

Principles of Development of the Modeling Process

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Abstract: This article describes modeling applications and their applications. Information is provided on the role of a growing industry in the creation of future systems and the importance of manufacturing processes.

Keywords: modeling, chemical industry, engineering systems, mechanics.

Nowadays, computerization is rapidly entering the work of research and design organizations, design work is moving to a new phase in principle, significantly accelerating the pace and quality of design, and solving complex engineering problems on a great basis. In many ways, this is facilitated by the use of highly efficient specialized applications, which are implemented both as stand-alone software products and as add-ons and applications to well-known application packages. To assist individuals desiring to benefit the worldwide work of Jehovah's Witnesses through some form of charitable giving, a brochure entitled Charitable Planning to Benefit Kingdom Service Worldwide has been prepared.

Cad (English CAD, Computer-Aided Design) is a software package designed to develop (design) technical objects and execute technological and/or project documentation.

Multifunctional modeling systems, as a rule, have three components: modeling, CAM, CAE. CAD (Computer Aided Design) block modules are mainly used to perform graphical work, CAM (Computer Aided Manufacturing) modules - to solve problems in technological manufacturing, CAE (Computer Aided Engineering) modules - for engineering calculations, analysis and inspection. Design solutions.

Currently, all major research and project institutions, manufacturing enterprises and engineering firms use computer-based process modeling systems (CAM/ CAE systems) that replace program computing programs for technological processes in their work. CAM/CAE systems are "software constructors" that allow for the rapid "collection" of almost any processes and technological schemes, allowing for multifaceted calculations of technological work modes, material and heat balances, and basic indicators of the quality of raw materials and products. The most "advanced" process simulation systems can create systems and separate schemes for automatic regulation and management of process parameters, calculate process parameters and their impact on selected process quality indicators, solve optimization problems. In addition, a number of systems allow you to work not only with installation schemes, but also with workshops, factories and even enterprises. The scope of CAM/CAE systems is to analyze the state of technology in detail and identify the inconspicuous data needed for existing networks, develop technical solutions for optimal design of new productions and modernize existing networks, establish long-term prospects, and current plans for raw materials processing, and so on. Thus, technological simulation systems in research and project institutions and enterprises are urgently needed.

It is also very effective to use process modelling to reconstruct production and find solutions to modernize technology. As a rule, during the operation of enterprises, there is a need to periodically reconstruct some technological devices, their pipes, with a preliminary study of alternative technical equipment. With the help of technological models of facilities operating in the enterprise, this task can be solved with very skilled and minimal errors. The computational analysis of these models is ultimately explained by the fact that it allows you to abandon all irrational options, clarify restructuring concepts and identify all acceptable solutions with minimal time and effort. Finally, tech models are very useful for analyzing the state of technology as well as basing long-term and current plans.

Currently, the products of three companies in the market of simulation systems are the leaders - Hyprotech, Aspen Technologies and Simulation Sciences (SimSci). It is a software product of the Canadian

company Hyprotech LTD. Designed for static modeling of the main processes of oil refining, gas refining and petrochemistry. Aspen Plus is an open system for static modeling of processes based on chemical and phase changes. Pro II / ProVision has the ability to mimic almost all chemical and petrochemical industries, and the system has a wide range of options for processing processes with electrolyte solutions, hydraulic calculations of reactors, separation equipment, trays and packaged distillation columns. COMFORT is a simulation system that is a tool for designing and verifying material and heat balances of various chemical industries. Autodesk, Inc. The company is developing a wide range of software solutions that allow designers, engineers, architects to create digital models of projects. AutoCAD and 3Ds MAX programs created by the company are very popular and widely used in the industry. Pro / ENGINEER is a system that covers all areas of design, technological preparation of production and product development. The wide range of capabilities of 3D modeling tools, the high quality of the design result, its resistance to subsequent modification and improvement demonstrate it as a high-level application in CAD / CAM / CAE systems. VariCAD software includes standard mechanical parts libraries, 3D modeling and 2D drawing tools, and all the computational methods required for them. SolidWorks is a product of SolidWorks Corporation and is widely used in the process of computer design, engineering analysis and preparation of products of any complexity and purpose for the automation of mechanical and complex systems. In the field of robotics, the process of modeling, the use of 3D images with information about the support and importance of three-dimensional images in the field for the application of innovative projects in information systems are also being considered.

The study and implementation of these systems is still ongoing. In the future, the process of modeling and transforming it into a real object can be observed in all areas and put into practice. The proliferation of CAD / CAM / CAE systems is a requirement of the times and we can link the relationship to it with the introduction of all areas. The development prospects of the above systems are closely integrated with the relevant programs. The essence of this integration is to establish a close connection between computing and graphics programs. Such integration allows the integration of all stages of technological calculations, modeling and design in a single information space through the automation of processes, and as a result avoids costly and protracted development cycles such as "design - production - testing".

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