



## Web Development Using ReactJS

Priya Maurya  
School of Computer Science and  
Engineering  
Galgotias University  
Greater Noida, Uttar Pradesh, India  
mauryapriya0018@gmail.com

Pankaj Keshari  
School of Computer Science and  
Engineering  
Galgotias University  
Greater Noida, Uttar Pradesh, India  
pankajkeshari099@gmail.com

Pankaj Kumar  
School of Computer Science and  
Engineering  
Galgotias University  
Greater Noida, Uttar Pradesh, India  
py151419@gmail.com

Dr. Alok Katiyar  
Professor, School of Computer Science  
and Engineering  
Galgotias University  
Greater Noida, Uttar Pradesh, India  
alok.katiyar@galgotiasuniversity.edu.in

### Abstract:

ReactJS is an open-source library used to explicitly build the UI for a single-page application. ReactJS allows software developers to create huge web applications with data available. After some time, it will change without refreshing the website.

It has sophisticated computations that make them different from others used to restore what should have been in the DOM hub restored while preserving everything else without warranty.

Using reusable parts gives you an easy way to build an application. Great idea for React also tidying up the interface makes it more reliable and takes a lot of time freeing up programmers to focus on more huge restrictions and business thinking. Also available do not force specific methods to play with specific methods companies. There is a rich library out there from which clients can select a particular play, Company. Other significant features relating to configurations of opportunities called during the

lifespan of a segment are lifecycle strategies and react hooks. This paper presents various highlights. How to use the ReactJS system and these highlights for building applications. Also, it discusses some of the most often used phrases, as well as how and when to use them. These terms may be utilised in our application.

**Keywords:** RACTJS, React-Library.

### 1. Introduction

An open-source JavaScript library called React JS is made for creating web apps' user interfaces. The open-source JavaScript library React JS was created by Facebook software developer Jordan Walke in 2011 but only became available to the general public in May 2013. [1].

When ReactJS arrived, it revolutionized how online applications are made. With ReactJS, each component handles its state and builds it into the ui design. With the idea of pieces, many pieces of



information can easily be supplied to the application in place of layouts in JavaScript [2], It helps prevent the state from entering the DOM.

React JS's top priority is to deliver the fastest rendering speed. Its focus on particular elements is its main asset. Rich UI design is made simpler for coders by reusable components. The View component of the M-V-C paradigm is present in React JS (Model View Controller). React JS is easier to use than conventional data binding because it uses One Way data flow. In order to provide quicker processing and simpler programming, react makes use of a virtual DOM. The goal of the paper is to do in-depth study on the JavaScript-based ReactJS library. This research paper will address the core ideas, traits, features, development procedures, architecture, and some dependencies. The objective is to offer an in-depth comprehension of the ReactJS library and also how Reacts is Better than the traditional way of making a website.

### WAY TO INSTALL

We can install Reacts on various OS such as Windows, and Unix. Nodejs and NPM are important platform to develop reacts application. We can simply install Node.js by typing download Node.js in google or any application.

The latest version of React.JS 18 and you can simply see it after installing Reacts in your system.

1. Open a cmd window to install React application in your system. Type the command i.e., npm install create-react-app.
2. For develop a ReactJS application type command npx create-react-app application\_name.
3. Finally, use the command npm start to run the project. NPM is a package manager that activates servers and runs applications on the default server <http://localhost:3000>

### Write anything after learning once

We don't assume anything about the other components of the technological stack, so you can use React to create new features without having to rewrite any of the current code. Moreover, React supports both React Native and Node for server-side rendering and mobile app development.

### Cross-platform mobile app (React Native)

The following benefits come with using Reacts within the project: Yes, you can create cross-platform apps for Android & iOS with React Native [6]. Suppose we want to make a website for business bakery. With React Native's assistance, you may eventually also create mobile apps. Your web-written code cannot be reused by other developers. You can utilise them, which is much better. mobile



phones are built using the same architecture and process.

**Problem statement and exploration**

Step into the tech realm of 2015 and earlier, when scripting and rendering were the main focuses of web development. a period when PHP controlled the back end while languages like HTML and CSS dominated the front end. It was so simple to create websites back then. I just needed to place static

HTML pages in a subdirectory and use PHP to render them. We were nevertheless able to create a two-way connection between the client and the server even if this is not a particularly inventive or straightforward approach to create a website. Server Side Rendering deserves all the praise (SSR). We have been developing online apps in this manner for many years, but we never imagined that the use of Javascript libraries on websites, such as React JS, would undergo such a revolution.

