

AI-Assisted Traditional Craft Design & Marketplace Platform

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Abstract- *Traditional handicrafts are culturally significant but face challenges in modernization, digital exposure, and market accessibility. This project presents an AI-Assisted Craft Design Customization and Marketplace Platform that bridges traditional craftsmanship with intelligent digital tools. The system enables users to select a craft style and customize design parameters such as motif density, colour themes, pattern type, and traditional-modern blend ratio. Using pretrained artificial intelligence models for image generation, the platform produces craft-inspired design variations based on user inputs. To enhance usability, generated designs can be previewed on product mock-ups such as textiles, pottery surfaces, and carved panels. The platform also includes a marketplace module where users can upload, describe, price, and list their generated or handcrafted designs for browsing and simulated purchase. This integrates creativity with a digital commerce ecosystem. The project emphasizes accessibility, cultural preservation, and digital empowerment of artisans by combining AI-assisted creativity with a scalable web-based marketplace. The system demonstrates how intelligent tools can support traditional art forms without replacing human craftsmanship, offering a practical model for technology-enabled craft innovation.*

Keywords: Artificial Intelligence (AI), Traditional Handicrafts, Craft Design Customization, Image Generation, Digital Marketplace, Cultural Preservation, Web-Based Platform, AI-Assisted Creativity, E-Commerce, Product Visualization.

I. INTRODUCTION

Traditional handicrafts are an important part of cultural heritage and artistic identity, but they face several challenges in the modern digital era, including limited market reach, lack of technological adaptation, and reduced visibility among younger consumers. Many artisans still depend on conventional methods for designing and selling products, which restricts business growth and creative innovation. At the same time, the increasing demand for personalized and modernized products has created a need for intelligent systems that can support traditional craftsmanship while preserving its cultural value. Recent advancements in Artificial Intelligence

(AI) and digital commerce technologies provide new opportunities to modernize traditional craft industries and improve accessibility for artisans and customers.

This project proposes an AI-Assisted Traditional Craft Design Customization and Marketplace Platform that combines AI-based design generation with a web-based marketplace system. The platform enables users to customize design parameters such as motif density, colour themes, pattern types, and traditional-modern blend ratios to generate craft-inspired designs using pretrained AI models. The generated designs can also be previewed on product mock-ups such as textiles, pottery, and carved surfaces for better visualization. In addition, the system includes a marketplace module where artisans and users can upload, describe, price, and showcase handcrafted or AI-generated products for browsing and simulated purchase. The proposed platform aims to support cultural preservation, digital creativity, and artisan empowerment through the integration of intelligent design tools and online commerce technologies.

II. METHODOLOGY

A. System overview

The proposed AI-Assisted Traditional Craft Design Customization and Marketplace Platform is a web-based system designed to support traditional artisans and users through intelligent design generation and digital commerce integration. The system allows users to select traditional craft styles and customize design parameters such as colour themes, motif density, pattern type, and traditional-modern blend ratio using an interactive interface. These inputs are processed by pretrained AI image generation models to create multiple craft-inspired design variations that preserve traditional artistic elements while introducing creative customization. The generated designs can be visualized on realistic product mock-ups including textiles, pottery surfaces, and decorative objects to improve user experience and product presentation.

The platform also incorporates a marketplace module that enables artisans and users to upload, describe, price, and showcase handcrafted or AI-generated products for browsing

and simulated purchasing. The system architecture integrates frontend web technologies, backend processing, database management, and AI-based image generation models to ensure efficient operation and user accessibility. By combining artificial intelligence with digital marketplace functionalities, the proposed system provides a scalable and user-friendly environment for promoting traditional crafts, enhancing creative design exploration, and improving market accessibility for artisans in the digital era. The backend system manages user data, design storage, marketplace listings, and product information through database integration. The overall methodology combines artificial intelligence, image processing, and web technologies to create an accessible digital ecosystem that supports traditional craftsmanship.

B. System architecture

The system architecture of the proposed AI-Assisted Traditional Craft Design and Marketplace Platform is designed as a multi-layered framework that integrates user interaction, AI-based design generation, visualization, and marketplace functionalities. The architecture processes user customization inputs through frontend and backend modules and generates craft-inspired designs using pretrained AI models. The generated outputs are visualized on product mock-ups and stored within the database for efficient management and retrieval. The integrated marketplace further supports product listing, browsing, and digital commerce activities for users and artisans.

