

Unit - V

5.1 Writing Web Projects

Writing web projects

A web project is a project that involves the creation or development of a website. This includes the following activities.

- Design
- Development
- Deployment
- Maintenance and Improvement

Mission Statement

Every web project must have a mission statement. It is a concise and clear statement that outlines the primary purpose, goal, and objectives of the project. Mission statement helps everyone involved in the project understand its purpose and remains focused on achieving its goals. Main objectives of mission statement are

- Specific
- Measurable
- Attainable
- Realistic
- Time limited

Identification of Objects

The components that are visible in a website are called objects. For every project, based on the requirements received from the user various objects are identified for usage in a webpage. Some of the most commonly used objects are

- Text content

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- Links
- Images
- Multimedia
- Interactive elements

Target Users

The content of a website is determined by the users who visit the website. The developer decides the target user by performing

- **Market Research:** By analyzing the market available for the category of website being launched.
- **Focus Group:** It uses a small, diverse group of individuals who discuss and provide feedback about the target users.
- **Understanding the Audience:** Based on the purpose of the website the target users are identified.

Web Team

It is a team of technical experts involved in developing a website from designing the page to maintaining the web server. A web team consists of the following roles

- **Project Manager:** The project manager is responsible for overseeing the entire web development project. They coordinate team activities, manage timelines and budgets, and serve as a point of contact between the client or stakeholders and the development team.
- **Web Developer:** Web developers are responsible for writing the code that makes a website or web application functional. They can be divided into various specialized roles, including:
 - **Front-End Developers:** Focus on the user interface and client-side functionality, using technologies like HTML, CSS, and JavaScript.

- **Back-End Developers:** Handle server-side programming, database management, and application logic using languages like Python, PHP, Ruby, or Node.js.
- **Full-Stack Developers:** Have expertise in both front-end and back-end development and can work on the entire web stack.
- **UX/UI Designer:** User experience (UX) and user interface (UI) designers work on the visual and interactive aspects of the web project. They create wireframes, mockups, and prototypes, ensuring that the website is user-friendly, visually appealing, and aligns with the project's goals.
- **Graphic Designer:** Graphic designers create visual elements such as logos, icons, images, and illustrations that enhance the aesthetics and branding of the website.
- **Content Writer:** Content writers or copywriters are responsible for creating and editing text content on the website. They ensure that the content is clear, engaging, and aligned with the project's objectives.
- **Quality Assurance (QA) Tester:** QA testers focus on identifying and reporting issues, bugs, and inconsistencies in the web application. They conduct testing, including functional, usability, performance, and security testing, to ensure the website functions correctly.
- **Database Administrator (DBA):** DBAs manage the database systems that store and retrieve data for web applications. They optimize database performance, implement security measures, and ensure data integrity.
- **System Administrator:** System administrators maintain the server infrastructure that hosts the website or web application. They ensure server security, reliability, and scalability.

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Planning and process development

Planning and process development are crucial steps in any project, including web development. Proper planning helps set clear objectives, allocate resources efficiently, and establish a roadmap for the entire project. In website development the following are the important planning phases

- **Early Planning:** This is the first planning phase, this is used to identify the target audience of the website. This involves activities such as focus groups, market research and gathering end user requirements.
- **Content Planning:** In this phase the content such as images, audio, video, other media files and links that are required for the design and development of the website are identified.
- **Technical Planning:** In this phase the database, transaction system and scripts that are required for the working of the website are designed.
- **Production Planning:** This is the final phase which performs a market research about the requirements of the website. In this phase the different web pages that are developed are combined to get the complete website.

Web Applications

Web Applications

A web application, also known as a web app, is a software application that runs on web browsers over the Internet or an intranet. It is designed to provide interactive functionality and deliver services to users through a web interface. Some examples of web applications are

- Social Media Platforms

- E-Commerce Websites
- Content Management Systems
- Online Learning Platform

Content Management System

CMS stands for "Content Management System." It is a software application that allows users to create, manage, and publish digital content on the web. CMSs are commonly used for websites and web applications where content needs to be regularly updated, such as blogs, news sites, e-commerce platforms, and corporate websites.

