Craftcart A Digital Marketplace for Handicraft Jewellery

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***Abstract*—Handicraft jewellery represents cultural heritage, artisanal skill, and traditional craftsmanship. However, artisans often lack access to suitable online platforms that allow them to reach wider markets. CraftCart is a digital marketplace designed to empower artisans by enabling them to showcase and sell handcrafted jewellery directly to customers. The system integrates modern e-commerce functionalities such as secure payments, product catalogue management, reviews, and order tracking, while also promoting cultural preservation and sustainable buying practices. This project presents the design, development methodology, and system architecture of CraftCart, highlighting its role in bridging the gap between artisans and consumer. This project outlines the platform's objectives, development approach, system architecture, and its potential impact in empowering artisans while enhancing customer accessibility to authentic handcrafted jewellery. This project presents the platform's concept, development workflow, and architectural design, emphasizing its role in generating economic opportunities for artisans and enhancing consumer access to authentic, culturally rich jewellery.**

***Index Terms*—handicraft jewellery, digital marketplace, e- commerce platform, artisan empowerment, cultural heritage**

I. INTRODUCTION

1.1. Background and Motivation

Handicraft jewellery represents a deep connection to cultural heritage, artistic expression, and traditional craftsmanship. Despite the uniqueness and value of these handcrafted products, many artisans struggle to access digital markets where their work could reach wider audiences [10]. Most traditional craftsmen rely on local markets or middlemen, limiting both their income and visibility. At the same time, modern consumers increasingly seek authentic, eco-friendly, and handmade products, yet lack a centralized platform dedicated exclusively to handcrafted jewellery.Moreover, many artisans struggle with product photography, online promotion, inventory updates, and customer engagement tasks that are essential in digital selling but unfamiliar to those who primarily rely on local markets. As a result, their earning potential remains restricted, and unique art forms risk fading over time due to lack of exposure and financial support.

In today's digital economy, there is a strong demand for a platform that not only showcases handcrafted jewellery but also guides artisans through the entire selling process. A system that offers an intuitive interface, easy product uploads, secure transactions, and tools for communication can help artisans confidently enter the online market.

1.2. Problem statement

Despite the cultural and economic significance of handcrafted jewellery, artisans face major challenges in accessing wider markets. Many rely on local sales, exhibitions, or middlemen, which restricts their earning potential and often results in unfair pricing.[5] Limited digital literacy, lack of online presence, and high competition on mainstream e-commerce platforms make it difficult for small-scale craftsmen to showcase their products effectively.

Existing online marketplaces primarily focus on mass-produced items, causing handcrafted jewellery to receive minimal visibility. High listing fees, complex seller requirements, and overcrowded platforms create additional barriers for artisans. Furthermore, customers searching for authentic handmade jewellery often struggle to identify genuine products due to the absence of a dedicated marketplace.

This disconnects between artisans and consumers results in reduced market opportunities, weakened cultural preservation, and limited financial growth for

craftsmen. CraftCart aims to address this gap by providing a specialized digital platform that enables artisans to present, manage, and sell their handcrafted jewellery directly to customers through a simple, secure, and user-friendly system.[3]

1.3. Objectives

The primary objective of CraftCart is to develop a dedicated digital marketplace that empowers artisans to showcase and sell handcrafted jewellery directly to customers. To achieve this goal, the project focuses on the following specific objectives:

- Enable Artisan Onboarding
- Create a User-Friendly Marketplace
- Ensure Secure and Seamless Transactions
- Promote Cultural Heritage and Sustainability
- Implement Core E-Commerce Features
- Enhance Artisan Visibility and Market Reach
- Develop an Efficient Admin Monitoring System
- Support Future Scalability

Build the platform with flexibility for future enhancements such as mobile applications, multilingual support, AI-based recommendations, and international shipping. Build the platform with flexibility for future enhancements such as mobile applications, multilingual support, AI-based recommendations, and international shipping Include essential marketplace functionalities such as shopping cart management, order tracking, reviews, and personalized product recommendations.

II. LITERATURE REVIEW

2.1 E-Commerce and Handicraft Marketplaces

E-commerce platforms provide global reach, digital payment integration, and scalable infrastructure for sellers. For handicraft segments, they offer the potential to connect local artisans with national and international buyers seeking authentic and unique products. However, most mainstream platforms are designed for generic retail, not specifically for handcrafted goods [1]. As a result, handicraft products frequently compete with mass- produced items, reducing their visibility and perceived value. Studies on digital marketplaces for crafts highlight that while online platforms can significantly increase reach and revenue, they must be tailored to the specific needs of artisans such as simple onboarding, low fees, cultural storytelling, and trust- building mechanisms like reviews and ratings.[2]

2.2 Maintaining the Integrity of Platform Content

All product-related content within CraftCart follows a carefully structured framework to ensure authenticity, accuracy, and credibility. Each artisan-uploaded item including product descriptions, images, materials used, and pricing is reviewed to maintain the integrity of handcrafted jewellery showcased on the platform. The user interface employs readable fonts, balanced layouts, and consistent visual structure to highlight product details without overwhelming the customer. Features such as ratings, reviews, and artisan profiles are presented with clear spacing and organized design to enhance transparency and trust.

