

Development Trends of the Arts and Crafts Market from the Perspective of Big Data: Extraction of Core Design Features and Analysis of Industrial Innovation Strategies

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ABSTRACT The arts and crafts industry is at a critical stage of digital transformation and consumption upgrading. From the perspective of big data, this study systematically deconstructs the internal logic of market development trends through multisource data collection and core design feature extraction. Multidimensional data from 2019 to 2024 are collected, covering e-commerce platform transactions, social media interactions, design patent applications, and offline exhibition and sales records. Text mining, image recognition, semantic feature extraction, and feature quantification methods are used to identify key design elements affecting market trends. The study finds that the arts and crafts market shows accelerated style iteration, stratified consumer preferences, and diversified value evaluation. Modern interpretation of traditional patterns, innovative application of environmentally friendly materials, and digital presentation constitute three core dimensions of current design features. Based on the analysis results, a data-driven industrial innovation strategy system is proposed, including precise product design, intelligent production management, and omnichannel marketing optimization. Empirical results show that enterprises using big data analysis improve product-market matching, inventory turnover efficiency, and customer satisfaction.

INDEX TERMS arts and crafts, big data analysis, design feature extraction, industrial innovation, market trend

I. INTRODUCTION

AS an essential carrier of cultural memory and the inheritance of skilled craftsmanship, the arts and crafts sector, particularly through traditional weaving and intricate fiber processing, plays an increasingly vital role in modern economic and social development. The preservation of these techniques ensures that historical identity remains integrated with the technical evolution of the broader industry. With the popularization of digital technology, the continuous upgrade of the consumer market, the art and crafts industry is undergoing a profound transformation from traditional handicraft workshops to modern creative industries. This restructuring means not only a change in the method of production, but this transformation represents a fundamental reorganisation of the logic of market analysis and development models of the industry. Traditional market research on arts and crafts is largely qualitative and based on judgment made from the experience of the researcher, therefore the dynamic changes in market demand cannot be easily understood, or

the motivating elements of the design cannot be identified in the design products that affect market changes. In the era of digital economy, the amassing of large amounts of data allows for unprecedented possibilities for the fine analysis of the arts and crafts market. Market trend analysis and industrial innovation strategy formulation based on big data analysis have become an inevitable choice of the industry's development.

This study has big data perspective and is aimed at building a technical framework for the analysis of the arts and crafts market. Through the multiple sources of data collection and key design features extracting, it penetrates to the internal logic of the market development trend and proposes specific industrial innovation strategies according to the analysis results. The comprehensiveness of the three levels of the core objectives of this research is: firstly, to establish a multi-dimensional data collection system of the arts and crafts market, to lay the foundation of data for the follow-up data analysis, and to identify the core factors

influencing the market trend of the arts and crafts field in the second step; and finally, to establish a system of data-driven industrial innovation strategy, which will provide empirical support for regions enterprises decision-making. By achieving these research goals, this paper bridges the gap between the micro-level of fiber design elements and the macro-level of market fluctuations, offering theoretical references and practical pathways for the digital transformation and quality development of the arts and crafts industry. This integration ensures that traditional weaving precision and modern manufacturing standards are seamlessly aligned with the broader economic evolution of the sector.

II. RELATED WORK

Research in the field of arts and crafts is increasingly characterized by interdisciplinary and diversified features. Tapfuma et al. [1] emphasized the key role of art and crafts in creating authentic tourism experiences, providing economic opportunities for local artisans, and protecting cultural heritage. Yang et al. [2] explored the ecological wisdom contained in traditional crafts and its potential for application in modern environmental protection practices. Zhaohui and Xinlu [3] studied the development and consumption trends of the arts and crafts industry in China in the new era, revealing the main driving forces for the development of the arts and crafts industry. Hart [4] shaped and disseminated an interior design aesthetic that is more lifelike, emphasizes craftsmanship and female perspectives, and challenged the male-dominated narrative of the arts and crafts movement. Chavraiparn et al. [5] explored how to protect and revitalize local handicrafts through effective community management, making them an economic and cultural resource for the sustainable development of the community.

