International Journal of Multidisciplinary Research And Studies

Available online at www.ijmras.com

INTERNATIONAL JOURNAL OF MULTIDISCIPLINARY RESEARCH AND STUDIES
ISSN: 2640 7272
Volume:07; Issue:05 (2024)

React functionality to make website easier

PROF. AAKANSHA MITAWA [1], SAMREEN [2*]

[1] Professor in Department of Computer Science Engineering (CSE), Sobhasaria group of institutions, Sikar / Orcid ID: [0000-1111-2222-3333],

[2] M Tech Research Scholar in Department of Computer Science Engineering (CSE), Sobhasaria group of institutions, Sikar/ Orcid ID: [1111-2222-3333-4444]

Abstract

Mobile friendly websites are a must in today's web development industry. React and its implementation by Facebook has changed the usual way of creating websites by moving them to the right way. This paper investigates the role of React functionality in the development of websites which are easier to use and the processes that are utilized in such websites.

The introduction of the paper starts with discussion of the importance of user-friendly ways at the website and achieving this goal through React. The major research inquiry relates to the positive impacts on web usability and website development procedures or mode methodologies from the use of React.

This paper analyses Reacts core functionality the components, the management of state and virtual DOMs emphasizing the way they enhance the user experience and developers' efficiency. Moreover, it talks about the React documentation and compares React to other frameworks like Angular and Vue. code, in the web development context to identify its features and limitations.

It also highlights typical problems that arise when working with React as well as existing and future advancements in web design. This paper offers examples and case studies on how developers and stakeholders using React's utilities are able to design highly effective and user-friendly websites amidst constantly changing marketplace.

Keywords: Facebook, Doms, Angular and Vue. Code, Websites.

1. Introduction

In the modern world, when users access the Internet to obtain information, use services and communicate with each other, the issue of convenient interfaces takes on a special significance. Contemporary web design strives to achieve creating web interfaces that not only work but also are good-looking, interactively interactive and adaptive. 'Web user experience' comes into the picture in leveraging users' experience with the website to attract and retain them, promote the brand and enhance business accomplishment.

Behind many of the recent trends and techniques related to web development is React that is a JavaScript library developed by Facebook. React has been introduced to the development world in 2013 and has received a lot of positive feedback from the developers for its unique and latest approach to develop user interfaces. React is an open-source JavaScript library which is based on the software's component and

has an effective rendering mechanism that has revolutionized the way developers should design web applications.

Background and Significance

It is important to note that the creation of easy-to-use websites is crucial in current web design. In the present day and age where digital experiences define objects and characterize human behavior websites create first impression about the virtual world. There is the design of an accessible website; this is one that both looks good and can be accessed without a problem through different devices and sizes. such websites do more than just please the user they help to increase conversion success rates, increase the website visibility within search engines and increase participation within the website.

React then becomes a leap forward when it comes to the progress of web development. Created on the principle of previous declarative, component-based frameworks, react is a library that allows for building complex interfaces. Its virtual DOM implementation makes the rendering and updating process very effective to perform faster and to make the UX better. Also, the React community has a great number of tools, libraries, and technical support that is unavailable through other frameworks.

Research Question and Objectives

Central to this research is the question: **How does React functionality make websites easier to use and develop?**

To address this question comprehensively, this paper sets forth the following objectives:

1. **Explore React's Features:** Delve into the core features of React, including components, state management, virtual DOM, and JSX, to understand how they contribute to building user-friendly web applications.
2. **Compare React with Other Frameworks:** Conduct a comparative analysis of React with other popular JavaScript frameworks, such as Angular and Vue.js, to identify its unique advantages and potential drawbacks in the context of web development.
3. **Discuss React's Future:** Investigate upcoming features, trends, and innovations in React development, and speculate on its future trajectory within the rapidly evolving landscape of web development.

2. Overview of React

History and Evolution

Origin of React at Facebook

React was initially developed by Jordan Walke, a software engineer at Facebook, in 2011. It was created to address the company's need for a more efficient and dynamic approach to building user interfaces for their applications. Before React, Facebook faced challenges with maintaining and updating their large-scale applications. Traditional JavaScript frameworks were not sufficient to handle the complexity and interactivity required. React was first deployed on Facebook's newsfeed in 2011 and later on Instagram in 2012【Aggarwal & International Journal of Recent Research Aspects, 2018】.

