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A Review of Tailor Craft E-Commerce: Design, Implementation, and Evaluation

Dinesh Swami[1,*], Sneha Soni[2], Snehlata Barde[3], R. Bharath Kalyan[4], N. Sai Prapul[5], Y. Praveen Reddy[6], Y. Chandrasekhar Reddy[7]

Abstract

The rapid growth of e-commerce has transformed consumers' purchasing and interaction with businesses. In particular, the clothing and fashion industry has embraced digital platforms to extend its reach, improve accessibility, and offer convenience to its customers. However, challenges such as unclear product information, insecure payment methods, poor user experience, and inefficient order tracking still limit customer satisfaction on many platforms. The Tailor Craft E-Commerce project aims to bridge these gaps by designing and developing a full-stack web application dedicated to clothing retail. The system focuses on simplicity, reliability, and security, offering a user-friendly interface, a robust product catalog, responsive search and filter options, smooth shopping cart management, and transparent checkout and payment systems. It integrates Razorpay with secure payments and includes an order tracking feature to keep customers informed at every stage. An admin panel further empowers store managers to handle products, users, and orders effectively. Developed with React.js for the frontend, Node.js/Express.js for backend services, and MongoDB for data storage, the system demonstrates modern web development practices. The testing results indicate strong performance, improved usability, and high security. Beyond technical implementation, this project provides insights into the importance of usability, trust, and transparency in e-commerce design. The project also outlines future extensions, including artificial intelligence for product recommendations, augmented reality (AR) try-on systems, mobile app development, and expansion into a multi-vendor marketplace. Overall, Tailor Craft contributes to both academic research and practical solutions in the evolving digital shopping landscape.

Keywords: Data flow diagram, e-commerce, ER diagram, MongoDB, Node.js, Razorpay, React, system architecture, Tailor Craft

***Author for Correspondence**
Dinesh Swami
E-mail: dkswami2020@gmail.com

[1]Assistant Professor, Department of Computer Science & Engineering, Parul Institute of Engineering and Technology, Parul University, Vadodara, Gujarat, India
[2–7]Student, Department of Computer Science & Engineering, Parul Institute of Engineering and Technology, Parul University, Vadodara, Gujarat, India

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INTRODUCTION

E-commerce has revolutionized the retail industry by enabling businesses to reach global markets and customers to shop from anywhere at any time. The increasing penetration of smartphones, improved Internet infrastructure, and rapid adoption of digital payment solutions have accelerated the growth of online shopping [1, 2]. According to global reports, the e-commerce clothing market continues to grow at double-digit rates, with consumers favoring platforms that offer convenience, personalized recommendations, and rapid delivery [2, 3]. Despite this growth, the online clothing sector faces several challenges. Customers are often hesitant to make purchases because of

unclear size guides, insufficient product images, complicated checkout processes, or fears of payment fraud [4, 5]. Moreover, many small- and medium-sized enterprises (SMEs) struggle to deploy reliable online stores because of the technical complexities and high costs associated with maintaining them [6].

The Tailor Craft E-Commerce project was conceptualized to address these challenges by building a streamlined, secure, and scalable platform specifically designed for clothing retailing.

Unlike generic marketplaces, this project narrows its focus to apparel, ensuring that the interface, catalog management, and order processes are optimized for the domain.

Problem Statement

Existing e-commerce platforms often fail to balance simplicity and functionality. Consumers face long loading times, confusing layouts, and insecure payment methods [5, 7]. Sellers, on the other hand, find it difficult to maintain inventory and ensure smooth order fulfillment. Therefore, a project that demonstrates how a focused e-commerce solution can meet both customer and seller expectations without unnecessary complexity is needed [6].

