VOLIRO AG

ACCELERATING DEVELOPMENT OF SPECIALIZED INSPECTION DRONES WITH SOLIDWORKS AND 3DEXPERIENCE WORKS SOLUTIONS

Case Study

Voliro relied on design, modeling, collaboration, communication, and data management solutions from the 3DEXPERIENCE Works portfolio in concert with SOLIDWORKS Standard design and SOLIDWORKS Simulation Professional software to accelerate development of its innovative flying robotic drone platform for efficient, cost-effective inspection and maintenance of hard-to-reach and hard-to-inspect structures.

Challenge:
Develop complex drone parts and assemblies more efficiently and cost-effectively while supporting increased collaboration across different locations and devices.

Solution:
Implement **3D**EXPERIENCE Works design, modeling, collaboration, communication, and data management solutions in concert with SOLIDWORKS Standard design and SOLIDWORKS Simulation Professional software.

Results:
- Saved time and money during drone development
- Reduced prototyping time and costs using simulation
- Managed data and version control transparently
- Avoided investments in costly IT infrastructure

"The 3DEXPERIENCE platform offers us a seamless environment in which mechanical and electronic components can be coordinated. It enables us to manage all steps of mechanical design centrally and efficiently, increasing the speed of iteration and significantly accelerating teamwork."

–Florian Braun, Hardware Lead

Voliro AG is an innovative startup that emerged from ETH Zurich, a public research university based in Zurich, Switzerland, that develops specialized drone solutions for contact-based nondestructive industrial testing and inspection. Using the Voliro drone to examine materials and structures for defects, without damaging or altering them, helps customers minimize downtime and associated costs.

The startup developed its flying robotic drone platform to enable efficient, cost-effective inspection and maintenance of hard-to-reach structures. Voliro's modular robot platform is equipped with various sensors that can be exchanged depending on the application. Sensors include Ultrasound (UT) for measuring material thickness, Electromagnetic Acoustic Transducer (EMAT) for testing metal thickness, Dry Film Thickness (DFT) for determining the layer thickness of coatings, and Lightning Protection System (LPS) for earthing testing of lightning protection systems, among others.

Because the Voliro drone utilizes modular sensor technology, it is extremely flexible and able to carry out precise contact-based inspections, which is of great benefit in many industries, including energy, construction, and the oil and gas industry. The drone helps to reduce inspection costs and minimize plant downtime, as maintenance and inspection processes can be made safer and more efficient. Voliro strives to combine technological innovation with industrial know-how to revolutionize conventional inspection methods in various industries by increasing safety and making difficult-to-reach or dangerous areas accessible without direct human intervention.

In 2023, management realized that the company needed a new CAD system and product development platform to advance development, support collaboration across multiple locations, manage data effectively, and scale up capabilities to support growth without having to invest in expensive IT infrastructure, according to Hardware Lead Florian Braun. "When evaluating a new CAD system, we specifically looked for a solution that would enable us to design complex parts and assemblies efficiently," Braun explains. "What was particularly important to us was a high level of user-friendliness, flexible licensing without our own license server, and the ability to access and work with the design data from different locations and devices. In addition, integrated file and version management was a key criterion."

During a transitional phase, Voliro utilized **3D**EXPERIENCE® Works solutions on the cloud-based **3D**EXPERIENCE platform with SOLIDWORKS® Standard CAD and SOLIDWORKS Simulation Professional software in parallel with its previous CAD system. Voliro management decided in late 2023 to move entirely to using SOLIDWORKS and the **3D**EXPERIENCE platform.

