WEB DEVELOPMENT

Web development refers to the creating, building, and maintaining of websites. It includes aspects such as web design, web publishing, web programming, and database management. It is the creation of an application that works over the internet i.e. websites.

The word Web Development is made up of two words, that is:
- Web: It refers to websites, web pages or anything that works over the internet.
- Development: It refers to building the application from scratch.

Web Development can be classified into two ways:
- Frontend Development
- Backend Development

Now we will have an overview of the frontend development and backend development as follows.

Frontend Development

The part of a website where the user interacts directly is termed as front end. It is also referred to as the 'client side' of the application.
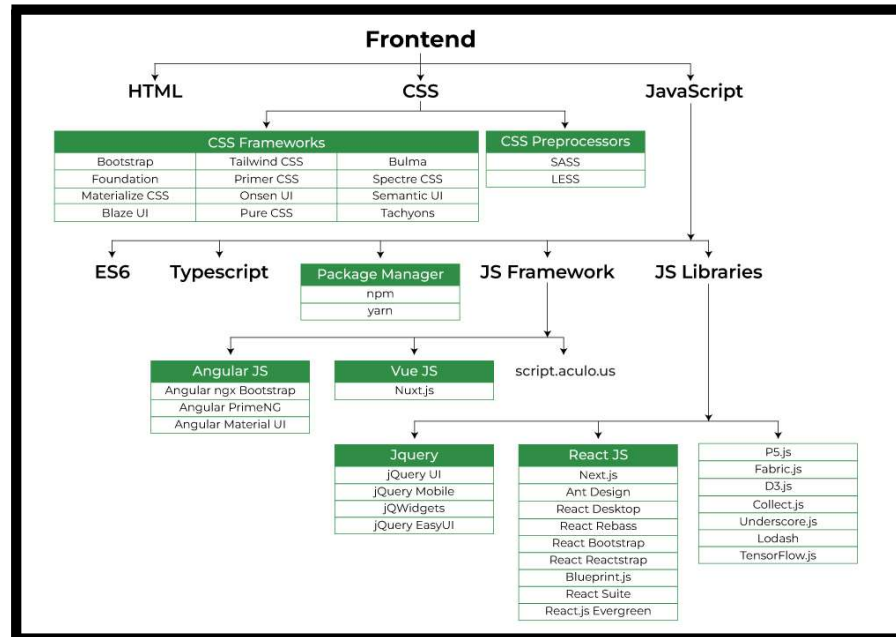
Frontend Roadmap

Figure:Frontend Roadmap

Popular Frontend Technologies

- HTML: HTML stands for HyperText Markup Language. It is used to design the front end portion of web pages using markup language. It acts as a skeleton for a website since it is used to make the structure of a website.
- CSS: Cascading Style Sheets fondly referred to as CSS is a simply designed language intended to simplify the process of making web pages presentable. It is used to style our website.
- JavaScript: JavaScript is a scripting language used to provide a dynamic behavior to our website.
- Bootstrap: Bootstrap is a free and open-source tool collection for creating responsive websites and web applications. It is the most popular CSS framework for developing responsive, mobile-first websites. Nowadays, the websites are perfect for all browsers (IE, Firefox, and Chrome) and for all sizes of screens (Desktop, Tablets, Phablets, and Phones).
  - Bootstrap 4
  - Bootstrap 5

<u>Frontend Libraries and Frameworks</u>
<u>HTML</u>
<u>CSS</u>
1. CSS Frameworks
   - Bootstrap
   - Tailwind CSS
   - Bulma
   - Foundation
   - Primer CSS
   - Spectre CSS
   - Materialize CSS
   - Onsen UI
   - Semantic UI
   - Blaze UI
   - Pure CSS
2. CSS Preprocessors
   - SASS
   - LESS

   a) JavaScript
   - ES6
   - TypeScript

   b) JavaScript Frameworks
   - AngularJS
   - Angular ngx Bootstrap
   - Angular PrimeNG
   - VueJS
   - NuxtJS
   - script.aculo.us
   - Ember.js
   - Handlebar.js
   - Backbone.js

   c) JavaScript Libraries
   - jQuery
   - jQuery UI
   - jQuery Mobile
   - jQWidgets
   - jQuery EasyUI
   - ReactJS
   - NextJS
   - Ant Design
   - React Desktop
   - React Rebass
   - React Bootstrap
   - React Reactstrap

- BlueprintJS
- React Suite
- React.js Evergreen
- React Material UI
- P5.js
- Fabric.js
- D3.js
- Collect.js
- Underscore.js
- Lodash
- TensorFlow.js