Additionally, the platform enforces quality guidelines that help artisans present their creations accurately while ensuring customers receive reliable and genuine information. Any updates to the layout, product display, or catalogue design are made with careful consideration to preserve CraftCart's emphasis on authenticity, user trust, and the promotion of traditional craftsmanship.

III. SYSTEM DESIGN ARCHIETECTURES

3.1 Overview

CraftCart is a digital marketplace designed to support and promote the sale of handcrafted jewellery by connecting traditional artisans directly with customers.[3] The platform provides an organized and user-friendly system where artisans can upload their products, manage inventory, and track orders, while customers can browse, filter, and purchase unique handmade jewellery.

CraftCart combines essential e-commerce features such as secure payments, product catalogues, reviews, and delivery tracking with an artisan-centric approach that highlights cultural craftsmanship [4]. By offering a dedicated environment focused solely on handcrafted jewellery, the platform ensures greater visibility for artisans and a more authentic, engaging shopping experience for customers. The system is built to be scalable, accessible, and efficient, supporting both artisan empowerment and the preservation of traditional jewellery-making practices.

3.2 System Components

1. User Interface (Frontend)

The user interface serves as the primary point of interaction for artisans, customers, and administrators. Designed using modern web technologies, the UI ensures a seamless, intuitive experience across devices.

2. Application Server (Backend)

The backend handles the core business logic required to manage platform operations Processes artisan registrations, product uploads, customer orders, and authentication requests.Ensures secure communication between users and the database via RESTful API

3. Database Management System

A reliable and scalable database system is used to store and manage platform data Stores artisan profiles, customer information, product catalogues, order histories, reviews, and transaction records Maintains data integrity, security, and fast retrieval features to support real-time operations.

Uses relational or NoSQL systems (e.g., MySQL, PostgreSQL, or MongoDB) depending on scalability needs.

4. Payment Gateway Integration

The payment component enables secure and encrypted online transactions Supports multiple payment methods such as UPI, cards, wallets, and net banking.Ensures PCI- DSS compliance and encryption standards for safe financial processing. Provides real-time payment verification and order status updates.

5. Logistics and Delivery Integration

This module ensures accurate tracking and delivery of jewellery items.Connects with third-party courier APIs for real-time shipping updates.

3.3 System Architecture

The system architecture of CraftCart follows a structured, three-tier model designed to ensure efficiency, scalability, and secure data handling. This architecture separates the platform into distinct layers presentation, application, and database allowing seamless interaction between users, the backend server, and data storage systems. The modular design ensures that each layer operates independently while maintaining consistent communication through well-defined APIs.

3.4 Feasibility Study

CraftCart is technically feasible due to the availability of robust and scalable tools:The system uses widely adopted web technologies such as HTML, CSS, JavaScript, React.js, Node.js, and MongoDB/MySQL, all of which are easy to integrate and well-supported.

Cloud hosting platforms like AWS, Azure, or Google Cloud provide affordable and scalable infrastructure. Existing APIs for payment gateways (Razorpay, Paytm,Stripe) and logistics (Shiprocket, Delhivery) simplify third-party integration.

The modular three-tier architecture ensures the platform can be maintained, extended, and scaled efficiently.

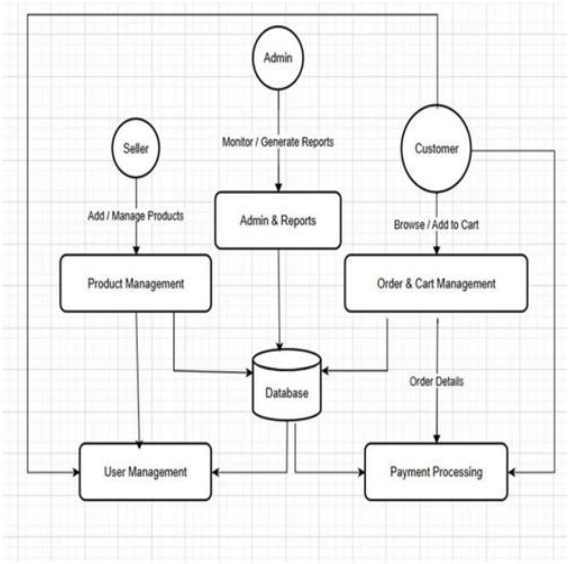

Fig: 1 System Architecture diagram

IV. IMPLEMENTATION

4.1 Technologies Used

The implementation of CraftCart utilizes modern, scalable, and open-source technologies to ensure reliability, performance, and ease of use. The technology stack is divided into frontend, backend, database, and supporting tools.

