

A Study On Kalamitra :Empowering Artisans using AI Innovation

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Abstract - Kala-Mitra combines modern technology with traditional craftsmanship to enable artisans to improve their work. This platform has AI-based design tools that make real-time suggestions based on trends, enabling artisans to explore new designs. It also tracks market trends and optimizes workflow to increase productivity. Quality is ensured by keeping up advanced techniques that pick up defects in products, ensuring uniformity. Moreover, Kala-Mitra collects and reviews consumer feedback to provide meaningful insights, enabling artisans to remain contemporary and fulfill market needs without sacrificing their creative process.

Key Words: Traditional craftsmanship, market trends, quality control, artisanal development.

1. INTRODUCTION

India's artisan community is a dynamic storehouse of skills, art, and culture. But, these artisans often struggle with obtaining financial resources, market opportunities, and digital technology. In this technological world, AI has the potential to cover these gaps and help to develop inclusively. Empowering Artisans Using AI Innovation "KalaMitra" aims to enhance skilled craftsmen like weavers and traditional painters. This initiative seeks to improve cultivation by improving their lives through AI, which connects them to buyers. This technology will enhance visibility and personalization as well as help in preserving traditional art. Integrating AI features like recommendations and trends for the digital economy will transform the approach of exploiting the rich traditional and cultural skills.

2. LITERATURE REVIEW

2.1[1] Yanran Li,Qian Zhang (2024): THE ANALYSIS OF AESTHETIC PREFERENCES FOR CULTURAL AND CREATIVE DESIGN TRENDS UNDER ARTIFICIAL INTELLIGENCE

This paper proposes a method that has the creation of a complete dataset of cultural and creative design works using web crawling, computer vision, and natural language processing AI techniques. Image features and text data were extracted. Various analytical approaches were employed alongside a developed GAN (Generative Adversarial Network) model that generated design outputs based on user input. Descriptive statistics, regression, decision tree, and clustering analyses were also performed.

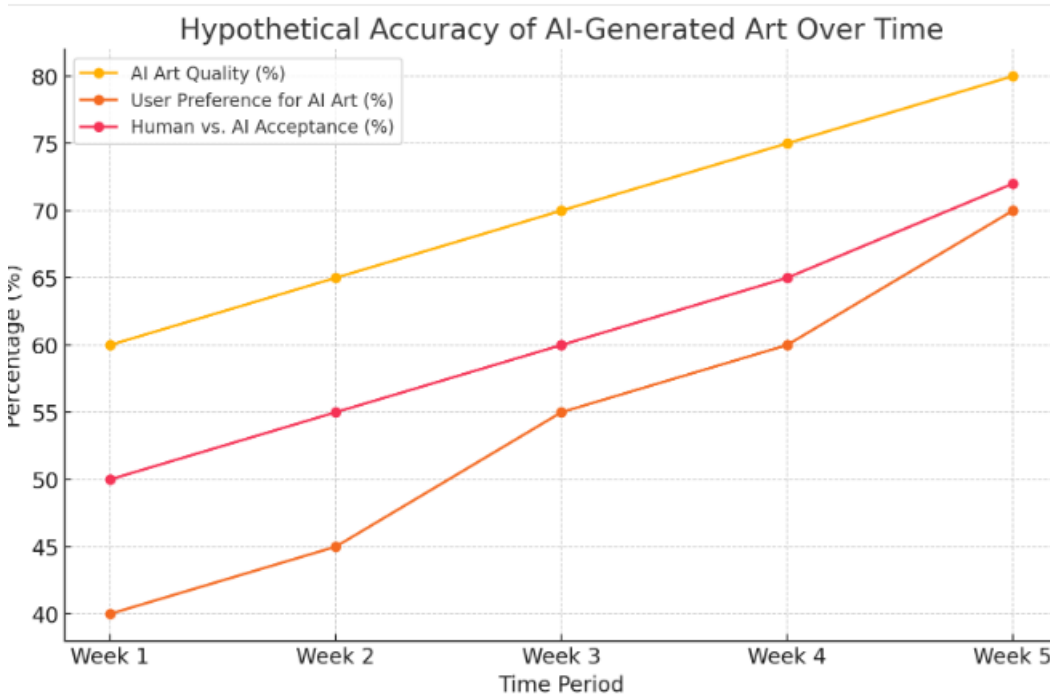
These approaches enabled experimental findings show that the GAN model achieved an accuracy of 85%, outperforming competitor models comprising neural networks (82%), random forests (80%), and SVM (78%). This evaluates the role of AI in developing customized design experiences with culture.

