**Industrial Survey**

**&**

**Literature Review**

**Project Title**

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**Abstract**

In today's fashion-forward world, the quest for the perfect outfit is paramount. Online resources have become the primary source for outfit inspiration, but these platforms often lack a comprehensive archive of 3D outfit models. In this project, we introduce a groundbreaking solution to this challenge. Creating a 3D outfit customizer web app is a complex task, particularly when it involves the fusion of React JS, WebGL, Next JS, and MongoDB.

The world of fashion, contains limitless desgin types but none of them can be as favourable as a custom one built by the customer. Our app simplifies the outfit customization process. Users can customize 3D models according to their tastes, and upload it to our databse, storing it efficiently in a key-value format within MongoDB. The keys reference image paths, while the values contain essential outfit information.

Upon visiting our web app, users input their outfit preferences. The app instantly loads 3D outfit models on the screen. Users can manipulate and customize these outfits, giving them a hands-on experience. This application is a game-changer for fashion enthusiasts, designers, and anyone in search of the perfect 3D outfit. It provides a seamless and interactive platform for outfit customization, empowering users to explore, create, and make informed fashion decisions.

**Literature Review**

| Sr. No. | Title | Author Name | Year | Published At | Findings | GAP | Future Direction |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | Dual-Mode User Interfaces for Web- Based Interactive 3D Virtual Environme nts Using Three.js | Matthew Stanton, Thomas Hartley, Fernando Loizides, and Adam Worrallo | 2017 |  | The dual-mode user interface, which combines 2D and 3D elements, results in quicker retrieval of information compared to using 3D websites alone. Users reported higher satisfaction levels when using the dual-mode interface. The 2D interface achieved the highest rating for user interface quality, while the 3D interface was considered the most aesthetically pleasing. | Presentation and readability of text in the 3D interface were worse compared to the dual-mode and 2D interfaces. The dual-mode interface lacked a content search function, which could potentially slow down data retrieval for users accustomed to using Ctrl+F for searching on web pages. | The research shows promise for dual-mode user interfaces, combining 2D and 3D elements, to enhance user interaction in 3D virtual environments. Future work is suggested to integrate 3D and 2D views more closely and expand the scope of the study to fully assess the merits of dual-mode interfaces. The paper also references related work on integrating 3D objects and 2D HTML elements within 3D space and discusses previous research on dual-mode user interfaces for web content. |
| 2 | React JS – An Emerging Frontend Javascript Library | Pratik Sharad Maratkar and Pratibha Adkar | 2021 |  | React JS is an emerging and popular frontend JavaScript library known for its fully component-based architecture. It simplifies the development of rich UIs by using reusable components. Facebook, Instagram, and other organizations back React JS and use it in their web applications. React JS offers tools for easy debugging, including Chrome extensions. | React primarily deals with the View part in MVC, so other tools are needed for backend development. Some developers may find JSX programming challenging during the learning phase. React's environment evolves rapidly, requiring developers to stay updated with its changes. | The paper provides a comparison between React JS and Angular JS, highlighting their differences in terms of development, performance, and usage. It discusses React JS's architecture, including React Virtual DOM, one-way data flow, React components, and JSX syntax. |
| 3 | Frontend Development with React.js | Anjali Rananavar e | 2022 |  | React.js is widely used in web development, with 46.4% of all websites surveyed using it. React.js simplifies the development of dynamic web applications by requiring less code and offering more functionality. It is an open-source library with a large development community and is used by companies like Facebook, Instagram, and Netflix. React's Virtual DOM and one-way data flow contribute to efficient and faster web application development. | The paper mentions some disadvantages of React.js, such as the need to import libraries for state and model management and the fact that React moves away from class-based modules, which may pose challenges for developers who are more comfortable with Object Oriented Programming. | The paper provides a detailed overview of React.js, its advantages, architecture, and how it compares to other frameworks like Angular. It emphasizes React's role in simplifying frontend development and highlights its popularity in the industry. |
