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| Research Document | | | |
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# Introduction

In this Research Document I am going to try to answer the question:

Which frontend tool: React, Vue or Angular, is the best for my project?

As we know there are many JavaScript libraries that are used for web development. All of them having their own way of working.

In this document I am going to be looking at the categories performance, usability, documentation, and simplicity from the frontend frameworks.

I will be answering the questions:

* What is DOM?
* What are the frameworks?
* What are the advantages?
* What are the disadvantages?

# What is DOM?

The Document Object Model, or different said DOM, is a programming interface for web documents. It represents the page so that programs can change the document structure, style, and content. The DOM represents the document as nodes and objects; that way, programming languages can interact with the page.

# What is React?

React is a JavaScript library developed by Facebook. It was originally designed to build Instagram. The goal of React is to allow developers to create fast user interfaces for websites and web applications.   
The main concept for React is a virtual DOM. It is a tree based on JavaScript components created with React that mimics a DOM tree. React makes use of the least amount of DOM manipulation possible to keep your components up to date.

## What are the advantages and disadvantages from React?

### 2.1.1 Advantages

1. Performance:

React was design with the idea that it should be a high performance framework. This is done with the virtual DOM program and server-side rendering. This makes even complex apps run extremely fast.

2. Usability:

Deploying your website or web application is fairly easy to accomplish with React, if you have some basic knowledge from JavaScript. A JavaScript developer can learn all ins and outs of React in a day of two.

3. Simplicity:

The functional approach to rendering HTML makes React very simplistic. In React.js, you can know what given component will render based on the properties it is supplied with.

It makes React.js component into a side-effect free function. It’s easy to know exactly what will happen. That directness and simplicity helps greatly with building software. It’s the big appeal of functional languages.

### 2.1.2 Disadvantages

1. Poor documentation:

React has a pretty poor documentation because they are constantly updating their technologies. React is accelerating so fast that there is no time to make proper documentation. To overcome this, developers have to write their own documentation with the new releases and tools in their projects.

# What is Vue?

Vue.js or Vue, is a lightweight, JavaScript framework just like React. Vue extends standard HTML and CSS to create a suite of powerful tools for frontend development, such as interactive web applications.

## 3.1 What are the advantages and disadvantages from Vue?

### 3.1.1 Advantages

1. Simplicity:

You can write a Vue application with very little lines of code. Vue streamlines the web app development by doing a lot of automation tasks under the hood such as:

* It links the data to DOM automatically
* Takes care of configurations
* Create watchers for each component

2. Reusability:

The component bases approach if Vue makes single file components reusable. Instead of separating the code into arbitrary layer, Vue collates components that can be reused and into a function.

Reusing the components imply:

* Less repetitive coding
* Increases code readability
* Simplifies testing and maintenance

3. Documentation:

Documentation is a very important and essential part of any framework or library. For beginners this is especially crucial. Vue possesses an extremely detailed documentation, including an introductory guide. The documentation gives a good overview of the framework and provides information for the installation process. The documentation is also constantly updated to reflect recent changes and best practices.

4. Performance:

When it comes to performance, Vue is an exceptionally fast tool. At an 22.9KB after zipping, this technology will probably have a long life ahead of it.

# What is Angular

Angular is an open-source, JavaScript framework written in TypeScript. Angular is maintained by Google and it is primary purpose is to develop single-page applications.

## 4.1 What are the advantages and disadvantages from Angular?

### 4.1.1 Advantages

1. Simplicity:

Angular is very suitable for beginners.

2. Performance:

Due to the many features of this framework, sometimes they can burden your projects, translating into a heavier application with slower performance

### 4.1.2 Disadvantages

1. Usability:

There is not much to find about the usability of Angular

2. CLI documentation is lacking details:

Some developers express concerns with the current state of CLI documentation. While the command line is very useful for Angular developers, you won’t find enough information in their official documentation on GitHub and you have to spend more time exploring threads on GitHub to get answers.

# Conclusion

Looking at the questions answered and looking at the disadvantages and advantages from each library. Angular comes out on top, checking all of the categories.

|  |  |  |  |
| --- | --- | --- | --- |
|  | **React** | **Vue** | **Angular** |
| Simplicity | x | x | x |
| (Re) Usability |  | x |  |
| Documentation | x | x |  |
| Performance | x | x | x |

# Recommendation

I recommend comparing more JavaScript frameworks in the future, because for now I have only taken the three most popular frameworks. Next that, there can be looked at more categories.