International Journal of Science, Strategic Management and Technology
Volume **02** Issue **06** June-**2026** | ISSN: **3108-1762 (Online)** | Impact Factor: 3.8
An International, Peer-Reviewed, Open Access Scholarly Journal Indexed in recognized academic databases

Kala Parichaya: An E-Commerce Marketplace for Cultural Handmade Product

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https://doi.org/ 10.55041/ijsmt.v2i6.085

Cite this Article: Lenka, S. & Das, P. K. (2026). Kala Parichaya: An E-Commerce Marketplace for Cultural Handmade Product. International Journal of Science, Strategic Management and Technology, *02*(6). https://doi.org/10.55041/ijsmt.v2i6.085

***Abstract*—Kala Parichaya is an e-commerce marketplace developed to promote cultural handmade and handicraft products through a digital platform. The system connects artisans, vendors, and customers by providing features such as product listing, cart management, wishlist, secure payment, order tracking, reviews, and admin management. The platform includes User, Vendor, and Admin modules for efficient marketplace operations. The project is developed using React, Node.js, Express.js, MongoDB, Tailwind CSS, Redux Toolkit, Firebase, and Razorpay/Stripe integration. The main objective of the system is to support local artisans and provide customers with an easy and secure online shopping experience for handmade products.**

Keywords—Artisan Marketplace, Handicraft Platform, Online Shopping System, Cultural Handicrafts, Digital Marketplace

INTRODUCTION

The advancement of internet technologies and digital commerce has significantly transformed the traditional business environment. In recent years, e-commerce platforms have become one of the most important mediums for buying and selling products online. Customers prefer online shopping because it provides convenience, accessibility, product variety, and secure payment facilities. Businesses are also adopting digital platforms to improve customer reach and increase sales opportunities. However, despite the rapid growth of e-commerce systems, many local artisans and handicraft sellers still struggle to establish a strong digital presence in the global market.

Handmade and cultural products represent the traditions, heritage, and artistic skills of local communities. These products include handloom items, paintings, pottery, jewelry, home décor materials, handcrafted accessories, and other cultural artifacts. Most artisans depend on local exhibitions, small markets, and traditional selling methods to promote their products. Due to limited marketing resources and lack of technical knowledge, many artisans are unable to reach larger customer audiences. As a result, their products often remain restricted to local markets, reducing business growth and economic opportunities.

Kala Parichaya is a web-based e-commerce marketplace developed to address these challenges by providing a digital platform for artisans and vendors to promote and sell cultural handmade products online.

The platform acts as a bridge between artisans and customers by enabling easy product browsing, online purchasing, and secure transaction management. The proposed system focuses on improving the visibility of handmade products while supporting local artisans in expanding their businesses through technology.

The platform includes several advanced features such as product listing, category-based product browsing, shopping cart management, wishlist functionality, secure online payment integration, order tracking, customer reviews and ratings, and user profile management. These functionalities improve customer engagement and provide a smooth online shopping experience. The integration of Razorpay and Stripe payment gateways ensures secure and reliable digital transactions for customers and vendors.

The proposed system contains three major modules namely User Module, Vendor Module, and Admin Module. The User Module allows customers to register, log in, browse products, add products to cart or wishlist, place orders, and track delivery status. The Vendor Module enables artisans and sellers to upload products, manage inventory, monitor orders, and analyze sales performance. The Admin Module manages the complete marketplace activities including vendor verification, product approval, order monitoring, user management, analytics, and report generation.

Kala Parichaya is developed using modern web technologies such as React for frontend development, Node.js

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and Express.js for backend services, MongoDB for database management, Tailwind CSS for responsive user interface design, Redux Toolkit for state management, and Firebase for authentication and cloud support. These technologies provide scalability, security, performance optimization, and efficient data management for the marketplace platform.

