ENGINEERING ACTIVITIES AND WAYS OF MODELING IT

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Annotation. This article analyzes engineering activities and ways of modeling it. In addition, the methods of modeling engineering activity and its modeling stages and the generalized methods of solving issues based on the analysis of cognitive activity were discussed.

Keywords. Model, modeling, muhammdism, modeling method, experiment, experimental issues.

Introduction. This article considered the main elements of the cycle of classical engineering activities: first of all, the training of future engineers in the technical direction according to the modern educational standards of technical universities, in this research work it is talked about the development of some types of professional activities that are part of the cycle of classical engineering activities; secondly, elements of the cycle of classical engineering activities constitute the “vertical” structure of structural technical engineering activities.
Literature Review. The results of the analysis of the research work of the following authors provide an opportunity to determine the structure of the engineering activity cycle. The discovery, design, construction, engineering research, manufacturing technology and its establishment, operation and destruction of obsolete technical equipment are all the founders of the classical engineering cycle of activities.
The main types of professional activity of the engineer are the following: discovery. In the field of inventive activity, theektekt, that is, the future engineer, using scientific knowledge and technical achievements, recreates new principles of action, methods of implementation of this principleillarni or the construction of technical devices or individual components. The result of such activity – the right of the author to be considered a special product, this invention is formalized and strengthened in the form of a patent.
Research Methodology. Another complete description of the discovery process is presented in the form of three stages.
In the 1-th stage, the action of intuition is the origin of the plan. On the first print, the inventor first understands the terms of the problem. As a result of this stage, a plan, an estimate, that is, a clear picture of the future device, is formed. In its original form, it is considered not about what the inventor will get, but only about what the inventor will want.
In Step 2, this stage is the development of a scheme or plan. The task of this action is to abandon his assumption of the idea that appeared in the first stage. To solve such a problem, the inventor must perform calculations, draw a scheme, create models and experiment with them. As a result of the second stage, the inventor must prove the expediency of his invention, draw up a plan or scheme that includes everything necessary and sufficient for the invention.
3-stage skill, the act of constructive implementation of the invention. At this stage, the task of the inventor is divided into many separate tasks, the number of which depends on the parts that make up the invention. To solve such problems, creativity from the inventor is not required. The inventor solves them with the help of practically verified knowledge and ready-made samples of the available “machines”. At the third stage, the constructor connects with the inventor.
The result of the skill effort is the execution of the invention in full volume, even if it is a copy of the prototype.
Design. Many believe that designing and constructing is the same process, but designing stands before constructing. The process of designing-represents the search for scientifically based, technically feasible and economically profitable engineering solutions.
Analysis and results. One of the” internal “and” external " loyalization is different from the other. ” Internal " design is associated with the creation of Labor-technical projects, which are the main documents for the development of technical objects or systems in production. ” External " design is aimed at developing common ideas about the technical aspect or system, studying it through theoretical knowledge, relevant technical disciplines.

Construction. The design is based on the results of the design and determines all the engineering decisions taken in the project. The design activity is not only to help the inventor in the production of a technical obyekt or system prototype, but also to create a variety of options for the prototypes of the device in the future, from the point of view of customers and the development of technical documentation. That is, the testing and development of handrails for their preparation in production consists in choosing the most optimal of them.

The result of the design activity is a materialized technical object or system or individual elements of it in the production process, as well as calculations of its design, technical and technological parameters.

Engineering Research. Engineering Research, in contrast to research in technical sciences, deals directly with engineering activities. Engineering research is carried out in a relatively short period of time aimed at concretizing the existing scientific knowledge on a particular engineering problem: "research before design, the scientific justification of the development, the characteristics of the development efficiency, the analysis of the missing need. scientific research and others".

Technology of Organization of production. As a result of the construction, a structure or individual elements of it, created technical obyekt (system) and its technical documentation, which is an intermediary between the inventor and the technologist-engineer, appear.

At the present time, the task of complex engineering is the modernization of obsolete technical devices or the destruction of their components. Therefore, engineers who are at the stage of developing technical devices should be able to identify the requirements for the materials and component parts of technical devices in order to be able to process them with minimal damage to the environment in the future.

The development of the main types of professional activity is inextricably linked with the acquisition of such methods of scientific knowledge as: generalization, analogy, analysis, synthesis, abstraction, modeling. Therefore, a given description of the types of engineering activities will help to confirm the fact that the development of each element of such activity is associated with the use of different types of modeling.

As proof of the above points of view, below are a few examples.

1. At the beginning of the engineering activity cycle, the inventor begins to work with the idea of an imaginary model - a future device. Tiradi in a long or short period of time, it changes the model over and over again in intelligent imaginary activity. As a result, the inventor comes to the prototype of a technical device that interests him or her, which in turn becomes an example for the designer and the constructor.
2. Modeling is the main technological process of the project activity, since at different stages of its design there is a huge demand for different models. Initially, the purpose of designing a technical device is ambiguous, tarqoq is the initial model of this technical device. The next design work is the improvement, clarification, detailing of the model, which will help to bring it to the level of information that will give it the opportunity to produce and use the intended technical device.
3. The application of modeling in engineering activities can be cited as an example of the compatibility of the main stages of modeling and modeling, as well as an example of the similarity of the content of activities in the design and modeling of the technical device and the object of cognition.

Conclusion. Summarizing the above views and comments, modeling is a method of cognitive development and its use in the process of teaching students of technical universities is of professional importance for the future engineer in the formation of engineering fundamentals and modeling skills.

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