Zhi-hao [6] pointed out that the modern transformation of traditional Chinese arts and crafts, represented by glass art, is not a simple replication of tradition, but a contemporary expression of the spirit of traditional aesthetics. Hashim and Saruddin [7] summarized the lessons learned by entrepreneurs from the crisis and made suggestions for policymakers and industry support agencies to help the handicraft industry enhance its resilience. Tai and Zhao [8] integrated traditional arts and crafts elements into modern art and design teaching, providing new empirical support for the modern value of traditional crafts. DLUHOPOLSKA [9] confirmed that the art market is volatile and closely related to macroeconomic changes. Yurt [10] pointed out that artists can develop their careers by making wise use of emerging trends and available resources. Existing research lacks a macro-level grasp and quantitative presentation of the overall development trend of the arts and crafts market. In particular, there are still significant research gaps in existing literature on how to systematically identify and extract the core design features that affect market trends, and how to propose forward-looking industrial innovation strategies based on massive data. This article takes a big data

perspective to deconstruct and analyze the dynamic trends of the arts and crafts market, aiming to bridge the gap between micro-design elements and macro-market fluctuations, and to provide a more empirically grounded innovation path for the sustainable development of the industry.

III. METHODS

A. CONSTRUCTION OF MULTI-SOURCE DATA ACQUISITION AND PREPROCESSING SYSTEM

Data sources include four dimensions: transaction records of e-commerce platform data, interactions of social media users, design patent application documents, and offline exhibition and sales data. E-commerce platform data was retrieved from transaction data of large arts and crafts sales platforms between January 2019 and June 2024 and fields like product descriptions, transaction prices, sales quantities, user reviews, and store ratings, totaling more than 1.2 million valid transaction data records. Social media data was obtained by API calls of the arts and crafts-related data in the social media platform Weibo, Xiaohongshu and Douyin, which is consistent with the time of the transaction data, resulting in 856,000 pieces of text, images and video data of users, including user comments, likes and reposts. Design patent data came from the list of patents in the public database of the State Intellectual Property Office, searching for design patents and utility model patents of arts and crafts for a total of 42,000 patent texts, claims, and associated drawings. Offline data was collected by way of cooperation with arts and crafts associations and large exhibition organisations in 12 provinces, including exhibition sales records, audience survey questionnaires and feedback from the exhibitors, covering 46 large-scale arts and crafts exhibitions held between 2019 and 2024 [11].

The data preprocessing steps employ a layered cleaning method. For transaction data, outlier detection and removal are performed first, eliminating obviously invalid records caused by data entry errors (such as negative or zero prices, or completely missing key attributes). After cleaning 1.183 million valid records are left. Next, handling of missing values is implemented which deletes records with more than 10% missing key fields and fills missing values similar to mean imputation methods. Finally, standardization of the data is carried out ensuring that currency units, measuring standards, and time standards are unified. Social media data preprocessing has a text cleaning and structured transformation phase, which removes html tags, special symbols and meaningless characters. Chinese word segmentation tools utilize vocabulary segmentation, part of speech tagging, and entity recognition, which are carried out according to the arts and crafts field professional dictionary, which builds a tagging system, design elements, materials and processes, and style categories. Patent data preprocessing, including text extraction, classification coding, and citation relationship analysis, establish a classification classification system for arts and crafts patents of multiple levels based on International Classification of Industrial Designs. Offline

data preprocessing is the data preprocessing of the questionnaire data coding and multi-source data alignment, the transformation of the results of the questionnaire survey results into online data and transformation into the unified time dimension and product classification standard.

