ISSN 2618-1568 Vol. 5, Issue 8: 12-21, DOI: 10.25236/FAR.2023.050803

Study on Information Graphic Design and Evaluation of Whale Falls from the Perspective of Defamiliarization

Yuhan Ma[1,a,*], Jin Wang[2,b]

[1]School of Art and Design, Beijing Forestry University, 100080, Beijing, China
[2]School of Art and Design, Beijing Forestry University, 100080, Beijing, China
[a]943313378@qq.com, [b]wswsws1026@163.com
**Corresponding author*

Abstract: *To make the information graphic design of whale falls under the perspective of defamiliarization more in line with user needs and improve the dissemination efficiency of information, this study explored the process of whale fall information graphic design guided by the defamiliarization theory and the Technique for Order Preference by Similarity to Ideal Solution (TOPSIS). This study aimed to promote people's understanding of the unique deep-sea ecosystem formed by the whale fall process, and to raise awareness of the need to protect the marine ecological environment. The defamiliarization theory and TOPSIS method were combined to explore the demand factors that affect user cognition, based on the clear explanation of relevant concepts. The factors that affect the understanding of whale fall information graphic design were identified through literature review and user research. After obtaining the results of user research, a evaluation matrix was established using the TOPSIS method to score different design options. The best solution that meets user cognition needs was obtained by calculating positive and negative ideal solutions, and the value of using a hybrid method to guide design practice was analyzed. Whale fall information graphic design not only has important research value for human understanding of the deep-sea ecosystem and how to maintain the mechanism of deep-sea life, but also promotes the protection and utilization of deep-sea biodiversity resources in China. The application of the defamiliarization theory and TOPSIS in the whale fall information graphic design process can eliminate the influence of subjective factors of designers, and provide a scientific and rigorous basis for information graphic design and option selection. This study has theoretical significance and practical value for the design of whale fall-related information graphics, providing innovative ideas and practical references for related research.*

Keywords: *Defamiliarization Theory; Information Graphic Design; Information Visualization; Whale Falls; TOPSIS*

1. Introduction

As a branch of information visualization, information graphic design aims to present information efficiently and accurately by utilizing graphic power, bringing interest and vitality to the rigid data [1]. However, the rapid development of information graphic design inevitably produces problems such as homogenization and low efficiency. The defamiliarization theory originated from Russian Formalism, which aims to constantly change people's outdated perceptions of life, events, and the world, freeing humans from the constraints of narrow daily relationships, breaking away from the shackles of customary habits and adopting unique ways to enable people to have new experiences and discoveries even when facing familiar things. Whale fall refers to the process where the dead body of a whale sinks to the bottom of the sea, forming an ecosystem that promotes the prosperity of deep-sea life. Understanding whale fall is of great significance for protecting the ecological environment. In this study, we aimed to use information graphic design to popularize whale fall-related knowledge and incorporate defamiliarization theory for innovative design. The TOPSIS method was applied to calculate the closeness of different information graphic design schemes with the optimal scheme, evaluate the strengths and weaknesses of different design schemes with whale fall as the theme, and finally determine the best scheme

Wang Jianrong [2]constructed a research framework for defamiliarization theory and visual metaphor, information dissemination effectiveness ranking, and information visualization theory. In

ISSN 2618-1568 Vol. 5, Issue 8: 12-21, DOI: 10.25236/FAR.2023.050803

recent years, many scholars have introduced the TOPSIS method into design research for scheme evaluation, such as He Jintao et al. [3], who used the approximate ideal solution ranking method to design and evaluate the color of tourist cultural creative products, and Cang Shijian et al. [4], who used the AHP-TOPSIS model to evaluate three design schemes and existing packaging for Tianjin's mud figurine Zhang. Qu Yundong et al. [5] improved people's awareness of endangered animals by visualizing the current population and historical data. Through literature review, it is known that there is little research on using defamiliarization theory for innovative information graphic design and TOPSIS method for evaluation, most of which explore certain thematic information graphic design from a qualitative perspective, and there is not much research on what methods are used in the design, which has a certain degree of subjective bias. Therefore, the research results of the estrangement theory can guide the design process and the TOPSIS method can provide scientific and feasible options for decision-making. This study focuses on the practice of whale fall information graphic design under defamiliarization theory and uses the TOPSIS method to determine the optimal scheme as perceived by the target audience. Finally, the study explores the value of using defamiliarization theory and TOPSIS method to regulate information graphic design and provides a reference for other related research.