The main objective of this project is to provide a secure, scalable, and user-friendly digital marketplace for promoting handmade cultural products

CHALLENGES IN HANDMADE PRODUCT MARKETPLACE

The handmade product marketplace faces several challenges in the modern digital environment. Many local artisans and handicraft sellers still depend on traditional selling methods such as local exhibitions and small retail markets. Due to limited online visibility, artisans often fail to reach a larger customer audience. This affects business growth and reduces opportunities for promoting cultural handmade products globally.

Fig. 1. Challenges in Handmade Product Marketplace

Fig. 1: Challenges in Kala Parichaya

Another major challenge is managing product inventory and customer orders efficiently. Vendors face difficulties in updating stock details, handling product categories, processing customer orders, and maintaining delivery records. Customers also expect secure payment systems, fast order tracking, and reliable delivery services while shopping online.

Maintaining customer trust and product authenticity is another important issue in cultural marketplaces. Customers need assurance that the products are genuinely handmade and of good quality. In addition, security and data protection are essential for safeguarding customer information, payment details, and vendor data from unauthorized access.

The proposed Kala Parichaya system aims to solve these problems by providing a secure, scalable, and user-friendly digital marketplace for artisans and customers.

SYSTEM MODULES OF KALA PARICHAYA

The proposed Kala Parichaya marketplace system consists of three major modules namely User Module, Vendor Module, and Admin Module. These modules work together to manage the complete functionality of the handmade product marketplace efficiently. Each module is designed with specific responsibilities to ensure smooth platform operation, better customer experience, and effective product management.

A. User Module

The User Module is developed for customers who visit the platform to explore and purchase handmade cultural products. Users can create accounts, log into the system, browse products based on categories, and search for specific handmade items. The module also allows customers to add products to cart and wishlist for future purchases.

Users can place orders using secure payment gateways such as Razorpay and Stripe. The module also provides order tracking functionality, enabling customers to monitor delivery status in real time. Customers can submit ratings and reviews for products, which helps improve product quality and customer trust within the marketplace.

B. Vendor Module

The Vendor Module is designed for artisans and sellers who manage handmade products on the platform. Vendors can register and create their profiles to upload and manage products. The module allows vendors to update product details, manage inventory, process customer orders, and monitor sales activities.

C. Admin Module

The Admin Module controls and monitors the complete marketplace system. Administrators manage users, vendors, products, and platform activities. The module helps in verifying vendor accounts, monitoring product uploads, managing customer complaints, and generating marketplace reports.

KNOWLEDGE DISCOVERY AND COMPUTATIONAL COMPLEXITES

Knowledge discovery is one of the most important processes in modern e-commerce and marketplace systems. In the Kala Parichaya platform, a large amount of data is continuously generated from various activities such as product uploads, customer searches, shopping cart management, online payments, reviews and ratings, order tracking, and vendor management. Extracting meaningful information from these datasets helps improve customer experience, product recommendations, business analysis, and marketplace performance. The process of identifying useful patterns, customer behavior, and sales trends from large datasets is known as knowledge discovery.

However, handling large-scale marketplace data introduces several computational complexities. As the number of users,

vendors, products, and online transactions increases, the system requires efficient storage, fast data processing, and scalable computing resources. Managing thousands of product records, customer requests, payment transactions, and order details simultaneously can reduce system performance if proper optimization techniques are not used

MongoDB supports flexible and scalable database management for storing large marketplace datasets.

A. Scalability and Performance Issues

Scalability and performance management are major challenges in handmade product marketplace systems. As the number of users, vendors, products, and online transactions increases, the system must handle large amounts of data efficiently without reducing performance. In Kala Parichaya, thousands of customers may browse products, place orders, submit reviews, and make online payments simultaneously. Managing these activities in real time requires efficient backend services and optimized database operations.

Another important issue is maintaining fast response time during high traffic conditions. Slow product loading, delayed payment processing, and inefficient order tracking can negatively affect customer experience and reduce platform reliability. The system must support continuous availability and smooth operation even when multiple users access the marketplace at the same time.