B. CORE DESIGN FEATURE EXTRACTION AND QUANTIZATION MODEL

The extraction of core design features uses the method of multi-dimensional feature engineering, building a system of feature vector arts and crafts products from three levels: visual features, semantic features, market feedback features. Visual feature extraction is based on the deep learning image recognition technology, and convolutional neural network is used to process the products of the images collected, thereby transforming the image into the visual feature such as the color composition, the complexity of pattern and proportion of shape and so on. Specifically, the features related to color are extracted by the algorithms of dominant hue extraction and color gamut distribution analysis, the numerical distribution of hue, saturation and brightness is recorded; the features related to pattern are extracted by the algorithms of edge detection and texture analysis, the fineness, repetition and symmetry of the patterns are quantified; the features related to shape are extracted by the algorithms of contour extraction and geometric analysis, the aspect ratio, surface complexity and space occupancy of the product are recorded.

Semantic feature extraction makes use of natural language processing (NLP) technology to analyze social media text, user reviews and patent descriptions to a deep extent. Topic modeling algorithms are used to detect latent topic distributions within the text that filters out high frequency design concepts and keywords (style). However, in the field of arts and crafts, relying solely on the linear logic of "positive emotion = good design" has limitations. Therefore, this study refined the sentiment analysis process: not only did it measure users' emotional inclinations towards various design elements and construct a basic sentiment rating matrix, but it also emphasized contextual analysis of "controversy" and "aesthetic tension." Specifically, through co-occurrence network analysis, we identified design features that frequently co-occurred with "negative" sentiment terms (such as "weird," "curious," and "disruptive") but were simultaneously associated with market value terms such as "innovation," "avant-garde," and "collectible." These features often represent cutting-edge designs that break with convention and lead trends; their negative sentiment feedback may be a manifestation of their pioneering spirit rather than a signal of market failure. Co-occurrence network analysis identifies associations between design patterns, where occurrence patterns with high frequencies are identified. Market feedback features are determined using the transactions and interaction data like price acceptance, sales growth rate, repurchase rate, social media reach and collection/attention. Each indicator is normalized in order to

eliminate dimensional differences.

The feature fusion stage employs a weighted integration method, consolidating visual features, semantic features, and market feedback features into a unified design feature vector. To address the quantification of the decisive feature "cultural significance," this study constructs a multi-level quantitative framework: First, using expert scoring, ten experts in the field of arts and crafts (including national-level intangible cultural heritage inheritors, design professors, and senior curators) were invited to score each design feature on a 5-point Likert scale for its cultural authenticity, historical heritage value, and cultural symbol representativeness. The average score was used as the baseline score for the cultural significance of that feature. Second, semantic network analysis was used to extract cultural keywords (such as "auspicious," "traditional," and "craftsmanship") related to the feature from social media texts and user comments, calculating their cooccurrence frequency and emotional tendency to form a dynamic cultural resonance index. Finally, through multiple regression analysis, the baseline score for cultural significance and the dynamic cultural resonance index were used as independent variables, and the product's market performance index was used as the dependent variable to calculate regression coefficients. Ultimately, the weight of cultural significance in the feature vector was determined based on the regression coefficients, achieving the mathematical and quantitative embedding of the abstract concept of cultural significance. The final design feature vector contains 32 dimensions, comprehensively capturing the visual characteristics, cultural connotations, and market acceptance of handicrafts, and providing a quantitative basis for reflecting market trends and formulating market strategies.

C. MARKET TREND ANALYSIS AND STRATEGY GENERATION METHODS

Market trend analysis based on time series analysis and tracks and finds the dynamic pattern of extracted design feature vector. First of all, a time series database of design features is built in which the distribution and changes of those different features are recorded with a granularity of a month. Second, trend decomposition technology is adopted to separate the time series into three parts including long-term trend, seasonal fluctuations, and random disturbances to identify the evolution pattern of each feature. Third, the algorithms of cluster analysis are implemented for grouping the design features, finding the categories of design elements with similar patterns of evolution. Finally, association rule mining is applied to determine the cause-and-effect relationship between design features and performance in the market, establishing a quantitative model for the influence of design features on trends in the market.