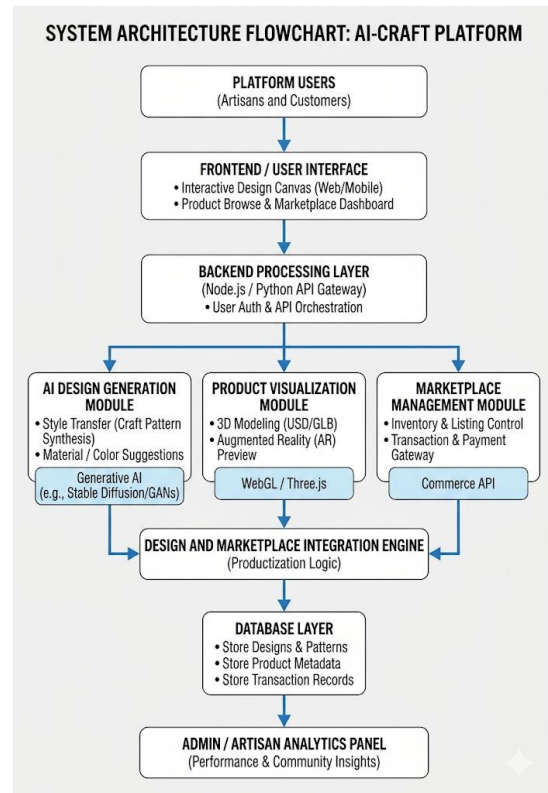


Fig.1 :As shown in the figure, the AI-Craft Platform integrates AI-based design generation, product visualization, and marketplace functionalities within a unified web-based system. The architecture supports user customization, design storage, and digital commerce for artisans and customers.

C. Modules of the system

The proposed AI-Assisted Traditional Craft Design Customization and Marketplace Platform is a web-based system designed to support traditional artisans and users through intelligent design generation and digital commerce integration. The system allows users to select traditional craft styles and customize design parameters such as colour themes, motif density, pattern type, and traditional-modern blend ratio using an interactive interface. These inputs are processed by pretrained AI image generation models to create multiple craft-inspired design variations that preserve traditional artistic elements while introducing creative customization. The generated designs can be visualized on realistic product mock-ups including textiles, pottery surfaces, and decorative objects to improve user experience and product presentation.

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management, and AI-based image generation models to ensure efficient operation and user accessibility. By combining artificial intelligence with digital marketplace functionalities, the proposed system provides a scalable and user-friendly environment for promoting traditional crafts, enhancing creative design exploration, and improving market accessibility for artisans in the digital era.

D. Methodology

The methodology of the proposed AI-Assisted Traditional Craft Design Customization and Marketplace Platform is divided into multiple stages involving user interaction, AI-based design generation, product visualization, and marketplace integration. Initially, users access the web-based platform and select a preferred traditional craft style from the available categories. The system then allows users to customize various design parameters such as motif density, colour themes, pattern type, and the balance between traditional and modern design elements. These inputs are collected through an interactive user interface and processed by pretrained AI image generation models to create multiple craft-inspired design variations. The generated outputs are designed to preserve the visual characteristics of traditional art forms while adapting them according to user preferences.

After the design generation stage, the produced designs are integrated with product mock-ups such as textiles, pottery surfaces, decorative panels, and handcrafted objects to provide realistic visualization. The platform further includes a marketplace module where users and artisans can upload product details, add descriptions, set pricing information, and list their handcrafted or AI-assisted creations for browsing and simulated purchasing. The backend system manages user data, design storage, marketplace listings, and product information through database integration. The overall methodology combines artificial intelligence, image processing, and web technologies to create an accessible digital ecosystem that supports traditional craftsmanship, creative customization, and online artisan commerce.

III. WORKFLOW

Level 1- User interaction and input collection

The workflow begins when users or artisans access the web-based platform through the user interface. The system allows users to register, log in, browse traditional craft categories, and select a preferred craft style for customization. Users can provide design preferences such as motif density, colour themes, pattern type, and traditional-modern blend ratio through interactive input controls. This stage focuses on

collecting user requirements and ensuring a smooth and user-friendly interaction experience.

Level 2- AI-based design processing

After receiving user inputs, the system forwards the customization parameters to the AI processing module. Pretrained artificial intelligence and image generation models analyze the selected craft style and generate multiple craft-inspired design variations based on the provided preferences. The AI module combines traditional artistic characteristics with intelligent pattern generation techniques to create visually customized outputs while preserving cultural design elements.