2. Related Concept Elaboration

2.1. The Concept of Defamiliarization

Defamiliarization, originally a literary theory and a core concept of Russian Formalism, was first proposed by Viktor Shklovsky. It emphasizes violating people's habitual ideas and concepts in terms of essence and form, and transcending the boundaries of art. The basic principle of defamiliarization is the opposition and conflict of multiple factors that have no apparent relationship on the surface but have some internal connections, resulting in the phenomenon of defamiliarization, which stimulates the emotions or creates a new sensory experience for the audience.

In other words, defamiliarization is the artistic technique of processing familiar things into unfamiliar ones, making the audience interested and desiring to learn more about the object due to the sense of novelty and unfamiliarity. As Chernyshevsky once said, "Art comes from life, but it is higher than life." Defamiliarization makes ordinary things extraordinary and increases novelty, thereby increasing people's interest. Defamiliarization is also a basic principle of various arts, and the foundation of defamiliarization in various art forms is to give people a sense of novelty.

In the field of design, defamiliarization can be translated into a sense of novelty, aiming to break away from the original design form and content while conforming to the audience's cognition. For example, using information graphics to assist in understanding textual knowledge is a form of defamiliarization in contemporary information and knowledge dissemination. Applying this theory to the information graphics design of whale falls, it is possible to explore new design methods and presentation techniques, providing audiences with a completely new experience of the well-known object. This process can be summarized as deconstruction, recombination, and innovation, ultimately achieving a unique and novel sensory experience.

2.2. Whale Fall

Whale fall refers to the process in which the carcass of a large whale sinks to the ocean floor after natural death, forming an ecosystem that relies on the whale carcass as a source of nutrients. It is more appropriate to understand it as a unique deep-sea biological community supported by the whale carcass[6]. Whale fall, along with hydrothermal vents and cold seeps, is known as an "oasis" of deep-sea life. Some scholars describe this beautiful and tragic existence as "one whale fall, and all things live."

Whale fall is a complex but meaningful process, and related knowledge is quite professional, as shown. In recent years, people's awareness of natural ecological protection has greatly increased, but it has also led to a lack of understanding of how to protect or incorrect protection behaviors. More and more children or teenagers have become interested in whale fall, but due to the complexity of professional knowledge and the dullness of data, many readers are deterred and only know the phrase "one whale fall, and all things live."

Using the theory of unfamiliarity to process the information graphic design of whale fall on the basis of users' existing cognitive foundations can greatly improve people's awareness of the protection of marine life and promote ecological environment protection. This is not only reflected in increasing

ISSN 2618-1568 Vol. 5, Issue 8: 12-21, DOI: 10.25236/FAR.2023.050803

people's interest in whale fall, but also in making humans understand that to increase the likelihood of this process, we must protect the marine environment, marine ecosystems, marine animals, and especially whales. Only by protecting whales can we ensure the occurrence of more whale falls and enable whales to be reborn. However, how to improve people's cognitive efficiency is a problem that designers should consider.

2.3. Information Graphic Design

Information graphic design is the process of transforming text into visual representations that are easier to comprehend. Research has shown that people grasp information more effectively from images than from text alone. Mayer [7]has also suggested that "people learn better from words and pictures than from words alone." Information graphic design combines text and images to display complex information, filtering, analyzing, and integrating it before using artistic techniques to present it visually. This approach aims to achieve more intuitive and effective communication of information, truly realizing the goal of information visualization. By using information graphic design, the process of whale fall and the complex knowledge involved can be presented clearly and concisely. The use of graphic elements instead of complicated words and phrases can increase understanding efficiency and deepen memory effects, thereby enhancing public awareness of marine ecology conservation. However, the increasing number of information graphic design forms has made it difficult for audiences to choose.

Currently, as a new communication method, information graphic design has become the primary means by which people acquire various types of information. However, with the popularity of this method, the homogeneity and lack of attractiveness have also emerged. Therefore, the key to innovative development of information graphic design is to find the point of convergence between the theory of unfamiliarity and information graphic design. When using the theory of unfamiliarity, designers need to conduct research to identify different unfamiliar perspectives. Avoiding the influence of designers' subjective factors on the design perspective and design solution selection is the basis for achieving optimal practice results.