Major Milestones in its Development

React was open-sourced at the JSConf US in May 2013, which marked a significant milestone in its development. The release of React 16, also known as "React Fiber," in 2017 was another critical

advancement. React Fiber introduced a complete rewrite of the React core algorithm to enhance its capability to handle asynchronous rendering, improving the performance and responsiveness of applications【Indla & Puranik, 2021】. Another milestone was the introduction of hooks in React 16.8, which provided a new way to manage state and side effects in functional components, further simplifying the development process and improving code reusability【Johansson, 2020】.

Core Concepts and Features

COMPONENTS

Definition and Examples

Components are the building blocks of React applications. They allow developers to break down complex UIs into smaller, manageable pieces. Each component is a self-contained unit that encapsulates its logic and UI, making it reusable across different parts of an application. For instance, a "Button" component can be created once and used multiple times throughout an application, each time with different properties to define its behavior and appearance【Mishra, Gupta & Department of Computer Science and Engineering, Malout Institute of Management and Information Technology, 2022】.

Importance of Component-Based Architecture

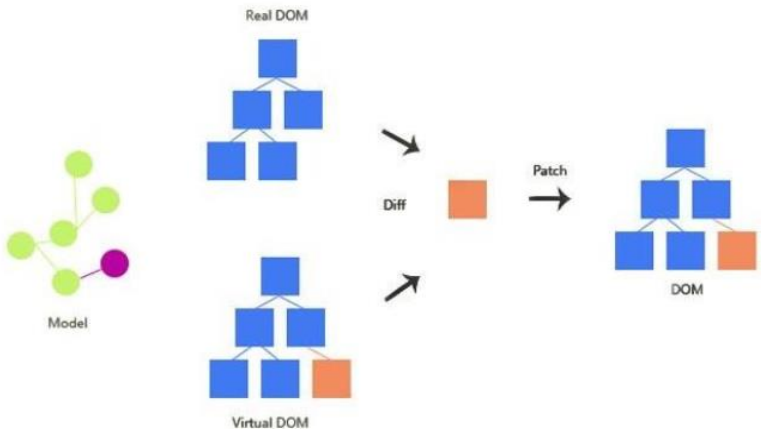
The component-based architecture of React promotes modularity and reusability. This approach allows developers to build applications in a more structured and maintainable manner. Components can be composed together to create complex UIs, and changes to one component do not affect others, reducing the likelihood of bugs and making the code easier to understand and maintain【Nguyen, 2022a】.

STATE AND PROPS

Explanation and Use Cases

State and props are also fundamental in the context of react. State – It is an object that store data which may change in the lifecycle of a component. It is in-house and therefore employed to govern the component as well as its display. State is mutable, whereas props are properties of child components passed in from the parent component. It helps to pass data from one part to the other and it also helps to choose the kind of component that you want in the dynamic web sites. For example, the example could be where a parent component passes a title prop on to a child “Header” component to determine the title content.

Virtual DOM



How It Works and Why It Improves Performance

Virtually DOM is one of the major advancements of the React Framework. It is a simplified model of DOM. React performs a process called "reconciliation", in which it creates a new "virtual DOM" and compares it to the older one in order to determine exactly what has changed. React does not refresh the whole page when a component has changed; instead, it only updates the minimum number of changes necessary. Allows for high performance especially on systems with complex HMI systems【Rawat & Mahajan, 2020】.

JSX

Syntax and Benefits

In JavaScript XML – or JSX – is an extension to the JavaScript language which makes it similar to HTML. It is easier to write and its code is more readable because it is concise and helps to define UI elements specifically. The JSX syntax produces JavaScript function calls thus being both efficient as well as powerful. It also supports putting JavaScript expressions to keep the content dynamic 【Ritwik & Sandeep, 2020】.

Finally, React is commonly used by developers today because it is versatile and has several key features, including a component-based architecture, state and props management, the virtual DOM, and JSX. These features make it possible for the developer to create web applications that are very interactive and very fast to use both the client and the developer's perspective making react one of the most useful tools for web application development.

3. REACT'S IMPACT ON WEBSITE USABILITY (700 WORDS)

Enhancing User Experience

Interactive UIs and Responsiveness

React is known for being adept at making versatile and reactive UIs. React adopts component-based architecture approach that enables the developer to go for the development of complex UI from pieces of code that is self-contained and can be reused. This modularity provides the developers with the ease of creating the software as well as the user for how the UI components should behave. React works on the concept of declarative programming as its user can describe what the User interface should look for a specific state and React will always render the right UI when the state is changed【Aggarwal & International Journal of Recent Research Aspects, 2018】.

