

Tulos-E-Commerce

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Abstract :

TULOS is a modern e-commerce platform designed to provide a seamless and scalable online shopping experience. Built using the MERN stack (MongoDB, Express.js, React.js, Node.js), along with Next.js for optimized performance and Sanity CMS for content management, the project supports both customers and admins in efficiently managing orders, products, and user accounts. This paper outlines the technology stack, features, architecture, and goals of TULOS, demonstrating its potential as a robust solution for digital commerce.

Keywords:

E-commerce, MERN Stack, React, Next.js, MongoDB, Sanity CMS, Clerk Authentication.

1.INTRODUCTION :

TULOS is an end-to-end e-commerce web application aimed at enhancing digital shopping experiences. It leverages modern technologies like React and Next.js for frontend, Express and Node.js for backend APIs, and MongoDB for data storage. Features such as real-time order updates, secure authentication, and a user-friendly CMS allow businesses to reach customers globally, streamline operations, and adapt to future market needs.

2.TECHNOLOGY STACK :

- Frontend: React 18, Next.js 14, Tailwind CSS, Framer Motion
- Backend: Node.js, Express.js
- Database: MongoDB (with Mongoose)
- CMS: Sanity Studio (Headless CMS)
- Authentication: Clerk (with MFA and JWT support)
- Hosting & Tools: Vercel (frontend), MongoDB Atlas, Sentry, Cypress, Jest

3. KEY FEATURES :

- **Dynamic Product Catalog:** Filterable, searchable, and categorized listings
- **User & Admin Dashboards:** For order history, product management, and analytics
- **Secure Payments & Authentication:** Clerk integration for user access and roles
- **Order Tracking:** Real-time status updates for users

- **Sanity Integration:** Easy content updates via a headless CMS
- **Responsive UI:** Mobile-friendly, fast-loading pages with animations

4. SYSTEM ARCHITECTURE :

TULOS follows a modular and scalable architecture:

- **Frontend (Next.js):** Renders pages using SSR and SSG for performance
- **Backend (Express):** Handles RESTful APIs and integrates with MongoDB
- **Database (MongoDB):** Stores users, orders, and products
- **CMS (Sanity):** Powers content updates and menu management
- **Authentication (Clerk):** Manages sessions, roles, and secure login

5. DEVELOPMENT APPROACH :

The project followed an iterative development model using Agile principles. Key stages included:

- Technology selection and planning
- Modular component design
- API integration and testing
- UI/UX enhancement and mobile responsiveness
- Final deployment and documentation

6. FUTURE SCOPE :

- Integration with payment gateways (e.g., Razorpay, Stripe)
- AI-based product recommendations
- Advanced order tracking with WebSocket
- Multivendor support and chatbot integration

7. CONCLUSION :

TULOS provides a practical, scalable solution for modern e-commerce needs. It combines powerful tech stacks with user-focused design to support both end users and administrators.

By offering seamless shopping, flexible content management, and robust security, TULOS sets a foundation for further development in digital retail.

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REFERENCES :

- React & Next.js Documentation
- MongoDB & Mongoose Docs
- Clerk and Sanity CMS Guides
- Industry articles on MERN stack development
- Tutorials from W3Schools, GeeksforGeeks