

# Research and system application of sustainability oriented commercial design

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## Abstract

**The challenge of sustainable business transformation makes enterprises begin to pursue new design architecture and design value transformation mode. Based on the theory of value creation, this paper will build a sustainable business design research framework with sustainable concept as the core value, design as the research subject, and business system as the value carrier and practice scene, and classify research in different types of business environment to clarify its innovation value to the current and future of business system. Based on the sustainable value system and commercial design application architecture, this paper constructs a sustainable commercial design innovation path in series from five levels: design objectives, design strategies, experience effects, product modes and system impact, and explains it with practical cases. It provides a reference for design practice and enterprises to build a specific sustainable value creation and transmission system.**

## Keywords

**Sustainable design; Commercial design; Design scenarios; Innovation path; Sustainable business design.**

## 1. From design to sustainable business design: drivers and implementation dimensions

The unique design system is the key to supporting enterprises' continuous innovation and maintaining competitive advantage. In the sustainable business system, the unique design system can help enterprises transform business value into sustainable value and realize the sustainable profitability and development of enterprises. Sustainability oriented commercial design aims to provide clearer design concepts and practical schemes for the current and future commercial systems through the integration of sustainable design and commercial design, so as to promote the sustainable value proposition of the commercial system for the common development of economic prosperity, ecological friendliness and social equity[1].

The design of sustainable business system is driven by its unique values, design field and growth environment. This chapter mainly discusses the construction background and implementation aspects of sustainable commercial design from three themes: design development under the concept of sustainability, value proposition and reform of commercial design and development trend of future design, so as to provide reference and basis for subsequent expansion research.

### 1.1. Design development under the concept of sustainability

As an important perspective of sustainable research, design has gradually formed a series of mature theoretical frameworks and research results. From the perspective of the development process and impact of sustainable design (Figure 1.1), it can be divided into the following categories:

Sustainable design at product level: in his book "design for the real world" in the late 1960s, Victor Papanek proposed that "design should seriously consider the use of Limited earth resources and serve the protection of the earth's environment". Under the advocacy of green design, ecological design and other concepts, designers began to pay attention to environmental protection in the production process, as well as the recycling and reuse of products after use; 2. Sustainable design of product service level: design introduces product service system (PSS), decouples the whole life cycle of products, and forms a sustainable design mode with higher maturity and systematization with products, use and results as the core respectively. 3. Sustainable design at the social system level: expand the dimension of sustainability to the social level, gradually take shape for the design of social equity and harmony, and form different design modes such as design for the bottom of society, designer innovation and social innovation design. 4. Current multi-dimensional driven sustainable design: comprehensively consider the impact of the concepts of carbon neutrality and harmonious development advocated by the social ecosystem, and consider the drive of artificial intelligence, big data, virtual reality and other information technologies under the technological trend, integrate the sustainable design mode with more dimensional systems, and form the current multi-dimensional driven sustainable design system[2].



Figure 1.1 design transformation under the concept of sustainability

### 1.2. Value proposition and reform of commercial design

Commercial design refers to the design behavior of serving consumers and creating commercial value for enterprises and brands. The emergence and development of design are always closely connected with commerce. Design is evolving and iterating rapidly with the development of social civilization.

1. Design value: design has changed from value increment to value driven.

For some products, design has changed from visual expression or function optimization to the value core of the product; 2. Design field: design is empowered from the field of fashion consumption to more innovative fields, gradually becoming the subverter of destructive innovation, and providing innovative solutions for scientific and technological breakthroughs and model changes; 3. Design process: design gradually penetrates into all processes of the whole product commercialization from being a simple formalization, and plays its value in the whole life cycle of the product; 4. Design object: the design changes from the design for the minority to the design for the majority, pays more attention to the experience of barrier groups and personalized groups, and accommodates a more diverse user base[3].

### 1.3. Development trend of future design

Where design will lead in the future is still a question worth exploring. In the traditional design concept, the design mode simply related to people and things is gradually disappearing, and design has gradually evolved into the product of the joint action of multiple factors such as people, products, environment and culture. This section will summarize the mainstream change trend of future design in combination with the latest insights of organizations and institutions such as Smith Group, ammunition and Gensler.

