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HISTORY AND DEVELOPMENT OF INDUSTRIAL DESIGN

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Annotation

Today, industrial design is a complex interdisciplinary design and artistic activity that combines natural sciences, technical and humanities, engineering and artistic thinking, and aims to shape the objective world on an industrial basis in a very wide "contact zone" with man.

Keywords: *aesthetics, model, construction, design, industry, stylization, functional, conceptual*.

注解

今天，工业设计是一种复杂的跨学科设计和艺术活动，它结合了自然科学、技术和人文、工程和艺术思维，旨在在与人类非常广泛的“接触区”中以工业为基础塑造客观世界。

关键词：美学、模型、建筑、设计、工业、程式化、功能、概念。

INTRODUCTION. At present, the main problem of design around the world is the creation of a world of cultural and anthropos-like objects that are considered aesthetically compatible and integrated. Therefore, along with engineering and technical and natural sciences, it is important to use the tools of the humanities - philosophy, cultural studies, sociology, psychology, semiotics and others. All of this knowledge is combined in the act of design and artistic modeling as an objective world unit based on figurative, artistic thinking.

Industrial design, which is a branch of design, is a field of artistic and technical activity, the purpose of which is to determine the formal qualities of industrial products, ie their structural and functional properties.

The term "industrial design" was coined in 1919 by Walter Gropius, a German architect who founded the Bauhaus Revolutionary School of Industrial Design in Weimar, Germany.

Industrial design is a major group in the application of design labor (tools and mechanisms), which includes machinery, vehicles; household goods - consumer goods (tableware, home appliances, audio and video equipment, electrical units, mechanisms,

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children's toys, furniture). They are the most common field of design activity today.

The first industrial design association was founded in 1849 in Sweden. Later, similar unions began to appear in Germany, Austria, Norway, Denmark, and Finland. Nineteenth-century designers sought to create new, practical forms for machines and manufactured products.

In the 1860s, national trade fairs began to be organized. The first such exhibitions were held in London in 1761–1767. In Paris (1763), Dresden (1765), Berlin (1786), Munich (1788), St. Petersburg (1828), and others.

While the focus of such exhibitions was on commercial purposes, they also served to showcase technical discoveries and great achievements.

In 1756, the International Industrial Exhibition was held in England. But it did not reach the level of a world exhibition.

From 1878 to 1889, progress was so great that visitors to the exhibition were amazed by the examples of scientific and technological progress. Cars, the palace and the Eiffel Tower, the Crystal Palace are among these unique discoveries. In the era of transport and communications, the industrial revolution, all industries have become a platform for the application of design methods.

METHODS. The rapid development of industrial production with pictures has played an important role in the emergence and development of the design of world industrial exhibitions. At these exhibitions, technical creations and works of art were presented to the public as works of art. It was here that the aesthetic flaws in the forms of the first industrial products became apparent.

As spectators and experts inspected the industrial goods, they noticed that in their creation, they copied the shapes created by artisans for handicrafts and added new decorations.

However, the research at that time did not yield good results, and often led to non-functional and meaningless solutions. But at the same time, there were pragmatic views formed by many other designers. One of them was expressed in 1894 by Frank Lloyd Wright: "Machines are part of a world that will continue with us, and we must make optimal use of this tool of civilization."

Figure 1. Frank Lloyd Right.

Based on these views, and at a time when the first steps towards a high level of design civilization around the world were being made, after the end of World War I in 1919, architect Walter Gropius founded the Bauhaus School of Industrial Design in Weimar.

This international design center has also brought together teachers and students from around the world.

It should be noted that most European educational institutions still use the basic course ideas developed at Bauhaus. However, World War II forced Gropius to close his school.

The impetus for the development of industrial design was formed during the Great Depression, when manufacturers needed to increase sales. Designers have tried to modernize

products, improve their appearance and minimize production costs. At that time, the industry began to focus on the production of consumer goods. The greatest demand of that period was the need to produce goods that sold quickly and brought in good profits.

It was the end of World War II that contributed to the further development of industrial design.

After 1945, followers and students of Walter Gropius opened new design schools in the Netherlands, Denmark, Norway, Sweden, and Finland. These European countries later became the centers of world design thinking.

It wasn't until the early 1920s that the United States became very technologically advanced. The series of products made of new energy-saving materials was in great demand among a wide range of consumers. In addition to advertising and packaging, the appearance of the product has become increasingly important to meet consumer demand. Formal reform has always been a market factor in the United States, unlike in Europe, where it has always been considered primarily from a social point of view. And it was in the late 1920s that large-scale expansion of production capacity led to a mismatch between the purchasing power of the population and the consequent global crisis.

To support the economy in practice, the U.S. government has sought to increase consumer incentives through design, encouraging consumers as much as possible. During the crisis, manufacturers began to pay more attention to product design:

- primarily as a means of dealing with their immediate competitors,
- as a method of later recovery of the economy.