Features of CMS

- **Content Creation:** Users can create and format content, including text, images, videos, and documents, without needing extensive knowledge of coding or web development.
- **Content Editing:** CMSs provide easy-to-use text editors and media upload tools for making changes and updates to existing content.
- **Content Organization:** Content can be organized into categories, tags, and hierarchies, making it easier to manage and navigate.
- **User Management:** Different user roles and permissions can be assigned, allowing multiple users to collaborate on content creation and management while controlling access levels.
- **Template-Based Design:** CMSs often use templates or themes to control the visual design and layout of a website, enabling consistent branding.

- **Customization:** Users can often customize the look and feel of their website through themes and plugins/extensions that add additional features.

Website Vs CMS

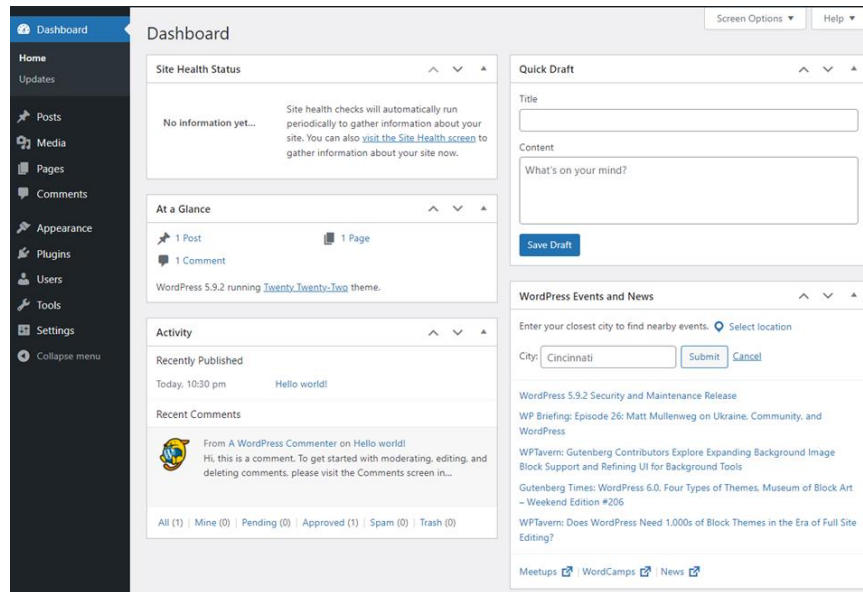
| Website | CMS |
|------------------------------|---------------------------|
| Collection of webpages | Software application |
| HTML, CSS, JavaScript | User Interface, Templates |
| Require coding skills | User friendly |
| Full control over the design | Design based on template |
| Manual updates | Centralized management |
| HTML web pages | WordPress, Joomla, Drupal |

WordPress

WordPress is an open-source content management system (CMS) and website creation platform. It was initially developed as a blogging platform. WordPress was initially released on 27th May, 2003 by Matt Mullenweg and Mike Little. WordPress was announced as open source in October 2009.

- Download from
 - <https://wordpress.org/download>
- Requirements
 - Database: MySQL
 - Server: XAMPP
 - Backend: PHP

Install WordPress and create users for the application. Login to the Admin Panel which shows the dashboard where templates can be chosen and various options for the website can be given.



The WordPress Dashboard provides a navigation menu that contains some menu options such as posts, media library, pages, comments, appearance options, plugins, users, tools and settings on the left side.

Advantages

- It is Open-source
- CSS files can be modified as per the user needs.
- Plugins available for users which can be added to enrich the website.
- Needed Media files can be uploaded easily.

Disadvantages

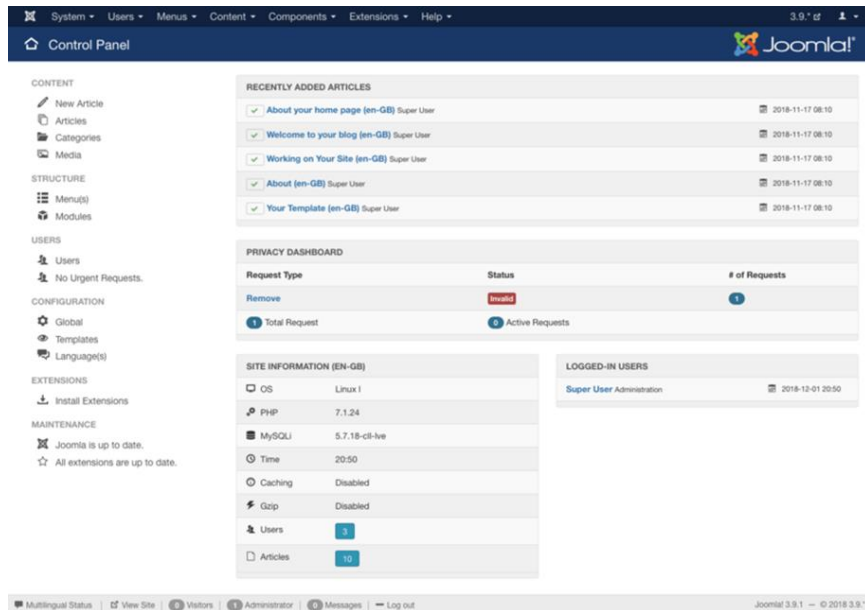
- Websites become heavy due to usage of plugins.
- PHP knowledge is required for manipulating the templates.
- Joomla software requires regular updates

