Exploration on the Integration and Innovation of Art Design and User Experience

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Abstract: With the rapid progress of modern society, the requirements for art design and services are also increasing. In order to meet people's aesthetic needs and spiritual desires, it is necessary to integrate art design with user experience to achieve mutual promotion and improvement of the two. This article mainly explored the connection between art design and user experience, and delved into the complementary relationship between the two. In addition, through in-depth analysis of the current market situation and problems, it was found that current art designers lack humanized management and homogeneous competition when creating art works. This article tested a model that integrates art design and user experience. The test results showed that the task completion time was within 6 seconds, and the level of operation was also moderately easy; the error rate was within 3%, and the satisfaction rate was between 0.82 and 0.87; the pleasure level was between 0.85 and 0.96; the interest level was between 0.83 and 0.96; the user's click through rate was usually around 0.8, and the smoothness fluctuated around 0.95; the originality and innovation of combining artistic creation with user experience were both above 74%. These made art design closer to the public and provided more personalized services for people.

1. Introduction

Art design and services are playing an increasingly important role in today's society, with significant changes in socio-economic, cultural, and lifestyle. Art design not only possesses creativity and technicality, but also has ornamental value and commercial benefits. Therefore, designers should closely follow market trends and create works based on user needs to meet the spiritual enjoyment needs of consumers at different levels. At the same time, they should also integrate aesthetic ideas into their services and provide customers with more humane and psychological products and experiences, thereby enhancing their position and influence in society.

Chinese scholars mainly focus on internal design and engineering practice. Some scholars

believe that 'art' is a highly comprehensive and integrated creative activity with certain cultural connotations. Therefore, in order to better promote social and economic development, it is necessary to integrate art into the entire human spiritual activities, making it a way of life and a mode of thinking, in order to ensure social harmony and order [1-2]. Other scholars believe that art design is a creative activity aimed at aesthetics. By applying aesthetic principles and laws, art design expresses people's pursuit and appreciation of beauty, which can analyze the interaction between people, the environment, and works from a psychological perspective, as well as the impact on the spiritual level of human beings [3-4]. Therefore, this article would study the integration and innovation of art design and user experience.

Art design, as a comprehensive social activity, to a certain extent reflects the cultural, political, and economic development level of a country or region. Against the backdrop of fast-paced life and increasing aesthetic demands, art design no longer only meet practical functions. From the perspective of user experience, this article studied how to effectively apply aesthetic principles to create more infectious and widely recognized works, in order to enhance one's own quality and social value in the art market.

2. Discussion on the Integration and Innovation of Art Design and User Experience

2.1 Functions of Art Design and User Experience

The creation of art originates from life, but it transcends life itself. It not only contains the connotation of ideas, but also contains rich emotional accumulation, as well as various factors such as understanding the value and significance of life. In the design process, it is first necessary to conduct product research to understand market demand and customer psychological characteristics, as well as their preferences for work creation style, color selection, and other aspects. Secondly, designers need to find the material information needed to express the theme and emotional content based on their own preferences or uninterested elements, and use certain software to transmit it to users [5-6]. In today's fast-paced life, there is enormous social pressure and heavy work and study pressure. While people gradually pursue spiritual enjoyment and material needs, they also hope to relax and release their inner selves. Art designers apply materials and space to their products through reasonable planning, making the elements used more diverse and layered; At the same time, it is necessary to fully utilize colors to enhance the visual impact of the work itself, leaving a deep impression in people's hearts, and meeting emotional and psychological needs. Figure 1 shows the integration process of art design and user experience.
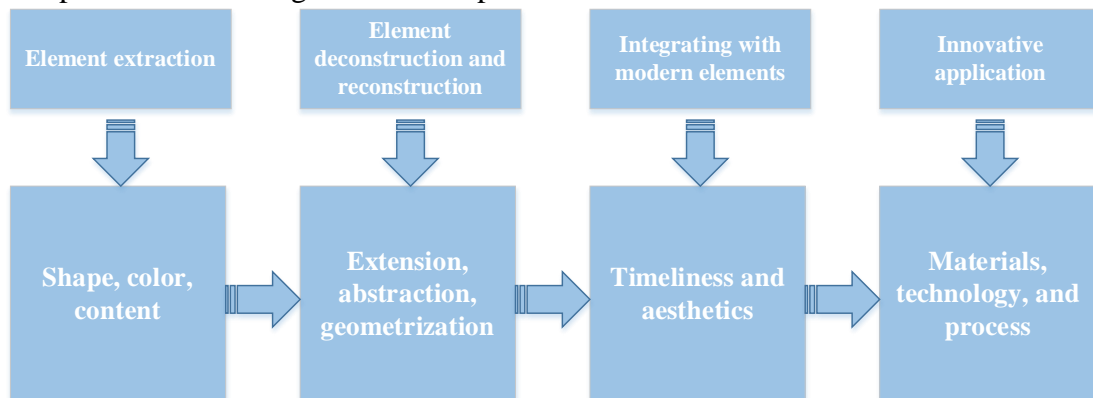

