DASSAULT SYSTEMES

ENOVIA

Enabling the Future of Engineering

*ENOVIA® powered by **3D**EXPERIENCE® platform*
– The Integrated solution for Innovation and Product Development

INTRODUCTION

Dassault Systemès works with most of the leading manufacturers in the world. As we listen to our customers, they tell us that the bar continues to rise on their engineering and product development performance. To compete, they must be able to develop products concurrently across global innovation networks, introduce more variants, and launch products simultaneously across the globe.

This paper shares:

- The challenges our customers tell us they must overcome to compete in today's competitive, global markets.
- Requirements describing how the latest generation of engineering software must operate as set out in a recent research report—Tech-Clarity's Integrating Product Design and Development Environments.
- Examples of how ENOVIA's advanced database-centric architecture helps manufacturers conquer these challenges and addresses the Tech-Clarity requirements.

"The benchmark for the next decade will be the ability to simultaneously introduce products around the globe with increased personalization. To accomplish this, manufacturers will need to compress the time it takes to design global variants of products without compromising quality or cost."

Tech-Clarity, Integrating Product Design and Development Environments.

NEW CHALLENGES REQUIRE A NEW ARCHITECTURE

Dassault Systèmes has led the way in helping manufacturers improve their engineering performance. The **3D**EXPERIENCE platform is the next step in the evolution of engineering systems. As the Tech-Clarity report explains, "Manufacturers are once again looking to their enabling technologies to take them to the next level. Most current engineering software implementations, however, will not support the real-time, concurrent, design-in-context environment required. The current best in class technology offers seamless integration between authoring, analysis, and enterprise tools and allows engineers and product developers to work together in a real-time environment." Let's explore in this paper how ENOVIA addresses the challenges manufacturing companies are facing.

Traditional file-based approaches can no longer support today's global, dynamic enterprises. ENOVIA V6 takes a fundamentally different approach enabling CATIA® design authoring on a centralized database, eliminating local CAD repositories on a designer's desktop. This makes design updates from anyone anywhere available to all globally, enabling concurrency and real time information across the enterprise. **3D**EXPERIENCE platform is the only leading PLM solution that provides the data-centric approach required to take manufacturers to the next level.

ENOVIA updates PLM to a modern approach more like a Google Doc or an online discussion than an outdated, asynchronous process like email.

CHALLENGE – WE DESIGN GLOBALLY!

Our customers tell us they innovate in global teams but can't see the impact of what others are doing. For example, they have a designer in Italy changing the shape of a product casing. At the same time, an engineer in Asia is using old data to analyze heat exchange and a partner in North America is designing wiring paths that interfere with the ribs of the new case. They are blind to each other's changes and unwittingly creating problems for each other.

The problem is that the entire casing is checked out and undergoing changes for a few days, so others can't identify the problem with the modified casing until it is checked back in. They are working blind, wasting time, and creating rework. This impacts downstream departments as well. For example, Marketing may be creating advertising materials based on the old design. Today's manufacturers simply don't have time for this inefficiency with today's short lifecycles and demands for rapid time to market.

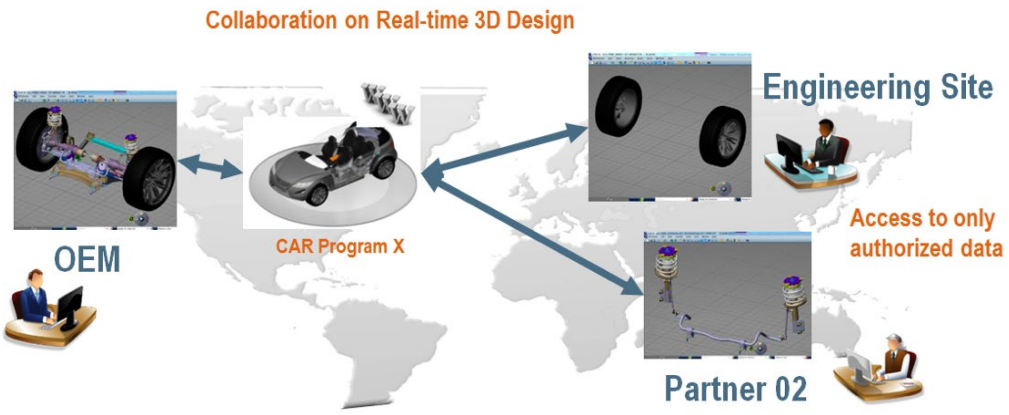
Requirements from Tech-Clarity Report

Engineers can no longer afford to work in a vacuum while they wait for files to be checked in. Instead, the latest generation of design and development software reflects changes in real-time to quickly understand the impact of change.