React's virtual DOM makes React highly responsive because it in part eliminates many of the complexities of how the updates are managed. Instead of working directly with the DOM as we would in a traditional approach, React keeps a virtual DOM where it works with a copy of what is displayed on the page. React can be defined as an Open-source JavaScript library for implementing UI and according to Rawat & Mahajan (2020) it helps in calculating the minimal set of changes required to update the actual DOM when the state of an application changes to make sure that the user interactions on the website are as fast as possible.

COMPONENT REUSABILITY

Examples of Reusable Components

Every module in the program is built specifically so that its component is reusable. The atomic unit of React applications is called component — it consists of HTML and JavaScript that define the UI. This is

beneficial especially because software developers will be in a position to use the same components in different environments within the application thereby minimizing redundancy and hence the overhead of maintaining the application.

For instance, imagine having a button that would allow reusing the same component across different forms and pages in one application. With the above, the developers will have to repeat the same steps whenever they want to ensure that the buttons on the application menu or button have the same appearance and functions; it also becomes easier to find and change the way a button works with the application without necessarily having to search through the code for each button again【Ritwik & Sandeep, 202】.

Benefits for Development Speed and Consistency

The reusability of components accelerates development by enabling rapid assembly of applications from pre-built, tested, and standardized components. This modular approach not only speeds up the initial development process but also facilitates easier maintenance and updates. When a component needs to be updated or a bug needs to be fixed, changes can be made in one place and propagated throughout the application, ensuring consistency and reducing the likelihood of errors【Nguyen, 2022a】.

PERFORMANCE IMPROVEMENTS

Efficient Updates with the Virtual DOM

The virtual DOM is one of React's key features that helps to optimize the speed of application. React is a library that creates virtual DOM which is an approximation of the real DOM created by React components. In the reaction's world if any component's state is modified then the react first updates the virtual DOM and then check the previous DOM and find out the minimum change and finally updates the DOM.

This process is called reconciliation and helps React in optimizing the DOM by minimizing the DOM template and other operations in faster updates. All this ensures that the number of operations on the DOM browser object is reduced reducing the amount of resources required when applications are used in large scales【Feature Analysis of React.js for Web Development, 2024】.

Real-World Performance Comparisons

In actuality, applications developed using React technology exhibit higher response time from the application as compared to their counterparts who use other technologies. For instance, comparing the performance of a React app against a regular server-rendered application: React is usually faster to load and has a better consistency at reacting to user actions due to its efficient management of state updates and DOM re-rendering.

Various researches and benchmarks have illustrated how React's approach to manipulating the DOM reduces performance overheads where there is high variability in application UI and high frequency of state switching. These benefits are demonstrable in different case studies and performance tests carried out by third party developers as well as organizational bodies【Johansson, 2020】.

REAL-WORLD EXAMPLES

Case Studies of Websites Using React Effectively

The React library is widely used in many popular websites and applications to improve user experience and efficiency in 2022. For example, React is a popular JavaScript library that has been developed by

Facebook; React is an important technology that Facebook relies on to deliver its web application for a variety of content that is dynamic and user interface interaction. It is one of the most well-suited frameworks if the matter concerns the high volume of data received from many users and frequent updates for this service are essential [Indla & Puranik, 2021].
React is also used by popular service like Airbnb, which enables it to integrate a lot of interactivities in its interface. Components instead of elements in React provide Airbnb with a good platform to achieve consistency in developing the numerous elements of the site for the benefit of the millions of users.

Another instance of React's wide adoption is in Netflix's web interface; React's performance optimizations and component reusability is also used in Netflix. Using React will help Netflix to achieve a fast and responsive application even when users reach the site to use it for accessing large collections of video content【Rawat & Mahajan, 2020】.

Summarizing React's impact on the usability of websites is quite significant since it helps users improve the quality of their work, the speed of development, and code consistency as well as the loading speed of the site. Implemented with its virtual DOM and majorly thanks to its many component-based modules in the ecosystem, React has been a major pillar in web development to deliver interactive and efficient Web applications.

