Libraries and Frameworks

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**Abstract – This document serves to discuss subjects under the topic of libraries and frameworks in terms of web design**.

Web design have become a very prominent aspect in the world of communication and information and so to aid in the design of these webpages, programmers utilize libraries and frameworks to handle a bulk of the work that would have to be done to create the desired design. Due to the time saving nature of these components of web design, they are widely and commonly used when creating pages that require extra details or information.

Firstly, libraries and frameworks are commonly used in the building of websites and web applications, but the terms websites and web applications are often used interchangeable in conversation and though they have their similarities they also have discrete differences that serve to define each term differently. Due to how similar the terms website and web app are, it may be argued that the difference between them are subjective or very opinion based but from a technical aspect, a website is a collection of webpages that contains different forms of content be it in the form of pictures, videos, or plain text [1]. However, a web application can contain the same elements, but a web app is created to perform specific tasks. To give a clearer distinction, websites concentrate on the provision of information whereas a web app requires more interaction from the user. Websites tent to stay static, where in some cases the information presented is changed infrequently or never changed. On the other hand, web applications depend on the user input and thus what is displayed depends on how the user interacts with it [2]. For example, if a user logs onto a web presence of a movie theatre that only contains the movie theatre’s location from a static map, it’s available movies and times of the movies and other additional information, the user has logged on to a website. Whereas, if a user has logged onto the same site with addition features such as the ability to order tickets and select seats, the functions listed are specific to a web application.

Furthermore, the production of web applications are typically enhanced by the utilization of libraries and frameworks. A library, is a collection of precompiled routines that a program can use [3]. In its simplest form, it provides functions for the program to reduce time spent coding them. A framework, however, provides a model for designers to use to allow them to solve a particular problem. This is an abstraction where code that is used often for a generic purpose forms a model for designers to modify for specific needs, overriding or specializing using their own code [4]. This makes frameworks more constraining in terms of style of formatting code whereas libraries do not affect the formatting of code. Within the creation of server-side web applications, PHP is commonly used. PHP is a widely used programming language made to serve the purpose of server-side functionality. PHP being a programming language has access to different libraries made for it allowing users using PHP to perform different actions that may or may not have an effect on the interface the user interacts with. An example of a PHP library is ImageWorkshop that is an open source library that allows the designer to manipulate images with layers. With the implementation of the PHP libraries, nothing is changed in the way the code is formatted and the purpose the library serves is very specific and sometimes on a small scale. Frameworks in PHP saves the developer a large amount of time providing models to perform tedious coding tasks so the developer can use this time building the foundation. Because a PHP framework creates a model to use, when the develop is utilizing it, they must conform to the formatting style of the model to access the functionality of it which contrasts the style of libraries where the functions provided can be freely used. Frameworks in PHP also apply on a larger scale usually performing a substantial overall task for web applications that may not be possible by a single library. Javascript is another programming language and so, the concepts of libraries and frameworks and their differences apply the same way as they do for PHP since they are both programming languages even though the functionality provided by the libraries and frameworks differ between the languages.

Use of these libraries and frameworks is extremely beneficial to the designer in a large amount of ways especially we design due to the repeating nature of creating web pages. One such benefit is efficiency. Even though some tasks may seem very simple in what it does, it may be the result of many lines of code that was tediously typed. By utilizing libraries and frameworks, hundreds of lines of code that was coded over hours can be replicated within minutes with a few lines of code using pre-functions [5]. Also, using libraries and frameworks makes it easier for developers to create. If a developer uses functions from a library, even though they need to know what the functions do and what they entail, they do not need to understand every aspect of each function which allows the developer to execute the task they desire easier than coding from scratch. In addition, usage of functions and frameworks can provide stability in the web applications to be designed. If a developer tries to code in all the functionality from scratch, it may work as intended but there may also be holes or vulnerabilities in the code that can be exploited compromising user information or even bringing down the web application. Also, if coded from scratch, the web application my not run efficiently. Whereas, popular libraries and frameworks are updated often and use techniques that not all developers may not think of that can help the web app to run smoother and less susceptible to failure. Though the benefits of using libraries and frameworks make them extremely desirable and useful, it can also serve as a double-edged sword. An example of this is the general solution a framework may solve. If a developer seeks to make a basic model of a web application, then frameworks are almost always the best route but if a developer requires a more specific problem to be solved, a downfall of frameworks then appear. When a developer designs the web app from scratch, they gain complete control over the web presence’s functionality and what areas of it are affected whereas when a developer uses a framework, the specific problem may not be wholly addressed or additional unwanted process may be done on every request. In addition, on importing libraries for use, their powerful functionality and convenience comes at a cost, which is the performance of the system. Developers sometimes need to only perform one specific function from a library but would have to import the entire library. Some libraries a very large and are not optimized for speed so implementing these can bring down the overall performance of the system. On the other hand, when designers code from scratch, the specific functionality can be implemented without any additional unwanted load to the system.

Reuse, flexibility, specific needs of system, maintainability. Before implementing frameworks to web applications, it may be sensible to evaluate the use of these frameworks within a web application. Some notable characteristics of frameworks are reusability, maintainability and security. In this era of web design, it is important to be able to create and deploy a minimum product for consumers to interact. Having a minimum product running allows the developer to receive feedback from and thus, more efficiently adjust the system. This is facilitated by the reusable nature of frameworks. In addition, after the code is implemented and the web application is developed, there is still the task of maintenance. In the case, that an aspect of the web app no longer works correctly or there is something to change, it is paramount to have a strong foundation to work from to make maintenance possible and easy for the developer. Developers should be able to make these changes without affecting other unrelated aspects of the code. Frameworks provide this because of the strong foundation it provides to developers in the form of models. Furthermore, security is a big concern when it comes to web development and so frameworks enhance the security of the developer and the consumer when using web applications. This is because most popular frameworks are optimized using advanced techniques or tediously tested to ensure the goal of security is reached. PHP frameworks can be observed to lending more of its functionality to websites than web applications or vice versa. Yii is a PHP framework that is known to be a very fast framework and enables fast loading of information due to its powerful caching system. Another example of a PHP framework for websites is PHPixie. On the other hand, examples of PHP frameworks for web applications are CodeIgniter and Laravel.

Web development, as a part of technology, is constantly changing and new techniques and possibilities are constantly being realized thus it is important for developers to take every step possible to maximize efficiency when creating websites and application. Therefore the utilization of libraries and frameworks are essential to designers so more time can be invested in making a final product that is satisfactory for consumers.

References

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