

The Necessity of Frameworks in Web Development

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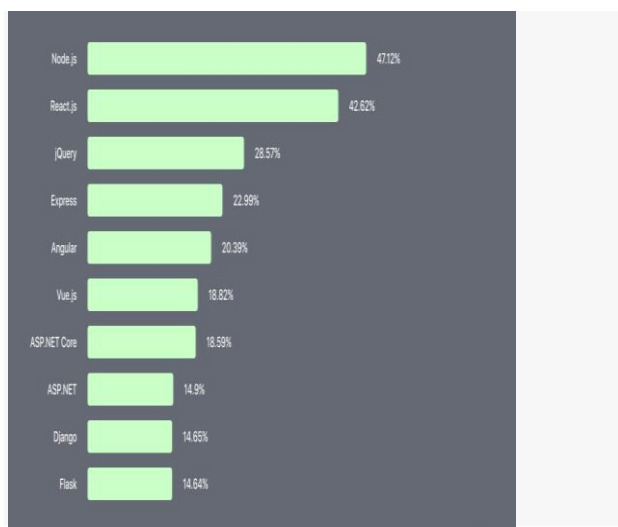
Abstract: Frameworks provide pre-built modules, tools, and libraries that can speed up the development process and improve code quality. Web development frameworks are used to make the work for a web developer easier. So it is important to know about the frameworks used in web development. Choosing the right framework when creating a website is very crucial as it will make the work for a developer easier. The field of web development is split into frontend and backend development. There are various frameworks present in both of them. In this paper, we will see about different frameworks such as Bootstrap and jQuery in frontend development and express.js in backend development.

Keywords – Framework, frontend, backend, Bootstrap, jQuery, express.js.

I. INTRODUCTION

As industries get evolved day by day, they are expecting new recruits to know about different frameworks. When taking the initiative to learn a framework, it is better to learn a popular framework because when working as a team in an industry it is more likely for a developer to know about the framework which is more frequently used. In client-side frameworks, animated features and fancy layouts are implemented and improved to provide a better user experience. Bootstrap, Angular, and React are some of the frameworks for client-side. A server-side framework, on the other hand, has rules and architecture and allows you to build many different types of web pages which can provide safety factors for a web page. Django and Ruby on Rails are some of the frameworks in server-side programming.

This is a graph that tells about the most voted frameworks used by professionals in Stack Overflow.



II. BOOTSTRAP



Bootstrap is a popular front-end framework used for developing responsive and mobile-first websites. It was created by Twitter developers Mark Otto and Jacob Thornton in 2010 and is now maintained by a group of developers known as the Bootstrap team.

“Every line of code should appear to be written by a single person, no matter the number of contributors”.
-Mark Otto

Bootstrap provides a set of HTML, CSS, and JavaScript components and styles that help developers create consistent and visually appealing user interfaces. These components include things like navigation bars, forms, buttons, and typography. Bootstrap also includes a grid system that allows developers to create responsive layouts that adjust to different screen sizes.

One of the key benefits of Bootstrap is that it allows developers to save time by providing pre-designed components and styles that can be easily customized to fit the needs of a specific project. This can help to speed up development and ensure consistency across different pages of a website.

Bootstrap is also well-documented and has a large community of developers who contribute to its development and share resources and tips online. This can make it easier for developers to find solutions to common problems and learn best practices for using the framework.

Overall, Bootstrap is a powerful tool for web development that can help developers create responsive and visually appealing websites quickly and efficiently.

To install Bootstrap, there are a few different options depending on your project's needs. Here are the most common ways to install Bootstrap:

1. Downloading the files:

You can download the Bootstrap files directly from the official website at <https://getbootstrap.com/>. Simply select the version you want to use and download the CSS and JavaScript files. Then, include them in your HTML code as needed.

2. Using a package manager:

If you are using a package manager like npm or yarn, you can install Bootstrap using a command line interface. For

example, if you are using npm, you can run the following command in your project directory:

```
npm install bootstrap
```

This will install the latest version of Bootstrap and add it as a dependency in your package.json file.

3. Using a CDN:

Finally, you can also use a Content Delivery Network (CDN) to load Bootstrap directly into your HTML code. This can be a quick and easy way to get started with Bootstrap, but keep in mind that you will need an internet connection to access the files. Here is an example of how to include Bootstrap from a CDN:

```
<head>
<link rel="stylesheet" href="https://cdn.jsdelivr.net/npm/bootstrap@5.1.3/dist/css/bootstrap.min.css">
<script src="https://cdn.jsdelivr.net/npm/bootstrap@5.1.3/dist/js/bootstrap.min.js"></script>
</head>
```

Once you have installed Bootstrap, you can start using its components and styles in your HTML code. Remember to include the necessary CSS and JavaScript files in your project, and to follow the Bootstrap documentation for best practices and examples.