2.4. Evalution Method of TOPSIS

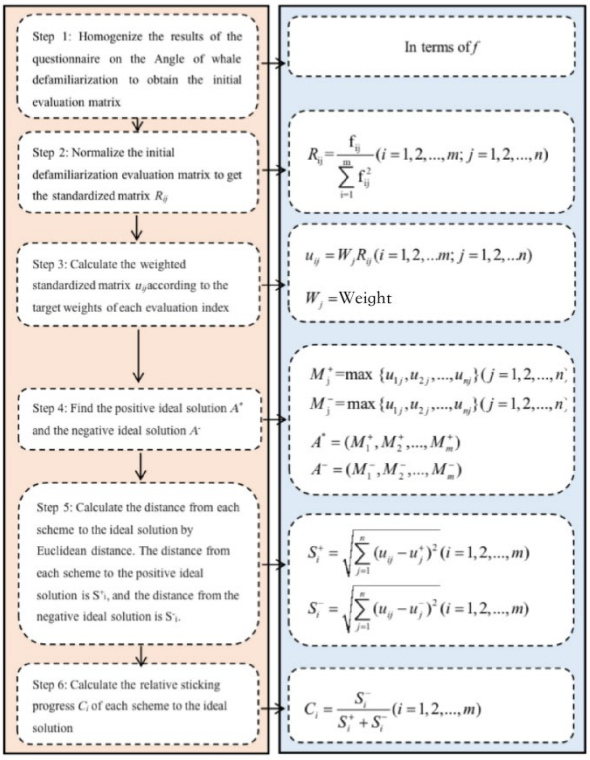


Figure 1: Approximate ideal solution sorting (TOPSIS) operation flow.

The TOPSIS method is an evaluation and ranking method that evaluates the degree of proximity

ISSN 2618-1568 Vol. 5, Issue 8: 12-21, DOI: 10.25236/FAR.2023.050803

between various schemes and the ideal target scheme, also known as the ranking method of approaching the ideal solution [8]. By using the normalized evaluation matrix, the difference between the object and the positive ideal solution and negative ideal solution is calculated to evaluate the scheme. If the evaluated object is closest to the positive ideal solution and farthest from the negative ideal solution at the same time, then the object is the best scheme; otherwise, it is the worst. During the research process, it is necessary to summarize the evaluation indicators of the scheme, invite relevant experts and users to score the indicators of each scheme, and use a seven-level Likert scale to make decisions on the scheme's superiority and inferiority[9]. The Ci value is used to determine the superiority or inferiority of the design scheme, and the larger the Ci value, the higher the priority.

Using the TOPSIS method to screen the best scheme can make the final design practice more user-friendly, which is a scientific and rigorous method of evaluating schemes. In the whale fall information graphic design, the involvement of the TOPSIS method makes the application of alienation theory get the most authentic user evaluation, and then selects the most suitable design scheme for promotion, thereby achieving the purpose of this topic's information graphic. In the process of using the alienation theory and the ranking method of approaching the ideal solution, exploring the relationship between the two and information graphic design also guides the output of the final scheme.

3. Theoretical Guidance and Evaluation Mechanism of Information Graphic Design

3.1. Defamiliarization Theory Provides Theoretical Guidance for Innovative Information Graphic Design

Innovation in information graphic design requires the guidance of defamiliarization theory. Donald Arthur Norman[10]mentioned in "Design Psychology": "When humans face things that are completely familiar to them, they find it difficult to be interested, and things that are already known are easily ignored, while completely unfamiliar things can easily cause people's resistance." As a new way of presenting and disseminating information, information graphics transform textual content originally presented in traditional media such as books into graphic elements such as images, symbols, and graphics through artistic design techniques. As a means of defamiliarization for information dissemination, information graphics can rekindle people's interest in textual content and enhance the effectiveness of information dissemination. It has become the primary means of information dissemination, and this process requires theoretical guidance and constraints.

