explain social media and emerging technologies such as wikis, blogs, social networking, and social bookmarking;
- v. Discuss the issues and challenges related to different evolving technologies.

WORKING THROUGH THIS COURSE

To complete this course, you must go through the modules and read the study units carefully, as well as participate in practical activities and examinations. It is also critical that you open and read all of the offered links by clicking on them. You should also read the necessary books and other resources, as well as attend all the course's practical sessions. You should always make an effort to participate in your study center's online facilitation. Each course unit has an introduction and learning objectives that you should complete by the end of the course. There is also a summary of everything you should learn in the unit at the end. There's also the Tutor-Marked Assignment (TMA) to help you assess what you have learnt. You can save the course to your device and study it whenever you want, even if you are not connected to the Internet.

ASSESSMENT

There are two types of evaluations. These are formative and summative assessments. The formative assessments will help you keep track of your progress. In-text questions, discussion forums, and Self-Assessment Exercises are used to do this. The university will utilise the summative tests to evaluate your academic success. This will be delivered as a Computer-Based Test (CBT), which will be used for both ongoing assessment and final examination. You must complete three continuous assessments of ten percent each, as well as a final examination worth 70 percent at the conclusion of the semester. You must complete all the computer-based tests as well as the final exam.

STUDY UNITS

This course has 15 study units organised into five sections. The following are the modules and units:

Module 1: Concept and Scope of Web technologies

Unit 1 Definition of Concepts, Categories, and Characteristics of Web Technologies

Unit 2 Types, application/relevance, and challenges of the application of Web Technologies in Libraries and Information centres.

Module 2: Evolution and Development of Web Technologies

Unit 1 Development of Web Technologies

Unit 2 Web 1.0, Web 2.0, and Web 3.0 and Libraries

Unit 3 Web-based Library Services

Module 3: Open Source Software

Unit 1 The Concept and Types of Open Source Software

Unit 2 Different Initiatives on Open Source Software in Libraries

Unit 3 Challenges of Library Open Source Software

Module 4: Social Media Technologies in Libraries

Unit 1 Definition and Concept of Social Media

Unit 2 Types and Categories of Social Media Used in Libraries

Unit 3 Social Media Characteristics

Module 5: Issues and Challenges of Social Media Technologies in Libraries

Unit 1 Social Media and Libraries

Unit 2 Benefits of Social Media in Libraries

Unit 3 Challenges of Social Media in Libraries

Presentation Schedule

The presentation's timetable will familiarise you with key days for completing your computer-based assessments, engaging in forum discussions, and facilitating. Please keep in mind that your assignments should be submitted at the earliest possible opportunity. Plagiarism is not a good idea because it is a serious academic crime. It is a crime that is penalised by law. You should also refrain from procrastination to the greatest extent possible.

Assessment

There will be two types of evaluations offered to you, both of which will be graded in this course. There are two Continuous Assessments as well as a final exam. There will be three components to the continuous assessment. Two computer-based assessments will be given. The computer-based tests will take place according to the university's academic timetable. It is required that you adhere to the timetable to the letter. Each of the computer-based evaluations will receive a maximum of 10%. Your participation in discussion forums will be assessed at a maximum of 10% if you fulfil the participation requirement of 75%. This means that the maximum continuous assessment score will be 30%, and it will be factored into the final grade. The final test for LIS 404 will last no more than two hours and will account for 70% of the overall course mark. If you participate in the course discussion forum at least 75% of the time, you will receive a 10% bonus, and if you do not, you will lose 10% of your overall score.

How to Get the Most from the Course

You will get the most out of this course if you have Internet access and a good laptop. Because the course materials are online and accessible to you at any time and from any location, learning in this course will be simple. Please utilise the Intended Learning Outcomes (ILOs) as a reference for your course self-study. At the end of each unit, examine yourself with the ILOs to ensure that you have met the objectives. You must carefully go over each unit of this handbook and write down your

notes. Participate in a scheduled online real-time facilitation. If you happen to miss one of the scheduled online real-time facilitation sessions, you can listen to the recorded session whenever you choose. The live session will be video filmed and made available on the site. Watch the video and audio recorded summary in the corresponding unit in addition to the online session. After that, you can listen to the audio by clicking on the links in the text. Go over the self-evaluation exercises. It is critical that you adhere to all of the class's rules and standards.

Facilitation

You will be assisted via the Internet. Learners are at the core of the facilitation. Asynchronous and synchronous facilitation will be used. Your facilitator will do the following for the asynchronous facilitation:

- ✓ Provide the week's theme;
- ✓ Facilitate the forum discussion;
- ✓ Organize the platform's activities;
- ✓ Performing the grading and scoring of the activities;
- ✓ Publish the results on the university's platform;
- ✓ Provide help and support to you through personal mails that will be addressed to you.
- ✓ Please send you videos, audio lectures, and podcasts.

For the synchronous: On the online platform, there will be eight hours of online real-time video conferencing.

- ✓ The eight hours will consist of eight one-hour contact sessions.
- ✓ At the conclusion of each one-hour video conferencing session, the video will be published for you to watch at your leisure.
- ✓ The facilitator will only cover the topics that are important for you to understand in the course.
- ✓ The facilitator will focus on the course's essential ideas that must be understood
- ✓ At the start of the course, the facilitator will give the online real-time video session schedule, and in the first lecture on the first day of facilitation, the facilitator will walk you through the course guide.
- ✓ Make an effort to contact your facilitator if you have the following information:
- ✓ You're having trouble understanding any element of the study units or tasks.
- ✓ Find the exercises for self-evaluation.
- ✓ When you're faced with a difficult topic or dilemma regarding an assignment, or with your tutor's comments, it's important to be calm.
- ✓ You can also contact the technical support team using the contact information given.

CONTENTS

Module 1:	Concept and Scope of Web technologies.....	1
Unit 1:	Definition of Concepts, Categories, and Characteristics.....	1
	of Web Technologies	
Unit 2:	Types, application/relevance, and challenges of the application of Web Technologies in Libraries and Information centres.....	10
Module 2:	Evolution and Development of Web Technologies.....	32
Unit 1:	Development of Web Technologies.....	32
Unit 2:	Web 1.0, Web 2.0, and Web 3.0 and Libraries.	40
Unit 3:	Web-based Library Services.....	52
Module 3:	Open Source Software	59
Unit 1:	The Concept and Types of Open Source Software.....	59
Unit 2:	Different Initiatives on Open Source Software in Libraries.....	71
Module 4:	Social Media Technologies in Libraries.....	80
Unit 1:	Definition and Concept of Social Media.....	80
Unit 2:	Types and Categories of Social Media Used in Libraries.....	88
Unit 3:	Social Media Characteristics.....	95
Module 5:	Issues and Challenges of Social Media Technologies in Libraries.....	102
Unit 1:	Social Media and Libraries.....	102
Unit 2:	Benefits of Social Media in Libraries.....	106
Unit 3:	Challenges of Social Media in Libraries.....	110

MODULE 1 CONCEPT AND SCOPE OF WEB TECHNOLOGIES

In this module, you will be introduced to the concept of information explosion, history, and development of knowledge and classification.

Unit 1: Definition of concepts, categories, and characteristics of Web Technologies

Unit 2: Types, application/relevance, and challenges of the application of Web Technologies in Libraries and Information centres.

UNIT 1: DEFINITION OF CONCEPTS, IMPORTANCE, AND CHARACTERISTICS OF WEB TECHNOLOGIES

CONTENTS

- 1.0 Introduction
- 2.0 Objectives
- 3.0 Main Content
 - 3.1 Concept of Web Technologies
 - 3.1.1 Categories of Web Technologies
 - 3.1.2 Characteristics of Web Technologies
 - 3.1.3 Benefits of Web technologies to Libraries
- 4.0 Conclusion
- 5.0 Summary
- 6.0 Tutor-Marked Assignment (SAEs)
- 7.0 References/Further Reading

1.0 INTRODUCTION

This unit will introduce you to various web technology terminology and ideas. This will give you a better grasp of what they are. You'll also learn about the characteristics of Web technologies, their importance, and the advantages they provide to libraries and information centres.

2.0 OBJECTIVES

You will be able to do the following by the end of this unit:

- ✓ Describe the benefits of web technologies to libraries and information centres by defining web technologies,
- ✓ Enumerating their importance in libraries,
- ✓ Explaining their qualities, and defining web technologies.

3.0 MAIN CONTENT

3.1 Concept of Web Technologies

Web technologies, also known as web-based technologies, are Internet-based network applications such as blogs, discussion boards, conferencing tools, online multimedia and mobile technologies, and online games that allow people to connect. Web technologies also refer to the way computers/devices connect over the Internet using mark-up languages, as well as the creation, delivery, and management of web content utilising hypertext mark-up language (HTML). Web technologies include social networking, virtual referencing, RSS feeds, and blogs, among other Web 2.0 tools that allow users to engage with one other. This module will use the word "web technologies" to refer to all of these types of software, tools, delivery methods, and strategies for the sake of clarity and brevity.

Web technologies provide librarians with a once-in-a-lifetime chance to improve user-centered services while also facilitating and promoting collaboration between libraries and their patrons. In real-time, emerging technologies enable library professionals to locate, gather, organise, customise, and provide information products and services to the user community in a range of formats and types, both on-demand and in advance, in both physical and virtual places. Though any library operation is that developed with active participation and feedback from its user community qualifies as a library activity. Emerging technologies can assist libraries to create the collaborative and participatory environment needed to provide user-centric library services, create new resources, and build collections. Libraries may now deliver better customer-driven services to their patrons because of technological advancements. Web technology has impacted many facets of human life as a primary medium of communication, transaction, and consumption. Human resource potential has become the most significant aspect of global development as a result of the web technology environment.

Libraries are no longer discussing or considering whether or not to adopt new technology; instead, they are frantically deciding which technologies to acquire and how to tailor them to their specific needs. Libraries must examine their context and potential for engaging and serving their patrons through such technology when making these selections.

3.1.1 Categories of Web Technologies

Web applications can be categorised as follows:

- Document centric web technologies
- an online application that focuses on documents that are interactive
- Workflow-based web application transactional web application
- Web application for collaboration
- an online application that is centred around a portal
- Web application that is available everywhere
- a web application that is built on knowledge.

Document-centric: websites are static HTML documents that are stored on a web server and provided to the client on demand. With the use of appropriate tools, the web pages are manually updated. These apps are static, simple, and stable, and they reply quickly. These apps are expensive to maintain (at the time of updating), have inconsistency issues due to their static nature, and lack timely information updates.

Interactive web application: CGI and HTML Forms provide interactive online applications. It has radio buttons, menu selections, and forms, among other things. These programmes are easy and quick to use. Web pages and links are created based on user input in this type of application.

Transactional web application: These types of web applications allow users to make changes. These applications are more interactive and allow for organised database searches. Data is handled consistently and effectively by the database system.

Work-flow based web application: These web applications are capable of managing workflow between businesses, private entities, and government agencies. For interoperability, web services are included. It is a powerful, dependable, and flexible workflow management system that allows businesses to operate independently. The best illustration of such applications is B2B e-commerce.

Collaborative web application: These programmes are mostly utilised as group applications with a strong emphasis on group communication. Some examples of such web applications are chat rooms, online forums, e-learning websites, and websites where content is shared with the option of modification, such as Wikipedia.

Portal oriented web application: These web apps fall into this category because they use a single access point to connect several sources of

information and services. The best examples of portal-oriented applications are search engines, community portals, and so on.

Ubiquitous web application: These programmes deliver tailored services for any device, at any time, from any location. It offers limited interaction capabilities and device support. It necessitates prior knowledge of the context in which the web application is being dynamically adjusted. A web application that is dependent on location is an example of this type of web application.

Knowledge-based web application: This type of programme is used to provide information to both humans and machines. Semantic web technologies are used to manage knowledge. Web mining, connecting, and repurposing knowledge are just a few examples.

3.1.2 Characteristics of Web Technologies

It is difficult to forecast how often a web application will be used because it changes depending on the user, the devices they use, and other factors. As a result, web application user characteristics can be split into three categories. Natural content, social content, and technical content are the three types. They are discussed in turn as follows:

Natural Content:

It includes both the geographic location from which online applications can be accessed and the availability of the web application. When a web application is accessible globally and online 24 hours a day, seven days a week, it improves its performance, stability, and demand.

Social Content:

It has something to do with a user-specific feature. Users demand immediate and spontaneous benefits from the thousands of competing web applications available throughout the world. Two of the most crucial characteristics of a social web programme are scalability and multiculturalism.

Technical Content:

It has to do with the web application's network and the devices on which the web application is used. Some important aspects that affect the performance of an online application include connection bandwidth, stability, and reliability. Web application performance and accessibility are determined by device specifications, browser configuration, version, and other factors.

Other notable characteristics of web applications include but are not limited to:

Development Team:

The development team must be knowledgeable in their field. Designers, database developers, IT specialists, hypertext experts, and application developers are all need to be knowledgeable. Nerds with a passion for knowledge, willing to work, creative, and interested in cutting-edge technology and tools should join the team.

Development Process: The development methods are often straightforward and adaptable. Parallel development procedures are required.

Technical Infrastructure: The web application must be bug-free, and development should be completed within a reasonable amount of time. The two external components that should be considered during development are the server and the browser. Because the actual use of a browser is unknown and is dependent on user preference, the server is usually set and maintained according to the user's wishes.

Integration: The web application must be able to integrate with other systems as well as external information and services.

Evolution related characteristics

Changes or upgrades to the web application are made in response to changes in requirements. All three additional aspects, namely: product, use, and development, could be affected by this progression. Changes may be prompted by market competition or rapid progress.

3.1.3 Benefits of Web Technologies to Libraries

Academic libraries participate in a variety of instructional activities, including library orientation and tours, on-site and online classes, webinars, symposia, and conferences, where the use of various web technologies would allow virtual attendee participation, incorporate learning assessment, or engage new library users. Additionally, librarians can "reverse" educational sessions by assigning movies and other online resources prior to group discussion, collaboration, and application using web technology.

Emerging online technologies can also help health sciences librarians who want to expand their professional outreach responsibilities. Other health sciences librarians concentrate on patient education and consumer health to ensure that patients and their families obtain accurate health information before to and following medical incidents. Other librarians

focus on user education to ensure users obtain appropriate information before and after events, while embedded librarians and information professionals provide information services to interdisciplinary teams of researchers. Each of these new and integrated librarianship positions could be an excellent approach to introduce new instructional web technologies to communicate search results, explain how to use reliable user resources, and promote innovative research projects. Instructional web technologies could be used by information professionals or workers to give training and references to users who travel long distances or dwell in remote regions.

During the first 10 to 15 years of the web's existence, the Internet, hypertext/hypermedia technology, a variety of search engines and tools such as Excite and AltaVista, followed by Yahoo!, Google, Hotbot, and Google Scholar/Books, and the explosion of free content all contributed to a perceived eclipse of the academic library's role in supporting research and other key activities in higher education. A new generation of web technologies has emerged (or been enhanced), with the potential to reverse academic libraries' marginalisation and restore their standing as critical components of research. Improved digitised collection hosting platforms (such as Biblioboard, ContentDM, Hathitrust, and Internet Archive), LMSs (such as Blackboard, Moodle, Sakai, and Canvas), and widespread availability of e-books have the potential to increase traffic to library resources and services.

Web discovery tools provide the advantage of allowing users to access the majority of an individual library's electronic resources from a single location. Users do not need to be familiar with all of the library's resources, nor do they need to search each one separately. Additionally, consumers do not need to get comfortable with many search interfaces; instead, they only need to become familiar with one easily identifiable Google-like interface. Discovery tools also give libraries the "illusion" of being able to "aggregate" their content by collecting metadata from a variety of vendors (Shapiro, 2013a)

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Serials Group recently produced a research (November 2013) that revealed a correlation between discovery tools and increased e-resource usage, particularly for e-books (e-journals did not exhibit any significant trends; Spezi, Creaser, O'Brien, & Conyers, 2012). In addition, there are indications that people are returning to the library to begin their studies. Institutional repositories are another developing technology that enables academic libraries to make locally created information (faculty and student publications, dissertations and theses, e-journals, and other digital material) accessible to the campus community and a wider audience (community at large). They could also serve as portals for on-campus academic newspapers, as well as showcase professor and student publications and research.

With projects like Highwire Press and Project Muse, academic libraries at Stanford University (Highwire) and Johns Hopkins University (Project Muse) set the standard for libraries as publishers in 1995 (Shapiro, 2013b). Institutional repositories and discovery services collaborate to promote locally created material (e.g., faculty and student publications) by making it accessible online and easy to find. This allows academic libraries to play a bigger role in publishing and disseminating research both within and outside their institutions. In addition to institutional repositories, libraries like Oregon State University and the University of North Florida, for example, use discovery tools (Shapiro, 2013b).

Other technologies that are becoming increasingly widespread include mobile computing on devices such as iPads, iPhones, Smartphones, Tablets, and Kindle and Nook e-readers, as well as wireless Internet. Both of these widely used technologies are anticipated to have a positive impact on library e-resource usage. It is impossible to ignore the trend toward "Information on Demand," or the capacity to acquire information at any time and from any location. At least 40% of adults, according to Pew Foundation study, use their mobile phones to access the Internet, e-mail, and instant messaging (Smith, 2010). Our users will want more library e-resources as well as mobile-friendly services as a result of this. Another noteworthy trend is the use of social media to connect customers with libraries (e.g., Facebook, Twitter, Pinterest, and LinkedIn). The new science of Altmetrics (which uses social media to quantify the impact of journal papers) shows the use of social media in disseminating important research that has sparked a lot of debate among academics. It's not difficult to see how this could benefit libraries.

The second generation of web technologies, like as Discovery Services, Institutional Repositories, Platforms for Digital Collections, and LMSs, can help libraries take control of their destiny. Academic libraries that invest time, energy, and money in this opportunity will reap benefits such as the ability to remain central to academic institutions' research missions

and expand their role to become content "aggregators" and "publishers," as well as provide an online venue for showcasing faculty and student research and work.

Other noticeable benefits of web-based technologies in libraries are:

Faster time to market:The information environment in which libraries operate today is changing at a greater rate than it has ever been before. Library 2.0 is an idea for a library service that uses tools like RSS, Blogs, and Social Networks to meet the needs and expectations of library customers more quickly. Libraries must go above and beyond to meet the needs, wants, and demands of their patrons, attempting to anticipate them as much as possible.

A closer relationship with customers:Library 2.0 is a virtual community centred on users. Users communicate with one another and with librarians, resulting in the creation of more and more content in less time. Participation in library activities fosters relationships with other library patrons. Users uploading their historical images to Flickr to create community photo archives and allowing users to evaluate and rate books in the library's catalogue help to build relationships.

Increased responsiveness:Increased responses are because publishing is simple, allowing you to focus on content delivery. A blog can be created, updated, and published from any computer that is connected to the Internet. Readers are encouraged to leave comments on blogs. The content can be typed in plain text, and there are design templates to choose from. There is no need to install any additional servers or software on your computer.

4.0 CONCLUSION

This unit has exposed you to the concept of web technologies, categories of web technologies, characteristics, and benefits of web technologies. The discussion is considered to be of immense benefits to the librarians in training as it will enable them to have a good understanding of what the technologies are and their benefits to libraries and all their stakeholders.

5.0 SUMMARY

From the discussion in this unit, you learned about the concept of web technologies, categories of web technologies, characteristics, and benefits of web technologies. In the light of this, you can refresh the study through this recommended link [Web Technologies for Libraries \(https://www.slideshare.net/digicmb/web-technologies-for-libraries \)](https://www.slideshare.net/digicmb/web-technologies-for-libraries) and

<https://youtu.be/5aQkldDT4I0> (Emerging trend and technologies in library services by Nabi Hasan) before answering the self-assessment exercise to evaluate your learning.

SELF-ASSESSMENT EXERCISE

- What are the benefits of web technologies to libraries and information centres?

6.0 TUTOR-MARKED ASSIGNMENT

- Explain web technologies
- Describe the categories of web technologies in libraries
- Discuss the characteristics of web technologies

7.0 REFERENCES/FURTHER READING

Nabi Hasan (2020). Emerging trends and technologies in library services. Available: [Web Technologies for Libraries \(https://www.slideshare.net/digicmb/web-technologies-for-libraries \)](https://www.slideshare.net/digicmb/web-technologies-for-libraries) and <https://youtu.be/5aQkldDT4I0>

Steven Shapiro (2014) The Internet, Web-Based Technologies, and User vs. Library Empowerment in Academic Institutions, *Journal of Electronic Resources Librarianship*, 26:3, 216-221, DOI: 10.1080/1941126X.2014.939042 To link to this article: <http://dx.doi.org/10.1080/1941126X.2014.939042>

Wanucha, M. & Hofschire, L. (2013). U.S. Public Libraries and the Use of Web Technologies, 2012. Library Research Service 201 East Colfax Avenue, Suite 309 Denver.

UNIT 2: TYPES, APPLICATION/RELEVANCE, AND CHALLENGES OF WEB TECHNOLOGIES IN LIBRARIES AND INFORMATION CENTRES

CONTENTS

- 1.0 Introduction
- 2.0 Objectives
- 3.0 Main Content
 - 3.1 Types of Web Technologies Used in Libraries and their Applications
 - 3.1.1 OPAC
 - 3.1.2 Cloud computing
 - 3.1.3 Internet of things
 - 3.1.4 Blockchain
 - 3.1.5 Blog
 - 3.1.6 Wiki
 - 3.1.7 E-mail
 - 3.1.8 RSS
 - 3.1.9 Instant messaging
 - 3.1.10 Podcasting
 - 3.1.11 Tagging
 - 3.1.12 Social Bookmark
 - 3.1.13 Social Networking
- 4.0 Challenges of Web Technologies Application in Libraries
- 5.0 Conclusion
- 6.0 Summary
- 7.0 Tutor-Marked Assignment (SAEs)
- 8.0 References/Further Reading

1.0 INTRODUCTION

This unit will expose you to different types of web technologies and, their application and relevance to libraries and information science. You will also be introduced to the challenges associated with the application of Web technologies to libraries and information centres.

2.0 OBJECTIVES

By the end of this unit, you will be able to:

- ✓ identify different types of web technologies
- ✓ describe the various types of web technologies in libraries
- ✓ describe the relevance/application of web technologies in libraries
- ✓ identify and explain the challenges associated with the application of web technologies in libraries and information centres.

3.0 MAIN CONTENT

3.1 Types of Web Technologies

Web technologies are diverse and varied, and libraries and information centres all over the world are using them to boost their services and operations. Web technologies, as defined in the preceding unit, are a collection of Web 2.0 tools that enable interaction with users in libraries and information centres, such as social networking, virtual reference, RSS feeds, and blogs. For the sake of clarity and brevity, this module will refer to all of these types of software, tools, delivery methods, and tactics as "web technologies." These web technologies are available in a wide range of sizes and shapes. We'll go over them in this part.

3.1.1 Online Public Access Catalogue OPAC

The web online public access catalogue, also known as the online public access catalogue, is a sort of library catalogue that allows users to browse, search, and discover content. Users' needs were the driving force behind the development of web OPACs. The online public access catalogue (OPAC) is a public-access Internet-based catalogue of a library's collection. It's an online bibliography of a library's collections that is open to the public. An OPAC is a computerised version of a traditional card catalogue. The web online public access catalogue, also known as the online public access catalogue, is a sort of library catalogue that allows users to browse, search, and discover content. Users' needs were the driving force behind the development of web OPACs. the online public access catalogue (OPAC) is a public-access Internet-based catalogue of a library's collection. It's an online bibliography of a library's collections that is open to the public. An OPAC is a computerised version of a traditional card catalogue.

Relevance and Application of OPAC to Libraries

- i. It gives users access to library functions, particularly circulation.
- ii. It provides immediate access to machine-readable bibliographic entries to library users.
- iii. The online catalogue does not need to be sorted in a fixed order; the user can choose author, title, keyword, or systematic order dynamically.
- iv. Most online catalogue let you search for any term in a title or other area, broadening your search options.
- v. Most online catalogue allow you to link multiple variations of an author's name. If an author's name is keyed in differently in a catalogue as "Ado John Sule," "Ado A. Sule," and "A.A. Sule," there will be linkages between the three names, boosting findability.

- vi. Because of the introduction of OPAC in libraries, many people with impairments, such as the visually impaired, wheelchair users, and those allergic to paper or building materials, now have easier access to information.
- vii. The usage of OPAC in libraries has resulted in a significant reduction in physical storage space, making updates easier and more efficient.