Backend Development

Backend is the server side of a website. It is part of the website that users cannot see and interact with. It is the portion of software that does not come in direct contact with the users. It is used to store and arrange data.
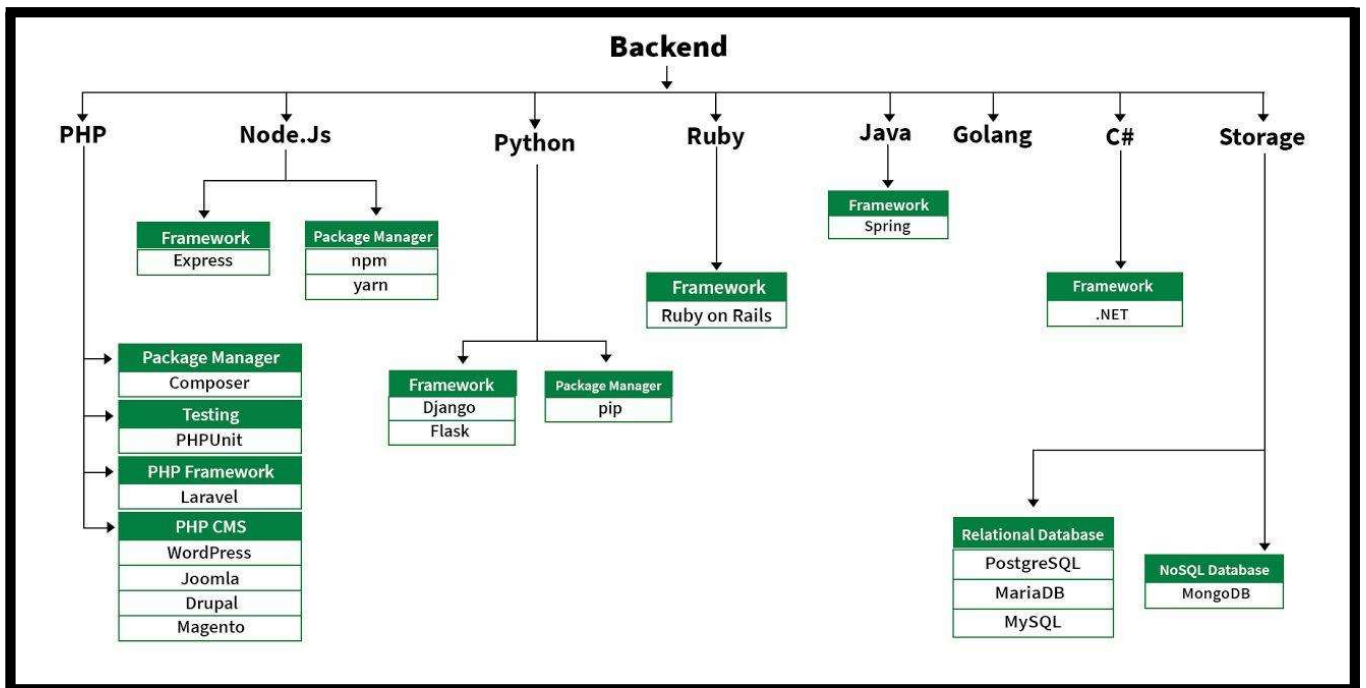
Backend Roadmap

Figure:Backend Roadmap

Popular Backend Technologies

- PHP: PHP is a server-side scripting language designed specifically for web development.
- Java: Java is one of the most popular and widely used programming languages. It is

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highly scalable.
- <u>Python</u>: Python is a programming language that lets you work quickly and integrate systems more efficiently.
- <u>Node.js</u>: Node.js is an open source and cross-platform runtime environment for executing JavaScript code outside a browser.

Back End Frameworks and Technology:
PHP
- Framework: Laravel
- CMS: WordPress

NodeJS
- Framework: Express

Python
- Framework: Django
- Package Manager: Python PIP

Ruby
- Framework: Ruby on Rails

Java
- Framework: Spring, Hibernate

C#
- Framework: .NET

Database:
- Relation Database
- Postgre SQL
- MariaDB
- MySQL
- NoSql Database
- MongoDB

Key Technologies:
- HTML (Hypertext Markup Language): HTML is the backbone of web development. It's used to structure the content of a web page, defining elements like headings, paragraphs, images, links, and more.

- CSS (Cascading Style Sheets): CSS is used to style and format the content defined in HTML. It controls aspects like layout, colors, fonts, and responsive design.

- JavaScript: JavaScript is a programming language that enables interactivity on the web. It's used for tasks like form validation, animations, and creating dynamic content.

Front-End vs. Back-End

Front-End Development

Front-end developers work on the parts of a website that users interact with directly. They focus on creating responsive, visually appealing user interfaces using HTML, CSS, and JavaScript.
- Back-End Development: Back-end developers work on the server-side of web applications. They handle data storage, user authentication, server logic, and communication with the front-end.

Web Development Frameworks:
- Developers often use frameworks and libraries to streamline the web development process. For example, popular front-end frameworks include React, Angular, and Vue.js. Back-end frameworks like Ruby on Rails, Django, and Express.js are also widely used.

Responsive Design:
- Websites should be designed to work on various devices and screen sizes. Responsive web design ensures that the layout and content adjust automatically to provide a consistent user experience.

Web Hosting:
- Once a website is developed, it needs to be hosted on a web server so that it can be accessed by users over the internet. There are various hosting options, including shared hosting, virtual private servers (VPS), and cloud hosting.

Security:
- Web developers must consider security when building websites. This includes protecting against common vulnerabilities like SQL injection, cross-site scripting (XSS), and ensuring secure data transmission with HTTPS.

Content Management Systems (CMS):
- Content management systems like WordPress, Drupal, and Joomla provide pre-built platforms for creating and managing websites. They are particularly useful for non-technical users.

Version Control:
- Developers often use version control systems like Git to track changes in their code, collaborate with others, and easily manage codebase versions.

SEO (Search Engine Optimization):
- SEO practices are essential for improving a website's visibility in search engine results. This involves optimizing content, meta tags, and other factors to rank higher in search results.

<u>Continuous Learning:</u>
- The field of web development is constantly evolving. Developers need to stay up-to-date with the latest technologies and best practices to remain competitive.

<u>Web Accessibility:</u>
- Web developers should ensure that websites are accessible to all users, including those with disabilities. Compliance with accessibility standards, such as WCAG, is crucial.

<u>Performance Optimization:</u>
- Optimizing website performance is essential for a positive user experience. This includes reducing page load times, optimizing images, and minimizing the use of large assets.

Web development is a dynamic and ever-evolving field that requires a combination of technical skills, creativity, and attention to detail. Whether you're building a simple personal blog or a complex web application, understanding these fundamentals will help you create effective and user-friendly websites.