Figure 1. Integration process of art design and user experience

Art design and user experience are complementary and closely related, and there is a close

mutual influence between the two. art design should be committed to meeting the public's pursuit of personalized services and aesthetic needs. From a psychological perspective, people have certain psychological and physiological characteristics when perceiving artistic works, which in turn can trigger changes in people's emotions and behavior at multiple levels, resulting in a series of social relationships such as emotional experience, sense of belonging, identity recognition, and psychological security, all of which belong to the category of human emotions. Every artistic creativity has its own uniqueness. Every artist expresses their personal thoughts or emotions through their own life experiences and embodies them in their works. At the same time, artists are also a type of information transmitter, who integrate and adjust different styles and personality factors into the design and creation process based on the ideas, emotions, and aesthetic experiences conveyed by their works [7-8]. During the interaction process, designers should fully utilize various methods such as online and offline media, community platforms, etc., to achieve communication and exchange. For example, works can be discussed through online forums or WeChat groups, and other artists can be presented with their own artistic works and related content such as different styles and personality traits, which can be uploaded to professional design teams to achieve resource and technical advantages sharing, thus making art design more approachable.

2.2 Optimization of Data Mining Rules for Art Design

Data mining is the process of revealing hidden patterns by analyzing a large amount of information, which can be used as a basis to design systems that better meet user needs and enhance user experience. In a complete data mining system, the original database, text classification, and other related types can be used as sample sets to study the common relationships between different categories or test their similarity and correlation. By extracting useful information from duplicate data, classifying and processing it, a completely new system is ultimately established [9-10]. Data mining technology mainly includes three levels: firstly, for objects or things that are related but not closely related, it is necessary to determine the logical correlation points between them to determine whether they affect each other. Secondly, for abnormal phenomena or certain regular problems, it is necessary to find the logical correlation points between them and other factors. At the same time, it is also necessary to consider the complexity and computational time of data mining algorithms themselves, in order to avoid increasing error rates and reducing efficiency due to repeated operations. Based on defining the set I, set T, and transaction database of items for the same category of data, two mappings can be defined:

$$X \in I, f(x) = \{y \in T \mid \forall X \in X, (x, y) \in DB\} \quad (1)$$

$$Y \in T, g(x) = \{x \in I \mid \forall Y \in Y, (x, y) \in DB\} \quad (2)$$

One of the commonly used methods for classifying a large amount of different types of information is the hierarchical structure method. Through this method, information can be classified, organized and predicted. In addition, the probability density function rule is often applied to determine the similarity between different categories, in order to study the relationship between the attributes of things. In mathematics, if a function g(f(X))=X holds, then X is called the closed set of elements. Similarly, if f(g(Y))=Y holds for a certain function, Y is called a closed label set. When the closed set of elements is X and the closed set of labels is Y, the binary relationship (X, Y) is referred to as a concept [11-12]. For any set of common elements X, the set of common closed elements of X can be obtained by applying operations f and g. This method can help reduce repetitive work in data processing and extract missing or invalid parts from the original sample. In sensitive and difficult to detect situations such as processing massive complex structures and non-stationary distribution signal features, it is necessary to choose appropriate and effective

methods for extraction. This is because traditional data processing methods may have issues of high repeatability and low efficiency redundancy. Therefore, in order to effectively handle these situations, it is necessary to adopt appropriate methods to extract missing or invalid parts from the original sample and obtain more accurate analysis results [13-14].

