



## E-Commerce Website with Augmented Reality (AR)

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### ABSTRACT:

This project aims to transform the traditional online shopping experience by integrating cutting-edge augmented reality (AR) technology into an e-commerce website. The incorporation of AR allows users to visualize products in their physical space before making a purchase, enhancing the overall shopping experience. Through a user-friendly interface, customers can interact with virtual 3D models of products, enabling them to assess size, color, and design compatibility with their surroundings. This innovative approach not only addresses the limitations of conventional online shopping but also offers a more immersive and personalized platform for consumers. The study explores the technical implementation, user experience design, and potential impact of augmented reality in the context of e-commerce, ushering in a new era of interactive and engaging online retail.

**Keywords:** Augmented Reality (AR), Purchase Intention, Online Shopping.

### INTRODUCTION:

In recent days, e-commerce has surged in utility due to its unmatched convenience, offering customers the ability to shop anytime, anywhere, and providing an extensive range of products personalized recommendations and streamlined geographical barriers, enabling businesses to reach a global audience. "E-commerce has revolutionized the way we shop, bringing convenience and accessibility to our fingertips". More and more people are hopping online to shop for everything from clothes to groceries. It's not just about convenience anymore; it's become a way of life. And with the rise of smartphones and faster internet, shopping on the go has never been easier. Additionally, businesses are getting smarter with personalized recommendations and speedy delivery options, making the online shopping experience even better. All these factors driving growth, e-commerce is expanding at a rapid pace. Innovative technologies like Augmented Reality (AR), Virtual Reality (VR), and Artificial Intelligence (AI) further enrich the online shopping journey, while flexible payment options and sustainability initiatives cater to evolving consumer preferences. To help the customers to let them to virtually try on the different product with customization they wished for. Thus, It will increase the satisfaction of customers as well as the company's profit. Try-on features on e-commerce websites hold significant importance as they bridge the gap between online and offline the shopping experience. By allowing customers to virtually try on products such as eyewear, or shoes, these features enhance the confidence of shoppers in their purchasing decisions. Significantly, try-on functionalities reduce the uncertainty associated with buying items online by providing a more accurate representation of how the product will look or fit. This not only improves engagement, boost sales, elevate the overall online shopping experience.

### SETUP DEVELOPMENT ENVIRONMENT:

1. Node.js and React: Node.js provides a scalable backend environment for handling server-side logic, while React facilitates the creation of dynamic and interactive user interfaces on the client side.
2. Three.js: Three.js is a powerful JavaScript library for creating and displaying 3D graphics in web browsers, serving as the foundation for rendering AR content within the browser environment.
3. AR.js and WebXR: AR.js is a lightweight JavaScript library for building AR experiences on the web, leveraging features such as marker-based tracking and image recognition. WebXR enables immersive AR and virtual reality (VR) experiences directly within web browsers, ensuring cross-platform compatibility.
4. Strapi: Strapi is an open-source headless Content Management System (CMS) that enables developers to create customizable APIs for managing content and data. It serves as the backend CMS for managing product information, user accounts, and other e-commerce functionalities.
  - a. Install Strapi CLI globally: `npm install strapi@beta -g`
  - b. Create a new Strapi project: `strapi new my-project`

5. **Cloudinary:** Cloudinary is a cloud-based media management platform that simplifies the process of uploading, optimizing, and delivering images and videos on the web. It provides seamless integration with e-commerce websites for hosting product images and AR content.
6. **Stripe:** Stripe is a popular payment processing platform that enables secure online transactions. It facilitates seamless integration of payment gateways within e-commerce websites, allowing users to make purchases directly within the AR shopping experience.

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## IMPLEMENTATION:

1. **Selection of Technologies:** Both three.js and ar.js are popular choices for implementing 3D models and augmented reality (AR) features on websites. It is compatible with a wide range of devices and browsers, offering flexibility in implementing 3D elements on websites without requiring additional plugins. Ar.js is an extension of three.js specifically designed for implementing AR experiences on the web.
2. **Integration of 3D Models:** AR integration tools that support the platform such as WebAR (for web-based AR experiences). We'll need 3D models of products or you can use ready-made models from online marketplaces like TurboSquid or Sketchfab.
3. **Enable AR View:** Allowing users to view 3D models of selected products in augmented reality. This could involve adding a button or option on the product page that launches the AR experience using the device's camera.
4. **Optimization:** Optimizing 3D models for web and AR use to ensure optimal performance and compatibility. This may involve reducing polygon count, optimizing textures for web use, and exporting the models in formats suitable for AR integration (e.g., glTF or USDZ).
5. **Exporting:** Export finalized 3D models in the appropriate file format for integration into e-commerce website and AR experiences.
6. **Testing:** Test 3D models across different devices and browsers to ensure that they display correctly and perform well in the AR environment. Make any necessary adjustments or optimizations based on the test results.

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## CONCLUSION:

In conclusion, our proposed e-commerce system represents a cutting-edge solution that combines innovative technologies with user-centric design principles to deliver an immersive and seamless shopping experience. By integrating augmented reality (AR) for virtual try-on, implementing advanced features such as wishlist functionality, and ensuring secure payment processing through the Stripe payment interface. The integration of AR technology enables users to visualize products in real-world settings, enhancing their confidence in purchasing decisions and reducing the likelihood of returns. Throughout the development process, we prioritized user feedback and iteratively refined the system to address user needs and preferences. The result is a responsive and user-friendly platform that adapts seamlessly to diverse devices and screen sizes, providing a consistent and optimized experience across all touchpoints.

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