

USE OF THE CLOUD ENVIRONMENT BY ENGINEERS OF THE AGRO-INDUSTRIAL COMPLEX

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Recently, information technologies have gained active development and their application is becoming more relevant. The use of these technologies in any field of activity is an evolutionary step towards giving the educational process the properties of adaptability, flexibility, openness and mobility. There is an intensive implementation of "cloud technologies" and services in the engineering system of agro-industrial complex workers.

The modern new design technology has improved functions for preparing design documentation and allows you to create interactive technical documents and exchange projects on the network. For example, in Solid Edge ST10, it is much easier to optimize the design of parts taking into account the possibilities of additive manufacturing, as well as to request price offers, material options and production times from additive manufacturing service providers.

Advanced publishing tools allow you to create interactive technical documentation and share projects in the cloud. These documents always remain linked to the original project data, so the documentation can be quickly updated if the project changes.

SOLIDWORKS is a powerful design tool based on advanced hybrid parametric modeling technologies, integrated SWR-PDM/Workflow electronic document management tools and a wide range of specialized modules. SOLIDWORKS is now directly connected to the 3DEXPERIENCE Marketplace. Dassault Systèmes 3DEXPERIENCE® Marketplace enables collaboration with qualified industrial service providers who provide a wide range of services throughout the product innovation process (Figure 1). The first two services are "Make" for on-demand manufacturing and "Part Supply" for intelligent parts sourcing. 3D modeling and design not only create virtual objects and 3D images, but also make them a reality [1].

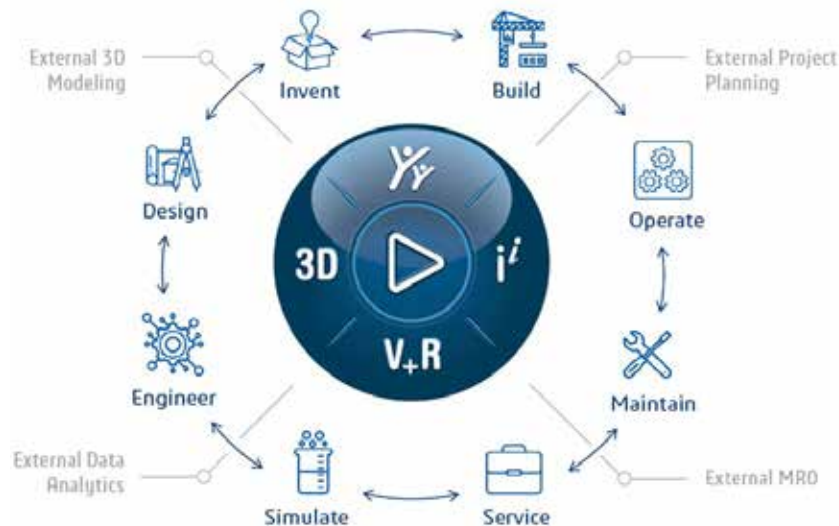


Fig. 1. Features of 3DEXPERIENCE

Agricultural companies, as a rule, specialize in the supply of original spare parts for imported agricultural machinery; high-quality analogues of spare parts for imported agricultural machinery from the world's leading manufacturers; working bodies for domestic and imported tillage machinery; spare parts of rare demand for other brands of imported agricultural machinery in the shortest possible time [2].

Dassault Systèmes positions 3DEXPERIENCE precisely as a platform, and not as a monolithic PLM/PDM system in the classical sense. Working with 3DEXPERIENCE implies a

stack of modern technologies, an approach to engineering data management and the use of modern web technologies. So, for example, the main means of connecting to the platform is a browser.

This will come in handy when supplying spare parts and repairing agricultural machinery. Using the libraries of standard products of the corresponding CAD program, the engineer chooses from the available standards (ANSI, ISO, DIN, etc.). Most users switch to programs in the original language and have some difficulties with translation, especially specific terms. The schedule and the desire to learn English help in this [3].

Each service adheres to industry standards and uses 3D as a universal language to improve collaboration and ensure no details are lost in translation. From finding a qualified partner to payments, 3DEXPERIENCE Marketplace handles all aspects.

3DEXPERIENCE WORKS allows you to combine experts, ideas, data and solutions in an interactive environment for joint work, providing a connection between the virtual environment and the real world, as well as a comprehensive visualization of business processes and the ecosystem in real time.

Today, almost all CAD/CAM/CAE/PLM applications, from a technical point of view, have a chance to get into the cloud. In addition, the use of Internet technologies is natural for modern production due to its globalization and territorial distribution. Of course, it is not yet effective for all areas of application of cloud technologies. Engineers can appear on the labor market thanks to the knowledge gained with the help of applied programs, so graphic training is of great importance for specialists in engineering specialties [4].

According to the unanimous opinion of experts, these are primarily those areas that involve human interaction. Of the entire set of engineering software, PDM and PLM systems are the most suitable for working in the cloud. They provide collective access to data, which is convenient and natural to implement precisely with the help of cloud technologies. PLM tasks translate well to the cloud because high computing power is not required and data warehouse sizes are only a matter of payment. There are a number of tasks for which the cloud approach allows to reduce the execution time and cost, improve the quality of the project and interaction.

The tendency to ensure the mobility of specialists encourages developers to create cloud services and mobile applications that perform the functions of CAD/CAM systems or expand their capabilities.

Cloud-oriented CAD/CAM systems are becoming the leading means of forming the professional competences of future specialists, forming the ability to use computerized systems of design (CAD), production (CAM), engineering research (CAE) and specialized application software for solving engineering tasks, processing information and results of experimental studies.

The decision to use one or another type of cloud should be made by the customer, based on the specific features of his activity. At the same time, it is necessary to take into account the required performance, the specifics of the tasks to be solved (modeling, calculations, storage and transfer of files), data security requirements, the availability of communication channels, the possibility of maintaining a local data center, the availability of qualified personnel for hardware and software maintenance etc.

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