3. Experimental Process of Integrating and Innovating Art Design and User Experience

3.1 Integration and Innovation

The process of art design aims to combine creative thinking with application abilities to meet the needs of different users. In experiential learning, corresponding services can be provided based on the differentiated needs of users. For example, for students in the rapid development stage, they usually lack the ability to think independently and solve problems, and require the cultivation of comprehensive qualities. For parents, they hope to enjoy convenient, comfortable, and personalized services, while also requiring a certain degree of independence and autonomy in art design. Therefore, art design is closely related to social life and interact with each other [15-16]. During the creative process, corresponding functions can be set according to the needs of different users. In the process of data collection, screening, and processing, it is necessary to transform the data into a meaningful, easy to understand, and identifiable set of parameters required for prediction or decision support systems to provide predictive descriptions. I is assumed that $X = \{x_1, x_2, x_3, ..., x_n\}$ is an n metadata set. The clustering method is to divide X into k subsets $S_1, S_2, S_3, ..., S_n$. If $C = \{c_1, c_2, c_3, ..., c_n\}$ represents the center of this k subset and u_{ij} represents the membership degree of element x_j to S_n, then the objective optimization function is:

$$R = (U, C) = \sum_{i=1}^{K} \sum_{j=1}^{n} u_{ij}^m d_{ij}^4 \|x_j - c_j\| \quad (3)$$

Among them, the sum of membership degrees of the dataset is 1, then there are:

$$\sum_{i=1}^{k} u_{ij} = 1, 1 \le j \le n \quad (4)$$

d_{ij} represents the distance between object d and the cluster center C_j of class i, using the Euclidean distance calculation method. In the objective function, the parameter m is called the fuzzy weighted index, which represents the relationship between different categories. By establishing corresponding models and conducting correlation testing and correlation testing, new sample patterns can be obtained to predict the next research direction and development trend. In this process, a certain number of models need to be used to qualitatively or quantitatively analyze the results, in order to validate or regress methods to judge and evaluate the final conclusion [17-18]. The process of obtaining information and knowledge visually and transmitting, exchanging, and sharing them can achieve aesthetic value judgment and emotional resonance. On the spiritual level, art design works have meaning and function, as they can cover multiple aspects such as life experience and outlook on life. Some works of art may not be expressed in language, but they still hold significant significance.

3.2 User Experience Effect

In the field of art design, user experience effectiveness, as an intuitive evaluation of a product, is an important indicator to measure the designer's hard work and ultimate goal achievement. At the same time, the user experience should also include the participation of all participants in the entire

art design process. Therefore, artistic works can be recreated to meet people's emotional needs and psychological feelings, while making them more diverse, contemporary, and personalized, making them more easily accepted by the public and generating a huge sense of value. This further enhances the effectiveness of user experience effects, making it a new form of culture that may appear in new products or services [19-20]. The interaction and communication between designers and artists is an interactive, two-way, comprehensive and multi-level dialogue mode, with emotions as the link, allowing users to participate and establish good relationships with other subjects and resonate. From the perspective of user experience, the design process of artistic products is achieved through interaction. Designers can utilize the characteristics of interactivity to innovate in creativity, appearance, and style. For example, incorporating original creative points or elements into traditional works and making changes to artistic products can add novelty and personalized feel, making them unique while meeting aesthetic needs.