III. JQUERY



jQuery, written in 2005 by John Resig, is by far the most popular JavaScript library today, finding its way onto more than half of the 10,000 most-visited websites. It is free, open source, and employs a syntax that makes it easy to use if you are already handy with CSS, JavaScript, and the DOM.

jQuery allows developers to write shorter and cleaner code by providing a set of functions and methods that can be used to manipulate the Document Object Model (DOM), create animations, handle events, and perform other common tasks.

One of the key features of jQuery is its ability to select and manipulate HTML elements using CSS selectors. This makes it easy to find and modify specific elements on a page, without having to write complex JavaScript code.

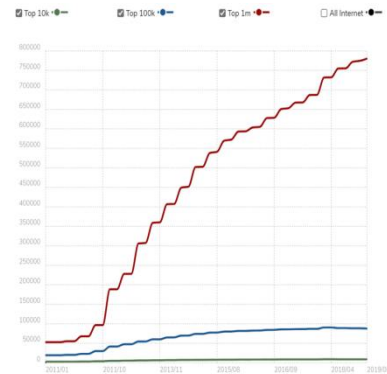
Another useful feature of jQuery is its support for AJAX (Asynchronous JavaScript and XML) requests. This allows developers to send and receive data from a web server without having to reload the entire page.

In addition to these core features, jQuery also has a large ecosystem of plugins and extensions that can be used to extend its functionality. These plugins range from simple UI components, like date pickers and sliders, to more complex tools for building responsive web applications.

Overall, jQuery has been a major contributor to the evolution of web development, making it easier and more

efficient for developers to create dynamic and interactive web pages.

According to BuiltWith, jQuery is 'used' by over 80% of the top 1M websites. That is an impressive statistic.



To install jQuery:

1. Download jQuery from the jQuery website:

You can download the jQuery library directly from the jQuery website and include it in your project. To do this, go to the jQuery website (<https://jquery.com/>), download the latest version of the library, and save it to your project directory. Then, include the jQuery file in your HTML file using a script tag, like this:

```
<script src="path/to/jquery.js"></script>
```

2. Use a Content Delivery Network (CDN):

Another way to use jQuery is to link to it from a Content Delivery Network (CDN). To use jQuery from a CDN, include a link to the jQuery library in your HTML file, like this:

```
<script src="https://code.jquery.com/jquery-3.6.0.min.js"></script>
```

This will link to the latest version of jQuery hosted on the jQuery CDN.

IV. EXPRESS.JS

Express.js is a popular open-source framework for building web applications using Node.js. It provides a robust set of features and tools for creating server-side applications, including support for handling HTTP requests and responses, routing, middleware, and more.



The Express website describes Express as “a minimal and flexible node.js web application framework, providing a robust set of features for building single and multipage and hybrid web applications.”

One of the key benefits of using Express.js is its simplicity and flexibility. It allows developers to easily create modular and scalable applications, and supports a wide range of plugins and extensions that can be used to customize and enhance its functionality.

Express.js also has a large and active community of developers, who contribute regularly to its ongoing development and provide support to other users. This

community has created a wide range of plugins, modules, and tools that can be easily integrated into Express.js applications, further enhancing its functionality and ease of use.

Overall, Express.js is a powerful and flexible framework that is well-suited for building a wide range of web applications, from simple prototypes to complex, enterprise-grade systems. Its simplicity, flexibility, and community support make it an ideal choice for developers who want to quickly and easily build scalable and robust web applications using Node.js.

Another key aspect of the Express philosophy is that Express is extensible. Express provides you a very minimal framework, and you can add in different parts of Express functionality as needed, replacing whatever doesn't meet your needs.

To install express, just like any other NPM module,

```
$ npm install express@4.2.0
```

Express is a popular web application framework that can be used to build web APIs that interact with databases. In fact, many web APIs are built using Express.js and databases to store and retrieve data.

To work with databases in Express, you need to establish a connection to the database using a driver or ORM library. Popular database drivers for Node.js include Sequelize, Mongoose, and Knex.

Express APIs typically support CRUD (Create, Read, Update, Delete) operations on data entities. These operations are performed by sending HTTP requests to the API and are

handled by Express route handlers that interact with the database using the data models.

V. CONCLUSION

Overall, frameworks are essential in web development because they help developers to write better code faster, reduce the amount of repetitive work needed, provide a consistent structure and coding style, and offer built-in security features and best practices. Each website has its own characteristics, which are reflected in its design. It is important to consider and analyze these characteristics during the design process. Overall, frameworks can be an essential tool for web developers looking to create high-quality, scalable, and secure web applications efficiently. The proposed frameworks can be used for building or designing websites for different governmental, non-governmental, or private institutions.

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