

## REACT JS – AN FRONTEND JAVASCRIPT LIBRARY

Avinash Mishra\*<sup>1</sup>, Arshita Gupta\*<sup>2</sup>

\*<sup>1,2</sup>Department Of Computer Science And Engineering, Malout Institute Of Management And Information Technology, Malout, Punjab, India

### ABSTRACT

The more fundamental software or any application development is to selected which is the correct frontend framework or library to go with. The market has a large diversity due to the large range of problem that developers face every day. For frontend development react.js is playing a crucial role and developing new opportunities for developers to build new application .This paper show about how react.js is helping in the forming those application and what merits it is having in developing the front end. With larger than 1500 developers and over 80,000 sites making use of React.js to develop their websites it wouldn't be an overstatement to call React the future of front-end development. After all, companies like Amazon, PayPal, utilize this JavaScript based User Interface library for a principal part of their application's front-end development for web as well as mobile. In this paper, the key features comprising this library were analyzed and its benefits' over other frameworks was also analyzed.

### I. INTRODUCTION

React.js is an open-source frontend JavaScript library for developing UI or User Interface parts. It is maintained by Facebook and a set of individual developers and companies. React can be used as a foundation in the development of single page or andriod applications. However, React is only concerned with state management and provide that state to the documented object model, so developing React applications usually requires the use of additional libraries for routing, as well as certain client- side functionality. React JS is an open-source JavaScript library designed at Facebook by Jordan Walked a Software Engineer in 2011 but released to the public in the month of May 2013. The core aim of React.JS is to give the better analyzing the performance. Its solidity comes from the focus on each components. Using recyclable unit, it is found to be easy development for developers to design rich UI's. React.JS incorporates with View partfrom M-V-C (Model View-Controller) model. React JS implements Single direction dataflow so that it gets simpler than old data binding. React uses virtual document object model it offers not so difficult programming with quick execution.

### INSTALLATION

React.JS can be installed on dissimilar operating systems like Macintosh, Microsoft Windows, Unix etc. Node.JS & NPM are one of the policy required to develop any React.JS application. Node.JS and NPM package manager can be installed Considering the current version of React.JS 17.0 launched on 20 Aug 2020 below are the few steps to install and create react application.

1. Open command window to install React. we use thecommand npm install create react app
2. For design React JS project we use command npx create react app
3. And finally, to run the project we use the command npm start.

Node Package Maneger is a package manager which allow the server andruns the application at default server.

### ARCHITECTURE

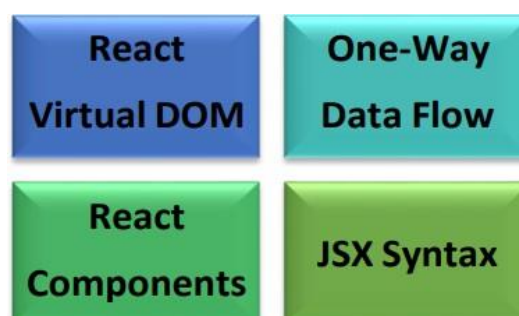
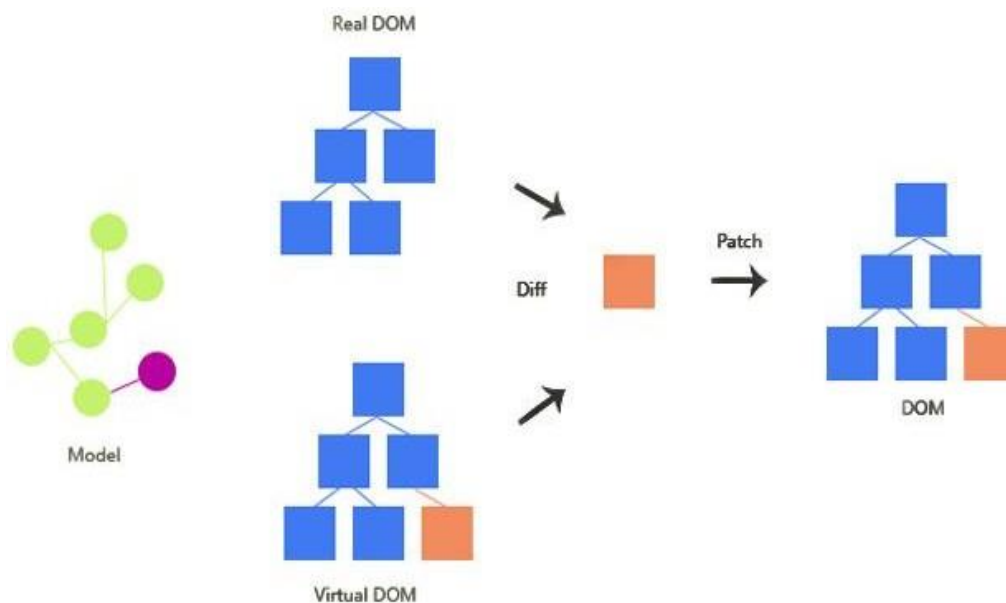