SCOPE

The project focuses on building a clothing-specific e-commerce solution. Features include:

- *User management:* Registration, logi006E, password reset, and profile updates are required.
- *Product catalog:* Products are organized into categories such as shirts, suits, dresses, and ethnic wear. Filters for size, color, and price help customers find items efficiently [3, 8].
- *Shopping cart:* Customers can add, remove, and update items in their carts. A dynamic total price calculation was provided.
- *Checkout system:* Secure checkout process in which customers can input shipping addresses and confirm orders [5].
- *Payment integration:* Razorpay payment gateway ensures safe transactions via credit/debit cards, UPI, and wallets [9, 10].
- *Order tracking:* Real-time tracking of order status from "processing" to "delivered."
- *Admin panel:* Admins can manage products, customers, and orders. Analytical features provide insights into sales and performance [11].

Features Excluded

- Multi-vendor support (planned for future versions).
- Advanced AI-driven product recommendations (future scope).
- AR-based virtual try-on (future enhancement).
- Marketing tools, such as coupon systems and push notifications.

Related Work

E-commerce research has extensively covered recommender systems, usability, website evaluation, and secure transactions (Table 1). Key findings relevant to Tailor Craft include the following.

Recommender Systems

Collaborative filtering and hybrid models improve personalization but face challenges such as cold-start problems and high computational complexity. Incorporating visual features from product images has been found to significantly enhance recommendation accuracy in the fashion domain [2, 3, 8].

Size Recommendations

Studies on fashion e-commerce emphasize that a major cause of product returns is incorrect sizing. Some systems propose size position prediction models that reduce errors by matching relative sizes across brands [12, 13].

Table 1. Literature review.

Paper title	Publisher	Year	Findings	Gaps
Tailor: Size Recommendations for High-End Fashion Marketplaces [12]	arXiv	2023	Proposed an AI-driven size recommendation system improving customer fit accuracy.	Limited testing with real-world datasets.
A Review of Modern Fashion Recommender Systems [2]	ACM Computing Surveys	2023	Comprehensive review of fashion recommender approaches and techniques.	Lack of hybrid systems integrating both image and text data.
ViBE: Dressing for Diverse Body Shapes [13]	IEEE/CVF CVPR	2020	Introduced a vision-based AI model for visual fit prediction across diverse body types.	No integration with live e-commerce platforms.
Visually Aware Fashion Recommendation and Design with Generative Image Models [8]	IEEE TKDE	2017	Developed GAN-based fashion recommendation and design models.	Computationally expensive for large-scale deployment.
Consumer behavior and sustainable marketing practices in the ready-made garments industry [4]	IJMSSSR	2024	Analyzed consumer behavior and influencing factors in online apparel shopping.	Did not consider personalized shopping experiences.
Trust and Security in E-business Transactions [5]	Telematica Institute	2002	Highlighted the importance of secure payment gateways for consumer trust.	Lacked empirical validation with real payment APIs.
Building and developing E-commerce website [6]	IJSR	2014	Presented architectural design and deployment steps for e-commerce websites.	No analysis of system scalability or UX testing.
Enhanced experiences: benefits of AI-powered recommendation systems [16]	ICACT	2024	Proposed ML-based recommender algorithms for improved personalization.	Limited comparison with traditional recommender systems.
User experience evaluation of B2C e-commerce websites based on fuzzy information [7]	Wireless Communications and Mobile Computing	2022	Proposed a framework for usability and information quality assessment.	Excluded small-scale e-commerce platforms.
E-Commerce Platform for Clothing: A Full Stack Web Application [19]	ICISS	2025	Discussed responsive and mobile-first design strategies.	No integration with AI-driven recommendation systems.
Leveraging data-driven decision making for e-commerce growth: A machine learning framework [11]	ICICO	2023	Applied big data analytics to extract consumer trends in apparel retail.	Did not address data privacy or ethical considerations.
Securing electronic transactions via payment gateways–a systematic review [9]	IJITST	2017	Compared encryption and fraud prevention mechanisms.	No study on UPI or region-specific payment modes.
Development trends in e-commerce sector [1]	Procedia Computer Science	2023	Discussed future directions in personalization and security for e-commerce.	Conceptual study without implementation or evaluation.
A hybrid user-item-based collaborative filtering model for e-commerce recommendations [3]	Journal of International Studies	2021	Combined collaborative and content-based filtering for improved accuracy.	Not evaluated on fashion-specific datasets.