The latest generation design and development platform needs to enable real-time design collaboration with quick response times connecting globally dispersed design teams.

On-line Collaborative Environment

On-line collaborative environment enables global R&D teams and partners to connect confidently to the virtual prototype, regardless of functions or locations around the world for collaborative definition and validation of the product. Globally dispersed designers always access the latest 3D design from a single, centralized source without requiring any database replication, improving engineering efficiency, and accuracy.



Zero Files on a designer's desktop, as described earlier, enables design updates by anyone anywhere on the centralized database to be instantly accessible to everyone globally. Changes made by suppliers or partners are immediately accessible to the OEM designers in real-time. In the above example, the changes to the casing design are instantly accessible to the engineer in Asia for heat exchange analysis and the engineer in North America for routing the wiring correctly based on new updates.

Robust security mechanism limits data access to only authorized information. For example, an engineering partner developing a suspension will only see design data for the suspension and other systems authorized by the OEM.

Proven Results and Performance

ENOVIA, powered by **3D**EXPERIENCE platform, is a proven, scalable solution:

- There are 13,500 ENOVIA customers globally with approximately one million users.
- Eaton has 20,000 ENOVIA users globally to support their design anywhere strategy.
- GE deploys ENOVIA to over 80,000 users worldwide, consolidating hundreds of legacy applications. They have up to 10,000 concurrent users.
- LG runs their mission-critical business processes on a single global instance, enabling collaboration for 16,000 stakeholders across the enterprise.

Concurrent design within product assemblies: CATIA® assemblies are managed in a database and not in physical files, enabling concurrent design updates within the same product assembly by multiple designers. For example, while one designer is updating the position of "brake pad," another designer is working concurrently on updating the position of "brake disc." There is no need to lock the entire "brake assembly." Positional change is merely a metadata update. Both designers can see each other's changes instantly in their open design sessions.

Access to the **latest 3D design data for non-CAD users** across the enterprise as it is being developed allows faster validation to develop products right the first time. Project managers, product managers, suppliers, service engineers, quality engineers, and others that don't use CAD tools have online access to the latest 3D product definition for design reviews based on a real-time digital mock up helping detect design, manufacturing, or service related issues earlier.

CHALLENGE – WE DESIGN MORE VARIANTS CONCURRENTLY

Our customers tell us they have more variants than ever before. Addressing the global market requires more options to be offered, resulting in a significant increase in the number of variants that could be developed.

To support this, engineers need to see the impact of changes across all of their various configurations. For example, if an engineer changes the position of the tailpipes on a car, will it interfere with the sports model? With the towing package? With the hatchback? As engineers make changes, it becomes a huge challenge to validate the changes against all variants. However, engineers need to plan and develop designs considering all variants to increase re-use, improving productivity in engineering as well as the entire value chain.