3.1.2 Cloud Computing

Cloud computing, rather than using a personal computer, uses remote servers on the Internet to manage, store, and analyse data. According to the National Institute of Standards and Technology (NIST), the US Department of Commerce, cloud computing is a model for enabling convenient, on-demand network access to a shared pool of configurable computing resources (e.g., networks, servers, storage, applications, and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction (2012). Simply described, cloud computing is the process of performing computations in the cloud. The term "cloud" refers to the vast networks of hardware and software that are used to provide a variety of services to clients over the Internet. As a result, the term "Internet-based computing" was coined. Cloud computing allows clients to access a wide range of resources, including software, platforms, and information.

There are three deployment models of cloud computing in libraries. These are public, private, community, and hybrid cloud.

- i. **Public Cloud:** The term "public cloud" refers to a service that is available to the general public. To use cloud services, all one has to do is sign up and use. The customer's payment is calculated based on the number of services used. Public clouds are often vast in size and are managed and maintained by large companies. Applications from several customers are blended together on public cloud servers, storage systems, and networks, such as Amazon Web Services and Google's App Engine.
- ii. **Private Cloud:** A single organisation or institution with multiple consumers, such as business units, uses the private cloud. An organisation, a third party, or both can own and administer private cloud infrastructure.
- iii. **Community Cloud:** A community cloud is a cloud that is intended solely for the use of members of a specific community. This type of cloud allows community members to exchange concerns such as mission, security requirements, policy, and compliance considerations, and so on.
- iv. **Hybrid Cloud:** The term "hybrid cloud" refers to the combination of two or more different cloud infrastructures. A private-public,

private community, public-community, and various combinations of cloud infrastructure are available. Individual clouds in the common infrastructure keep their distinct identities, but data and application portability is made possible thanks to standardised technology.

Application of Cloud Computing in Libraries

- i. Because apps and data are hosted on a remote server, cloud computing allows users to access them from any computer at any time. Cloud computing is ideal for libraries that cannot afford to invest in technology or hire people.
- ii. Cloud computing is utilised for a variety of purposes, including hosting library websites, backing up media collections, and storing and accessing bibliographic data.
- i. Tella (2020) stated that cloud computing has made the integration of information organisations in libraries much easier by providing multi-level user-centered services. As a result, most libraries are turning to cloud computing technologies to keep their digital libraries and social networking sites up to date and flexible.
- ii. Libraries can use cloud computing to boost the power of collaboration and establish a strong, unified online presence. This computing method can help libraries save time and money while also streamlining procedures.

3.1.3 Internet of Things

The Internet of Things (IoT) is a network of connected devices (IoT) The Internet of Things, or IoT, refers to the billions of physical gadgets across the world that are connected to the Internet and collecting and exchanging data. The Internet of Things (IoT) is the process of extending the power of the Internet beyond computers and smartphones to a range of other things, processes, and environments. The Internet of Things, according to Mcelland (2020), is a network of interconnected computing devices, mechanical and digital machines, objects, animals, or people with unique identifiers and the ability to transfer data across a network without the need for human-to-human or human-to-computer interaction. IoT refers to physical devices that are connected to the Internet and exist as separate entities.

Devices include household appliances and security systems, operating systems in autos, trucks, and construction and farming equipment, sensors in traffic signals and street lights, smart tags on retail items, and mobile gadgets that many users wear or carry with them at all times. Data streaming over the Internet can be utilised for a variety of business goals,

including equipment performance monitoring, system updates, and inventory control. The Internet of Things (IoT) is a scenario in which objects, animals, or people are given unique identifiers and the ability to transmit and receive data via a network without needing to interact with humans (TechTarget, 2018). The Internet of Things is important because it allows people and things to connect at any time, from anywhere, with everyone and everything connected to the network. Smart cities, where regular monitoring of data produced by sensors can lead to resource management efficiencies, are where the IoT's promise is most apparent.

Application of IoT to Libraries

It is not enough to understand new IT principles; we must put them into practise in libraries. It's difficult to fathom all of the conceivable IoT applications in the future, but they all require communication tools such as the Internet, Wi-Fi, and RFID. Here are some examples of library applications:

- i. You might use Wi-Fi or Bluetooth to find smartphones in specific locations of the library and send tailored communications to them (such as announcing an event currently taking place inside the library).
- ii. Alternatively, you could use Wi-Fi devices to watch traffic patterns and identify popular shelves so that you can make smarter space-usage decisions.
- iii. Many libraries include RFID tags on the objects in their collections to make it easier to check out and return resources. Smart tagging can also assist libraries in finding missing or misplaced objects in their collections, tracking items as they move through the library, and deciding whether or not to transfer underutilised resources to increase their visibility.
- iv. Both inside and outside a library, smart lighting can be implemented. The library could then use the Internet to monitor and control the lighting (and the costs associated with it) by using the library's Wi-Fi network to turn the lights on and off.
- v. The same can be said about establishing a smart energy system that allows energy use to be adjusted according to need rather than being made available all of the time, saving the library a lot of money.
- vi. The commencement and progress of a potentially disastrous fire can be tracked and dealt with securely from outside the library using Internet-connected fire sensors, showing danger zones and dealing with them remotely.

It's worth noting that, just as book-based libraries have evolved into electronic libraries, digital libraries, and virtual libraries, smart libraries will undoubtedly emerge in the near future.

3.1.4 Blockchain

Tella (2020) defines blockchain as a "simple but creative technique of sending information from one location to another in a fully automated and secure manner." According to the author, one transaction participant starts the process by producing a block. This block is verified by thousands, if not millions, of machines all over the Internet. The validated block is then added to an Internet-wide chain, creating a record that is not only unique but also has a unique history. It is a time-stamped collection of immutable data records controlled by a group of computers that are not owned by a single organisation in its most basic form (Tella, 2020).

Application of Blockchain in Libraries

- i. Blockchain could facilitate new distributed, large-scale metadata systems, eliminating the need for centralised databases such as Worldcat, CrossRef, and ORCID. The necessity to change large-scale metadata systems, on the other hand, is unclear, and other technologies, such as linked data, offer alternative approaches to achieve decentralisation.
- ii. Another application is digital preservation and general data deposit, such as climate data, where data integrity is crucial regardless of preservation goal. Current systems use non-standard approaches to track the origins and integrity of digital assets (e.g., hash values to track unintended changes to the digital object). Blockchain registries could be perfect for tracking large-scale distributed digital assets, as well as locations, owners, stewards, and other metadata that needs to be dependable and traceable over time.
- iii. Libraries offer training in information literacy and locating reliable sources of information. By giving new means to analyse its sources and changes over time, blockchain technology applied to data on scholarly material, from news items to research outcomes, may boost public trust in that information. For example, "Climate Feedback," which is now dependent on annotations, might employ blockchain to "sign" notations or comments made by scientists via a ledger-based comment system.
- iv. Blockchain has the potential to improve library acquisitions' ownership and first sale records management, as well as circulation, interlibrary borrowing, and e-lending records management.
- v. Blockchain is best suited to immutable recordkeeping and works best for simple transactional data. It can strike a balance between the library community's privacy ideals and open access, openness, and responsibility. Even if it isn't the greatest answer, blockchain is assisting libraries in rethinking their processes in terms of trusted, immutable transactions and their subjects... It incorporates

- supply chain management principles with a variety of library activities.
- vi. The most obvious use of blockchain in libraries is in archives and special collections, such as records management, where provenance and authenticity are critical for authoritative monitoring and where broader access to that provenance and authenticity is required. Existing blockchain platforms could provide provenance metadata for archive materials, providing a better alternative to the present fragile, time-consuming record-keeping operations.
 - vii. The most obvious use of blockchain in libraries is in archives and special collections, such as records management, where provenance and authenticity are critical for authoritative monitoring and where broader access to that provenance and authenticity is required. Existing blockchain platforms could provide provenance metadata for archive materials, providing a better alternative to the present fragile, time-consuming record-keeping operations.
 - viii. Libraries, regardless of their type, purchase a wide range of items from around the world in a variety of currencies, and currency changes can devastate library budgets. Blockchain's financial applications give up unexpected possibilities for using blockchain-based currencies (such as bitcoin) for financial transactions between libraries and publishers, potentially eliminating exchange rate concerns while speeding up buying processes (essentially a supply chain).

3.1.5 Blog

A blog (short for "web log") is an online journal or educational website that shows content in reverse chronological order, with the most recent posts appearing first. It's a forum where a writer, or a collection of writers, or a library, can contribute their perspectives on a specific topic. Blogs serve as more personal online diaries and provide analysis or news on a certain issue. A blog is a web page that contains concise, chronologically ordered material. A blog can be a diary, journal, what's a new page, or a collection of links to other websites.

A blog, like a website, has content organised as text and hyperlink posts posted in reverse chronological order, a time stamp for each item so the reader knows when it was written, and an archive of previously posted information that visitors can access fast. Text, images, and links to relevant blogs, Web pages, and other media make up a standard blog. Many blogs allow viewers to contribute comments in an interactive format.

Weblogs, often known as blogs, are websites that document specific points of view, ideas, or opinions throughout time. These are online applications that contain regular updates on a single web page. These posts are usually in reverse chronological sequence, but this isn't always the case. Each blog recounts a story about someone, an organisation, an event, or a topic like an environment, healthcare, disasters, language, literature, and so on.

A blogger is someone who writes and maintains a blog, while blogging is the act of writing and maintaining a blog. A bigger community reads, comments on, and discusses the postings in a blog, which often leads to lively debate. This may sound like a listserv, and it is in some ways. Unlike a listserv, however, blogs are often open to the general public, encouraging a wider range of readers and spreading information more widely and quickly. Weblog entries' hypertextual, link-centric character encourages this quick flow and spread of information even more.

The appearance of blogs has changed over time, and they now include a variety of features and widgets. Most blogs, however, nevertheless have some common characteristics and architecture. The following are characteristics of a typical blog:

- The header contains the menu or navigation bar.
- In the main content area, there are highlighted or most current blog articles.
- In the sidebar, you can include social profiles, favourite articles, or a call-to-action.
- The footer contains a disclaimer, privacy policy, contact page, and other useful information.

Figure 1, is a typical example of a blog.

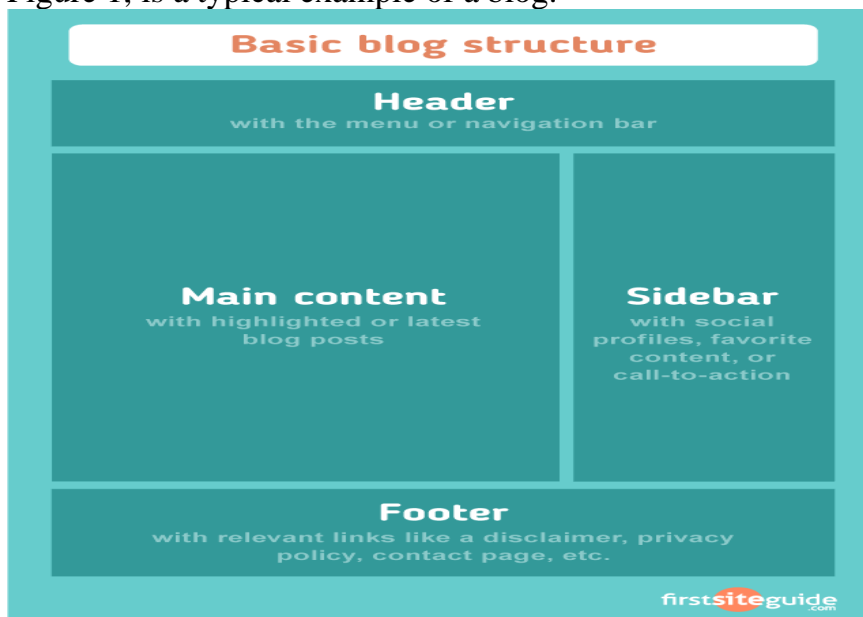


Figure 1: A Typical weblog platform

Source: Artem Minaev (2021) – What is a blog? – Definition of terms blog, blogging, and blogger <https://firstsiteguide.com/what-is-blog/>

Application of Blog in Libraries

A blog is relevant to libraries and can be useful in the library and information centers to promote the following services in the library.

Libraries can launch blogs to enhance interaction between library customers and staff. A blog can also be used to promote library events and services. It enables two-way engagement, with users being able to remark on the information that has been submitted.

Blogs provide a venue for library users to voice their complaints, questions, and comments about the library's services and activities. It is used for collection development, where users seek marketing material and library resources, as well as for posting meeting minutes for required activities. It is also used by libraries and their users as a discussion forum. Other library-related blog applications include:

Outreach Services: Building a community of library users based on the types of customers the library serves, such as youth, students, and neo-literates. Many more outreach services can be planned/implemented utilising a blog, for example, a library can support the joining of online book stores and library customers for personal purchases. It has been noticed that when people order from a specific blog/site, book suppliers offer a bigger discount.

Support the Community: Librarians and libraries are always looking for ways to offer value-added services. Through blog, library can offer a special service to the community. This can be done by: providing information about local election news, posting announcements about candidate websites, nominations, and meetings; and make local council minutes and agendas available to the public.

Users can subscribe to RSS feeds for specific sections, and the library can keep all material in one place, avoiding mass mailings. Blogging allows for the immediate dissemination of information to all RSS feed subscribers in a certain area. Also, if any adjustments or corrections are required, they may be made in a single location.

Library Administration: Library staff opinions promote openness, transparency, and give the library a voice. Staff members can use blogs to express, share, and contribute more on a variety of professional subjects. The library blog makes it simple to gather and measure information on training, conferences, and tacit knowledge about tools, among other things.

Community Building: Sharing best practises and experiences is beneficial to librarians. Blogs are a great method to provide advice and criticism on current library topics promptly. Blogs also allow readers to share their thoughts and experiences. Sharing experiences and perspectives from various users (from all over the world) helps to establish a robust user base. Blogs make learning and sharing a lot easier and more productive.

Library Resources: Blogs can be used to draw attention to new and useful resources that have been added to the library's collection. Blogs can even serve as a web page, allowing users to access a wide range of free and paid electronic resources. The same section can be used to collect comments, provide training advice, share expertise, rate information goods, and so on, resulting in improved library resource utilisation.

Fast communication: Blogs are useful for facilitating communication between project team members and the institutions/libraries where they are working on projects. RSS-enabled information dissemination facilitates communication among RSS feed subscribers and blog users. On individual blogs/pages, any information posted will be automatically gathered. Similarly, blogs can be used to collect data from other sites / sources without the need for time-consuming tasks.

Marketing of Library: In all types of libraries, including corporate, special, academic, and public libraries, there is a higher understanding of return on investment. In some circumstances, funds/budget are allocated to libraries based on the library's contributions to the development of the organisation. Many libraries continue to offer essential services, but only a small percentage of the population has access to them. The visibility of library services as well as inputs for organisational development grows as the user base grows.

Library services (Lending, Reference, CAS, SDI, and so on), resources (books, reports, audiovisual materials, e-journals, databases, and so on), expertise (especially information searching and repackaging abilities), database searching, and so on must all be promoted to users by librarians. All of the aforementioned may be effectively marketed through blogs, which eliminates temporal and geographic barriers. The most cost-effective and innovative approach to promote library services is through a blog. Sharing resources becomes exceedingly simple, and it encourages users to share materials without having to visit the library.

3.1.6 Wiki

In Hawaiian, a wiki is a website where a group of people may produce and update content. Users do not require “web authoring software or advanced HTML coding skills” to update wikis. Wikis encourage

community engagement in the creation and maintenance of the website. Internal communication, institutional collaboration, and research can all benefit from wikis. Wikis are a "technology that facilitates participatory librarianship since it allows users to contribute original and real contributions to the subject contents a library seeks to cover," according to the authors.

As a student learning platform, some academic libraries combine wikis and blogs. Wikis allow anyone to share knowledge and information, although they are rarely regarded as "authoritative" or "scholarly." A wiki contains a lot of dubious material since anyone can manufacture facts or pass off thoughts as facts. Even though some larger wikis (such as Wikipedia) go to great lengths to verify the information and acknowledge sources, these sites are still not regarded as credible or trustworthy. If you find information on a wiki, you should double-check it with information from a different source, such as an encyclopaedia, dictionary, or index.

Application of Wiki in Libraries

- i. Wikis can be utilised for social interaction and debate between librarians and users.
- ii. A library can use the wiki to enhance professional growth by creating forums for people to share their thoughts on specific topics.
- iii. Wiki can be utilised as an internal communication tool for library workers to share information.
- iv. Users can utilise wikis to share information and improve the material, and a record of these transactions is kept for future reference.
- v. Keep a record of the activities that took place.
- vi. A library can create reference resources using a wiki.

3.1.7 E-mails

Businesses, libraries, and information centres use electronic mail, or e-mail, as one of the most extensively used information and communication technologies. E-mail streamlines operations and transactions, allows for information transmission, enhances staff quality, speed, and efficiency, and promotes relationships amongst library stakeholders. E-mail, in a similar vein, can be a great tool for sharing information and coordinating tasks across a large organisation.

The e-mail system, as well as any other IT products, technologies, or facilities made accessible by the University to send or receive electronic messages and attachments, instant messages, and other similar communications, are referred to as the "e-mail system." E-mail systems

are computer-based systems that enable the generation and transfer of communications. Using a unique system address, messages can be transmitted online to general or private directories or electronic mail boxes. Messages can come from both inside and outside an organisation. The electronic mail service, also known as e-mail service, is the simplest and most generally used communication facility available on the Internet. It's used to deliver messages to other people using other computers' programmes. People can send and receive communications over e-mail that aren't always text-based but can also be graphic, sound, or data-based. Messages transmitted via the Internet can include attachments.

Application of E-mail in Libraries

Some of the major applications of e-mail in libraries and information centres are discussed as follows:

Resource sharing: Resource sharing is one of the most important tasks of libraries and information centres. Due to budget cuts and increases in the price of reading materials, libraries have been driven to use faster communication means to spread the resources available. One of the more efficient and speedy ways of communication is e-mail. At any time, a library can utilise this system to make a document request to one or more libraries. It's even possible to see if a document is available before making a formal request and waiting for a response. Both the librarian and the users benefit from this.

Ordering: E-mail could be used by libraries to order books, journals, and other reading materials. It is possible to check the availability of individual titles by submitting a list to the publishers using this approach, and after confirmation, final orders can be placed. Journal claims are another area where E-mails could be more beneficial. Many large publishers utilise this method to send their list, which is then confirmed before final orders are placed. They can also order library management software, databases, online journals, and library equipment via this manner.

Document Delivery: Document delivery is another application of E-mail in libraries. Reprint orders can be placed electronically through document delivery services like the UMI Articles clearing house (UMIAC). Many requests are produced these days as a result of online searches, and some online database owners are providing this feature as part of their search protocols. The introduction of comprehensive text databases is another component of electronic document distribution. The full text of journal databases, in particular. Databases may be searched, and the results can be downloaded and sent to user mailboxes, which is another way E-mails can be used successfully.

Reference service: Sending reference requests and responses via e-mail is more efficient. For example, it could be from one librarian to another, a patron to a librarian, or a librarian to topic specialists. It is not need to write a separate letter because the response is simple and may be easily forwarded. Librarians on and off campus can utilise e-mail to send users reminder reminders, new additions, lists, and other information. A regular news bulletin outlining the library's many activities may be broadcast. Electronic mail has the potential to be utilised for everyday communication. This media can be used by users to submit feedback on the services.

In-House work: Patrons of libraries and information centres can take advantage of a number of services. The library could use R-mail for internal objectives like altering notices, informing users about newly available services and facilities, and raising user awareness. For the book issue-return procedure, the SOUL2 Library management software, for example, has a mail alert feature.

Professional communication: Professional societies and organisations in the field of library and information science, like many other national and international professional societies and organisations, are based in various locations and, in some cases, all over the world. E-mails can help these organisations communicate more effectively. Meetings in the library, as well as any department or unit within the library, are also announced by e-mail. It also allows people with similar interests to communicate without regard to their geographical location. Using e-mal, libraries can collaborate on a variety of tasks, such as bibliography compilation, collection development, and policy formulation.

3.1.8 RSS

RSS

RSS is a simple XML-based standard for sharing website content. RSS (formerly known as Rich Site Summary) is a method of describing news or other Web content that may be fed into (distributed or syndicated) to Web users from an online publisher. RSS is a standard for delivering web material that is updated on a frequent basis. When new content is added to the collection, it is used by the Library to notify staff and patrons. RSS is an Extensible Markup Language (XML) application that follows the Resource Description Framework (RDF) of the World Wide Web Consortium (W3C).

Netscape created RSS for their Netcenter channels in their browser. The RSS specification is presently available for anyone to use. RSS is a popular Web 2.0 tool for giving up-to-date news or current information to library patrons. The library community uses RSS feeds to stay up to speed

on current events, activities, new products, and other new information that they are interested in. As a result, the publisher of a website can create an RSS document in order to share and publish some of its content to other websites at the same time. This material is available on the website, and any user can access it while browsing other sites. This is the syndication portion of the acronym, which refers to content being shared at the same time with other websites.

Application of RSS in Libraries

Just like other webtechnologies, RSS is relevant can be applied to improve library services. This can be done in the following ways.

- i. **Marketing Ideas:** RSS feeds, as previously indicated, can be used to post any announcements from the library's website regarding activities, exhibitions, promotions, and new library resources, notably databases. Alternatives to these services include weblogs, which are more interactive. Librarians may introduce a new database with a quick blog post, and users could discuss their experiences, culminating in a discussion on the database, which RSS feeds could also tell subscribers about during their scheduled update periods. Libraries join consortiums to receive better discounts on large purchases. Similarly, library consortia could enable member libraries to work together to provide RSS aggregators with more detailed information about their 'products' and services, both in terms of quantity (volume) and quality (quality) (depth). Of course, library webmasters might compile this data and publish it on their particular library websites for the benefit of their more immediate or local user base.
- ii. **Generation of various kinds of book lists:** The most practical use of RSS feeds in library settings is probably the simple creation of various types of book lists. A "New Items" list may be attempted, as customers are often curious about what's new. Although the progress made to date is unknown, the Koha ILS, an Open Source system developed by Katipo in New Zealand, has started a project for RSS feeds – with the newest items, most reserved, and longest unseen books featured feeds – (see). (see). In fact, for large public or academic libraries, it would be unfeasible because the hundreds or even thousands of volumes added each month would far exceed RSS's maximum item listable limit. For smaller libraries — and perhaps for each branch, division, or collection of larger libraries — an RSS feed showing new items accessible is possible. Use 10, 20, 100, or whatever number of predetermined subject headings you choose, and have the system post RSS feeds on new items per subject as another approach to build more user-friendly, readable lists.

Something comparable is being tried by the world's most well-known online bookseller. Amazon is already working on several RSS feeds that compile book news into popular headlines. Another list (or combination of lists) for the library's "Most Wanted" (books, videos, CDs, CD-ROMs, DVDs, and so on) might be made, parodying the classic crime posters. Because new patrons will likely only be able to access these products through reservation systems, this list could even be dubbed "Most Reserved Items," a play on the cliché of the dignified and sophisticated library atmosphere. This would assist in the promotion of the library's goods (the things that everyone wants) and services (in this case, the option for patrons to reserve desiderata). Using data from the library's integrated library system, this type of list could be prepared and distributed on a daily, weekly, bimonthly, monthly, or other basis (ILS).

- iii. Current awareness services and compilation of table of content: Table of Contents (TOC) compilation, for example, has traditionally been a manual, tedious, and slow process. Web services have improved efficiency by speeding up the procedure and reducing library staff labour. As aggregated Tables of Contents (TOC) for academic publications are now becoming available, RSS feeds have improved this. Content from Emerald Publishers and Taylor & Francis, for example, can now be received as RSS headline feeds. These have significantly more information, including abstracts of the papers in each issue of the journal. Additionally, the Nature RSS feed can now be subscribed to. Earlier on, publishers recognised the value of RSS feeds and began developing the Publishing Requirements for Industry Standard Metadata, or PRISM. This research resulted in the creation of a TOC module that allows journal TOC information to be published online.
- iv. Improvement of reference services: The value of search engines cannot be overstated, particularly for reference librarians and their prospective clientele. For instance, XmlHub, an Open Directory custom RSS-feed generator, just revealed two highly fascinating utilities that are sure to make a splash. For any search word given, the first provides a customised RSS feed of Open Directory search results. For any Open Directory category, the second generates a customised RSS feed.

