Driving the design revolution

The product design process is changing, driven by product platforms that are shorter. Product platforms have to be designed to satisfy market demand for newness to be attractive, and design precision is paramount. Modern consumer are more clued-up than in the automotive industry. Models are being replaced increasingly quickly and often - the car itself has been given a whole new life. The result is a broad range of different models which are being released very frequently and are often only marginally different from the original model. At the same time, automotive design has become significantly more complex. The industry has experienced revolutionary advances in technology and reduced change in cost and time expectations in terms of both form and quality, while surfaces have become much more intricate. These pressures are combining to make the design process more intensive. As quickly as possible, engineers must incorporate changes into the design environment before the product is released. The development of the initial concept is a critical step, involving multiple iterations of the design process. The best Class A surface design tools act as a key interface between the design department and the engineering team that will actually "build" the car. Developed in collaboration with Class A surfacing professionals, Catia ICEM is the leading product used by a large number of leading car manufacturers and suppliers for the modeling of Class A surfaces, making it a clear leader in this field. Leading products must be responsive to customer needs, market developments, and other factors of change, requiring the ability to retain success. The most productive tools can mean the difference between life and death. CATIA ICEM therefore continues to drive and support the increasing virtualization of the design process by delivering advanced new evolutions on a regular basis.

CATIA ICEM enables mechanical designers, shape designers, and stylists to create, validate, and modify surfaces of any type, particularly those which are visible and tangible such as exteriors and interior trims. The chaotic environment of automotive design has significantly increased in complexity, and CATIA ICEM continues to support the increasing virtualization of the design process by delivering advanced new evolutions on a regular basis. CATIA ICEM is the leading product used by a large number of leading car manufacturers and suppliers for the modeling of Class A surfaces, making it a clear leader in this field. Leading products must be responsive to customer needs, market developments, and other factors of change, requiring the ability to retain success. The most productive tools can mean the difference between life and death. CATIA ICEM therefore continues to drive and support the increasing virtualization of the design process by delivering advanced new evolutions on a regular basis.

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The CATIA ICEM solution suite is unique in the market. No other surface design solution allows design professionals to create stunning surfaces of all types, and accurately measure and see the impact of individual changes to other parts of the design. No other surface design solution fits better within the all-encompassing product development environment.

Because Class A surfaces cannot be developed properly in isolation, the integration with the virtual design environment is crucial to maximize the efficiency and effectiveness of the entire product development process. The greater the emphasis manufacturers put on the development of Class A surfaces, the closer design and engineering teams have to work together, making that integration still more important. Without it, the resultant gaps in the development process chain lead to engineering headaches and expensive redesigns.

CATIA ICEM was the first Class A surface modeling tool to be fully integrated into CATIA virtual design environment, setting a new standard for Class A modeling. Users can now work towards the surface quality required for the end product through the entire development process without any compromises, and without converting or losing data. Using a single common data format for designs, from end to end – as opposed to different formats from standalone, incompatible systems – results in improved workflow efficiency, as well as significant time and cost savings. This integration covers the entire development process chain, reducing headaches and expensive redesigns.

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In addition, data models created in CATIA ICEM can be used in other CATIA modules, creating a powerful, efficient, and more cost-effective complete development process. This integration covers the entire development process chain, reducing headaches and expensive redesigns.

One of the most powerful of CATIA ICEM’s many capabilities is perhaps its real-time diagnosis feature. If the geometry of a surface changes while working with CATIA ICEM, the impact of the change is directly visible via advanced diagnosis capabilities. The surface modeler receives real-time notification about the quality and the visual appearance of the surface enabling him to make a judgment on the validity of the outcome in terms of surface quality and aesthetics.

**Key Benefits**

- One single solution for the whole product development process, from design to manufacturing
- Integrated associative product development environment
- Real-time diagnosis, ensuring surfaces high-end quality
- Hybrid modeling environment with both explicit and feature-based approaches
- Efficient easy-to-use tools and commands

**Now you see it**

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CATIA ICEM Shape Design Center
CATIA ICEM Shape Design Center is the foundation of the ICEM Shape Design product portfolio. It offers advanced surface and curve functionality to create, modify, and analyze surfaces, and integrates shapes to the highest quality. Based on traditional explicit surface-modelling techniques, it introduces a strong associative and feature-based modeling methodology to dramatically improve the productivity within the Class A process. It also delivers new levels of integration in the overall product development process.