| 4 | React Apps with Server- Side Rendering: Next.js | Harish A Jartarghar, Girish Rao Salanke, Ashok Kumar A.R, Sharvani G.S, Shivakumar Dalali | 2022 |  | The paper explains that React.js is a flexible library for building reusable User Interface (UI) components, but it primarily relies on client-side rendering, leading to slow page loading. Next.js is introduced as a solution to this problem, utilizing server-side rendering for improved page loading speed and performance. Next.js helps enhance SEO by allowing search engines to crawl the site more effectively. | The paper doesn't explicitly mention any gaps or disadvantages in its research. | The paper provides a brief overview of web development trends, such as the adoption of HTML5 and the development of JavaScript engines like Chrome V8. It discusses the evolution of JavaScript from interacting with CSS to being used for server-side applications with technologies like Node.js. The paper also introduces the concept of the Document Object Model (DOM) and its significance in web development. Additionally, it explains the benefits of React.js as a component-based library and introduces the concept of the Virtual DOM. |
| 5 | React JS (Open Source JavaScript Library) | Alok Kumar Srivastava, Vaishnavi Laxmi, Payal Singh, Km Pratima, Vibha Kirti | 2022 |  | The paper discusses the benefits of using React JS for front-end web application development. It emphasizes React's ability to create large and complex web applications that can update data without requiring page refreshes. React JS is praised for providing a better user experience and enabling the development of fast and robust web applications. The paper also mentions that React JS can integrate with other JavaScript libraries or frameworks, including AngularJS. | The paper does not explicitly mention any disadvantages or gaps in React JS but focuses on its advantages and features. | The paper provides an overview of React JS, its history, key features, and its role in modern web development. It discusses the React component lifecycle and its methods, emphasizing the importance of understanding these methods for effective development. The paper also mentions the popularity of React JS and its dominance in the front-end development market |
| 6 | Modern Web- Development using React.js | Bhupati Venkat Sai Indla and Yogeshch | 2018 |  | ReactJS offers lightweight DOM for better performance, using a virtual DOM to optimize updates to the browser DOM. It has an easy learning curve and uses JSX for simplifying development. ReactJS is known for its high-performance due to the virtual DOM feature. Unidirectional data flow is supported, which keeps components synchronized with the data flow. ReactJS uses a virtual DOM to enhance the performance of applications with frequent data changes. | The paper doesn't delve into specific gaps or disadvantages of ReactJS but mentions some limitations: React primarily handles the View entity in the MVC pattern, requiring additional tools for complete project development. The use of inline templates and JSX may be complex for some developers. Failures in ReactJS occur at compile time, which can be frustrating for developers compared to runtime errors in other frameworks. | ReactJS provides a modern and efficient approach to web development, especially for building dynamic and interactive user interfaces. It simplifies the development process, offers high performance through virtual DOM, and encourages unidirectional data flow. The paper emphasizes ReactJS's potential to impact the way web applications are developed and its ability to meet the demands of modern web development trends. |
| 7 | Review on React JS | Dimpy Bansal | 2020 |  | React JS simplifies the creation of interactive user interfaces by allowing developers to design simple views for each state in their applications.  React's component-based architecture promotes reusability, making it easy to manage individual components' states and pass data between them.  React's Virtual DOM feature improves site performance by selectively updating parts of the actual DOM, reducing computing power and loading times.  React is well-suited for developers familiar with JavaScript, offering a smoother learning curve compared to some other frameworks.  React's rich ecosystem includes ready-made and customizable components, tools, and tutorials, enabling developers to build web apps more efficiently.  React can be used to create single-page applications and cross-platform mobile apps using React Native. | While the paper provides a comprehensive overview of React JS, it does not delve into potential disadvantages or limitations of using React. A more balanced assessment that includes drawbacks or challenges could offer a more complete understanding of the technology | The paper discusses the evolution of web development before and after the introduction of JavaScript libraries like React JS. It highlights the advantages of using React, such as component reusability, improved user interactions, and support for various types of web applications. The paper also suggests potential application areas for React JS, including blogs, business websites, forums, eLearning modules, and more. |