With these tools, patrons can be notified when new resources in their areas of interest are added to Open Directory. Other databases, such as library OPACs, bibliographic and full-text databases, and online directories, might use the same process to create customised RSS feeds.

3.1.9 Instant Messaging

It's a sort of online chat that allows users to send and receive text messages in real-time over the Internet. With the exchange of text messages via software applications in real-time, it's typically abbreviated to just IM or IMING. Because libraries use IM to provide online reference assistance, similar to phone reference assistance, it is very popular. Librarians and users can speak with each other via instant messaging (IM) and retain a script of their conversations. IM is free for libraries and patrons, is more often used in people's daily lives, is generally platform-independent, and is more compatible in a Web 2.0 setting.

Instant messaging has gained in popularity as a result of its quick response time, convenience of use, and multitasking possibilities. Millions of people use instant messaging for a number of reasons, including simple requests and responses, scheduling face-to-face meetings, and just checking the availability of coworkers and acquaintances. Instant messaging (IM) has, of course, become a popular mode of communication, particularly among younger people, who make up a large section of library patrons. Simply said, instant messaging (IM) is real-time two-way Internet communication between two or more people. People can use the medium to "chat" over the Internet by sending and receiving quickly changing text messages. A user communicates with another user by typing a message into a particular window, or "chat room," created by instant messaging software. The message displays on the other user's screen nearly instantly. It is read by the recipient, who responds by typing a response. Basic chat systems can be accessed with just an Internet connection. When a person sends or receives a message, the IM system usually makes a sound. Because all users view messages that appear in the chat room, multiple persons can chat at the same time. Those who want to chat in secret might create a private chat room with just invited users.

Applications of Instant Messaging in libraries

- i. Instant messaging (IM) provides an alternative for librarians looking to restructure reference service delivery; remote users can be reached across campus and around the world because physical obstacles do not inhibit communication.
- ii. During IM reference, patrons who are embarrassed by the nature of their query or their lack of understanding can remain anonymous. Multiple learning styles, the hearing handicapped, and non-native English speakers can all benefit from interactive text communication.
- iii. Complicated URLs, which can be difficult to express accurately over the phone or at the reference desk, can be readily transferred through online reference. IM, rather than e-mail or Web forms, is

- ideal for conducting reference interviews, clarifying questions, and obtaining comments.
- iv. Additionally, it has made telecommuting a viable option for busy reference librarians.
 - v. Instant answers to user questions, online meetings, and virtual reference services are all feasible in libraries thanks to instant messaging.

3.1. 10 Podcasting

A podcast is a digital recording of a radio broadcast or other programme that is made accessible for download to a personal audio device through the Internet. A podcast is a collection of digital audio or video files distributed over the Internet via syndicated downloads, Web feeds, and personal computers.

The term podcast comes from the combination of Apple's iPod portable media player and the word "broadcast." The podcasting syndication process can be broken down into three parts, each of which can be uploaded to the web as an audio file. An RSS feed is created and uploaded to the web in conjunction with such a file. The podcaster application reads the stream and then downloads the audio file. Podcasts differ from other digital-media forms in that they may be syndicated, subscribed to, and automatically downloaded when new content is added.

Application of Podcast in Libraries

Booktalks, displays and exhibitions, library education, library training, library news, storytime, live programmes, and institutional podcasts are just a few of the applications and uses of podcasts in libraries. Libraries employ podcasting to create and transmit education, information, and professional development resources to members of the campus community swiftly and affordably. Other podcast applications in libraries include:

- i. For a library that works hard to create audio content, such as programme recordings or library tours, podcasting can be a useful way to make that information more publicly available.
- ii. New resource spotlights on the podcast
- iii. Librarians can communicate information with anybody at any time through podcasts.
- iv. Podcasting can be used to publish oral talks by users and librarians.

3.1.11 Tagging

A tag is a word or phrase that is used to describe a digital item (such a website, image, or video clip) but is not part of a formal classification system. Tagging has gone beyond website bookmarking, with services like Flickr (photos), YouTube (video), and Audio (podcasts) allowing users to socially tag a variety of digital artefacts. Social tagging is the process of freely adding tags or keywords to online resources, and it is a crucial component of social bookmarking services that sparked the development of folksonomy.

Individuals freely tagging resources available on the Internet create folksonomies. Folksonomies are the result of individuals freely labelling materials available on the Internet, whereas taxonomy and ontology are expert-created classifications and naming rules. In a technique known as social tagging, also known as collaborative tagging, social classification, and social indexing, users label or annotate webpages or digital items they find important on the Internet. The main purpose is to make it easier for users to find the material in the future by letting them to search for it using the keywords they've supplied.

Applications of tagging in libraries

- i. Tagging can be used in the LMS to change subject headings from a user's perspective, improving indexing and relevancy of searches and making the collection more dynamic.
- ii. Tagging would make lateral searching much easier.
- iii. Information can be categorised in ways that make sense to users through social tagging. Users can use their phrases to "tag" or characterise material as they think fits and is meaningful to them. Even though individuals tag an item to consume it themselves, the result of the tagging provides communal intelligence when it is shared in the Internet community.
- iv. Social tagging also helps people with similar interests to connect, making information sharing easier. In addition to gathering data, the taggers build social bonds with one another, which is a useful discovery in and of itself. The tags that are issued to online resources are usually shown as a tag cloud, with a larger and darker font size indicating a higher frequency of tag assignment.
- v. For library users, social tagging can be a beneficial tool. Instead of saving each site in its folder, users may simply write a few phrases called tags, and their sites will be automatically arranged alongside sites uploaded by other users using the same keywords. Social tagging can help users at all levels. It has the potential to be another useful tool for both free and commercial users.

3.1.12 Social Bookmark

Internet users can use social bookmarking to share, organise, search, and manage their bookmarks of websites. The resources themselves are not shared, unlike files, but rather bookmarks that lead to them. Social bookmarking platforms are handy for more than just collecting bookmarks; they can also be used to quickly create topical resource lists and share them with others. The process of storing bookmarks on a public website and labelling them with keywords, so making them accessible from anywhere, to anybody, is known as social bookmarking.

These tags are keywords that the user chooses to assign to a piece of information (a bookmark in the case of social bookmarking). End users, rather than specialists, can arrange and display bookmarks with meaningful labels using these tags, and the assigned tags are immediately available publicly on the web. Social bookmarking is a computer network activity that allows users to save and categorise personal bookmark collections and share them with others. Users can also add bookmarks from other people's collections to their own, as well as subscribe to other people's lists - a personal knowledge management tool."

Cooperative tagging entails a group of people with similar interests utilising a shared word or phrase. It's a simple approach to share relevant content with clients and other librarians as a type of cooperative collection development. Simply choose a tag, enlist the help of volunteers, and begin bookmarking.

Social Bookmark Application in Libraries

- i. Library users can construct personal bookmark collections, which they can share publicly or with members of a specific group.
- ii. It allows user-defined tags to be used to classify, categorise, and index bookmarks. Tagging also allows users to save bookmarks in several categories, making it non-hierarchical and inclusive.
- iii. Social bookmarking systems allow users to explore collections of other users' bookmarks and, to be successful, require some engagement. It finds other users with similar interests and resources that are tagged similarly to one's own.
- iv. Other web-users can subscribe to tags via RSS, which, unlike traditional search engines, discovers new and interesting sources and users.
- v. Users can describe bibliographic distribution lists by supplying specific information, so simplifying them.
- vi. Elaborating link services recommended from specific fields of knowledge.
- vii. Sharing resources with other users who are researching with them.
- viii. Encouraging user interaction and engagement.

3.1.13 Social Networks

In recent years, the use of social media has increased dramatically. They can be classified using a variety of characteristics depending on their target audience and purpose. Because there are so many existing networks, it's tough to keep each one up to date, which is why libraries normally stick to just one. Myspace allows businesses to build their profiles and pages, and libraries can utilise it as well. Individual librarians, on the other hand, can build profiles on Facebook. The academic library may employ them in a variety of ways. Academic libraries have utilised SNS to improve their communication efforts with their users because SNS facilitate the exchange of information online.

Several academic libraries are using social media sites like Facebook, MySpace, YouTube, and Flickr to share information, allow users to search their catalogue, market their services, create image databases, share photos and keywords, share videos and PowerPoint presentations, and communicate with potential library users, among other things. Live videos or discussion forums are used by academic libraries to do this.

Application of Social Networks in Libraries

- i. Libraries can set up a page to attract new visitors.
- ii. In an electronic medium, social networking could allow librarians and patrons to not only connect but also to exchange and alter resources dynamically.
- iii. to form a network among those who are interested in discussing a common interest.
- i. User-generated information, such as book reviews or other comments, can be uploaded to the library catalogue.

4. Challenges of Web Technologies Application in Libraries

The introduction of the Internet and its accompanying web technologies (the first generation of Internet technologies) presented problems to libraries and users in terms of web technology use and application. These challenges are discussed in this section.

Lack of effective training and understanding on the right use of online applications, as well as a lack of dedication and cooperation, are all notable issues. In general, there is a low uptake of web technologies in most academic libraries in Sub-Saharan Africa and on the African continent, compared to the developed world, for a variety of reasons, including bandwidth, a lack of technical skills among librarians and library users to make the best use of the tools, conservative culture and a natural lag in adopting new technology; ignorance or lack of appreciation of the potential value of Web tools, particularly among older users.

Others include a lack of supportive policies, strategies, and goals, as well as a perception of web content's low legitimacy. The African specific challenge of "unstable power supply," which is "a prevalent concern for users who face frequent power outages and long rationing hours due to over-reliance on hydro-generated electric power, which is vulnerable during droughts," can also be mentioned. Academic librarians have also been prevented from using Web technologies for work-related activities due to a lack of awareness and a poor Internet connection. Another issue worth highlighting is the lack of adequate Internet bandwidth.

As a result, librarians have been discouraged from actively participating in Internet discussions. Lack of technical skills among librarians and library users to make the best use of the tools; conservative culture and natural lag in adopting new technology; ignorance or lack of appreciation of the potential value of Web 2.0 tools, particularly among older users; lack of supportive policies, strategies, and plans; and perceived low credibility of Web 2.0 content are also issues.

In addition, there are insufficient computers and unstable Internet access and electricity, as well as a lack of awareness and Internet skills and supportive policy/guidelines. Other problems include a lack of knowledge and skills among information workers, insufficient management support, librarians' lack of time to use social media, and a lack of desire among librarians who want to do things the old way.

5.0 CONCLUSION

This unit has exposed you to the type's web technologies, and their application to library services. The discussion is considered to be important to the librarians in training because it will enable them to have a good understanding of the application of web technologies to libraries and information centres.

6.0 SUMMARY

From the discussion in this unit, you have learned about the various types of web technologies, their application in libraries, and their associated challenges

SELF ASSESSMENT EXERCISE

Describe the web technologies that are useful to libraries and information centres.

7.0 TUTOR-MARKED ASSIGNMENT

- Describe how web technologies are used in libraries.
- Discuss the issues of implementing web technologies in libraries.
- What advantages do web technologies provide to libraries and information centres?

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MODULE 2 EVOLUTION AND DEVELOPMENT OF WEB TECHNOLOGIES

In this module, you will be introduced to the development of web technologies. The module will also introduce you to the concept of Web 1.0, 2.0, and 3.0, and discuss web-based library services.

Unit 1:	Development of Web Technologies
Unit 2:	Web 1.0, Web 2.0, and Web 3.0 and libraries
Unit 3:	Web-based Library Services

UNIT 1 DEVELOPMENT OF WEB TECHNOLOGIES

CONTENTS

1.0	Introduction
2.0	Objectives
3.0	Main Content
3.1	History of Web Technologies
4.0	Conclusion
5.0	Summary
6.0	Tutor-Marked Assignment (SAEs)
7.0	References/Further Reading

1.0 INTRODUCTION

This unit will expose you to historical and background development about web technologies. This will enable you to have a good understanding of how the technologies emanate.

2.0 OBJECTIVES

By the end of this unit, you will be able to:

- define web technologies
- narrate the development of web technologies
- mention some important personalities that contributed to the development of web technologies.

3.0 MAIN CONTENT

3.1 Development Web Technologies

Tim-Oreilly conceptualised a revolution of web-based and web-enabled products and services at the turn of the millennium, which has gained a lot of traction in terms of experiencing and pioneering research in

contextualising webtechnologies for social benefits. This has presented a significant challenge and opportunity for many businesses in terms of delivering varied products to end-users. Web access, digital post-polio on the web, and our presence have become a deciding element for corporate research and industrial organisations all over the world, including government services and e-governance, as well as creating libraries. It will accelerate at a faster rate in the coming year as Internet usage data continues to rise at a rapid rate. The higher education industry is playing a key role in moulding human resource potentials through the adoption of emerging technology. It has provided significant opportunities for librarians and information scientists, as well as new types of information products and services.

Before it became a standard household service in the 1990s, the Internet had been an idea for at least half a century. The visual component of the Internet's rise has been significantly tied to its acceptance by mainstream culture. The Internet's potential, like that of many other computer systems, was not understood by the general public until a graphic interface was created to appeal to the masses.

In comparison to today's standards, connection speeds were considerably too slow when the Internet initially started. As a result, site design was not a high priority because complex processes were overlooked. By the mid-1990s, however, it was evident that data and information needed to be represented in methods other than text. Web designs with components like background graphics, text columns, and animated gifs began to appear during this time. All of these factors helped to improve the overall design and user experience.

Before the 1990s

When the Internet first began, connection speeds were far too slow in comparison to today's standards. As a result, web design was not a top concern because sophisticated processes were not even considered. However, by the mid-1990s, it was clear that content and data needed to be represented in ways other than text. During this period, web designs with elements such as background images, text columns, and animated gifs began to appear. All of these elements contributed to a better overall design and user experience.

The late 1990s

The great majority of web designers had shifted their focus to developing user-friendly websites and applications by the late 1990s. Flash's debut was a game-changer at the time. Flash was first released as a graphics editor for computers. It served as a music and video player, as well as an interactive presentation tool for websites and games. Flash's significance in the early phases of web design development cannot be emphasised.

Microsoft also introduced Ajax in 1999. Although developers were unaware that they could utilise JavaScript for programming, there was a lack of awareness about the use of Ajax.

The Era of 2000s

In the years following the tech meltdown of 2000–2001, the Internet advanced quickly and dramatically. Cascading Style Sheets (CSS) first appeared at the turn of the century. It was crucial in allowing web developers to have complete control over the layout of their websites on each page. The text was contained in HTML coding, while the visual graphic presentation was handled by CSS. CSS simplified website customization and upkeep. It also resulted in faster website loading times. Social media platforms began to appear later in 2004 and 2005. The arrival of Facebook, Gmail, YouTube, and other social media platforms such as Myspace ushered in a major shift in web development, as programmers began to incorporate these platforms into their design techniques. John Resig, a university graduate, created jQuery in 2006 to increase usability and responsiveness.

Between 2007 and 2008, Apple achieved important technology advancements. The App Store's launch in 2008, followed by the release of the first-generation iPhone in 2007, was a massive intervention. When the iPhone first came out, it was a game-changer, requiring designers to focus on responsive mobile phone-compatible designs. Third-party developers could also offer their products and services through the App Store.

BackboneJS, the first JavaScript framework, piqued the interest of a significant number of developers when it was released in 2010. Web development initiatives began to focus on faster loading times, security, and ease of use after the emergence of smartphones and fast Internet connections.

Scope of Web Development Today

The goal of web development today is to identify new applications in a variety of sectors. Web development is no longer limited to the creation of websites. From behind-the-scenes coding and programming to maintaining a website's responsiveness, incoming traffic, and overall performance, the scope of web development is expanding. Web developers and designers have a strong idea of what the Internet can do. Because of the Internet of Things (IoT) and other technical equipment, many gadgets that use the Internet may be connected.

Fixed-size web pages are no more prefer in the presence of many various Internet gadgets. They cause the user to have difficulty, and there is no consistency based on the gadget being utilised. The concept of "one web"

has emerged to make webpages identical across all platforms and gadgets flexible. Using one web, responsive features and adaptive designs are built into the CSS code. It enables the website or web application to detect the device and reorganise its structure and visual presentation accordingly.

The feature has been improved with the addition of the latest HTML5 and CSS3 versions. Modern online apps can now work under the "one web" paradigm thanks to cutting-edge methods.

The bottom line is that people in today's world have easy access to the Internet and may use it to do a variety of things. Web development has progressed dramatically in recent years, and it is an ongoing process.

Current Process of Web Development

When we think about web development, we just think about the technical parts, such as coding, wireframes, and content management. Great website design, on the other hand, entails more than just slick photos, eye-catching graphics, and social media buttons.

Initial data collection, in-depth planning, and post-launch maintenance are all critical steps in the web development life cycle that are typically concealed behind the scenes. A website production process that is in line with the overall purpose and strategy is the key to successful web design. The eight stages of the full web development and design process are detailed below.

Website Development Timeline

When considering developing a website or any project in general, it is important to think about two things: time and money. The length of time and expense of the project will depend on its size and scope. To cover the complete design and development process, a process timeline with tasks and milestones is created. It helps you to follow the development of your project and keep an eye on the deadlines.

Planning – Main Goals, Purpose, Target Audience

This stage is all about investigating and experimenting with various results. The most crucial duties in this step are to have a firm grasp on the website's purpose, major goals, and target audience. Typically, during this step, all stakeholders meet down and map out information based on the following broad questions:

- Purpose: What is the website's main goal? Is it more important to inform, sell (e-commerce), or entertain?
- Who is the site's target audience?
- Content Development: What are the expectations of the target audience in terms of what they will find or do there?

- USP (Unique Selling Proposition): Who is our rival (if there is one), and how should we differentiate ourselves?

Time and money can be saved with a well-defined plan based on pre-development data.

Sitemap and Wireframe Creation

Have you ever thought about building a mansion without a blueprint? It's analogous to building a website without a sitemap, and it's equally suicidal. A sitemap is the backbone of any successful website. It gives web developers and designers a clear image of the website's information architecture. It also makes the landing page concept and content pieces more understandable.

Based on a sitemap, a wireframe or mock-up is created to create a visual presentation. A "wireframe" is a visual representation of the user interface that will be created. Although a wireframe does not represent the final version of elements such as colours and logos, it does serve as a "blueprint" for how the website will seem once it is finished. It's like a low-budget, sloppy production sketch.

Design – Visual Elements and Page Layouts

During this phase, the website's preliminary sketch takes shape. All visual content is created, including graphics, photos, and videos. All of the information obtained during the planning process comes in helpful once more. While working on the design, keep the target audience in mind.

Existing branding components, colour selections, and logos, as requested by the customer, frequently shape the layout design process. The layout's primary purpose is to visualise the content and display the overall outlook.

Content Creation

Content generation frequently overlaps with other phases of website development. The importance of content cannot be underestimated. It is vital to state everything in black and white that you wish to express to the audience at this stage.

Content writing also entails headline development, fresh text writing, editing, and tinkering with old text, among other things. Creating compelling content requires a lot of time and work. The customer frequently supplies content that is ready to be moved to the website in today's world.

Coding and SEO

At this point, the website is being built by the developers. The graphic elements that were created in the previous stages are now used. All of the web page elements created during the mock-up are given a code language and tested. Frameworks and content management systems (CMS) are also

used. It's critical at this point to have a thorough understanding of each website development technique being used.

SEO is an important stage as well (Search Engine Optimization). SEO is the process of optimising aspects of a website such as the title, description, keyword, and so on. The number of people who visit a website grows as a result of SEO.

Testing and Launch

One of the most routine aspects of the procedure is testing. Every relationship is put to the test. Furthermore, each script is run, each form is reviewed, and proofreading is completed. Code validators are typically used at this stage to ensure that your code adheres to current web standards.

The webpage is uploaded to a server using FTP (File Transfer Protocol) software after multiple rounds of testing. After the uploading is complete, another test is done before the website becomes live.

Maintenance and Regular Updating

Web design is a never-ending process that necessitates continual upkeep. A website is more of a service than it is a product. The importance of maintaining and upgrading a website cannot be overstated. In this stage, problem-solving and troubleshooting become major priorities.

To stay competitive, it's also important to keep the website up to date with new technologies and industry standards during this era.

Web Technology of the Future

How website technology is used has changed dramatically. Websites have gone a long way from the days when they could only display text to the days when video calls and live streaming are available. Everything these days is done online, from meeting new people to making purchases. Every day, billions of people connect to the Internet. Browsers and apps have evolved to the point where they can detect a user's mood and display suitable material on web pages.

It may become impossible to draw a line between today's web/Internet technologies and everyday life activities in the future. Information technology may interact with our lives in ways that are difficult to envision in the future, according to reports from the technology area. Wearable computers that take technology to a whole new level are already on exhibit. With everything from phones to refrigerators, televisions to autos becoming smart, gadget access to the Internet will become more frictionless in the future.

There may be autos that can alert you to the fact that you are late for school and drive you without your intervention. Refrigerators that detect a lack of vegetables or other food products within them may automatically arrange orders with retailers. There may be televisions that remember and recommend programmes for you to watch, or that record your favourite programme without your intervention while you are away.

Future Predictions of Web Development

The Internet is continually expanding, and technology evolves at a dizzying pace every year, as we all know. Similarly, the web development industry is rapidly evolving. Because it is such a fast-paced growing sector, web development enthusiasts and professionals must predict and learn about the future of web design and development. They risk being stuck in the past if they don't. Let's have a look at some of the predicted web development trends for the future:

Artificial Intelligence (AI)

Artificial intelligence does not require an explanation. Several businesses have already utilised AI to meet their specific demands. Some of them have reaped the rewards as well. The use of computer intelligence rather than human intelligence is a simple definition of AI.

Internet of Things (IoT)

The Internet of things (IoT) is a promising concept that, like Artificial Intelligence, will be omnipresent in the future of web development. The Internet of Things (IoT) is defined as connecting ordinary devices to the Internet in order to derive greater utility from them. This tendency is fueled by the availability and utilisation of cloud connections.

4.0 CONCLUSION

Based on the discussion on the evolution of web technologies, it can be concluded that the development of web technologies will continue and there will be more web developed applications that will be relevant to libraries and information centres.

5.0 SUMMARY

In this section, you have learned the various stages of web technologies evolution, before 1990 and till date. You have also been intimated with the scope of Web development, the current trend, the design, content creation, regular updating, and future development.

SELF ASSESSMENT EXERCISE

Explain what the future holds for web development.

6.0 TUTOR-MARKED ASSIGNMENT

1. Describe the evaluation of the web before 1990
2. Describe the evolution of the web after 1990 to 2000
3. What can you say about the current development of a web application?

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UNIT 2 WEB 1.0, WEB 2.0, AND WEB 3.0 AND LIBRARIES**CONTENTS**

- 1.0 Introduction
- 2.0 Objectives
- 3.0 Main Content
 - 3.1 Web 1.0
 - 3.1.1 Characteristics of Web 1.0
 - 3.1.2 Web 1.0 Limitations
 - 3.2 Web 2.0
 - 3.2.1 Characteristics of Web 2.0
 - 3.2.3 Philosophy of Web 2.0
 - 3.2.4 Challenges of Web 2.0
 - 3.3 Web 3.0
 - 3.3.1 Characteristics of Web 2.0
 - 3.3.2 Challenges Associated with Web 3.0
 - 3.3.3 Comparison among Web 1.0, 2.0, and 3.0.
 - 3.4 Web 4.0
 - 3.4.1 Characteristics of Web 4.0
- 4.0 Conclusion
- 5.0 Summary
- 6.0 Tutor-Marked Assignment (SAEs)
- 7.0 References/Further Reading

1.0 INTRODUCTION

This unit will expose you to Web 1.0, 2.0, and 3.0. You will be intimated with the idea behind each of these Web development. The characteristics of each of them will be discussed along with their associated peculiar challenges.

2.0 OBJECTIVES

By the end of this unit, you will be able to:

- define web 1.0, 2.0, and 3.0.
- describe the rationale behind each of the web development.
- identify the characteristics of each web development.
- discuss the challenges associated with each of the web development.