The generation of innovation strategies of industries uses the decision support theory of using data for decision making. Based on market trend analysis, it identifies current market opportunities and risk factors, predictive models are

used to forecast market demand over the next six to twelve months, (resulting in market potential assessments for different combinations of design features) and, considering the company's resources and capabilities, optimization algorithms are used to generate personalized product innovation solutions and marketing strategies. The strategy generation process gives full regard to the specific nature of the arts and crafts industry and includes the cultural heritage requirements, technological limitations, and commercial goals of the market in a unified optimization process to achieve the feasibility and effectiveness of the strategies.

IV. RESULTS AND DISCUSSION

A. A MULTI-DIMENSIONAL PRESENTATION OF THE DEVELOPMENT TREND OF THE ARTS AND CRAFTS MARKET

Based on multi-source data, the present study firstly presents a panoramic view on the development trend of the arts and crafts market on the whole (Table 1). From the standpoint of the size of the market, it can be seen that the online transaction volume of arts and crafts continued to show a continuous growth trend from 2019 to 2023, with an average compound growth rate of 16.3 % per year. The volume of online transaction was 28.6 billion yuan in 2019. In 2020, affected by the outside world, the growth rate was 12.3%, but after a short period of recovery, the growth rate is 21.5% in 2021, and the annual growth rate of more than 15% can be maintained, which is 61.2 billion yuan in 2024. This growth trajectory shows that the arts and crafts market has excellent resilience and recovery capabilities and digital transformation has become the basic driving force for the growth of the market.

Consumer structure analysis shows remarkable changes in the market demand. Based on the core consumption motives and value orientations of the products, this study divides the craft market into three categories: traditional collectibles (primarily for investment and inheritance), lifestyle aesthetics (emphasizing daily practicality and aesthetic value), and cultural and creative derivatives (centered on IP licensing and thematic innovation). Although these three types of products overlap in reality—for example, a lifestyle aesthetics product may also be a cultural and creative product—this study's classification is based on attribution analysis of their dominant attributes. According to transaction data, the sales share of traditional collectible handicrafts reduced from 35.2% in 2019 to 22.8% in 2024, with the sales share of lifestyle aesthetic handicraft increasing from 41.6% to 58.3%, and the share of cultural and creative derivative products increasing from 15.3% to 18.9%. This is a structural shift and shows a change in the consumption orientation of arts and crafts from an investment- and collection-oriented way of consumption to a daily consumption-oriented way of consumption, where equal attention is given to practical functionality as well as aesthetic value. Price range distribution data show that the products between 100 and 500 yuan accounted for the largest sales volume at 38.7%, however

products greater than 1000 yuan accounted for 45.2% sales that seems to have a clear stratification in the market as the mass consumption and a high-end customization are developing in parallel. Regional market analysis indicates that the eastern coastal region is the primary market in terms of the consumption of arts and crafts. The Yangtze River Delta, Beijing-Tianjin-Hebei, and Guangdong-Hong Kong- Macau Greater Bay Area area accounts for 62.4% of online transaction volume in the country. However, the growth rate for the central and western regions is much higher than the east. From 2019 to 2024, the average annual growth rate in the western region was 24.6%, 6.8 pp higher than in the eastern region. To analyze the driving factors behind this regional shift, this study, building upon previous analysis, further introduced quantitative indicators of logistics infrastructure and the penetration rate of digital commerce. By integrating regional express delivery volume data released by the State Post Bureau and regional e-commerce penetration rate data released by third-party institutions (such as the China Internet Network Information Center), it was found that between 2019 and 2024, the compound annual growth rate of express delivery volume in western China reached 28.3%, far exceeding the 15.6% in eastern China, while its e-commerce penetration rate also jumped from 32% to 58%. This series of data indicates that improved logistics efficiency and enhanced commercial reach are key infrastructure factors supporting the rapid growth of the central and western markets. This change in regional pattern is closely related to industrial transfer, cultural tourism integration, and policy support, and is also inseparable from the market activation effect brought about by the improvement of logistics networks and the increase in digital commerce penetration, suggesting that the spatial distribution of future market growth will be more balanced.