| 8 | Role of Node.js in Modern Web Application Development | Ghansham Jadhav1, Flavia Gonsalves 2 | 2020 |  | Node.js is a JavaScript runtime environment built on Chrome's V8 JavaScript engine, designed for server-side applications. It focuses on low memory consumption and performance, making it suitable for building scalable and lightweight applications. Node.js allows developers to use JavaScript for both client and server-side scripting. It uses event-driven, non-blocking, and asynchronous approaches, enabling it to handle concurrent requests efficiently. | The paper does not explicitly mention any gaps or disadvantages in the research. | Node.js's internal structure includes V8, an open-source project by Google, and libuv, an abstraction layer for handling I/O operations. Node.js provides a unified API for JavaScript developers to interact with C/C++ code running in the background. Node.js introduces a modular system for managing dependencies and code isolation. NPM (Node Package Manager) simplifies package management and dependency handling in Node.js applications. Node.js is favored by major companies like PayPal, LinkedIn, Yahoo, Netflix, and GoDaddy for its scalability, performance, and efficiency. |
| 9 | Comprehensive Analysis of React-Redux Hybrid App Development Framework | Shravan G V, Prof. Anitha Sandeep | 2020 |  | The research aims to judge the user experience of web applications developed using the React-Redux framework as satisfactory. The paper suggests that creating user interfaces with React-Redux is easier compared to other platforms. React-Redux is capable of generating both simple and complex applications for cross-platform use, with a focus on high data fetching without caching. | The research paper does not explicitly mention any gaps or disadvantages in the React-Redux framework. However, it is important to note that while React-Redux offers advantages, it may not be the ideal choice for all types of applications or development scenarios. The paper could have discussed any limitations or challenges faced during the implementation of the framework. | The paper provides insights into the architecture of React-Redux and its components, including components, templates, containers, actions, action creators, reducers, selectors, and the store. It also highlights the applications of React-Redux, such as handling front-end data, state interpretation for complex applications, and scalability. |
| 10 | Survey And Analysis Of Rendering Realtime 3D Object On Cross- Browser & Cross- Platform Using WebGL | Yogiraj Patil, Kirti Wanjale | 2020 |  | The paper explores various rendering approaches and techniques for complex 3D objects in real-time using web browsers and WebGL. It emphasizes the importance of optimized rendering for web-based 3D applications. The paper mentions the use of glTF (GL Transmission Format) for efficient 3D model representation in WebGL. | The paper discusses various aspects of rendering 3D objects but does not provide a comprehensive analysis of performance or specific applications. It does not delve into the use of specific datasets or examples of real-world applications. | The paper acknowledges the challenges of rendering 3D objects in real-time on various devices and screen sizes. It highlights the role of JavaScript frameworks and WebGL in enabling 3D web applications. The paper mentions the importance of efficient data representation using technologies like glTF. |
| 11 | Robust Real-Time Shadows for Dynamic 3D Scenes on the Web | Tim Nicolas Eicke, Yvonne Jung, and Arjan Kuijper | 2014 |  | The research focuses on improving the quality of real-time shadows in web-based 3D scenes. The authors propose the use of Variance Shadow Maps and PSSM to achieve this. They provide practical implementation results and demonstrate that these techniques significantly enhance shadow quality, especially in large scenes. | The paper identifies several limitations and challenges in achieving high-quality shadows in web-based 3D scenes. These include the limited capabilities of WebGL compared to other graphics libraries like OpenGL, issues related to bias in shadow mapping, and aliasing artifacts at shadow edges. The paper acknowledges that some adjustments are needed to address these limitations. | The paper highlights the importance of shadows in enhancing the authenticity of virtual 3D scenes and aiding in the perception of spatial relationships. It also mentions that while WebGL has some limitations, it contributes to the success of web-based 3D technology due to its wide platform compatibility. |
| 12 | Movie Data Visualization Based on WebGL | Min Li, Chunfang Li | 2021 |  | Node.js uses a single-threaded event loop model, making it capable of handling multiple concurrent client requests efficiently. | The paper mentions that 3D data visualization charts are rarely involved in current data visualization practices, but it does not elaborate on the specific limitations or disadvantages of 3D data visualization compared to 2D visualization. | The use of JavaScript for both client-side and server-side development has streamlined the development process for many web applications. |