4. EASE OF DEVELOPMENT WITH REACT (700 WORDS)

Developer Experience

React has become a top choice among developers because of such appealing features as its easy API and rich set of tools. Declarative nature is one of the primary advantages of it, which makes it easy for developers to work with user interfaces because they describe the final state rather than the ones needed to implement it. This ensures that the code is easier to account for and trace back on any problem that arises. Additionally, there are a large number of libraries in React and a large number of people who are familiar with React who are capable of helping developers should they run into difficulties【Aggarwal & International Journal of Recent Research Aspects, 2018】.
Development resources such as React Developer Tools browser extension are crucial to development. This tool enables developers to see the prop and state of components, see the component hierarchy more clearly, and to debug more efficiently. Furthermore, capabilities like the hot reloading, which allows the code to be refreshed in place while maintaining only the changed part of the page, streamline the development process and increase the productivity 【Indla & Puranik, 2021】.

STATE MANAGEMENT

Redux

Sources – Redux is a library that is normally used with React for state management. It acts as a place to store application state in a way that is easier to manage even when the state becomes difficult to accurately manage. Redux follows three core principles: State – the entire application is based on a state, which is immutable: it means that the state itself is not changed, and you cannot update the state (it's read-only), and the changes in state are made using pure functions. Both these principles allow the predictability of state and easy tracking of changes and this is of special advantage in large applications.
For example, in a big e-commerce web application, it can store the user information, all shopping cart contents and which products are displayed in the various sections. Redux also centralizes the control of

States management and makes it a less bug prone system than the AngularJS or ReactJS【Comparative Analysis of AngularJS and ReactJS, 2016】.

Context API

For a trivial context switching situations, React developers may use the context API that comes with the React library. It is especially useful for application state that needs to be shared between numerous components without the complications of a state manager such as Redux. The context API provides a mechanism allowing the developers to create context objects and fill them in with values necessary for the component's work and pass it down through the component tree, facilitating global state management. For instance, a theme context can be used to handle all the theme parameters (dark or light mode for an entire application) without problems. This helps in avoiding usage of 'props' at every level of component tree hence reducing complexity in code and making it easier to maintain【Ritwik & Sandeep, 2020】.

TOOLS AND LIBRARIES

Create React App

The Create React App or CRA is a standalone tool that helps you to setup new react projects. It offers a familiar structure and configuration setup and is ready to be programmed by developers from the box without having to check build configurations. CRA provides users with a pre-configured environment with Webpack, Babel, and ESLint to make the development process more effective and incorporate all necessary tools to ensure the best practices in the development process【Nguyen, 2022a】.

When deciding on the usage of CRA, there are several advantages: the shorter time for preparing the project basis, an established project structure, and the ability to use new JS features. It is also a good option for beginner and experienced developers looking for a quick development environment to start projects【Parmar, 2021】.

React Router

React Router is a standard library for routing in React applications. It enables developers to create and manage navigation within single-page applications (SPAs). React Router allows for dynamic routing, meaning routes can be added or modified at runtime based on the application's state or user interactions【Johansson, 2020】.

For example, in a blog application, React Router can manage the navigation between the homepage, individual blog posts, and user profile pages. This ensures a seamless user experience without full page reloads, preserving the state and context across different parts of the application【Ritwik & Sandeep, 2020】.

CASE STUDIES

Examples of Development Projects Using React

There are a few major cases in which the benefits of using React in development and improving UX were shown in specific projects. For instance, Facebook and Instagram are both designed with React, and it uses a component-based approach to further on satisfactorily manage complex and interactive user interfaces【Indla & Puranik, 2021】.

Airbnb is another prominent example of React and React native used for the interface. The use of React has been crucial in providing the complex state management and efficient handling of change when it comes to Airbnb's Search and Booking process. This means that users will not experience disruption

when traversing through thousands of listings and recommendations based on their preferences【Aggarwal & International Journal of Recent Research Aspects, 2018】.

In addition, Netflix utilizes React to process UIs that are web-based and client-side scaled and modular. React's virtual DOM and the efficient diff algorithms ensure that even a huge number of users at the same time in an equally busy system don't hinder smooth streaming for each of them on Netflix【Rawat & Mahajan, 2020】.

Finally, React has one of the most logical and balanced APIs, numerous options for managing the state of a web page, and tools for web development. For complex state management there is Redux state library and for smaller simpler applications developers can use Context API, there is also Create React App – a tool for creating React websites and React Router routes library. These features shown in specific projects and platforms such as Facebook, Instagram, Airbnb and Netflix prove the reactive applicability and efficiency in modern web development.