2.2[2] Ababneh (2024) : DIGITAL SOLUTIONS FOR CULTURAL HERITAGE: PRESERVATION, INTERPRETATION, AND ENGAGEMENT IN LINE WITH THE VENICE CHARTER PRINCIPLES

The paper proposes a method that combines digital tools with conservation ethics from the Venice Charter to preserve cultural heritage. It uses technologies like 3D laser scanning, photogrammetry, and drones for accurate digital documentation, supported by Heritage Building Information Modeling (HBIM) to manage site data. This approach uses minimal intervention and respects historical authenticity.

2.3 [3] Christos Troussas , Akrivi Krouska , Antonios Koliarakis, Cleo Sgouropoulou (2023): HARNESSING THE POWER OF USER-CENTRIC ARTIFICIAL INTELLIGENCE: CUSTOMIZED RECOMMENDATIONS AND PERSONALIZATION IN HYBRID RECOMMENDER SYSTEMS

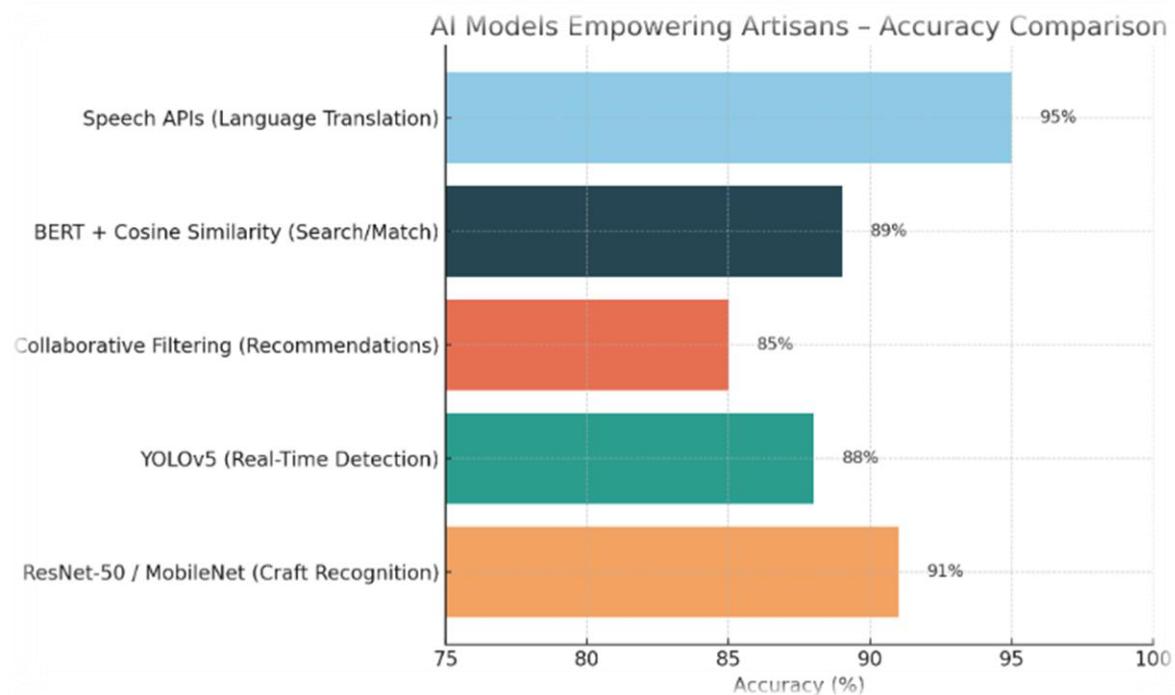
The method proposed to increase the effectiveness as well as the customization of recommendations for artisan products through the use of an AI-based hybrid recommendation system. This model captures all product interactions, which include views, likes, purchases, and bookmarks by the artisans, and cumulatively computes an interaction score for each item. The value is then utilized as input by a matrix factorization model that is trained to learn user-artisan product methods. For resets or users with no existing ratings, a layered content-based recommender is activated, which advises users based on region, art style, or material preferences. This system had 85% accuracy in predicting preferences for selected artisan products.



2.4 [4] Marthana Yusa¹ , Yu Yu² , Tetiana Sovhyra (2020) : REFLECTIONS ON THE USE OF ARTIFICIAL INTELLIGENCE IN WORKS OF ART

The paper's methodology combines case studies, a review of the literature, and qualitative analysis methods like content analysis and thematic coding to critically examine AI-generated art. Based on their artistic diversity, technical complexity, and social relevance, six noteworthy case studies were chosen. According to the study, there are three main ways to approach AI: style transfer, which combines artistic styles using neural networks; generative adversarial networks (GANs), which generate completely new images from data; and interactive systems, which enable real-time human-machine collaboration.