CATIA ICEM Shape Design Expert
CATIA ICEM Shape Design Expert offers an extended tool set that complements ICEM Shape Design Center. This add-on module enables the creation and modeling of aesthetic and ergonomic shapes using advanced global surface-modeling and shape-modeling capabilities. It also provides specialized Class A and dedicated industry-specific tools for defining and manipulating surfaces. CATIA ICEM consists of multiple modules, each addressing a different aspect of the product development process.

CATIA Freestyle Sketch Tracer
CATIA Freestyle Sketch Tracer is an add-on module that enables designers to integrate designers' work into a 3D format for creating 3D virtual mock-ups. An intuitive toolbox helps the user to create 3D data from 2D sketches.

CATIA Digitized Shape Editor
CATIA Digitized Shape Editor is an add-on module that addresses the import, filtering, trimming, tessellation, and character line definition of digitized data from 3D scanners and coordinate measuring machines.

CATIA Quick Surface Reconstruction
CATIA Quick Surface reconstruction is an add-on module that simply and rapidly reconstructs surfaces from digitized data and offers several approaches to generating these surfaces, depending on the type of shape required.

CATIA Digital Shape Sculptor
CATIA Digital Shape Sculptor is an add-on module that provides modeling tools to quickly create, edit, or refine a shape from a concept or an existing physical model. This approach to creating aesthetic forms allows non-CAD specialists to visualize and create the final shape without requiring the use of CAD software.

CATIA Real Time Rendering
CATIA Real Time Rendering is an add-on module that enables designers to interactively create realistic and dynamic renderings and animations, taking advantage of all available hardware features. By providing the dynamic display of 3D scenes and the evaluation of final mock-ups, CATIA Real Time Rendering allows designers to make real-time decisions and validate their work.

CATIA Photo Studio
CATIA Photo Studio is an add-on module that enables designers to create high-quality photo-realistic images and movies of digital mock-ups. By using a powerful ray-tracing engine, CATIA Photo Studio manages reusable scene settings and delivers powerful animation capabilities. By giving a realistic, photorealistic validation of the model appearance, it can be used for final design validation.

The ultimate surface-modeling platform
Every iteration of CATIA ICEM addresses a wide range of enhancements specifically requested by professional developers and designers. Many of these new features improve the integration between concept creation, Class A surface-modeling and CAD modeling.

The geometry has also been made more accessible, for example, surfaces may now be freely edited by the user, independent of their definition. Feature modeling enables surfaces to be defined as features. This allows changes to be made to the surface with ease. The new association model makes it easier to modify the Class A surface-modelling properties even further. Available through the user interface, a simple selection tool allows the selection of surfaces. Furthermore, commands have also been added to make them more efficient and easy-to-use for the selection, manipulation, and modification of surface elements.

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Users of CATIA ICEM can take advantage of the new bidirectional interface with CATIA ICEM for a smoother integration of their product designs with the integrated associative product development environment of CATIA ICEM.

CATIA ICEM consists of multiple modules, each addressing a different aspect of the product development process. The suite can be supplied in different configurations according to your own specific requirements.
About Dassault Systèmes

As a world leader in 3D and Product Lifecycle Management (PLM) solutions, Dassault Systèmes brings value to more than 115,000 customers in 80 countries. A pioneer in the 3D software market since 1981, Dassault Systèmes applications provide a 3D vision of the entire lifecycle of products from conception to maintenance to recycling.

The Dassault Systèmes portfolio consists of CATIA for designing the virtual product - SolidWorks for 3D mechanical design - DELMIA for virtual production - SIMULIA for virtual testing - ENOVIA for global collaborative lifecycle management, and 3DVIA for online 3D lifelike experiences.

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