Defamiliarization theory guides and regulates the process of information graphic design. Specifically, graphic design must convey accurate and complete content to ensure that experienced readers can pick up their interest in reading graphics and gain new insights and feelings, while also ensuring that readers with less experience have a desire to view. In short, defamiliarization thinking is an innovative method for information graphic design. Based on this thinking, designers can break away from traditional information dissemination methods and create new modes. Information graphics are composed of elements such as text, data, symbols, images, and colors. The design of these elements must take into account users' cognition and consensus, and creative transformation and innovative development must be carried out on this basis. The inherent cognition of visual graphics must be estranged to achieve innovation without destroying information translation. Therefore, how to maintain the foundation of information graphic design on the basis of innovation requires the correct evaluation method to select the best solution from several subjective outputs of designers.

3.2. TOPSIS Method Selects the Best Solution for Information Graphic Design

The Technique for Order of Preference by Similarity to Ideal Solution (TOPSIS) can quickly and effectively analyze and evaluate design solutions. After personal subjective thinking and user research, designers generate several or even multiple design schemes, which are qualitative analysis results. In these several design schemes, how to choose the optimal design scheme requires scientific quantitative calculation. If the selection of design schemes relies entirely on the designer, the design practice will carry a lot of personal subjective color and may not mobilize and cater to the attention of most users. Therefore, using TOPSIS method for scheme optimization and selection can greatly improve the dissemination strength of works. The entire process involves defamiliarization theory obtaining corresponding design methods through theoretical guidance, then producing several design practice schemes, and finally using TOPSIS for evaluation to verify the best application scheme of defamiliarization theory, which can further innovate the work.

ISSN 2618-1568 Vol. 5, Issue 8: 12-21, DOI: 10.25236/FAR.2023.050803

4. Information Graphic Design Method for Whale Fall Based on Alienation Theory

The characteristics of information graphic design are eye-catching and intuitive, which can be easily perceived, understood, and remembered by users. Especially when dealing with large and complex data sets, information graphics are an important way to reveal the metaphorical features and underlying rules of data [11]. Applying alienation theory to information graphic design is not starting from creating information, but innovating and redesigning the form on the basis of existing information. This redesign gives users new cognition, makes valueless or low-value significant information valuable and meaningful, and even surpasses the information itself to achieve a new level of cognition. Below are three information graphic design methods based on alienation theory obtained through user research.

4.1. Testing the Alienation Perspective of Information Graphic Design that Affects User Perception

Through literature review and research, this study selected six aspects that affect the alienation of information graphic design, and selected 100 users (distributed in four age groups) to fill out a questionnaire, to identify the alienation perspectives that helped them understand the information graphic design of whale fall. The users tested met the conditions of four age groups, and were from various industries and had different levels of cognitive ability.

The 100 tested users needed to select three of the six options: comfortable visual flow, interactive experience in information reception, three-dimensional graphic presentation, typography, abstract graphic design, and pleasurable emotional experience when viewing, according to their personal understanding of the previous text and combined with a brief introduction to alienation and whale fall.

A total of 100 questionnaires were distributed in this survey, and 95 effective questionnaires were collected, including 20 users under 18 years old, 35 users between 18 and 35 years old, 22 users between 36 and 50 years old, and 18 users over 51 years old. After collecting and sorting the research results, the three conditions with the highest proportion were: comfortable visual flow, three-dimensional graphic presentation, and pleasurable emotional experience when viewing, as shown in Table 1.

Table 1: Whale fall information graphic design defamiliarization user requirements testing.

Influence Factor	Numerical Value	Proportion
Comfortable Visual Lines	79	83.16%
Interactive Experience in Receiving Information	35	36.84%
The Presentation of 3D graphics	71	74.74%
The Way the Text is Set up	23	24.21%
Abstract Graphic Design	32	33.68%
The Pleasurable Experience of Sight Reading	67	70.53%

Based on the research findings, the following implementation plan has been determined for the alienation treatment of information graphic design on the theme of whale falls, guided by the three aspects mentioned above.

4.2. Reducing Cognitive Load by Applying Audience Visual Perception Rules

People first cognize the outside world through visual perception, including the form, color, etc. of things, from which they obtain meaningful and necessary information. According to research, over 80% of external things are obtained through people's visual perception [12]. Language is limited in terms of expressing thoughts, and visual images are the origin of language. User visual processes are active and selective, and this active selection is the basic characteristic of visual perception. When users perceive visually, aesthetically pleasing graphic designs are more attractive than purely textual content. The degree of visual perception by users affects the degree of information memory and is also the primary reason for stimulating audience interest. Visual perception unfamiliarity prolongs the user's visual stay time, thereby increasing the opportunity for information dissemination.