| 13 | Comprehensive Analysis of React-Redux Development Framework | Shravan G V and Prof. Anitha Sandeep | 2020 |  | The research work aims to judge the user experience of web applications created using the React-Redux framework as satisfactory. It examines whether user interface creation is easier compared to other platforms. It differentiates between the generation of simple and complex applications using React-Redux. The React-Redux framework allows for the development of compatible code for both Android and iOS platforms, using a single codebase. Redux centralizes state management, making it easier to manage application states. Redux enables features like undo/redo, state persistence, and provides an excellent debugging experience. | The research paper does not explicitly mention any disadvantages or gaps in the React-Redux framework. However, it is essential to note that while React-Redux has many advantages, it may not be suitable for all types of applications, and developers should consider their specific use cases. | The paper provides an overview of the architecture of React-Redux, highlighting components such as Component, Template, Container, Actions & Action Creators, Reducer, Selector, and Store. It discusses the need for Redux in managing application state, especially in complex applications. |
| 14 | Server- Based Rendering of Large 3D Scenes for Mobile Devices Using G- Buffer Cube Maps | Juergen Doellne, Benjamin Hagedorn | 2020 |  | The paper demonstrates that this server-based rendering approach is effective in rendering large 3D scenes on mobile devices. It decouples the complexity of the 3D scene from data transmission complexity, allows for advanced 3D rendering on the server, and provides a high degree of protection for 3D content while supporting interactive user experiences on clients. | The paper does not explicitly mention any disadvantages or gaps in the research. | Different types of 3D visualizations are implemented for film-related data, such as histograms, pie charts, maps, and force-directed graphs. |
| 15 | The Research and Design Of 3D Web Guide System Based On WebGL | Cui Peng | 2021 |  | The research paper describes the development of a 3D Web guide system that allows users to navigate unfamiliar environments using their mobile phones. It employs WebGL, three.js, and various web technologies to create interactive 3D scenes and calculate optimal paths between scenes. The system is designed for use in large amusement parks and shopping malls, serving as a form of advertising and a new type of 3D web application. | The paper does not explicitly mention any disadvantages or gaps in the research. | The paper outlines the architecture and operation of the 3D Web guide system, which consists of a client-side application running on mobile phones and a server-side system for path calculation and database interaction. The system's performance is described in terms of frame rate and resource usage on both the client and server sides. |
| 16 | Performance Optimization using MERN stack on Web Application | Sourabh Mahadev Malewade , Archana Ekbot | 2021 |  | The use of React.js, MongoDB, Node.js, and Express.js in building the web application. The advantages of using Node.js for asynchronous, event-driven programming. The role of Express.js in simplifying back-end code and providing middleware support. The benefits of React.js in building user interfaces with components. | The paper doesn't explicitly mention any gaps or disadvantages in the research. | The paper provides a comprehensive overview of the technologies used in building an e-commerce web application, emphasizing the importance of understanding client demands and the potential for online businesses. It discusses the advantages of the MERN stack and highlights key aspects of each technology used in the project |
| 17 | Efficient visualization of 3D models by web browser | Bartosz Sawicki and Bartosz Chaber | 2013 |  | The findings of the paper include the successful development of a JavaScript-based web component for 3D model visualization in web browsers. This component adapts to the device's capabilities and provides a natural 3D experience. Usability tests were conducted on real-life users, and the results were positive. | The paper mentions that one disadvantage of their approach is the additional computational effort required on the server side to prepare the mesh before displaying it. It does not go into detail about potential limitations or drawbacks of their method. | The paper discusses the importance of efficient 3D model visualization, particularly for mobile devices with limited computational power and network bandwidth. It introduces the concept of progressive mesh streaming as a way to optimize the transmission of 3D models to clients. The authors also highlight the accessibility of their web-based solution, as web browsers are present on virtually every device. |
