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Generative Car

Solutions for the automotive industry

DS CATIA DS ENOVIA DS SMARTEAM

Generative Car

Solutions for the automotive industry

IBM and Dassault Systèmes (DS) have been working with major automotive Manufacturers and Suppliers for more than 20 years to provide a range of leading CAD/CAM/CAE and PDM solutions.

Today, the Automotive Industry faces many challenges, including those of safety and the environment, at a time when the economic climate shows few signs of recovery. Yet, more pressures are on the horizon. Future legislation in Europe dictates that vehicles will have to be fully recyclable, hence manufacturers are rethinking their selection of materials, manufacturing processes, and how to re-use raw materials once the vehicle has been taken out of service. The result is that manufacturers require their business processes to be transformed, and major improvements to be achieved via new technology.

Generative Car is the ultimate goal for our automotive customers. It allows the capture, sharing and re-use of company knowledge to faster evolve or 'morph' a new vehicle.

The scope of Generative Car covers the key automotive development domains:

- *Vehicle*
- *Body*
- *Interior and exterior trim*
- *Chassis*
- *Powertrain*
- *Electrical and electronic systems.*

Each domain includes not only the product, but also the resources and the process design and simulation within a collaborative environment, if we look at the Body process, we require a seamless process from the initial stylist sketch through to final assembly, whilst integrating all the sub-processes including Conceptual Surface Design, Vehicle Architecture, Class A, Body-in-White, Analysis, Tooling and Assembly.

For each domain, Dassault Systèmes has developed a unique and evolving set of PLM practices. Generative Car is a combination of automotive-specific DS PLM Practices and selected IBM products developed by Dassault Systèmes that are easily implemented and increase productivity, profitability, and rapid return on investment.

Generative Car Design Solutions cover

- *Body-in-White*
- *Chassis*
- *Powertrain.*

Generative Tooling Solutions cover

- *Jigs and Fixtures*
- *Press Die*
- *Mold Tooling.*

Implementation of a Generative Car Solution begins with your PLM assessment to define priorities and a deployment roadmap. DS PLM Practices ensure rapid and secure implementation of the solutions and are used by IBM and its Business Partners to support delivery in consulting engagements. BCS has developed a unique value-based Innovation Management consulting approach, based on integrated methodologies and industry-focused solution sets, combined with strong project management discipline, ensuring global deployment and consistent execution with quantifiable results.

Generative Car Design Solutions

The Generative Car Design Solutions offer Automotive OEMs and their suppliers a set of collaborative solutions for full product development process coverage from concept to maintenance.

They helps you to capture, share and optimise end-to-end business process knowledge (BiW, Chassis, Powertrain) embedding engineering and manufacturing specifications to reduce considerably design cycle time by re-using company know-how from carry-over to intelligent templates.

The Generative Car Design Solutions are based on our industry experience. It is also based on a consultative approach that facilitates business process transformation and speeds up CATIA V5 implementation versus a traditional approach.

These solutions exploit the use of CATIA V5 for product design and knowledge optimisation with ENOVIA to provide a collaborative environment, enabling design-in-context and concurrent engineering. Using DELMIA products, each solution can be extended to digital manufacturing and assembly, allowing product/process integration.

Generative Car Design – Body-in-White (BiW)
You continuously strive to achieve shorter product design times between styling freeze and SOP (Start of Production), whilst aiming to reduce cost and improved quality.

Generative BiW Solution allows vehicle manufacturers and their suppliers:

- *To optimise the BiW design process by using intelligent templates to avoid BiW programmmes beginning from scratch.*
- *To execute concurrent engineering within a Digital Mock-UP (DMU) context, ensuring collaboration within the extended enterprise.*
- *To support relational design from concept to manufacturing, avoiding long, and late, iterations with sequential processes.*

Generative Car Design – Chassis
Chassis Engineers face specific challenges relating to suspension and steering systems as well as engine mounting subframes and control systems.