Storage management is also a significant challenge because the platform stores product images, customer details, vendor information, transaction records, and reviews. As marketplace data grows continuously, efficient database management and cloud storage techniques become necessary for maintaining system performance.

To overcome these issues, Kala Parichaya uses scalable web technologies such as Node.js, Express.js, MongoDB, and Firebase. These technologies help in handling multiple user requests, improving data management, and ensuring faster system performance. Efficient frontend development using React and Tailwind CSS also improves user experience and platform responsiveness.

B. Security and Data Management Challenges

Security and data management are important challenges in online handmade product marketplaces. In Kala Parichaya, large amounts of customer, vendor, and transaction data are stored and processed regularly. Protecting this information from unauthorized access, cyber threats, and data loss is essential for maintaining customer trust and platform reliability.

Customers share sensitive information such as login credentials, addresses, contact details, and payment information while using the platform. Therefore, secure authentication systems and encrypted payment gateways are required to ensure safe online transactions. Unauthorized access to customer or vendor data may lead to privacy issues and financial risks.

Managing large amounts of marketplace data is another significant challenge. The platform stores product details, product images, reviews, order records, payment history, and vendor information continuously. Efficient database management techniques are necessary to maintain data accuracy, fast retrieval, and smooth system performance. Data backup and recovery mechanisms are also important to prevent information loss during system failures.

In addition, maintaining secure communication between frontend and backend services is necessary for protecting marketplace operations. The system must also monitor suspicious activities, fake product listings, and unauthorized transactions to improve platform security.

To overcome these challenges, Kala Parichaya uses MongoDB for efficient database management, Firebase for secure authentication, and Razorpay/Stripe integration for protected payment processing. These technologies help improve data security, transaction reliability, and overall marketplace performance.

CUSTOMER ENGAGEMENT AND PRODUCT AUTHENTICATION

Customer engagement and product authenticity are important factors in the success of a handmade product marketplace. In Kala Parichaya, customers expect high-quality handmade products, smooth user experience, and reliable marketplace services. Maintaining customer satisfaction becomes challenging when the platform contains a large number of products and vendors.

One major challenge is ensuring the authenticity of handmade and cultural products. Customers need assurance that the products are genuinely handcrafted and not machine-produced duplicates. Fake or low-quality products can reduce customer trust and negatively affect the reputation of the marketplace.

Another challenge is improving customer interaction and engagement within the platform. Customers prefer systems that provide personalized recommendations, product reviews, ratings, wishlist functionality, and easy navigation. Poor user interface design, delayed responses, or complicated purchasing processes can reduce user satisfaction and platform usage.

Handling customer feedback and communication efficiently is another important challenge in handmade product marketplaces. Customers may face issues related to delayed deliveries, damaged products, refund requests, payment failures, or incorrect order details. Providing quick customer support and efficient complaint management is necessary for maintaining a positive shopping experience and long-term customer relationships.

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In addition, customer retention becomes difficult in highly competitive e-commerce environments. The platform must continuously provide quality products, secure payment systems, reliable order tracking, and attractive user experiences to encourage repeat purchases. Seasonal product demand and changing customer preferences also require continuous analysis of customer behavior and marketplace trends.

To address these challenges, Kala Parichaya provides verified vendor management, review and rating systems, secure payment integration, order tracking functionality, and responsive user interfaces. The platform also supports wishlist features, customer feedback systems, and efficient product management techniques to improve customer engagement and ensure authenticity of handmade cultural products.

PAYMENT PROCESSING AND TRANSACTION MANAGEMENT

Payment processing and transaction management are critical components of an online handmade product marketplace. In Kala Parichaya, customers perform online transactions while purchasing cultural handmade products through integrated payment gateways. Ensuring secure, fast, and reliable payment services is essential for maintaining customer trust and smooth marketplace operations.

One of the major challenges is handling secure online payments without exposing sensitive customer information such as card details, banking credentials, and transaction records. Cyber threats, payment failures, unauthorized transactions, and fraudulent activities can affect the reliability of the marketplace system. Therefore, secure payment encryption and authentication mechanisms are necessary for protecting customer and vendor data.