Figure: Architecture Of React JS

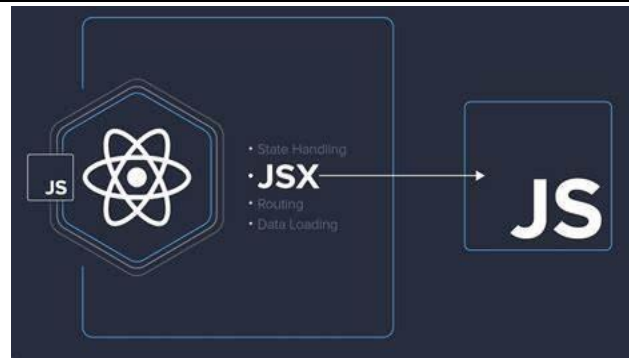
**1. React Virtual DOM** - Some manipulations in DOM does a job on increasing the web app's performance regardless of how fast the client platform and the JavaScript engine is and these manipulations are extremely useful. The DOM has a tree like structure and changes on top may affect the bottom and this will create a complication on giving lag to user interface responses and impacting the user experience React.js solves the complication with layer of the Virtual DOM between the user layer and actual DOM favorably. The Virtual DOM is a virtual representation of the DOM and rather than staying on the screen, it stays on the memory. The changes made on the Virtual DOM is taken care by an algorithm which is made and determines which changes must has to be made to the real DOM and, thus, the user's screen. Virtual DOM devours any modification to the DOM and keeps them in memory. The algorithm then indicates on which element the modify was made and update that segment of the DOM. This change will be emulated on the user's screen without disturbing the other elements.



**2. One-Way data flow** - React JS is built in such a way that data flow i.e., downstream is allowed and supported. Unidirectional flows assure that data flows in single direction all over the application which offers higher control between the states and models in an application. Unidirectional flows also assure that architecture of application is less complicated and understandable. It does not make any cascading amend and pupation in the view part.

**3. React Components** - Build wrap item that manage their own state, then build them to manufacture complex UIs. Since item logic is written in JavaScript instead of templates, you can efficiently pass rich data through your app and keep state out of the DOM.