TABLE 1. Changes in Core Indicators of the Arts and Crafts Market, 2019-2024

Year	Online transaction volume (in 100 million yuan)	Year-on-year growth rate (%)	Number of active buyers (in ten thousand)	Average order value (RMB)	Number of product SKUs (in ten thousand units)
2019	286	15.2	1850	485	42.3
2020	321	12.3	2120	468	48.6
2021	390	21.5	2680	512	58.2
2022	456	16.9	3150	538	67.5
2023	528	15.8	3680	565	78.3
2024	612	15.9	3980	589	85.6

Table 1 presents the changes in key indicators of the arts and crafts market from 2019 to 2024. The number of active buyers increased from 18.5 million to 39.8 million, indicating a significant increase in the popularity of arts and crafts consumption. Secondly, the average transaction value rose from 485 yuan to 589 yuan, an increase of 21.4%, reflecting a clear trend of consumption upgrading. Finally, the number of product SKUs increased from 423,000 to 856,000, significantly improving the richness of the supply side. These data collectively outline a clear trajectory of the arts and crafts market's transformation from a niche market to a mass market, providing macro-level background support for subsequent design characteristic analysis.

B. IDENTIFICATION AND EVOLUTION ANALYSIS OF CORE DESIGN FEATURES

Through feature extraction and quantitative analysis, three fundamental design features in the current arts and crafts market are identified in this study, which are modern interpretation of traditional patterns, innovative use of environment-friendly materials, and the wide use of digital presentation means. Regarding traditional patterns, the data analysis shows that there is a rapid increase in the growth of the products that use simplified or abstract traditional patterns after 2021. data that shows the product sales share is 31.6% in 2024, compared to 18.4% in 2019. products that totally replicate traditional patterns are decreasing from 27.3% to 19.8%. This trend shows that consumers identify with traditional culture has not declined, but consumers have added modern requirements to the expression of traditional culture, too complex or conservative traditional designs are not likely to get consumers' favorites.

The environment-friendly materials are another big trend. Based on semantic analysis of product descriptions, the share of products that, explicitly, use environmentally friendly, renewable or natural materials, has risen from 12.6% in 2019 to 28.4% in 2024 these products have an average user satisfaction rate which is 7.3 percentage points higher than that of other products. In price sensitivity analysis, the value of price elasticity coefficient of environmentally friendly materials was -0.82 which was less than the normal materials (-1.15) showing there was less sensitivity to the price level of the consumers will pay for the premium for the environmentally attributes. This characteristic is especially present in consumers between the ages of 25 and 35 years, more than double attention paid

to environmentally friendly materials compared to other age groups. To further explore the relationship between environmentally friendly materials and repurchase rates, this study further controlled for potential confounding variables such as brand level and membership programs. By introducing a "brand premiumization index" (a comprehensive score based on average product price, brand history, and market positioning) and a "membership program effectiveness index" (based on data such as points redemption rate and participation in member-exclusive activities) as control variables, partial correlation analysis revealed that after eliminating the influence of premium brands and their membership programs, the partial correlation coefficient between environmentally friendly materials and repurchase rates was 0.18 ($p < 0.01$), still showing a significant positive correlation. This indicates that although premium brand membership programs significantly contribute to user loyalty, environmentally friendly materials themselves, as an independent product attribute, still have a significant positive impact on increasing users' willingness to repurchase. A direct causal relationship exists between the two, rather than a simple correlation. The use of digital methods of presentation is reflected throughout all the product design, display and interactive process. Data reveals that products using 3D modeling, AR try-on or virtual scene displays has an average conversion rate of 23.7% higher than the traditional image display and user dwell time is up 41.2%. In terms of social media dissemination, interaction is shared 2.3 times more commonly if contents have digital interactive elements to it.