Another challenge is managing multiple payment transactions simultaneously during high marketplace traffic. Delayed payment verification, failed transactions, or duplicate payment requests may create confusion for customers and vendors. The system must efficiently process payments, update order status in real time, and maintain accurate transaction records to avoid operational issues.

Refund and cancellation management also increase system complexity. Customers may request order cancellations, refunds, or payment reversals due to delivery issues or damaged products. Managing these financial transactions accurately while maintaining transparency is important for improving customer satisfaction and vendor reliability.

In addition, transaction monitoring and financial reporting are necessary for effective marketplace management. Vendors require sales reports and payment summaries, while administrators need transaction analytics to monitor platform performance and identify suspicious activities.

To overcome these challenges, Kala Parichaya integrates secure payment gateways such as Razorpay and Stripe for protected online transactions. The system also uses secure authentication, encrypted communication, and efficient order management techniques to improve transaction reliability.

Another challenge is integrating multiple payment methods within a single platform. Customers prefer flexible payment options such as UPI, net banking, debit cards, credit cards, digital wallets, and cashless payment systems. Supporting multiple payment methods while maintaining transaction speed and security requires efficient backend services and scalable system architecture.

To overcome these challenges, Kala Parichaya integrates secure payment gateways such as Razorpay and Stripe for protected online transactions. The platform also uses encrypted communication, secure authentication, and efficient order management systems to improve payment reliability and transaction accuracy. Real-time payment verification, automated order confirmation, and secure financial data management help ensure smooth marketplace operations.

Fig. 2. Payment Processing and Transaction Flow

VENDOR AND INVENTORY MANAGEMENT CHALLENGES

Vendor and inventory management are essential components of a handmade product marketplace system. In Kala Parichaya, multiple artisans and vendors continuously upload products, update stock details, process orders, and manage customer requests. Handling these activities efficiently becomes challenging as the number of vendors and products increases within the marketplace.

One of the major challenges is maintaining accurate inventory records. Vendors must regularly update product availability, pricing, product descriptions, and stock quantity. Incorrect inventory information may lead to order cancellation, delayed deliveries, and customer dissatisfaction. Therefore, the system requires efficient inventory tracking and real-time stock management techniques to maintain product accuracy and smooth marketplace operations.

Another important challenge is managing a large number of vendor accounts and product listings. Since handmade marketplaces contain different categories of cultural products

such as paintings, handloom items, jewelry, pottery, and handicrafts,

organizing products properly becomes necessary for improving search functionality and customer navigation. Duplicate product entries, incorrect categorization, and poor-quality product images can reduce platform efficiency and customer engagement.

Order management and delivery coordination also increase system complexity. Vendors need to process customer orders, update delivery status, manage shipping details, and handle return requests efficiently. Delays in order processing or incorrect shipment management can negatively affect customer trust and vendor performance within the marketplace.

Vendor verification and quality monitoring are additional challenges in handmade product marketplaces. Administrators must verify vendor authenticity and ensure that uploaded products maintain quality standards and originality. Monitoring fake products, misleading product descriptions, and unauthorized listings is important for protecting customer trust and marketplace reliability.

Another challenge is sales analysis and business monitoring for vendors. Vendors require proper sales reports, order summaries, and product performance analysis to understand customer demand and improve business growth. Generating these reports from large marketplace datasets requires efficient data processing and management techniques.

To address these challenges, Kala Parichaya provides vendor dashboards, inventory management systems, product categorization features, order tracking mechanisms, and sales analytics tools. The platform also supports real-time product updates, vendor verification, and efficient order processing to improve marketplace management and ensure better customer satisfaction.

User Experience and Interface Design Challenges

Large User experience and interface design are important factors in the success of an online handmade product marketplace. In Kala Parichaya, customers interact with the platform to browse products, place orders, manage wishlists, and track deliveries. Therefore, the system must provide a simple, attractive, and user-friendly interface that improves customer satisfaction and encourages continuous platform usage.

