

Faurecia debuts model-based cockpit of the future

Digital twin drives Faurecia's innovation for mobility experiences





Call for change

Mobility is changing, and consumers expect more from their experience. Innovative design, like more comfortable, connected and energy-efficient interiors, can offer greater value to original equipment manufacturers (OEM) and consumers. As cars become like “computers on wheels”, Faurecia, a FORVIA Group company, is evolving from original equipment supplier (OES) to “mobility experience supplier.” To achieve this, Faurecia develops intelligent cockpit systems and innovative interiors that improve the consumer experience.

Faurecia’s engineers capture a lot of data from end-user experiences to better understand their cockpit preferences, from the steering wheel position to seating, heating, lighting, infotainment and ergonomic controls—but this data is currently located across a variety of documents and models. This makes it hard to see how the different parts could fit together to deliver an optimal

experience. For example, seat comfort isn’t just a question of the seat itself: knee room, armrest position, ease of steering and visibility need to be factored in.

Faurecia set itself a bold challenge to develop a new cockpit concept using model-based systems engineering (MBSE).

MBSE uses models as single version of the truth to facilitate collaboration among engineers. It enables engineers to gain a holistic view of the design environment to support decision-making and robust design. Using MBSE’s virtual simulation and digital twins, Faurecia would be able to quickly understand the impact of the design for the OEM and end consumers.

To create its latest generation immersive cockpit experience demonstrator, Faurecia sought to work with the right partner to take this innovative approach from concept to reality.

When tech meets human ingenuity



Accenture helped Faurecia develop integrated design processes in a Dassault Systèmes 3DEXPERIENCE platform. We also trained the Faurecia team on the new MBSE approach and modeling tools.

While traditional engineering modeling tools and product lifecycle management (PLM) are great to manage all information about a manufactured product (including its 3D representation), modern vehicles require new engineering methods and tools to manage more complex mechanical, electronic and software components. We assembled Dassault Systèmes' MBSE tools (Catia Magic, Controlbuild and Catia) in an end-to-end digital thread to power these new engineering methods.

The MBSE platform enables Faurecia to develop an integrated model of all subsystems and equipment—a “single source of truth”—for the cockpit architecture. This new capability allows the company to simulate new scenarios quickly.

Prototypes mix digital and physical models to offer a user experience in mixed virtual reality.

The cockpit is entirely virtualized in a digital chain, from system models to 3D mock-up, but the prototype also includes physical elements like the steering wheel, seats, touchpad and rotary knob to show how the physical world can directly interact with the digital twin in MBSE.

For instance, when the designer turns the physical rotary knob to change the cockpit temperature, the physical touchpad and its digital twin displayed on the screen both indicate the new temperature. In addition, passengers' thermal comfort is simulated “live” in the digital twin; yellow thermal bubbles are displayed on the screen to demonstrate the thermal change around passengers.

A valuable difference

The solution is helping Faurecia reduce costs and speed products to market. Faurecia can now test new cockpit designs without creating physical models for each iteration.

The hybrid prototypes foster creative thinking and collaboration, allowing designers and engineers to immediately see the implications of their choices and adjust designs. Visualizing thermal comfort or audio experience from an immersive passenger point of view, when moving seats or raising window blinds, for instance, was previously impossible. MBSE has changed that. The new approach is helping Faurecia unleash its creativity to accelerate innovation, taking complex, difficult-to-execute ideas and making them a reality.

Co-collaboration with OEMs is becoming easier. Designers and OEM clients can sit in a physical cockpit and use a physical touchpad or rotary knobs to tweak, test and validate various elements in the virtual scene. They can immediately see the results and more accurately judge how their design changes may affect the driver or passenger experience. It also helps them identify and resolve

issues earlier in the design process—based on data, not safe guesses, reducing the risk of inconsistencies and rework.

In addition, Faurecia can measure the impact of the OEM's design choices—say, the effect that placing a heating panel in a door will have on the sound system—or come up with a more efficient, data-driven solution that meets customer requirements. For example, Faurecia showed an OEM how a change to its heating system could generate energy savings of 50% compared to the traditional thermal system. A change in the location of the heating system directs heat to cold-sensitive areas like the consumer's hands and face. The innovative, space-saving heating system also allows for a roomier interior.

The benefits go far beyond cost savings and problem solving. Faurecia's new capabilities allow it to be more ambitious, exploring innovative designs and concepts to meet growing customer demand for new experiences and innovations.



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