

FAURECIA

Case Study



Challenge

As a world-class automotive supplier, Faurecia requires a unified solution to increase the efficiency of production start-up by planning line balancing to achieve the optimum target rate without delays.

Solution

DELMIA Digital Manufacturing is gradually being deployed globally across all of the company's business areas, with the introduction of the **3DEXPERIENCE®** Twin digital twin to model and virtually simulate global production processes while also taking into account the customization constraints specific to each of them.

Benefits

- Implement a single methodology and share unified processes around the world
- Ramp-up more efficiently
- Reduce production start-up costs at the factory through advance simulation of the manufacturing line.
- Harness resources and best practices to better collaborate with a standardized work tool
- Improve communication inside and outside the factory between different Faurecia teams, as well as with manufacturers



“Synchronization between PLM and DELMIA is imperative. The integration of processes, from design engineering to manufacturing, is guaranteed by digital continuity.”

— Laurent Vachey, Design & Validation
Solution Manager, Faurecia

TOMORROW'S MOBILITY

As a leading automotive supplier in its various markets, Faurecia brings innovative solutions to major automotive manufacturers. Today, around one in three vehicles worldwide is equipped with Faurecia technologies. The company helps manufacturers address the challenges of automotive mobility through its four strategic activities: Faurecia Seating, which develops and manufactures the various systems that make up a seat; Faurecia Interiors, the leader in interior systems, including dashboards, door panels, central consoles and smart surfaces; Faurecia Clarion Electronics, which develops and produces built-in infotainment systems, digital audio solutions, advanced driver assistance systems, connectivity solutions and cloud services; and Faurecia Clean Mobility, which develops innovative solutions for sustainable mobility. The company thus meets the needs of manufacturers of all types of vehicles, as well as the needs of mobility operators and local governments with technologies for improving air quality, energy efficiency, acoustic performance and electrification. Through its various business areas, Faurecia innovates to design tomorrow's mobility solutions and make them even safer, more efficient and more environmentally friendly.

THREE-STEP DECISION-MAKING PROCESS

Faurecia wanted to find a solution to unify its methods and processes while ensuring the synchronization of its production operations, all over the world. The selection of DELMIA Digital Manufacturing was the result of a perfectly executed methodology.

“The decision-making process that led to us choosing DELMIA comprised three main steps,” explained Laurent Vachey, Design & Validation Solution Manager at Faurecia. “Over a quarter of the year, we introduced DELMIA to our teams with the help of Dassault Systèmes, using different case studies adapted to our business areas. The objective at this stage was to identify, with the various stakeholders, the fields of study needed to launch Proof of Concept (POC)

and the demonstrators required to prove the feasibility of the project.” In phase 2, over the course of six months four demonstrators were carried out, leading to a positive conclusion and the selection of DELMIA. A number of points for improvement were identified during this phase, which led to the implementation of a Digital Manufacturing Plan with Dassault Systèmes. This improvement plan ensures that DELMIA will fully meet all the needs of Faurecia's various business areas.

Phase 3 involved process creation and implementation, with business rules specified, leading to the launch of the Digital Factory, a virtual replica of the actual factory. The development process enabled Faurecia to formalize and document the internal functionalities and all of the production unit's workflows.



To meet the expectations of its customers, Faurecia unified its methods and processes and ensured the synchronization of its production schedules worldwide

DIGITAL CONTINUITY GUARANTEED THROUGH 3DEXPERIENCE® TWIN

Faurecia uses the 3DEXPERIENCE® platform for product lifecycle management (PLM). The selection of this platform and the study regarding the migration to this new environment date back to 2014, having formed part of the TIGER project. The deployment of DELMIA complements that first project. Consistency between the PLM project and the DELMIA Digital Manufacturing project is possible thanks to digital continuity, including the Bill of Materials (BOM). This document lists all of the items needed to manufacture a given product. Whether the information is represented as a tree or in a table, it allows all involved parties to quickly see which parts, components, subassemblies or raw materials are used.