One of the major challenges is designing a responsive interface that works efficiently across different devices such as desktops, tablets, and smartphones. Customers expect fast-loading pages, smooth navigation, and visually appealing product displays while shopping online. Poor interface design, complicated navigation, and slow system response can negatively affect user engagement and reduce customer retention.

Another important challenge is organizing a large number of products in an efficient manner. Handmade marketplaces contain multiple product categories such as jewelry, pottery, paintings, home décor items, and handloom products. Proper categorization, filtering, and search functionality are necessary for helping users find products quickly and easily. Inefficient product organization may create confusion and increase customer frustration.

Accessibility and usability management also increase interface design complexity. Different users may have varying levels of technical knowledge, internet connectivity, and browsing preferences. The system must provide clear navigation menus, readable content, responsive layouts, and simplified checkout processes to improve usability for all customers.

Providing personalized user experience is another challenge in e-commerce systems. Customers expect recommendation systems, recently viewed products, wishlist management, and customized shopping experiences based on their interests and browsing history. Managing these features efficiently requires continuous analysis of user activities and marketplace behavior.

Maintaining consistency in design and user interaction is also essential for improving platform reliability. The interface should provide consistent layouts, buttons, product displays, and navigation structures throughout the marketplace. Inconsistent design elements can reduce usability and affect customer trust.

To address these challenges, Kala Parichaya uses React and Tailwind CSS for developing responsive and interactive user interfaces. The platform provides category-based browsing, advanced search functionality, smooth navigation, and optimized product displays to improve customer experience and marketplace accessibility.

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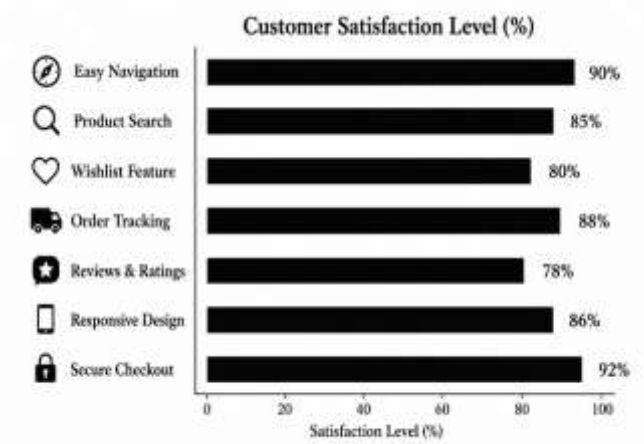

Fig. 3. User Experience and Customer Engagement Analysis

The above analysis shows that secure checkout, easy navigation, and responsive interface design play an important role in improving customer satisfaction and user engagement within the Kala Parichaya marketplace platform. Efficient product search, order tracking, customer support, and review systems also contribute to providing a better online shopping experience for users

Future Enhancements and Research Opportunities

Future enhancement of the Kala Parichaya marketplace system can improve platform intelligence, scalability, and customer experience. As digital commerce continues to evolve, handmade product marketplaces require advanced technologies and innovative solutions to meet growing customer demands and improve business performance.

One possible enhancement is the implementation of Artificial Intelligence and Machine Learning techniques for personalized product recommendations and customer behavior analysis. These technologies can help vendors understand customer preferences, improve sales performance, and provide customized shopping experiences. Recommendation systems can suggest products based on customer interests, browsing history, and purchase patterns.

Another important research area is the integration of Augmented Reality (AR) and Virtual Reality (VR) technologies for product visualization. Customers may be able to view handmade products in virtual environments before making purchasing decisions. This can improve customer interaction and increase confidence in online shopping.

Blockchain technology can also be integrated for product authenticity verification and secure transaction management. Since handmade cultural products require originality and trust, blockchain-based verification systems can help customers identify authentic artisan products and reduce counterfeit product issues within the marketplace.