Frontend Technologies

The frontend is responsible for delivering an interactive and user-friendly shopping experience HTML5 & CSS3: Used to create the structural and visual layout of the platform.

JavaScript: Handles dynamic elements and client-side functionality.

React.js: Enables the development of a responsive, component-based UI with efficient rendering for pages such as product listings, artisan dashboards, carts, and checkout.
Bootstrap / Tailwind CSS (Optional): Ensures mobile responsiveness and a clean aesthetic across devices..

Backend Technologies
The backend manages the business logic and server-side functionality required for smooth system operations.
Node.js: Provides a lightweight, scalable runtime environment for handling concurrent user requests.
Express.js: Simplifies API creation, routing, and middleware management for operations like authentication, cart processing, and product management.

Database Technologies
The database stores and manages all essential platform data.
MySQL / PostgreSQL: Can be used for structured relational storage depending on project needs.
Payment & Logistics Integrations.
To support essential e-commerce features.
Development and Deployment Tools
Git & GitHub: Version control and collaboration. VS Code: Primary development environment.
Cloud Platforms (AWS/Azure/GCP): To deploy and scale the platform.

4.3 Testing and Validation
Testing is an essential phase to ensure that CraftCart functions correctly, performs efficiently, and meets user expectations. Different testing techniques were applied to validate both functional and non-functional requirements.
1. Unit Testing
Unit testing focuses on individual components, modules, and API endpoints.
Each function, such as login authentication, product upload, cart update, and order creation, is tested independently.
Helps identify early-stage bugs in isolated components.
Tools such as Jest, Mocha, or Chai may be used for automation.

2. Integration Testing
Integration testing validates the interaction between system modules.
Ensures smooth communication between frontend, backend APIs, and the database.
Example: Verifying that a product added to the cart on the frontend correctly updates the backend and database records.
Tools like Postman and Selenium assist in integration validation.

3. User Acceptance Testing (UAT)
UAT ensures the platform meets the expectations of real users.
Conducted with sample artisans and customers to test usability and functionality.
Evaluates ease of navigation, clarity of product uploads, and smoothness of checkout flow.
Feedback is used to refine UI/UX and overall user experience.

4. Performance Testing
Performance testing assesses the stability and responsiveness of the system.
Measures server load capacity, API response time, and frontend rendering speed.Ensures platform performance remains stable even with multiple concurrent users.Tools like JMeter or LoadRunner can be used to simulate traffic.

V. RESULTS AND EVALUATION

5.1. Enhanced Marketplace Experience
CraftCart significantly improves the experience of both artisans and customers by offering an organized and user- friendly digital marketplace. Artisans benefit from simplified product uploads, easy profile management, and clear visibility of their handcrafted jewellery. Customers gain access to authentic, handmade products presented through a clean interface with detailed descriptions and high-quality images.The structured product categories, search filters, and recommendation system help users discover jewellery more efficiently compared to traditional or unorganized selling channels. This enhanced browsing experience strengthens user trust and encourages repeat visits.

5.2. User Engagement
CraftCart effectively enhances user engagement by integrating interactive features that make browsing, purchasing, and product management more appealing

for both customers and artisans. Elements such as personalized product recommendations, wishlist options, customer reviews, and real-time order tracking contribute to a more dynamic and involved user experience. For artisans, the intuitive dashboard featuring product upload tools, inventory indicators, and order notifications creates a sense of ownership and active participation in the platform. These components motivate artisans to regularly update their listings and monitor customer interactions. For customers, the ease of exploring handcrafted jewellery through category filters, high-quality visuals, and similar- product suggestions keep them engaged and encourages longer browsing sessions. The responsiveness and smooth transitions within the interface contribute to a seamless shopping journey, sustaining user interest and promoting consistent platform usage. Overall, CraftCart's interactive design fosters a positive engagement cycle where users feel informed, connected, and motivated to continue using the platform.

5.3. System Performance

CraftCart demonstrates strong performance across speed, stability, and scalability, ensuring a smooth marketplace experience for both artisans and customers. With React providing fast and efficient UI rendering, users can navigate product listings, artisan profiles, and the checkout system with minimal delay. The use of MongoDB/MySQL for data storage enables flexible, scalable management of product catalogs, user accounts, and transaction records.Testing indicates that Node.js handles backend operations efficiently, processing requests such as product uploads, order placements, and login authentication without noticeable lag. This stable performance remains consistent even when multiple users access the platform simultaneously.Maintaining fast response times is essential for an e-commerce environment, where delays can impact purchasing decisions and user satisfaction. CraftCart's optimized architecture ensures minimal load time, real-time updates, and uninterrupted interactions resulting in a seamless and reliable user experience that supports high retention and engagement.