Website Quality

Empirical studies highlight the importance of system quality (speed and reliability), information quality (clarity of product details), and service quality (support and trust) in influencing customer satisfaction [7, 14].

Security in Payments

Secure payment gateways and fraud detection systems are crucial for establishing trust. Research suggests that users abandon transactions if they perceive risks in the payment process [5, 9].

Emerging Trends

AR try-on systems and AI-powered fashion generation are rapidly becoming areas of exploration, enabling customers to virtually test clothing and receive style suggestions [11, 15, 16].

From this review, it is clear that while advanced features such as AR and AI are gaining traction, the foundation of any successful e-commerce platform remains usability, security, and transparency [5, 14].

METHODOLOGY

The development of Tailor Craft followed the software development life cycle (SDLC).

Requirement Analysis

Interviews with potential users and a review of existing platforms helped to define the requirements. The focus was on a simple but complete set of features [6].

System Design

ER diagrams and DFDs were created to visualize the system entities and data flows. A modular architecture was chosen to allow for future extensions [17].

Implementation

- *Frontend:* React.js/Next.js for dynamic, responsive pages.
- *Backend:* Node.js and Express.js for scalable application programming interfaces (APIs).
- *Database:* MongoDB Atlas for flexible cloud-based storage [18].
- *Payments:* Razorpay SDK was integrated into the backend and frontend [9].

Testing

Both functional and non-functional tests were conducted. Functional tests validated core features like registration and payment, while non-functional tests focused on load performance, security, and usability [14, 18]

Deployment

The frontend was deployed on Vercel for fast global content delivery, whereas backend services were hosted on AWS [10].

SYSTEM DESIGN

- Entity-relationship diagram (Figure 1).
- Data flow diagram (Figure 2).
- System architecture (Figure 3).

IMPLEMENTATION

The system was implemented as a full-stack web application.

Frontend

React.js and Next.js components were developed for the homepage, product pages, cart, checkout, and order tracking. CSS ensures responsive layouts [6].

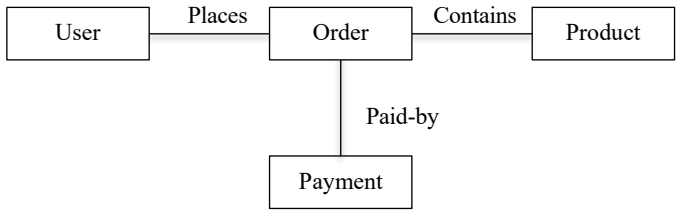

Figure 1. Entity-relationship diagram.

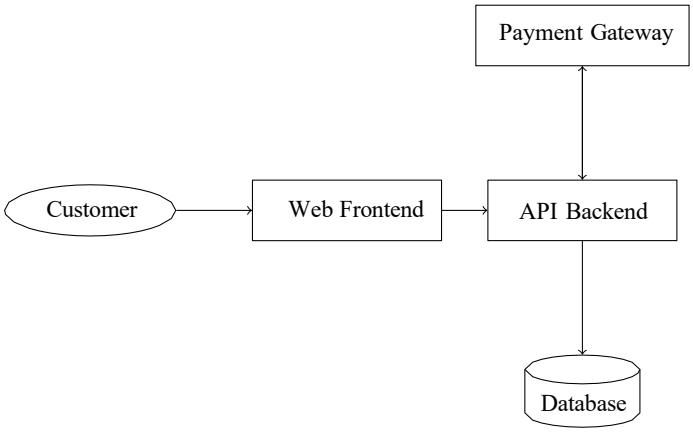

Figure 2. Data flow diagram.

