

THE ROLE OF INDUSTRIAL DESIGN AS A STRATEGIC TOOL IN ITS DEVELOPMENT

Valijonov Toir Muhsinovich

Kamoliddin Behzod National Institute of Arts and Design
Senior Lecturer of the “Design” Department
Design.84@mail.ru

Annotation: This article explores the essence of industrial design, its historical evolution from the 18th century to the present, its key practical stages, and its strategic importance in the modern economy. It examines the impact of design on increasing brand value, improving user experience (UX), and key future trends (such as artificial intelligence, sustainability, and the Industrial Internet of Things - IIoT). The article urges viewing design not as an expense, but as a core investment that enhances competitiveness.

Keywords: Industrial Design, Strategic Tool, User Experience (UX), Sustainable Design, 3D Printing, Brand Value, Dieter Rams.

Аннотация: Статья исследует сущность промышленного дизайна, его историческую эволюцию с XVIII века по настоящее время, ключевые практические этапы и стратегическое значение в современной экономике. В ней рассматривается влияние дизайна на повышение ценности бренда, улучшение пользовательского опыта (UX), а также важные будущие тенденции (такие как искусственный интеллект, устойчивое развитие и Промышленный Интернет вещей – IIoT). Статья призывает рассматривать дизайн не как издержку, а как ключевую инвестицию, повышающую конкурентоспособность.

Ключевые слова: Промышленный дизайн, Стратегический инструмент, Пользовательский опыт (UX), Устойчивый дизайн, 3D-печать, Ценность бренда, Дитер Рамс.

Industrial design is a fundamental process aimed at developing physical products intended for mass production. This activity is not limited to a purely creative act, but involves strategically defining the form, functionality, and characteristics of a product before the manufacturing process begins. In professional contexts, the term “design” is often used synonymously with “industrial design,” emphasizing its broad sphere of influence.

The key feature of industrial design lies in its multidisciplinary nature, combining elements of art, marketing, and technology. It covers a wide range of objects—from household utensils to complex high-tech equipment, vehicles, and production machinery. The primary task of an industrial designer is not merely to create something aesthetically pleasing, but to develop a product that meets the principles of “good design.” These principles include the following:

- From an aesthetic perspective, the product must possess an attractive and appealing appearance.
- From an ergonomic standpoint, it should be comfortable and easy to use.
- From the viewpoint of design innovation, it must incorporate new features that distinguish it from competitors.

It is also essential for the product to be intuitive, meaning that the user should understand how to use it at a glance. Additionally, the environmental impact of the product must be considered at every stage of its life cycle.

A product should not make false or exaggerated claims about its features.

Underestimating the role of design in the early stages of production can lead to the creation of technologically advanced products that nevertheless fail to meet market demands. This proves that neglecting design is not merely an aesthetic flaw, but a serious strategic business mistake, as design-oriented companies significantly outperform their competitors in terms of revenue and capitalization.

The history of industrial design began in the 18th century in England, alongside the development of industrial manufacturing and the work of figures such as Josiah Wedgwood. The theoretical foundations were laid by early thinkers like William Morris, who argued that the aesthetic appearance of an object must correspond to its purpose.

Peter Behrens and AEG (1907): A key milestone in the transition from craftsmanship to industrial culture occurred in 1907 through the collaboration between the German company AEG and the architect Peter Behrens. The head of the company, Walter Rathenau, understood the importance of aesthetics in industrial products and hired Behrens as an artistic consultant. Behrens became the first industrial designer to develop a unified corporate style for an entire company, creating designs for kettles, fans, lamps, and other products.

The next significant stage was the emergence of design schools such as the Bauhaus (Walter Gropius, 1919, Germany) and VKhUTEMAS (1920, RSFSR). These educational institutions firmly established design as a discipline that integrates art, technology, and production.

In the second half of the 20th century, two different but equally important ideological directions took shape. The American approach, led by Raymond Loewy (often called “the father of industrial design”), focused primarily on styling—improving the external appearance of products—and increasing sales.

In contrast, in Europe, particularly in Germany, the “good design” philosophy emerged, canonized by Dieter Rams, who worked at Braun. His works (such as the Braun SK2 radio) became symbols of minimalism and functionality. Rams’s principles—such as “every detail is well-considered” and “the absence of superfluous elements”—were a reaction against excessive American styling and laid the foundation for modern minimalist design.