Joomla

Joomla is an open-source content management system (CMS) that is used to build and manage websites and web applications. Joomla is known for its flexibility, ease of use, and extensibility. It was developed based on Mambo CMS which was developed in 2000. Joomla was released in 2005 for public use.

- Download from
 - <https://downloads.joomla.org/>
- Requirements
 - Database: MySQL
 - Server: XAMPP
 - Backend: PHP

Install Joomla and login to the administrator panel. Choose the template for the website and customize layout. Create menus for navigation of the website, articles for text-based content display.



The **Joomla dashboard** is the central control panel where you manage and control your website. It provides a quick overview of your site's status, recent activity, and access to various tools and settings

Advantages

- Joomla has User friendly interface
- This provides Powerful content Management
- Joomla is Flexible and extensible
- Joomla has Multi Language support
- Joomla security is implemented using Access control

Disadvantages

- Joomla has a learning curve for users new to CMS.
- Joomla is resource intensive
- It is less popular than Wordpress

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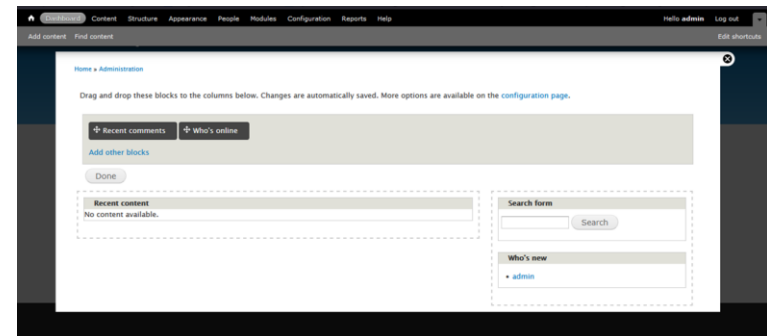
- Joomla is complex for beginners.

Drupal

Drupal is a popular open-source content management system (CMS) used to build and manage websites. It's known for its flexibility, scalability, and powerful features, making it suitable for a wide range of projects, from personal blogs to complex enterprise websites.

- Download from
 - <https://www.drupal.org/download>
- Requirements
 - Database: MySQL
 - Server: XAMPP
 - Backend: PHP

Install Drupal and login to the administrative interface. Content is created using nodes and content types are defined to structure the website's content. Theme can be chosen to define the overall look and feel of the website.



The Drupal dashboard is the central control panel to manage and control the website. It provides a quick overview of the site's status, recent activity, and access to various tools and settings.

Advantages

- Drupal is flexible and extensible
- Drupal has strong security to avoid vulnerabilities
- Drupal has multi language support
- Drupal can be used to create mobile responsive websites.

Disadvantages

- Drupal has a steep learning curve
- It is more complex to implement
- It has limited themes
- It relies on third-party extensions.

Steps to Hosting a Website

Types of Website

Website is the collection of web pages, different multimedia content such as text, images, and videos which can be accessed by the URL which you can see in the address bar of the browser. Based on how the server returns the information to the user, there are two types of website

- Static Website
- Dynamic Website

Static Website

A static website, also known as a static web page, is a type of website that displays the same content to every visitor and **does not use server-side processing** to generate web pages. Important characteristics of a static website are

- It has fixed content
- It has faster loading time

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- It is simple to create
- It has high Security
- Easy to host and low cost

Static websites are used for personal blogs, portfolio sites, brochure sites and landing pages.

Advantages

- They are easy to create and maintain.
- They are relatively inexpensive to host.
- They are secure.
- They are fast to load.