3.0 MAIN CONTENT

3.1 Web 1.0

In the 1960s, text-only browsers like ELISA were introduced, followed by HTML, which improved the aesthetics of pages, and the first visual browsers like Netscape and InternetExplorer. Web1.0 is the original version of the Internet, often known as the informational web. Websites are the only places where users may read and distribute data. It alludes to Tim Berners Lee's invention of the web and is described as a read-only web in which a small number of producers create web pages (interconnected) and a large number of customers access those web pages through the Internet using a browser. The user can only read the material on these pages; they are unable to interact with it (such as putting up a comment, answering a question, contributing to a post). The read-only web is a term used to describe Web 1.0. Web 1.0 began as a platform for businesses to broadcast content, with users able to only search for and read it. Web1.0 makes use of HTML, HTTP, and URI, which are all basic web technologies. Newer protocols are also in use, such as XML, XHTML, and CSS. Web1.0 makes use of both server-side and client-side scripting, with server-side scripting languages like ASP, PHP, JSP, CGI, and PERL, and client-side scripting languages like JavaScript, VBScript, and Flash. Web 1.0 was a platform for static, well-designed content that included text and images. The read-only web portrayed a world in which data and information were static and displayed, with no interaction between the information and the user and few content creators. It's an information space in which resources are identified by global identifiers called Uniform Resource Identifiers (URIs) (URIs).

The initial generation of the Internet was primarily based on static pages for content delivery. To put it another way, the early Internet enabled us to find and read information. There was very little user interaction or content donation. The situation is depicted in Figure 1.



Web 2.1

Source: Delgado (2021)

3.1.1 Characteristics of Web 1.0

The key properties of web 1.0 are as follows:

They' have only skimmed the text. Create a website and make their information available to everyone at any time. It provides static web pages and employs basic Hypertext Mark-Up Language.

The essential aspects of Web 1.0 are static. Although it contains potentially useful information, there is no compelling reason for a visitor to return to the site in the future. An example is a personal web page that contains information about the site's owner but does not update.

Visitors to these sites can only look at them; they can't edit or add to them. Most organisations have profile pages that visitors can view but not edit, but a wiki allows anybody to visit and edit.

Apps built on the Web 1.0 platform are proprietary: Customers can download but not see or change software applications created by companies that follow the Web 1.0 philosophy.

Web 1.0 Technologies include core web protocols such as HTML, HTTP, and URI. Web 1.0 has the following basic characteristics:

1. There is information that can only be read.
2. Establish a web presence and make their information available to the public at all times.
3. It provides static web pages and employs basic Hypertext Markup Language.

3.1.2 Web 1.0 Limitations

The following are the primary limitations of Web 1.0:

1. Web 1.0 pages are solely readable by humans (web readers) and do not include machine-readable material.
2. The webmaster is exclusively responsible for keeping users up to date and administering the website's content.
3. Lack of dynamic representation, i.e., no online console for performing dynamic events was accessible to collect only static information.

3.2 Web 2.0

Web 2.0 (Fig. 2.2) was coined by Tim O'Reilly in 2004 to define the second generation of Web page models. It is seen as both a new navigational philosophy and a new way to interact with the network. The navigation technique on Web 1.0 was more static, but this new layout encourages active participation. The user no longer has access to data;

instead, he or she is the one who creates it. The phrase "Web 2.0" was coined by O'Reilly Media in October 2004.

Online 2.0, rather than being a fresh web development, was seen as an extension of Web 1.0's key ideas, concepts, and underlying infrastructure. Web 2.0 refers to enhanced collaboration between customers, programmers, service providers, and organisations, allowing them to re-use and contribute information, hence expanding the amount of content exchanged on the Internet among cooperating parties. By facilitating major traits such as participatory, collaborative, and dispersed behaviours, Web 2.0 permits formal and informal venues of daily activities on the web.



Fig. 2.2 Web 2.0

Source: Delgado (2021).

The Philosophy of Web 2.0

Web 2.0 is a concept that refers to six major ideas that have drastically revolutionised how people connect. The following is a summary of these ideas:

- 1) **User Generated Content and Individual Production:** This notion is focused with each individual's contribution to the generation of meaningful knowledge via online technologies such as wikis and blogs.
- 2) **Harness the Power of the Crowd:** This notion is focused with crowdsourcing as well as the re-use of the participants' collective information or contributions.
- 3) **Massive Data:** This notion centred upon user-contributed data that might be obtained in unique ways and pooled in an indirect manner.
- 4) **Participation Architecture:** Participation architecture is a method of building an online technology to make it more user-friendly and useful for collaborative knowledge creation.

- 5) Network Effects: This notion describes how the utility of a system rises as more people join it.
- 6) Openness: This notion emphasises open access, open software, and the reuse and repurposing of freely available information.

3.2.1 Characteristics of Web 2.0

The key features of Web 2.0 sites can be classified into three categories: "relationship" technologies, participatory media, and the wisdom web, a social digital technology.

The importance of a people-centric and participatory web, as well as the ability to read and write on the web, allowing for bi-directional web transactions, are all considered.

Online 2.0 is a web platform that allows users to remove many of the constraints that they had in prior web versions. To put it another way, web2.0 users participate in more activities while exerting less control. Web 2.0 entails a flexible web design, creative reuse, and upgrades, in addition to being a new version of web 1.0. Web 2.0's remarkable qualities include collaborative content production and modification, as well as support for cooperation and assistance in acquiring collective intelligence as compared to Web 1.0. Other features worth mentioning include, but are not limited to:

- Community and social: A consumer's capacity to use the Internet to browse, produce, modify, and share content.
- Technology and architecture: Software and apps that are compatible with a variety of devices and platforms.
- Business and process: Cloud technologies, software, and networked resources.
- Users have total control of their information.

The Internet becomes decentralised for the client, which subsequently becomes a server. This approach encourages user involvement, as seen by the use of social media and the growth of collective intelligence.

The 2.0 methodology has had a tremendous social impact. Users today have greater power than ever before in the network because they may freely express themselves and be heard: have a say on the Internet.

Improves a website's usability and saves the user time.

Language standardisation enables better code reuse and improved interoperability between programmes and computers (software-hardware).

It also makes spotting shortages or new forms of application use, as well as media and content convergence, easier.

The following are the model 2.0's principles:

- The Internet is a platform, and information is what propels it forward.
- Participation moves the impacts of the Internet.
- The network's many properties can be built independently.

3.2.4 Challenges of Web 2.0

If a new technology satisfies public expectations, it may be susceptible to a range of external variables that restrict or limit the flow of technology in providing achievements that may or may not be possible, resulting in a decline of the technology's overall performance.

1. A constant iteration cycle of service changes and updates.
2. Ethical concerns around the development and use of Web 2.0.
3. There is still a lack of interconnectivity and knowledge sharing amongst platforms across community boundaries.

3.3 Web 3.0

Web 3.0 is a new and evolving topic that is tied to the Web 2.0 innovations that came before it. Web 3.0 was first proposed by John Mark of the New York Times in 2006 as the third generation of the Internet. Web 3.0 is sometimes known as "executable web." Web 3.0's fundamental idea is to define data structures and connect them to improve data discovery, automation, integration, and reuse across applications. It can help with data management, mobile Internet accessibility, creativity and invention, the globalisation phenomenon, consumer happiness, and the organisation of social online collaboration.

Web 3.0 is also known as the semantic web. The semantic web was created by Tim Berners-Lee, the architect of the World Wide Web. A dedicated team at the World Wide Web Consortium (W3C) is working to improve, extend, and standardise the system, languages, publications, and tools that have already been created. Web 3.0 is a web in which the concept of a website or webpage is obliterated, data is shared rather than controlled, and services display multiple versions of the same web or data. These services can be apps (like browsers, virtual worlds, or anything else), devices, or something completely different, and they must be focused on context and personalization, which will be accessed via vertical search.

Web3.0 includes a global database as well as a web-oriented architecture, originally known as a web of documents. It focuses on static HTML papers, although dynamically produced sites and other formats should

follow the same conceptual layout ideas if practical, and links should be across or inside publications. The network of documents was designed with people in mind, with primary objects being documents and secondary objects being document links (or parts of them). The semantics of content and links are assumed, and the degree of structure between items is low.

Web 3.0 is a web in which the concept of a website or webpage is no longer relevant, data is shared rather than owned, and services display multiple versions of the same web and data. These services can be apps (like browsers, virtual worlds, or anything else), devices, or something completely different, and they must be focused on context and personalization, which will be accessed via vertical search. One may argue that the Google-Sun Microsystems collaboration on a web-based operating system for word processing and spreadsheets is a predecessor of this trend.

Web 3.0 is also known as the semantic web. The semantic web was created by Tim Berners-Lee, the architect of the World Wide Web. A dedicated team at the World Wide Web Consortium (W3C) is working to expand, extend, and standardise the system, and languages, publications, and tools have already been created. A semantic web can present data in a way that a computer can understand. The semantic web's main goal is to make the Internet readable by both machines and humans.

The current web is a web of papers that, like a global file system, comprises the following major issues: The network of documents was designed with people in mind, with primary objects being documents and secondary objects being document links (or parts of them). The semantics of content and links are assumed, and the degree of structure between items is low.

3.3.1 Characteristics of Web 3.0

Metaverse is the merging of the virtual and physical worlds. Information can be accessed at any time and from any location. The widespread usage of smartphones and cloud applications is largely to blame. It's a web development layer that includes open video 3D simulations of TV quality, augmented reality, human-constructed semantic standards, and ubiquitous broad-band, wireless, and sensor technologies.

The following are the essential aspects of Web 3.0 that appear in all of the observations:

- i. The development of new programming languages that can categorise and manipulate data, allowing machines to comprehend data and the sentences that describe it.

- ii. The capacity to extract contextual information from a web search and organise it into hierarchical groups based on similar traits for quick and precise retrieval.
- iii. The ability to obtain data from a larger and more diversified range of sources, including previously walled apps.
- iv. The ability of any device or machine to create and distribute any type of data over any type of network.

The following are some of the other significant aspects of Web 3.0:

1. The Software-as-a-Service (SaaS) business model.
2. Platform for Open Source Software.
3. A distributed database, often known as "The World Wide Database."
5. Personalization of the web.
6. Pooling of Resources
7. The Internet of Things.

3.3.3 Web 3.0 Challenges

Web 3.0 has its peculiar challenges. These are:

1. Vastness - The World Wide Web has billions of pages. If all semantically duplicated phrases have not yet been deleted, data redundancy may occur.
2. Ambiguity - This is caused by ambiguous user questions, content provider concepts, matching query terms to provider terms, and attempting to combine knowledge bases with overlapping but considerably separate concepts.
3. Inconsistency- These are logical inconsistencies that will surely emerge during the building of large ontologies, as well as when multiple ontologies are combined.
4. Deceit - When the information's producer intentionally misleads the information's consumer, this is called deceit.

3.3.4 Comparison of Web 1.0, 2.0, and 3.0

S/N	Web 1.0	Web 2.0	Web 3.0
	1996	2006	2016
	The Web	The Social Web	The Semantic Web
	Tim Berners Lee	Tim O'Reilly	Sir Tim Berners Lee
	Read only web	Read and write web	Read, write and execute web
	Information sharing	Interaction	Immersion
	Million of users	Billion of users	Trillion of users
	Ecosystem	Participation	Understanding self
	Connect information	Connect information	Connect knowledge

	Brain and Eyes (= Information)	Brain, Eyes, Ears, Voice and Heart (= Passion)	Brain, Eyes, Ears, Voice, Heart, Arms and Legs (= Freedom)
	The Hypertext/CGI Web. (the basics)	The Community Web (for people: apps/sites connecting them).	The Semantic Web (for machines).
	Pushed web, text/graphics based flash	Wikis, video, podcasts, shading, personal publishing, and 2D portals are all examples of two-way web pages.	All media flows in and out of virtual Web worlds, including 3D portals, avatar representation, interoperable profits, multi-user virtual environments (MUVEs), integrated gaming, education, and business.
	Companies publish content that people consume (e.g. CNN)	People create material for other people to consume, and companies provide platforms that allow people to create content for other people to consume (e.g. Flickr, YouTube, Adsense, Wikipedia, Blogger, MySpace, RSS, Digg)	People create applications that other people can interact with, and businesses create platforms that allow people to publish services based on social connections or unique content (e.g., Facebook, Google Maps, My Yahoo!).
	In Web 1.0 search engines retrieve macro contents. Search is very fast but many times results are inaccurate or more than users can chew.	Web 2.0 search engines look for tags that contain microcontent (Furl even retrieves tags with macro contents). Tagging is a time-consuming, manual operation that covers only a small portion of the Internet. Everything in Web 2.0 is tagged: images, links, events, news, blogs, audio, video, and so on. Even	In Web 3.0, search engines should be able to obtain microcontent texts that have been automatically labelled. This entails converting billions of big Web 1.0 material into micro content. Because tagging can eliminate some of the uncertainty that homonyms and synonyms put into the search process, the result could be a more specific search.

		micro content texts are retrieved by Google Base.	
	Web 1.0 was all about static material and one-way content distribution, with no actual interaction between readers, publishers, or each other.	Through social networking, blogging, wikis, tagging, user created material, and video, Web 2.0 is more about two-way communication.	Web 3.0 is strangely undefinable. The web and AI are learning what you want and providing you with a customised web experience.
	When the Internet was first being developed, it was known as web 1.0.	Online 2.0 introduces new technologies that enable for far more complex user engagement with web pages - citizen journalism, social networks, and Wikis are all examples.	Web 3.0 is thought to represent the future, in which the web becomes more interactive with users, resulting in a form of artificial intelligence web.
	Personal web sites	Blog	Semantic Blogs: SemiBlog, Haystack, Semblog, Structured Blogging
	Semantic Blogs: SemiBlog, Haystack, Semblog, Structured Blogging	Wikis, Wikipedia	Semantic Wikis: Semantic MediaWiki, SemperWiki, Platypus, dbpedia, Rhizome
	AltaVista, Google	Google personalized, DumpFind, Hakia	Semantic Search: SWSE, Swoogle, Intellidimension
	Citeseer, Project Gutenberg	Google scholar, Book search	Semantic Digital Libraries: JeromDI, BRICKS, Longwell
	Message boards	Community portals	Semantic Forums and community portals: SIOC, OpenLink DataSpaces
	Buddy Lists, Address book	Online social networks	Semantic Social Networks: FOAF, People Aggregator
			Semantic Social Information Spaces: Nepomuk, Gnowsis

Sources: Naik and Shivalingaiah (2009).

3.4 Web 4.0

Ultra-Intelligent Electronic Agents, Symbiotic Webs, and Ubiquitous Webs are the three categories that make up Web 4.0. The relationship between humans and machines in symbiosis inspired the symbiotic network. Web 4.0 interfaces that are as powerful as a human brain, telecommunications developments, nanotechnology advancements around the world, and controlled interfaces are all on the horizon. To put it another way, machines would be capable of comprehending online material and reacting in the form of executing and determining what to execute first in order to load websites rapidly, with higher quality and speed, and design more commanding interfaces. Web 4.0 will be a concurrency-aware read-write web.

In important communities such as industry, politics, and society, it guarantees global transparency, governance, distribution, participation, and collaboration. WebOS will be a middleware that will become an operating system in the future. WebOS will work in the same way as the human brain, meaning a massive network of highly intelligent connections.

3.4.1 Characteristics of Web 4.0

Various qualities are linked with Web 4.0. These include, but are not limited to, the following:

- i. The symbiotic web is a term used to describe Web 4.0. The symbiotic web's goal is to create a symbiotic relationship between man and machine. The distinction between man and machine will become increasingly blurred.
- ii. As a result, this online environment must be an "always-on" connected world. On the Internet, users can meet.
- iii. The new web is a Web OS - the Internet as a whole is one operating system with data flowing from one machine to the next.
- iv. In the background, self-learning systems use artificial intelligence to learn to understand you.
- v. It communicates with users in the same way as people communicate with one another.
- vi. Web 4.0 is an open, linked, and intelligent Internet.
- vii. Web 4 is faster and more reliable than ever before.
- viii. Web 4.0's criteria include ubiquity, identification, and connection. The new web has yet to be properly defined.

4.0 CONCLUSION

This unit has exposed you to the meaning of Web 1.0, 2.0, and 3.0, and also 4.0. The characteristics peculiar to each of them have been discussed along with the associated challenges. The unit has also introduced you to the comparison of the first three Web stages leaving the fourth one because there is currently no acceptable definition, and because it is still emerging.

5.0 SUMMARY

From the discussion in this unit, you have learned about the various types of web stages Web 1.0, 2.0, and 3.0, and also 4.0. You have also learned about the characteristics of each of the web stages along with the associated challenges. Moreover, you have also learned the differences among the first three Web stages.

SELF ASSESSMENT EXERCISE

What do you understand by the terms web 1.0, 2.0, and 3.0?

6.0 TUTOR-MARKED ASSIGNMENT

1. What are the characteristics behind each of the web development?
2. What are the challenges associated with each of the web development?
3. What is Web 4.0, and its associated characteristics?
4. What differences can you draw among Web 1.0, 2.0, and 3.0?

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UNIT 3 WEB-BASED LIBRARY SERVICES

CONTENTS

- 1.0 Introduction
- 2.0 Objectives
- 3.0 Main Content
 - 3.1 The Concepts of Web-based Library Services
 - 3.1.1 Types of Library Web-based Services
 - 3.1.2 Rationale behind Library Web-based Services
 - 3.1.3 Advantages and Disadvantages of Web-based Library Services
- 4.0 Conclusion
- 5.0 Summary
- 6.0 Tutor-Marked Assignment (SAEs)
- 7.0 References/Further Reading

1.0 INTRODUCTION

This unit will introduce you to the notion of web-based library services and what they include. In this course, you'll also learn about the different types of web-based library services available, as well as the reasoning behind the library's decision to provide these services. Furthermore, the course will inform you of the benefits and drawbacks of using web-based library services.

2.0 OBJECTIVES

By the end of this unit, you will be able to:

- Define web-based library services and list the many types of web-based library services that are available.
- Explain why you think web-based library services are a good idea.
- Discuss the benefits and drawbacks of using a web-based library service.

3.0 MAIN CONTENT

3.1 Concept of Web-based Library Services

Web-based library services are those that are delivered through a website that is accessible over the Internet and provides integrated access to different databases. Web-based library services are those that use the Internet as a medium and a library website as a gateway, all with the assistance of an integrated library management system. It's also known as an electronic information service that allows customers to submit

questions via e-mail or web forms. Users can access information on their own time via web-based library services, saving money and time while also providing new options for answering reference inquiries. These services are not limited to typical business hours and can be offered at any time.

The library portal, which is a unique sort of access to web-based library materials, is where most web-based library services are given. It enables one-click access to the metadata of a library's numerous databases. It brings together a number of useful information resources on a single page, allowing users to tailor their information resources by selecting and viewing content that is relevant to them.

mLibrary webpages, web OPACs, Bulletin Board Services, Ask-a-Librarian services, web forms, digital reference services, online document delivery, interlibrary loan, online help, and information skill tutorials, online current awareness bulletins, e-mail based services, online reference services, and electronic journals are some of the most commonly used web-based library services (UGC-INFONET digital library).

3.1.1 Types of Library Web-based Services

There are various types of library web-based services. Some of these services are identified and discussed in this section.

1. **Ask-A-Librarian:** Ask-A-Librarian is one of the services accessible. Are a web-based question-and-answer service that connects customers with subject-matter experts with the ability to conduct precise queries. Users can send their inquiries to the service using a web form or an e-mail address. After a service has read a question, it is assigned to a single expert who responds with either factual information or a list of information resources. After a certain length of time has passed, the responses are either sent to the user or posted on the web for the user to access.
2. **Bulletin Board:** A bulletin board is a type of electronic bulletin board where users can submit comments and articles on a shared topic, theme, or interest." It allows users to dial in and leave or retrieve messages. The message can be delivered to the entire bulletin board or to a specific subset of users. Several libraries are promoting their Internet-based library services via bulletin boards. The bulletin board system can also be used to solicit suggestions for library events and services through an interactive interface. As an associate in the interface, it can also be used to deliver library services.

3. **Library Webpage Service:** Library webpages provide search engines for finding information about the library. It combines metadata from a library's multiple databases, e-journals, and catalogue to provide detailed information about the library, as well as access to all computer-based services it offers, such as library collection, library timing, library working hours, list of subscribed online journals, CAS/SDI/Reference services, popular documents based on circulations, reservations, user feedback, and so on. The library's website enables it to immediately disseminate its services and capabilities to the global academic community.
4. **Online Database Access:** Using web-based computer network technologies, several publishers now provide native access to their databases. A few examples include Silver Platter, Cambridge Scientific Abstracts, and the Institute for Scientific Information. Journal publishers, such as Elsevier, have begun to provide a similar scenario for their electronic journals. Large R&D libraries can benefit from these improvements by allowing users to access crucial databases and electronic publications from their desktops. In addition to databases acquired elsewhere, libraries have their own collection of ROM databases stored on their CD server/tower. Online database vendors include Dialog, Lexis-Nexis, and ERIC.
5. **Web-Based User Education:** Teaching aids and guidelines on the Internet because they're easily updated, viewed, and printed on demand, they're all over the Internet. Users benefit from a high level of involvement and flexibility with web-based user education. Web-based user education will be used on library websites to provide instruction to users in the following areas:
 - Instructions on subject search training, Boolean operators, and utilising search engines to find Internet resources.
 - Basic library skills, as well as a dictionary of library terms; using the Library OPAC/Web OPAC to access books, magazines, and other library materials; searching fixed storage and Internet-based databases and other electronic resources; and,
6. **Electronic Selective Dissemination of information:** The majority of the R&D and academic institute's scientists and faculty members were unable to personally visit the library due to the institute's rigorous teaching and research schedule. An electronic SDI service was created to give current material of relevance to faculty members directly to their desktops. Users' Research Interest Profiles (RIPs) are searched in batch mode on the most recent updates of EDBs every month through this service, and the results are e-mailed to the appropriate academic members.

7. As a result, this service influenced not just the purchase of information sources, but also the use of other library services such as document delivery, resource sharing, and reprint purchasing. To promote E-SDI services on the web, libraries should create a link from their existing library environment (e.g., the E-SDI page can be accessed by clicking the SDI siblink from the library main page's information service link), and the various tasks that are performed to provide the services can be tracked by hyper-navigating the active link. A broad definition of E-SDI can be derived from H.P. Luhn's original definition of SDI, which was developed in 1958 and entails the matching of user-profiles with new materials, communication of user comments, and, as a result, alteration of user profiles. Further links discuss the various steps involved in delivering the output, how the RIPs are built, answers to commonly asked questions, user feedback, statistical information about the service, and a graphical representation of the entire activity.
8. E-mail: E-mail is a good web-based medium that librarians can utilise for a variety of purposes, including supplying web-based services such as electronic document delivery service, table of contents, RSS feeds, and so on. It provides scientists with a great current awareness service. It's a popular service among publishers and researchers.
9. E-reference services: The library's e-reference service is one of the most significant services for finding information. It is a personalised service that provides one-on-one assistance in finding information on a variety of topics, regardless of the library's size or collection. The majority of traditional libraries have placed a strong emphasis on information access within the library's physical limits. However, due to the emergence of the web-based library, web-based reference services have gained a lot of appeal among library and information workers. The library's reference services are available 24 hours a day, 7 days a week, and can be accessed from any location at any time, even the kitchen table. An illustration of a reference <http://www.members.eb.com/> Britannica Online Dictionary on the Internet <http://www.dictionary.com> Answers is provided by the website [dictionary.com](http://www.dictionary.com), which uses Webster's dictionary. For library and information professionals, this site is a useful and efficient reference tool. It has a lot of features, such as the Ask Dictionary, which allows you to consult Webster's Dictionary to find out the meaning of words, adjectives, adverbs, and other terms. Community Service: -provides services to the online community of readers, such as delivering online magazines, newspapers, classic texts, and so on. You can see or

visit <http://www.atlapedia.com/index.html> for online maps and atlases. Full-color physical, political, and political maps, as well as vital data and statistics on countries around the world, are all available on Matapedia Online. [http://www. Encyclopedia.com](http://www.Encyclopedia.com) is an online encyclopaedia. Informatics Corporation established it to provide Internet users with a convenient one-stop-shop to start their inquiry and get answers to fundamental questions.

10. **Instant Messaging Reference Service:** It is an Internet-based real-time electronic consultation and reference service provided by academic libraries. It is text-based communication between two or more people that allows patrons to communicate with librarians in real time, much like they would in a face-to-face reference setting. The software includes features like as co-browsing, file sharing, screen capturing, and data mining of previous transcripts. Libraries are already using 24x7x265 technology to provide collaborative live reference services.

