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# Application of Sustainable Development Concept in the Brand Strategy of High-End Pet Products

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**Abstract:** With the popularization of the concept of sustainable development, many enterprises attach more importance to environmental protection and social responsibility when formulating brand development strategies. Exploring how to combine the concept of sustainable development with brand strategy to enhance market competitiveness is particularly crucial in the high-end pet product market. This article aims to explore the practical application of sustainable development in the development of high-end pet brand strategies, conduct in-depth analysis of their applications in digital supply chains, low-carbon production, corporate social responsibility, and propose targeted brand strategy optimization solutions. Research has found that by relying on information technology, high-end pet brands can optimize resource allocation, reduce carbon emissions, and increase brand information transparency, thereby gaining a competitive advantage in the market.

**Keywords:** sustainable development; high end pet brands; brand strategy; digital supply chain

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## 1. Introduction

In modern business, brand sustainability has become a key factor in consumer decision-making. With technological innovation and shifts in consumer consciousness, enterprises can adjust their brand strategies by integrating sustainable development concepts, which is not only beneficial for the long-term development of the brand, but also enhances its market competitiveness. This article aims to explore how high-end pet product brands can apply the concept of sustainable development to their brand strategies, analyze the integration of digital supply chain management, low-carbon production, and corporate social responsibility (CSR), and how these methods can be efficiently integrated into brand strategies to promote sustainable brand development.

## 2. Overview of Sustainable Development Concept

### 2.1. The Importance of Sustainable Development in Modern Brand Strategy

In the context of economic globalization, the deepening of consumers' awareness of corporate social responsibility has made brand success no longer solely determined by the quality and cost of goods, but also by their impact on the environment and society. Adhering to the concept of sustainable development, enterprises need to focus on resource conservation, reduction of environmental pollution, and enhancement of social responsibility while pursuing maximum profit. For various brands, adopting sustainability strategies is not only a positive contribution to society and ecology, but also an enhancement of brand image, which can strengthen consumers' sense of identity with the brand [1].

With the support of information technology, brands can achieve more efficient resource management and environmental monitoring through digital tools, promoting green production and innovation. This comprehensive sustainable development strategy can not only enhance the long-term competitiveness of the brand, but also help the enterprise gain market recognition and promote the sustained growth and development of the brand.

### *2.2. The Impact of Sustainable Development Concepts on High-End Pet Brand Strategies*

In high-end pet brands, consumers are increasingly paying attention to whether the brand undertakes social and environmental responsibilities. Especially in the high-end consumer market, consumers are more inclined to pay additional fees for products that implement sustainable development concepts. The impact of sustainable development concept on high-end pet brand strategy is mainly reflected in multiple aspects such as product design, manufacturing process, and brand image shaping. High-end brands not only reduce environmental pressure by introducing green production processes and low-carbon technologies, but also improve the environmental friendliness of their products, meeting consumers' requirements for environmental protection. The application of digitalization and information technology, such as intelligent supply chain and big data analysis technology, can help brands efficiently manage resources and optimize production, while increasing the transparency of the supply chain [2]. The various influences have transformed the concept of sustainable development into one of the core competencies of high-end pet brands, providing a solid foundation for the sustainable development of the brand.

## **3. Analysis of Sustainable Development Needs for High End Pet Brands**

### *3.1. Transformation Needs of Digital Supply Chain and Intelligent Procurement*

Some high-end pet brands still rely on traditional manual operations and non-digital systems in logistics chain management. These brands cannot achieve real-time monitoring and intelligent analysis of data, resulting in delayed information transmission and difficulty in quickly adapting to market fluctuations. The data within their supply chains is fragmented and lacks uniformity, posing great instability to supplier management and inventory control. This situation makes it difficult for these brands to effectively track the use and flow of raw materials, resulting in resource waste and prolonged production cycles. In the procurement process, many brands still use traditional manual procurement methods and lack the assistance of digital technology. These brands' procurement decisions are based on personal experience and market intuition, rather than a comprehensive understanding of the entire supply chain, which not only increases procurement costs but also leads to problems of excessive procurement or insufficient inventory. At the same time, traditional procurement methods make it difficult to ensure the environmental protection and sustainability of raw materials, which puts increasing pressure on brands to fulfill their environmental responsibilities [3].

