3DEXPERIENCE® Works

AirView Robotics

AIRVIEW ROBOTICS PVT. LTD.

GROWING A DRONE DEVELOPMENT AND SIMULATION CONSULTING BUSINESS WITH **3D**EXPERIENCE WORKS SIMULATION SOLUTIONS

Case Study

Using **3D**EXPERIENCE Works simulation solutions on the cloud-based **3D**EXPERINCE platform to perform advanced simulations on drone designs, AirView Robotics has not only helped other drone manufacturers, with which it consults, improve drone performance but has also grown its simulation consulting business to constitute more than half of its revenue.

DASSAULT SYSTEMES

Challenge:

Grow drone simulation and analysis consulting business while improving the performance of the company's own drones without the need to rely on and transport a high-end, bulky workstation for running simulations.

Solution:

Run drone simulations in the cloud on the **3D**EXPERIENCE platform by implementing **3D**EXPERIENCE Works modeling, design, simulation, and communications solutions.

Results:

- Grew drone simulation and analysis consulting business to 60 percent of revenue
- Reduced agricultural drone weight by 10 pounds
- Doubled agricultural drone flight time
- Cut drone manufacturing costs tenfold

AirView Robotics Pvt. Ltd. is at the forefront of innovation in the Unmanned Aircraft Systems (UAS) industry. The Indian company specializes in developing cutting-edge, customized drone solutions tailored to a wide array of societal applications. The drone manufacturer is empowering industries, simplifying tasks, and revolutionizing operations with its state-of-the-art technology, striving to make the integration of UAS technology effortless, while unlocking limitless possibilities for various business sectors. AirView Robotics drones stand out for their unparalleled robustness and advancements in safety, reliability, autonomy, and performance, by incorporating the latest technological advancements.

In support of its vision of a future where autonomous drones seamlessly enhance productivity and safety for businesses and communities alike, AirView Robotics provides simulation and analysis consulting services to other drone manufacturers in addition to developing its own UAS systems. This consulting work helps manufacturers improve drone performance without the delays and costs that are associated with repetitive prototyping cycles, and also helps clients obtain accreditation by the Quality Certification Alliance (QCA), an independent, non-governmental, not-for-profit accrediting organization for industry suppliers, for their UAS products.

"Weight is a major concern in all drone development. Even a reduction of 100 to 200 grams is a big deal, and a reduction of the magnitude of 10 pounds simply by using a lighter but just as strong material can lead to improved performance, such as doubling the flight time. With 3DEXPERIENCE Works SIMULIA simulation tools, we not only developed a better performing drone design but also slashed manufacturing costs substantially."

– M. Varunkumar, CEO

QCA accreditation helps protect a supplier's brand and reputation by offering compliance with the highest product standards for quality in the market.

Until December 2022, AirView Robotics used the combination of SOLIDWORKS® Standard CAD software, Ansys® simulation software, and a large, high-end workstation, which was necessary for running simulations and conducting finite element analysis (FEA) studies with Ansys, to support its consulting business. However, that approach became challenging and unwieldy because the workstation had to be transported to client locations to run simulations, adding time and cost to the effort, according to CEO M. Varunkumar.

"Conducting drone design validation and reliability studies are imperative for developing well-performing drones without a lot of slow, costly prototyping," Varunkumar explains. "Consulting was becoming a growing part of our business, and we needed improved data mobility, so we can access simulation tools from multiple locations, and licensing flexibility, so we can more affordably continue this growth trajectory, which is why we started looking for a cloud-based solution."

AirView Robotics found a better solution for supporting growth in **3D**EXPERIENCE® Works simulation tools, which operate on the cloud-based **3D**EXPERIENCE platform and leverage leading physics simulation technologies from the SIMULIA

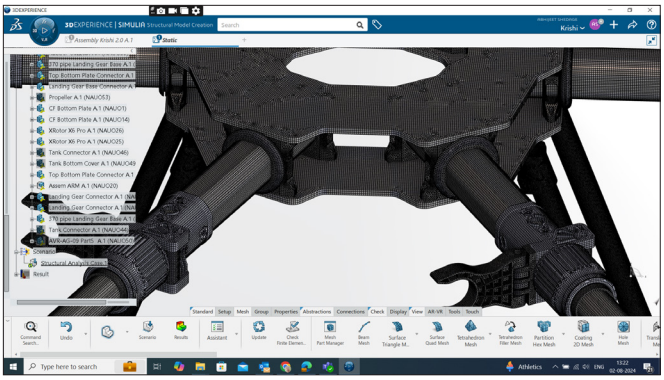
Brand of Dassault Systemes. With the capabilities of the Durability and Mechanics Engineer, and Fluid Dynamics Engineer, roles—both of which utilize the advanced Abaqus® solver—AirView Robotics can access data and run simulations in the cloud, negating the need to transport a bulky, high-end workstation. "Being able to access advanced simulation tools from multiple locations on any device has helped us a lot because it makes it easier to travel, run simulations from anywhere, and present our model and results at the customer location as ready to go," Varunkumar says.