3.1.2 Rationale behind Library Web-based Services

Web-based services are established in libraries due to the following reasons:

- i. The need to keep users and their accessible information sources properly matched at all times;
- ii. To enable timely and appropriate delivery of information sources to users;
- iii. To ensure that the information provided is of high quality, accurate, and appropriate;
- iv. To assist the user in interpreting the materials, if necessary;
- v. To promote users' awareness of new services and information sources as they develop;

Users will receive individualised advice and help as they improve their information research and application skills.

3.1.3 Advantages and Disadvantages of Web-based Library Services

Web-based library services have some associated advantages and disadvantages. These are discussed as follows.

Advantages

Following are the advantages of web-based services:

- i. It saves users valuable time.
- ii. Web-based library services can assist a big number of users at the same time.
- iii. Less reliant on library employees for information

- iv. No need for a big number of library staff to carry out library duties and services.
- v. Information is readily available in a variety of locations and media.
- vi. Budget cuts at the library
- vii. Instantly meet information requirements
- viii. Operating costs are kept to a minimum.
- ix. It can't be stolen or misplaced.
- x. Saves a lot of storage space
- xi. Immediate issue receipt
- xii. Quick publishing

On the other hand, there are associated disadvantages of web-based library services. These are:

- i. A vast volume of data is generated every minute.
- ii. There is no order or rules placed on the development, distribution, access, or use of this material at this time.
- iii. There is no fully comprehensive record of the various documents at this time.
- v. Utilise is restricted by copyright laws and licencing agreements.
- iv. Requires some training for users to use special equipment.
- vi. Right now, access is unreliable (URL problems, Internet connection problems)
- vii. The format is still being worked on.

4.0 CONCLUSION

This course has exposed you to the meaning and concept of web-based library services. The many types of web-based library services, the reasons for providing these services in the library, and the benefits and cons of doing so were also covered in the course.

5.0 SUMMARY

Through the discussion in this unit, you learned about the meaning of web-based library services, the types of web-based library services, the justification for providing the services in the library, and the benefits and drawbacks of web-based library services.

SELF ASSESSMENT EXERCISE

Describe the benefits and drawbacks of using a web-based library service.

6.0 TUTOR-MARKED ASSIGNMENT

- 1. What do you mean when you say "web-based library services"?
- 2. Identify and define the various types of web-based library services accessible.
- 3. Explain why you think web-based library services are a good idea.

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MODULE 3: OPEN SOURCE SOFTWARE

In this module, you will be introduced to the concept of open-source software, the types of library open-source software, initiatives on open-source software in libraries, and the challenges of library open-source software.

Unit 1: The Definition and Concept of Open Source Software

Unit 2: Different Initiatives on Open Source Software in Libraries

UNIT 1: THE DEFINITION AND CONCEPT OF OPEN SOURCE SOFTWARE

CONTENTS

- 1.0 Introduction
- 2.0 Objectives
- 3.0 Main Content
 - 3.1 Concept of Open Source Software
 - 3.1.1 Benefits of Open Source Software in Libraries
 - 3.1.2 Characteristics of Open Source Software
 - 3.1.3 Types of Library Open Source Software
 - 3.1.4 Reasons for Libraries Use of Free Open Source Library Software
 - 3.1.5 Challenges of Using Open Software in Libraries
- 4.0 Conclusion
- 5.0 Summary
- 6.0 Tutor-Marked Assignment (SAEs)
- 7.0 References/Further Reading

1.0 Introduction

In this unit, you will be exposed to the concept of Open Software. The unit will also feature a discussion on the benefits of open-source software in libraries, the characteristics, and the types of library open-source software. The discussion in the unit will also include the challenges of using open source in libraries.

2.0 Objectives

By the end of this unit, you will be able to:

- Describe open source software
- Identify library open source software
- Describe the benefit of library open source software
- Explain the characteristics of library open source
- Identify the type of library open-source software.
- Describe the challenges associated with the use of an open-source in libraries.

3.0 MAIN CONTENT

3.1 Concept of Open Source Software

Anyone can run, copy, distribute, study, modify, share, and improve open-source software for any reason. Anyone can create new versions of open-source software, port them to new operating systems and chip architectures, distribute them, and even sell them. Open source aims to make a product more understandable, flexible, repeatable, dependable, or easily available while remaining commercial.

Open-source software is taking over the world, affecting every aspect of information technology. In the last five years, the adoption of open-source software has increased dramatically, and it has become a global trend. Operating systems, programmes, libraries, databases, cloud computing, big data, and other applications now use open code. In today's world of information technology, open source solutions give great prospects for organisations that provide Mobile App Development & Services, as well as their teams. In terms of price, quality, reliability, and customizability, they surpass proprietary software, and open-source software still has a number of advantages.

3.1.1 Benefits of Open Source Software in Libraries

Quality and reliability: A well-developed set of subroutines and functions is typical of open-source libraries. Because of their technical superiority, many developers and enterprises prefer open-source libraries and applications. Open code attracts bright brains in the technological realm. Closed-source software is developed by a small group of specialists, but open-source software can be created by thousands of experienced and motivated app and web developers.

Furthermore, all users of the best open-source software have access to the source code and debugging tools. Anyone can evaluate and rectify flaws, offer updates, and expand the library's functional set.

Security and Stability: OSS is widely regarded as having a high level of security. It is inextricably linked to the availability of source code. As a result, open-source development libraries can be constantly monitored. Because faults and vulnerabilities are frequently fixed quickly by the developer community, the product's quality is determined. Furthermore, proponents of the open-source code concept characterize open source software as software that is virtually immune to viral attacks. Even, if there is a threat, because of unfettered access, it may be eliminated in the quickest possible time. If one person is unable to do this work, debugging can be accomplished through collaborative efforts.

Adaptability and customization: Unlike restricted libraries, the OS library allows you to modify code more easily to meet your specific needs. Because the source code is open to all interested parties, companies can use all of the library's present capabilities for free and add more functionalities to their software development projects. The ability to customise and adapt open-source libraries and software is one of the most compelling reasons to use them.

Freedom and flexibility: Another advantage of open-source software is its adaptability. Because this code isn't tied to a single developer, it can perform a wide range of tasks. Users can select only the functions that match their needs or develop additional functions by altering the source code, as long as the open-source software licence allows it.

Cooperation and community: The development of collaboration and the building of a community of technology aficionados is encouraged by OSS. Developers share their expertise and information with one another. Companies profit from increased product focus, and they can even publish a list of open-source software. They are also working to update, modernise, and improve these goods. As can be shown, employing an open-source library is far superior, especially when developing an open-source project. Aside from being free, a library like this can considerably improve the competitiveness of your final product.

Lower hardware and software costs: In most cases, open source solutions do not require any licencing fees. The natural conclusion is that no maintenance fees will be charged. Media, documentation, and, if necessary, assistance are the sole costs. In general, Linux and open-source systems are small and portable, requiring less hardware power to do the same functions as traditional servers or workstations (Windows, Solaris). As a result, you may be able to get away with using older or less expensive technology.

Simplified license management: You only need to download the software once, and then you can install it as many times and in as many different locations as you choose. There's no need to count, manage, or verify licence compliance.

Scaling/consolidation potential: Once again, Linux and open source software and services offer a lot of scalability. Organizations can scale up for new growth or consolidate to do more with less resources owing to a variety of load balancing, clustering, and open source database and e-mail applications.

Support:Support for open source solutions is frequently better than for proprietary solutions. To begin with, open-source assistance is freely

available and accessible via the Internet via the online community. Second, many software businesses, such as Liblime, are now actively supporting open source with both free online and paid support.

Escape of vendor lock-in: For all IT administrators, vendor lock-in is a source of frustration. In addition to ongoing licence fees, there is a lack of portability and the inability to adapt the software to meet specific needs. The fact that open source exists is a statement of freedom of choice.

Unified management: CIM (Common Information Model) and WBEM (Web-Based Enterprise Management) are open source technologies that integrate or combine server, service, application, and workstation management to provide sophisticated administration.

Quality software: Based on data and research, open source software appears to be advantageous. The peer-review process and community standards, as well as the fact that source code is open to the public, tend to promote design and coding efficiency.

3.1.2 Characteristics of Open Source Software

Although open-source software does not earn a lot of money, it is nonetheless highly valued. These are capabilities that go beyond monetization and, in many cases, aren't even available in proprietary software. These characteristics are:

1. **Freedom:** The term "free and open-source software" refers to more than just the absence of a price tag. Users of open-source software have the flexibility to use it in anyway they want. They can use the software for any reason they choose, whether it's on the cloud or in an on-premise data centre. They're free to change and adapt the software to their own needs, and they're also free in the sense that they're not tied to a single vendor or system.
2. **Innovation:** The community has unrestricted flexibility to interact, create, and diversify as a result of open-source independence. No proprietary software could ever approach this level of software innovation in terms of speed, scale, or diversity. Communities are not only permitted, but also encouraged, to grow and improve existing open-source software, resulting in new, better, and more precise software solutions.
3. **Integration:** When it comes to choosing software, ease of interaction with existing infrastructure is critical, and open-source software excels in this regard. This advantage, according to many businesses, often outweighs the low cost and even performance speed.
4. **Continuity:** It's evolved into the finest option for businesses looking to keep up with or remain ahead of the competition, and

it's only getting better. With the ability to fork and develop open-source projects to meet specific needs, you can rest assured that the software you require will always be available.

3.1.3 Types of Library Open Source Software

System of Integrated Libraries (Koha) Koha is a free, open-source ILS (integrated library system) that is used by libraries all around the world. An ILS is a system for keeping track of a library's operations, such as payroll, expenses, purchases, and, most importantly, keeping track of the various media checked out by the librarian's patrons. Because many smaller libraries cannot afford to purchase, install, and maintain an ILS, Koha is a good alternative. The OPAC (open public access catalogue) interface is used by Koha, a library information system. Furthermore, libraries can get technical help from whoever they wish because Koha has no vendor lock-in.

DSpace: Dspace is a cutting-edge digital institutional repository that digitally collects, preserves, indexes, maintains, and redistributes the intellectual output of a university's research faculty. It organises and distributes digital objects, which are made up of digital files, and allows for the development, indexing, and searching of associated metadata in order to locate and retrieve them. DSpace was designed and developed in collaboration between the Massachusetts Institute of Technology (MIT) Libraries and Hewlett-Packard (HP). DSpace was designed to be an open-source platform that institutions and organisations with limited resources could use. Its goal is to help the repository's digital content be preserved for the long term. It's also designed to make submitting a breeze. DSpace allows users to submit, manage, and access digital content.

Greenstone Digital Library Software: Greenstone is a free and open-source digital library software that allows you to create and exhibit information collections. It builds collections with capabilities like full-text searching and metadata-based browsing that are beautiful and simple to use. They are also simple to maintain and can be built and augmented fully autonomously. Different document and metadata types can be accepted by software "plugins," making the system extensible. The purpose of the Greenstone programme is to allow users to establish their own digital libraries, particularly at universities, libraries, and other public-sector organisations.

NewGenLib: (New Generation Library) is an integrated library automation and networking solution created by Verus Solutions Pvt Ltd and The Kesavan Institute of Information and Knowledge Management in India. In March 2005, NewGenLib version 1.0 was released, followed by versions 2.0 and 2.1. On January 9, 2008, Verus Solutions Pvt Ltd of

Hyderabad, India, released NewGenLib Open Source Software under the GNU GPL License.

Fedora: Fedora open-source software provides a flexible service-oriented architecture for organising and distributing digital content. At its foundation is a complex digital object model that supports several views of each digital object as well as relationships between them. Remote content can be referenced and locally controlled content can be contained in digital objects. It's possible to create dynamic views by associating web services with objects. A repository architecture allows for a variety of administrative functions as well as the storage of digital goods. At the object and repository levels, all Fedora functionalities are available via web services. These functions can be protected with fine-grained access control settings. Fedora appeals to a wide spectrum of people due to its unique set of traits. Fedora-based applications include library collections management, multimedia authoring systems, archive repositories, institutional repositories, and digital libraries for education, to name a few.

Evergreen: Evergreen ILS is another option when looking into open source ILS options. Equinox Software's Evergreen enterprise-level ILS solution is designed to support the workload of large libraries in a fault-tolerant system. It, too, adheres to industry standards and use the OPAC interface. It includes a variety of features, including flexible administration, work-flow adjustment, and adaptable programming interfaces, and it can benefit from any community improvements because it is open source.

EPrints: Eprints is an open source software tool for generating open access repositories that comply with the Open Archives Initiative Protocol for Metadata Harvesting. It has many of the same features as Document Management systems, but it's specifically developed for institutional archives and scholarly journals. EPrints was developed in the School of Electronics and Computer Science at the University of Southampton and is released under the GNU General Public License.

Ubuntu: Ubuntu is the most widely used Linux-based operating system. (Ubuntu is a Linux variation; Linux is an open-source alternative to Microsoft's Windows operating system.) Ubuntu is an ideal choice for libraries wanting to upgrade older computers running obsolete Windows or for large-scale computer purchases requiring a new operating system. Many libraries have computers available for users to use for Internet browsing, but that is their main use. Why pay for all the goodies on Windows when all you want to do is get online? You may be apprehensive of a new operating system at first, but like anything else, the hardest part is getting started. There's also a lot of Ubuntu installation aid available.

Drupal: Drupal is an open-source web publishing platform that allows a single user or a group of users to easily publish, manage, and organise a wide variety of content on a website. Drupal has been used to power a wide range of websites, including community web portals, discussion forums, corporate websites, intranet applications, personal websites or blogs, e-commerce applications, resource directories, and social networking sites, by tens of thousands of people and organisations.

Wordpress: Only a few years ago, Wordpress was a simple, free, open-source blogging solution; today, it is a fantastic alternative for building a website from the bottom up. The Wordpress community has exploded, with hundreds of users and programmers creating custom themes and plug-ins to drastically alter the appearance and functionality of the software, which is also completely free to use (and easy to install). The user-friendly interface and content management system are the most essential features of the software. Using the website's aesthetically rich editor, anyone can publish content and photos. Among the other features are several authors (each with their own log-in), built-in RSS (Really Simple Syndication) technology to keep subscribers updated, and a comment system that allows users to interact with the site's content. Libraries are an excellent way to interact with patrons, employees, and others.

Other libraries open-source software includes but is not limited to:

OpenBiblio: One of the most widely used open-source library management systems is OpenBiblio. This open-source LMS is primarily used in tiny libraries. OpenBiblio (Fig. 2.3) has significant language support for a variety of languages. It provides excellent circulation for its employees, allowing them to inspect different items and gain new customers. Staff can use their catalogueuing function to create and delete records, as well as upload MARCXML and MARC records. This free library management system makes use of an OPAC, or online public access catalogueue. It's a public catalogueue where patrons can look for the books they're looking for. Its administration option comprises software management and configuration. This entails overseeing the personnel, library, fines, materials, and other website configurations. In the form of reports, get all the information you need from your database. This includes obtaining information such as overdue letters and other statistics on library materials. To get this information, librarians and users do not need to learn any unique language.

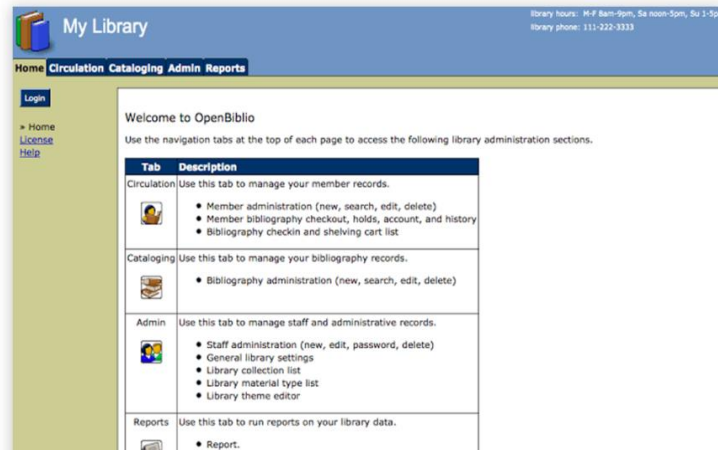


Fig. 2.3: OpenBiblio
Source: Riya Basu (2019).

OPALS: OPALS is an open-source automated library management system that can be used in a variety of settings. OPALS (Fig. 2.4), is used by over 2000 libraries all around the world to manage their resources. OPALS can be accessed online by an unlimited number of library members at the same time. Multiple options and fields for classifying library materials; acquisition management and circular management; comprehensive indexing feature that allows you to quickly search for the library resources you need; and, because it is cloud-based, users can get real-time reports.



Fig. 2.4 OPALS
Source: Riya Basu (2019).

INVENIO: Invenio is an open-source library software developed by a heterogeneous group of universities. It's a one-stop shop for managing research data, managing institutional repositories, and managing assets. It is a free library management system licenced under the MIT licence; it is an integrated library management system that covers circulation, catalogueuing, and acquisitions; and it has a comprehensive back-office module with a modern user interface. There is also strong support for users' APIs, authentication, and storage systems; libraries and users can find a toolbox to create applications like enterprise search, digital repositories, discovery mechanisms, and data management systems; and

there is a toolbox to create applications like enterprise search, digital repositories, discovery mechanisms, and data management systems; and there is a toolbox to create applications like enterprise search, digital repositories, discovery mechanisms, and data management systems.

CODEACHI: This is open source library administration software that may be used to manage and administer your library's books. Entering details for new books and monitoring book circulation is a simple using Codeachi's digital catalogueue. Users can maintain all library assets, enrol library users and staff in one platform, track different user activities, and automatically calculate the amount of fine the user must pay; generate up to 50 types of reports; easy data migration using a CSV sheet and excel; and a user-friendly interface with barcode and QR facility. The software is compatible with Windows 7 and later versions.

BIBLIOQ: Libraries of various sizes, whether small, medium, or large, use Biblioteq. It's a professional library management system that works with a variety of QT-compatible platforms. BiblioteQ may search for papers, movies, and books, among other things. The software's features include support for ARM architecture, the ability to drag and drop cover images as needed, a customised display facility using this open-source management software, and the ability to personalise data connected to individual things. The software also has comprehensive and localised search capabilities; it can simply export and attach files; it can retrieve cover images for every book from Amazon; it supports Z39.50 and SRU; users may make data queries and send or receive notifications about unavailable items.

3.1.4 Reasons for Libraries Use of Free Open Source Library Software

Free library management systems, often known as LMS, are used to help people work more efficiently and accomplish more in less time. Library Management of Software satisfies the needs of tech-savvy people while also benefiting the academic community. The LMS welcomes digitization and does away with the need for human oversight. Let's have a look at some of the benefits of using digital library software.

- i. **Records Management:** Only authorised individuals have access to all records about books issued. You can view the availability of each book and manage return deadlines. This software can also keep track of the penalties that students owe.
- ii. **Time and Cost-Effective:** By eliminating paper-based activities, open-source library management software lowers operating expenses while also saving time. The library management system makes everything easier by keeping records and information online.

- iii. **Reliable and secure:** Manual labour is prone to mistakes. The paper-based method can potentially result in data loss. However, if you utilise a library management system, you will be using a secure and trustworthy programme that eliminates the possibility of human error.
- iv. **Increased Employee Productivity:** Using open source library management software increased the productivity of those in charge of the library. Authorized individuals can preserve and maintain accurate records and facts about books, such as the edition, number of copies, return date, author, issue date, and fines for late book returns.
- v. **Simplicity and Ease of Use:** Open source library management software has a very user-friendly interface. Most LMS software has a basic and user-friendly user interface. As a result, there is no need to hire additional IT support to use the product.

3.1.5 Challenges of Using Open Software in Libraries

As good and beneficial as open-source software is to the libraries and information centres, there are some associated challenges. These are discussed in turn as follows:

Lack of Skills: To properly execute and integrate open-source software, skilled individuals are necessary. Another important risk of implementing open-source software in the library context is a lack of software technology skills among library workers. Having to rely on IT specialists or qualified people increases library costs and negates the aim of OSS activities.

Training: Adequate training is essential for the open-source software movement to prosper among working professionals. One of the most dangerous problems is how to train library personnel on how to use open source software's operational modules. There are also new version updates included. Continuous training assistance is required to cope with new versions and technology.

Up-gradation: Upgrading to the new version from the existing source is difficult. The danger of data migration and compatibility is significant at this level. For example, improved new versions of 'Koha' are released on a regular basis, and they are difficult to replace with the prior version unless the librarian is familiar with them.

Installation and Customisation: Because librarians may lack the necessary IT skills to install and customise software, the process of implementation becomes more difficult. Basic IT expertise may not be sufficient for

customising open source software, which necessitates the intervention of programming and IT experts.

Support: Another important risk in an open source software environment is the lack of developer or vendor support for resolving issues at the installation, implementation, and post-implementation levels. Some commercial developers and vendors are willing to help, but the fees are excessive. Commercial suppliers like as Nucsoft OSS laboratories in Bangalore, Informatics India Pvt. Ltd. in Bangalore, and DELNET in New Delhi, for example, provide KOHA support across India. Informatics India Pvt. Ltd. costs rupees 50,000 per year as a service price for KOHA installation and minimal customization, as well as cloud hosting. The cost of software customisation varies depending on the client's needs.

Sustainability: It is neither straightforward nor easy to predict future progress in open-source software. The long-term viability of OSS and its future is not assured; anything can happen at any time, such as software crashes, failures, or software flaws affecting the programme. The main danger is a lack of long-term IT support.

Security: Security Precautions OSS adoption and implementation in libraries is a large and risky effort. Librarians must be knowledgeable of the current system, as well as the ideal state and what the library system seeks. The following are some of the security measures that are required for OSS deployment.

Cost involvement: Manpower, training, and hardware installation are all included in the price. For a seamless project implementation process, real cost involvement must be measured and planned.

Compatibility Test: Before implementing new software, it is necessary to conduct a compatibility test. It is vital to test the software's compatibility with the existing one. Compatibility must be carefully assessed, and decisions should be made based on the results of the test.

Network Security: To prevent unwanted access, it is critical to developing a security control system that ensures the protection of OSS network operations. Special security procedures must be implemented ahead of time to ensure the integrity and confidentiality of data transfers via public networks. To deal with the threat of network attacks, new versions of firewalls must be updated regularly.

4.0 CONCLUSION

This lesson introduced you to the notion of open-source software, as well as the many types of open-source software and their advantages for libraries. The class also covered the characteristics of open-source software, as well as the obstacles that come with using it in libraries.

5.0 SUMMARY

You learnt about the meaning of open-source software from the discussion in this unit. You've also learnt about the different kinds of open-source software that libraries utilise. Similarly, you've learned about the advantages of open-source software in libraries, as well as its qualities and drawbacks.

SELF ASSESSMENT EXERCISE

- What is open-source software, and how does it differ from proprietary software?

6.0 TUTOR-MARKED ASSIGNMENT

1. What are the distinctive qualities of library open source software? Define library open source software. Discuss the benefits of library open source software.
2. What kinds of open source software are available on the market for libraries?
3. Determine the difficulties that come with using an open-source in a library.

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UNIT 2: INITIATIVES ON OPEN SOURCE SOFTWARE IN LIBRARIES

CONTENTS

- 1.0 Introduction
- 2.0 Objectives
- 3.0 Main Content
 - 3.1 Initiatives on Open Source Software
 - 3.1.1 Budapest Open Access Initiative
 - 3.1.2 Open Source Movement
 - 3.1.3 **Major Initiatives on Free and Open Source Software**
- 4.0 Conclusion
- 5.0 Summary
- 6.0 Tutor-Marked Assignment (SAEs)
- 7.0 References/Further Reading

1.0 INTRODUCTION

In this unit, you will be exposed to the initiatives on Open Software. The unit will also feature a discussion on the Budapest Open Access Initiative in libraries and the open-source movement.

The discussion in the unit will also include the major initiatives on free and open-source software.

2.0 OBJECTIVES

By the end of this unit, you will be able to:

- Describe the Initiatives on Open Source Software
- Explain Budapest Open Access Initiative
- Describe Open Source Movement
- Identify the major Initiatives on Free and Open Source Software

3.0 Main Content

3.1 Initiatives on Open Source Software

"Open Source" refers to a software licencing model in which the software's source code is often made freely available to users, with terms allowing redistribution, modification, and addition, albeit with restrictions. Support, training, updates, and other software services are provided by a number of organisations, with commercial ties becoming increasingly widespread. Open-source software is often, but not always, the result of a collaborative effort in which many people contribute

different components of the final product. Businesses are also helping the open source movement by donating paid programmer time and in-house developed software. There are a lot of open source software projects out there.

