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INNOVATIVE APPROACHES TO DESIGN AND PRODUCTION AUTOMATION

Modern industrial development is characterised by a high level of digitalisation and requires the introduction of automated systems in all areas of production. Traditional approaches to product design and manufacturing no longer deliver the speed, accuracy, and flexibility required. 3D design and visualisation are gaining particular importance, having become an integral part of creating promising design and engineering solutions. The issue of integrating engineering methods and tools arises as engineers simultaneously address the shortage of qualified engineers. The key to efficiency today lies in having professional tools and organising coordinated teamwork within a single digital space.

Considerable attention is given to developing the professional mobility and the communicative and professional skills of engineering and technical workers, which are built through the effective use of modern information and communication technologies (ICT), including cloud technologies. They are an integral part of ICT, defined as a set of methods, tools, and techniques used to collect, systematise, store, process, transmit, and present important messages and data [2, 3].

The implementation of automated design systems, which allow integrating all stages of the product life cycle in a single digital environment, is becoming particularly relevant.

The process of creating a modern product is multifaceted and includes the following stages:

- idea generation and sketch creation;
- development of an accurate 3D model and design documentation;

- programming for CNC machines and model manufacturing;

- manufacturing of a prototype.

Cloud CAD platforms play a special role in modern conditions, enabling real-time collaboration on projects.

Autodesk Fusion is a professional, full-scale, integrated cloud-based CAD/CAM/CAE/PCB 3D modelling platform for manufacturing, machining, engineering, and industrial design professionals [1]. Such systems bring engineers, designers, technologists, and other process participants together in a single digital environment.

Using a cloud environment for teamwork will automate these stages, minimise errors, and speed up time-to-market. One of the most innovative solutions for working with data is Autodesk Fusion. It unites all project participants (analysts, engineers, designers, technologists, etc.) in a shared digital space (Fig. 1).

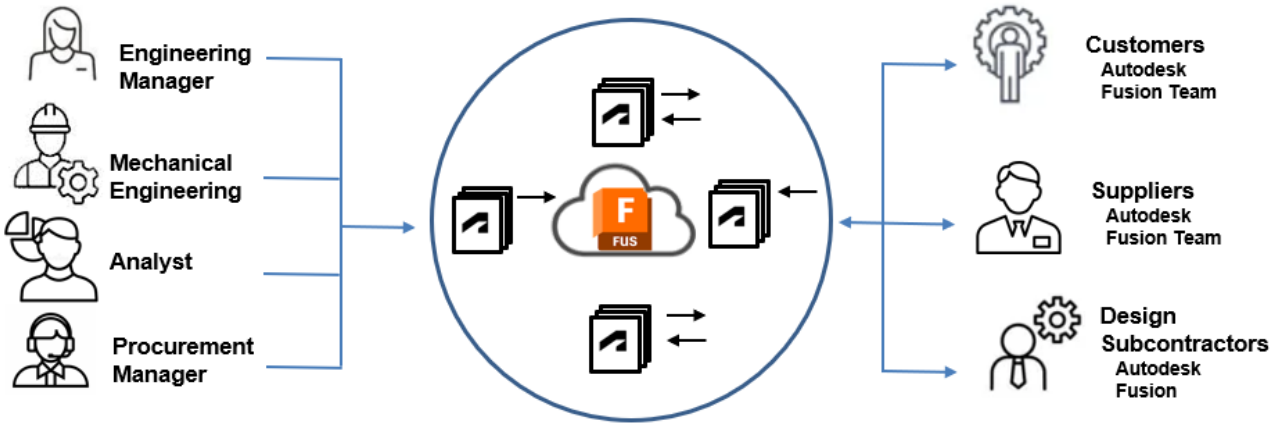

Fig. 1. Interactions between teams in Fusion

Cloud collaboration allows you to involve external contractors, subcontractors, and customers in the project. This gives us production flexibility, as the system supports the full lifecycle – from concept to production management and smart services.

Effective organisation of a common data environment (CDE) is achieved by using innovative tools and approaches. The Autodesk Fusion cloud platform allows you to provide differentiated access to projects, meaning you can manage them effectively. After registering via the appropriate link, project participants can view or edit content depending on their assigned access rights. Transparent management of

access rights across teams enables you to optimise document flow between architects, engineers, and production teams.

Fusion cloud services will be accessible for up to 30 days without an Internet connection, enabling offline work. This is especially important in martial law conditions for project participants with limited access to the Internet and specific sites. Therefore, information is provided through all available communication channels, including online resources and services [4].

Implementing systems like Autodesk Fusion is a strategic step towards manufacturing automation. It not only enables the modelling of objects but also facilitates the creation of a comprehensive digital interaction system that underpins a modern enterprise's competitiveness.

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