Today, industrial design is not merely a component of the production process, but a powerful competitive tool.

It directly influences a company’s financial performance by increasing added value. Consumers are willing to pay more for products that feature attractive and well-considered design.

The DMI (Design Management Institute) Design Value Index (2015) demonstrated that companies that actively invested in design saw their market capitalization grow up to 211% faster than major corporations listed in the S&P 500 index.

A McKinsey study (2018) showed that companies with high levels of investment in design outperform their competitors in revenue growth by twofold.

These findings clearly indicate that design is not an abstract cost item, but a strategic investment that delivers substantial financial return.

The influence of design extends beyond economics and directly affects user experience (UX). UX refers to everything a person feels and thinks during interaction with a product. Industrial design is a means of enhancing this experience. It makes a product intuitive, safe, and convenient to use.

High-quality design solves user problems, evokes positive emotions, and creates a recognizable identity. This emotional response and ease of use establish a strong connection with the brand and enhance its recognition. Design becomes a key link in the value-creation chain: thoughtful design leads to a positive UX, which in turn fosters brand loyalty.

In saturated markets—where products often share similar functionality—design becomes the primary differentiating factor that allows a product to stand out among competitors.

The process of developing a new product through industrial design is a complex, iterative sequence that requires in-depth analysis and close collaboration among various specialists. Digital tools have radically transformed this process.

The main stages in this process include:

1. Design research – a comprehensive analysis of the market, competitors, and the needs of the target audience.

Collecting data, studying trends, and determining the intended use of the product.

2. Conceptualization – generating ideas and forming the overall concept of the product based on the gathered information.

Creating sketches and drafts, developing mock-ups and exploratory variations.

3. Translating sketches into a digital environment.

3D modeling (sketch-to-3D, assembly models), evaluating proportions, and producing photorealistic renderings for presentations.

4. Creating an experimental sample or prototype.

3D printing (which has revolutionized this process), building functional models, and testing them with users.

5. Implementing the approved design while taking all manufacturing requirements into account.

Close collaboration with engineers, cost estimation, and preparing technical documentation.

The shift to digital tools such as 3D modeling and 3D printing has significantly reduced the time and financial costs required to create prototypes. At the initial stage, the ability to create virtual models and photorealistic renders allows businesses to start sales and attract investments without producing a physical sample.

The future of industrial design is closely linked to technology and global challenges. Design strategy should be oriented toward the following key trends:

1. Making Sustainable Design the Core Strategy

Companies must adopt the principles of sustainable design. This means that the product's entire lifecycle—from raw materials to disposal—should be designed to minimize environmental impact. Attention to eco-friendly materials and recycling is now a mandatory standard.

2. Integrating Artificial Intelligence and Generative Design

Active use of Artificial Intelligence (AI) and Generative Design is recommended. AI can optimize forms, patterns, and colors. Generative Design enables the creation of complex and optimized structures that are difficult or impossible to design manually, thereby minimizing material consumption.

3. Learning from Products via the Industrial Internet of Things (IIoT)

The Industrial Internet of Things (IIoT) allows the collection of large amounts of data on product performance and usage. This data should then be analyzed by AI and passed to Generative Design for the development of the next-generation products. This creates a closed loop of continuous improvement.

4. Redefining the Designer's Role as a "System Architect"

The designer is no longer just a "form creator" but becomes a "System Architect." They design not only the physical shell but also the product's entire lifecycle, its interaction with data, and its integration with the digital world. Businesses must reorganize their design departments to align with this new role.

Conclusion

Industrial design is a multidisciplinary field that shapes the economic, cultural, and social value of products. Historical experience shows that design has evolved from narrow functional craftsmanship into a strategic business discipline capable of significantly increasing company revenue and capitalization.

For modern business, investments in industrial design are not merely expenses for aesthetics but strategic investments aimed at strengthening competitiveness and brand value. In a saturated market, design is the primary tool for creating a positive user experience, eliciting emotional responses, and fostering long-term customer loyalty.

In the future, the success of industrial design will be defined by the integration of digital technologies such as AI, 3D printing, and IIoT. These innovations transform a product from a static object into a dynamic, intelligent system. The designer's role evolves into that of a creator of complex systems, responsible for designing the product's complete lifecycle and its interaction with the digital world.

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