5. COMPARISON WITH OTHER JAVASCRIPT FRAMEWORKS (600 WORDS)

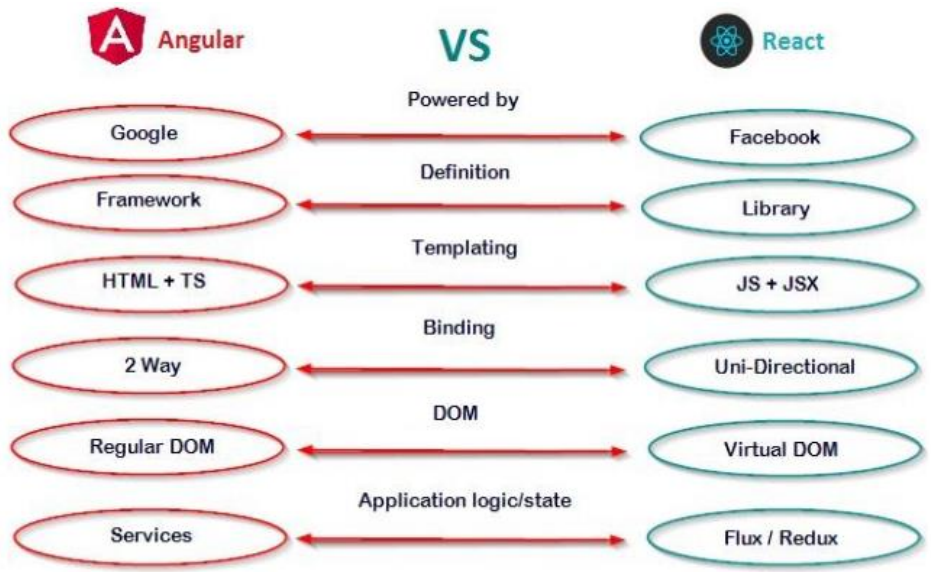
React vs. Angular

Key Differences and Use Cases

React and Angular are two of the most commonly used application development frameworks that are based on JavaScript and have their unique methods and ways of application. React is an open-source online JavaScript library designed to build user interfaces with a component-based approach and was created by Facebook. It applies a virtual-DOM to efficiently render the UI and it provides a component-based declarative framework to construct the UI. The easy implementation and modular structure of the React make it a good option to create a smooth and responsive user interface with optimal speed.

Angular is a JavaScript platform developed by Google…Angular is a complete platform that helps us serve solutions for developing web applications. It has insightful implementations as view controllers such as two-way data binding, dependency injection, and a command line interface for scaffolding projects. React.js has highly customized workflows and tools which are useful in building large scale enterprise engineering applications with focused functionality【Different Considerations of Angular, 2016】.

React is chosen for the purpose of building fast dynamic web applications for example social/ content rich web tools and dashboards. On the other hand, angular is preferred for applications that are large and complex such as ERP, CRM, etc., as indicated by others【Rawat & Mahajan 2020】.



React vs. Vue.js

Comparison of Features and Community Support

Vue. js is yet another noted JavaScript framework that is said to be simple and is easy to integrate and which was developed by Evan You. Like React, Vue. js utilizes an MVC architectural approach and virtual DOM for efficiency. However, Vue. js is considered easy to learn and use compared to Angular and in many cases even React which are much more opinionated and restrictive frameworks than js.

One of Vue.js's standout features is its reactivity system, which provides a straightforward way to manage state changes and updates in the DOM. Vue.js also includes a template syntax that combines the best aspects of Angular's declarative templates and React's JSX, making it accessible to developers familiar with either framework【Feature Analysis of React.js for Web Development, 2024】.

In terms of community support, react boasts a larger community and ecosystem, with a wealth of third-party libraries, tools, and resources available. This extensive support network contributes to React's robustness and adaptability in various development scenarios. Vue.js, while having a smaller community compared to React, is rapidly growing and has garnered a strong following, particularly in Asia and among developers who appreciate its gentle learning curve and integration capabilities【Nguyen, 2022a】.

PROS AND CONS

Advantages and Disadvantages of React in Various Scenarios

Advantages:

1. **Component-Based Architecture:** React's modular approach allows developers to build reusable UI components, leading to more maintainable and scalable codebases. This architecture promotes code reusability and separation of concerns, enhancing productivity and collaboration【Mishra, Gupta & Department of Computer Science and Engineering, Malout Institute of Management and Information Technology, 2022】.

2. **Virtual DOM:** React's use of a virtual DOM improves rendering performance by minimizing direct manipulation of the actual DOM. This results in faster updates and a smoother user experience, especially in applications with dynamic content【Rawat & Mahajan, 2020】.

