Bentley Motors: When heritage meets technology

Bentley Motors benefits from Dassault Systèmes (DS) 3D manufacturing simulation tools to communicate and optimise designs for production of the new Mulsanne.

The recently launched Bentley Mulsanne is Bentley’s all-new flagship grand tourer. DS PLM solutions including CATIA, ENOVIA, DELMIA and 3D VIA have been deployed to allow Bentley to exploit 3D visualisation and simulation techniques across the core product lifecycle processes.

The Mulsanne sets new standards in terms of comfort, effortless performance and hand-crafted refinement – the very qualities for which Bentley is renowned. It combines a completely re-engineered 6.75 litre engine with luxury features such as sustainable hardwood veneers and specially treated leather upholstery and trim. It takes nine weeks to build a Mulsanne during which time around 10,500 separate parts are brought together and assembled into a combination of luxury and performance that is unique in the motoring industry. In 1919, Bentley’s founder W.O. Bentley had a vision of building “a good car, a fast car, the best in its class.” Over 90 years later, Mulsanne’s position at the pinnacle of the premium segment is a sign of Bentley’s commitment to its founding principles.

For Bentley Mulsanne, we have been able to integrate production functions much earlier than previous projects, reducing risk, retaining knowledge and have enjoyed the considerable benefits of concurrent collaborative working.

Ian Swann, Bentley’s Senior Virtual Assurance Engineer described how 3D technology is used to develop the Mulsanne: “We use DS manufacturing simulation tools to develop seamless introduction of new products. By modelling a total of 831 build operations across 30 stations, the complete build process was simulated in 3D. Using this simulation, a detailed assessment of the build process was then carried out and any potential build concerns were identified and then resolved much earlier in the design process.”

This methodology, facilitated with DELMIA, includes 3D reviews at regular ‘virtual build’ meetings where the power of 3D visualisation allows production build associates to make valuable contributions to the design process and influence the design based on their experience and specialist knowledge.

“Part load feasibility, clearance and tool access are crucial factors for optimised production and these are readily reviewed and assessed using DELMIA during these cross-functional meetings. Using 3D visualisation, any design or process changes can also be validated and optimised accordingly. Any potential problems can then be planned for and other complexities accurately assessed,” continued Swann.

John Unsworth, CAD Strategy Manager at Bentley added: “DS PLM tools allow us to exploit improved standards means that the Mulsanne is like no other car. Our Digital validation has helped us rectify many issues and concerns much earlier than would previously have been possible.”

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MALUSANNE STRAIGHT TO SUCCESS IIG

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“With DS technology, data comes to life. 3D is delivered across the enterprise in ways that bring the most benefit. 3D is being used to enhance our ability to plan and make decisions quickly and efficiently as we design and manufacture vehicles throughout all phases of the product lifecycle process.”

Unsworth continued: “Currently, we have around 260 active Design Engineers designing in the system and around 500 seats of DS PLM generally being used at Bentley. The PLM system was built upon a formal approach to strategy discovery, development and deployment. The method was designed to exploit 3D and furnish the needs of the Bentley business goals. Bentley understands PLM is a journey, it has made significant steps along the way but with its use, we can not only verify but truly optimise the build process before any physical parts are available.”

The Mulsanne was entirely conceived, designed, developed and now produced in the integrated Bentley production facility at Crewe. The car incorporates Bentley heritage, advanced features and enviable performance characteristics, the assembly of which has been greatly assisted by the exemplary use of DS PLM.

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