The term "open source" refers to a technique of creating and distributing software that allows anybody to use, modify, and redistribute it. Open source software can be downloaded for free or for a low cost, and it can be used, distributed, borrowed, or modified without restriction. Open-source practises improve software stability and quality by fostering independent peer review and rapid source code change.

The Open Source Initiative (OSI) manages the open source definition, which is a set of standards that defines open-source software. It is a California-based 501(c) (3) tax-exempt public-benefit nonprofit organisation. The organisation was founded in late February 1998 by Bruce Perens and Eric S. Raymond as part of a group inspired by Netscape Communications Corporation's publishing of the source code for its flagship Netscape Communicator product. In August 1998, the group constituted a board of directors.

The Open Source Initiative (OSI) is a non-profit organisation whose purpose is to promote open-source software's commercial use. In order to accomplish this, OSI maintains and promotes the Open Source Definition, as well as the OSI Certified Open Source Software Certification Mark and Program. Software must be released under a licence that permits users to freely access, share, alter, and utilise it in order to be OSI certified. Free redistribution, source coding, derived goods, and the author's source code integrity are all included in the OSI definition of open source. Individuals or groups will not be discriminated against. There will be no discrimination between fields of endeavour. Licenses must not be product-specific, must not limit the use of other software, and must be technology-neutral.

3.1.1 Budapest Open Access Initiative

The Budapest Open Access Initiative (BOAI) was released to the public on February 14, 2002 as a public declaration of principles about open access to academic papers. It sprang out of a symposium hosted by the Open Society Institute in Budapest on December 1–2, 2001 to promote open access, which was then known as Free Online Scholarship. This small gathering of people is one of the key defining events of the open access movement. The initiative's text has been translated into 13 languages. On the occasion of the initiative's tenth anniversary in 2012, the original initiative's goals and methods were reiterated, along with a series of concrete proposals for attaining open access in the next ten years.

The Budapest Open Access Initiative⁶ explains the concept of abolishing all barriers to scholarly literature access in order to assist both affluent and poor people's education and research. The practise is not straightforward, given the current starting point of the established academic publishing industry, and OA has become the subject of much research and debate, prompting investigations into publishing models and researcher behaviours, despite the fact that scholarly communication is a major focus in the HE sector in developed countries. In the 2006 Baseline Study report (Electronic Publication Services, 2006), the scholarly communication landscape was explored in six primary categories, including the economics of publishing and access, as well as scholars' viewpoints, attitudes, and behaviours.

The first declaration of the Budapest Open Access Initiative encapsulates what the open access movement is all about, as well as its potential: An ancient ritual and cutting-edge technology have merged to provide a once-in-a-lifetime public good. For the sake of inquiry and knowledge, scientists and researchers have traditionally been ready to publish the results of their study in scholarly publications for free. The Internet is a relatively new form of technology. The public good they facilitate is the global electronic distribution of peer-reviewed journal material, as well as completely free and limitless access to it by all scientists, academics, instructors, students, and other curious minds.

3.1.2 Open Source Movement

Open source software may be traced all the way back to the dawn of computer and software development. Programmers and developers were recognised for sharing their work freely at the time. Profit-driven software development businesses suffocated the culture of software source code sharing. Significant milestones in the history of open source software include:

- 1983 - Richard Stallman formed GNU project. 1
- 1985 – Creation of Free Software Foundation.
- 1991 – Development of Linux kernel by Linus Torvalds.
- 1998 – Open Source Initiative (OSI) formed by Eric Raymond.

To refer to the free distribution of software, the terms "free" and "open source" have been interchangeably used. Common licences used for this purpose include the GNU General Public License (GPL), BSD licence, GNU Lesser General Public License, MIT License, Mozilla Public License, and Apache License. Each of these licences has slightly different conditions and restrictions, but they all offer users the ability to use, copy, distribute, and upgrade the programme. The Free Software Foundation's philosophy is reflected in the basics of these licences. "The freedom of

users to run, copy, distribute, study, modify, and develop software" is defined as "the freedom of users to run, copy, distribute, study, modify, and produce software" (Kumar, 2008).

A group of people recommended in 1998 that the term "free software" be replaced with "open-source software" (OSS) as a less ambiguous and more acceptable term for the commercial world. Software developers may choose to make their work available under an open-source software licence so that others can improve it or learn how it works. Anyone can create new versions of open-source software, port them to new operating systems and chip architectures, distribute them, and even sell them. Open source aims to make a product more understandable, flexible, repeatable, dependable, or easily available while remaining commercial. The Open Source Definition, for example, promotes an open-source mindset and limits the usage, modification, and redistribution of open-source software. Users can use software licences to access functionalities that would otherwise be blocked by copyright. These rights include the ability to use, alter, and redistribute data. The Open Source Definition has been met by a number of open-source software licences.

The most well-known example is the GNU General Public License (GPL). While open source allows for broad public access to a product's source code, open-source licences allow the authors to control who has access to it. In response to Netscape's January 1998 announcement of a Navigator source code release, the term "open source" was invented during a Palo Alto strategy conference (as Mozilla). The meeting was attended by Todd Anderson, Larry Augustin, John Hall, Sam Ockman, Christine Peterson, and Eric S. Raymond. Before releasing Navigator's source code, they took advantage of the opportunity to clarify a potential misunderstanding caused by the ambiguity of the English word "free." The origins of the "open source" movement can be traced back to this strategic conversation. Despite this, many people believe that the open-source movement began with the arrival of the Internet in 1969, while others confuse open source with free software movements. The Free Software Foundation (FSF) was created in 1985 with the intention of making software "free as in free speech," not "free as in free beer." Because so much free software was (and still is) free, it was associated with the word "free," which sounded anti-commercial.

The Major Initiatives on Free and Open Source Software

1. **NRCFOSS** – The National Resource Centre for Free and Open Source Software was founded to provide design, development, and support services to the FOSS community, as well as to contribute to the open-source pool and improve the worldwide FOSS ecosystem. Several milestones have been reached, including the

indigenized GNU/Linux operating system distribution "Bharat Operating System Solutions (BOSS)" with Indian language support, the National Help-Desk for FOSS, the National FOSS Portal, and the development of FOSS Human Resources. CDAC (Chennai, Mumbai, Hyderabad, Delhi), AUKBC Research Centre (Chennai), and IIT (Indian Institute of Technology) are among the entities involved in this collaborative initiative (Bombay, Madras). Research and development has been carried out in the areas of SaaS (Software-as-a-Service) stack delivery, Service oriented architecture (SOA) design, Service oriented kernel for Linux, GNU Compiler Collection (GCC), mobile applications on the Android platform, improving accessibility of FOSS Desktops for disabled people, Human Resource development, and Online courses and certification. The findings have been presented at national and international conferences, as well as in several research papers.

2. **BOSS – Bharat Operating System Solutions:** Assamese, Bengali, Bodo, Gujarati, Hindi, Kannada, Kashmiri, Konkani, Maithili, Malayalam, Manipuri, Marathi, Oriya, Punjabi, Sanskrit, Tamil, Telugu, and Urdu are among the 18 Indian languages supported by BOSS, Bharat Operating System Solutions. The Linux Foundation has validated BOSS, and it is intended to meet the severe requirements of e-governance. BOSS is accessible in both desktop and server versions. EduBOSS, an educational variation, has also been released for schools. All versions can be downloaded for free at <https://www.bosslinux.in/>. (link is external). BOSS provides end-users with a low-cost computing platform, as well as flexibility and choice. BOSS gives a low-cost computing forum, simple, flexible to the end-users.
3. **BOSS Support Centers:** In India for instance, BOSS Support Centers were established. They've also been raising awareness through training and workshops, as well as giving away free BOSS CDs and DVDs to end-users. BOSS Support Centres give consumers installation and maintenance assistance. BOSS has been used in the areas of e-governance and education, as well as libraries.
4. **Enhancing Accessibility of FOSS desktops:** CDAC Mumbai has created several tools and programmes to make FOSS Desktops more accessible to people with disabilities. Accessible Linux for Visually Challenged has been developed as a software-based assistive technology for differently-abled individuals (ALVIC) Gestures with Mouse (GeM) was created specifically for physically handicapped people. It's designed to primarily leverage gesture-based input mechanisms for various 'navigation and input

related tasks,' allowing physically disabled persons to interact with the system more easily. In addition, CDAC Mumbai has launched upgraded ORCA, and Anumaan, a predictive text entering system, has been developed and deployed. For visually impaired users, training programmes and pilot testing sessions have been done.

5. **GNU Compiler Collection Centre (GCC):** IIT Bombay has established a GCC (GNU Compiler Collection) Resource Center to do concentrated research in GCC on the Optimizer Generator, Precise Pointer Analysis, and Simplifier Machine Description mechanisms. The international GCC community has praised GCC research. The Centre also hosts training programmes and workshops. Several research articles have been published, and they have been presented at both national and international conferences.
6. **Open Source e-Learning Laboratory:** A free and open source e-learning lab has been built. There have been developed e-learning solutions such as LMS, CMS, Authoring Tools, Video Streaming Tools, and e-Learning standard-conforming solutions. The Centre offers online certificate courses in "Linux System Programming," "Linux Kernel Programming and Device Drivers," and "Web Application Development Using Open Source Software." Also, through e-Shikshak and Moodle, an online course on 'Financial Literacy' is now available. It's accessible in 10 different languages (Assamese, Hindi, Marathi, Bengali, Gujarati, Kannada, Malayalam, Tamil, Telugu, and English).
7. **Technology/applications development for Mobile platforms:** At C-DAC Chennai, technology development for mobile platforms is being conducted using open-source software. NetBOSS, a variation of BOSS with a fast startup time and support for touch screen displays, has been created for Netbooks. Multilingual support, Wi-Fi, and Bluetooth connectivity are among NetBOSS's capabilities. Android application development has also been created for mobile platforms. Swar-Suchak is an open-source voice-enabled information retrieval system developed by the team. The voice gateway successfully connects the mobile phone network with automatic speech recognition, text-to-speech in Hindi and English, and a web navigation system based on open standards and open-source software. Live weather, daily vegetable prices, current flight information, real-time currency exchange rate information, and BSE Sensex information are among the applications that have been built. Leading worldwide journals have published research articles.

8. **HR development in FOSS:** The AUKBC Research Centre at Anna University in Chennai has made significant progress in the field of FOSS HR development. Through awareness campaigns, training programmes, and workshops, a pool of FOSS-trained teachers and students has been created across India. Several higher colleges of technical learning currently offer FOSS optional courses as part of their curricula. All 32 District Central Libraries in Tamil have adopted the open-source library management system Koha.
9. **Bharti Sim: An Advanced Micro-architectural Simulator:** As the number of cores in computers grows dramatically, there is a pressing need to parallelize simulation software. BhartiSim is a highly adjustable parameterized simulator with a simple XML interface being developed at IIT Delhi. Parallel Execution, Support for Multiple Emulators, Transactional Memory, Accelerators, and Network on Chip are some of the simulator's key features (NoC).
10. **Localization and Hardware Interface for Android Based mobile devices:** This project, which is being carried out by CDAC (Chennai, Delhi) and ICFOSS Kerala, includes several research components aimed at improving the Android platform's utility. A Telepresence Robot has been constructed as part of the project, which employs an Android Tablet as its processing and communication component, as well as an open hardware Arduino board to control the wheel movements. The robot may be controlled remotely from a PC using keystrokes while viewing footage through the eyes of the robot (the camera in Android tablet). It also supports two-way voice communication and connects to the Internet through WiFi. Proof-of-concept Rovers have been constructed that can be controlled using basic gestures (tilt up and down) from Android phones and tablets. They connect through WiFi or Bluetooth and can be operated using simple gestures (tilt up and down). Raspberry PI boards enable compute and connectivity in rovers, which then transfer control commands to an open Hardware Arduino board for rover movement. The Raspberry PI board's camera transmits video, allowing vision-based control from mobile devices.
11. **Educational domain projects:** The project "Trainers Training and Students Talent Transformation" was launched in collaboration with CBSE to develop e-content (enhanced with multimedia, experiments, question banks, and other features) for Secondary Mathematics, Science, and Social Science subjects, as well as to train CBSE teachers. As part of the project, an e-Journal called "Creative Computing Schools" was created. CDAC is in charge of implementing the project (Chennai, Mumbai, Bangalore, and Delhi). The project "Computer Enabled Continuous and

5.0 SUMMARY

From the discussion in this unit, you learned the Initiatives on Open Source Software, the Budapest Open Access Initiative, Open Source Movement, and the major Initiatives on Free and Open Source Software.

SELF-ASSESSMENT EXERCISE

What are the most important open-source software projects in libraries?

6.0 TUTOR-MARKED ASSIGNMENT

1. What is library open source software? Identify open-source software initiatives
2. What do the terms Budapest Open Access Initiative and Open Source Movement mean to you?

7.0 REFERENCES/FURTHER READING

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MODULE 4: SOCIAL MEDIA TECHNOLOGIES IN LIBRARIES

In this module, you will be introduced to social media technologies and libraries. The module will also familiarise you with the types and categories of social media users in the libraries, the benefits to libraries and the users as well as the associated challenges.

- Unit 1: Definition and concept of Social Media
- Unit 2: Types and Categories of Social Media Used in Libraries
- Unit 3: Characteristics of Social Media Used in Libraries

UNIT 1: Definition and Concept of Social Media

CONTENTS

- 1.0 Introduction
- 2.0 Objectives
- 3.0 Main Content
 - 3.1 Definition and concept of social media in Libraries
 - 3.2 Function of Social Media in Libraries
 - 3.3 History of Social Media
- 4.0 Conclusion
- 5.0 Summary
- 6.0 Tutor-Marked Assignment (SAEs)
- 7.0 References/Further Reading

1.0 INTRODUCTION

This unit will expose you to the concept of social media in libraries. The unit will also intimate you with the function of social media as well as brief historical background on social media and the spread of its use to libraries.

2.0 OBJECTIVES

By the end of this unit, you will be able to:

- ✓ define social media
- ✓ identify and explain the functions of social media in libraries
- ✓ narrate the development of social media and its spread to libraries.

3.0 MAIN CONTENT

3.1 Concept of Social Media

The phrase "social media" is frequently used to refer to new forms of media that allow for interactive interaction. The phrase "social media"

refers to a collection of online groups that allow users to interact. Web forums, wikis, and user-generated content (UGC) websites are examples of user-generated content (UGC) websites. They are websites and computer programmes that allow people to communicate and share information over the Internet using a computer or a mobile phone. Through social media, there are more opportunities to reach out to the user community, target specific audiences, and allow people to connect with the library. You can utilise social media to engage with potential leads, learn more about your target market, and generate sales. Because there are so many different types of social media to choose from, it's important to be informed of all of your alternatives before settling on the best one.

The phrase "social media" has a lot of different definitions. According to the Oxford Dictionary, "websites and programmes that enable users to develop and share content or participate in Social Networking" (2013). Social Media may alternatively be defined as "the use of web-based and mobile technology to transform communication into an interactive discussion." "A collection of web-based apps that build on the ideological and technological origins of Web 2.0 and enable the creation and exchange of User Generated Content," as another definition goes. "The democratisation of information," writes Brian Solis, one of the most extensively published authors in new media, "converts people from content readers to publishers." It's the shift from a one-to-many to a many-to-many broadcasting model centred on interactions among writers, individuals, and peers" (Solis, 2010). According to the author's understanding of the aforementioned definitions, social media is a collection of web-based and mobile applications that allow users to exchange and develop knowledge in real-time social interactions. It is user-centric, multi-purpose, and independent of time and location.

The Internet is a communicative medium, and social media is an interactive way of providing information that serves as a communication medium as well as a platform for conversation and content sharing, with universality, interactivity, accessibility, mobility, and communicativeness as the primary characteristics. The phrase "social media" refers to a group of online platforms that allow individuals to communicate and generate content with one another. To put it another way, these are web resources that allow people to connect via the Internet. Users can exchange news, information, videos, images, music, and suggestions, as well as engage with one another, make contacts, and share news, information, videos, images, music, and suggestions.

The broadcast period and the interactive epoch are sometimes used to divide the evolution of media. During the broadcast era, media was practically fully centralised, with one institution spreading messages to a

large audience, such as a radio or television station, a newspaper corporation, or a film production studio. In most cases, media feedback was indirect, delayed, and impersonal. Individual contact was usually conducted on a much smaller scale, either by personal letters, phone conversations, or, on rare occasions, photocopied family newsletters.

3.2 Functions of Social Media in Libraries

You may reach out to more people in your community using social media, target certain audiences, and allow them to connect with your library. According to statistics, there are over 700 million active Facebook users, over 100 million LinkedIn members, 5 billion+ photos on Flickr, 24 million pages on Wikipedia, 300 million Twitter users sending over 7,000 tweets per second, and over 2.9 billion hours of YouTube viewing per month. The fundamental point of libraries is to connect people with information, and social media is no different. We use social media to reach out to our communities and provide them with the information they need quickly. Several libraries have invited users to identify the people, places, and events represented in historical photographs posted on Wikis, Flickr, and blogs. Several libraries use wikis to create content and stimulate collaboration between the library and the community. As a result, inquiries are answered via IM (Instant Messaging), SMS, Twitter, and e-mail.

Using social media, libraries can engage with their patrons and allow them to participate in the creation of library products. Social media includes networking sites like Facebook and MySpace, microblogging sites like Twitter, and other media including blogs, podcasts, pictures, and videos. By uploading library materials via social media on the library page, it can be used by many websites on the Internet.

Academic libraries could use these social networking platforms to communicate information, provide services, and promote new releases. Like-minded people can come together on social networks to share their opinions, ideas, and personal information. E-mail has been one of the most common forms of social communication since the invention of computers. Before there were sites like Facebook, Twitter, Flickr, YouTube, and others, people used to share content using e-mail messages. Libraries may find that social media is an excellent tool for disseminating information, allowing them to promote their activities, resources, and services while also allowing for two-way dialogue with stakeholders.

According to a 2010 poll by the Society of Chief Librarians in the United Kingdom 6, Internet users trust library personnel more than most other providers of online support and information, and public library workers are second only to doctors in terms of the trust placed in them by

information seekers. Librarians are in a unique position to integrate and use social media to their (and their users') benefit because sharing knowledge is at the heart of librarianship.

Social media can be used in a variety of communication methods, which can be summarised as broadcast messages, responses to inquiries, and then the conversation between the institution and its users, but there are compelling reasons for libraries to engage with social media, regardless of the approach taken. In a time of substantial technological change, libraries must demonstrate the value of their proposition, and with information readily available, social media can provide a competitive advantage.

Librarians can use social media to connect with customers who may not have considered the library as a source of information.

Other functions of social media in libraries worth mentioning include:

1. **Communication with patrons:** Social media makes it simple to interact with present and potential clients, especially the elusive 'digital natives,' who have grown up in a culture of sharing information, allowing others to join, and participating in online debates. Young people are not the driving force behind social technology, but they are quite engaged online and see a clear divide between work/study and leisure activities, with libraries providing a specific purpose in the work/study arena. The new two-way communication between the library and the user can help the library respond to user collection requests more quickly.
2. **Publicity and marketing:** Many companies use social media platforms solely for marketing and advertising purposes. This allows libraries to advertise exhibitions, seminars, and other events as well as announce new additions to their collections. It's crucial to remember, too, that while social media may give the means, the library must also provide the content for marketing, which takes time and money. It is only possible to advertise what is sent on social media.
3. **A technique for improving customer service:** Because we lay so much emphasis on social media for marketing and broadcasting, we overlook its participatory element. Although most people think of social media as a tool for marketing and promotion, it also has the ability to improve customer service issues and complaints. A company can utilise social media to keep track of what people are saying about them and respond quickly to positive (and especially negative) feedback. There are now a myriad of platforms that supply these services, but as this hidden cost continues to rise, libraries must consider who is in charge of this activity and how much time to devote to it.

Tella and Akinboro (2014) summarised other functions of social media in libraries as:

- i. Publicize the library's events.
- ii. Promote library services through it.
- iii. Create online library study groups and book clubs for students and market library events.
- iv. Provide a chance for kids and staff to ask questions about how to use the library.
- v. Demonstrate how to use basic library search tools.
- vi. To notify the general public, information about new books might be posted on the walls of SNSs.
- vii. Provide clients with brief updates
- viii. To provide library services at any time and in any location, for example, by contacting a librarian.
- ix. Libraries and library schools can use them as teaching aids.
- x. Libraries can use social media as a venue for user education or orientation programmes, among other things.

3.3 History of Social Media

The evolution of social media has been fueled by the human drive to communicate, as well as advancements in digital technology. It's a storey about forming and maintaining close relationships on a vast scale. "Forms of electronic communication (such as websites for social networking and microblogging) via which people create online communities to share information, ideas, personal messages, and other content," according to Merriam-Webster such as videos.

Pre-Internet Roots

A torrent of electronic dots and dashes hammered out by hand on a telegraph machine on May 24, 1844, heralded the beginning of social media. Samuel Morse displayed his understanding of the historic consequences of his technical success when he inscribed "What has God wrought?" on the first electronic transmission from Baltimore to Washington, D.C.

A Washington Post article titled "Before Twitter and Facebook, There Was Morse Code: Remembering Social Media's True Inventor" explains the history and utility of Morse code, which includes early versions of today's "OMG" and "LOL." While digital communication has a long history, most modern interpretations of the Internet's and social media's modern origins point to the Advanced Research Projects Agency Network, or ARPANET, which launched in 1969.

In order to allow scientists from four associated universities to share software, hardware, and other data, the US Department of Defense built an early digital network. In 1987, the National Science Foundation (NSF) established the NSFNET, a more robust, nationwide digital network that served as a predecessor to today's Internet. A decade later, in 1997, the first true social media network was created.

The Launch of Social Sites

According to "The History of Social Networking" on the technology news site Digital Trends, the Internet's proliferation enabled the launch of online communication services such as CompuServe, America Online, and Prodigy in the 1980s and 1990s. Individuals were introduced to digital communication through e-mail, bulletin board messages, and real-time online chatting. The first social media networks were born in 1997, with the short-lived Six Degrees profile posting service.

Friendster was introduced in 2001 as a substitute for this service. These rudimentary services, which allowed for e-mail account registration and basic Internet networking, were used by millions of individuals. Another early type of digital social communication, weblogs, or blogs, gained prominence with the launch of the LiveJournal publishing site in 1999. Pyra Labs, a tech startup acquired by Google in 2003, established the Blogger publishing platform around the same time.

In 2002, LinkedIn was launched as a professional networking site for professionals. By 2020, it has grown to over 675 million users worldwide. For job seekers and HR managers looking for qualified candidates, it is still the most popular social networking platform.

Following a brief period of success, two more major forays into social media failed. In the year 2003, Myspace was launched. By 2006, it had become the most popular website on the planet, mainly to the ability for users to share new music directly from their profile pages.

Facebook had eclipsed it by 2008. In 2011, artist Justin Timberlake purchased Myspace for \$35 million, but it has since become a social media afterthought.

In 2012, Google+ began as Google's attempt to break into the social media industry. In 2018, a data security breach exposed the personal information of almost 500,000 Google+ members, bringing an end to a tumultuous existence.

Kaplan and Haenlein took a different approach to the rise of social media (2010). Tom Truscott and Jim Ellis of Duke University, according to the authors, founded Usenet, a worldwide discussion system that allows Internet users to post public messages, in 1979. However, the modern era

of social media began roughly 20 years ago, when Bruce and Susan Abelson founded "Open Diary," an early social networking site that brought together online diary authors into a single community. Around the same time, the phrase "weblog" was coined, and a year later, when a blogger transformed the noun "weblog" into the sentence "weblog," it was shortened to "blog."

The concept's growing popularity was facilitated by the increased availability of high-speed Internet connections, which led to the creation of social networking sites like MySpace (in 2003) and Facebook (in 2004), (Back in 2004). As a result, the term "Social Media" was coined, which has contributed to its current popularity. The most recent addition to this amazing class is so-called "virtual worlds," which are computer-based simulated settings inhabited by three-dimensional avatars. Second Life, created by Linden Lab, is possibly the most well-known virtual world (Kaplan & Haenlein, 2009c).