3. **Strong Ecosystem:** The extensive ecosystem surrounding React, including libraries like Redux for state management and React Router for routing, provides developers with powerful tools to address common development challenges. Additionally, tools like Create React App streamline the initial setup of React projects【Indla & Puranik, 2021】.

4. **Active Community and Support:** React's large and active community offers abundant resources, tutorials, and third-party libraries. This support network helps developers quickly find solutions to problems and stay updated with best practices【Aggarwal & International Journal of Recent Research Aspects, 2018】.

Disadvantages:

1. **Learning Curve:** While react itself is relatively simple to learn, mastering its ecosystem and associated tools, such as Redux and Webpack, can be challenging. This complexity may be daunting for beginners【Johansson, 2020】.
2. **Boilerplate Code:** Managing state and other concerns in React can sometimes involve writing boilerplate code, especially when using libraries like Redux. This can lead to verbose code and increased development time【Ritwik & Sandeep, 2020】.

3. **SEO Challenges:** React's client-side rendering can pose challenges for search engine optimization (SEO). Although solutions like server-side rendering (SSR) with Next.js exist, they add additional complexity to the development process【Nguyen, 2022a】.

In conclusion, while react offers numerous advantages such as a robust component-based architecture, efficient performance, and strong community support, it also presents challenges like a steep learning curve and potential SEO issues. Developers should consider these factors along with the specific requirements of their projects when choosing between React, Angular, and Vue.js. Each framework has its strengths and is suited to different types of applications and development scenarios.

7. FUTURE OF REACT AND WEB DEVELOPMENT (400 WORDS)

Upcoming Features and Improvements

The React team continuously works on enhancing the library, and several exciting features are on the horizon. One of the most anticipated features is React Server Components, which aims to improve server-side rendering and hydration. This feature will enable developers to build more efficient and seamless server-rendered applications by allowing both server and client components to coexist, reducing the amount of JavaScript sent to the client【Aggarwal & International Journal of Recent Research Aspects, 2018】.

One more important change is concurrency for rendering that helps increasing React’s efficiency in the execution of parallel tasks without disrupting the main thread. This can be beneficial for users in terms of machine learning, especially when running a complicated program that involves a lot of calculation or animation. React Suspense is another feature related to fetching the asynchronous data which will also

gain wider usage and increasing the level of simplicity to work with asynchronous tasks in the component tree【Johansson, 2020】.

Trends in Web Development

Web development is constantly evolving, with several trends shaping its future. Progressive Web Apps (PWAs) continue to gain traction, offering the capabilities of native apps with the reach of the web. React, with its robust ecosystem and flexibility, is well-positioned to support the development of PWAs. Tools like Next.js, which integrate seamlessly with React, are making it easier to build feature-rich PWAs with excellent performance and user experience【Feature Analysis of React.js for Web Development, 2024】.

The rise of Jamstack architecture, which emphasizes decoupled frontends and pre-rendered content served via CDN, is another trend where react plays a significant role. Static site generators like Gatsby and frameworks like Next.js utilize React to deliver fast, secure, and scalable web applications. Additionally, the increasing use of headless CMSs pairs well with React's component-based architecture, providing flexible content management solutions for modern web applications【Nguyen, 2022a】.

Long-term Impact of React

React has a significantly impacted web development and development trends are expected to continue their current trajectory. The support for the component-based architecture and declarative programming paradigm has established new frontier for designing user interface. I believe that as more developers embrace such paradigms in their coding and development of web applications, the overall quality and maintainability benefits will also be felt. Although react evolves slowly, with backward compatibility and gradual adoption of new features, it will remain a standard choice for developers【Ritwik & Sandeep, 2020】.

Considering future trends, it can be hypothesized that React's integration with other upcoming technologies like WebAssembly as well as further web performance optimization will enhance its functionality. The ability of a framework to meet the requirements of more sophisticated, performance-intensive applications will contribute to the expansion of such a framework in various areas, including the field of multimedia technology and especially in the area of VR/AR and gaming applications.

In conclusion, it can be stated that the future of React and web development as a whole is quite bright and exciting, especially considering the numerous improvements and developments to come. Evolving web development is void without putting into consideration the use of React; this is a technology that is here to stay and will continue to prove its usefulness for many years to come due to its unparalleled flexibility. The future of the web continues to be bright and reactive is sure to be the brains behind technological advancements in web development and setting the bar for building powerful web applications.