Appropriate information graphic design eliminates some uncertainty when people acquire information, making disorderly arrangements orderly and transforming single units of information into logical information combinations. As a result, the number of information people receive also increases. Information graphic design integrates multiple contents, making it inherently complex. To clearly convey various integrated information, graphic design can solve problems such as complexity and

ISSN 2618-1568 Vol. 5, Issue 8: 12-21, DOI: 10.25236/FAR.2023.050803

disorderliness, making information organization more orderly, logical, and guided, thereby enabling smooth expression. Information designers should pay attention to the unfamiliarity of information graphic design, replacing simple stacking and listing of information. They should also focus on the user's cognitive process, anticipate how graphic design guides to simplify audience cognition. Additionally, they should note that information graphics not only simplify reading but also present various relationships between information and the logical relationship between different parts, while choosing more diverse presentation methods.

4.3. Creating Diverse Presentation Forms

The way information graphics designs attract audiences is mainly reflected in the main graphic. Dynamic information graphics display static graphics in a dynamic way, making it more vivid and interesting, and presenting the transition from two-dimensional to three-dimensional. Most information graphics designs are expressed as a single output of static planes and rarely consider the way in which audiences receive and process information. Designers should use the theory of alienation to combine dynamic and static graphics, showing information (dynamic description process, flow, etc., and static textual analysis and interpretation) to promote users' multi-angle understanding.

Unlike paper media, the target audience of information graphics design has the right to choose actively. Therefore, information graphics design needs to consider people's preferences to present different content, and usually needs to filter data to display specific content. In terms of information transmission, compared with static and two-dimensional graphic design, dynamic and three-dimensional display make the information transmission mode more diverse, more efficient, and present more details, reflecting the alienation of the presentation form. Innovating the information transmission method, from simple vertical output to bi-directional reception and feedback, pays more attention to the viewers' experience.

4.4. Emphasizing User Emotional Experience

Similar to industrial design, information design also requires a human-centered approach, where designers imbue information products with a humanized emotional experience that gives users a pleasant sensory experience. Throughout the entire process, information design focuses on the user, rather than other factors such as technology[13]. Information graphics provide an intuitive understanding and with novel graphics, it not only adds deeper meaning to the information but also enhances the emotional reading experience of users. Emotional experience is a higher level expression of information graphics design, which goes beyond satisfying basic functional needs to elevate the emotional appeal of the design. This aspect reflects the designer's passion and emotions that blend individual, social, environmental, and cultural factors together, making the visual presentation of information personalized and interesting. The design is not just presenting information in a dull and boring manner, but also creating empathy and sympathy between the designer, the work, and the audience, enabling the audience to naturally and joyfully receive the information and avoid forced inputs.

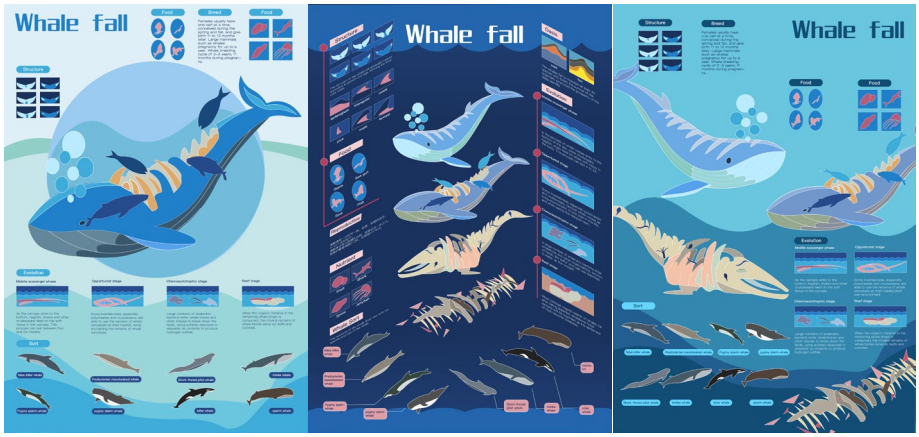
From the perspective of unfamiliarity, graphic design needs to pay attention to emotional expression, aiming to trigger emotional communication and interest connection between the viewer and the work. Rational information can be imbued with emotional expression through sensory graphic design. When unfamiliarity is incorporated into the emotional level of information graphic design, the work is endowed with emotional orientation. Users are not just reading mechanically but are also immersed in the atmosphere created by the work, exchanging emotions with the theme, and increasing the degree of information dissemination.

