Module 8

Web Technology and Libraries

**Unit 1**

**Website Development**

**Learning objectives**

* To provide an overview of the history and development of the Internet
* To explain different aspects of world wide web
* To elaborate on the criteria of website evaluation
* To develop a website for an educational institutional library

1. **Introduction**

The Internet is considered as one of the greatest inventions of the mankind. It has become an integral part of our life and today billions of people across the world are depending on Internet for their daily routine. The life without Internet is not imaginable in our personal as well as professional lives.The Internet plays a very vital role in education by facilitating cost effective and affordable quality education,providing effective and interactive teaching-learning tools and inmany other ways.

However, having dependent on Internet that much,did we ever think of who invented this revolutionary stuff and what are the technologies behind it? In this Unit, we will learn the basics of Internet and Web and how to develop a website for an educational institution library.

1. **Origin and Development of Internet**

In simple terms, the Internet is a global network of computersformed by ‘interconnecting’ many small and big computer networks across the world. In fact, nobody invented Internet in its current form. It gradually grew up as a global network from a small network of four computers in USA called ARPANET (Advanced Research Project Agency Network). The ARPANET was established by the US government for storing and sharing defence-related information in1969. It was established as a de-centralized network and same resources were simultaneously stored in more than one computer in the network so that if one part of the system fails the rest can still function. This was to make sure of survival of the network even during unforeseen events and disasters like war. It may be noted that during that period USA was expecting an aerial attack from Soviet Union and Japan. Another feature of the ARPANET was its ability to connect and communicate with computer devices with different configurations. In the early 1980’s, the National Science FoundationNetwork (NSFNET), a network of universities and research institutes in USA joined ARPANET followed by many other academic and research networks across the world.

The first ever email was sent in 1971 on ARPANET by Ray Tomlinson, the US engineer who invented the email. According to Internet Live Stats, today, almost 2.8 million emails are sent every second.

Different tools and techniques were invented to store and share resources on the Internet over the years. These include e-mail, file transfer protocol (ftp), telnet, Usenet news, gopher and world wide web (in short, web). Of these, the emergence of the web in 1990’s was a turning point in the revolutionary growth of the Internet. The web with its user-friendly nature and attractive features over shadowed other resources and services on the Internet till that time. Eventually, services like gopher and UseNet disappeared, telnet and ftp side lined and email reshaped into a web-based format. Thus, today, the Web occupies the major portion of the Internet.

1. **How Internet Works?**

As discussed earlier, the Internet is a network of computers spread across the world. Computers on the Internet are mainly of two types: server computers and client computers. The server computers are the systems which store information resources. The client computers are the computers using which we access and use the resources and services stored in the server computers. Thus, when you are downloading an application form from an Institution website, you are actually retrieving a copy of the application form stored in the server computer of that Institution. Your computer, that is the computer you usedfor downloading the application form is called Client Computer.

Today, any devices even our fridge and washing machine can be connected to the Internet. This technology is known as Internet Of Things (IOT)

Before knowing the basics of information communication over the Internet we should know what is meant by a protocol. A protocol in simple terms is a set of rules used for communication between electronic devices, especially computers over a network including Internet. The protocol covers the rules regarding the types of data or information that are shared, how to send and receive data etc. Normally, the protocols work in the background in a network, so it is not necessary for the ordinary users like us to know the technical details of them.

When a user sends or retrieve information across the Internet – e.g., access Web pages or upload files to a server, a protocol by name Transmission Control Protocol (TCP) on the sender’s machine breaks the message into into small packets of about 1500 bytes and send them out. Another protocol by name Internet Protocol is responsible for addressing and forwardingthose individual packets to the destination. Each packet will have the information regarding the sender and receiver and each will be taking the same or different route on the Internet to reach the destination. Upon reaching the destination, the packets are re-assembled and delivered to the recipient in proper format. There are devices on the Internet called Routers to direct the path of the packets to the destination. If a particular packet encounter with a problem in its path, it will be routed through another path ensuring the delivery of the entire message.