8. CONCLUSION

Summary of Findings

React has fundamentally and positively transformed the world of web development in terms of the possibilities provided by offering the opportunity to create an efficient, flexible and powerful framework for the development of the interface. Its modularity allows a developer to work with different UI components that can be used in different parts of the application hence lowering the complexity, and the number of codes that grows so large that they become more challenging to maintain. This is because of

functions such as the virtual DOM, which effectively eliminate all forms of direct operations in the actual DOM so as to improve rendering times and the overall usability of the user. It was also found that Redux and the Context API are an efficient and feasible solution for realizing such complex state logic for the application while also improving the development efficiency of the application through Create React App and React Router.

Implications for Web Development

React has many benefits for developers, as it is friendly, feature-rich, and easy to deal with and much more. Enterprises also have advantages like increased speed of application delivery, a more responsive and better performing application, and a higher level of user experience that can result in greater user satisfaction. React is made to last via the backing of a strong community and regular updates that keep the technology at the top of web development industry.

Suggestions for Further Research

React remains one of the most popular web development options; however, there are some issues that need to be addressed regarding its future role. Futuristic research might include optimizing React apps even further and in resource-intensive scenarios. Also exploring the development of React environments that leverage the use of other emerging technologies like WebAssembly, VR/AR too, or machine learning could be interesting avenues for web development. Another interest is in the provision of accessibility and internationalization to support React applications providing these applications to a broad and diverse set of users.

Overall, react has made web development faster and more effective. It continues to have a positive influence on the industry and these people, both developers, and businesses. Improvements and further testing will result in even more functionality that will continue to make React an indispensable part of the future of web development.

REFERENCES:

- Aggarwal, S. & International Journal of Recent Research Aspects. (2018). Modern Web-Development using ReactJS. In *International Journal of Recent Research Aspects* (Vol. 5, Issue 1, pp. 133–137) [Journal-article]. IJRAA. http://ijrra.net/Vol5issue1/IJRRA-05-01-27.pdf
- Comparative analysis of angularjs and reactjs. (2016). *International Journal of Latest Trends in Engineering and Technology*, *7*(4). https://doi.org/10.21172/1.74.030
- Feature analysis of React.js for web development. (2024). In *International Journal of Research Publication and Reviews* (Vol. 5, Issue 3, pp. 1674–1676) [Journal-article]. https://ijrpr.com/uploads/V5ISSUE3/IJRPR23518.pdf
- Indla, B. V. S., & Puranik, Y. (2021). Review on React JS. In P.E.S. Modern College of Engineering, *International Journal of Trend in Scientific Research and Development* (Vol. 5, Issue 4, pp. 1137–1139) [Journal-article]. https://www.ijtsrd.com/papers/ijtsrd42490.pdf
- Johansson, D. (2020). Building maintainable web applications using React - An evaluation of architectural patterns conducted on Canvas LMS. In *Master's thesis*. https://www.diva-portal.org/smash/get/diva2:1415320/FULLTEXT01.pdf
- Mishra, A., Gupta, A., & Department Of Computer Science And Engineering, Malout Institute Of Management And Information Technology, Malout, Punjab, India. (2022). REACT JS – AN

FRONTEND JAVASCRIPT LIBRARY. *International Research Journal of Modernization in Engineering Technology and Science*, *04*, 752–753. https://www.irjmets.com/uploadedfiles/paper//issue_11_november_2022/31217/final/fin_irjmets1668401774.pdf

- Nguyen, N. (2022a). *Creating a modern web user interface using React and Typescript* [Thesis, VAASAN AMMATTIKORKEAKOULU UNIVERSITY OF APPLIED SCIENCES]. https://www.theseus.fi/bitstream/handle/10024/745669/Thesis.pdf?sequence=2&isAllowed=y
- NS, C. (2021). Benchmarking React Library: A Developer perspective [Thesis]. In Department of Information systems with computing, Dublin Business School, *Department of Information systems with computing, Dublin Business School*.
- Parmar, M., 16BEC003. (2021). WEB DEVELOPMENT USING REACT.JS. In *Department of Electronics & Communication Engineering, Institute of Technology, Nirma University, Ahmedabad 382 481*.
- Rawat, P., & Mahajan, A. N. (2020). ReactJS: a modern web development framework. *International Journal of Innovative Science and Research Technology*, 698–699. https://ijisrt.com/assets/upload/files/IJISRT20NOV485.pdf
- React-JS: a Cutting-Edge framework for web designing. (2024). In *International Journal of Research Publication and Reviews* (Vol. 5, Issue 4, pp. 2029–2033) [Journal-article]. https://ijrpr.com/uploads/V5ISSUE4/IJRPR24825.pdf
- Ritwik, C., & Sandeep, A. (2020). REACT.JS AND FRONT-END DEVELOPMENT [Journal-article]. *International Research Journal of Engineering and Technology (IRJET)*, 3676. https://www.irjet.net/archives/V7/i4/IRJET-V7I4714.pdf
- Sammeta, N., M, J. B., S, K., K, K., V, M., & Department of CSE/R.M.K. College of Engineering and Technology. (n.d.). Reactive website using React. *ASEM*. http://proceeding.conferenceworld.in/ASEM-19/8MgXHP1zDxM611.pdf