Disadvantages

- They are Difficulty to scale
- There is no user interaction in the website
- There is Limited personalization
- This is not suitable for e-commerce

Dynamic Website

A dynamic website is a website that generates its content on the fly, based on the user's input or the current state of the website. Dynamic websites are typically created using server-side scripting languages, such as PHP, ASP.NET, or Java. Important Characteristics of a dynamic website are

- Personalized content
- User interaction
- Database integration
- Real-time updates
- E-Commerce Capabilities
- Scalability

Dynamic websites are used for creating E-Commerce Websites, social media websites, News websites, Online learning platforms, etc.

Advantages

- It can be easily updated with new content.
- It can be customized to the individual needs of users.
- It can be used to create interactive applications.

Disadvantages

- It is complex to develop.
- It requires high development cost
- It has slower loading times
- It requires server resources
- It has security risk
- It has complexity in maintenance

Choosing Hosting Server

Web hosting is the process where a web hosting provider stores and maintains website files and applications on a server to make its customers' websites accessible on the internet.

A web hosting server is a powerful computer that stores and serves your website files to visitors on the internet. There are two types of hosting server

- Linux server
- Windows server

Linux Hosting

Linux hosting refers to web hosting services that use the Linux operating system on the server to manage websites, databases, and applications. Linux is an open-source operating system, making it a popular choice for web hosting providers due to its flexibility, security, and cost-effectiveness. Examples of Linux server OS are Ubuntu, CentOS, Debian and Alma Linux.

Advantages

- Cost-Effective: Linux is an open source operating system.
- Security: Linux is highly secure than Windows operating system
- Low resource consumption: Linux requires less resource for operation
- Customization: As Linux is open source it can be customized to the user's needs.

Disadvantages

- Command Line operation as Linux does not have GUI.
- Software compatibility issues

Windows Hosting

Windows hosting refers to web hosting services that run on Windows Server operating systems provided by Microsoft. This type of hosting is designed to support applications, websites, and technologies that rely on Microsoft's ecosystem. This provides support for Microsoft Technologies such as ASP.NET, MS SQL, MS Access and IIS (Internet Information Services).

Advantages

- Provides user friendly GUI
- Provides up to five years of support
- Requires less administrator monitoring for managing the server

Disadvantages

- Higher cost as this is not open source
- Compared to Linux, Windows hosting is not secure
- Usage of GUI requires high resources

Web Hosting Plans

Each website has its own needs, based on this there are various types of web hosting. some of the most commonly use web hosting plans are

- Shared Hosting
- VPS
- Dedicated Hosting
- Cloud Hosting

Shared Hosting

Shared Web Hosting is a type of web hosting where multiple websites are stored on a single server, and they share their resources like memory, storage, and processing power (CPU, RAM, and Disk space). Shared hosting plans are ideal for website owners that do not receive a large amount of web traffic.

VPS (Virtual Private Server)

VPS hosting allocates a dedicated portion of a server, also called a *partition*, to website owners. Each partition provides dedicated RAM and processing power for each website. Websites hosted on this type of platform rarely suffer from performance issues. VPS hosting is less expensive than dedicated hosting but costs more than shared hosting. VPS hosting is suitable for small business owners as it provides root access for customization and specialized software installations.