5. Information Visualization Design Practice and Evaluation of Whale Fall from the Perspective of Alienation

5.1. Design Practice

Based on user research results and the three design methods summarized, the following three design proposals were finally produced, as shown in Figure 2.

ISSN 2618-1568 Vol. 5, Issue 8: 12-21, DOI: 10.25236/FAR.2023.050803



Scheme 1 *Scheme 2* *Scheme 3*

Figure 2: Three kinds of information graphic design scheme.

Among the three proposals, while satisfying the three requirements of user research results, different color combinations and presentation forms were selected for each to convey the theme information.

5.2. Evaluation and Optimization Using TOPSIS Method

To reflect the objectivity of each design proposal and prevent personal subjective preferences caused by the author's own ideas, the three demand elements obtained in Table 1 were adopted as evaluation indicators for the TOPSIS decision-making of each design proposal: comfortable visual circulation, 3D graphics form, and visual emotional experience (named A, A2, and A3, respectively).

Ten information graphic design experts were selected to rate the three indicators of the three proposals in Figure 3 using a seven-point Likert scale (with 1-7 representing seven different levels of feeling from very bad to very good), and the average score of the rating results was used to obtain the initial evaluation matrix, as shown in Table 2.

Table 2: Initial evaluation matrix.

Evaluation Index	A1	A2	A3
Scheme 1	4.2	3.2	2.2
Scheme 2	5.2	4.6	3.9
Scheme 3	3.4	4.1	2.8

According to the operation program of the Ideal and Anti-ideal Solution based on the Approximation Algorithm, the positive ideal solution, negative ideal solution, and relative proximity degree of each scheme are calculated as shown in Table 3. The results indicate that the Ci value of Scheme 2 is the largest, indicating that Scheme 2 is the best option.

Table 3: Evaluation of scheme calculation results.

	Positive Ideal Solution	Negative Ideal Solution	Relative Closeness	Rank
Scheme 1	5.2	3.4	0.249	3
Scheme 2	4.6	3.2	1.000	1
Scheme3	3.9	2.2	0.333	1

5.3. Evaluation Results Analysis

Based on the optimal solution obtained from Table 4, Scheme 2 was optimized through technical means, as shown in Figure 3. Scheme 2 features a complete whale fall process as the main graphic, displaying the complete process from the whale's survival to disappearance. The overall color scheme is blue, with pink and yellow accents to attract the audience. In terms of information transformation, textual descriptions were transformed into icons and graphics to convey information intuitively, creating a direct impression in the audience's mind while viewing. Visual guidance was used to aid reading order, with the layout order and method following the audience's visual perception process, enabling them to follow visual guidance during reading. Additionally, a three-dimensional presentation

ISSN 2618-1568 Vol. 5, Issue 8: 12-21, DOI: 10.25236/FAR.2023.050803

was created on a two-dimensional plane, providing the audience with a novel experience. Color and graphic design were both considered for different age groups, taking into account the audience's emotional experience.