APPENDIX:

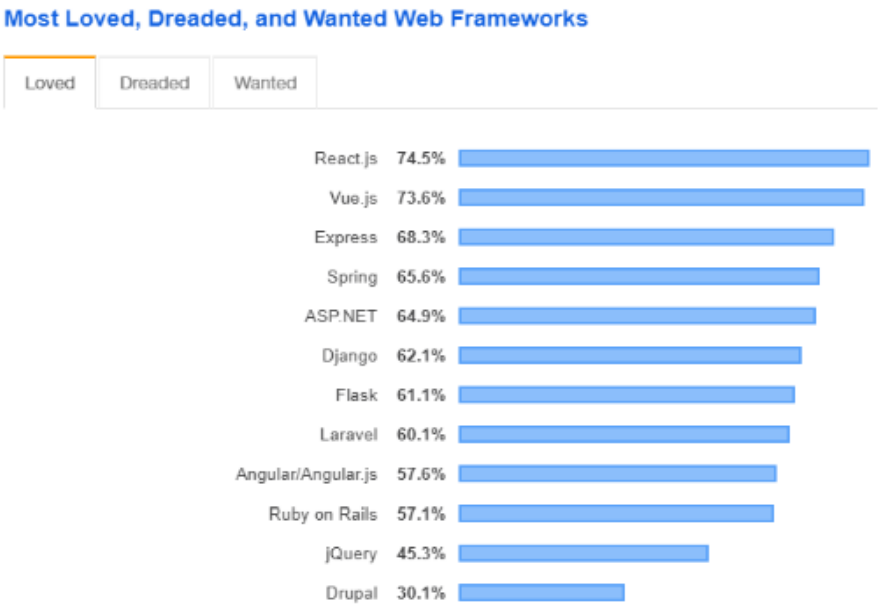


Figure 1 : Most Loved Web Frameworks

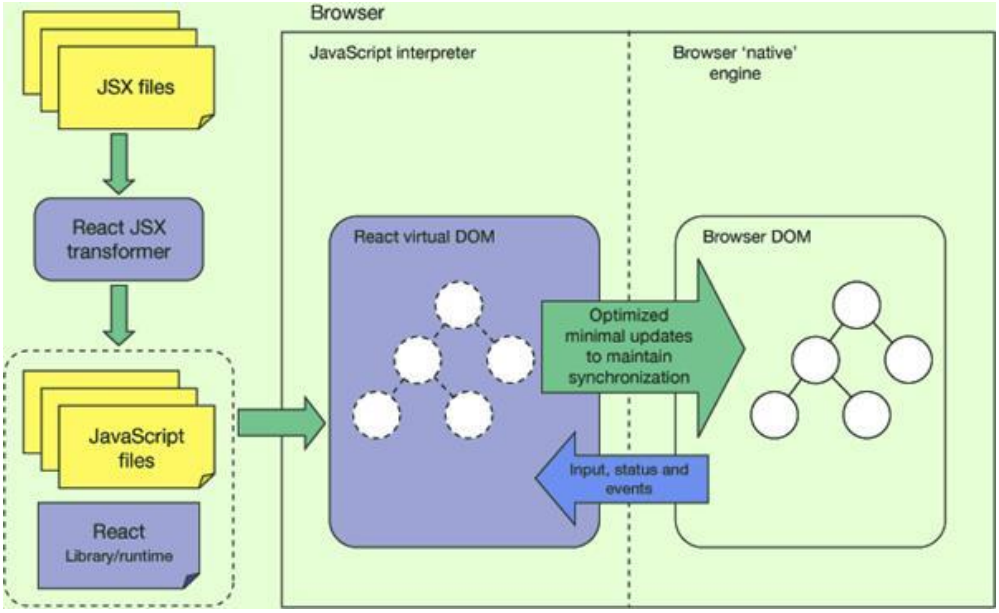


Figure 2: What is Virtual DOM