



Working together  
www.rcis.ro

## **Revista de Cercetare și Interventie Sociala**

ISSN: 1583-3410 (print), ISSN: 1584-5397 (electronic)

---

### **INTERVENTION STRATEGIES FOR THE IMPACT OF SOCIAL CONSUMER BEHAVIOR ON MUSEUM CULTURAL AND CREATIVE PRODUCTS**

*Jialin HU, Hasnul Azwan AZIZAN-MAHDZIR, Yulin TAN*

---

Revista de cercetare și intervenție socială, 2024, vol. 87, pp. 97-108

<https://doi.org/10.33788/rcis.87.6>

Published by:  
Expert Projects Publishing House



On behalf of:  
„Alexandru Ioan Cuza” University,  
Department of Sociology and Social Work  
and  
HoltIS Association

# Intervention Strategies for the Impact of Social Consumer Behavior on Museum Cultural and Creative Products

Jialin HU<sup>1</sup>, Hasnul Azwan AZIZAN-MAHDZIR<sup>2</sup>, Yulin TAN<sup>3</sup>

## Abstract

This article focuses on the impact of social consumption behavior on the innovation of museum cultural and creative products, as well as corresponding intervention strategies. With the increasing demand for cultural consumption in society, understanding and adapting to consumer behavior patterns has become the key to promoting the development of museum cultural and creative products. By carefully observing and analyzing consumers' purchasing habits, browsing preferences, and review feedback, we can gain a deeper understanding of their deep cultural identity, price sensitivity, and design style preferences. In order to achieve this goal, the museum has adopted visual survey technology to display design sketches in the form of 3D animation, allowing consumers to personally experience product effects and collect more direct and immediate feedback. This interactive process not only accelerates the iterative optimization of the product, but also increases consumer engagement and satisfaction, thereby promoting brand loyalty.

*Keywords:* data mining; consumer behavior; museum cultural and creative products; innovation research; social media; social influence.

---

<sup>1</sup> College of Creative Arts, Universiti Teknologi MARA (UiTM) Cawangan Kedah, Kampus Sungai Petani, 08400 Merbok, Kedah Darulaman, MALAYSIA; Luliang Vocational and Technical College, Shanxi, 032300, CHINA, E-mail: 2022132069@student.uitm.edu.my; ORCID: 0009-0006-0850-9081 (Corresponding author)

<sup>2</sup> College of Creative Arts, Universiti Teknologi MARA (UiTM) Cawangan Kedah, Kampus Sungai Petani, 08400 Merbok, Kedah Darulaman, MALAYSIA, E-mail: hasnul622@uitm.edu.my; ORCID: 0009-0001-6348-364X

<sup>3</sup> College of Creative Arts, Universiti Teknologi MARA (UiTM) Cawangan Kedah, Kampus Sungai Petani, 08400 Merbok, Kedah Darulaman, MALAYSIA, E-mail: 2022195251@student.uitm.edu.my; ORCID: 0009-0008-9148-7411

## Introduction

From a global perspective, the cultural and creative industry of museums in China is still in its infancy compared to mature systems abroad, with a relatively low overall level of development and a lack of complete supporting systems and clear development paths. Although a few leaders, such as the Palace Museum, have made remarkable achievements in cultural and creative product design and market promotion by building the “+Internet” ecological model, most domestic museums still face many challenges in the innovative design of cultural and creative products (Lorusso, Rossoni, & Colombo, 2020). Currently, there are problems with unclear design concepts and ideas, as well as serious homogenization in the design of cultural and creative products in domestic museums, which directly leads to a lack of uniqueness and market competitiveness of the products. At the same time, due to insufficient sensitivity to market and user feedback, product design often struggles to accurately meet consumer needs, lacks innovation and technological sense, and is difficult to integrate into modern life scenarios, thus limiting the further development of museum cultural and creative industries. In response to this situation, it is particularly important to introduce consumer behavior analysis techniques based on data mining (Bernardo & Duarte, 2021). This technology can deeply explore consumers’ purchasing behavior, preference patterns, and emotional tendencies, providing accurate data support for the design of museum cultural and creative products. Through data analysis, we can gain a clearer understanding of consumers’ real needs, predict market trends, guide the design direction of cultural and creative products, avoid homogeneous competition, and enhance product innovation and differentiation.