“We actually use three BOMs,” explained Vachey. “The E-BOM or Engineering BOM comes from the design phase, and the M-BOM or Manufacturing BOM is put together when the product is industrialized.” The entire industrialization process uses the M-BOM to develop the different scenarios in the production simulation. “When we transition to the production phase, a third BOM, the P-BOM, or Production BOM, serves

as a supply-chain reference relating to components and raw materials.” The Product and Process Design and Validation Manager believes that “synchronization of the PLM side (E-BOM) and the DELMIA side (M-BOM) is imperative. We are very vigilant when it comes to the integration and consistency of bills of materials. The integration of processes, from design engineering to manufacturing, is guaranteed by digital continuity.”

INTEGRATING DISRUPTIVE ELEMENTS

E-BOM product bills of materials are the starting point for industrialization, when the Manufacturing BOM (M-BOM) is created. The bill of materials is then integrated into Faurecia’s ERP, SAP, using the P-BOM. “In order to respond to project challenges, in most cases the M-BOM requires a simulation to define the optimum production process. In DELMIA, we create different scenarios and we carry out workload-balance studies, which we challenge with various flow simulations, integrating incidents and errors. We then integrate the workshop constraints that we do not have during the line-balancing phase,” said Vachey.

This phase allows us to plan processes by analyzing sequences and the time spent on each operation, simulating flows, arranging different stations and assembly lines, and validating the ergonomics of the various human interventions. “At this stage, we worked extensively with Dassault Systèmes to perform virtual production tests,” said Loïc Painvin, Tool & Process Simulation Expert at Faurecia. “In particular, we tested our Seating business by simulating a sewing manufacturing line. By comparing the results of the simulation with the results seen on the ground, which were almost identical, we demonstrated that the simulation was very realistic.”

Faurecia then moved on to the next step, which was to integrate errors, breakdowns and supply disruptions into the simulations. “The new process showed that there were bottlenecks that we had not seen before the simulation,” said Vachey. The result was then presented to the factory, and feedback from the teams working on the design of this new manufacturing line was very positive.



With DELMIA Digital Manufacturing, Faurecia reduces in-factory production start-up costs through advance simulation of the manufacturing line

Painvin is certain that “by integrating disruptive elements we can show operators what can happen. And seeing what could happen on the production line in 3D in a virtual simulation video makes discussions much easier. You can literally see what you’re talking about right away. It is a truly digital factory.” This makes ramp-up much more efficient because everything has been tested upstream, and production start-up is optimal as maximum use can be made of production means.



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DIGITAL FACTORY

The digital factory can produce a large number of performance indicators.

“The KPIs are used to manage reporting specific to our business,” confirmed Vachey. They include indicators relating to cost and time, as well as to resource and equipment mobilization, but can also include ergonomic indicators such as the distance traveled by an operator over a cycle, or the weight borne by an operator in various operations. “Finally, the challenge and aim of the project is to use the simulation results to restructure our process bill of materials,” he added.

Painvin also highlighted the benefit of 3D simulation, which he believes to be an essential step forward in Faurecia’s digital transformation. “It is easier to speak with people on the ground with shared terminology, and easier to manage the multi-robot with very concrete, visual information.” He also explained that in robotics, tool validation is an essential function that traditionally occurs during or after tool design. “With DELMIA, we can now plan by working upstream and the tool is designed around the robot arm shell. We tell our internal and external suppliers the volumes within which they should not work.”

About Faurecia

Founded in 1997, Faurecia is a major player in the global automotive industry.

Products: Seat mechanisms and structures, vehicle interiors, emissions control technologies, built-in electronics and ADAS systems

Turnover: EUR 17.5 billion (2018)

Employees: 122,000 across 300 locations in 37 countries

Headquarters: Nanterre, Paris Region

Find out more

www.faurecia.com/

Finally, with regard to the implementation of the **3DEXPERIENCE®** Twin with Digital Factory within the company, Painvin stressed the importance of the Workshops conducted with Dassault Systèmes for development. On the business side, the project architecture is led by Manufacturing Engineering, in line with the Program Management System and the Faurecia Excellence System. The IT teams are, of course, indispensable and closely linked. The project is therefore a team effort, bringing together all internal and external stakeholders. A collaboration made all the more necessary by the fact that, as Painvin points out, "it must work everywhere: in the United States, China, India, France and Germany."



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