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LEVELS OF HIERARCHICAL SYSTEMS IN GEOMETRICAL MODELLING AND ERGODESIGN

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The article is sanctified to consideration of substantial signs of modelling in the tasks of the applied geometry and ergodesign. Essence of qualificatory dependences is found out in the processes of geometrical modelling and designer planning. Description over of planning object is brought as a hierarchical system. Design requirements are educed in a geometrical modelling.

Key words: geometrical modelling, system, design, ergonomics, artistically-technical planning.

Formulation of the problem. Based on one of the meanings of "design - design", some researchers have identified a design activity with the design. And so can we believe? Most likely not. Design - is always a compromise between the demands of production and consumer desires. This compromise requires specific support. One of the components of the support acts geometric modeling. It is based on modern computer technology, which opens up the possibility of efficient obtaining, storing, processing and issuance of graphic information. This information is primarily characterized by clarity, which is an important factor in solving many problems of design.

Analysis of recent research and publications. Defining research methods in applied geometry is the geometric modeling methods, systematization which is continuous. [1] This is due to the ongoing development and improvement of methods of geometric modeling in different directions, as well as the gradual transformation of the contents tasks applied geometry. As for ergonomics, today it has a comprehensive multivariate optimization of employment rights. The object of study for which developed the theory, methodology, methods and means of ergonomic software is the system "man - technology - environment". Ergonomic studies [2] include the use of probabilistic characteristics as the original data, and require optimization requirements definition and management of the characteristics of the human operator [3] on the stages of design, testing and workflows.

Formulation of the article purposes. Identify level hierarchical systems associated with signs and characteristics erhodyzaynu. Conduct a review of geometric models for use in a wide ergonomic design practice.

Main part. Erhodyzayn uses various algorithms. Among these important given geometric modeling algorithms that facilitate imaging. The term "erhodyzayn" appeared earlier than absorbed the modern sense. The term "erhodyzayn" began to use mainly in cases where the need arose to provide a good design solution, which would coincide ergonomic requirements of a design idea formative and vice versa. Designer gradually learned how to successfully use this approach, and a new term reflects the desire to take into account the recommendations of ergonomics and design in one facility.

Now the system related to the "object design" require a reasonable knowledge of the subject. Such knowledge (and, if possible, quantitative) is especially necessary to describe the object properties provided automated artistic and technical design. Based on current data object can be described as an integrated hierarchical system [4], composed of subsystems of different levels of significance. This sequence of levels is as follows:

- first - level structural and logical and quantitative determination;
- the second - level aggregate subsystems, which provided partial generalized description of properties as objective functions and characteristics of importance;
- third - level simulation that includes appropriate options main characteristics relationship between them and, if possible, their value indicators.

In geometric modeling [5] treated subject (projection), cognitive and computational model (Fig. 1). Their design is based on experience and observation space to experience different spatial operations.

Applied geometry is widely used (including Object Models) method two images. The idea of the method is to obtain isomorphic (unique) object model that allows you to see and distinguish between each part of each element.

The estimated model provides complete geometric representation of specific calculations, or rather, the calculations for which is built on the model. Calculated models are usually intended for multiple use. Educational models is not always seen as a direct image of the object under study. Note that the object geometry and geometry phenomenon or process [6] - is, generally speaking, different things.

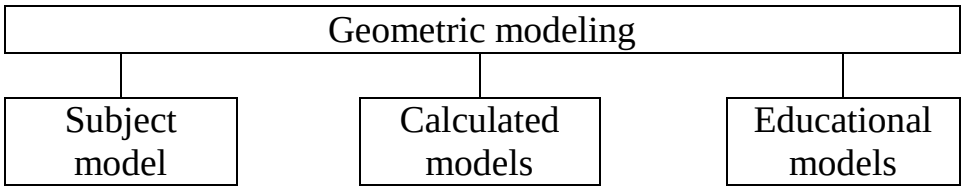

Fig. 1. Types of geometric models

Referring to erhodyzaynu. For a long time belief systems inherent design and ergonomics, existing independently. Even today the trend these views are not formed completely and requires further study. As a new concept, used to describe the scope of activities that occurred at the intersection of ergonomics and design, erhodyzayn [7] combines ergonomic research study "human factor" of project designs in ways that establish the boundaries between them is sometimes impossible.

Fig. 2 presents a scheme. It complies with the principles of hierarchical systems and provides the following definition:

- Design - scientific and practical work on forming a harmonious, aesthetically valuable protection of human life;
- ergonomics - Scientific discipline that studies the functional state human activities, means and instruments of its activities, the environment in the interaction of these components to ensure the safety and comfort of human life;
- erhodyzayn - a comprehensive research effort on the formation of human environment, based on consideration of ergonomic design requirements, properties and characteristics.

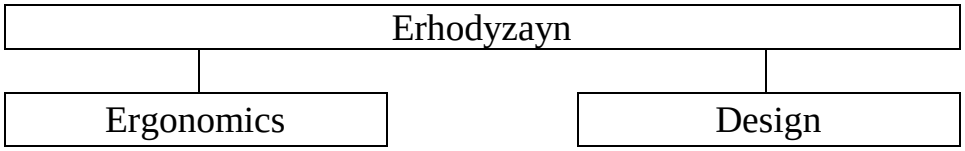

Fig. 2. Scheme of interaction ergonomics and design

To solve the many problems of geometric modeling and erhodyzaynu there is a need to optimize certain problems.

Considering optimization aspects should be noted that a typical optimization problem [8] is to determine the maximum linear function

$$\sum_{j=1}^{n} c_j x_j \tag{1}$$

under conditions

$$\begin{aligned} &\sum_{j=1}^{n} a_{ij} x_j \le b_i, \quad i = 1, \ldots, m, \\ &x_j \ge 0, \quad j = 1, \ldots, n, \end{aligned} \tag{2}$$

where c_j, a_{ij} i b_i – given numbers.

In content optimization problem is to choose (with some set of admissible solutions) of solutions that can be classified as the best in a particular way. This is considered a feasible solution that can be implemented effectively and optimally - one that is appropriate.

Conclusions. In the formation of geometric modeling geometric model provided information. In erhodyzayni modeling tasks are solved

using the capabilities of the system "man - technology - environment". This research model depends on a set of input data. Considered subsystem hierarchical system of "object" in the future provide further development of the overall structure and constituent elements and numerical indexes of each of the subsystems.

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