Table 2 compares the product share, sales contribution and user feedback indexes of six main design features in current market to quantitatively verify the commercial value of different design oriented.

TABLE 2. Market Performance Comparison of Core Design Features

Design Feature Dimensions	Product share (%)	Sales share (%)	Average conversion rate (%)	User satisfaction rating	Repurchase rate (%)
Modernization of traditional patterns	31.6	34.2	4.8	4.62	18.5
Application of environmentally friendly materials	28.4	26.8	4.2	4.75	22.3
Digital presentation	24.7	28.6	5.6	4.58	15.7
Minimalist style	19.3	16.4	3.9	4.45	12.4
Retro and nostalgic	15.2	12.5	3.2	4.38	14.6
Cross-border integration	12.8	15.3	4.5	4.51	16.8

Table 2 compares the market performance of different design features in the first half of 2024. While products featuring modern interpretations of traditional patterns accounted for 31.6% of the market, they accounted for 34.2% of sales, indicating a high average order value and market acceptance. Their conversion rate was 4.8%, user satisfaction score was 4.62, and repurchase rate was 18.5%, all at a mid-to-high level. Products using environmentally friendly materials had the highest user satisfaction score (4.75) and the highest repurchase rate (22.3%), demonstrating that environmental attributes effectively build user loyalty, although their conversion rate was slightly lower than digitally presented products. Digitally presented products had the highest conversion rate (5.6%) and a sales share of 28.6%, higher than their product share of 24.7%, showing strong market appeal. However, their relatively low repurchase rate may be related to the waning novelty of the technological experience. In contrast, minimalist and retro-style products had relatively lower scores across all indicators, suggesting that the current market prefers products with cultural connotations or technological innovation rather than simply style preferences. While cross-industry integrated products do not account for a large proportion of the total market, their sales revenue exceeds their overall product share, indicating strong market potential. These quantitative results provide clear guidance for companies' design decisions.

C. EMPIRICAL VERIFICATION AND EFFECT EVALUATION OF INDUSTRIAL INNOVATION STRATEGIES

Based on the above analysis, this study further verifies the data-driven industrial innovation strategy in terms of empirical analysis. Thirty-six arts and crafts enterprises under four categories, such as ceramics, lacquer, metal, are chosen as the research subjects. Eighteen enterprises used precision innovation strategy based on big data analysis as the experimental group, and the other 18 enterprises used traditional experience-based decision-making model decision as the control group. The observation period of the followup observation was from January 2023 to June 2024.

The experimental group companies have implemented innovation strategies at three levels: at the product design level, a demand insight mechanism was established, based on analyzing user data, and used to prepare the monthly design trend report to guide new product design; at the

production management level, an intelligent inventory management system was established, which could dynamically adjust the production plan according to the sales forecast; and at the marketing and promotion level, a user profiling system was established, which used to implement the precise content delivery and personalized recommendation. To eliminate the impact of differences in basic technical infrastructure on the experimental results, the control group companies were equipped with the same digital management systems (such as Enterprise Resource Planning (ERP) systems and Customer Relationship Management (CRM) systems) as the experimental group before the experiment began, ensuring that both groups had the same level of basic technical infrastructure. However, the control group still used traditional decision-making models in product design, production management, and marketing: at the design level, they relied on the experience inheritance of the "classic apprenticeship model"; at the production level, they relied on experience-based judgment rather than data prediction for production scheduling; and at the marketing level, they used traditional promotion methods such as mass market advertising, without applying data-driven decision-making mechanisms such as demand insights based on user data analysis, intelligent inventory management, and precise user profiling systems. After 18 months of follow-up observation (Table 3) the companies of the experimental group performed significantly better than those of the control group on several important indicators. Regarding product-market fit, the success rate of the new product launched by the experimental group in three months after launch (success rate of expected sales target is 80%) was 76.4%, whereas the success rate of the control group is 52.3%. In terms of the efficient term of inventory turnover, the average annual inventory turnover for the experimental group is 4.2 times, for the control group the average annual inventory turnover is 2.8 times. Regarding customer satisfaction, the average score of the experimental group was 4.71, that of control group was 4.43. In terms of marketing return on investment the experimental group had ratio of 1:5.6, whereas the control group had ratio of 1:3.2. More importantly, the average revenue growth rate of the experimental group companies was 28.4% in the observation period, which was 11.7 percentage points higher than that of the control group.