4.0 CONCLUSION

This unit has exposed you to the concept of social media and its functions of social media in libraries. The unit has also exposed you to the brief history/evolution of social media in libraries. You can now refresh what you have learned.

5.0 SUMMARY

From the discussion in this unit, you learned about the concept of web technologies, categories of web technologies, characteristics, and benefits of web technologies.

SELF ASSESSMENT EXERCISE

describe social media from at least two perspectives.

6.0 TUTOR-MARKED ASSIGNMENT

1. what are the functions of social media in libraries?
2. trace the evolution and development of social media and its spread to libraries.

7.0 REFERENCES/FURTHER READING

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UNIT 2 TYPES AND CATEGORIES OF SOCIAL MEDIA IN LIBRARIES

CONTENTS

- 1.0 Introduction
- 2.0 Objectives
- 3.0 Main Content
 - 3.1 Types of social media in Libraries
 - 3.2 Categories of Social Media in Libraries
- 4.0 Conclusion
- 5.0 Summary
- 6.0 Tutor-Marked Assignment (SAEs)
- 7.0 References/Further Reading

1.0 INTRODUCTION

This unit will expose you to the types and categories of social media in libraries. The unit will intimate you with this scheme of social medial classification for their better use in libraries and information centres.

2.0 OBJECTIVES

By the end of this unit, you will be able to:

- ✓ Identify the various type of social media used in libraries
- ✓ Identify based on categories or classification of social medial used in libraries

3.0 MAIN CONTENT

3.1 Types and Categories of Social Media Used in Libraries

There are many types of social media currently being used in the library. Most of these have been reported in the literature. They are described here as follows:

Facebook: The most popular social media site for library marketing and awareness is Facebook (Statista, 2021). Facebook is a popular and free social networking site that allows users to create profiles, upload photos and videos, connect with friends, family, and coworkers, and more (Tella et al. 2020). Facebook can be used to promote libraries and information centres in a variety of ways.

Librarians can use the Facebook page/account to alert readers to useful hidden gems of the library that library customers may have forgotten or are unaware of, such as grey literature. If time is limited, additional media such as Twitter feedback, the library calendar, and a library blog can be used to populate Facebook. For the convenience of library customers, the OPAC search can be embedded on the Facebook page. By establishing descriptive hashtags (e.g. #awesomelibraryevent!) that can be used on sites like Twitter and Facebook to encourage people to attend and live blog or tweet, the Facebook user community can be made aware of all the library events.

Facebook can also assist in the selection of acceptable techniques for evaluating social media platform marketing success. Stick to the point, pin essential posts to the top of your page, be casual and conversational, utilise photographs, publish regularly, share the same types of content on the same day of the week, give fans unique information or content, determine your ideal posting time, and use Insights.

Twitter: Twitter is the second most popular social media platform. It's a real-time microblogging platform where all posts must be under 140 characters. Twitter can be used to keep library staff and patrons up to date on daily activities, such as newly added library collections. Users can type in short messages or status updates on this site. Library service alerts can be sent out via Twitter (Ezeani & Igwesi, 2012). Many library patrons choose to engage with librarians using Twitter because it is more popular than other social media platforms and because what happens on Twitter does not stay on Twitter. To make it stand out, it needs to have a personal touch. You can, for example, use photos as the background of your Twitter account page. You can also use your Twitter account to construct searches to save and retrieve tweets quickly, such as a search for the name of your library or a geo-locational search. If you make a mistake when releasing a message, respond quickly and sincerely apologise. Choose from around a million Twitter tools that will give you with important information.

Blogs: One of the first kinds of social networking is blogs. A blog (also known as a weblog or online log) is a website that displays entries (also known as posts) in reverse chronological order, with the most recent information being displayed first (similar in format to a daily journal). They're ubiquitous at libraries, where they're used to broadcast library announcements and promote other library resources. The blogs are an important part of the New York Public Library's social content marketing strategy, with librarians functioning as internal champions, the bulk of traffic coming from Google searches, and the blogs serving as a customer service point of contact.

Some quick ways to increase Blog engagement are:

- i. Include a number;
- ii. Pose a question in the title or at the end of the post, and allow readers to respond in the comments section;
- iii. Make the hashtag a part of the title. Every time someone tweets a link to it, a greater audience will be able to read it;
- iv. Register your blog; and
- v. Make it permanently shareable via Twitter, Facebook, e-mail, and other social networking platforms.
- vi. Librarians can also start subject-specific blogs and promote the use of blogs for scholarly communication and research discussion (Ezeani & Igwesi, 2012). Libraries are increasingly using blogs to communicate information about new acquisitions, share library news, and encourage consumers to use library services.

Flickr: Flickr is a photo and video management/sharing website where you can upload and share up to 20 MB of photos and videos for free each month. It's an excellent marketing tool. Librarians can use it to market general library services to their customers. The majority of students and users are ignorant of the numerous library services provided, such as book reservations, reference services, and Strategic Information Dissemination (SDI). Flickr can assist users in becoming more aware of library services. It can also be used to create current awareness services (Ezeani & Igwesi, 2012).

Flickr allows users to submit images to a specific collection and develop a collection of user photos on a given topic, giving them a fantastic opportunity to own library material. Archives and libraries might use Flickr to "create new methods to communicate with their patrons" and "broaden the knowledge of such legacy to a larger and more diverse audience." Flickr can be used to post photos of library activities, historical events, and other similar subjects.

Pinterest: Pinterest is a new, free-to-use graphical social media website. It's "an online pinboard that lets you organise and share anything," according to the website. Pinterest is an excellent tool for promoting library material. On Pinterest, a library can create a profile and boards where it can pin photographs and videos related to the library. Because they provide fun images into the world of libraries, the Westerville Library has a huge collection of boards and pins, such as Unexpected Library Marketing and Reading Quotes.

The college library at Central Methodist University (CMU) in rural Missouri employs a pinboard to promote its popular DVD collection, which is very beneficial to students and reduces repetitive questions from

library personnel while also offering a good visual depiction of what is available. The New York Public Library is using Pinterest to promote library events, library collections, library educational resources, and New York history, among other things, in order to inspire lifelong learning, boost knowledge, and benefit the community.

Pinning book covers, showcasing historic archives, learning-related infographics, creating reading lists, sharing new acquisitions, craft projects, and more, promoting library activities (add fliers, etc.), collecting ideas, materials, library displays, and highlighting library staff are just a few examples of how libraries can use Pinterest.

YouTube: YouTube, which launched in May 2005, allows billions of people to search for, view, and share their own original videos. YouTube serves as a distribution platform for both major and small original content creators and marketers, as well as a place for people all over the world to communicate, inform, and inspire one another (<http://www.youtube.com/yt/about/>, 2015).

RSS: RSS is a simple web "reader" that maintains your preferred Internet information for you automatically. It organises and sorts your subscriptions, news, alerts, and shopping bargains, among other things. And it's all accessible from your computer, tablet/iPad, and smartphone - so the information you need is always at your fingertips (<https://www.rss.com/#>, 2015).

MySpace: MySpace is built in such a way that users must identify their interactions or connections with other users. Many observers believe that the expression of friendship is the same as friendship itself (Kornblum, 2006). MySpace provides contact information for MySpace professionals dedicated to responding to regulatory enforcement demands, including tragedy requests, as well as the specific information required and the legal process required allowing MySpace to connect different categories of information. MySpace is committed to making MySpace a safer and more secure place for all of its users.

aNobii: aNobii is a reader-oriented social networking platform. Greg Sung established this website in 2006. Individuals can catalogue their books and evaluate, review, and discuss them with other readers using the aNobii service. aNobii was created by readers for readers, allowing users to find, shelve, review, and exchange books. The purpose of aNobii is to connect readers and promote reading. This site allowed us to add our favourite books to our shelves and wish lists, as well as connect with millions of other book lovers to share our reading experiences.

Instagram: Instagram is a social media platform that allows people to upload photographs and videos. The corporation that owns it is Facebook, Inc. It was produced by Kevin Systrom and Mike Krieger and published exclusively on iOS in October 2010. Libraries can use social media to ask users about their favourite authors, to showcase their surroundings and collections, to publicise events, and to show what goes on behind the scenes – for example, to show how book ordering is done, how new events are planned, assisting students in a workshop, and even stacking the shelves at the end of the day. Libraries can also use Instagram to display their collections.

WeChat: Tencent's WeChat is a Chinese multi-purpose chat, social media, and mobile payment software that was launched in 2011." The Official WeChat of Nanjing University Library has been in operation for a year and has over 8200 users.

3.2 Classification/Categorisation of Social Media Used in Libraries

In their Business Horizons (2010) article, Kaplan and Haenlein devised a classification scheme with six different categories of social media. These are the following:

Collaborative Projects

Collaborative projects bring two or more people together to work on a common theme or question or to contribute to a collection of materials on a specific topic. Wikis fit into this category, with Wikipedia serving as an example. A Wiki is the most prevalent collaborative project site (e.g., Wikipedia). Wikis allow several individuals to work on the same project at the same time (e.g., a research analysis, writing a dictionary, or group work project). To make the project complete, all project members can change the content at any time and from anywhere. Wikis keep track of every action that takes place on the site. In addition, all course participants get access to the course discussion area, where they can share and contribute ideas.

Blogs and Microblogs

The initial type of social media site is assumed to be this second type. On blogs, microblogs, and forums, which are considered personal web pages, people can connect with one another using text and other multimedia such as videos, audio, and photographs. The owner of a blog or forum can post messages or upload content, and the blog's or forum's readers can browse, download, and comment on those messages. The most popular blogs and forums are Wordpress.com, Blogger.com, and Yahoo!Groups.com. A blog is an online journal maintained by one person about a certain topic (though this is not always the case). It is regularly updated, with entries appearing in reverse chronological order. Comments from other readers

and links to other websites are common features of blogs. Twitter is a popular type of "microblogging," which is a condensed version of a blog with messages limited to 140 characters.

Micro-communities

Micro-communities, in contrast to global communities like Facebook and YouTube, are small communities where actual relationships may be formed; micro-communities are designed around very narrow purposes with well-defined goals. They are insignificant at times, but they can have a big impact. The major purpose of Micro or Material Communities is to allow users to share media content (such as movies, photographs, audio samples, and PowerPoint presentations). Users of the library can create accounts for each of the Content Communities, then post and exchange media content on the sites. The simplest approach to share media content is to send a link to other library members or to publish a link to a personal blog. Library users can access media resources by clicking on the link that leads to the content page. Common Content Communities include Youtube (for videos), Flickr (for photos), and Slideshare (for presentations) (for PowerPoint Presentations).

Social Networking

A social networking site is an online community where you may establish a profile, add friends, discuss ideas and events, and interact with other users. The most extensively utilised social networking site (and the most-visited website in the world is Facebook). Friends, relatives, classmates, and coworkers can be found on Facebook by library patrons. Facebook, Ning, LinkedIn, and MySpace are the most popular social networking sites. They are called Social Networking Sites since they're used as venues for social communication. Users can create personal profiles, invite others to join the site, read the profiles of other users, share information (text, images, videos, and other links from other sites), and communicate with one another via e-mail and instant chat utilising the site's tools. The site owner has complete control over who has access to the site and who may participate in online group conversations. In the classroom, Facebook, in particular, can be used as a discussion platform.

Virtual Gaming Worlds

A virtual world is an online interface that allows several users to engage in a simulated environment. "Digital worlds," "simulated worlds," and "massively multiplayer online games" are all terms used to describe virtual environments. Users can virtually participate in games utilising customised avatars in these virtual environments. The virtual game universe of World of Warcraft is well-known.

Virtual Social Worlds

A virtual world is an online computer-simulated environment that combines real-world and fantastical elements. You can usually make an avatar (a digital representation of yourself) and interact with other "residents" of this virtual world. Second Life is a popular virtual world where non-profits and corporations may hold dialogues, virtual events, and fundraisers. This type allows Internet users to create individualised avatars, habits, lives, and acts that are identical to their real lives in their virtual lives. Users can meet up at a certain location in the virtual world to do activities together as they would in real life. The only difference is that in their virtual lives, people can do everything they want that they cannot do in their real ones. The most well-known site is Second Life, which contains a variety of teaching and learning applications.

4.0 CONCLUSION

This section has introduced you to the various sorts of social media that may be found in libraries. You've also learned about the many classifications and categorisations of social media in libraries as a result of this subject. You can now go over what you've learnt again.

5.0 SUMMARY

From the discussion in this unit, you learned about the types of social media in libraries. You have also learned about the classification/categorisation of social media in libraries.

SELF ASSESSMENT EXERCISE

what are the types of social media used in libraries?

6.0 TUTOR-MARKED ASSIGNMENT

what are the classification/categorization of social media in libraries?

7.0 REFERENCES/FURTHER READING

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UNIT 3: CHARACTERISTICS OF SOCIAL MEDIA IN LIBRARIES

CONTENTS

- 1.0 Introduction
- 2.0 Objectives
- 3.0 Main Content
 - 3.1 Characteristics of social media in Libraries
 - 3.2 Guidelines for Using of Social Media in Libraries
- 4.0 Conclusion
- 5.0 Summary
- 6.0 Tutor-Marked Assignment (SAEs)
- 7.0 References/Further Reading

1.0 INTRODUCTION

This unit will expose you to the types and categories of social media in libraries. The unit will intimate you with this scheme of social medial classification for their better use in libraries and information centres.

2.0 OBJECTIVES

By the end of this unit, you will be able to:

- Identify the various characteristics of social media used in libraries
- Discuss the characteristics of social media used in libraries
- Describe the guidelines for using social medial used in libraries.

3.0 MAIN CONTENT

3.1 Characteristics of Social Media in Libraries

Digital platforms are used by all social media platforms, whether mobile or stationary. Not all digital information, however, is fundamentally social media. Two characteristics distinguish social media. To begin with, social media allows users to participate in some way. Even if social networking services such as Facebook allow users to passively observe what others are posting, social media is never completely passive. At a minimum, a profile must be created that allows for the prospect of engagement to begin. That feature alone sets social media apart from traditional media, which does not provide personal profiles.

Second, because of their interactive nature, social media encourages participation. This engagement can occur with long-time friends, relatives, or acquaintances, as well as with new persons who share common interests or who are part of the same acquaintance network. Many social media platforms were or are considered distinctive at first, but as they get more integrated into people's personal and professional lives, they become less noticeable and more anticipated.

Other notable characteristics of social media used in libraries were identified by Tella and Akinboro (2015). These are:

1. **User-based:** Before social networks like Facebook and MySpace were popular, websites were centred on material that was updated by one individual and seen by Internet visitors. The information only flowed in one direction, and the webmaster, or writer, decided which way future updates would go. Online social networks, on the other hand, are developed and governed by the users themselves. Without users, the network would be a barren wasteland of unused forums, programmes, and chat rooms. Users add data and conversations to the network. Anyone who participates in the debate has the ability to shape the material. For Internet users, this is what makes social networks so much more fascinating and active.
2. **Interactive:** The great level of interactivity of today's social networks is another distinguishing aspect. As a result, a social network isn't just a collection of chat rooms and message boards any longer. On sites like Facebook, network-based gaming applications abound, allowing you to play poker with your friends or challenge a friend to a chess match. These social networks are gradually becoming a pastime that many prefer to watching television because they offer more than just entertainment; they also allow people to connect and have fun with their friends.
3. **Community-driven:** To develop and maintain social networks, community concepts are applied. This means that, just as communities and social groups around the world are founded on their members' shared views or interests, social networks are built on the same principle. Most modern online social networks today have sub-communities of people who share commonalities, such as graduates of a specific high school or an animal welfare club. In these interest-based groups, you can not only make new acquaintances, but also reconnect with old friends who have been out of contact for a long time.
4. **Relationships:** Unlike traditional websites, social networks thrive on relationships. The more relationships you have within the network, the more established you are at its heart. The idea operates in a forceful manner within online social networks, similar to how most pyramid schemes operate. When you post a

note or an update to a page with only 20 contacts, the content distributes over a much larger network of contacts and sub-contacts than you may realise.

5. **Emotion Over Content:** The emotional component of social networks is another unique aspect. Unlike prior websites, which were only focused on providing visitors with information, the social network provides users with emotional stability and the feeling that their friends are near by no matter what occurs. People are learning that being able to go online and instantly communicate with a group of friends provides a great deal of support in an otherwise overwhelming situation, whether they are going through a divorce, a break-up, or any other family issue.

Cronin (2009) added to the list of characteristics of social media used in libraries. These according to the author are:

1. **Simple Interface:** A frequent aspect of social media and networking websites is their user interface simplicity. Social networking websites are fairly basic in terms of colour scheme and aesthetics. The colour design is usually limited to a few colours with modest monochromatic changes; the background is usually white, and updates (such as status updates) are frequently highlighted with a light tint (usually green or yellow; alerts are usually highlighted with a red background color).
2. **Real-Time Updates:** One of the reasons why microblogging services have grown in popularity in recent years has been their capacity to add a new, "real-time" dimension to online social interaction. Unlike instant messaging, where users were primarily interested in two-way talks, Twitter and its competitors brought many-way dialogues to the Web. Modern customers want to notice an incoming message or post as soon as it arrives, as well as to be able to know what is happening in their social graph right now. Users should have a real-time update option that delivers updates as soon as they are published within the programme, according to social user interface designers. An automatic and eye-catching (but unobtrusive) update allows the user to "remain inflow," that is, to focus on his primary responsibilities while also being notified about secondary information that may be essential.
3. **User-Centric Social Interface:** Because social software is social, it offers a user interface that is heavily centred on the users' interests. It's no surprise that social user interfaces are particularly user-centric, given that social media and social networking sites live and die by their users' behaviours. Twitter, Facebook, and other social media platforms put the user at the centre of the experience, focusing on the finer points of their profiles and proposing new friends, interests, events, and groups to broaden their social circles and increase their participation. The home page of Facebook is a

perfect example of an egocentric user interface. It provides detailed information about a user's updates and notifications, as well as a one-click interface that allows you to update your current status, hide information provided by friends, and receive notifications about people a user may know groups or conversations in which the user may be interested. As a result, Facebook emphasises the app's value, placing the user at the centre of the software. Twitter is another example of a similar approach: the user, his connections, and dialogues among his friends are all featured prominently on the home page.

4. **Simple Usable Form:** For social media and networking sites, web forms are perhaps the most crucial design element. Everything from signup to search, log-in, reacting to a post, and adding other content uses forms and inputs. Because forms are so vital, they must be easy to use. This is especially true for sign-up forms, because without a "functioning" sign-up form, a social networking site's critical mass of users may be difficult to maintain. A variety of elements will contribute to the forms' usability. The simplest method is to keep it as short as possible. Many social media sites just ask for the bare minimum on the sign-up form (e-mail and password) and leave the rest for the user to fill out when their account is created (e.g. bio, location, and other general information). If at all possible, avoid requiring an e-mail address or password confirmation, and avoid using a captcha.
5. **Prominent and Functional Search:** Excellent search functionality is unquestionably the apex of usability and user interface design. Because of the large amount of information available on social media, search functionality is necessary. The search, on the other hand, has numerous dimensions: in addition to typical content searches, social applications also allow users to conduct advanced searches of social graph connections, such as groups, communities, and hobbies. A search box should be placed in the upper-right corner of the website. A search input field and a visible search button are expected by users.
6. **Calm Separation of Elements:** One of the advanced design difficulties that social user interface designers must deal with is the meaningful grouping and presentation of distinct bits of information. Content blocks must be visually divided for the content to be accessible, scannable, and easy to comprehend. Each element, to put it another way, must be identified and presented as a separate entity. Separating objects in a layout is, in fact, one of the simplest ways to create a clearer user interface that the user can easily interact with. When many things are visually separated, however, the interface becomes more sophisticated and carries more bits of information. As a result, for the layout to remain scannable, the visual difference must be minor. The most widely

used lines are horizontal and vertical lines in neutral, calm hues (for example, grey). A bright, strong colour would distract the user's attention away from the activity at hand, which is often difficult to overlook. Lines that are "calm" are, on the other hand, easier to ignore.

7. **Prominent Call to Action Button:** Without a doubt, social programmes have a lot of features that need to be communicated in some way. As a result, practically every page must feature buttons and links (a sign-up form is probably the only reasonable exception). Some links are for navigation, while others allow the user to adjust the preferences for specific software features. The use of buttons to push people to take action is common, whereas the usage of links is more passive and subtle. Buttons are typically larger, more colourful, and easier to remember. A button, no matter what role it fulfils, must be large and clickable.
8. **Treat Text as User Interface:** Good designers treat text as content, but excellent designers treat it as a user interface. While the content is essentially a large block of text, the user interface makes it more accessible by altering the text colour, backdrop, font sizes, and link display. In fact, changing the size and colour of objects on social networking sites to offer a clear visual and structural hierarchy on the site is a good user interface method. This tip is similar to the last one in that it assists in the separation and definition of objects while also cleaning up the interface. Treating text as a user interface improves both readability and usability by establishing explicit linkages between design elements and emphasising their importance.

3.2 General Guidelines for Successful Use of Social Media in Libraries

Guidelines and recommendations for successful Social Media marketing in library and information services can be found in the literature. The following are some of the most important principles and strategies for using social media effectively:

1. **Determine the goal and purpose of social media marketing:** First and foremost, the goal and purpose of social media marketing should be decided based on the specific demands of a particular library.
2. **Preparation work:** This includes customising the library profile on Twitter and Facebook by changing the colours and backgrounds, as well as linking it to the library website and writing a welcoming and casual description of the library.
3. **Think big, start small:** Establish a strong presence on one of the major social media sites, such as Facebook or Twitter, before

- going on to another. Doing one thing properly is superior to having a plethora of underutilised profiles strewn throughout the Internet.
4. Decide what to post: Whether it's library news and events, new library acquisitions, links to articles, videos, community information, images, or anything else, deciding what to promote on your Social Media platform is critical.
 5. Promote events: Creating descriptive hashtags (#awesomelibraryevent!) that can be used on sites like Twitter and Facebook to encourage people to come and live blog or tweet about all of your library's activities is a great way to market your library.
 6. Get the tone right: Use informal but not overly familiar language on your Social Media platform, pleasant but not overly personal, colloquial but grammatically, syntactically, and orthographically correct language.
 7. Combine content production with curation: It is not required, and in fact, it is preferred, to write all unique content for your blog, Twitter feed, or Facebook page. By curating and linking to other people's content on your Social Media, readers are not only directed to recommended resources, but they can also network with the content's original authors.
 8. Maintain ongoing communication: Having a social media presence is analogous to having a real-life commitment that requires a regular interaction between librarians and the user community. Spend as much time following and listening to others as you do releasing information about yourself to display genuine interest in others. Follow the posts on your library's Facebook page to stay up to date.
 9. Establish a network of connected and consistent brand channels: Maintain a consistent social media presence across all of your library's platforms. To show people your brand, link all of your profiles on each Social Media channel, and link all of the Social Media accounts on the library's website with the same logo and colour scheme.
 10. Declaring your library's location on social media sites like Foursquare and Facebook: Think about where you'd like to declare your library's location on social media sites like Foursquare and Facebook.
 11. Use contests to engage patrons: Many social media platforms, for example, provide a wealth of opportunities for creative libraries to reward their users through prizes and challenges. Libraries can use Foursquare to provide rewards to the person who checks into the library the most.
 12. Highlight patrons on social media: Whether through a Facebook page, Pinterest pins, or YouTube videos, highlight your library patrons who are enjoying your events or using your services.

13. Create a marketing strategy for your social media presence: Get the word out by making your Twitter feed (or whatever platform you're using) more engaging so that more people follow you and your library is promoted. There are a variety of strategies for promoting your Social Media presence, including linking anywhere available, conversing with people, printing ads, Web ads, creating a network of friends, following and being followed in return, and allowing it time to grow into an active community.

4.0 CONCLUSION

This unit has exposed you to the characteristics of social media used in libraries. The discussion has also familiarised you with the general guidelines for using social media in libraries. You can now go ahead and refresh yourself with the tutor

5.0 SUMMARY

From the discussion in this unit, you learned about the concept of web technologies, categories of web technologies, characteristics, and benefits of web technologies.