In search of a formal style, American industrial designers came up with a simplified form that means speed. Along the way, Raymond Lowy's simplified design of the Gestetner copying machine was a great success, and American designers followed suit and began designing home furnishings using a simplified style. Simplified form theory, based on the use of round, smooth-surfaced shapes, often in the form of droplets, was particularly popular in transportation technologies: shipbuilding, air transport, and automotive.

It was in the 1930s that simplified forms began to be used by designers for decorative purposes in all areas of consumption, which helped manufacturers to increase the competitiveness of products and the annual renewal of product appearance helped to increase the aesthetic life of products as well as sales.

The types of design developed in the 50s and 60s and the basic theories had a great influence on German design. Over the years, many design products based on these theories have been developed by High Shaping in Ulm specifically to train designers. On the one hand, this school was a continuation of Bauhaus ’ideas and practices, and on the other hand, it was a model that brought together many design education centers around the world. This school was founded in 1951 by Max Bill. In his view, Max Bill adhered to the concept of clean, functional design. The shapes are stiffer, the decors are less original, the product is mostly functional, and the shapes are mostly right angles.

In France, the design industry has a stable tradition in the development of artistic design ideas, and the Le Corbuse school has played a major role in creating a harmonious object environment using architecture and design, a comprehensive rethinking of the world of things.

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For example, the Bibendum chair, designed by Eileen Gray, one of the most famous and expensive pieces of furniture in the world, has greatly influenced the development of furniture design and the use of new and unconventional materials. Before Bibendum, furniture was made of wood, carvings, wrapping elements, and jewelry. And it was the Bibendum model that offered non-standard use of metal pipes, chrome plating and very unusual shapes.

Italian design is known for its excellent reputation around the world. The famous Italian style amazes many designers with its elegance, originality and perfection. Many Italian car brands are also recognized as car design classics.

The connection between design and art is especially strong in Italy. Unlike German and American design, Italian design was shaped by old traditions of culture and economics, and their free experimentation led to dynamic and individual forms. As Umberto Eco puts it, "If other countries have design theory, Italy has philosophy, even design ideology." The philosophy lies in the way Italians live, in their ability to be the best guide between past and future. That's why the Italian style is very attractive and modern.

In the 60s and 70s, a new stylistic period began in Italian design:

- the period of postmodernism with an unexpected combination of scale and meaning;
- the era of conceptual design, the uniqueness of the product, its sensitivity, the plot became as important as the actual size, material and functional form.

In Russia, the design of the 60s required stylists and graphic designers due to the need to revive post-war industry and rebuild ruined cities. In 1945, the Stroganov School in Moscow was rebuilt to train such specialists. In the post-war years, the first wide-profile design bureaus were established in the USSR. One of them was the Bureau of Architecture and Art, headed by Yuri Solovyov. Major developments of this bureau in the 50s include the trolleybus project, the interior and general appearance of the motor ship for rivers and lakes, and various furniture replacement projects. The first successful project was the modernization of passenger transport (1945), which for the first time used the principle of visual comparison.

At the same time, the project became very popular in industrial design around the world: in 1946, the Goby Automobile Plant began to produce a car "Victory", the author of which was a talented young designer V. Samoilov.

The car, which has a whole new set of principles: a simplified shape, smooth side walls, wings, a single body that covers the entire car, has become a major event in the world of design. The "Victory" car model began to be imitated not only in Europe ("Stan-dart-Vanguard"), but also in the homeland of the automotive industry. However, American buyers, accustomed to more fractional and fragmented forms of cars, could not immediately accept the new body design. In fact, wingless cars with smooth sides only appeared in the United States 10-12 years later, only in the late 50s.

Figure 2. Victory passenger car. Author: V. Samoylov

On December 25, 1920, the Moscow State Higher Art and Technical School of Art (VXUTEMAS) was established. The aim was to train industry-leading artists in higher education.

The institution was formed as a result of the merger of the Stroganovsky School and the educational institutions where artists grew up. In the 19th century, the university was transformed into an institute (VXUTEIN) and operated until 1930. The new educational institution will expand the scope of artistic creation, and in the field of art will work effectively on the invention of valuable artistic objects - home appliances. The curriculum was created in a short time. A one-year teaching methodology was developed, but it did not achieve the expected results, as the emergence of new fields in the field of art and technology led to the separate development of these two fields.

In the first two years of the institution's existence, students received a general education in art, which was considered a major part of it. New, valuable methodological developments have been created in this education. The course was designed to teach modern industries, such as Bauhaus graduates. The administration of VXUTEMAS has identified the future design path of the institution's metal and woodworking faculties with the issue of training all-round leading artists-producers for the society. In this regard, the head of the Faculty of Metal Processing A. Rodchenko writes: z I set a goal in front of me. This led to the emergence of the first Soviet designers.

