Semester 3 individual project

S3-S-CB-03

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Research Document

November 1, 2021

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# WHAT IS THE FRONT END OF A WEB APPLICATION ?

The front-end development is the part of a website that the user interacts with directly, which is also referred to as the ‘client side’ of the application. It includes everything that users experience directly: text colors and styles, images, graphs and tables, buttons, colors, and navigation menu, the **front-end developers being responsible for optimizing and tailoring the sweet spot proportion of an attractive user interface.**

**In order to achieve a responsive, performing and mobile-friendly user interface, the developers make use of the following languages:**

1. **HTML, which i**s used to design the front-end portion of web pages using a markup language
2. **CSS, which is used to** simplify the process of making web pages presentable
3. **JavaScript, which is used to make the website interactive for the users.**

**With the purpose of creating and developing a qualitative UI for a web application, the front-end frameworks** are required in order to help web developers in their process.

# WHAT ARE FRONT-END FRAMEWORKS ?

Frontend frameworks are needed to facilitate the job of developing an user interface : these software packages usually provide pre-written/reusable code modules, standardized [front-end technologies](https://www.ideamotive.co/frontend), and ready-made interface blocks, making it faster and easier for developers to craft sustainable web applications and UIs without coding every function or object from scratch.

One of the most important advatages of using a framework for making and designing the front-end of a web application is creating reusable components, because it eliminate the need to write a lot of repetitive code, and, furthermore, it keeps the code more organized and structured. Moreover, the frameworks help the web developers with the routing and page loading,

While the frameworks provide a faster, more delightful user experience, they also provide a consistent a consistent, standardized front-end approach.

Nowadays, choosing a framework for designing and implementing the front-end of a web application is a true challenge, because this topic generates a great deal of discussions among the experts in this field, everyone sharing their opinion and their experience with his/her chosen framework. Considering the fact that the best frameworks for web development in 2021 are React JS, Angular JS and Vue JS, the discussions are centered around the next question: ”Which framework should I choose between React, Angular and Vue”?

# Q: Which framework should I choose between React, Angular and Vue FOR MY INDIVIDUAL PROJECT?

For the people who are starting developing the front-end of a web application, choosing a framework consists in doing the research about the most popular and efficient frameworks, comparing them and analyzing which one suits their needs the best.

## React JS

React JS is an open-source front-end library, which can use JavaScript or Typescript and has an equal design standard framework called material UI. The React code is easier to maintain thanks to its amazing reusable components, which is an essential advantage, because it keeps the code from being repetitive. Being simple to read and easy to use made React easy to understand and implement, allowing businesses to hit the ground running and build what they need as quickly as possible.

## ANGULAR JS

Angular JS is an open-source JavaScript framework written in TypeScript, its primary purpose being to develop single-page applications. As a framework, Angular has clear advantages while also providing a standard structure for developers to work with. It enables users to create large applications in a maintainable manner with its compelling features including templating, two-way binding, modularization, RESTful API handling, dependency injection, etc.

## vue JS

Vue JS is a progressive JavaScript framework, which is used to build user interfaces and single-page applications. The fast learning curve is the signature of this framework, having the best-written documentation. Furthermore, it is designed to allow developers to migrate existing projects to the framework incrementally, moving features one by one, rather than all at once.

With that in mind, every developer should ask himself/herself some questions regarding what is the most important feature of framework, so he/she cand decide which framework is the most suitable for their project. Some of the questions could be?

# SQ: WHICH FRAMEWORK IS EASIER TO LEARN?

The time spent learning and getting familiar with a new framework could be crucial when the deadlines are tight, so, in order to achieve good results when the time plays an essential role,

the flow of becoming proficient in a new framework is important.

One of the methods a developer could be using for determining which front-end framework is easier to learn is conducting a community research in order to see which one of the three mentioned frameworks has the easiest learning curve.

According to a question posted on Quora, here are some interesting facts that can factor in while deciding which framework is the easiest to learn:

**React** requires a basic understanding of JavaScript as its APIs are quite minimal. The React system is partly fragmented which hinders productivity as the developer has to go looking for a lot of NPM packages and figure out how to integrate all of them and understand a bunch of best practices.

**Angular** is a little more complex to get started with, especially if the developer is new to TypeScript, as there are a lot of moving parts. It’s a great choice once he/she gets familiar with it because its integrated approach will boost productivity, but it’s not the easiest to pick up quickly.

**Vue** combines the best bits of React and Angular. It is simple to get started with and also has a nice integrated ecosystem of libraries and tooling once the developer becomes more advanced. He/She can quickly get productive with Vue, which can quickly help getting the developer proficient in this framework.