3.3 Integration Simulation Experimental Process

By integrating art design with user experience, it is possible to delve into the current problems, and analyze and study these problems, thereby finally proposing corresponding solutions. The simulation experiment process includes the following main stages: preliminary preparation, mid-term debugging, post-evaluation and scheme evaluation, as well as the effect summary and the next step. Firstly, from the perspective of user experience, a comprehensive analysis and selection of design works are conducted, followed by modeling and completing the final simulation experiment. In this process, the camera inputs data into the computer system and generates a visual effect corresponding to the content of the movie. Subsequently, various actions and data processing processes are completed using software. Finally, these results are output to the user interaction interface to quickly and conveniently obtain relevant information and provide a real environment for subsequent art design and simulation experiments. By studying the relationship between art works and scenes in real environments, the use of virtual reality systems has important advantages in improving the interactivity, operational efficiency, and data processing capabilities of works. At the same time, virtual reality systems can effectively reduce costs and time consumption. Such research and experiments can provide a deeper understanding of the relationship between art design and user experience, and provide strong support for future innovation and development. By combining technology with creativity, it can continue to push the boundaries of art design and provide a better experience for users.

4. Experiment on the Integration and Innovation of Art Design and User Experience

Table 1. Availability test

Number of test rounds	Task completion time(s)	Degree of difficulty in operation	Error rate (%)
1	5	Easy	3
2	4	Easy	2
3	6	Moderate	3
4	4	Easy	1
5	5	Easy	2

In the research, the main focus was on exploring the effects presented by art design and engineering at different stages, as well as how to endow them with practical value. Through this study, people's quality of life can be improved; social benefits can be increased, and the development of human culture can be promoted. At the same time, it also provides designers with

reference directions to improve their works and craftsmanship, thereby creating better and higher quality products or services, and ultimately achieving user satisfaction. Usability testing is the analysis and evaluation of the artistic quality and usage environment of a design work, in order to identify existing problems and take timely improvement measures. This type of testing includes two aspects: on the one hand, it can directly utilize existing technological means to complete the creation; on the other hand, usability testing can also evaluate whether designers need to adopt certain design processes. The availability of the work itself and the influence it exerts as a medium for the dissemination of art and culture are irreplaceable and indispensable factors. According to the availability test results in Table 1, the task completion time was within 6 seconds; the degree of operation was also moderate, and the error rate was within 3%.
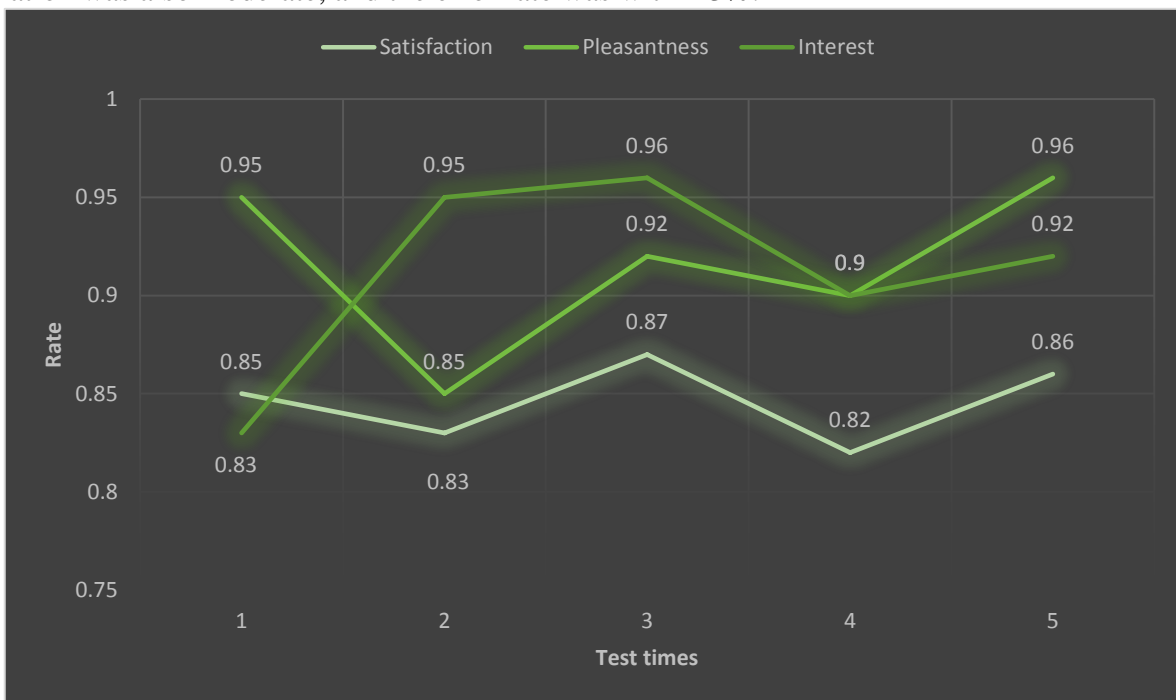