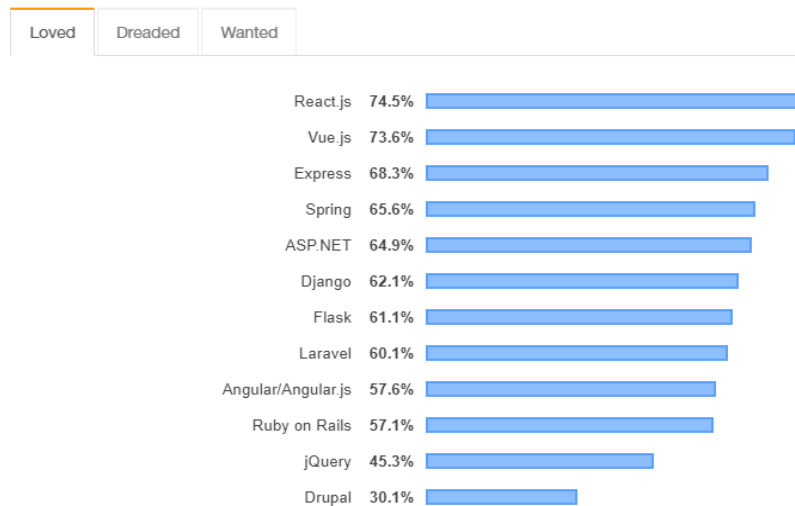
**4. JSX Syntax** - It stands for JavaScript XML. It is a syntax extension in JavaScript. JSX is suggested to be used with React. JS to draw and construct user interface. JSX is rapid, secure and simpler since, JSX source code is collect to JavaScript, and it shows a much amend result. Analyzing to the equivalent code written in JavaScript, the quality of application is way greater when developed with JSX. At the center of any basic website are HTML documents. Web browsers narrate these documents and exhibit them on your computer, tablet, or phone as web pages. During this action, browsers create something called a Document Object Model (DOM), a depicted tree of how the web page is organized. Developers can then add dynamic substance to their projects by alter the DOM with languages like JavaScript. JSX is a React.js extension that makes it simple for web developers to modify their DOM by using easy, HTML-style code. And since React.JS browser assist extends to all current web browsers JSX is consistent with any browser platform you might be working with. This isn't just a constituent of accommodation, though using JSX to update a DOM leads to consequence site work advancement and development capability.



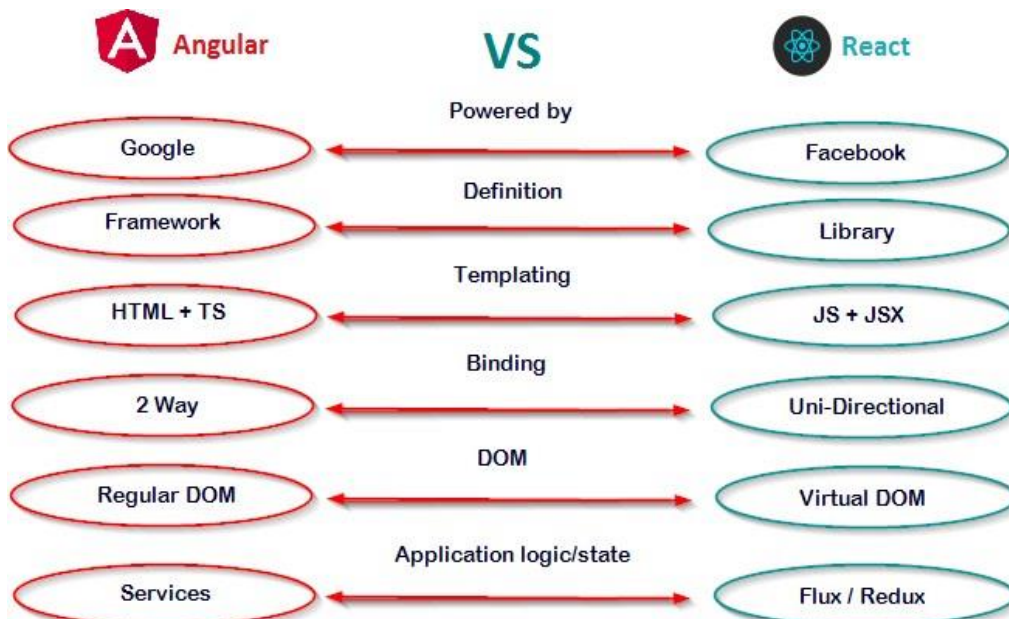
## II. ANALYSIS METHODOLOGY

**Analyzed framework:-** Analog would be made of the two much similar JavaScript frontend Frameworks, and assert of react.js continues to rise over the years. The following figure displays the rating of all reachable JavaScript frame works.

Most Loved, Dreaded, and Wanted Web Frameworks



### React VS Angular



JavaScript is one of the most and easier languages among all the developers nowadays. There are a lot of developers, and they love to build their application, project and web related thing using script but still there is

confusion when they have to take up correct framework or library for their project. Angular and React.js is the topmost priority for all but still, most of them can't decide between both on which one would be good for their project. Fresher want to know which one is simple to read and since with fewer functionalities React.js is simpler as it has higher demand in the market and developers want to get something which is simpler and faster to code. React.JS is a library and not a framework to create interactive user- interfaces. On the other hand Angular is a entire framework.