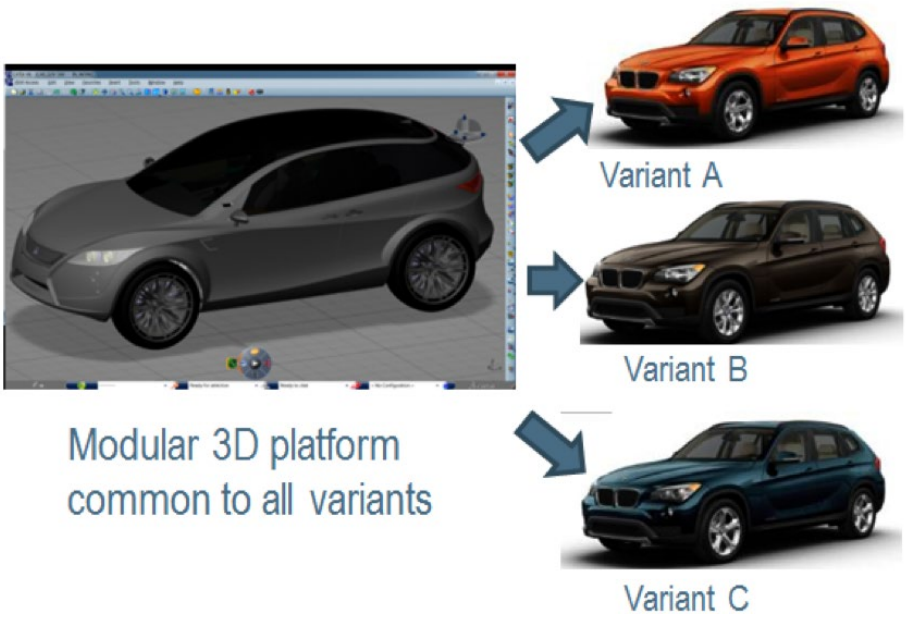
Requirements According to Tech-Clarity Report

An integrated design environment allows configurations and valid combinations of products to be defined in PLM and associated with design elements in CAD.

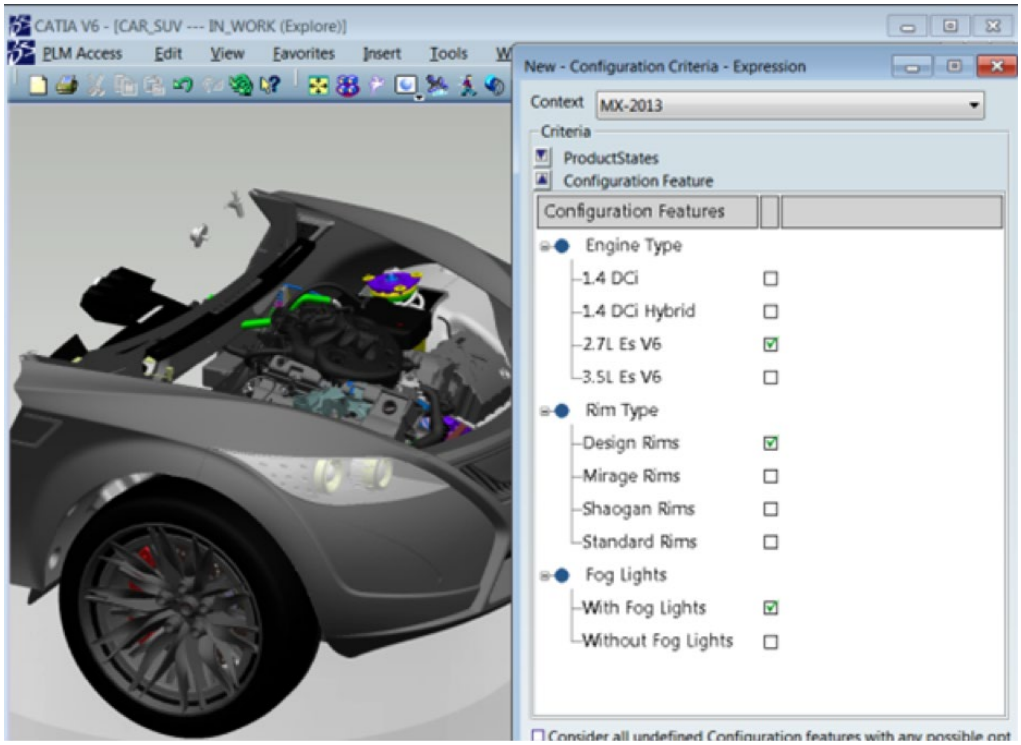
The latest generation of integrated solutions should access the configurations in PLM and allow engineers to turn features on/off to review different configurations in real-time as design options are explored.

ENOVIA Solution: Design in a Configured Context

A single modular 3D platform common to all variants enables simultaneous development of all planned variants to achieve design modularization.