In today’s era, consumer behavior has an increasingly significant impact on museum cultural and creative products, and the development of intervention strategies has become particularly important (Station B). Consumers are no longer limited to traditional modes of visiting and purchasing, their choices are more diverse, and their needs are more personalized. This change requires museums to re-examine the design and marketing strategies of their cultural and creative products in order to better adapt to and meet the needs of consumers (Paprocki, 2018). Firstly, with the diversification of consumer behavior, the design of museum cultural and creative products is no longer solely focused on the form and function of the product, but also pays more attention to the cultural connotation, educational significance, and emotional value that the product can provide. Consumers are not only seeking material satisfaction when purchasing these products, but also seeking spiritual resonance and identification (Abugharbieh & Marar, 2019). Therefore, museums need to have a deep understanding of consumers’ psychological needs, cleverly combine cultural elements with creative design, and create products that are both aesthetically pleasing and culturally rich. Secondly, changes in consumer behavior require museums to make adjustments in their marketing strategies. Traditional promotion methods are no longer sufficient to meet the information

acquisition habits of modern consumers. Therefore, museums need to rely on various channels and methods, such as social media, online and offline interactive experiences, to expand the exposure and influence of their products (Cowan, 2019). At the same time, museums should also pay attention to communication and feedback with consumers, timely understanding their needs and opinions, in order to continuously optimize and improve products.

In addition, combining the concept of product service system design, the museum cultural and creative industry can further expand its service scope, transforming the traditional physical product sales model into a comprehensive solution that integrates products and services. This not only helps to enhance consumers' shopping experience, but also increases the added value of products through value-added services, achieving sustainable development of cultural and creative products. Specifically, museums can use data mining techniques to analyze multidimensional data such as consumer purchase history, browsing behavior, and social media interactions, construct user profiles, and customize personalized cultural and creative products for different user groups. At the same time, with the help of computer-aided design tools such as CAD and AI algorithms, the product design process is optimized to improve design efficiency and quality. In the process of product design, attention should be paid to exploring cultural connotations and integrating modern technological elements, so that cultural and creative products have both traditional charm and modernity, and can better integrate into people's daily lives. In summary, by introducing consumer behavior analysis techniques of data mining and the concept of product service system design, China's museum cultural and creative industry is expected to achieve a comprehensive upgrade from design to market, enhance product innovation and market competitiveness, and promote the healthy development of the entire industry. This not only helps to inherit and promote excellent traditional Chinese culture, but also injects new vitality into the transformation and upgrading of the economy and society.

## **Related Research**

As an important battlefield for cultural inheritance and innovation, the design and market acceptance of museum cultural and creative products are directly related to the expansion of their social influence and the improvement of their economic benefits. However, in the development process of China's museum cultural and creative industry, there are common challenges such as vague design concepts, serious product homogenization, and slow response to market feedback (Pelliccia, Bojko, & Prielipp, 2021). These problems seriously constrain the innovation pace and market competitiveness of cultural and creative products. Therefore, it is crucial for the museum cultural and creative industry to deeply analyze consumer behavior and develop effective intervention strategies based on it. Through data mining techniques, we can systematically collect, organize,

and analyze multidimensional data such as consumer purchase history, preference changes, feedback opinions, etc., in order to reveal the consumer needs and behavior patterns hidden behind the data (Pradhan & Dhupal, 2022). These pieces of information can not only help museums clarify their design direction and avoid product homogenization, but also guide them in accurately positioning their target market, improving their sensitivity and response speed to market feedback.

By analyzing consumer purchasing history, frequency, and amount, we can understand their purchasing preferences and purchasing power, and provide a basis for pricing strategies and promotional activities for cultural and creative products. Using website visit logs, social media interactions, and other data, analyze consumers' attention, interest points, and browsing paths towards cultural and creative products, and provide guidance for product optimization and page design. Through natural language processing technology, sentiment analysis is conducted on textual data such as consumer evaluations and social media comments to understand consumer satisfaction and feedback on cultural and creative products, providing direction for product improvement. Provide customized cultural and creative product services based on consumers' personalized needs. For example, using AI algorithms to analyze consumers' interests and preferences, recommending cultural and creative products that match their personal preferences (Aizhambaeva, Zhetessova & Nikonova, 2019). Deeply explore the cultural connotations of museums, combine traditional cultural elements with modern design concepts, and create cultural and creative products that have both cultural characteristics and conform to modern aesthetic trends. Continuously optimize the user experience of cultural and creative products through user feedback and behavioral data analysis. For example, improving the material, craftsmanship, packaging, and other aspects of the product to enhance user satisfaction and loyalty.