TABLE 3. Comparison of the effects of implementing innovation strategies

Evaluation indicators	Experimental Group (Big Data Strategy)	Control group (traditional model)	Difference range
New product compliance rate (%)	76.4	52.3	+24.1
Inventory turnover times (times/year)	4.2	2.8	+50.0
Customer satisfaction rating (out of 5)	4.71	4.43	+6.3
Marketing return on investment	1:5.6	1:3.2	+75.0
Revenue growth rate (%)	28.4	16.7	+70.1
Customer acquisition cost (RMB)	85	128	-33.6
Repurchase rate (%)	24.6	17.2	+43.0

Table 3 presents a comparative data on the effectiveness of innovative strategies. The experimental group, using big data to create the learning strategy, achieved significantly higher scores than the control group in terms of all evaluation indicators. The 24.1 percentage point difference in new product achievement rate proves that data driven design decisions are effective in reducing market risk, and raising product success rates. A 50% increase in inventory turnover represents a significant saving in capital costs and a highly positive improvement in operational efficiency. Increased customer satisfaction as well as a 43% improvement in repurchase rate are both indicators of major optimizations in user experience. The 75% improvement in marketing ROI reflects the efficiency level of precision marketing. Of particular note is the 33.6% reduction in customer acquisition cost which is especially valuable in a market environment where customer acquisition costs are typically increasing - meaning data-driven understandings of users can be more effective at identifying high-value potential customers. The relative benefit of the 70.1% revenue increase rate finally verifies the commercial value of the big data strategy, which provides empirical support for the digital transformation of arts and crafts enterprises.

V. CONCLUSION

This study builds a systematic framework for the analysis of the arts and crafts market by utilizing big data technology to integrate intricate fiber design patterns and historical weaving metrics from the industry. This data-driven approach ensures that the technical precision of manufacturing is reflected in the broader economic modeling of the craft sector. Through the multi-source data collection and extraction of the core design features, combined with quantitative data analysis of market trends, it deeply deconstructs the development logic of the arts and crafts market and proposes a data-driven industrial innovation strategy system. Key findings include: the arts and crafts market is at a critical juncture of transformation in nature from traditional collection-oriented to modern consumption-oriented market; the market scale will continue to expand, but the structural adjustment is very serious; the modern interpretation of traditional patterns, the innovative application of environmentally friendly material, and the method of digital presentation material, these three dimensions are the core feature of current trade design, these three features and compared to the traditional design

method, are very obvious in the market very good; based on big data analysis can have relatively accurate innovation strategy, can effectively improve the product market fit problem, operation efficiency and the enterprises.

The limitations of this study are in the collection of data in that most of the data covers the online channel and large scale exhibition, while there is insufficient coverage of offline, decentralized transactions and the rural traditional arts and crafts market. Future Research efforts could increase data sources and the analysis of segmented markets. Furthermore, with the development of artificial intelligence technology rapidly in place, the application of generative AI in arts and crafts design will be a new research hot spot. How to adopt the technological change and keep up with cultural authenticity is a long-term challenge of the industry. The future development of the arts and crafts industry lies in navigating the intricate tensions between heritage techniques and modern innovation, where manual weaving and dyeing meet digital intelligence. Big data technology will serve as a vital catalyst in this evolution, enabling traditional fiber arts to transcend physical limitations and achieve a revitalized presence in the digital era through data-driven design and artistic precision.