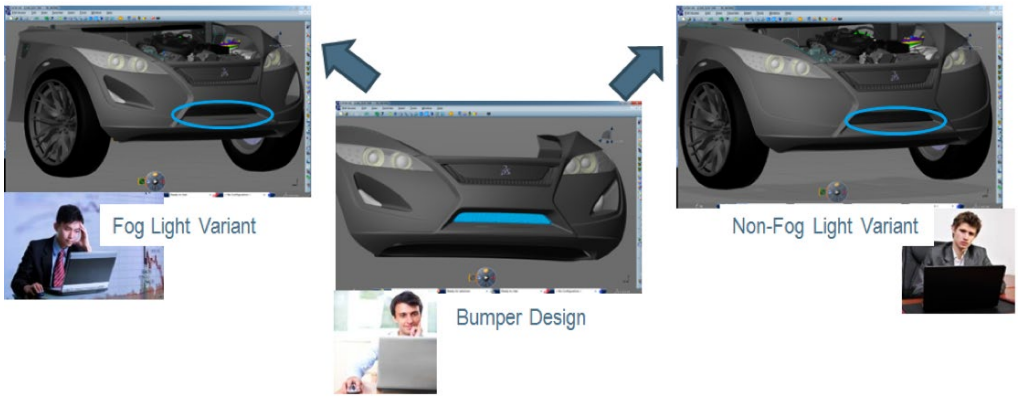


Engineers can turn features "on and off" using dynamic filters in CATIA to **access 3D designs instantly to review ad-hoc design configurations**. This enables designers to ensure their designs are compatible with all variants, helping support effective design modularization. For example, a designer making a change to the bumper accesses the 3D design for the fog light variant from the modular product structure to check for any issues.



This is only possible since we don't constrain assemblies within files but manage them in a database, enabling us to dynamically pull any components into the design session.

Design changes are propagated to all impacted variants, reducing the cycle time for engineering changes.



CHALLENGE – WE DESIGN MORE COMPLEX PRODUCTS

Our customers tell us that their products and design environments are more complex than ever. They have more complex designs and have more people working on them across the globe. Their products have complicated assembly structures that are hard for engineers to understand. This makes it difficult to set up their design environment to allow them to design in context.

For example, a supplier working on the drive train for a piece of agricultural equipment in Germany does not need all of the details of the wiring and hydraulic systems being designed in India, but needs to understand how they relate to his design. They need to see everything that is within a short distance of the drive train, regardless of what subsystem it may belong to.

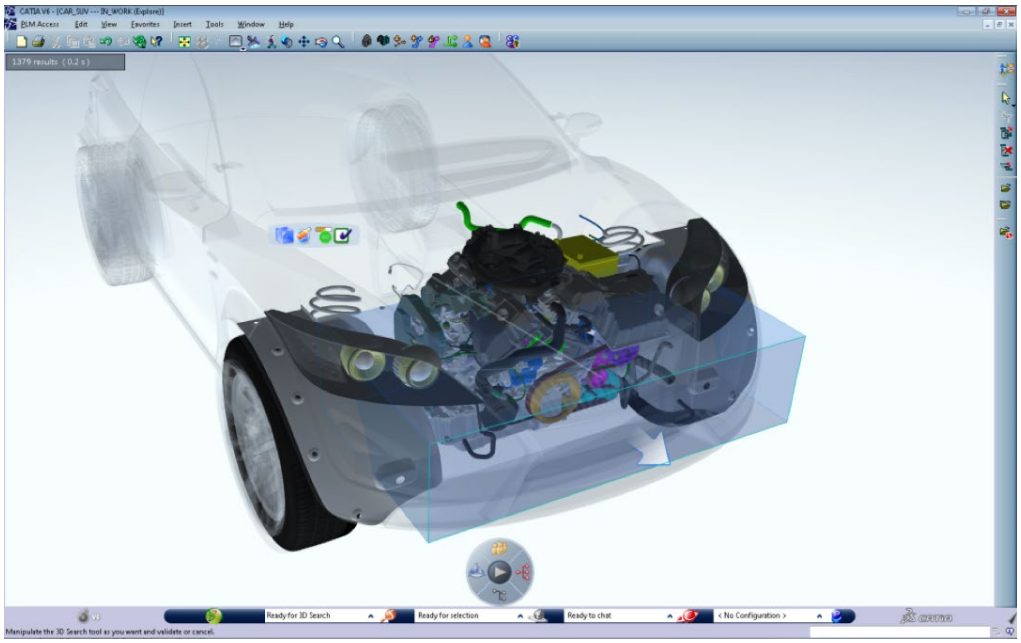
Requirements According to Tech-Clarity Report

The latest generation of an integrated design and development environment should allow engineers to quickly select the parts they need to work on to set up a design context, without requiring complete knowledge of the product structure.