#### 1.3.1. Prediction of future design trend

Society, people, things, behavior and way of thinking will all be the factors affecting future design (Figure 1.2). From the perspective of these correlations, we can gradually clarify the evolution path of design and clarify the dynamic and diversified outline of future design: 1. Mixing: real and virtual mixing, design and manufacturing mixing, process and result mixing, work and home mixing. 2. Intelligence: everything is intelligent. Metaverse is everywhere, without intelligence and without survival. 3. Participation: more collaborators participate in the design and decision-making process, and consumers become a member of the design process. 4. Filter: filtering under information overload is more important than obtaining. The initiative, methods and tools for selecting information are crucial to decision-making. 5. Mirror: the real world will be copied to the virtual world, virtual experience will replace the real experience, and virtual design will become the mainstream. 6. Opening: opening determines liquidity and speed tension. Closing can only bind itself. Solid state is synonymous with the past era. 7. Super: sameness and mediocrity will be abandoned. Only the extreme can be invincible in the flow[4].

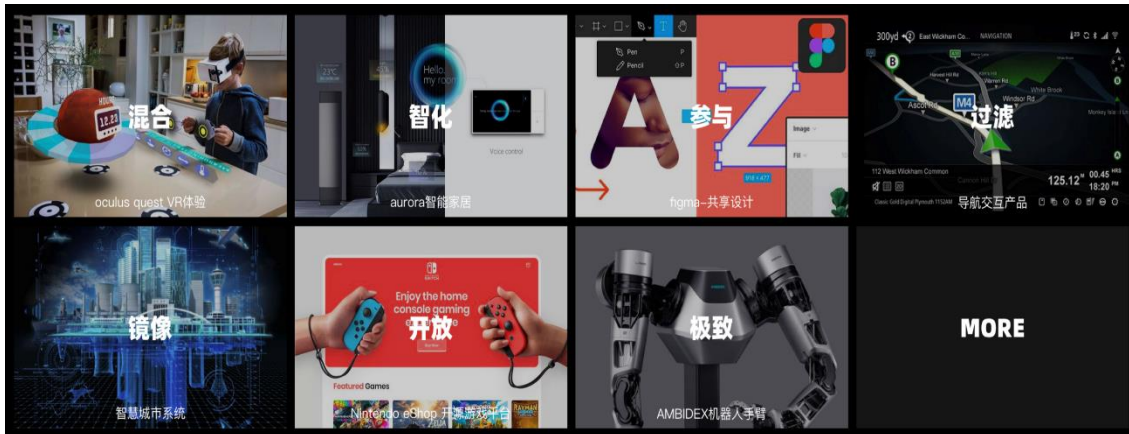


Figure 1.2 insight into future design trends

## 2. From design value to sustainable value: connotation understanding and design scenario

### 2.1. Connotation understanding

Based on the relevant conceptual research and discussion, this paper defines sustainable commercial design as follows: a design system based on the concept of sustainability to help the commercial system create, transmit and obtain economic value, social value and ecological value at present and in the future. It can adapt to the current and future benefit model of enterprise organizations, extend the length and breadth of value creation, so as to promote the sustainable change of business system and finally promote the sustainable development of the whole economy, society and ecology.

In order to more clearly define the significance and value of design to sustainable business system, it is necessary to classify it in different types of business environment. This chapter will discuss the innovation and creation mode of design in typical business scenarios and its role and influence, and analyze the relationship between design drive and value innovation from the perspective of axiology[4].

## 2.2. Design scenario

The creation scenario of sustainable business design is closely related to the innovation environment of business system. According to the enterprise innovation theory, the innovation of business system is mainly divided into two forms: progressive and breakthrough.

Incremental driving mainly refers to market driving, which occurs on the basis of the existing business fields and existing knowledge of the enterprise. Among them, design is to gradually drive enterprise reform with the help of consumer experience design and market insight and analysis.

The breakthrough drive is carried out in new markets or potential application fields by using new knowledge completely different from existing knowledge. Under the technology led mode, engineering technology breakthrough can well drive enterprises to open new markets and obtain a new value creation mode. Through the combination of design and technological change, it will deeply affect the application mode and development orientation of technology and bring greater gain to enterprises; In addition to technology, the innovation mode led by design is more subversive. Roberto verganti first proposed "design driven innovation" (Figure 2.1) in the book "the third innovation" in 2003, that is, endowing products with deeper connotation and significance through design. Roberto believes that "the novelty of the information and product language transmitted by the product is much greater than the novelty of the technical achievements contained therein". The essence of design is to create a new design language (meaning) to promote product innovation. This alternative driving mode effectively avoids the internal problems of market driving and technology driving, and has become an effective way to create popular products, which is highly praised by apple, IKEA, Nestle and other enterprises[5-6].