Figure 2. Emotional assessment

Through emotional analysis of the interaction between art design and users, it can be recognized that user experience plays an important role in their work. In addition, factors such as user attitudes, participation, and satisfaction with design works can also have an impact on the quality of artistic works. Therefore, it is necessary to evaluate the interaction and communication between users at different levels and take corresponding measures to improve these issues, thereby improving people's aesthetic values and quality of life. By experiencing art design works, it is possible to understand whether users have experienced changes in their emotions, ways of thinking, emotions, and attitudes during the aesthetic and creative processes. Thus, the unique charm of the artwork itself can be determined. According to the test results in Figure 2, the satisfaction of the model in terms of emotional value supply was between 0.82 and 0.87; the pleasure level was between 0.85 and 0.96; the interest level was between 0.83 and 0.96. Through this approach, it is possible to better understand the needs of users and create more satisfactory works of art for them.
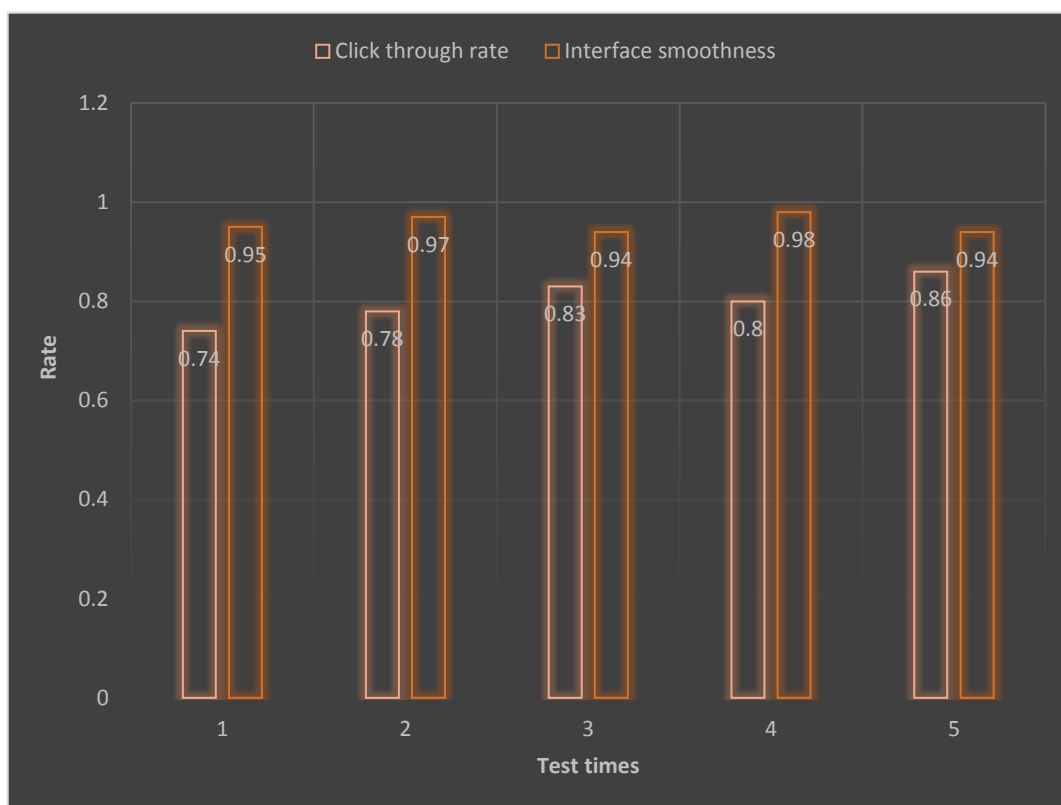
Figure 3. Interactive testing

