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Design and Development of a Fashion E-Commerce Website Using React.js and TypeScript

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Abstract: *This research presents the design and implementation of a modern Fashion E-Commerce Website created using React.js and Typescript. The aim was to develop a scalable and responsive online platform dedicated to apparel and accessories. The system provides an interactive interface that enables users to log in, browse products, view detailed descriptions, add items to a shopping cart, and complete purchases through a simulated UPI checkout. The study focuses on applying component-based architecture, asynchronous data handling, and responsive design to deliver a seamless user experience. The outcome demonstrates that combining React.js with TypeScript offers a powerful foundation for developing efficient and maintainable front-end systems suitable for commercial e-commerce deployment.*

Keywords: TypeScript; E-Commerce; Frontend Development; Responsive Design; User Interface

I. INTRODUCTION

E-commerce has rapidly become a dominant model in global retail. Consumers demand intuitive interfaces, fast responses, and cross-device compatibility. Fashion, being a highly visual and trend-driven industry, depends strongly on design quality and user engagement. The objective of this work is to develop a web-based fashion e-commerce solution utilizing React.js and TypeScript to create a seamless and reliable online shopping experience. React's component-based paradigm enables reusable code and efficient rendering, while TypeScript adds type safety and maintainability. The project emphasizes modular architecture, responsive layout design, and a clean, data-driven interface to bridge technology with practical fashion-retail usability.

II. SYSTEM OVERVIEW

Conventional fashion e-commerce sites often rely on static HTML or tightly coupled server-side rendering, leading to slower loading speeds and reduced interactivity. Many small-scale systems also struggle with inconsistent design and limited scalability. These systems typically lack responsive behavior and require full page reloads during navigation. Studies such as Mardianto et al. (2024) and Olivia (2025) demonstrate that non-responsive interfaces decrease conversion rates and user satisfaction. Hence, a need arises for lightweight, modular, and client-driven web systems that ensure consistent performance across devices.

III. PROPOSED WORK

The proposed system is a single-page fashion e-commerce web application developed with React.js and TypeScript. The architecture separates UI logic from data management, improving scalability and reducing maintenance overhead. The design offers:

- **User Authentication:** Login and registration validation.
- **Product Display:** Dynamic listing of clothing items via JSON API.
- **Cart Management:** Real-time add/remove/update functionality.
- **Checkout:** Simulated UPI payment workflow for demonstration.

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- **Responsive Design:** Optimized viewports for all screen sizes.

By integrating Axios for data communication and React Router for navigation, the system achieves fast transitions and low reload latency. The modular approach allows effortless future expansion such as connecting to databases or real payment gateways.

IV. CONCLUSION

This work successfully demonstrates that React.js combined with TypeScript can create a highly responsive and efficient fashion e-commerce platform. The developed website achieved modular design, fast load performance, and ease of maintenance. The adoption of component-based architecture and typed scripting language proved advantageous in handling large-scale front-end operations. The project thus provides a practical model for implementing scalable web retail systems aligned with modern UI/UX standards.

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