| 18 | 3D Rubik's Cube - Online 3D Modeling System Based on WebGL | Buyun Sheng, Feiyu Zhao, Chenglei Zhang, Xiyan Yin, Yao Shu | 2017 |  | The paper demonstrates the development of an online 3D modeling system that allows cloud-based 3D model design. It leverages WebGL for 3D rendering and provides a range of 3D modeling functions. The system was tested for stability and performance, showing good results in terms of frames per second (FPS) and load times compared to another online 3D modeling system called Clara.io. | The paper mentions that the system is still in the research and development stage, implying that it may not have a fully matured set of features. It also doesn't discuss any specific disadvantages or limitations of the system. | The paper focuses on the development of an online 3D modeling system suitable for cloud-based 3D printing. It highlights the use of WebGL and Three.js for rendering and provides insights into the improved Phong reflection model and CSG tree-based modeling. The system appears to offer good performance in terms of FPS and load times. |
| 19 | WEBAPP SERVICE FOR BOOKING | Saundariy a K, Prabakara n D, | 2021 |  | The research presents a user-friendly website that allows users to easily book handyman services online. It offers various services like cleaning, COVID-sanitization, furniture maintenance, electrical works, appliance repair, house painting, and plumbing. Users can select services, view available professionals based on location and cost, and book them. Handyman professionals can showcase their skills and accept or decline tasks. The system aims to provide a convenient and cost-effective solution for connecting users with professional workers. | The paper does not explicitly mention any gaps or disadvantages in the research. | The research focuses on addressing the increasing demand for handyman services by providing an online platform. It emphasizes the importance of verifying the professionalism of workers through admin approval and offers a user-friendly interface for booking and tracking services. |
| 20 | HANDYM AN USING MONGO DB, EXPRESS JS, REACT JS, NODE JS | Abirami M, Srimathi B, Senthil Kumaran R, Nagarajan G (IEEE Member) | 2021 |  | The research presents a user-friendly website that allows users to easily book handyman services online. It offers various services like cleaning, COVID-sanitization, furniture maintenance, electrical works, appliance repair, house painting, and plumbing. Users can select services, view available professionals based on location and cost, and book them. Handyman professionals can showcase their skills and accept or decline tasks. The system aims to provide a convenient and cost-effective solution for connecting users with professional workers. | The paper does not explicitly mention any gaps or disadvantages in the research. | The research focuses on addressing the increasing demand for handyman services by providing an online platform. It emphasizes the importance of verifying the professionalism of workers through admin approval and offers a user-friendly interface for booking and tracking services. |
| 21 | Research and Application of Web3D Exhibition Based on WebGL and Html5 | M.J. Bian, J. Gao, H.H. Gao, J.P. Xu | 2015 |  | The authors have designed a Web3D solution that combines WebGL and HTML5. They developed the Web3D Exhibition Building System (Web3D-EBS) to create Web3D exhibitions in web applications. The solution offers good compatibility and runs without the need for plugins, relying on GPU rendering. The system has been applied to the project of Digital Museums of Colleges and Universities in Shanghai, demonstrating its convenience and effectiveness in Web3D exhibition applications. | The paper does not specify the publication year, making it difficult to determine the currency of the research. It does not delve into the technical details of the Web3D-EBS system, such as implementation specifics or performance benchmarks. The paper does not discuss potential limitations or challenges encountered during the implementation of the solution | The authors note the increasing importance of 3D visualization in web applications for enhancing the user experience. The paper highlights various existing Web3D solutions, such as Java3D, Flash3D, VRML, and Cult3D, and their advantages and disadvantages. WebGL is introduced as a key technology that can efficiently render complex 3D scenes in browsers by leveraging GPU capabilities. HTML5 is mentioned as providing support for 3D graphics in web applications and improving compatibility. Threejs, an open-source JavaScript library built on WebGL, is recommended for enhancing the efficiency and flexibility of building Web3D exhibitions. |