The platform can further be enhanced by developing mobile applications for Android and iOS devices. Mobile applications can improve accessibility, increase customer engagement, and provide better real-time notifications for order tracking, payment updates, and promotional offers.

Multi-language support and regional customization can also improve platform usability for users from different geographical locations. Supporting multiple languages will help local artisans and customers interact with the system more effectively and increase marketplace accessibility.

In addition, future research can focus on improving cloud-based scalability, advanced security systems, and efficient big data analytics for marketplace management. These enhancements can help Kala Parichaya become a more intelligent, scalable, and globally accessible digital marketplace for cultural handmade products

Further enhancement of the Kala Parichaya platform can focus on implementing advanced analytics and intelligent business management systems. Data analytics techniques can help administrators and vendors analyze customer purchasing behavior, seasonal product demand, and marketplace trends more effectively. These analyses can improve inventory management, product recommendations, and sales forecasting for handmade cultural products. Efficient analytical systems can also support better business decisions and improve marketplace profitability.

Another important future enhancement is the integration of social media marketing and digital promotion systems within the platform. Vendors and artisans can promote their products directly through social media channels to reach larger customer audiences.

Features such as live product showcasing, customer interaction forums, and digital advertising integration can improve customer engagement and increase online visibility of handmade products. These enhancements can help artisans expand their businesses and strengthen the digital presence of cultural handicraft marketplaces.

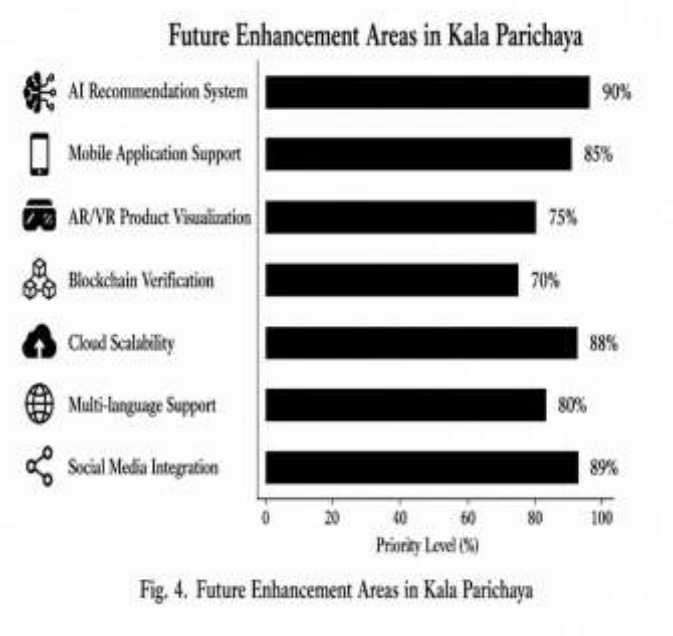

Fig. 4. Future Enhancement Areas in Kala Parichaya

CONCLUSION

Kala Parichaya provides a modern and efficient digital marketplace for promoting handmade and cultural products through online platforms. The system helps local artisans and vendors expand their businesses by providing secure product management, online payment facilities, order tracking, and customer interaction features. The platform improves product visibility and enables customers to access authentic handmade products easily from different locations.

The marketplace system integrates modern web technologies such as React, Node.js, Express.js, MongoDB, Tailwind CSS, Redux Toolkit, Firebase, and Razorpay/Stripe to ensure scalability, security, and efficient performance. The implementation of User, Vendor, and Admin modules helps manage the complete functionality of the marketplace effectively.

The study also highlights important challenges such as inventory management, payment security, customer engagement, scalability, and product authenticity within handmade product marketplaces. Various solutions and future enhancement opportunities including Artificial Intelligence, blockchain technology, AR/VR integration, and cloud-based analytics can further improve the platform in the future.

Therefore, Kala Parichaya can serve as a reliable and user-friendly e-commerce marketplace that supports local artisans, preserves cultural heritage, and provides customers with a secure and convenient online shopping experience for handmade products.

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