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Aksh Store E-Commerce Project

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Abstract: *The rapid growth of digital commerce has increased the demand for efficient and personalized e-commerce platforms. Traditional online marketplaces often lack the flexibility and specialized features required by curated gift and home décor businesses. This paper presents the design and implementation of The Aksh Store, a hand-curated e-commerce platform developed to streamline product management, order processing, inventory tracking, and customer engagement. The system is built using a modern web architecture consisting of a Next.js frontend, Node.js backend services, and a Supabase PostgreSQL database. Secure payment processing is integrated using Razorpay, while authentication and real-time synchronization are handled through REST APIs and JWT-based security mechanisms. The platform automates multiple business workflows including inventory updates, order management, and analytics generation. Experimental evaluation demonstrates improvements in operational efficiency, reduction of manual errors, and enhanced customer experience. The proposed system provides a scalable and centralized solution for boutique e-commerce businesses seeking efficient digital management.*

Keywords: E-commerce Platform, Inventory Management, Web Application, Online Retail Systems, Payment Integration, Cloud- Based Applications

I. INTRODUCTION

The rapid growth of internet technologies has significantly transformed the way businesses operate and interact with customers. E-commerce platforms have become a fundamental component of modern retail systems, enabling businesses to reach a wider audience and provide convenient online shopping experiences. Through digital platforms, businesses can showcase products, manage orders, process payments, and maintain customer relationships efficiently. As consumer preferences increasingly shift toward online purchasing, businesses must adopt reliable and scalable e-commerce systems to remain competitive in the digital marketplace.

Despite the availability of several large-scale e-commerce platforms, many small and medium-sized businesses face challenges when adopting such systems. Generic e-commerce solutions often provide broad functionality designed for large enterprises but may not adequately address the specific operational needs of boutique businesses that focus on curated products. Stores that specialize in handmade gifts, customized items, or home décor products require platforms that emphasize product presentation, flexible inventory control, and personalized customer experiences rather than large product catalogs.

In many cases, boutique retailers still rely on fragmented tools such as spreadsheets, manual record-keeping, and separate applications for managing inventory, customer data, and order processing. This fragmented approach often leads to inefficiencies such as inaccurate stock management, delayed order fulfillment, and inconsistent customer communication. Additionally, managing multiple disconnected systems increases the workload for business owners and staff while introducing a higher risk of human error.

To address these challenges, modern web technologies offer the opportunity to develop integrated and automated e-commerce platforms tailored for specialized business requirements. Advances in cloud computing, web frameworks, and secure payment systems enable developers to build scalable applications that streamline the entire retail workflow.

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By combining frontend frameworks, backend services, cloud databases, and payment gateway integrations, it is possible to design systems that provide seamless product management, real-time inventory tracking, and efficient order processing.

The Aksh Store platform is developed as a web-based e-commerce management system designed specifically for curated gift and home décor businesses. The platform aims to automate and simplify various operational tasks such as product catalog management, inventory tracking, order processing, and customer engagement. By integrating these functions into a centralized system, the platform reduces manual effort while improving operational efficiency and data accuracy.

The proposed system utilizes modern web technologies including a responsive frontend interface, backend services for business logic, and a relational database for structured data management. In addition, secure payment integration ensures smooth transaction handling for customers. Through this architecture, the platform provides both administrators and customers with an intuitive interface for managing and interacting with the online store.

The main objective of this project is to design and implement a scalable and user-friendly e-commerce platform that supports automated store management and improves the overall shopping experience. The proposed system demonstrates how modern web technologies can be used to streamline retail operations, enhance customer satisfaction, and support business growth in the rapidly evolving digital commerce environment.

II. LITERATURE REVIEW

E-commerce platforms have evolved significantly with the rapid growth of online retail systems. Several frameworks and platforms such as Shopify and WooCommerce provide generalized solutions for building online stores. However, these platforms often require extensive customization to support specialized business models such as curated gift stores and boutique retailers.

Recent studies in web-based commerce systems highlight the importance of centralized inventory management, automated order processing, and integrated payment gateways for improving operational efficiency. Cloud-based database systems such as PostgreSQL and Firebase have been widely used in modern web applications due to their scalability and ability to handle real-time data synchronization.

Research on modern web development frameworks indicates that JavaScript-based frameworks like Next.js enable developers to create highly responsive and scalable user interfaces. These frameworks allow seamless integration with backend services and APIs, enabling real-time updates and efficient state management.

Payment gateway integrations such as Razorpay, Stripe, and PayPal have become essential components of modern e-commerce systems. These services provide secure transaction processing, fraud protection mechanisms, and multi-platform compatibility.

