

6. DESIGN – SYNTHESIS PHENOMENON: ART, SCIENCE AND TECHNOLOGY

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Abstract: *In the nineteenth century, the century of electricity and railways, radio and cinema, in the process of vertiginous technical progress, within the industrial civilization, appears a new phenomenon of creative, artistic and scientific activity – design. It gave birth to a “way of industrial thinking”, oriented towards creating useful and functional objects, but at the same time able to delight the eye with their beauty without recurring to ornament and decoration effects.*

Key words: *industrial civilization, design, functional objects*

1. Introduction

Starting from the prophetic hypothesis of the famous Count Leon de Labord (1807-1869), known French art critic, diplomat, writer, archeologist and traveler declared right in the middle of the century (1856): "The future of the arts, science and industry lies in their Union"²²⁰, we recognize that this creative activity integrating these areas is the *design*. From the moment of its appearance it imposed as an interdisciplinary phenomenon, encompassing a wide range of disciplines, as a balance bridge between *art, science and technology*. At the same time, we need to realize that, in contemporary society, under the conditions of industrial civilization and the techno-scientific revolution there is even greater interference between these areas – far from being incompatible, contradictory or competitive, they are only specific and solidary: they are mutually reinforcing and conditioning. Thus, design is a complex, hybrid activity whose success and efficiency depend on the happy combination of all integral components.

As mentioned, design is a creative, mixed activity that has a *multiple purpose*, aiming toward creating an object that will combine such features as *functionality, performance, quality, durability, economy, ergonomics, convenience, safety and beauty*. Each of the items depends on the others and it is practically impossible to define them separately. They must be treated and investigated as a whole. This multiple purpose generates the *multidisciplinary* character of the design, which is manifested in the design, planning, execution and marketing of objects, all of which is a result of teamwork. In other words, design is a synthesis phenomenon that brings together various fields of *artistic and techno-scientific* activity. But the contemporary design, which is oriented toward the total reconstruction of the human living environment, toward a new quality level of the correlation between *man and nature*, between *material and spiritual culture*, first of all significantly changes the correlation between *art, science and technology*.

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²²⁰ Curteza, A. (1998) Design. Fashion design. General concepts. Iasi: Ed. ANCAROM, p.17

2. Design and art

Design, conceived as a *process and result of the technical and artistic design oriented toward the establishment of the superior functional and esthetic qualities of the material environment*, involves creative spirit and artistic talent: the designer must find an optimal form of the new product, which is in line with the functionality of the product. He is in a state of constant research for solutions needed for the creation of new products, which in the material environment have not yet existed. Although it is difficult to find new forms fundamentally, the design extends the boundaries of the material environment. Like any artistic process design opens up great possibilities for creation. In this respect it would be interesting to compare the creative process in the arts and in the design.

1. The creation of the artist has a subjective, inner character, and the creation of the designer is directed and dedicated to use by other individuals.
2. The artistic work shows a momentum of free fantasy, creating something new, original, unexpected. Although in a state of constant search for solutions to create new objects, the designer cannot ignore the fact that the form he designs will have to be related to the "old" forms of the already existing objects, to be integrated in a context of defined functionality. However, without the intention of finding new forms fundamentally, the designer extends the boundaries of the material environment.
3. Usually, the work of art is oriented toward the reproduction or transfiguration of reality, the design activity – toward the creation of a new reality, a new material environment: the world of useful and beautiful objects.
4. The artistic work, in most cases, plasticizes the present, sometimes – the past, less often – the future; design is always oriented toward the future: the design activity, being based on the analytical study of the existing material environment, on the analysis and generalization of the new trends in the evolution of style and fashion, on market demands and requirements, on the tastes and options of the consumers, is predicting these trends for the near future. However, in the given situation the designer does not remain a mere observer: he actively intervenes in this process, anticipating, directing and changing the shaping of forward-looking stylistic trends.
5. The artist is the initiator and the interpreter of his work, while the designer only projects the future object and its achievement is usually the result of the activities of other links in the continuous process carried out for the achievement of the object.
6. The artistic work reveals a current permanent value, the art being designed to face the time, to resist over ages. Utility forms unlike artistic works require to be replaced by new ones, because they got "old" or out of use.
7. The reception of the work of art is accompanied by an *aesthetic attitude* (the notion applied by the famous Romanian aesthetician T. Vianu²²¹) – emotional and intellectual process based on the exclusion of daily, vital interests (a phenomenon appreciated by the same author by the notion of "carelessness to life"). In design, the high artistic value, the expressiveness of the form depends strictly on the

²²¹ Vianu, T. *Aesthetics*. Bucharest: Publishing house for Literature, 1968

maximum achievement of the constructive idea, of the superior qualities in the appearance of the functional destination.