Although museum cultural and creative industries are an important branch of the cultural and creative industry, in recent years, the government, industry, academia, and research circles have not yet formed a clear and unified definition of them. Zhao defined the connotation of museum cultural industry for the first time based on the concept of cultural industry, that is, "the cultural industry of museums refers to a cultural industry that uses museums as its main resources and engages in the production, operation, and service of museum cultural products (Zhao, 2022). At this stage, the concept has not yet attached importance to the use of creative elements. Some scholars emphasize the introduction of cultural concepts in the museum cultural and creative industry. She believes that the museum cultural and creative industry currently lacks the support of brand concepts. She suggests integrating brand concepts into the development of the cultural industry, fully exploring the unique cultural connotations of museums, and developing them into the core competitiveness of the museum cultural industry (Liu *et al.*, 2023). Museum cultural and creative products are an extension and development of the profound cultural foundation of museums. The "I Know" tape launched by the National Palace Museum in Taipei has become popular on the internet and has

made museum cultural and creative products a highly anticipated focus of public attention. Inspired by this marketing event, many museums in China have launched their own museum cultural and creative products. Of course, the scope of museum cultural and creative products is relatively broad, and some scholars refer to them as museum derivatives or museum cultural derivatives. In recent years, some scholars have begun to use the concept of museum cultural and creative products. Museum cultural and creative products are defined as cultural products derived from museum resources, possessing the general attributes of materialization and value of spiritual labor, as well as special attributes such as cultural dissemination, humanistic value appreciation, resource uniqueness, artistic creation, purpose orientation, and public benefit feedback. Based on the relationship between the comprehensive cultural and creative industries and museums, it is believed that cultural and creative products, as the most creative and dynamic connecting medium between museums and society, play a role in promoting interaction between museums and the general public, and help promote cultural dissemination.

### **Data Mining Based Optimization Model for Cultural and Creative Product Art Design**

In today's market environment, consumer behavior analysis has become an indispensable part for enterprises to understand market demand and guide product design optimization, especially in the museum cultural and creative industry, where its importance is more prominent. By deeply understanding key behavioral characteristics such as consumer preferences, purchasing habits, and emotional feedback, we can provide precise consumer perspectives for the design of cultural and creative products. Firstly, we need to comprehensively collect and analyze consumer behavior data from multiple channels, including sales records of museum cultural and creative products, user evaluations, social media interactions, and offline experience feedback. These data will help us outline a complete picture of consumers, clarify their preference trends and potential needs. Next, based on the results of consumer behavior analysis, we will develop targeted intervention strategies to optimize the artistic design of cultural and creative products. In this process, we focus on integrating consumers' actual needs and aesthetic preferences into product design, ensuring that the product not only has cultural connotations, but also touches consumers' emotional resonance. In order to further enhance the innovation and uniqueness of the design, we introduce optimization techniques from artificial intelligence (represented by intelligent optimization algorithms such as SAA), which intelligently adjust various dimensions of the design based on consumer behavior data, such as color matching, pattern innovation, material selection, etc. This data-driven design optimization method allows us to constantly explore the boundaries of design and lead the trend while respecting market rules. In this process, computer technology plays a crucial role. It not only provides

technical support for precise visualization of data, but also makes the presentation and adjustment of design optimization results more convenient and efficient. Through human-machine collaboration, we can respond more quickly to market changes and achieve continuous optimization and iteration of designs.