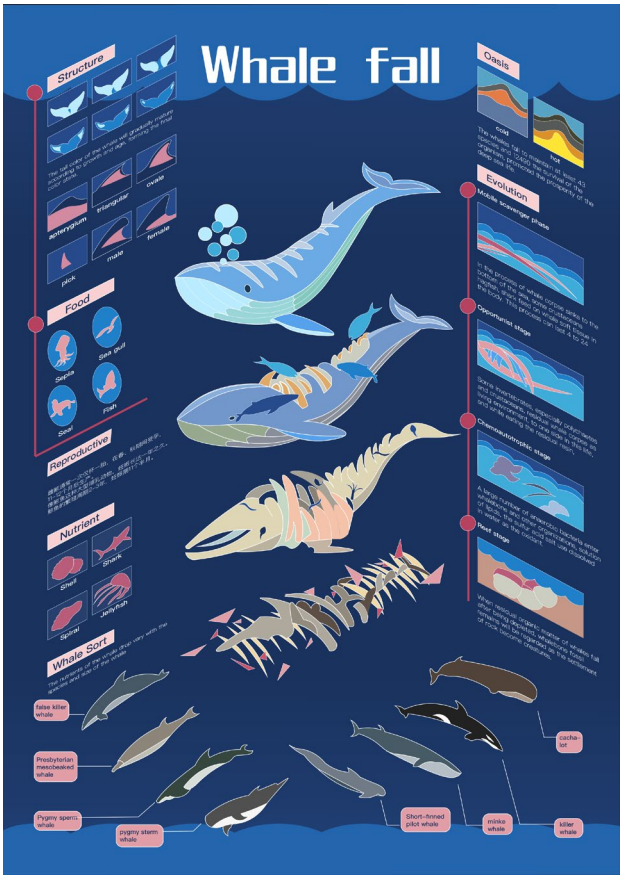


Figure 3: Whale fall information graphic design the best scheme.

To further test user satisfaction with Scheme 2 and the standard design process, a user satisfaction survey was conducted after simulating the effects of Scheme 2. A total of 124 questionnaires were distributed, with 115 valid questionnaires collected. Based on the results of a seven-level Likert scale, the user satisfaction score for Scheme 2 reached 5.25 points. This verifies the results of the user survey and the TOPSIS method mentioned above.

6. The Value of Using Alienation Theory and TOPSIS Method to Standardize Design Practices

6.1. Enhancing the Dissemination of Marine Knowledge

Information graphics have obvious advantages over textual descriptions in terms of dissemination. They organize and analyze a large amount of data and information and process it into a visual format, establishing an accurate, fast, convenient, and intuitive communication bridge [13]. Excessive proliferation and fragmentation of information inundate human life, making it difficult for people to understand a large amount of complex information in a short period of time. Information graphics design integrates information to establish connections between various parts, bridges the digital divide, and enhances the rate at which users accept information. However, the homogenization phenomenon of information graphics design not only slows down the development of information visualization but also reduces users' interest in reading information. The complex and professional knowledge associated with the process of whale fall makes it difficult for people to have a clear understanding or approach to this valuable existence, and it is even more challenging to take follow-up protective measures.

The application of alienation theory to graphic design can effectively solve the above problems. Alienation implies innovation, which is the mission of design and the source of inspiration. Alienation processing enables information graphics design to break free from fixed thinking patterns and presents a fresh feeling, fully mobilizing viewers' interest. Overly simple and plain expressions shorten the

ISSN 2618-1568 Vol. 5, Issue 8: 12-21, DOI: 10.25236/FAR.2023.050803

process of people's thinking and feeling, making it difficult to intersect with information and thereby failing to analyze and understand information at a deeper level. By enhancing the visual guiding line of the information graphics related to whale fall, users are gradually led to participate and read related knowledge, significantly improving the dissemination of whale fall and marine knowledge.

6.2. Stimulating the Target Audience's Desire for Knowledge

Aristotle [14] once said, "We are astonished at what is not familiar." Experiments have shown that unique things can attract attention more easily. Users' visual perception is always attracted by things that differ in color, size, texture, and other aspects. This difference can be divided into two aspects: one is relative to the surrounding things at the same time, and the other is relative to the things that the user is already familiar with. Therefore, when the presented information graphics design differs greatly from users' psychological expectations, the work is more likely to be noticed, and alienation theory is an important processing method that brings about this difference. In information graphics design, users usually have some prior experience judgments about certain aspects. If the final presentation is consistent with the user's associative expectations, people will automatically omit this part of the work. If the actual presentation of the work is contrary or partially contrary to users' experience norms, it will stimulate users' desire for knowledge and exploration, increasing their attention and perception time for the work. Things that have a sense of alienation can better arouse people's curiosity and prompt viewers to seek exploration of unknown things.