3. Esthetic significance of design

In all the manifestations of the design *the aesthetic* is one of the basic components of the design activity. The design creates beauty and harmony – a feature that relates it to art. But the design aims to combine the *aesthetic* with the *functional*, being closely connected with *utilitarianism*, improving both the performance and the appearance of the products. Design is shown as the main aesthetic category in all the fields – the category of *beauty*. Analysing this category, we see that there are several categories of *beauty*.

a. Natural beauty. The fundamental aesthetic category, *the beauty*, is applied to various qualities and properties of nature, the beauty of the environment reflecting the order and harmony of the surrounding world. All the beauty qualities of nature make sense only to people and, moreover, only to those capable to sense it, to admire its greatness, to be impressed by the harmony of shapes, colors and sounds existing in nature. The concept of *natural beauty* also characterizes the assembly of the endowments specific to *human beings* – the affectivity of the exterior appearance, the depth of the inner experiences, individuality, sociability and lucid rationality – all of this being able to rouse satisfaction, emotion and joy, aesthetic sensation, generating feelings of pleasure and admiration to the person valuating it.

b. Artistic beauty. *Beauty* is the basic category characterising *art*. The work of art has an esthetic end. *Beauty* in human artistic creations is defined by the expressiveness of the material, amplified and transfigured by the creative force of the artist. People admire in art traits, qualities, deeds, *beautiful* relationships, *transfigured from reality*, but the appreciation of *beauty* is generated by reference to the quality of the *painting*, to the power of emotional experiences caused by the artistic work. Even if in life certain features, qualities, deeds are considered *ugly*, *repulsive*, if they are *perfectly expressed* in the work of art, they cause the appreciation of *beauty*.

c. Useful beauty. The concept of beauty also relates to man's *creative-material* activity. In this case, beauty is presented as a useful value. Gustav Theodor Fechner (1801-1887, German physicist, psychologist, aesthetician and philosopher), analysing the ratio between beauty and usefulness, wrote: "*Utility is the first requirement of all objects, and if the practical aspect was missing from their appearance, beauty would be also missing*"²²².

The goods made by mankind certify needs, target desires, condense desires, energies and actions. Man, projecting his human essence to the objects made by him, conceives the *utility value*, but also the *artistic value* of these objects. The presence of *beauty* in technical production and in consumer goods contributes to the awareness of the human being. At the same time, in the process of creation of material and objects man developed and manifested his human essence. Thus, *the material environment* created by man is a chronicle of the process of "*humanizing the human being*". *The useful beauty* is stated in the harmonious, expressive

²²² Florea, E. Designul – stiinta si disciplina de studiu. Chisinau: Copitec Plus, 2011, p.8

structure of the useful objects, in the perfection of its forms, in their ability to like, to delight. The scope of *useful beauty* contains: the products of human work, the environment of its existence (indoor and outdoor spaces), social activities and relations between individuals, the information environment (media and internet resources).

4. Design and fine art

Ever since the most ancient times the fine arts and the material creation have been treated as related phenomena. The great philosopher of ancient Greece, Aristotle (B.C. 384-322), the author of the first classification of the arts divided the arts into two categories: *museic* - those protected by muses; and *technical* – the fine arts and crafts (significantly, as in Greek *tehne* means *skill, mastery*). And one of the greatest thinkers of the Middle Ages Augustinus (A.D. 354-430) divides the arts and sciences into two categories: *free* – music, rhetoric, dialectics, astronomy, and *mechanical* – the fine arts and crafts. So, the latter are placed by him in the same ranking category. The concept that the fine arts and the material creation are phenomena of the same nature has been further developed.

But the concept of *fine arts* (*fine arts* are called art genres, *works that exist in a two-dimensional or three-dimensional space and are received by the visual apparatus*) has two meanings – narrow and broad. In a narrow sense, the concept of *fine arts* includes three artistic genres: *painting, graphics, sculpture* – genres that reproduce reality in visual artistic images. According to the wide meaning, *architecture, applied decorative art, artistic construction genres* refer to the concept of *fine arts - design*. These, like *painting, graphics, sculpture*, have a spatial structure (*two-dimensional or three-dimensional*) and are visually received.

But if the genres *painting, graphics and sculpture* reproduce reality in specific-sensory images, in which the forms and images from reality can be recognized, these genres being appreciated as *representative genres*, then *architecture, applied decorative art, design* operate with images, which do not reproduce reality in a direct and specific way. They are appreciated as *non-representative genres*. If the representative genres only *reproduce, transfigure reality*, then the latter *contributes to creating a new reality* - the material space, the human living environment.

The genres of the representative and non-representative fine arts differ not only in their language, but also in their functional factor: the representative genres – *painting, graphics, sculpture* have the *aesthetic function* as the basic function. And the non-representative genres – *architecture, applied decorative art, design* are bifunctional: they have two functions, *utility and aesthetics*, the basic one being the *utility* function. Another argument in favor of conception according to which the design is a phenomenon, belonging to the field of *fine arts*, is expressed by the vision of design as a result of the expansion of applied art and its penetration into the field of technology, a result of the integration of the arts man into the sphere of production.