One of the core contents of this article is an optimization model for cultural and creative product art design based on artificial intelligence and consumer behavior analysis. This model aims to optimize the artistic design of cultural and creative products through SAA (a hypothetical intelligent optimization algorithm representing optimization techniques in artificial intelligence), while closely integrating the results of consumer behavior analysis to ensure that the design meets market demand and is innovative. Firstly, we focus on collecting and analyzing consumer behavior data in depth. These data extensively cover multidimensional information such as consumer preferences, purchasing behavior, usage feedback, and social media interactions. Through in-depth mining of these data, we can accurately grasp consumers' real needs and aesthetic trends, providing strong market guidance for the artistic design of cultural and creative products. Next, we will integrate the results of consumer behavior analysis into the mathematical model for optimizing the artistic design of cultural and creative products. This model not only defines the concept and scope of design variables, but also establishes mathematical expressions of design goals and constraints based on consumer behavior data. For example, design goals may include increasing the attractiveness of the product, enhancing user experience, or meeting the preferences of specific consumer groups; Design constraints may involve factors such as cost control, production feasibility, and cultural sensitivity. In the process of solving the model, SAA technology is used to intelligently explore the design space and find the optimal or near optimal design solution that satisfies all constraints. This process not only relies on powerful computing power, but also fully utilizes the insights provided by consumer behavior analysis to ensure that the design results are both in line with market rules and full of innovative vitality. Compared with product modeling design based on traditional algorithm, SAA is more conducive to simulating the detailed design process in design thinking. The basic process is shown in Figure 1. Specifically, the realization method of the optimization model of Wenchuang product art design based on SAA mainly includes the following steps: 1) Parameter setting: according to the characteristics and requirements of Wenchuang product art design optimization, set SAA parameters, including initial temperature, cooling coefficient, minimum temperature and so on. 2) Problem coding: Code the parameters and objective function of Wenchuang product art design, so as to facilitate SAA's search and optimization. 3) Initialization: Initialize the state of SAA according to the result of problem coding, including the initial values of design variables and optimal solutions. 4) Iterative search: On the basis of initialization, SAA starts iterative search. In each iteration, a new candidate solution is generated according to the current state, the objective function value is calculated, and the selection is made according to the comparison result between

the objective function value and the current optimal solution. Moreover, the temperature is gradually reduced according to the cooling coefficient to increase the probability of accepting poor solutions. 5) Result output: After a certain quantity of iterations, SAA converges to the optimal solution or the optimal solution meeting certain accuracy requirements. At this time, the artistic design parameters of Wenchuang products corresponding to the optimal solution are output, and the optimization results are visually displayed and operated by using CAD.

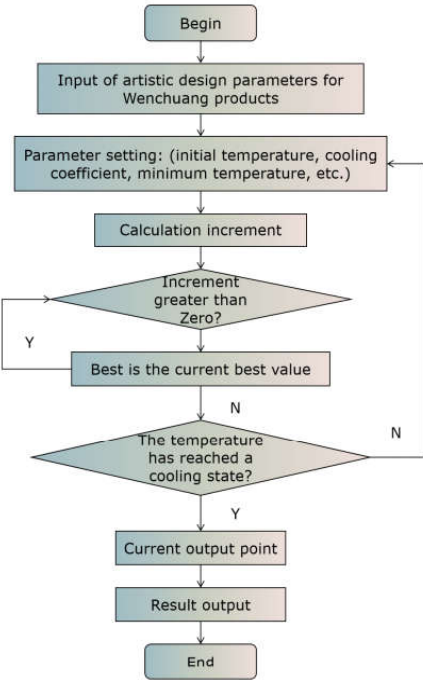


Figure 1: Basic process of SAA

After the training of the art design optimization model for museum cultural and creative products, this article further integrates consumer behavior analysis techniques of data mining to verify and optimize the design of cultural and creative products through visual surveys. This method not only focuses on optimizing visual elements such as shape, color, and material of cultural and creative products, but also delves into the data patterns behind consumer behavior to ensure that cultural and creative products can accurately meet market demand. Firstly, utilizing data mining techniques to collect consumer behavior data from multiple channels such as museum membership systems, e-commerce platform transaction records, and social media feedback. These data cover consumers’ purchase history, browsing preferences, review feedback, and social interactions, providing rich materials for in-depth analysis of consumer behavior. Through data mining techniques such



as association rule mining, clustering analysis, and classification algorithms, we have revealed key decision-making factors for consumers when choosing cultural and creative products, such as cultural identity, price sensitivity, and design style preferences. Based on the analysis results of data mining, targeted adjustments have been made to the art design optimization model of cultural and creative products. Subsequently, this article adopts advanced visual survey techniques to demonstrate different design schemes of cultural and creative products through 3D animation simulation. By using ISA/EISA/Micro Channel extension bus to load 3D animation survey instructions for cultural and creative products, combined with IoT technology and embedded technology, the full area grid display of cultural and creative product art design has been achieved. Designers and consumers can observe the details of cultural and creative products from different angles and intuitively feel the design effect through operations such as rotation, scaling, and movement. Visual surveys not only provide designers with intuitive evaluation tools, but also achieve iterative optimization of cultural and creative products by collecting real-time feedback from consumers (As shown in Figure 2). Consumers can express their preferences and opinions while watching 3D animation displays, and these feedback data are once again incorporated into the data mining process for further analysis of consumer behavior trends and potential needs. Through this closed-loop feedback mechanism, the design of museum cultural and creative products continues to align with consumer needs, achieving a dual improvement in design efficiency and quality.