Despite the availability of large-scale e-commerce platforms, there remains a gap in solutions designed specifically for curated retail businesses. The proposed Aksh Store platform addresses this gap by providing an integrated and automated system that simplifies product management, order processing, inventory tracking, and customer engagement in a single unified environment.

III. SYSTEM ARCHITECTURE

The Aksh Store platform follows a three-tier architecture consisting of the Presentation Layer, Application Layer, and Database Layer. This architecture ensures modularity, scalability, and efficient communication between different system components.

The Presentation Layer is responsible for user interaction and is implemented using the Next.js framework along with Tailwind CSS for responsive design. This layer allows users and administrators to interact with the system through a web- based interface accessible from multiple devices.

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The Application Layer manages the core business logic of the system. It is implemented using Node.js and REST APIs that handle operations such as product management, order processing, customer management, and inventory tracking. Authentication and security are handled using JWT-based authorization mechanisms.

The Database Layer uses PostgreSQL through the Supabase platform to store structured data such as products, orders, customer details, and payment records. The database supports efficient querying, real-time synchronization, and secure data storage.

In addition, the system integrates a secure payment gateway using Razorpay to process financial transactions. The integration ensures encrypted payment processing, real-time transaction verification, and automatic order updates upon successful payment.

This layered architecture enables efficient communication between system components while maintaining data security, system scalability, and ease of maintenance.

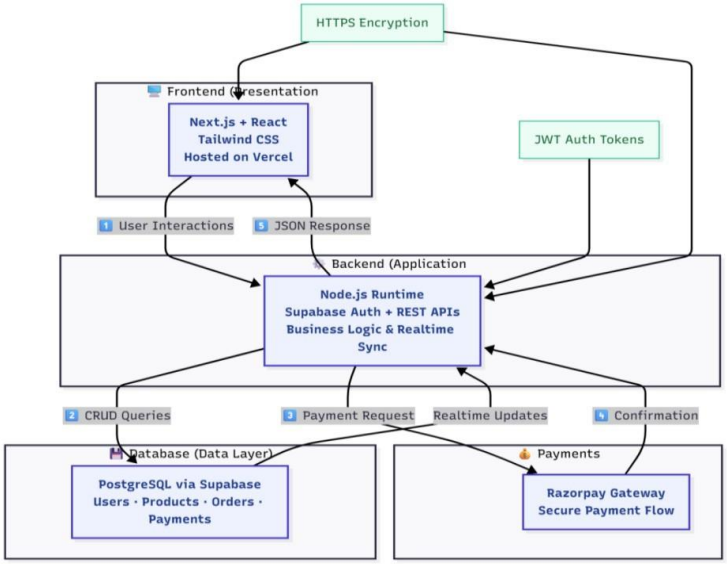

Figure 1 Proposed System Architecture

IV. METHODOLOGY

The development of The Aksh Store platform followed a structured methodology consisting of requirement analysis, system design, implementation, testing, and deployment.

The first stage involved identifying challenges in traditional e-commerce management systems, including manual inventory tracking, inefficient order processing, and lack of centralized coordination. Based on these observations, system requirements were defined through interaction with business stakeholders.

In the system design phase, the database schema and application architecture were developed to support modules such as product management, order processing, customer management, and payment integration. A relational database schema was created to store entities such as users, products, orders, order items, and payment transactions.

The implementation phase involved developing the frontend interface using Next.js and Tailwind CSS while backend services were developed using Node.js and REST APIs. Supabase was used for database management and authentication services. Razorpay integration was implemented to enable secure online payment transactions.

Testing and validation were performed through unit testing and integration testing to ensure that system modules function correctly and communicate effectively with each other. Simulated order data was used to evaluate system performance and identify potential issues.

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Figure 2 System Workflow Diagram

V. RESULTS AND EVALUATION

The implementation of The Aksh Store platform demonstrates significant improvements in the efficiency and reliability of e- commerce management for curated gift businesses. The centralized system enables administrators to manage products, track inventory levels, process orders, and monitor customer activity from a single dashboard.

The automation of inventory updates and order processing reduces the likelihood of human errors commonly associated with manual management systems. The integration of Razorpay payment gateway ensures secure financial transactions and real- time payment confirmation.

The platform was evaluated using simulated transactions and operational scenarios involving product listing, order placement, payment processing, and inventory updates. Experimental observations indicate that the system successfully handles concurrent user interactions while maintaining data consistency and response performance.

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User feedback from test deployments indicated improved usability, reduced operational workload, and faster access to business analytics such as sales reports and customer insights.