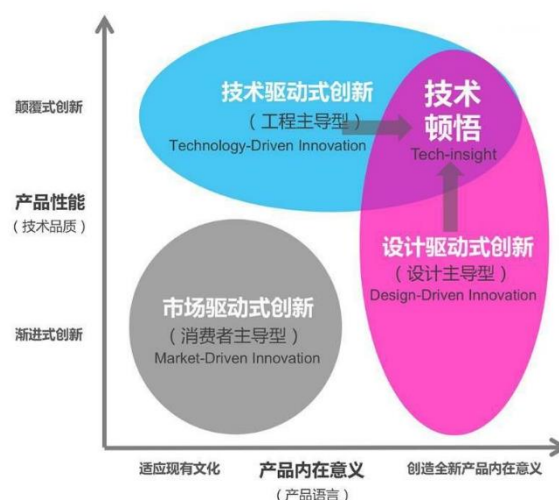


Figure 2.1 Industry driven mode

### 2.2.1. Sustainable business design driven by market

Market driven enterprise innovation starts from users. Through the insight into the needs of users and the trend analysis of consumer preferences, innovate the products, technologies or services of enterprises, so as to drive the reform of enterprises. Among them, design provides assistance for enterprise reform driven by the market through a series of means such as



empathy with users, insight into needs, defining opportunities, innovative design and development plans.

Under the traditional market driven mode, business design is based on the insight and analysis of consumer groups to design truly touching experiences. For sustainability oriented enterprises, design is not only required to create market value, but also need to bring social and ecological value. Therefore, sustainable business design driven by the market not only needs to create the ultimate user experience for enterprise products, but also needs to pay attention to sustainable factors such as experience equity and ideal consumption.

Example: inclusive design is a representative sustainable business design model driven by the market. Inclusive design is the broadest design mode that allows products to be used fairly by different users (including different physical abilities, language, culture, gender, age, sexual orientation, etc.). Different from barrier free design, we pay high attention to the disabled and disabled; It is also different from universal design. It adopts a single solution to meet the needs of as many people as possible. At the moment when personalized experience is popular, inclusive design requires designers to pay considerate and meticulous attention to individual experience in a wider range and finer granularity, and make use of the current technical advantages to truly achieve the experience fairness of both personalization and quality[7].

### **2.2.2. Sustainable business design driven by technology**

Technology driven enterprise innovation is dominated by the development of new technologies or the application and transformation of original technologies. The development of science and technology is the macro force to break through the existing model and explore new business fields. The products of the enterprise can not be directly accepted by the market, or the technological innovation can not be directly accepted by the enterprise. Especially for mature large enterprises, technological leadership may not bring success in the market. The design explores the deep-seated market demand by paying attention to the social and cultural trend; Through the analysis of existing technical capabilities, realize the reasonable matching between demand and technology, and change the "innovator dilemma" for technology driven enterprises.

Driven by traditional technology, commercial design plays the role of "value rationality". Guide "technical insight" and bring double breakthroughs in technical level and product significance. Based on the perspective of sustainable development, the value brought by technological insight needs to be brought into play to a greater extent, and bring more positive gains to stakeholders in social, ecological and other fields on the basis of meeting economic benefits.

Example: hardware and software co design is the most influential design mode driven by technology. With the breakthrough development of software and hardware technology, the design has more innovative power and implementation means: the integration and cooperation of hardware equipment, software equipment, real space and virtual space, so that the equipment capability and interaction space are highly released, creating a multi-dimensional experience space for enterprises; The breakthrough and development of Internet of things technology, quantum computing technology and biotechnology have driven the upgrading of production capacity and intelligence, creating conditions for the digital transformation of the whole life cycle of consumer goods[8].

### **2.2.3. Sustainable business design driven by design**

Design driven enterprise innovation is an innovation of meaning construction, and the core goal is to create new product meaning through design. As a creative means, design cannot create new technologies or create new social and cultural trends independently, but it can creatively tap the advantageous resources from the market, technology and product itself, and build a unique product meaning through the reconstruction of product positioning, the expression of functions and characteristics, the description of cultural connotation and other means. For

example, Disney not only sells its cartoons and animation surroundings, but also takes the happy experience as its core product to present the best entertainment experience for people of all ages in the world. Or new products such as Nintendo and Instagram, which are neither technology driven nor market driven, but obtain sustainable competitive advantage by meeting the emotional, psychological and socio-cultural needs of consumers.

Under the conventional design system, designers with core driving ability need to have stronger organizational ability and decision-making judgment. Based on more comprehensive resource collection ability and more breakthrough creative perspective, designers can often bring longer-term competitiveness and development driving force to enterprises. Under the sustainable commercial design system, designers are required to jump away from the enterprise itself, comprehensively consider the relationship and influence between enterprises and people, enterprises and society, enterprises and ecology, and create value beneficial to a wider range of stakeholders through design innovation.