*Figure 2: Original Creative Product Art Design*

## Results and Analysis

Table 1 shows the reliability coefficient table of the overall analysis of the pre survey questionnaire using SPSS 26.0. The table shows that the Cronbach's coefficient is 0.875, and the standardized Cronbach's coefficient is 0.875, both of which are greater than 0.8, indicating that the overall reliability of the questionnaire is relatively high.

Table 1: Overall Reliability Analysis Results of Pre survey Questionnaire

Cronbach's coefficient	Based on standardized Cronbach's coefficients	Number of projects
0.875	0.875	36

In this study, the main factors were measured in the form of scales, so verifying the data quality of the measurement results is an important prerequisite for ensuring the significance of subsequent analysis. The above table shows the internal consistency analysis of the questionnaire during the pre survey process. Based on the data results, we can see that the Cronbach's coefficients of the six factors of perceived value are all greater than 0.7, indicating a high overall reliability; The Cronbach's alpha coefficient for perceived cost is 0.523, indicating relatively low reliability. Therefore, the perceived cost item has been revised: both the purchase intention and the willingness to integrate new media factors are 0.8, indicating high reliability. After removing the five items of emotional value 2, social value 4, cultural value 4, new media field value 1, and consumer behavior 2, the corresponding Cronbach's coefficients showed a significant improvement. Therefore, these five items will be removed from the final questionnaire.

The data for this study mainly comes from sales and visit records of multiple e-commerce platforms, social media, and museums themselves. Through data cleaning, integration, and mining, we extracted multidimensional information such as consumer purchasing behavior, browsing preferences, and evaluation feedback, and conducted in-depth analysis of the data using methods such as association rule mining, cluster analysis, and sentiment analysis.

Table 2: Characteristics of consumer groups

Group characteristics	Proportion	Characteristics of purchasing behavior	Proportion	Product preference features	Proportion
26-35 years old	50%	Self consumption	70%	Retro style	65%
36-45 years old	25%	Gift giving	20%	Minimalism	20%
46 years old and above	15%	Collection	10%	Cute/Cute	15%

In terms of product design style, consumers present diverse preferences, among which artistic/elegant and retro styles are more popular. In terms of product categories, stationery and daily necessities have become the preferred choices for consumers. Meanwhile, most consumers are more price sensitive and tend to choose products at medium to high price points. Consumers have a positive overall evaluation of museum cultural and creative products, with unique design and rich cultural connotations being the main reasons for receiving positive reviews. However, high prices and similar designs have also become negative evaluation points for some consumers.

Museum cultural and creative products should focus on targeting young people, especially urban white-collar workers and students, while also paying attention to the needs of female consumers. In design, attention should be paid to innovation and personalization, avoiding design similarity, while incorporating rich cultural connotations to enhance the added value of the product. Strengthen the construction and promotion of e-commerce platforms, enhance the convenience and experience of online shopping, while maintaining the uniqueness and interactivity of offline sales. Based on the actual value of the product and market demand, develop a reasonable pricing strategy to avoid high prices leading to consumer loss. Establish an effective consumer feedback mechanism, collect and process consumer opinions and suggestions in a timely manner, and continuously optimize products and services. In summary, through data mining and consumer behavior analysis techniques, museum cultural and creative products can more accurately grasp market demand, enhance product innovation and market competitiveness, and achieve sustainable development. Firstly, data mining techniques enable us to accurately depict the target consumer group profile of museum cultural and creative products. Research has found that young people, especially urban white-collar workers and students aged 18-35, are the main consumers of cultural and creative products, with a higher proportion of female consumers. This discovery emphasizes the need for cultural and creative product design to pay more attention to youthfulness and female aesthetic trends in order to meet the needs of this core consumer group. Secondly, through consumer behavior analysis, we have clarified the positioning