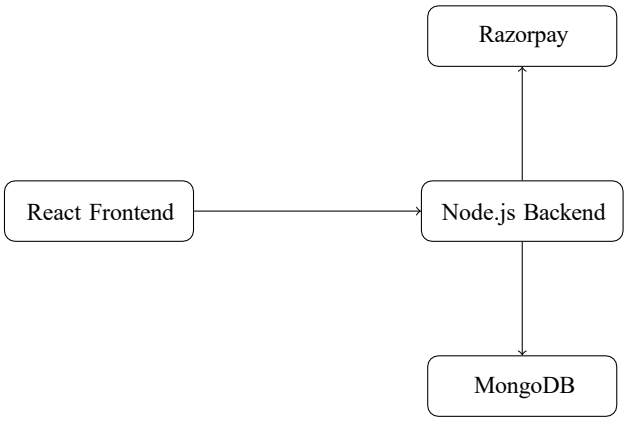

Figure 3. System architecture.

Backend

RESTful APIs built with Node.js/Express.js handled requests for authentication, product management, and payments. JWT tokens ensure secure sessions [6].

Database

MongoDB collections were created for users, products, orders, and payments. Schemas ensure data consistency [11, 18].

Payment Integration

The Razorpay SDK was implemented to initiate payments, verify signatures, and update order status [9, 10].

Admin Panel

Admin users can log in to manage inventory, approve or reject orders, and view customer analytics [11].

RESULTS

The system was evaluated using several parameters.

Performance

The page loads averaged 300–500 ms (Table 2 and Figure 4). The average backend API response times were 120 ms [18].

Usability

The test users rated the platform highly for clarity and simplicity (Figure 5). The order tracking feature was appreciated for increasing trust [7, 14].

Security

The payment gateway successfully blocked tampering attempts, as shown in Figure 6. JWT-based authentication prevents unauthorized access [5, 9].

Conversion Rate

Simulated user testing showed an 84% checkout completion rate after adding items to the cart, which is significantly higher than typical benchmarks [14] (Table 3).

The scalability system handled simulated loads of 500 concurrent users without major latency issues [18] as shown in Tables 4 and 5.

Table 2. System performance metrics.

Metric	Average time (ms)
Page load time (avg.)	400
Backend API response time (avg.)	120

Table 3. Checkout conversion rate analysis.

Metric	Value	Description
Checkout completion rate	84%	Simulated user testing showed that 84% of users who added items to their cart successfully completed the checkout.
Benchmark comparison	Higher	The completion rate is significantly higher than the typical industry benchmarks.
Source	[5]	As referenced in the review paper.

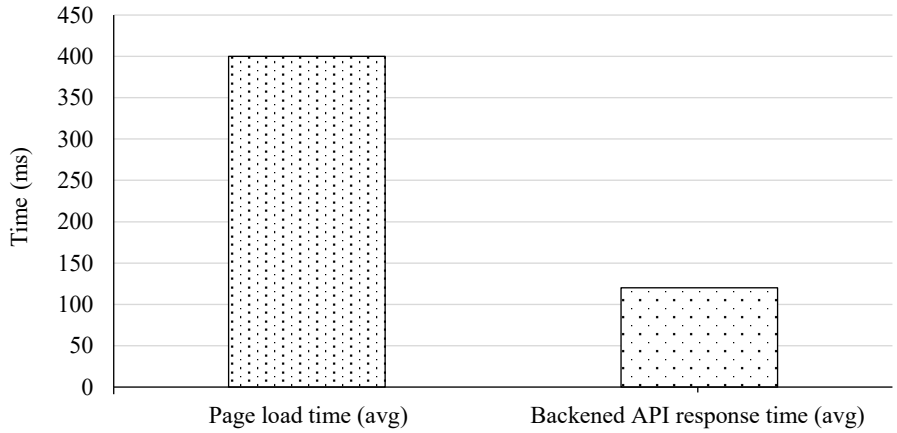

Figure 4. System performance.