Web Server:As we have discussed previously, today, majority of the Internet resources and services are web-based. The software application used for managing the web resources on a server computer is known as Web Server**.**

Web Browser:We have learnt that the computers using which we access the Intern is called Client Computer. In fact, in order to access the web resources stored on a server computer on the Internet, our computer needs to have a software application called Web browser. Thus, a web browser is the software application for accessing the web. E.g. Google Chrome, Mozilla Firefox, Internet Explorer (now replaced by Microsoft Edge) etc.

Web Pages:In web servers, the resources and services are organized in the form of specialized computer files called web pages. The major characteristic feature of the web pages is that they can be linked to other web pages in the same web server or to other page(s) located in servers elsewhere in the world. Webpages are made using a very simple computer coding language known as hypertext mark-up language or in short, html. The web was invented by Mr. Tim Berners-Lee, a British computer scientistin1989 while he was working at CERN, the European Organization for Nuclear Research (In French: Conseil européen pour la recherche nucléaire). It was originally conceived and developed to meet the demand for automated information-sharing between scientists in universities and institutes around the world. On 30 April 1993, CERN put the World Wide Web software in the public domain and later released it with an open licence to maximise its dissemination. These actions allowed the web to flourish.

The first ever website developed by Tim Berners-Lee is still active. It is built on basic htmland the page contains a few lines of text. The website address is: http://[info.cern.ch](http://info.cern.ch/hypertext/WWW/TheProject.html).

Uniform Resource Locator or URL: A Uniform Resource Locator is used to locate a resource on the internet. With the dominance of the web, it is used as synonymous to a web address. A URL consists of multiple parts.

Domain Name: The Website address is technically known as domain name. Usually, an Internet server computer is identified by a series of unique numbers assigned to it known as IP address. An IP address is like 203.164.168.22. It is difficult for a human being to remember an IP address of a site which is in the form of a string of numbers and access it. To resolve this issue the domain name system was developed. The domain name has to be registered before you using it. Also, it should be unique as two websites cannot have the same domain name.

Homepage: The default first page that visitors see when they access a website is homepage page. Usually, this will be the main page of the website where visitors can find links to other pages on the site.

Website Address: The location of a particular website on the Internet is uniquely identified by its address called as website address. e.g. [www.riemysore.ac.in](http://www.riemysore.ac.in) is the official website address of the Regional Institute of Education, Mysuru. A website address is online equivalent of our postal address.

1. **Who owns the Internet?**

We have learnt that the Internet is grown from the four server computers of ARPANET. Later, many small and big computer networks joined the network established by the ARPA. The ARPANET was officially decommissioned in 1990, whilst in 1995 the NFTNET was shut down. By the time ARPANET and NSFNET dissociated with the Internet, many others have linked with it thus becoming a global network. Each one of the network on the Internet has its own identity. However, there is no central agency to control the Internet as a whole and nobody owns it.

Internet Society: Though nobody owns and control the Internet, a non-profit American organization by name Internet Society established in 1992 is responsible for overseeing the formulation of policies on access and standards on Internet.

Internet Engineering Task Force(IETF): The IETF is a global community of network designers, operators, vendors, and researchers who deals with the Internet architecture and the smooth operation of it.

Internet Service Provider:An Internet service provider in short, ISP is an organization that provides Internet connectivity to persons and organizations in a country. In India BSNL, Reliance, Airtel etc. are the leading Internet Service Providers.

World Wide Web Consortium (W3C): The World Wide Web Consortium is an international community established by [Tim Berners-Lee](https://www.w3.org/People/Berners-Lee/) , the inventor of the Web to develop [Web standards](https://www.w3.org/standards/). The mission of W3C is to lead the Web to its full potential.

The first Internet Service Provider in India was Videsh Sanchar Nigam Limited (VSNL) which launched its service on 15 August 1995.