Dedicated Hosting

Dedicated hosting is a web hosting environment where an entire server is allocated to a single client. Unlike shared or VPS hosting where resources are divided among multiple users, with dedicated hosting, the client uses the full power of the server's
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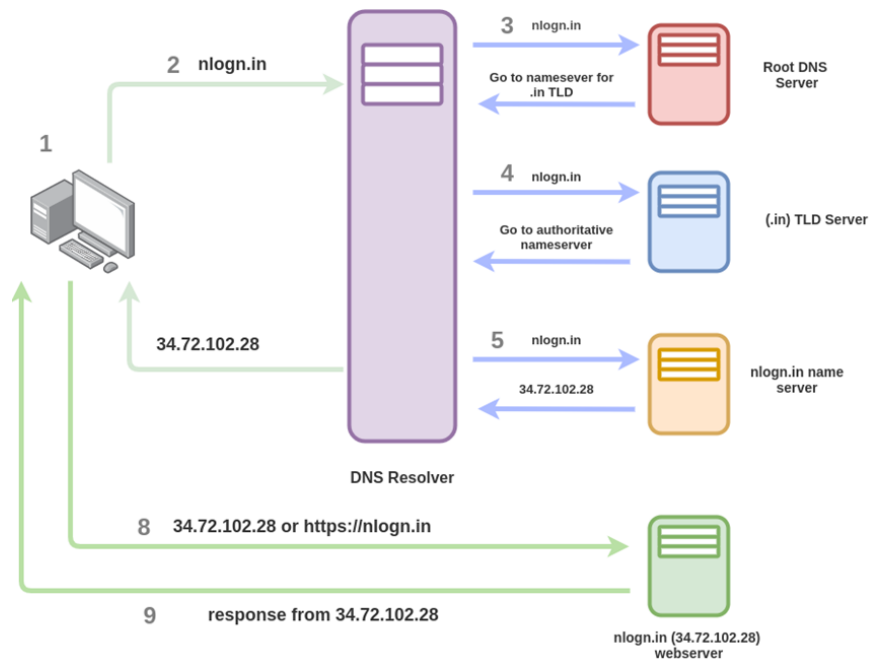
hardware and software resources. With dedicated hosting, clients have the flexibility to customize their server settings, install specialized software, and tweak configurations to fit their specific needs.

Cloud Hosting

Cloud hosting is a type of web hosting that uses multiple interconnected servers (in a cloud infrastructure) to host websites, applications, or data. Instead of relying on a single physical server, cloud hosting distributes resources across a network of virtual servers, providing more flexibility, scalability, and reliability. This flexible hosting option lets website owners manually scale resources up or down, depending on their usage requirements.

DNS

DNS (Domain Name System) is a system that translates human-readable domain names (like www.example.com) into IP addresses (like 192.0.2.1) that computers use to locate and communicate with each other on the internet.



1. **Domain Names:** When you type a domain name (e.g., example.com) into your browser, you are asking the DNS to find the corresponding IP address of the server that hosts the website.
2. **DNS Query:** The browser sends a DNS query to a DNS server (also called a DNS resolver) to find the IP address linked to the domain name.
3. **DNS Resolution Process:** If the DNS server doesn't already know the answer, it goes through several steps to resolve the domain name:
 - **Root Server:** The resolver first contacts a **root DNS server**, which directs it to the appropriate **TLD (Top-Level Domain) server** (e.g., .com, .org).
 - **TLD Server:** The TLD server points to the **authoritative name server** for the domain.

- **Authoritative Name Server:** This server provides the final IP address for the domain name, and the browser can now use this IP address to access the website.

4. Caching:

- Once the IP address is found, it is cached by the DNS resolver for a specified amount of time (called the TTL - Time to Live) to make future lookups faster for that domain.

DNS Server Updating

DNS server updation refers to the process of updating the DNS records or changing the DNS server settings for a domain name. This may involve modifying the authoritative DNS servers for a domain or updating specific DNS records such as A records, MX records, CNAME records, and more. This process can take up to 48 hours to complete, depending on the size of the zone file and the number of DNS servers that need to be updated. DNS server updates are commonly performed when:

1. Switch web hosting providers
2. Migrate a website
3. Modify DNS settings for security or performance reasons

Uploading the Website

Uploading a website to a hosting server is the process that involves transferring the website's files from the local computer to the server where the website will be hosted. Once the website files such as HTML, CSS and Javascript files are ready for upload, using any of the following methods it can be uploaded

- using FTP

- using cPanel

Using FTP

The following steps are used to upload the website using the FTP

- Download and install an FTP client such as FileZilla.
- Open the FTP client and enter your web hosting account's FTP login credentials.
- Click on the "Connect" button.
- The FTP client will connect to your web hosting server.
- In the left pane of the FTP client, you will see a list of the files and folders on your local computer.
- In the right pane of the FTP client, you will see a list of the files and folders on your web hosting server.
- To upload your website files, drag them from the left pane to the right pane.
- The website files will start uploading to the server. Once the upload is complete, you will see a success message.

Using cPanel

The following steps are used to upload the website using cPanel

- Log in to your web hosting account's control panel.
- Find the file manager icon and click on it.
- Navigate to the public_html folder. This is the folder where your website files should be uploaded.
- Click on the "Upload" button.
- Select the website files that you want to upload and click on the "Open" button.
- The website files will start uploading to the server. Once the upload is complete, you will see a success message.