6.3. Creating an Interesting Atmosphere for Information Reception

The interestingness of design acts as a bridge between the audience and the work, and graphics that are full of interest can capture the psychological needs of users and resonate with their emotions. To create a dialogue between users and works, it is necessary to pay attention to the interesting expression of the work [15]. The interestingness of graphic design refers to the pleasant, enjoyable, and interesting sensory experience that users feel after viewing the work. Designers use techniques such as color, symbols, and text to give works a unique charm during the process of information translation and visual expression. Ordinary and plain things cannot arouse people's interest, and therefore, they do not lead to other pleasant experiences. However, by consciously engaging in the process of re-creation, substitution, destruction, and resetting, designers can present works that are refreshing and captivating. Such works can strongly attract users' attention and give them a familiar yet unfamiliar visual experience. The unfamiliarity of information graphic design refers to the contrast effect between the visual and conscious experiences that are beyond the viewer's imagination or that break away from their fixed patterns of thinking. This contrast effect increases readers' interest and promotes the positive dissemination of information.

7. Conclusion

Information graphic design plays an important role in breaking through the limitations of information dissemination and innovating information transmission paths. Proper theoretical guidance and program evaluation are key steps in the information graphic design process. In this paper, we took the design of information graphics for whale falls as the research object, and conducted research on the design process based on the theory of alienation and the Technique for Order of Preference by Similarity to Ideal Solution (TOPSIS) method. First, we used qualitative research methods to investigate the user needs from the perspective of alienation. Then, we constructed an initial evaluation matrix to evaluate and rank the three design schemes, avoiding the influence of personal subjective color as much as possible, and obtaining an optimal solution. Finally, we conducted user testing on this scheme to verify the rigor of the results. Meanwhile, the author also summarized the value and significance of applying the theory of alienation and the TOPSIS method to the design of information graphics for whale falls. However, while applying the theory of alienation, we should also grasp the "degree" of alienation. Alienation is about innovation and redesign, not about abandoning the existing cognitive level. Excessive alienation between audience cognition and works will have the opposite effect.

References

[1] Chen H. (2020) Study on Information Graphic Design Based on the Three Principles of Function,

ISSN 2618-1568 Vol. 5, Issue 8: 12-21, DOI: 10.25236/FAR.2023.050803

Process, and Form -- The Integration of Three Principles. Art Observation, No. 395(11):122-123.
[2] Wang J. (2020) Research Framework on Information Visualization in Alien Context. Decoration, No. 326(06):126-127.
[3] He J, Chen D, Yu S. (2021) Evaluation Method of Multi-cultural Image Color Design for Tourist Cultural Creative Products. Mechanical Science and Technology, 40(01):92-100.
[4] Cang S, Yu M, Qian M. (2022) Application Research of KANO-AHP-TOPSIS Hybrid Model in Packaging Design of Niurenzhang. Packaging Engineering, 43(18):169-177.
[5] Qu Y, Mao H, Zhong Y. (2019) Design of Information Graphics in "Endangered Animal List". Hunan Packaging, 34(01):155.888.
[6] Lin M, Li S. (2023) Research Progress and Prospect of Whale Falls Ecology. Chinese Journal of Tropical Biology, 14(01):32-41.
[7] Mayer R E. (2014) The Cambridge Handbook of Multimedia Learning. Cambridge University Press.
[8] Li J, Tong S. (2022) Research on Narrative Theory in Public Facilities Experience Design - Taking the Design of Intelligent Street Lamp in Zhuzhou as an Example. Packaging Engineering, 43(04):357-363+404.
[9] Zhao X, Wei F, Bai Y. (2021) Construction and Application of Product Design Model Driven by User Requirements. Mechanical Design, 38(S1):56-61.
[10] Norman D A. (2013) The Design of Everyday Things. Beijing: CITIC Press.
[11] Wu Q. (2011) From Presentation to Interpretation - The Characteristics of Information Graphic Design. Decoration, No. 220(08):68-70.
[12] Yin J, Zhou M. (2020) Research on the Design of Short Video APP Based on User Experience. Packaging Engineering, 41(06):198-204.
[13] Lu X, Bu Y. (2021) Overview of Practice and Development of Information Design. Packaging Engineering, 42(20):92-102+12.
[14] Ross W D. (1997) Aristotle. Beijing: The Commercial Press.
[15] Yang Y. (2018) Research on the Interest of Graphic Language. China Academy of Art.