Senny Huang - CGT 353 Research Assignment 1

Client-side web development is everything that an end user would see if they used a product. This can include images, text, and any UI elements as well as any particular action that the product is supposed to perform (cloudflare.com). Some of the most common client-side web development languages include React, JavaScript, HTML, CSS, Angular, Vue, jQuery, Swift, SASS, and Elm (Clark). All of these have their own differences but the main differences to note is the platforms that each of these languages support. Languages such as Swift are primarily supported for Apple products while HTML can be used to program something that can be used for nearly any device that can access the internet. Most of the similarities amongst the languages is that most of the modern client-side languages have excellent debugging tools that allow work to be done error free and a lot faster (Clark).

One of the largest and longest standing client-side web development languages is JavaScript. For starters, JavaScript has been around for decades. It has emerged as one of the most well-known front-end development languages, and according to Clark's source W3Tech, over 97% of websites utilize JavaScript within their code. Furthermore, due to this scale, JavaScript will understandably have many libraries all used for various tasks on the web.

What is a JavaScript library? A JavaScript library is a file that contains functions that were defined already by another developer that could be useful for your web page (khanacademy.com). Think of it like a toolbox where you can obtain different functions to put on a webpage without having to write the code. The function of a library could be found within their documentation which could be seen as a manual for learning how to utilize a library. As for JavaScript libraries, according to Acharya of Kinsta.com, there currently exist around 83 different libraries that exist designed for many different purposes and use cases. The libraries

could be used for: data visualization, document object model (DOM), data handling, databases, forms, animations, image effects, fonts, math and string functions, and UI components (Acharya).

What are some of the more popular JavaScript Libraries? Well according to Mehul Gadhiya of Lambdatest.com, the eight best languages for front end development include React, Angular, Vue, Ember, Preact, Svelte, Backbone, and Alpine. Let us dive deeper and briefly discuss the differences between some of these front-end development JavaScript libraries.

React, the first library on this list, is one of the most widely used frameworks and can be seen as a large disruptor in the industry as it "delivered a real breakthrough in shaping the web applications we see today" (Gadhiya, 2023). Despite its learning curve, React has fostered a large community of developers, resources to learn, and large industry adoption that makes this JS library on top in 2023. This is further supported by Stack Overflow's statistics of top libraries, in which 40% of the 70,000 respondents said they use React.js in their projects (stackoverflow.com).

Following React comes Angular, which is an open-source framework developed by Google and Vue, which was inspired by Angular. The main difference between the two is that Angular is a lot more feature rich when compared to Vue which is the opposite and a lot lighter and easier to learn. The key difference between these two libraries though when compared to React is that they utilize MVC which stands for Model View Controller, as opposed to React's component-based structure (Gadhiya, 2023).

These previously mentioned libraries are modern solutions to web programming, but what about jQuery, a more legacy yet still popular JavaScript library that is still used to this day?

According to Stack Overflow's survey in 2023, there are still a large portion of developers using jQuery, around 22%. JQuery is a JavaScript library that was created in 2006 with the goal of simplifying and streamlining JavaScript programming (Echout, 2023). As Mohamed Echout describes it, jQuery can be seen as a jack of all trades for JavaScript and "bundling together everyday tasks into concise, cross-browser compatible code" (2023).

Now that the background of jQuery is clear, what are some of the features of it? The first is easy Document Object Model (DOM) manipulation, which allows programs to dynamically change the form, style, and content of a document (Echout, 2023). The next advantage of jQuery is the simplification of event handling. This allows you to capture events without the need of event handlers in your HTML code (Echout, 2023). Following that there is AJAX support which allows you to "load data from a server and place the returned data into the selected elements of your website or webpage seamlessly" (Echout, 2023). Along with this jQuery is also bundled with built in animations and effects that you can utilize in your web projects. Finally, jQuery provides cross-browser compatibility, which is quite important as websites can be accessed from quite literally all sorts of methods in 2023.

Now that the features of jQuery are clear, why is it still at top despite other options in the space being better in 2023? First and foremost, of course is the large amount of support and developer preference which is super helpful for developers starting out in jQuery. On top of that, jQuery is also quite flexible and user friendly, and the ease of use also contributes to its large upbringing. Finally, jQuery has also been an industry standard for a while now, with companies like Google, IBM, and Microsoft still having jQuery in their projects, it is no wonder why the library is still widely used today (Echout, 2023).

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