In the 1960s, two trends emerged in Soviet design. We can conditionally call the first of them - art-construction. It has relied heavily on scientific advances, engineering developments, and projects from the Bureau of Art and Design (SSDB) and the VNIITE Research Institute of Technical Aesthetics. In 1962, the art and design bureaus were formed in seven main structures. They were tasked with creating projects for all types of industries, and the government planned to upgrade all industrial products. The projects created by these agencies were required to be distinguished by their high functionality, technology and aesthetic value. The organization is also tasked with promoting the best practices in this area and removing obsolete and substandard products from production.

Art design bureaus operated on a self-supporting basis and cooperated on a contractual basis with industrial enterprises and design research organizations. In 1963, he signed 85 contracts with the Moscow Sovnarkhoz and united 200 artists with different specialties. They have designed many appliances, cars and appliances.

RESULTS. The idea of the role of an industrial designer in the life of society and in the eyes of the people is completely different. But it can be said that its main task is to invent and implement conceptual solutions to overcome the problems of form and ergonomics, functionality and aesthetics, and sometimes marketing, branding, sustainability and sales. It follows that an industrial designer is at the same time directly related not only to the design of the product but also to other aspects of it. Thanks to the inventions of many industrial designers from around the world, this area is still receiving a lot of attention.

Industrial design is based on a combination of art and technology. Its mission is to create an attractive look for a variety of industrial products, from simple items and furniture to all types of vehicles (cars, trains and airplanes).

Industrial design consists of three main pillars: technology, art, and marketing. The scale of industrial design extends from home appliances to high-tech scientific products. The main task of industrial design is to improve the ergonomics and aesthetics of work equipment, household appliances, complex technical mechanisms, various types of transport.

The development of industrial design addresses technological issues such as labor costs in the production of products, reduction of mechanical elements, multitasking of individual elements of the product, simplification of production. As a creative process of product creation, the basis of design is materials and technology.

The material chosen as a means of conveying design ideas must have certain characteristics and meet a number of requirements:

• functional;
• technological;
• aesthetics;
• ecological.

Functional requirements.

They are the ability of a material to withstand certain functions (being a base for construction, being electrical or dielectric, heating when in contact with hot objects, etc.). The group of properties includes: mechanical, physical, chemical and special (acoustic, color, etc.).

Technological requirements.

These requirements are characterized by the tendency of the material to change its shape under the influence of high temperatures (melting, stained glass), as well as under the same assembly state (liquid, plasticity, etc.) under external influences.

Aesthetic requirements.

These include the ability of a material to have a positive effect on a person's perception of the environment once it has taken its final form in the form of a product.

Environmental requirements.

This material must not be harmful to the human body or the environment, and must not contain or emit harmful substances during the operation of the product.

The formation of an industrial design project consists of the following stages:

• generating ideas;
• conceptual research;
• sketch drawing;
• prototyping;
• three-dimensional modeling;
• visualization;
• design;

The origin of an idea is the origin or "education" of an idea by an author or group of authors, its discussion and formation.

Conceptual learning is the initial stage of developing an idea, studying the shape, material, and functionality of a product. Sketching is the process of drawing a lot of ideas from different angles and colors. Prototyping is the creation of a product model (sometimes from improvised means). 3D modeling often involves the prototyping phase, including the creation of a three-dimensional model in a virtual environment. Visualization is the process of applying texture, coloring (usually using computer technology) to give realism to an object. Construction is the creation of an object from certain materials, the installation of functionality, ergonomics and aesthetic features. DISCUSSION. Today, designers focus on the production of furniture and equipment for the disabled, the elderly and people with musculoskeletal disorders. These are special

furniture and equipment for residential and medical buildings, cars, wheelchairs and many other interiors, and so on. It reveals one of the postulates of design as an activity related to caring for a person, creating things, and creating a thematic environment for a person.

Along with furniture, children's toys are especially popular in the designer's work. The child should be comfortable and safe to play with the toy, it should meet strict hygienic requirements, be manufactured in the industry, i.e. it should be cheap, not cause adverse reactions in the child and others are also taken into account.

There are two interrelated concepts in industrial design: form factor and style.

Priorities for industrial design can also be related to architecture and interior design.

In conclusion, it should be noted that industrial design has its origins in part in architecture. But it differs in that the architecture is space-oriented, while industrial design is object-oriented.

The main tasks of industrial design include:

- understand what the appearance of the object includes;
- understand how functional something is;
- It is very important to determine the features of its structure.

An industrial designer sometimes has to combine different skills, first of all - the skills of an engineer-designer and an artist.

It is well known that the need for industrial design has entered the field of design with the advent of engineering. At the time, some people believed that the quality of products made by flowing machines was inferior to that of professional craftsmen. There were also fears that the handicrafts would lose their originality and spoil the owner's sense of harmony. That's why manufacturers are trying to add decorative elements to their products. Today, there is a wide range of different products in almost every field.

Psychologists also say that a person's choices require a lot of stress, including emotional stress. After all, comparing and analyzing many components and different features of a theme is the main task of today's design industry.

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