Generative Chassis Solutions enables the users to:

- *Evaluate more alternative studies at conceptual stage thanks to intelligent template.*
- *Reduce design-cycle time through relational design methods allowing concurrent engineering and quick modification propagation.*
- *Avoid issues that are discovered late in the project, by designing in a Digital Mock-Up context, and through the up-front integration of manufacturing specifications.*

Generative Car Design – Powertrain
In order to react to evolving market trends the Powertrain Engineering process should incorporate the demands for performance, durability and environment-oriented specifications. These factors are combined in a cost-effective process when creating a new engine thus leading to a shorter development cycle.

The Generative Powertrain Solution with its associated DS PLM practices is the enabler for all the engineering disciplines to collaborate from the Conceptual Design phase to the Manufacturing Planning phase. As a result, it will dramatically reduce the design, simulation and manufacturing costs through the capture and re-use of company designs, know-how and innovation.

Generative Car Tooling Solutions

To meet the challenges of today's automotive industry, OEMs and suppliers can significantly reduce the costly and time-intensive creation and modification of jigs and fixtures, molds and dies with CATIA V5.

Generative Tooling Solutions make it possible for manufacturers and suppliers to deliver high quality products in less time, while driving costs down and improving their design processes by designing all the associated tooling using 3D geometry and embedded experience from previous designs.

The CATIA V5 architecture enables the user to 'copy' previously validated engineering rules and tooling definitions to automatically create new designs or modifications in a fraction of the time traditionally taken. Templates based on full 3D CAD geometry can be generated as standard master designs, and provide the links to simulation and manufacturing, all within one integrated set of applications.

Jigs and Fixtures
Jigs and Fixtures Solution is dedicated to Automotive OEMs and suppliers working on clamping fixtures, weld guns, checking fixtures, handling devices or manufacturing fixtures.

The benefits of the Generative Tooling Jigs and Fixtures Solution include:

- *Faster tooling design by automating and optimising the entire tooling design process*
- *Maximum re-use of company know-how and validated approaches from previous projects.*
- *Enhanced collaboration between design, simulation and manufacturing, based on the latest data.*
- *One integrated environment to support all business processes, and to provide the backbone for communication and the paperless engineering environment.*
- *Rapid implementation – CATIA V5 does not require intensive or time-consuming deployment.*

The value of this solution is not simply at the initial design phase, other benefits include:

- *The native integration on digital assembly simulation tools on the V5 platform (through DELMIA Products) enables optimised exchanges between design and assembly simulation phases. No data conversion is required, simple 'double clicks' enables the switching back and forth between the two phases, using the same data and the same user interface.*
- *Integrated with SMARTEAM PDM system, the Generative Tooling Solution enables determination of design change impacts for design and assembly simulation. Given a certain modification on an input product, SMARTEAM automatically determines the number of tooling stations requiring a design change and the number requiring a new simulation validation.*

Press Die
Press Die Solution is dedicated to Automotive OEMs and suppliers developing working on Press Dies for sheet metal stamping .

This solution covers the entire process from die design to manufacturing:

- *It speeds up the very crucial phase of bidding for new business, and ensures accurate quotations, while managing the whole tooling life cycle, thanks to SMARTEAM.*
- *It offers a high level of automation, including an automatic update of the entire process when the sheetmetal style or design is changed. In fact, it enables the design of the panel and the associated Press Die to be delivered at the same time. Unique shape morphing and surface optimisation tools are a first for the industry and provide capabilities to build in allowances for over-crowning and over-bending characteristics.*

Mold Tooling
Mold Tooling Solution is based on specific Mold Tooling applications that have been developed in partnership with innovative moldmakers.

The Core and Cavity and Mold Tooling features provide an early estimation of the feasibility of the mold and enable a quick evaluation of cost. In addition, the Healing Assistant provides fast tools to repair geometry and reduce the time-intensive task of cleaning imported geometry from other environments. Coupled with our innovative capabilities in molded part design, (Functional Modelling) this solution offers even more flexibility and really allows for simultaneous part and tooling design.