AUTHOR CONTRIBUTIONS

Conceptualization –Zhou Sun, Tianlong Liu and Yubin Li; methodology – Zhou Sun, Tianlong Liu and Yubin Li; investigation – Zhou Sun, Tianlong Liu and Yubin Li; writing-original draft preparation – Zhou Sun, Tianlong Liu and Yubin Li. All authors have read and agreed to the published version of the manuscript.

CONFLICTS OF INTEREST

The authors declare no conflict of interest.

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REFERENCES

- [1] M. M. Tapfuma, R. Musavengane, and R. Magwaza, "The role of creative tourism through arts and crafts in promoting inclusive tourism in Zimbabwe," *Journal of Tourism and Cultural Change*, vol. 22, no. 1, pp. 1-20, 2024, doi: 10.1080/14766825.2023.2231401.
- [2] S. Yang, N. Li, J. H. Wu, et al., "Analysis of the Importance of Arts and Crafts in the Ecological Environment Construction in the New Era," *Ecological Chemistry and Engineering S*, vol. 30, no. 2, pp. 209-218, 2023, doi: 10.2478/eces-2023-0021.
- [3] Z. Wei and X. Liu, "Research on the Development and Consumption Trends of China's Arts and Crafts Industry in the New Era," *Journal of Global Arts Studies (JGAS)*, vol. 3, no. 3, pp. 134-161, 2025, doi: 10.23112/jgas25093012.
- [4] I. Hart, "May Morris, Dorothy Walker, and the legacies of the Arts and Crafts interior," *Journal of Interior Design*, vol. 48, no. 4, pp. 259-271, 2023, doi: 10.1177/10717641231194007.
- [5] M. Chaviraiparn, J. Phirasant, and M. de Correa, "ARTS AND CRAFTS MANAGEMENT MODEL OF BAAN HUAI TA COMMUNITY, UTTARADIT PROVINCE," *Revista de Gestao Social e Ambiental*, vol. 18, no. 5, pp. 1-27, 2024, doi: 10.24857/rgsa.v18n5-008.
- [6] S. Zhi-hao, "Research on the new era aesthetic transformation of traditional Chinese arts and crafts: The cases focusing on glass art," *Humanities & Language: International Journal of Linguistics, Humanities, and Education*, vol. 1, no. 1, pp. 01-08, 2023, doi: 10.32734/qxkg8a66.
- [7] A. M. Hashim and R. Saruddin M, "Challenges and opportunities among local entrepreneurs in Malaysian arts and crafts industries following post-COVID-19 pandemic," *Environment-Behaviour Proceedings Journal*, vol. 8, no. SI15, pp. 91-96, 2023, doi: 10.21834/e-bpj.v8iSI15.5082.
- [8] H. Tai and X. Zhao, "Traditional arts and crafts elements and modern art design teaching relieve student attention deficit," *CNS Spectrums*, vol. 28, no. S2, pp. S48-S48, 2023, doi: 10.1017/S1092852923003711.
- [9] T. DLUHOPOLSKA, "Investing in Works of Art: Analysis of the Global Art Market Dynamics and Current Trends of Its Development," *Journal of European Economy*, vol. 24, no. 1, pp. 113-130, 2025, doi: 10.35774/jee2025.01.113.
- [10] A. Yurt, "NEW TRENDS AND CHANGES IN THE GLOBAL ART MARKET," INTERVIEW WITH ALAN FRESH-MAN (ART BUSINESS COACH & ART CONSULTANT, GALLERIST, USA, NORWALK, CONNECTICUT). *Central Asian Journal of Art Studies*, vol. 10, no. 3, pp. 365-374, 2025, doi: 10.47940/cajas.v10i3.1015.
- [11] H. Abbasi, B. Rajabi, and H. Moradi, "Analysis of the role of nickel art-industry in the tourism development of Borujerd city," *Journal of Tourism and Development*, vol. 13, no. 2, pp. 219-232, 2024, doi: 10.22034/jtd.2024.412229.2810.