### *3.2. Strategic Requirements for Low Carbon Production System and Green Manufacturing*

Most manufacturing processes still use traditional energy consumption methods, which cannot effectively reduce carbon emissions, resulting in low energy utilization efficiency and resource loss. In actual manufacturing, many manufacturers have not yet introduced environmental protection technology; the production process is relatively rigid, and the management of waste and exhaust gas is not strict, which exacerbates environmental pressure. At the same time, the management of green supply chains and the standards for the use of raw materials have not received the attention they deserve, making it difficult for some manufacturers to fully track the carbon emissions and ecological impact of their supply chains. Brands also lack standardized criteria in green design and material selection, neglecting environmental protection and recyclability in product packaging and raw material selection, resulting in low resource efficiency.

### 3.3. Strategic Requirements for Enhancing Corporate Social Responsibility and Brand Transparency

Currently, there is a gap between stated commitments and actual actions of some high-end pet brands in fulfilling their corporate social responsibility. Although some companies have begun to pay attention to social responsibility issues, most still lack complete social responsibility strategies and specific implementation steps. Some companies' social responsibility statements are only verbal commitments in areas such as environmental protection and animal rights, lacking substantive implementation and evaluation mechanisms [4]. At the same time, these enterprises lack transparency in the disclosure of social responsibility information, and consumers' awareness of their specific actions and effectiveness is limited. In terms of supply chain transparency, there is still a problem of information asymmetry, and brands do not disclose in detail the environmental protection measures and supplier screening criteria of the production process, which makes consumers skeptical of the actual operation of the enterprise. Even though some companies have released CSR reports to the public, the content is vague, lacks accurate data support, and is not transparent, and cannot effectively enhance the image of corporate social responsibility [5].

## 4. The Application Path of Sustainable Development Concept in High-End Pet Product Brand Strategy

### 4.1. Digital Supply Chain Management and Intelligent Procurement System

In the brand strategy of high-end pet products, building a digital supply chain and intelligent procurement mechanism has become the core link in implementing the concept of sustainable growth. The digital supply chain achieves seamless information integration from raw material procurement, production and processing, logistics transportation to terminal sales through the integration of information technology systems. By utilizing the Internet of Things (IoT) and big data analytics technology, brands can monitor the production progress, logistics status, and inventory levels of their products in real-time, achieving comprehensive visual management of the supply chain. This process not only improves operational efficiency, but also accurately predicts and meets the resource needs of the supply chain, reduces resource waste, and optimizes inventory management. The intelligent procurement system can accurately and dynamically complete supplier screening and procurement decisions in sustainable supply chain management. The system utilizes artificial intelligence (AI) technology to evaluate the environmental impact and social responsibility of suppliers based on real-time data, helping brands select suppliers that meet sustainability standards. In practical applications, standardized procurement optimization algorithms can help brands consider diverse indicators such as cost consumption, ecological impact, and production rate when selecting cooperative suppliers, in order to achieve optimal decision-making. Assuming there exists an objective function:

$$\text{Total Cos} = \sum_{i=1}^n (C_i \times X_i) \quad (1)$$

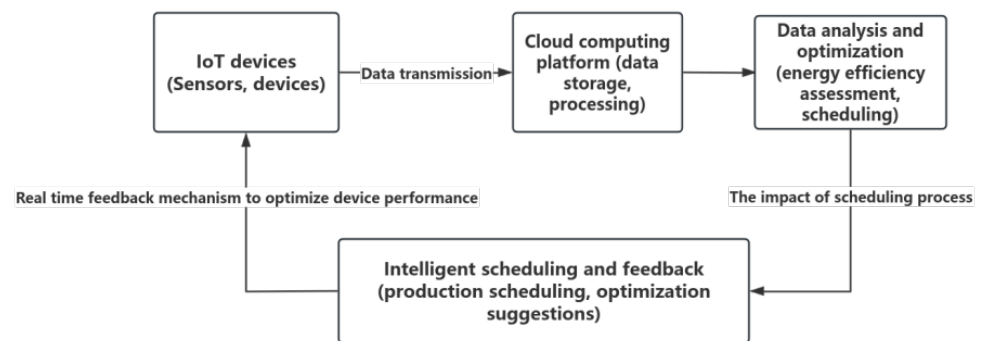
Among them,  $C_i$  represents the cost of the  $i$ -th supplier,  $X_i$  is the purchase quantity, and the overall cost is the sum of the costs of each supplier multiplied by the order quantity. After introducing environmental protection factors (such as carbon emission indicators, resource consumption ratios, etc.), the following optimization model is constructed:

$$\text{Sustainable Cost} = \sum_{i=1}^n ((C_i \times X_i) + \lambda \times E_i) \quad (2)$$

In this model,  $\lambda$  represents the environmental weight coefficient, and  $E_i$  refers to the environmental impact rating of the  $i$ -th supplier. With the help of this optimization algorithm, brand owners can prioritize selecting suppliers with less negative impact on the environment while ensuring economic benefits, thereby promoting the sustainability of procurement decisions.

#### 4.2. Application of Cloud Computing and Internet of Things Technology in Low Carbon Production

IoT sensing devices are embedded at different stages of the manufacturing process (including monitoring of temperature, humidity, energy consumption, machine operation status, etc.) to provide real-time monitoring of data during the production process. Induction devices are responsible for sending captured data in real-time to cloud computing servers, enabling real-time tracking and management of performance parameters at various stages of production. The information collected by each sensor is transmitted to the remote server through the Internet for storage. The cloud service platform adopts data processing technology to conduct real-time and in-depth analysis of the collected manufacturing data. Through in-depth data analysis, it is possible to identify which parts are experiencing energy waste and discover optimization potential. Based on the data analysis of cloud computing platforms, intelligent scheduling systems can be used to optimize production strategies, optimize the configuration of machine operating hours, and ensure that equipment operates in the best efficiency mode. The data flow path of cloud computing and IoT technology in low-carbon production process is shown in Figure 1.



**Figure 1.** Data Flow Path of Cloud Computing and Internet of Things Technology.

As shown in Figure 1, intelligent networked devices collect data in real-time and transmit the collected data to cloud computing platforms. With this framework, high-end pet brands can implement low-carbon control in the production process, reduce energy consumption and carbon emissions, and improve production efficiency. This application process can enhance the brand's competitiveness in the market and its sustainable public image.

#### 4.3. Corporate Social Responsibility (CSR) Data Tracking and Brand Transparency Enhancement

By utilizing detailed CSR information monitoring, enterprises not only achieve the implementation of social responsibility, but also improve transparency among the public and consumers, thereby enhancing brand reputation and market competitiveness. The specific execution process includes establishing an information tracking system, analyzing CSR-related information in depth, enhancing transparency, and performing periodic audits and disclosures. In evaluating brand transparency, a transparency evaluation model can be adopted to quantify the transparency of companies in fulfilling their social responsibilities. The specific expression of this model is as follows:

$$T = \frac{1}{N} \sum_{i=1}^N \left( \frac{C_i}{M_i} \right) \quad (3)$$

Among them,  $T$  is brand transparency,  $N$  is the number of CSR evaluation indicators,  $C_i$  is the degree of openness of the  $i$ -th indicator, and  $M_i$  is the maximum transparency score of that indicator, which is the comprehensive disclosure status. With this tracking and evaluation mechanism, enterprises can quantitatively analyze their transparency,

identify and improve transparency through score comparison, and promote the sustained growth and sustainable development of brand value.