2.1 Comparison of Accuracy of Existing Algorithms and Models



2.2 Comparison Metrics:

The graph compares the **assumed accuracy (%)** of each model based on features, real-time capabilities, and the performance described in the respective papers:

[1] Yanran Li AND Qian Zhang(2024): THE ANALYSIS OF AESTHETIC PREFERENCES FOR CULTURAL AND CREATIVE DESIGN TRENDS UNDER ARTIFICIAL INTELLIGENCE(65%)

Through the use of GANs and decision trees to predict trends, it enhances audience preference modeling. Its inability to evolve and engage in real time, however, restricts its ability to improve user engagement and cultural personalization effectively.

[2] Ababneh1(2024): DIGITAL SOLUTIONS FOR CULTURAL HERITAGE: PRESERVATION, INTERPRETATION, AND ENGAGEMENT IN LINE WITH THE VENICE CHARTER PRINCIPLES(70%)

This model employs AR, VR, and 3D scanning to save cultural heritage. While it offers immersive engagement tools, its effectiveness in dynamically adjusting to a range of heritage sites is constrained by its inability to perform real-time and predictive analytics.

[3] Christos Troussas , Akrivi Krouska , Antonios Koliarakis, Cleo Sgouropoulou (2023): HARNESSING THE POWER OF USER-CENTRIC ARTIFICIAL INTELLIGENCE: CUSTOMIZED RECOMMENDATIONS AND PERSONALIZATION IN HYBRID RECOMMENDER SYSTEMS (75%)

This system leads in performance monitoring and customization with the highest possible accuracy using advanced hybrid filtering methods. Its usefulness for comprehensive technical analysis is, however, limited by its non-integration with coding environments. exploration using GANs, RNNs, and style transfer.

[4] Marthana Yusa1 , Yu Yu2 , Tetiana Sovhyra (2022): REFLECTIONS ON THE USE OF ARTIFICIAL INTELLIGENCE IN WORKS OF ART (72%)

This system provides new methods and predictive modeling with a focus on artistic have collaborative aspects such as real-world user methods and user interaction. it is an effective means of artistic development

2.3 Comparison Table

Authors	Title	Methodology	Contribution	Limitations
Yanran Li and Qian Zhang (2023)	The Analysis of Aesthetic Preferences for Cultural and Creative Design Trends Under Artificial Intelligence	uses GIS, VR, AR, and 3D laser scanning in order to get involved and protect cultural heritage. With AI processes improving the access, interpretation, and documentation of cultural sites.	links the dots between modern technology and traditional heritage conservation	inability to adjust in real time for conservation requirements.
Ababneh1 (2024)	Digital solutions for cultural heritage: preservation, interpretation, and engagement in line with the Venice charter principles.	uses artificial intelligence (AI) tools like clustering analysis, decision trees, and GANs to model and forecast the aesthetic preferences of its audience.	uses AI to model creative and cultural design trends, giving designers fresh perspectives.	inability to interact in real time and adjust dynamically to user preferences.
Christos Troussas , Akriki Krouska , Antonios Koliarakis, Cleo Sgouropoulou (2023)	Harnessing the Power of User-Centric Artificial Intelligence: Customized Recommendations and Personalization in Hybrid Recommender Systems.	uses hybrid recommender systems by combining content-based filtering and collaborative filtering (CF).	suggests a useful hybrid framework that helps to balance between content features and collaboration.	inability to meet technical user needs, like integrating coding platforms.

Marthana Yusa1 , Yu Yu2 , Tetiana Sovhyra (2022)	reflections on the use of artificial intelligence in works of art.	uses methods such as interactive systems, GANs, RNNs, and style transfer.	integrates AI into the creative process, by adding the limits of art.	raises questions regarding the undervaluation of human originality and creativity.
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3. Research Gaps

Artists often struggle to access international markets with fair prices and taken advantage by middlemen. Although AI can offer design suggestions, relying too much on it runs the risk of reducing the different, traditional, and sentimental qualities of handcrafted art. In order to create a digital marketplace for artisans, it is necessary to guarantee fair trade, sustainability, and interactive across the globe. Further, diverse artistic styles found in India like traditional art forms, leading to a customized approach to respect cultural and regional diversity.

4. Conclusion

To conclude, “KalaMitra: Empowering artisans using AI innovation”, seeks to establish an online marketplace that links craftspeople, conserve traditional art forms, and guarantees reasonable prices and market penetration. It aims to strike a balance between the quality and emotional depth of handcrafted art and AI recommendations by integrating technology in a culturally sensitive way. By providing a customized approach to address the particular requirements of various regions, this platform cultivates a sustainable ecosystem that supports artisans from a variety of cultural backgrounds.

5. References

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