Usability and Accessibility:

CraftCart is designed with a strong focus on usability and accessibility, ensuring that both artisans and customers can interact with the platform smoothly, regardless of their technical background. The user interface is intuitive and visually clean, allowing users to navigate product categories, upload jewellery, manage orders, and complete purchases without confusion. Artisans with limited digital experience benefit from straightforward dashboards, simplified product upload forms, and clearly labeled controls that reduce the learning curve. Accessibility is further enhanced through responsive design, enabling seamless usage across desktops, laptops, tablets, and mobile devices. This multi-device compatibility ensures that users from diverse environments including rural areas where mobile access is more common can comfortably engage with the platform.

VI. CONCLUSION

6.1. Impact on Artisan Empowerment

CraftCart successfully empowers artisans by providing a dedicated digital platform where they can showcase and sell handcrafted jewellery without relying on intermediaries. The system gives artisans full control over product listings, pricing, and inventory management, enabling them to earn fair profits and expand their market reach. This empowerment promotes sustainable livelihoods and supports cultural preservation by encouraging continued production of traditional jewellery.enabling fast and scalable communication between frontend and backend.

6.2. Enhancement of Customer Experience

For customers, CraftCart delivers a seamless and trustworthy shopping experience. The platform's intuitive interface, personalized recommendations, and transparent product information help shoppers explore unique jewellery pieces with ease. Secure payment options, detailed product descriptions, customer reviews, and real- time tracking contribute to a reliable experience, increasing customer confidence in handmade products.6.3. Technical Performance:

6.3. User Engagement Through Interactive Features

Although CraftCart does not rely on gamification, its interactive features such as wishlists, sorting filters, artisan profiles, and responsive design significantly enhance user engagement. Customers spend more time discovering handcrafted pieces, while artisans engage regularly through dashboards that allow them to track orders, update listings, and monitor performance

analytics. This continuous interaction fosters long-term participation and platform loyalty.6.5. Overall Achievement:

6.4. Technical Performance and Reliability

The platform demonstrates strong technical performance through efficient UI rendering and fast backend processing. React ensures smooth navigation, while Node.js handles concurrent user requests with stability. The database system whether MongoDB or MySQL supports scalable data management for product catalogues, user accounts, and transactions. Testing results confirm low latency, stable performance under load, and reliable system responses even during peak usage.User Personalization:

6.5. Usability and Accessibility for All Users

CraftCart prioritizes accessibility and ease of use to ensure that artisans with minimal technical knowledge can operate the system effortlessly. A clean, mobile-responsive interface enables users from varied environments to access the platform comfortably. Clear navigation paths, readable fonts, consistent layouts, and simplified dashboards collectively improve usability. User Acceptance Testing confirms that both artisans and customers can navigate the system with minimal supportLimited Language Support

6.6. Contribution to Cultural Preservation

By providing a specialized marketplace for handcrafted jewellery, CraftCart contributes to the preservation and promotion of traditional art forms. The platform highlights regional craftsmanship, enabling artisans to narrate the cultural stories behind their creations. This not only increases product value but also encourages younger generations to continue practicing and sustaining traditional jewellery-making skills.

6.7 Economic and Social Impact

CraftCart generates meaningful economic opportunities for local and rural artisans by connecting them with broader national and international customers. By eliminating middlemen and reducing dependency on local markets, artisans gain improved income stability. Socially, the platform boosts artisan recognition, encourages entrepreneurship, and fosters community growth. It supports the vision of digital inclusion by helping rural craftspeople participate confidently in the online marketplace.Personalized learning path:

6.8. Platform Scalability and Development Potential

The platform's modular architecture ensures that CraftCart can be easily expanded with additional features. Future enhancements may include mobile app development, multilingual support, AI-driven recommendations, augmented reality (AR) try-on features, and international shipping. The system's flexible design ensures that it can scale to accommodate more users, products, and services as demand increases.Multilingual support

6.9. Strengthening Trust and Transparency

CraftCart builds trust between artisans and customers through its review system, secure payments, clear product details, and reliable delivery tracking. Artisan profiles provide authenticity and background information, helping customers make informed purchasing decisions. This transparency improves the credibility of handcrafted products and encourages repeat purchases, strengthening relationships within the marketplace ecosystem.Enhanced gamification features:

6.10. Overall Achievement and Project Significance

Overall, CraftCart achieves its primary objective of establishing a dedicated digital marketplace for handcrafted jewellery. The platform merges technology with tradition, creating a bridge between artisans and modern consumers. It supports cultural heritage, empowers artisans, enhances customer experience, and

provides a scalable, sustainable e-commerce solution. CraftCart stands as an impactful contribution to the digital transformation of the handicraft sector, promoting fair commerce, cultural appreciation, and long-term artisan growth.

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