#### 4.4. Big Data Analysis and Resource Optimization Configuration

Based on continuously growing data, advanced analytical methods are used to analyze consumer behavior patterns, market dynamics, and supply chain operations to effectively adjust resource allocation and achieve sustainable development strategic goals. Based on a big data processing platform, enterprises aggregate information related to consumer purchasing tendencies, market demand data, inventory levels, logistics distribution, and production efficiency. By utilizing cloud computing and IoT technology, the above data can be updated in real-time and processed and analyzed in depth using data analysis techniques. By using regression analysis, companies can predict fluctuations in demand for high-end pet brands and make precise production plan adjustments based on market trends. Define the dependent variable  $y$  of the model as the market demand, and the independent variables  $x_1, x_2, \dots, x_n$  as the multiple factors that affect market demand. Apply the least squares method to conduct regression analysis in order to obtain accurate market demand forecasting results:

$$y = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \dots + \beta_n x_n + \varepsilon \quad (4)$$

With the help of mathematical models, high-end pet brands can optimize resource allocation, enhance production efficiency, and strengthen their competitiveness in the market, promoting the achievement of sustainable development strategic goals.

### 5. Evaluation and Continuous Optimization of Brand Strategies for High-End Pet Products

#### 5.1. Evaluation System for Sustainable Development Goals

In the process of promoting sustainable development, high-end pet brands need to establish a precise and orderly evaluation mechanism to accurately measure the achievement of sustainable goals and optimize their strategic layout based on evaluation feedback. The role of this evaluation mechanism is not only to track the development of the brand in terms of environment, society, and economy, but also to efficiently promote the rational allocation of resources and ensure the sustainable development of the brand. The core of this mechanism lies in establishing evaluation criteria and relevant indices to quantitatively analyze the sustainable development status of the brand at various levels. The evaluation criteria for sustainable development goals are shown in Table 1, which aims to clarify the specific criteria and measurement dimensions for evaluation.

**Table 1.** Evaluation Criteria for Sustainable Development Goals.

Evaluation dimensions	Evaluation criteria	Quantitative indicators	Target value	Evaluation cycle
Environmental Sustainability	Reduced resource consumption, improved energy efficiency, and waste management	Resource consumption rate, percentage reduction in carbon dioxide emissions	-10%	every year
social responsibility	Employee welfare improvement, supply chain transparency, community contribution	Employee satisfaction and supplier social responsibility report disclosure rate	90% transparency	every quarter
economic benefits	Profitability growth, market share expansion, return on investment	Annual profit growth rate and market share growth rate	15% growth	every year



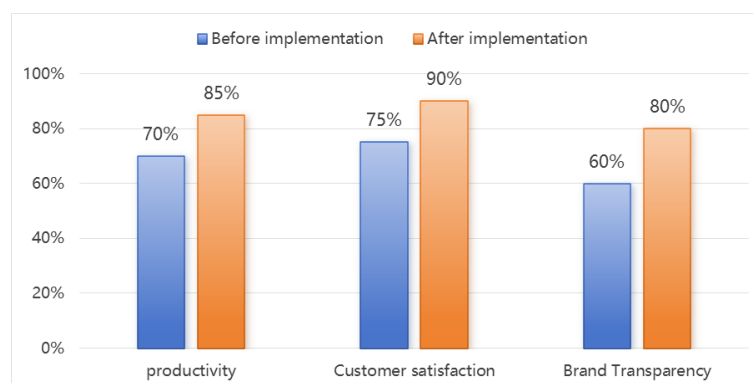
Brand Transparency	Degree of information disclosure and public recognition	Annual CSR report disclosure rate and consumer satisfaction rating	85% transparency	every quarter
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In this evaluation criteria framework, brands have developed quantitative scoring criteria based on different dimensions of sustainable development goals and have defined quantitative indices for each criterion. The time period for scoring can be flexibly set according to the brand's own operational status, generally divided into quarters or years.