Example: driven by sustainable design, products do not have to make the design distinctive and prominent like Disney; It doesn't have to rely on the wave of high technology like Apple, but should have stronger flexibility and adaptability. Natural / tranquil design mode is a representative. Designers minimize users' attention by perceiving the user experience, fully integrate the design into the use scene, and operate in a way similar to "background music". Design makes the design itself invisible, removes the stylized rules and explicit expression, and the negative impact of design and behind products on the natural environment and ecological environment gradually returns to zero.

### 2.3. Summary

Sustainable business design plays a differentiated influence and role in different business scenarios, and jointly guides the transformation from design innovation to sustainable value innovation. Design can ensure product friendliness and fair experience in the gradual innovation and reform of enterprises through insight into the market, empathy with users and polishing experience; Be able to integrate technical means and expand the value of tools, reduce energy consumption and production costs in the breakthrough reform of enterprises, fully tap the ways and output channels of enterprise profits, and bring positive value to stakeholders in social, ecological and other fields; Through the mode of breaking through the perspective, reorganizing resources and creating meaning, we can build sustainable product meaning and guide the transformation of mutual benefits of enterprises and the integrated development of economy, society and natural ecology.

Sustainable commercial design is a dynamic and evolving design model. In different design scenarios, it has considerable flexibility under the changes of social, scientific, technological and cultural environment. In the innovation and transformation of enterprises, it is of great significance to drive and realize the sustainable transformation of enterprises to reasonably apply the innovation mode of sustainable commercial design and clarify the objectives, effects and responsibilities of each design stage.

### 3. System application of sustainable business design (innovation path)

Sustainable commercial design combines the characteristics and responsibilities of sustainable design and commercial design, and always adheres to the unity of economic, social and ecological benefits. From the perspective of practicality, the objects to be considered and concerned in the design stage mainly include the following two categories: one is the human and freight yard and other factors associated with the enterprise economic system; The second is the stakeholders in the social and environmental system involved with the enterprise.

This chapter will discuss step by step in combination with the mapping of experience design elements in the commercial design system (respectively: design objectives, design strategies, experience effects, product value and system impact). Based on the two value dimensions of "economic value" and "social and environmental value", this paper constructs the basic application mode of sustainable business design. Analyze the series relationship between layers and improve the creation and transmission path of sustainable value in the application system (Figure 3.1).

经济价值	设计阶段	社会、环境价值
<p><b>单线串联</b> 企业与顾客之间关系</p>	5.系统影响	<p><b>生态融合</b> 环境、社会、企业与顾客之间关系</p>
<p><b>单核多能</b> 围绕一个核心功能设计, 附加其他功能体验</p>	4.产品价值	<p><b>消费向善</b> 体验模式与消费物料的合理规划与环境利好</p>
<p><b>创新易用</b> 通过创新设计进行品牌和体验差异化细腻化</p>	3.体验效果	<p><b>体验公平</b> 通过包容性、参与性的设计保证多角色体验平等</p>
<p><b>灵活多样</b> 设计手段多样, 快速迭代, 容错率高</p>	2.设计策略	<p><b>多维评估</b> 对设计全生命周期和附加系统进行可持续评估</p>
<p><b>业务导向</b> 围绕业务架构和生产流程设计</p> <p><b>用户导向</b> 围绕用户场景和商业价值设计</p>	1.设计目标	<p><b>目标解构</b> 应用服务设计手段精准拆解诉求, 避免冗余设计</p>

Figure 3.1 Innovation path of sustainable business design

### 3.1. Innovation path

#### 3.1.1. Design objectives

Both sustainable concept and commercial thinking require designers to have clear goals to promote the planning and implementation of design. Business design objectives need to be deduced around the mainstream business roles to form specific user-oriented or business oriented objectives: 1 User orientation: for general household products, enterprises, out of consideration of economic value, put more emphasis on user experience centered design to create considerate and ultimate consumption experience for users. 2. Business orientation: in addition to the design system around a wide range of users, the design system around organizational or business benefits is also very common. The design focuses on the business structure and production process to maximize the efficiency within or between organizations. Under the concept of sustainability, no matter what kind of business orientation to formulate design goals, we need to deconstruct the goals to evaluate their sustainable value. Disassembling the business demands in each scenario can avoid redundant design and unnecessary waste of resources; Matching or optimizing the design objectives corresponding to the business can promote the final sustainable value of the product.