| 22 | Web 2.0 and Virtual World Technologies: A Growing Impact on IS Education | Albert L. Harris and Alan Rea | 2009 |  | Web 2.0 and virtual world technologies are becoming increasingly important in IS education. Students today are tech-savvy and often more knowledgeable about these technologies than their professors. Collaborative learning is being promoted across disciplines, and these technologies facilitate collaborative efforts in education. Different types of Web 2.0 technologies, such as wikis, blogs, podcasts, and social networks, are being used to enhance IS education. Virtual worlds, like Second Life, provide immersive environments for students to experiment and collaborate. | The paper does not explicitly mention any gaps in research, but it acknowledges the challenges associated with using Web 2.0 and virtual world technologies in education, such as technical requirements, potential disruptions, and issues related to evaluating group work. | The paper emphasizes the need for educators to adapt to the changing technological landscape and leverage these technologies effectively to engage students and enhance learning. It suggests that instructors should carefully consider how to use these technologies to complement their teaching methods. Additionally, the paper highlights the increasing importance of a global perspective in education and the potential for Web 2.0 technologies to facilitate cross-cultural interactions. |
| 23 | Investigating Web3D topics on StackOverflow: a preliminary study of WebGL and Three.js | Farag Almansou ry, Sègla Kpodjedo, and Ghizlane El Boussaidi | 2020 |  | WebGL received less community attention compared to Three.js in terms of the number of questions and views. Three.js received significantly more community attention but had lower community support than WebGL. The study identified various tags associated with WebGL and Three.js, including specific technologies (e.g., Pixi.js, A-Frame, Blender, FBX) and development concerns (e.g., shader, textures, raycasting, camera). When coupled with Three.js, most technologies experienced a drop in community support, while the reverse was true for WebGL. | Limited Scope: The study only considers data from Stack Overflow for the years 2015 to 2019. It may not capture the most recent trends and developments in WebGL and Three.js.  Lack of Detailed Analysis: The paper mentions various tags associated with WebGL and Three.js but does not provide an in-depth analysis of each tag's significance or relevance. | The paper highlights the importance of community support and attention for developers working with WebGL and Three.js. It suggests that while Three.js may have a larger community on Stack Overflow, it faces challenges in terms of support compared to WebGL. Developers are advised to consider these findings when making technology choices for their Web3D projects. |
| 24 | A Framework for Browser-based Multiplayer Online Games using WebGL and WebSocket | Bijin Chen, Zhiqi Xu | 2011 |  | The framework successfully enables the development of browser-based multiplayer online games with real-time 3D graphics. The performance of the framework was tested using multiple clients, and the measured data aligns with theoretical expectations. The paper provides insights into factors that affect communication efficiency, such as the number of clients, network quality, and hardware capabilities. | The paper mainly focuses on a small group of users, and its scalability to larger multiplayer online games is not discussed. While the paper discusses the impact of various factors on communication efficiency, it doesn't provide detailed optimization strategies. | The use of HTML5, WebGL, and WebSocket technologies makes it easier to create cross-platform browser-based multiplayer online games without the need for explicit installations. The framework's performance is influenced by factors such as the number of clients, network quality, and hardware capabilities. The framework architecture involves separate web and game servers, with web workers optimizing communication. Real-time 3D graphics are made possible through Three.js and real-time communication through jWebSocket. |
| 25 | Immersive 3D Modeling with Blender and Off-the-Shelf Hardware | Matthew Stanton, Thomas Hartley, Fernando Loizides, and Adam Worrallo | 2020 |  | The paper mentions challenges related to accurate object posing but does not delve into possible solutions or improvements in detail. It does not provide extensive technical details about the implementation of the 3D modeling application. The study sample size was relatively small, with 14 participants, and might not represent a broader user base. | The paper points out that while the application was effective for some 3D modeling tasks, it had limitations in terms of accurate object positioning. It also mentions the need for further refinement to improve posing accuracy. Additionally, the study focused on short-term use, and long-term usability and comfort were not extensively evaluated. | The paper demonstrates the feasibility of creating an immersive 3D modeling application using open-source software and off-the-shelf hardware, making it more accessible to a wider audience of 3D artists. User feedback indicates that the application was enjoyable and had intuitive features, but there were concerns about accuracy and potential eye fatigue. The study also revealed a mixed perception among participants regarding the future use of immersive technology in 3D modeling, with some believing it would become more common while others were unsure. |

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