**Comparative Study of React Js over Traditional way of web development.**

| <b>Basis</b>          | <b>The traditional way of web development (HTML, CSS, JAVASCRIPT)</b>   | <b>Web Development Using React Js</b>   |
|-----------------------|---|---|
| <b>Line of code</b>   | We have to write more lines of code in traditional web development.   | While using React Js we don't need to write more line of code.                                  |
| <b>Execution Time</b> | Execution time is more as compared to web development using Reactjs.  | Execution time is less.   |
| <b>Manage</b>         | The language of the web is HTML, yet building large websites entirely in HTML may be tedious and challenging to manage.[13] | We just don't need to write code again and again. Simply, we just make it component and use it. |
| <b>Event</b>          | Event names are written in lowercase in HTML.[14]   | However, they are written as camelCase in React.  |



|                                     |  |   |
|-------------------------------------|--|---|
| <p><b>Document object model</b></p> | <p>HTML5 communicates directly with the browser's Document Object Model (DOM).[15]</p> | <p>React communicates with the DOM through a virtual DOM that exists separately in memory and serves as a conduit for communication with the browser DOM. This makes it possible for React to render and handle events more quickly and consistently.[15]</p> |
| <p><b>Action Listener</b></p>       | <p>Whenever we want, we can use external Javascript to create event listeners.[16]</p> | <p>All of the Events must be specified when the component is created.[16]</p>   |

## 2.Reacts Application

There are many properties used as a tool for creating interactive, wealthy, and powerful user interfaces.

(i). You can easily create dynamic applications.

React JS requires less coding and offers many features that make it easier for developers to build incredible website.

(ii). It is a JavaScript library i.e., freely available. In front-end developer groups and organisations, Reacts has become the JS library with the quickest growth rate. This is the main reason for this.

(iii). React JS is all about components. It is a key aspect of React JS applications. Applications can

contain multiple reusable components, reducing development time.

(iv). A simple debugging tool Chrome extension has been released by Facebook for debugging React applications. This will ultimately speed up debugging React applications. A Chrome extension named React Developer Tool is available for the free JavaScript library.

E. Facebook, who created and published React JS and makes use of it in their products, has a sizable developer community on its side. Moreover, among the leading businesses that use React Js in their online applications are Netflix, Reddit, and Instagram.





### 3. Architecture

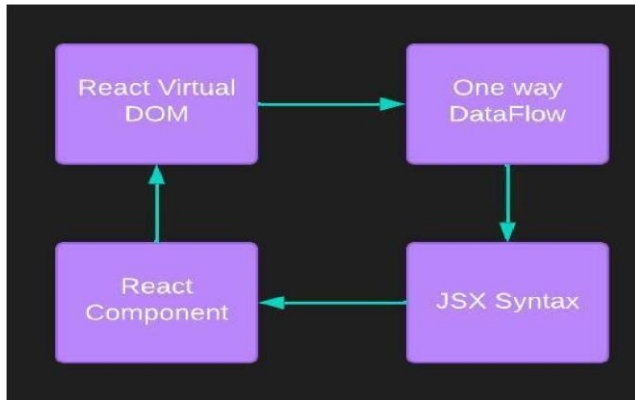


Figure 1. four major aspect of React Architecture.

#### Virtual DOM React:

The Virtual DOM (Virtual Document Object Model) [12] is the key component of React JS. The only difference between it and the DOM generated by the browser is that it is stored in memory. When adjustments to a page's content are necessary, they first appear in the in-memory virtual DOM. The virtual DOM and the browser DOM are the next two DOMs that the diff() algorithm traverses, and any changes made are reflected in the programme DOM itself rather than updating the entire DOM.

#### 2. Data flow:

React JS is built for data to flow. It's OK and encouraged to go downstream. Data flow through your application is ensured to be unidirectional, providing you greater control over the state and models inside. Application architectures become simpler and more difficult to comprehend when

one-way flows are used. View parts have no cascading updates and updates.

#### 3. React components:

Small UI (user interface) pieces known as components can evolve over time and serve as data sources for Views. Put these reusable parts together to create a complete user interface for your application. Components allow the developer to divide her UI into several components and create her Interface in the most efficient manner. They resemble the functions of JavaScript. They carry out the same goal, but in various settings and with various methodologies. They receive inputs known as props and output React elements.