#### 3.1.2. Design strategy

Formulating effective design strategies will help to promote the gradual realization of goals. Commercial systems require flexible and innovative design strategies and higher fault tolerance to cope with the rapidly iterative business environment and escalating market demand. The concept of sustainability requires considering the integrity of the design strategy. During the formulation of the design strategy, we should not only pay attention to the economic strategy, but also involve the solution strategy of social and ecological problems. For example, referring to the concept of ecological design, the design strategy of products should comprehensively consider the whole life cycle of production, use and waste, and bring environmental protection, effective utilization of resources and other issues into the standard of strategy evaluation.

### 3.1.3. Experience effect

For the design strategy, the designer should pay attention to the experience effect of the role corresponding to the specific strategy. The business system requires the product experience to be innovative and easy to use, that is, to differentiate and refine the commodity experience and brand expression through more creative design modes. A sustainable commercial product system requires designers to pay more attention to experience equity. For example, Google design continues to promote inclusive and participatory design to ensure the equal experience of disabled or personalized customers.

### 3.1.4. Product value

When the design focuses on clarifying the form of the product, we need to pay attention to the direct impact of the product on the surrounding stakeholders. In order to ensure the clear use value and consumption attributes of their products, enterprises generally require that the goods have the form of single core and multi-function, that is, design around one core function to hit the core users, and add other functional experiences to attract more customers and maximize the economic value of the products. Under the concept of sustainability, products should not be harvested for pure interests or stimulate consumption, but should have the attribute of consumption for the good, that is, through the design expression or experience mode, products have a certain significance to guide the concept of good environment or ecological environmental protection. For example, as mentioned earlier, the design creates the product significance of Patagonia, making it not only a fashion consumer goods, but also a textbook to guide users to pay attention to environmental protection and green consumption[9].

### 3.1.5. System impact

Finally, designers should be able to systematically consider the system impact of their design results. Under the conventional business thinking, design should pay attention to the stakeholder role of the product, and even the whole business system radiated by the product. Under the concept of sustainability, the design perspective and application system will affect more dimensional interest roles. The intertwined relationship and interaction among environment, society, enterprises and customers should be taken into account to form a more complete and multidimensional ecological integration system[10].

## 4. Summary

### 4.1. Conclusion

From the perspective of design, this paper analyzes and discusses the derivative background, connotation scene and innovation path of sustainable commercial design. The analysis conclusions and viewpoints in this paper are corrected and supplemented through enterprise cases, so as to form a relatively specific and complete research form of sustainable commercial design system. It provides a reference and supplement for the research of sustainable design and other related fields.

### 4.2. Deficiencies and research prospects

There are two deficiencies in this paper: on the one hand, the research on the origin and background of sustainable commercial design is not deep enough. At present, only sustainable design, commercial design and future design trends are included in the research scope, and more derivative fields and influence areas need to be further studied and supplemented; On the other hand, the splitting of the design application system in this paper is mainly based on the experience design level and the mainstream way of current commercial design. It has not been expressed more prospectively from the perspective of the future, and it is difficult to subdivide the characteristic application fields more accurately. In the future research, we need to focus



on summarizing more specific and typical industries or enterprises, and complete and improve the content of sustainable business design through specific case studies.

## References

- [1] Xie Jinxiao, Wang Gaofeng, Zhang Guangyu Design and application of ground source heat pump system in a commercial complex [J] HVAC, 2021,51 (S2): 170-175
- [2] Tu Juan, Qiu Wu, Hu Xi Design and application of business intelligence system for traditional manufacturing industry [J] Journal of Jiangnan University (NATURAL SCIENCE EDITION), 2020,48 (04): 90-96
- [3] Wang yuanze Application Research on personalized design of urban commercial pedestrian street guidance system [D] Hefei University of technology, 2020
- [4] Zeng Ming, design and application of key technology and business model of park integrated energy system under the background of energy Internet Henan Province, economic and Technological Research Institute of State Grid Henan electric power company, April 15, 2020
- [5] Zhou Jing Design and application of user portrait analysis system based on business intelligence WLAN [J] Microcomputer application, 2019,35 (08): 143-145 + 148
- [6] Yang Xianwen Application of lighting design in commercial space light environment system [J] Dagan (Forum), 2019 (07): 83-84
- [7] Zou Yongsheng Design and application of green building air conditioning system in a commercial complex in Guangzhou [J] Refrigeration, 2019,38 (02): 44-48
- [8] Li Dong, Dong Zhenghong, Liu xiaolang, Gong Jie Design and research of dual-purpose commercial remote sensing data application system [J] Dual use technologies and products, 2019 (05): 14-21
- [9] Li fajie Analysis and improvement design of application system log management in rural commercial banks [J] China informatization, 2019 (02): 60-61
- [10] Mou Bingxin Design and implementation of commercial property service management system based on mobile application [D] Shandong University, 2018

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