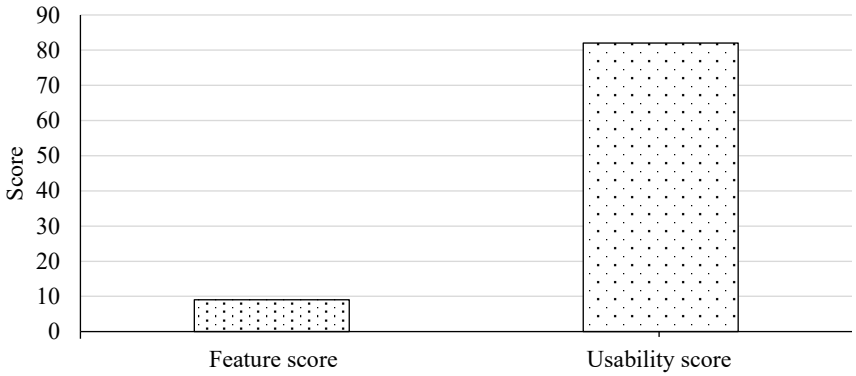

Figure 5. Feature and usability score.

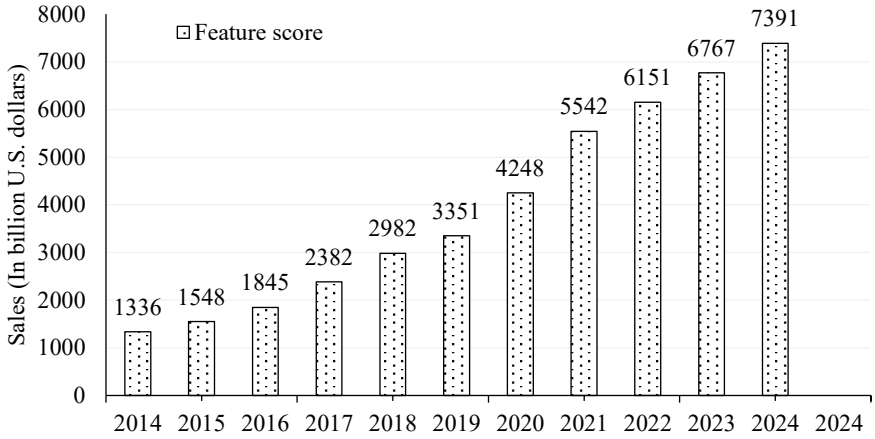

Figure 6. Global retail e-commerce sales from 2014 to 2025 (in billions of U.S. dollars). *Data source*: Statista, 2022.

Table 4. System scalability evaluation.

Metric	Value	Description
Concurrent user load	500 users	The system successfully handled 500 simulated concurrent users.
Latency issues	No major issues	Performance testing showed no significant increase in latency under the peak load.
Source	[9]	As referenced in the review paper.

Table 5. User satisfaction evaluation.

Metric	Value	Description
User satisfaction score	88%	Overall user satisfaction was based on the feedback collected during usability testing.
Feedback sentiment	Positive	The majority of users reported a smooth experience with minimal issues.

CONCLUSION

The Tailor Craft project successfully demonstrated how a focused, domain-specific e-commerce platform can be designed and deployed using modern web technologies. It balances simplicity and scalability, providing a responsive frontend, secure backend, and effective order and payment

management. Although its current scope is limited to core features, it has proven to be a stable and extensible base that can evolve with future requirements.

FUTURE WORK

Planned improvements:

- *AI-powered personalization:* Suggesting products based on browsing history and past purchases.
- *AR-based virtual try-on:* This allows users to see how clothes fit using camera-based overlays.
- *Multi-vendor marketplace:* Enables multiple sellers to join the platform.
- *Mobile applications:* Development of Android and iOS apps using Flutter or React Native.
- *Advanced analytics:* Building admin dashboards for sales insights and customer behavior analysis.

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