In terms of user experience and interface response time, the click through rate of interactivity is positively correlated with the smoothness of the page. In other words, if a system's functions are used by a large number of users, then this function often has good interactivity and fast interface response time. According to the test results in Figure 3, the user's click through rate was usually around 0.8. This indicated that the design of the system was relatively successful and could achieve the expected results. At the same time, there were also certain differences in the smoothness of interactive pages, and the smoothness of the model fluctuated around 0.95. Through user usage surveys, it can be found that artistic creation itself requires strong logical thinking ability, understanding, and imagination. For some complex or abstract topics that are difficult to express in ordinary language, simple program operation processes obviously cannot fully cover their meanings.

According to survey data, many individuals tend to prefer works that are full of creativity and innovative spirit, indicating that they are more willing to actively participate in the creation and creative process. This tendency also exists in the field of art design. Lack of originality and originality would make further development and improvement difficult. Only with good professional literacy can one become a complete individual, thereby promoting the value enhancement of the entire industrial chain and promoting the expansion of economic growth points. From the data in Figure 4, it can be seen that the originality and innovation of combining artistic creation with user experience were both above 74%.
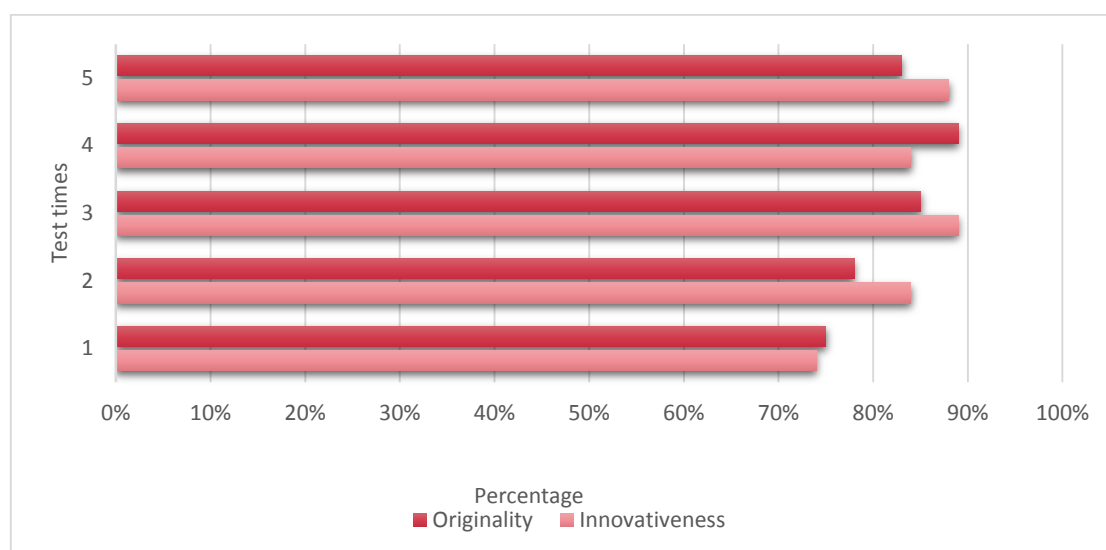
Figure 4. Art innovation evaluation

5. Conclusion

Like other fields of social development, art design is important aspects of creating wealth and meeting various needs between humans, nature, and interpersonal relationships. As a constantly developing emerging industry, art design has strong vitality, innovation, and application capabilities. This article aims to delve into the concept of art design and analyze how designers can integrate the cultural concepts of the new era into their creative process, as well as how to adapt to market changes through continuous adjustment of user experience feedback. Through these measures, designers can further enhance their design level and adaptability to artistic aesthetic values, creating a favorable environment for the future development of art design.

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If any, should be placed before the references section without numbering.

Data Availability

Data sharing is not applicable to this article as no new data were created or analysed in this study.

Conflict of Interest

The author states that this article has no conflict of interest.

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