To conclude with, Vue JS has the easiest learning curve and can quickly increase the productivity, its  relative simplicity and gradual learning process makes it a perfect starting framework for new JavaScript developers.

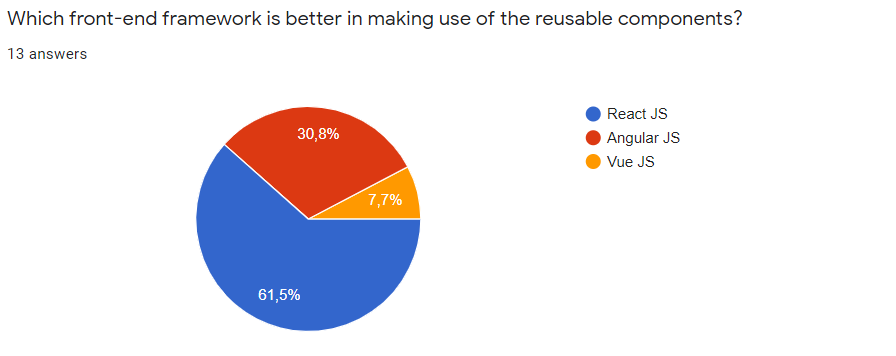
# SQ: WHICH FRONT-END FRAMEWORK IS BETTER AT MAKING USE OF THE REUSABLE COMPONENTS?

With the creation of the front-end frameworks, the process of creating reusable components has become more and more important. While such an approach to the app development bring in some essential advantages, such as reduced time-to-market, low learning curve etc., they do have some limitations such as increased software productivity, improvement of the software system interoperability or Reducing software development and maintenance costs.

One of the methods a developer could be using for determining which front-end framework is better for using reusable components is creating a survey in order to see which one of the three mentioned frameworks makes better use of the powerful components.

For this research document, I decided to conduct a survey myself and ask a few colleagues and friends, which are using these frameworks for the individual project/have previously worked in one of these frameworks to see which one is better when it comes to this issue.

The result of the survey are the following:



The results show that React JS is the best from the three mentioned front-end frameworks when it comes to developing reusable components, 61,5% of the people choosing this framework.

# SQ: WHICH FRAMEWORK IS BETTER FOR CONNECTING THE FRONT-END TO THE BACK-END USING SPRING BOOT FRAMEWORK?

A common application architecture is to host a front-end (user-interface) application and back-end (data-serving) application separately from each other. The goal is separation of concerns and therefore an increased ease in continuous integration between separate teams. There are some local development and production environment issues that must be addressed for this to happen smoothly.

In order to create a secure and functional web application, both the front-end and the back-end play an essential role in this process, the communication between these two being crucial

One of the methods a developer could be using for determining which front-end framework is better for connecting the front-end to the back-end is task analysis, in order to decide which one of the dicussed frameworks implements the API calls correctly.

For this research document, I decided to make a task analysis for the individual project and study which front-end framework could be used so the connection between the front-end and the back-end of my application is smoothly.

Considering the fact that I have to use the Spring Boot framework for implementing the back-end, I looked up which front-end framework is more compatible with Spring Boot.

There are many ways to connect a **React**-based front-end with a Spring Boot-based back-end, but one of the most efficient ways is by using Axios, which is a promise-based HTTP client that works both in the browser and in a Node.js environment. Because I am making use of the RESTFUL API calls, Axios is a simple way to make calls to my back-end.

**Angular** is a more complete solution to Enterprise application development. Although some like the freedom React gives to use different tools, libraries and frameworks for the Model and Controller aspects of the MVC architecture. Furthermore,  For the Angular app, the coded is going to be embeded within the Spring Boot project.

For a **Vue**-based front-end, you have to import to the Spring Tools Suite, which means that having a single deployable asset simplifies the deployment process which a lot of developers don't like to deal with. Furthermore, if the developer wants to change something small on the frontend, the entire applicationn will have to be redeployed.

# CONCLUSION

Choosing a framework for the front-end of my individual project has been a true challenge, because every framework has its own advatages and disadvantages, the discussions about choosing the framework that suits best the requirements of my project being intense.

After I carefully studied some important aspects regarding the learning curve, the compatibility with the back-end and the popularity of the discussed frameworks, I was able to choose React for my individual project.

In my opinion, React is the most suitable front-end framework for me, because it’s easy to learn, there is a lot of documentation on the Internet in case I get stuck on one issue, the connection to the Spring Boot back-end is simple to make and the power of the reusable components really helped me during the development of my application.

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