



Ascendance's journey to sustainable aviation takes off

The aviation pioneer strengthens its collaboration with Capgemini to pursue the development and industrialization of a cutting-edge hybrid electric propulsion system and low-carbon aircraft

When Ascendance launched its mission to develop technologies and solutions that will make aviation more sustainable, it faced a variety of complex challenges. There was the unique ambition to design new technology that made its vision possible, which took the form of two key products: STERNA, a hybrid-electric solution that drastically reduces carbon emissions, and ATEA, a vertical take-off and landing aircraft powered by STERNA, that operates as a low-carbon alternative to helicopters for regional air mobility (passenger transportation, medical emergencies, logistics and security missions).

Client: Ascendance

Region: France

Industry: Aerospace and Defense

Client Challenge: After refining its designs for aircraft prototypes, Ascendance wanted to accelerate the transition from technological demonstrations to industrialization as part of its effort to make the aviation industry more sustainable.

Solution: The start-up worked with Capgemini to advance its ambitions and identify sustainable aviation solutions, including continuous development of the company's two products and building relationships with suppliers and partners.

In addition, the startup also needed to prepare for the aftermath of creating an innovative new plane model. Once it had a pilot design ready to fly, Ascendance would have to transform its operations to industrialize. This transition required new strategies, workflows, and processes, all of which called for a partner that could help define the future after making contributions to the development of STERNA and ATEA. Acknowledging this reality, Ascendance reached out to Capgemini and the organizations launched a long-term collaboration that would cover the entirety of the product development process and the subsequent business transformation.

Accelerating sustainable aircraft design

As Capgemini experts joined the project, the combined project team focused on three key focus areas: flight physics, systems engineering, and mechanical engineering.

With flight physics, the partners studied flight properties of aircraft architecture as well as aerodynamics, which the team analyzed via numerical simulations and wind tunnels. This research provided insights into the impact of flight controls, weight, center of gravity, and aerodynamic forces on aircraft handling. All of this helped refine the design of the STERNA and ATEA products so that their performance matched the start-up's ambitions.

Meanwhile, Ascendance and Capgemini also collaboratively improved many areas of product

development thanks to systems engineering. This ensured that the aircraft prototypes were European Union Aviation Safety Agency (EASA)-certifiable and that aircraft systems essential for flight would function effectively while also achieving greater sustainability. This included the energy and propulsion systems, which involved power generation and distribution, batteries, and engine control and monitoring.

Finally, Capgemini deployed mechanical engineering expertise to design the architecture of the prototype. Ascendance and Capgemini combined composite materials, performed finite element analysis of parts and assemblies, and introduced construction principles while installing key components.

The collaboration between the two organizations made new achievements possible so that STERNA and ATEA continually improved in line with the start-up's goals. However, this was far from the end of the collaboration, which had a great deal of room to grow.

Strengthening a successful collaboration

In 2024, Ascendance and Capgemini further reinforced their collaboration via the definition of a comprehensive strategy for accelerating Ascendance's shift to industrialization, articulated around four interconnected workstreams.

First, Capgemini defined a target architecture for the future ATEA assembly line that demonstrates strong resilience to critical parameters which cannot be frozen at an early stage of design. Introducing high



flexibility to constraints and leveraging field-proven best practices for greenfield projects, the project team optimized Ascendance's future industrial setup, from the layout of assembly stations and equipment to stock strategy and premises surface.

Second, Capgemini focused on developing a make-or-buy strategy for batteries, which are a critical element of the aircraft. Developing a comprehensive understanding of the components, suppliers, costs drivers, and manufacturing bottlenecks throughout the value chain provided clear insights to guide Ascendance's decision-making and mitigate business impact.

Third, Capgemini defined a strategy for connected services development that increases customers' value perception while positioning Ascendance as a higher-premium aircraft provider in the market. Based on Ascendance's target market positioning, the project team built a tailored connected services portfolio to better serve specific customers, associated with services development roadmap and recommended business models.

Lastly, Capgemini developed a cross-functional data and digital continuity strategy that secures the foundations of Ascendance's operational efficiency. Driven by "at-rate" business needs, the project team designed a comprehensive data-centric target IS/IT

architecture to ensure robust and scalable processes in anticipation of future product evolution. In addition, this reduced the risk of enabling digital continuity by elaborating a data governance and operating model specifically for Ascendance.

Innovation now and for the future

Having laid the foundation for a strong collaboration to enable the pursuit of low-carbon aviation, Ascendance and Capgemini remain committed to accelerating the industrialization of both the STERNA and ATEA products. This will lead to the prototype's first flight in the upcoming year, which will mark a turning point for the start-up and the wider industry.

In addition, Ascendance and Capgemini will mature their collaboration with the industrial ecosystem to expand their access to resources that can enhance prototype performance and unlock industrialization bottlenecks.

The pursuit of a more sustainable world is an ongoing and complex journey. Through their collaboration, Ascendance and Capgemini have reached new heights that will only continue to enable their joint pursuit of sustainable design and practices in aviation.



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