1. **Planning and Designing a Library Website**

Proper planning and designing are important for the success of a library website. The major steps involved are the following:

1. Decide the Purpose of the Website: This is the first step in planning and designing a library website. During this stage, the purpose of the site, target audience, the types od information to be provided on the site etc. have to be decided. Also, all the information needed for the development of the site and its content creation have to be gathered.
2. Create a Site Map: In this stage, a list of all the items that constitute the webpages of a site will be prepared. The site map is very essential for building user-friendly site with better avigation options and search engine optimization.
3. Create a Wireframe: The wireframe is a visual guide that depicts the skeletal framework of the site. It is also called the visual prototype of the website.
4. Decide the Design Aspects: In this stage, the layout of the site has to be decided and check whether the layout selected are visually appealing.
5. Content Development: In this stage, compelling and appealing content have to be developed with catchy phrases and headlines.
6. Coding and Site Development: Coding is required only in case of a website developed from scratch using tools like html, css and JavaScript. The site can also be developed using tools like Wixi. First create a homepage followed by the subpages based on the sitemap and wireframe prepared earlier.
7. Testing: In this stage, the website will be tested for any errors.
8. **Website Development Tools**

In our daily life, we come across with hundreds of websites featuring interactivity, visual appeal, attractive design, audio, video and many more. Such multi-featured websites were not imaginable some years ago.The websites have evolved over the years from simple and static sites to advanced multi-media sites.

Paul V. Mockapetris, a US computer scientist and Internet pioneer invented the Domain Name System (DNS). The invention of the DNS led to the massive expansion, popularization and commercialization of the internet.

Basically, awebsite can be built in two ways:

1. Building from scratch
2. Using website design tools.

Building a Website from scratch: Normally, every website is made up of three components. These are: Hypertext Mark-up Language (html), Cascading Style Sheet

(CSS) and JavaScript. Better to say, these are the building blocks of any website. Of these, html is a very simple coding language which provides the basic structure for a website. The CSS provides stylistic appearance for the website like colours, layout and fonts. The JavaScript is a computer language that provides interactivity and functionality for a website. In order to develop a website from scratch we need to know the above threesoftware tools. First, we have to write code manually using html, then provide stylistic appearance using css and interactivity features with the help of JavaScript. This is a tedious and time-consuming job which requires in-depth mastery of the tools. However, the advantage is that we will get a complete control over the site development.

Using Website Design Software: Earlier website building demanded the knowledge of software tools like hypertext mark-up language (html) and related tools. Today, we can develop even a multi-feature website without any technical skills in a couple of hours with the help of readily available web design software tools. The web design software tools are of different types. The major one is content management system (CMS) which helps us to create, manage, and modify the contents of the website without the need for any coding skills. E.g. Drupal, Joomla and WordPress

There are more user-friendly web design tool than the content management system. They offer easily customizable templates which can be converted into beautiful websites in no time. E.g. Weebly and Wix. However, websites that require a database to store and retrieve information are not easy to create using tools like Wix and Weebly. For that we have to depend on Content Management System based tools.

Selection of a Website Builder**:** The selection of an appropriate website building software is relatively easy now-a-days. A couple of factors that are to be considered in this regard are: availability of free trial,kind of support like phone, chat and forums, presence of an active community of users, affordability of price and availability of required features.

1. **Launching a Website**

The pre-requisite for launching a website is the obtaining of a domain name for the site. There are many domain agencies in the country to do the job for us. Once we get the domain name, there are two ways for launching the website onto the web. (1) Setup a Server Computer by yourself, install the site you designed in it, get a 24/ 7 Internet connectivity for it and upload the site using your domain name. (2) launch the website using the website hosting service provided by the government or private webhosting organizations. It may please be noted that the government webhosting organizations will host only the government website. There are mainly three types of web hosting services: Free hosting service, shared hosting service and dedicated hosting service. The three main factors that determine the webhosting are: storage space, bandwidth and server operating system.

1. **Guidelines for Developing an Effective Library Website**

The website of an educational institution library must act as an information gateway for its academic community. The important guidelines for developing the site are:

* The website should have a vision and mission statement detailing its objectives and purposes in line with the vison and mission of the organization
* It should be ensured that the site is accessible with equal ease for the users through the major browsers and across all computer platforms.
* The site ownership must be mentioned on the homepage and all other entry pages.
* The terms conditionsof using the site should be mentioned on the site
* The site must incorporate a search box on a prominent place
* It should have proper navigation options
* Homepage, the most important part of the site where the user land first should not be cluttered with too much information.

1. **Development of a B.Ed. College Library Website**

[Practical]

1. **Conclusion**

The Internet and web are integral part of today’s education system. It is mandatory for an academic librarian to have a thorough knowledge on the Internet technologies and mastery over website development

**References**

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