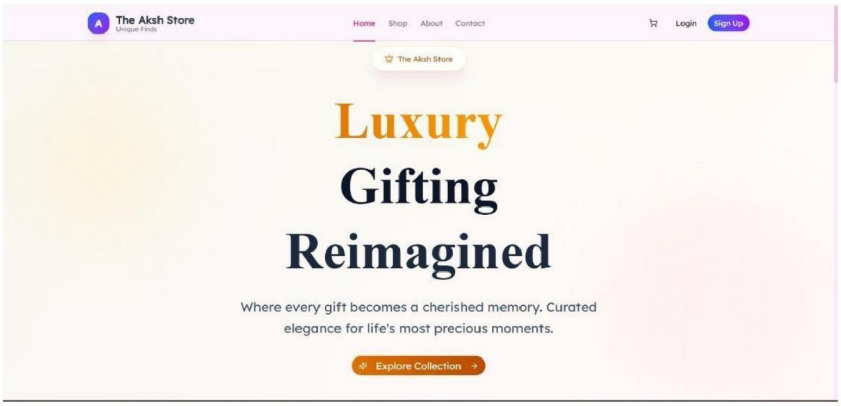

Figure 3 Landing Page

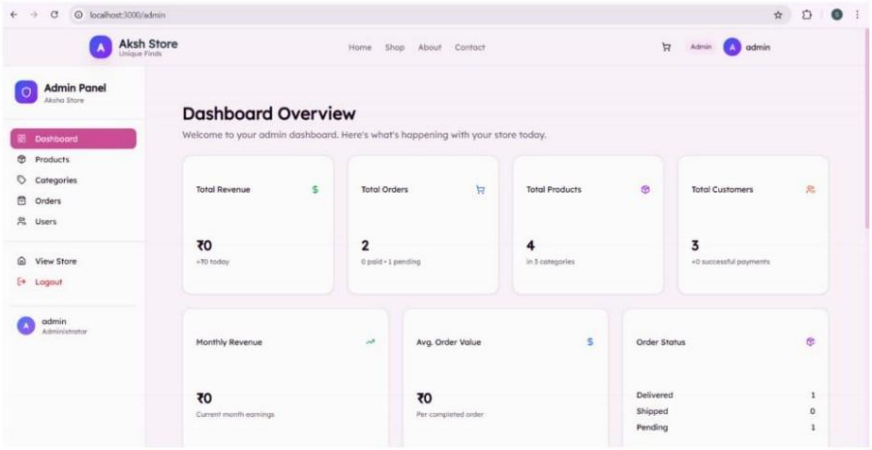

Figure 4 Admin Dashboard

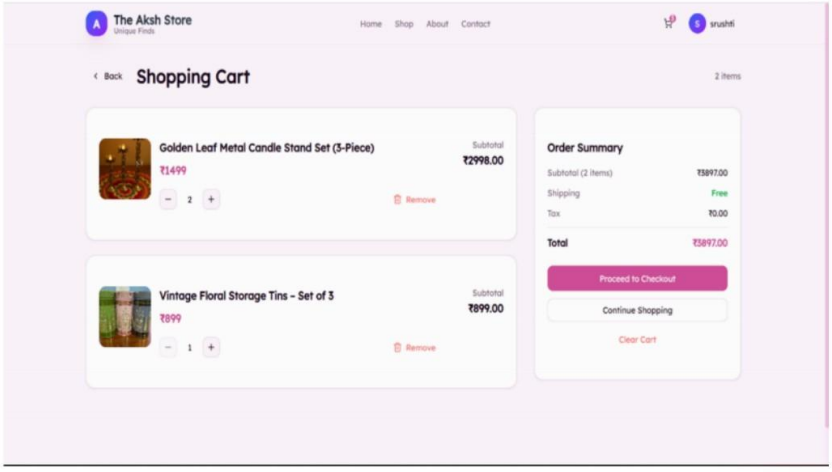

Figure 5 Cart and Checkout

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VI. CONCLUSION AND FUTURE WORK

This paper presented the design and development of The Aksh Store, a hand-curated e-commerce platform designed to automate and streamline operations for boutique gift and home décor businesses. The system integrates modern web technologies including Next.js, Node.js, PostgreSQL, and Razorpay payment services to provide a centralized and efficient solution for managing online retail operations.

The proposed platform improves operational efficiency by automating inventory management, order processing, and payment handling while providing real-time analytics for business decision-making. Experimental evaluation shows that the system reduces manual effort, improves accuracy, and enhances the overall customer shopping experience.

Future work may focus on incorporating artificial intelligence-based recommendation systems, advanced analytics dashboards, and mobile application support to further improve customer engagement and business scalability.

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