and differentiation strategy of cultural and creative products in the market. Consumers show a high level of interest in products that are uniquely designed, culturally rich, and highly practical. Therefore, innovation in museum cultural and creative products should focus on the combination of design novelty, cultural depth, and practical functionality, avoiding simple replication and homogeneous competition. Meanwhile, a reasonable pricing strategy is also an important factor in attracting consumers, which requires comprehensive consideration of product costs, market acceptance, and consumer willingness to pay. Furthermore, data mining techniques have revealed the importance of sales channels and consumer experience. E-commerce platforms have become the main channel for consumers to purchase cultural and creative products, which requires museums to strengthen the construction and operation of online channels while maintaining their offline experience advantages, and enhance shopping convenience and interactivity. In addition, digital platforms such as social media are also effective ways to spread the cultural value of cultural and creative products and enhance brand influence. Finally, the study emphasizes the crucial role of consumer feedback in cultural and creative product innovation. By establishing effective feedback mechanisms, collecting and processing consumer opinions and suggestions in a timely manner, museums can continuously optimize product design, improve service quality, and enhance consumer loyalty and satisfaction. This consumer centered design concept is the key to continuous innovation and maintaining market competitiveness of cultural and creative products.

## **Conclusion**

This study deeply analyzes the impact of consumer behavior on the innovation of museum cultural and creative products, providing scientific basis and practical guidance for product design and marketing strategy formulation. The research results show that consumer behavior directly reflects subtle changes in market demand and preferences, providing direction for the development of cultural and creative products. Specifically, the young consumer group has shown a high level of enthusiasm for cultural and creative products, preferring products that integrate unique designs, contain profound cultural connotations, and have practical functions. This discovery has prompted museums to pay more attention to youthfulness and personalized design in the creation of cultural and creative products, in order to accurately match the preferences of this core consumer group. Through careful observation of consumer behavior, we have identified key factors that influence purchasing decisions, such as price sensitivity, brand loyalty, and shopping channel preferences. These insights have prompted museums to adopt a series of strategies, including optimizing pricing strategies to enhance cost-effectiveness perception, strengthening brand building to enhance consumer identification, and expanding diverse sales channels to meet the shopping habits

of different consumers. These measures have effectively enhanced the market competitiveness of museum cultural and creative products.

### References

- Abugharbieh, K., & Marar, H.W. (2019). Integrating multiple state-of-the-art computer-aided design tools in microelectronics circuit design classes. *Computer Applications in Engineering Education*, 27(5), 1156-1167, DOI: 10.1002/cae.22143.
- Aizhambaeva, S., Zhetessova, G., & Nikonova, T. (2019). Modeling Arc Spraying Process for Eccentric Sleeve of Cone Crusher GP 500 Using CAD. *Materials Science Forum*, 970(11), 343-355, DOI: 10.4028/www.scientific.net/MSF.970.343.
- Bernardo, N., & Duarte, E. (2021). Immersive Virtual Reality in an Industrial Design Education Context: What the Future Looks Like According to its Educators. *Computer-Aided Design and Applications*, 19(2), 238-255, DOI: 10.14733/cadaps.2022.238-255.
- Lorusso, M., Rossoni, M., & Colombo, G. (2020). Conceptual Modeling in Product Design within Virtual Reality Environments. *Computer-Aided Design and Applications*, 18(2), 383-398, DOI: 10.14733/cadconfp.2020.162-166.
- Paprocki, M. (2018). The use of methods and computer aided systems in the ecological design of product development. *Mechanik*, 91(1), 73-75, DOI: 10.17814/mechanik.2018.1.17.
- Pelliccia, L., Bojko, M., & Prielipp, R. (2021). Applicability of 3D-factory simulation software for computer-aided participatory design for industrial workplaces and processes. *Procedia CIRP*, 99(1), 122-126. DOI: 10.1016/j.procir.2021.03.019.
- Pradhan, S., & Dhupal, D. (2022). An Integrated Approach of Simulation, Modeling and CAD of Hot Abrasive Jet Machining Setup, *Journal of Advanced Manufacturing Systems*, 21(03), 427-472, DOI: 10.1142/S0219686722500123.
- Zhao, Z. (2022). Analysis of museum cultural creation from the perspective of cultural industry. *Scientific Programming*, 2022(1), 8138574, DOI: 10.1155/2022/8138574.