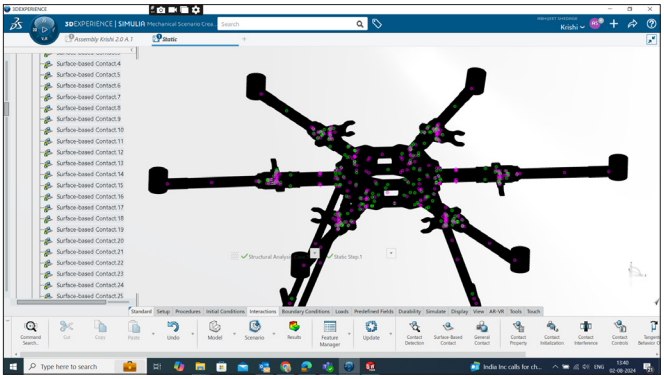
"Also, because the SIMULIA tools have similar user interfaces to Abaqus, it feels like having the capabilities of Abaqus at muliple locations," Varunkumar adds. "With improved data mobility and access, we believed our consulting business would continue to grow, which it has."

IMPROVING THE PERFORMANCE OF AN AGRICULTURAL DRONE

One of the first consulting projects that AirView Robotics worked on was the Krishi 2.0 Agriculture Drone, which sports a 10-liter tank for insecticide spraying of agricultural crops: Partnering with Drogo Drones Pvt. Ltd., AirView Robotics conducted structural, vibration, impact load, and computational fluid dynamics (CFD) studies—as well as center of gravity calculations—on the design using **3D**EXPERIENCE Works simulation tools. Along with performance improvements, these studies enabled development of the drone is just six months, including certification by the Indian government's Directorate General of Civil Aviation (DGCA).

"Among the key improvements over the earlier version of the Krishi Agriculture Drone that **3D**EXPERIENCE Works simulation studies produced is a 10-pound reduction in weight, due to using a lighter, stronger material," Varunkumar notes. "This weight reduction allowed us to double the flight time of the drone from 10 to 15 minutes to 30 minutes, making spraying with the drone more efficient."





With **3D**EXPERIENCE Works SIMULIA Durability and Mechanics Engineer and Fluid Dynamics Engineer roles, AirView Robotics can simulate the physical phenomena that most often affect drone performance from anywhere without needing bulky hardware because the simulation solution is run in the cloud.

SLASHING MANUFACTURING COSTS VIA SIMULATION

In addition to extending the flight time of the Krishi 2.0 Agriculture Drone, **3D**EXPERIENCE Works simulation studies resulted in a tenfold reduction in manufacturing costs. "The previous version of the Krishi drone had a body built from aerospace-grade aluminum," Varunkumar recalls. "The **3D**EXPERIENCE Works simulation studies revealed that we could dramatically reduce the weight by 10 pounds by building the fuselage with a composite combination of plastic and glass fibers.

"Weight is a major concern in all drone development," Varunkumar stresses. "Even a reduction of 100 to 200 grams is a big deal, and a reduction of the magnitude of 10 pounds simply by using a lighter but just as strong material can lead to improved performance, such as doubling the flight time. With **3D**EXPERIENCE Works simulation tools, we not only developed a better performing drone design but also slashed manufacturing costs substantially."

DRAMATIC GROWTH IN SIMULATION CONSULTING BUSINESS

With the flexibility, agility, and affordability of conducting **3D**EXPERIENCE Works simulation studies from anywhere and on any device in the cloud on the **3D**EXPERIENCE platform, AirView Robotics has been able to realize significant growth in its drone simulation and analysis consulting business, which now accounts for more than half of the company's business. "We've gone from just developing and manufacturing our own products to providing simulation and analysis consulting services to several leading drone manufacturers, which has grown to make up roughly 60 percent of our revenue," Varunkumar points out.

"The implementation of **3D**EXPERIENCE Works simulation solutions has done much more than just ease our hardware/IT and workstation transportation costs," Varunkumar continues. "These solutions have allowed us to take advantage of a significant consulting business opportunity and grow our business."

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