**Learning** - Angular is a complete framework which requires a lot of learning to be done and developers must put in more effort. In progressive topic, it is necessary to learn change detection etc. On the other hand, React.js is just a library and so it is having fewer topics and easier to learn as compared to Angular. React uses JSX (JavaScript XML) which is a form of writing HTML into JavaScript. React provides flexibility and developers can learn quickly using this.

**Server side rendering** is yet other essential advantage for some type of React.js performance using Axios etc whereas it is a bit challenging to connect to server using Angular.js.

**Components** - Angular works on Real DOM. Angular follows bidirectional data flow also it is larger in size with a lot of memory (92KB) in comparison of React. React on the other hand works on Virtual DOM which is a less weight duplicate of a Real DOM size (46KB) of React is lesser than Angular.

**Downloads** - All over popularity of react is exceeding and is having major downloads as correlate to angular which is a complete framework with all the performance needed by users or developers.

**SEO** - Relatively superior SEO in correlation with angular.

**Binding** - React.js has 2-way conclusive data property and Angular.js has 1-way conclusive property.

**TypeScript vs JavaScript/Flow** - React uses JavaScript. Because many developers earlier know and love JavaScript, this can be seen as a pro. Conversely, Angular uses Typescript which is old and not favored that much by the users or developers.

### III. LIMITATIONS

React JS has few barrier while appearing as finest JavaScript library

- React only contract with the View from MVC so we demand other tooling to finish the backend development too.
- Endeavoring developers complain about JSX programming in the learning phase and is treated as barrier.
- React's environment modify so fast that developers often find it difficult to accept to the new changes, relearn and appliance them. Developer's consistently needed to be updated with their skills and also with modification done in the React.JS environment.

### IV. CONCLUSION

The purpose of this paper is to focus how and why React JS library is in requirement with developer's community and organizations. Facebook developed React JS for their own ambition and later open sourced it in 2013. Since then, within a very less time React.JS has gained incredible fame among the developers and tech industry. Even though few limitations that React.JS has it is absolutely revolutionary. It has import a new dimension in the web application development. Client's requirements are enhancement fast and advancing so is React.JS. React.JS accelerates the application adaptability and it can be seen that React.JS has a larger scope as well worth the efforts. React.JS has it all which can accomplish the requirements of today's world. So, it can be said that React.JS has the capability to affect modern day web development. This paper inspect the use of react is primary for the frontend technologies and for the modeling of Web applications. The frontend frameworks React and Angular were contrast and React was definitely a better solution. React was considered in details and its pros and cons were listed too. The criteria for pick of specific framework were clearly comprehensible and react should be select in most of the cases. It contributes developers with the ability of working with a virtual browser (DOM) that is much rapid and user-friendly, than the real one. Apart from that, it offers the simple design of interactive UIs, JSX support, sequence segment-based design and much more. The of the above-mentioned factors makes it a feasible choice for both startups and enterprises.

## V. REFERENCE

- [1] React.js and Front-End Development - DZoneWeb Dev
- [2] Angular vs. React - A comparison - Haufe- Lexware.github.io (haufegroup.io)
- [3] Angular vs ReactJS : Which one is Most In- Demand Frontend Development Framework in 2019? - GeeksforGeeks
- [4] React Front-End Development - 6 Things To Consider (brainhub.eu)
- [5] React (JavaScript libr - Wikipedia)
- [6] Bhupati Venkat Sai Indla<sup>1</sup>, Yogesh chandra Puranik<sup>2</sup> "Review on React JS" 1PG Student, 2Professor, 1,2MCA, P.E.S. Modern College of Engineering, Pune, Maharashtra, India.
- [7] PRATIK SHARAD MARATKAR<sup>1</sup> , PRATIBHA ADKAR<sup>2</sup> "React JS – An Emerging Frontend Javascript Library "1 Student, MCA Department, Modern College of Engineering, Pune, India 2 Professor, MCA Department,Modern College of Engineering, Pune, India.