The company chose to implement design, modeling, collaboration, communication and data management solutions from the **3D**EXPERIENCE

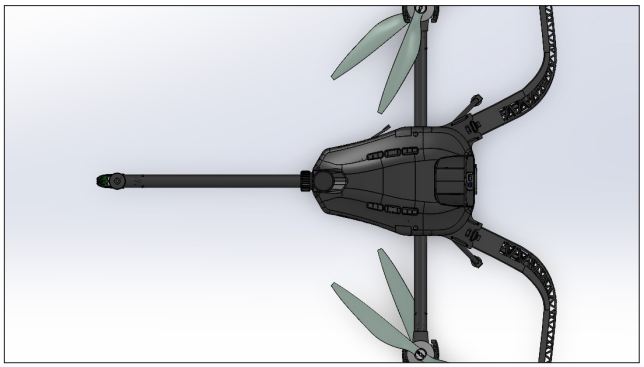
Works portfolio in concert with SOLIDWORKS Standard design and SOLIDWORKS Simulation Professional software, and to use those solutions exclusively to continue development of its innovative drone technology. The product innovation portfolio leverages the cloud-based **3D**EXPERIENCE platform to give customers access to the power of Dassault Systèmes' industry-leading tools for design, simulation, manufacturing, data management, and marketing.

"We chose the **3D**EXPERIENCE platform because of its seamless integration with SOLIDWORKS," Braun recalls. "For a startup company like Voliro, the **3D**EXPERIENCE platform offers decisive advantages: It enables us to work in a scalable manner without having to invest in complex IT infrastructure, allows us to work collaboratively independent of location, and provides transparent, integrated data management and version control, which enables efficient collaboration within the team and with external partners. ... The scalability of the platform is particularly advantageous for us, as it allows us to grow quickly and efficiently without having to worry about technical hurdles."

FAST-TRACKING DEVELOPMENT VIA CLOUD-BASED COLLABORATION

Moving to **3D**EXPERIENCE Works and SOLIDWORKS product development solutions exclusively has allowed Voliro to fast-track drone development due to enhanced collaboration in the cloud. "Our mechanical development process is handled via the **3D**EXPERIENCE platform — from the initial ideas and drafts to the final implementation," Braun notes.

"Depending on the project, one to three designers typically work closely together, often in cooperation with electronics engineers, to ensure smooth integration of the electronics," Braun adds. "The **3D**EXPERIENCE platform offers us a seamless environment in which mechanical and electronic components can be coordinated. It enables us to manage all steps of mechanical design centrally and efficiently, increasing the speed of iteration and significantly accelerating teamwork."



Using **3D**EXPERIENCE Works and SOLIDWORKS solutions, Voliro was able to fast-track development of its drone inspection platform through cloud-based collaboration, saving time, reducing costs, and improving product performance in the process.

SAVING TIME AND MONEY, IMPROVING PERFORMANCE WITH SIMULATION

In addition to helping Voliro increase collaboration in the cloud to speed development, the move to **3D**EXPERIENCE Works and SOLIDWORKS solutions is helping the company realize additional cost and time savings — as well as improved drone performance — through the use of SOLIDWORKS Simulation Professional software. "We use SOLIDWORKS Simulation Professional software to carry out extensive structural simulations and analyses," Braun points out.

"This capability enables us to evaluate the performance and resilience of our drones during the design phase and to make possible optimizations at an early stage, before physical prototypes are created," Braun stresses. "This saves costs and time, as fewer physical tests and iterations are required, and helps us optimize weight. ... The weight of our drone is very important. That is why we only ever use as much material as is absolutely necessary to reduce weight and that is why virtual testing with SOLIDWORKS Simulation is very important and necessary."

TRANSPARENT DATA MANAGEMENT AND VERSION CONTROL

Having transparent data management and version control in the cloud through **3D**EXPERIENCE Works solutions also helps Voliro accelerate product development and shorten time to market. "By introducing version management and central storage, we have gained a lot of speed, especially for larger projects," Braun notes. "The switch to the **3D**EXPERIENCE platform has also brought many advantages for our production and purchasing. In particular, the defined part numbers and versioning ensure that we order and install the right parts, which is extremely important in our dynamic environment.

"The **3D**EXPERIENCE platform offers a holistic solution to accelerate product development, reduce costs, and bring innovative products to market faster and more efficiently," Braun says.

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Products:

- **3D**EXPERIENCE SOLIDWORKS Standard
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