Level 3- Design visualization and mock-up generation

In this stage, the generated craft designs are integrated with realistic product mock-ups such as textiles, pottery surfaces, decorative panels, and handcrafted objects. The visualization module enables users to preview how the generated patterns appear on actual products before finalizing or uploading them to the marketplace. This stage improves design understanding, usability, and customer engagement by providing realistic visual representation of the customized outputs.

Level 4- Marketplace integration and product management

Once the design is finalized, users and artisans can upload the generated or handcrafted products to the marketplace module. The system allows users to add product descriptions, pricing information, product categories, and preview images for listing purposes. Customers can browse available products, search for craft designs, and perform simulated purchasing operations within the platform. This stage creates a digital commerce ecosystem that supports online visibility and accessibility for traditional artisans.

Level 5- Database storage and system management

The final stage involves storing and managing all platform-related information within the database management system. User profiles, generated designs, marketplace listings, customization parameters, and transaction-related details are securely maintained for efficient retrieval and processing. The backend system continuously manages communication between modules, ensuring smooth workflow execution, scalability, and reliable platform performance across all operations

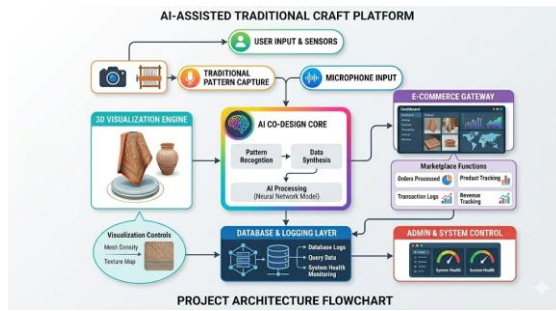


Fig.2 :Figure generated using AI-based image generation tools for illustrative purposes. It illustrates the proposed AI-Assisted Traditional Craft Platform integrates AI-driven design generation, 3D visualization, database management, and e-commerce functionalities within a unified digital system.

VI. CONCLUSION

The AI-Assisted Traditional Craft Design Customization and Marketplace Platform demonstrates how modern artificial intelligence technologies can be effectively integrated with traditional handicraft industries to support cultural preservation, creative innovation, and digital commerce. The proposed system addresses major challenges faced by artisans and traditional craft communities, including limited market accessibility, lack of digital exposure, and difficulties in adapting to modern consumer preferences. By allowing users to customize design parameters such as motif density, colour themes, pattern structures, and traditional-modern blend ratios, the platform provides an interactive environment for generating personalized craft-inspired designs using pretrained AI image generation models. The inclusion of realistic product mock-up visualization further improves user engagement and helps users better understand the appearance of generated designs on various handcrafted products. In addition, the integrated marketplace module enables artisans and users to upload, describe, price, and showcase handcrafted or AI-assisted products within a unified digital ecosystem, thereby expanding opportunities for online promotion and simulated commerce. The project emphasizes that artificial intelligence should function as a supportive tool that enhances human creativity rather than replacing traditional craftsmanship. By combining AI-assisted customization, web technologies, image processing, and marketplace integration, the system provides a scalable and accessible solution for modernizing traditional crafts while maintaining their cultural and artistic significance. Overall, the proposed platform offers a practical model for technology-enabled craft innovation, artisan empowerment, and sustainable digital transformation in the handicraft sector.

V. FUTURE SCOPE

The future scope of the proposed AI-Assisted Traditional Craft Design Customization and Marketplace Platform includes the integration of more advanced artificial intelligence techniques and enhanced digital commerce features to improve user experience, creativity, and scalability. Future improvements may include the implementation of real-time AI recommendation systems that suggest personalized craft designs based on user preferences and browsing behavior. Advanced generative AI models can also be incorporated to produce higher-quality and more diverse craft-inspired patterns with improved artistic accuracy. In addition, augmented reality (AR) and virtual reality (VR) technologies can be integrated to allow users to visualize handcrafted products in real-world environments before purchase. The platform can further be expanded into a mobile application to increase accessibility for artisans and customers across different regions.

The marketplace functionality can also be enhanced by integrating secure online payment systems, multilingual support, artisan verification mechanisms, and customer review features to create a more realistic and commercially viable e-commerce ecosystem. Future versions of the system may include blockchain-based authentication for verifying originality and ownership of traditional handcrafted products, helping to protect cultural authenticity and artisan rights. Furthermore, the platform can be extended to support a wider variety of regional and international craft styles, thereby promoting global cultural exchange and digital preservation of traditional art forms. These enhancements can transform the proposed system into a scalable and intelligent digital platform for sustainable craft innovation and global artisan empowerment.

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