SELF ASSESSMENT EXERCISE

Explain the guidelines for using social media used in libraries

6.0 TUTOR-MARKED ASSIGNMENT

1. Identify the various characteristics of social media used in libraries?
2. Describe the characteristics of social media used in libraries

7.0 REFERENCES/FURTHER READING

- Canty, Nick. (2012). *Social Media in Libraries: It's Like, Complicated*. Alexandria. 23. 41. 10.7227/ALX.23.2.4.
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MODULE 5: ISSUES AND CHALLENGES OF SOCIAL MEDIA TECHNOLOGIES IN LIBRARIES

In this module, you will be introduced to social media and libraries. The module will also familiarise you with the benefits of social media used in the libraries, as well as the associated challenges to the use of social media in libraries.

- Unit 1: Social Media and Libraries
- Unit 2: Benefits of Social Media in Libraries
- Unit 3: Challenges of Social Media in Libraries

UNIT 1: SOCIAL MEDIA AND LIBRARIES

CONTENTS

- 1.0 Introduction
- 2.0 Objectives
- 3.0 Main Content
 - 3.1 Social media in Libraries
 - 3.2 Reasons why libraries should engage users through social media
- 4.0 Conclusion
- 5.0 Summary
- 6.0 Tutor-Marked Assignment (SAEs)
- 7.0 References/Further Reading

1.0 INTRODUCTION

This unit will expose you to the concept of and the phenomenon of using social media in libraries. The unit will also intimate you with how the use of social media has spread to the libraries.

2.0 OBJECTIVES

By the end of this unit, you will be able to:

- explain the relationship between social media and libraries
- describe the phenomenon that resulted in the use of social media in libraries
- Identify and describe the reasons for libraries' engagement of the users through social media.

3.0 MAIN CONTENT

3.1 Social media and libraries

User Generated Content (UGC) is created and distributed using social media, which is a set of web-based apps. It is built on Web 2.0's conceptual and technological basis. One of the most common ways for libraries to promote their activities and services is through social media. Libraries with a strong public relations strategy are now actively using social media to promote their services, address problems, and meet their users' expectations.

Libraries have grown in importance to the point where our educational institutions can no longer function without them. They are required to promote teaching, research, and community service as part of the educational process.

Libraries must understand users' expectations and demands, just as they must understand the well-being of human society, to determine the essential and impactful information distribution methodologies, as well as consider how users' wants and expectations are met. The target audience that each library serves and/or seeks to serve is unique. Knowing the target population (in this example, library users) and how their distinctions, such as education, age, career, interest, and demeanour, play a major part in addressing their demands to the point of satisfaction is critical.

Organizations may connect and engage with a wide range of people using today's new media platforms, which are tremendously powerful for communication. Libraries could take advantage of these social networking platforms to spread information, offer services, and promote new releases. Social networks are gathering places for like-minded people to share their thoughts, ideas, and personal information. Since the dawn of computers, e-mail has been one of the most popular kinds of social communication. Libraries and their users are now using social media tools like Facebook, Twitter, Flickr, YouTube, and other sites to share content or send it via e-mail messages.

3.2 Why Library Should Engaged Users through Social Media

Online social media has been extensively studied in a variety of fields, and it has had a considerable impact on how businesses and organisations communicate with their clients and market their products and services (Kaplan and Haenlein, 2010). It is self-evident in the field of information and library science that understanding the user and their needs is crucial to library marketing success. However, based on the available literature

on the use of social media in libraries, this is far from the truth, with a clear disconnect between marketing advice and social media tool recommendations.

SM allows us to do more than just chat to our users; it allows us to engage them in discourse, and because so many library users are on SM, it is the perfect place to be. This, on the other hand, assumes that users will wish to access the library at any time. Libraries should follow the lead of other services that have done so well. The ostensible natural transfer of services and the ease of use of such tools have also been cited as reasons for libraries to adopt SM.

SM in libraries, according to Bradley (2015), is merely a different way of doing what is already being done. Communication, presentation, promotion, and marketing can all be done with social media platforms, which the library currently does; it's just a matter of fulfilling these jobs with other methods. The usage of social media is both cost-effective and simple, and it may be done in-house without the involvement of outside departments or advisers. As a result, nothing prevents libraries from employing it to streamline services and operations.

However, due to the ease with which these new technologies have been accepted, their potential have been overestimated. Libraries must research and comprehend the user community's behaviour, culture, and etiquette in addition to learning how to utilise the tools. Libraries must make their presence relevant and valuable, not just go where the people are.

Users have shown little excitement for libraries' attempts to use SM but customers would never have thought to e-mail the library a decade ago, and now it is the major mode of communication. As time goes on, SM will experience the same shift of mindset. Libraries should be proactive in either initiating this change or inquiring about what their users desire from the service.

4.0 CONCLUSION

This unit has exposed you to social media in libraries. The unit has also exposed you to the reasons why libraries should engage users through social media in libraries. You can now refresh what you have learned through the evaluation questions.

5.0 SUMMARY

From the discussion in this unit, you learned about social media and its relevance in libraries. You have learned about the reasons why libraries should engage users through social media.

SELF ASSESSMENT EXERCISE

what are the reasons for libraries' engagement of the users through social media?

6.0 TUTOR-MARKED ASSIGNMENT

what is the relationship between social media and libraries?

what phenomenon resulted in the use of social media in libraries?

7.0 REFERENCES/FURTHER READING

Jones, M.J. & Peveril, B. (2019). Library 2.0: The effectiveness of social media as a marketing tool for libraries in educational institutions. *Journal of Librarianship and Information Science*, 51(1), 3–19.

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McCallum I (2015). Use of social media by the library: Current practices and future opportunities. A White Paper from Taylor & Francis. *Australian Library Journal*, 64(2), 161–162.

Thakker, S. (2018). The three most common social media challenges for libraries and how to overcome them. <https://blog.techsoup.org/posts/3-most-common-social-media-challenges-for-libraries-and-how-to-overcome-them>

UNIT 2: Benefits of Social Media in Libraries**CONTENTS**

- 1.0 Introduction
- 2.0 Objectives
- 3.0 Main Content
 - 3.1 Introduction to benefits of social media in Libraries
 - 3.2 Various benefits of Social Media in Libraries
- 4.0 Conclusion
- 5.0 Summary
- 6.0 Tutor-Marked Assignment (SAEs)
- 7.0 References/Further Reading

1.0 INTRODUCTION

This unit will expose you to the various benefits of social media in libraries. The unit will also identify and explain each of the benefits of social media for your better understanding.

2.0 OBJECTIVES

By the end of this unit, you will be able to:

- identify the benefits of social media in libraries
- explain each of the benefits of social media in libraries.

3.0 MAIN CONTENT**3.1 Benefits of Social Media in Libraries**

Social media has evolved into a reliable platform for information transmission, feedback mechanisms, research, and, of course, promotion. As a result, it's not surprising that libraries all around the world are promoting their services via social media. Facebook, Twitter, Flickr, YouTube, Wiki, and other social media sites are great for advertising library materials and services as well as fast collecting feedback from library patrons.

When used in a positive manner, social media has a lot of advantages. As a result, libraries are taking advantage of this 21st-century gift to reach out to potential clients in far-flung regions. Social media allows library users to maintain a steady and flexible relationship. It also enables library users to generate and exchange data from anywhere on the planet. Social media provides instantaneous and up-to-date information on library news and opinions. It also offers customers a variety of services. Social media

is also being used to help libraries flourish in terms of usage and development.

Social media assists library customers in obtaining their information needs from across the library's boundaries. Social media aid in maximising the use of library resources. It aids in bringing library users together to strengthen their presence in cyberspace. SM can help libraries create two channels of communication between library staff and others promote library services and resources, reduce budget allocation, and increase capacity, and save library users' time.

Searching through the literature; it was observed that there are benefits for using social media to promote library and information resources and services. These are discussed as follows:

1. Building Brand Loyalty

Using social media to promote library and information services not only helps libraries advocate for themselves, but it also inspires library users to become advocates. Social media serves as a hub for interaction, dramatically enhancing two-way communication. As a result, the appearance of the library improves. Using social media in university libraries improves the library's trustworthiness, which leads to enhanced brand loyalty. In this age of social media, libraries, like celebrities and media commentators, have spent years developing their brands. University libraries rarely have a direct sales function, but they do have a history of forging long-term relationships with a range of stakeholders, including university administration, researchers, instructors, and students. One of the most important things that a successful academic library can give is a long-term relationship with the people who use its services.

2. Saves Time

Social media is used to advertise library and information services to save time. Social media has benefited libraries by providing immediate updates to users as well as a forum for quick and timely input from library consumers. More importantly, social media allows libraries to reach a large number of people in a short amount of time. Although there is a common misconception that good social media marketing necessitates a large amount of time and effort, this is not the case. The most major advantage of social media marketing, according to Street (2013), is that delivering online content can be the most cost-effective and time-effective part of the marketing mix.

3. Enhances and Fast-tracks Two-Way Communication

Responding to users' concerns or praise, acknowledging them, and demonstrating that the library is interested in and cares about their ideas is one of the most basic elements of customer service. Although librarians

have no control over what is said about a library, they can influence the message that is returned. This is where social media comes in, as it serves as a platform for library promotion feedback. It is worth noting that keeping track of library users' comments and questions gives the library the ability to clarify issues and maybe make improvements. This is a sort of promotion that helps the library's image.

4. Saves Costs and Increases Revenue

There are several free social networking programmes accessible. Using social media to market library and information services allows you to reach a huge number of people for a low price. It does not cost a kobo to use social media to promote library services. A library can engage in actions/activities on social media platforms such as Facebook, blogs, and Twitter to advertise items and services without investing a dime. A Facebook account, as well as a Twitter or MySpace account, is all that is required by the library. Patrons, the community, and stakeholders can "like" the library's Facebook page or follow them on Twitter. Following that, the promotion procedure can commence. Promoting libraries on social media, on the other hand, increases revenue. If librarians wish to obtain funds from stakeholders and the university administration, they must first develop a business plan.

5. Increases the Number of Library Users

Anyone can join the online community as long as they have access to the Internet. Friends who are connected to a friend or fan of a library page on Facebook, for example, are aware of the behaviour of that friend or fan. As a result, people might learn about the library's promotional activities when a fan of a library page comments or likes a status/post posted by the library. This may persuade a library fan's friend to become a member. In addition, social networking can boost library patron satisfaction. This isn't to say that the library's services should not be effective; if they were not, the library's efforts to promote them would fail to attract new clients.

It appears that social media has aided in the promotion of library and information resources and services, as well as the maintenance of user interactions. As librarians struggle to stay relevant in a digital society, social media might be considered a tool to help them seduce and retain their readers through promotion. Furthermore, both libraries and library users have a better awareness of the broader process of using social media to promote libraries.

4.0 CONCLUSION

You have learned about the advantages of social media in this unit. The unit has also recognised and explained some of the advantages of social media in libraries. You can now go over what you have learnt again.

5.0 SUMMARY

You learnt about the advantages of social media through the conversation in this unit. You' have also learnt about specific advantages and how to explain them. You can now review the evaluation questions to see if you comprehended the unit's material.

SELF ASSESSMENT EXERCISE

identify the specific benefits of social media in libraries

6.0 TUTOR-MARKED ASSIGNMENT

describe each of the benefits of social medial in libraries you have identified.

7.0 REFERENCES/FURTHER READING

Jones MJ, Harvey M. (2019). Library 2.0: The effectiveness of social media as a marketing tool for libraries in educational institutions. *Journal of Librarianship and Information Science*, 51(1), 3-19. doi:[10.1177/0961000616668959](https://doi.org/10.1177/0961000616668959)

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UNIT 3: CHALLENGES OF SOCIAL MEDIA USE IN LIBRARIES

CONTENTS

- 1.0 Introduction
- 2.0 Objectives
- 3.0 Main Content
 - 3.1 Challenges of social media in Libraries
 - 3.2 The way forward of social media challenges in libraries
- 4.0 Conclusion
- 5.0 Summary
- 6.0 Tutor-Marked Assignment (SAEs)
- 7.0 References/Further Reading

1.0 INTRODUCTION

This unit will expose you to the challenges of social media in libraries. The unit will also intimate you with the way forward towards eradicating the challenges associated with the use of social media in libraries.

2.0 OBJECTIVES

By the end of this unit, you will be able to:

- identify the challenges associated with social media in libraries
- identify and explain each of the challenges of social media in libraries
- describe the way forward towards eradicating the challenges of social media in libraries.

3.0 MAIN CONTENT

Challenges of Social Media Use in Libraries

The use of social media in Nigerian libraries is fraught with difficulties. According to Ezeani and Igwesi (2012), in their study on the Nigerian experience with using social media for dynamic library service delivery, indifference, lack of awareness and anxiety prevent most libraries, particularly in developing countries, from using social media. In addition, Ezeani and Igwesi (2012) discovered that low bandwidth and outdated Internet infrastructure, which they referred to as widely "moribund," are barriers to accessing Social Media in libraries. The author complained that it was inconvenient and that most Nigerian university libraries only paid for increased bandwidth during accreditation periods.

Inadequate trained staff:

Another significant issue impeding efficient usage and adoption of social media in most of our libraries is a scarcity of educated library employees to administer it. This has also become a problem that obstructs good library service delivery. The majority of library employees lack the skills required for the adoption and usage of social media platforms in library services. Lack of qualified ICT librarians, ineffective communication mechanisms, and insufficient budget have all been mentioned as barriers to ICT use in academic libraries. The case is not different in other African countries where inadequate ICT skills of librarians, inadequate computer infrastructure, and human capacity are major challenges. Inadequate ICT skills of librarians can hinder the use of social media and other ICT resources in libraries and information centers.

Technophobia: Another issue affecting the usage of online social networking technologies in libraries is technophobia. Because of their anxiety, most library personnel and users are unwilling to accept new technology and are content with old library services. Technophobia is the fear or hate of advanced technology or complex equipment, notably computers. Technophobia is an all-too-common phobia. According to some experts, we all experience some level of anxiety when confronted with new technologies. In today's fast-paced society, it's easy to feel out of touch. The usage of social media in most libraries today is hampered by an excessive fear or anxiety about the effects of modern technology.

Epileptic Power Supply:

It is shameful that the country's dependable electricity supply remains a mirage to this day. The situation is tragic; practically all social media programmes are powered by energy, but Nigeria's electrical supply is woefully inadequate. Power outages are a problem in African countries, making it difficult to provide and access information/Internet. Similarly, a power outage increases overall overhead and operational costs, restricting the usage of social media in Nigerian libraries to promote library and information services. As a result of this development, no library will be able to use social media for promotion in a cost-effective manner. According to another school of thought, even when electricity is accessible, the voltage is either too high or too low. Because of Nigeria's unstable power source, certain components were burned and could not be easily replaced. Furthermore, librarians and users in Nigeria are discouraged from participating in the online forum due to the country's unpredictable and intermittent power supply. In most underdeveloped countries around the world, irregular power supplies make it difficult to use technology gadgets. Even though Nigeria's electricity sector is undergoing significant changes; the country's power supply remains unreliable. Many Nigerian academics have bemoaned the country's notoriously unreliable electrical supply. Most libraries are currently

facing this difficulty. As a result of the situation, the use of SN, electronic information resources, and other Internet-based resources is harmed.

Lack of Awareness

In underdeveloped nations, the majority of librarians are uninformed of social media services. Even those who are informed are having trouble recognising the most active library users on these sites. Furthermore, people are uninformed of the social communication protocols. Many students, and even some faculty members, may be unaware that their discipline has a topic expert. Making initial contact with clients and attempting to develop a public presence are crucial for librarians.

In Nigeria, getting students and Facebook users (including librarians) to go beyond the social element of the platform and use it for more serious and productive purposes is difficult. In fact, in Nigeria, there is a popular motto that states, "Leave Facebook and Face Your Book." This demonstrates that Facebook is commonly seen as a platform for non-serious discussion (Tella et al., 2020). Furthermore, some librarians do not believe that promoting library and information services is necessary until more data is available.

Privacy Concern:

Students and employees working in university libraries should be concerned about their privacy if they engage in online social networking. This is because the misuse of personal information on social networking sites causes a significant number of people to suffer mental or physical harm. Social media poses a growing online security issue because library patrons' personal information on social media can be misused for financial gain. Sund (2007:68) argues that having a person's name, address, and birthdate (let alone a social security number) is enough for thieves to hack into financial accounts and steal personal data. Similarly, a string of advertisement messages on online social networks can upset certain consumers. With this in mind, librarians face the difficulty of most library customers being stalked by persistent adverts or promotional messages on social media. Social media can also be used to disclose the library's plans and aid competition. "In today's digital society, more and more of our personal information exists online, exposed and susceptible to anyone with prying eyes and access to a computer," writes Morale and Peterson (2010). Individual control over a library's personal information becomes a critical privacy concern as a result.

Low level of Technology Penetration:

The degree of technology in the country is often inadequate. The high cost of tariffs in the control sector, as well as government neglect, might be blamed for this. Nigerians dream of a time when every house and workplace is connected to the Internet for free or at a low cost, as it is in industrialised countries. Unfortunately, in most cases, only the rich in the

country have access to the Internet. According to Joseph and Statista (2021), there were 4.66 billion active Internet users globally in January 2021, accounting for 59.5 percent of the global population. 92.6 percent (4.32 billion) of this total used mobile devices to access the Internet. Despite the fact that the number of individuals with Internet access is growing, Nigeria continues to lag behind. It's equally disappointing to hear that Nigerian university libraries have very few Internet desktop computers.

Network Problems:

There is always an issue with an Internet network or a cable network. Either there is a problem with the cable network or a connectivity problem occurs when a connectivity component such as a hub, router, or switch malfunctions, or when cables connecting different areas of a network are severed or shorted. Excessive network collisions, software issues, and the use of the same IP address are all potential network issues. Ezeani and Igwesi (2012) add to this the issue of bandwidth, stating that most universities have insufficient bandwidth to enable this practice. Ineffective online involvement might be hampered by poor connectivity. Lack of technical knowledge and competence, high ICT costs, corruption and neglect, minimal government participation, opposition to change, and a variety of other issues have all been encountered while using social media to promote library and information products and services. Noorhidawati (2016) illustrated the challenges of using social media in the libraries as:

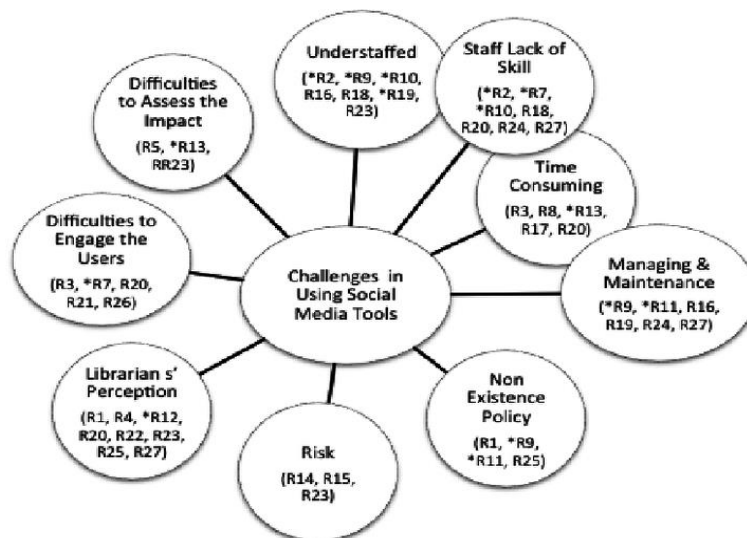


Fig 5.1: Challenges of social media in libraries.

Source: Noorhidawati (Year)

3.2 The Way Forward to the Challenges

In a time and resource-constrained sector, many libraries encountered repeated obstacles that failed to demonstrate that the effort was worthwhile. When used correctly and consistently, however, social media can be a very effective tool for building a community. The top three obstacles are broken down in this unit, along with a few ideas for making social media activities more fruitful. We have also included links to some handy resources to help you get the most out of your efforts.

Growing the Library Social Audience: Libraries will frequently post and receive little to no reaction; alternatively, if they do receive responses, they will not have time to keep focused on building their audiences. Social media is all about trial and error, so that's the way to go. However, before completely abandoning a site, we recommend giving it a few months of constant publishing to figure out what's working and what isn't. Patience and time are the two most powerful soldiers." The same may be said for social media.

It is also crucial to remember critical statistics when it comes to developing your audience and persuading them to connect. Pictures do not perform as well as videos. Text alone does not perform as well as pictures. According to research, video on Facebook and Facebook Live do exceptionally well. So, the next time you have a library reading, why not live-stream it on Facebook or do an Instagram story about it? This is more likely to attract your customers' attention than plain text or even a picture. Should librarians question themselves if they would reply to this Facebook post if they saw it? If you do not know the solution, do not publish it.

Try to come up with stuff that you know will be interesting. Take a look at some of your favourite social media accounts, consider why their content is engaging, and try to apply the same strategy to your content. Make use of movies and graphics, and have fun with your content. Your audience will undoubtedly pay attention to you. If your library has the funds, you can also try running a few paid advertising or boosting one of your best-performing pieces to give it a boost. Another wonderful strategy to gain followers is to hold a giveaway; just make sure to follow all applicable legal rules. You might also attempt something like "Caption of the Week," in which you publish a photo and ask your followers to caption it. Engaging activities like this will help you build your user base organically while also keeping existing users interested.

Inadequate Time and Resources: The lack of time to spend on social media is the second most significant difficulty that librarians confront. According to a survey (Oriogu et al, 2020), 81 percent of libraries spend

hardly more than 10 hours per week on social media. This could be due to a limited staff or a lack of awareness of how to effectively use social media marketing. So, how can libraries make the most of the limited amount of time they have to spend on social media? In this case, scheduling posts ahead of time would be a good idea. When working on social media sites, login into multiple accounts two or three times a day is inefficient and unlikely to happen. A library can use a social media scheduling tool like Hootsuite or CoSchedule to schedule all of their posts at once and have them dribble out over the week, eliminating the need to check-in and publish every day. After your piece auto-publishes, a library can simply spend a few minutes each day replying to any comments or queries that readers may have. Also, whenever you write, try to spend a few extra minutes producing pieces that are relevant so that if you miss a week, you will have enough information to get you through. If a library is unsure who should be in charge of this duty, it's customary to enlist the assistance of a few trusted librarians for copywriting, answering inquiries, and monitoring notifications. The library should set aside time to prepare copy and schedule posts for the coming week.

Measuring goals: The most popular social media platform is Facebook (Tella et al., 2021). The third most common issue for libraries is determining whether or not their social media activities are worthwhile. So, how do they assess the success of their campaigns? Setting goals is the greatest solution. Setting monthly goals in advance is the best way to go. New York Public Libraries, for example, has run some of the most effective social media initiatives. The set objectives such as improved brand exposure increased traffic and community building. When libraries know what they want to achieve, it is easier to figure out which platforms will help them get there and what kinds of campaigns they will need to run. Increase in followers, engagement with posts: reach, comments, likes, retweets, hearts, and others are some common metrics that libraries may want to track. The library's website receives a lot of traffic. Once a library is comfortable with these indicators, they can move on to more ambitious targets like increasing library card sign-ups and attendance at library-related activities. It is suggested that these metrics be kept in an Excel spreadsheet to see how campaigns are expanding or not growing. Introduce new and exciting ideas to social media, such as:

- Book clubs leveraging Facebook Events for Reader of the Month
- Quotes from well-known authors, accompanied by photos
- Announcements of when popular new books will be available, along with images of the books

Increasing Budget for Libraries: The parent institutions or library owners, such as the government, should consider raising library budget allocations. By doing so, libraries will be able to overcome the majority of these issues. They will, for example, be able to construct an alternate

power generation plant. They will be able to send personnel for further training on how to utilise and handle social media to improve library services. It will also allow them to provide more infrastructure in libraries to facilitate the use of social media, such as increased bandwidth and connectivity. Publicity, workshops, and conferences should be used to raise awareness of both social media and social media as a marketing platform.

4.0 CONCLUSION

This unit has introduced you to the problems that militating against social media adoption and used in libraries. Furthermore, the unit has informed you of the steps to take in order to eliminate the issues related with the use of social media in libraries.

5.0 SUMMARY

You learned about the obstacles of social media from the conversation in this lesson, as well as how each of the challenges affects the usage of social media in libraries. You have also learnt about the steps that may be taken to eliminate the problems that come with using social media in libraries.

SELF ASSESSMENT EXERCISE

List the specific issues related with social media in libraries

6.0 TUTOR-MARKED ASSIGNMENT

1. Explain each of the challenges you have outlined for social media in libraries.
2. What do you think the best course of action for overcoming the issues of social media in libraries?

7.0 REFERENCES/FURTHER READING

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