#### 4. JSX syntax:

JavaScript XML is referred to by an acronym. a JavaScript syntactic extension. For UI design and development, we advise combining JSX with React JS. JSX source code is compiled in JavaScript and displays highly optimised outputs, making JSX quicker, safer, and simpler.



## 4. Literature Summary

| Author   | Title  | Purpose  |
|--|--|--|
| Siddegowda C J ,Gitu mani Borah, Chandru K. [7]    | React framework (creating a web application with react native) [7] | This document discusses information regarding React installation and React's potential as a framework.           |
| Archana Bhalla, Shivangi Garg, Priyangi Singh. [8] | Present day web-development using ReactJS [8]                      | Gave details on how to create contemporary web applications using the React technology.                          |
| Ritwik C and Anitha Sandee. [9]                    | React.js and front end development [9]                             | In this paper, the React framework's usage as a front end technology is concisely introduced and described.      |
| Minati Biswal. [10]                                | React Lifecycle Methods [10]                                       | We can use this article to learn more about all the lifecycle methods available for use in our React application |
| Naimul Islam Naim. [11]                            | Metropolia University of Applied Sciences [11]                     | This thesis aims to provide comprehensive knowledge on the architecture and operation of ReactJS.                |

### Reusable Component

Reusing components is one of the key advantages of using React JS. Developers save time because they don't have to build several codes for the same functionalities. Furthermore, if changes are made to one part of the application, they won't affect the other parts.

## 5. Key Benefits of using React Js Speed

React's primary advantage is that it enables developers to use certain application components on both the side i.e., Client & Server, which eventually shortens the design phase.

### Performance

In order to give excellent performance,[3] React JS was created. A virtual DOM program and serverside rendering are provided by the framework's core, which allows complicated programs to run very quickly.

### Mobile Develop Applications

You would be dead wrong if you assumed React was only for web development.



The infrastructure for creating native mobile applications for both Android and iOS platforms has already been improved by Facebook.

## **6. Disadvantages**

React JS has few obstacles and has proven to be the best Js library

- (i). Further technologies are required in order to complete the backend development because React only works with MVC views.
- (ii). During the learning phase, a budding developer complains about her JSX code and is perceived as a roadblock.
- (iii). Because it responds to environmental changes so quickly, developers often find it difficult to adapt, relearn, and implement new changes. A developer should always update as her skills and her React JS environment change.

## **7. Successful Web Development Projects using ReactJS:**

ReactJS has been used in many successful web development projects, including Facebook, Instagram, and Netflix. These projects highlight the benefits and challenges of using ReactJS in realworld applications.

## **8. Conclusion**

This document's goal is to demonstrate how and why developer communities and organisations

value the React JS library. React JS was created by Facebook for internal use before being made open source in 2013. Since then, React JS has grown incredibly quickly in popularity among programmers and in the tech sector. React JS has some limitations, but it's certainly revolutionary. It brings a new dimension to web application development. As with React JS, customer requirements are rapidly updating and evolving. React JS accelerates application efficiency. You'll find that React JS is extensive and worth the effort. React JS has everything you need to meet the demands of today's world. So, it has potential to affect his current site development.

## **9. Future Work**

**Performance enhancement:** Although ReactJS is renowned for its speed, there is [5]always space for improvement. Future work can focus on optimising the speed of ReactJS apps, especially in terms of minimising the time it takes for components to render.

**User experience improvement:** ReactJS can be used to build responsive and interactive user interfaces, and future work can concentrate on improving the user experience by creating



additional components and frameworks that make it simpler to build intricate user interfaces.

Making ReactJS applications more accessible to users with disabilities: Accessibility is a crucial component of web development, and future work can concentrate on this. This may entail creating new libraries and components that support screen readers and keyboard navigation, among other accessibility features.

Adding other technologies: ReactJS may be combined with tools like GraphQL and Redux to build more sophisticated and potent applications. Future work can concentrate on investigating fresh combinations of ReactJS and other technologies to open up fresh web development opportunities. Creating new frameworks and tools: ReactJS has a sizable and active developer community, and future work can concentrate on creating new frameworks and tools that make it simpler to create and deploy ReactJS apps. This may entail developing new code editors, libraries, and deployment tools.

In conclusion, ReactJS-based web development projects in the future may focus on a variety of things, such as increasing user experience, enhancing accessibility, integrating with other technologies, and creating new tools and frameworks.

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