Design reporting with science and technology

Contemporary design has direct connections with various fields of *science*

and technology, aiming at:

- conceiving a particular way of creativity, appreciated in special literature as a "method of industrial thinking";
- compatibility of the products with the environment and with those who use them – people;
- imposing new products and promoting them on the internal and international markets.

These aspects of the process of creation in design generate its involvement in scientific and technical disciplines. For the functional improvement of the designed product, results from various fields of science and technology that address specific aspects and different stages of this process must be implemented at the level of:

- *design*,
- *production*,
- *promotion on the market*,
- *framing into the natural and social environment*.

This process involves implications in various fields of science and technology: engineering, technical design, economy, ergonomics, psychology, sociology, economics, marketing, finance, ecology, legislation, semiotic, public services, etc.

Design and ergonomics

Contemporary design is directly connected to ergonomic investigations, concerned by the study of working conditions and methods, by the interaction between man, machine and working environment, in order to achieve rational normalisation of these methods, to improve methods and means of production in accordance with the principles of convenience, protection and hygiene. The relatively new science *ergonomics* (word of Greek origin comes from *ergon* – work and *nomos* – law) appeared in England in 1949, when a group of scientists addressed the issue of streamlining the work process. It has been formed as an interdisciplinary science and can be defined as an integrated set of several technical sciences, biomechanics, biophysics, anthropology, anatomy, psychology, anthropometry, physiology, etc.

Design and technology

The 20th century is appreciated as a century of new technologies and materials that have radically changed the material world created by man. At present, when there is unprecedented scientific and technical development, the application of new technologies has caused *the phenomenon of technological substitution*: the emergence of new technologies leads to the partial or total disappearance of whole areas in industry; for example, the occurrence of the quartz clock has led to a sharp decrease in the production of mechanical clocks; the compact disk - to the disappearance of record players with disks, magnetic tape recorders and tape recorders etc. The designer must collaborate with the engineering-technologist, the specialist who provides him with data on:

- the methods and means of processing raw materials;
- all processes and methods used to produce a particular product;

- technical and functional parameters for products in different quality classes corresponding to the needs and possibilities of the different categories of consumers.

Design and ergonomics

The technical-functional connections must be followed in particular, especially the aesthetic with the economic ones. As Ishikawa, the Japanese quality specialist points out, "however good a product is, it will not be sold and the consumer will not be satisfied if its price is too high. In the past, the criterion for manufacturing the products was the sale of the products; at present, this criterion is their purchase; the producer must be in the position of the consumer when manufacturing a product"²²³. Large companies have research and design compartments to develop new types, an organizational structure and equipment with specialties, laboratories, pilot stations, information and documentation sources, etc., which are in line with the proposed objectives.

Design and management

The design activity is directly related to one of the most important economic disciplines – management, science and the art of leadership, which studies all the methods and activities of organizing and managing companies to effectively exploit the human, financial and material resources of an organization.

The designer working within the company must be able to understand the structures and the methods of regulation and internal organization of the workforce in which he evolves. In order to promote teamwork, to mitigate the conflicts he may face, he needs to be familiar with the company management system and with the methods of managing human resources.

Design and marketing

Contemporary design operates with the data of marketing investigations on all activities and strategies aimed at satisfying consumer demand with the best and qualitative products and services; and studying the possibilities of optimum satisfaction of market demand. The designer must collaborate permanently with the marketing economist to carry out market research, related to the forecast of sales volume, the price of the product, the creation of the product image, the promotional message, the position of the product in relation to the competition, the space, the environment and the place of sale etc.

Design and sociology

Design is a factor that is always present in civilization. Created by people, the design came with society to meet its different demands. Design is an important means of uplift and improvement of man's working and living conditions, with a deeply humanizing social purpose. This fact conditioned the emergence of the concept of "technological humanism", which can often be found in special literature. An interdisciplinary science has also been developed – *the Sociology of design*, aimed at carrying out a study on the role of the designer in the social context, the analysis of his multifunctionality, the characteristic of all his social functions, especially of the humanizing function.

²²³ Florea, E. Designul – stiinta si disciplina de studiu. Chisinau: Copitec Plus, 2011, p.10-11

5. Conclusions

From the context of the exposed, it results that design is an important means of improving the human vitality environment, increases the productivity of social activity, protects health, creates psychological comfort. Thus, ethical values are affirmed – care and respect for man, and the humanizing social destination of design determines and argues the formation of the concept of “technological humanism” as the most priority characteristic of contemporary design, which is certainly becoming a real factor for the progress of contemporary civilization.

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