### 5.2. Brand Strategy Application Effect Feedback and Adjustment Mechanism

To ensure that high-end pet brands implementing sustainable development strategies can continuously optimize their effectiveness, the key is to create an efficient feedback and adjustment mechanism. This adjustment mechanism can regularly collect data and conduct in-depth analysis, enabling brands to instantly grasp the effectiveness of strategy execution, and then adjust strategies based on this information to enhance the overall strength of the brand in sustainable development.

Taking a high-end pet brand as an example, the brand has been implementing a sustainable development plan for over a year, focusing on key areas such as ecological sustainability, supply chain transparency, and customer satisfaction. The feedback system constructed by the brand utilizes diversified survey and data collection methods to measure the effectiveness of strategy execution. The survey results before and after the implementation of the brand strategy are shown in Figure 2.



**Figure 2.** Performance Comparison before and after Brand Strategy Adjustment.

Figure 2 shows that after adopting the sustainable growth strategy, the brand has achieved significant progress in key areas such as manufacturing efficiency, user satisfaction, and brand reputation transparency. This phenomenon indicates that the sustainable growth strategy has an important impact on enhancing the brand's market competitiveness and consumer sense of belonging. To further optimize the brand strategy, the brand has designed a feedback system that is committed to ensuring efficient implementation of sustainable growth strategies through continuous feedback and optimization, while enhancing communication and interaction between the brand and consumers.

The brand continuously collects customer feedback on product and service experience through various channels such as online surveys, social media platforms, and customer service phone numbers. Afterwards, the enterprise uses data analysis software to sort and study the obtained information, in order to evaluate the effectiveness of its sustainable development strategy implementation. Based on feedback data, enterprises adjust and optimize their current strategies to better meet the actual needs of consumers. The adjusted strategy will be announced to consumers through multiple channels such as official websites and social media platforms, and its effectiveness will be continuously tracked during the execution phase.

## 6. Conclusion

Considering the increasing environmental awareness and emphasis on social responsibility among consumers, pet brands need to integrate the core concept of sustainable development into their brand strategy as a key factor in promoting long-term brand development. Through the integration of digital supply chain management, intelligent procurement systems, cloud computing, and IoT technology in the production field, as well as the monitoring of corporate social responsibility information and further improvement of brand transparency, various brands are able to achieve a balance between efficient resource allocation, ecological protection, and social responsibility. In the future, with continuous technological innovation, high-end pet brands will develop towards a more intelligent and low-carbon path.

## References

1. R. V. Ivanov, T. V. Grynko, V. M. Porokhnya, N. K. Maksyshko, and V. V. Oglih, "Model aspect of the study of the processes of sustainable development of socio-economic systems," *IOP Conf. Ser. Earth Environ. Sci.*, vol. 1254, no. 1, p. 012123, Oct. 2023, doi: 10.1088/1755-1315/1254/1/012123.
2. M. C. Medori, K. Donato, L. Stuppia, T. Beccari, M. Dundar, R. S. Marks, et al., "Achievement of sustainable development goals through the Mediterranean diet," *Eur. Rev. Med. Pharmacol. Sci.*, vol. 27, no. 6 Suppl, pp. 89–99, 2023, doi: 10.26355/eurrev\_202312\_34693.
3. V. Krasnomovets, "Theoretical foundations of hotel safety within the system of sustainable development," *Visegrad J. Bioecon. Sustain. Dev.*, vol. 12, no. 2, pp. 54–59, 2023, doi: 10.2478/vjbsd-2023-0011.
4. B. Graham, *Jewish Topographies: Visions of Space, Traditions of Place*. Ashgate Publishing, Ltd., 2012. ISBN: 9780754661536.
5. J. Wyrwa, J. Jędrzejczak-Gas, A. Barska, and J. Wojciechowska-Solis, "Sustainable energy development and sustainable social development in EU countries," *Energies*, vol. 16, no. 18, p. 6556, 2023, doi: 10.3390/en16186556.

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