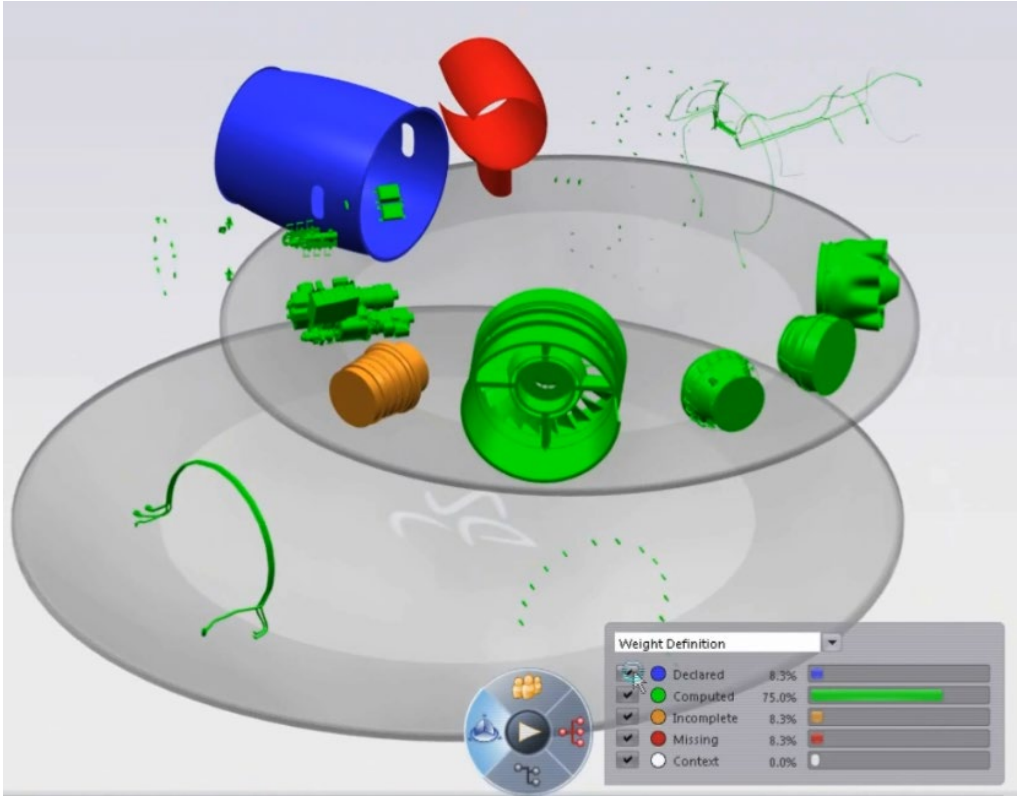
The latest generation of tools goes beyond technical and product design to incorporate a much richer view of the business of developing and delivering products.

Quick Design Context with 3D Navigation

ENOVIA provides the ability to create design sessions with the appropriate context quickly. Graphical 3D filters allow engineers to access contextual design data very intuitively in the 3D environment, without even the full knowledge of how the product structure is organized.



Visual 3D dashboards present the necessary engineering or enterprise information in the context of the 3D design for quicker decision-making. For example, Designers can track the weight of the assemblies using the weight dashboard to identify components with incomplete or missing weight definition.



CONCLUSION

Times have changed and the bar has risen on engineering and product development performance for Manufacturing in the age of Experience. ENOVIA, powered by **3D**EXPERIENCE platform, is the only leading PLM solution providing the database oriented approach for global product development to take manufacturers to the next level. It enables an **online collaborative environment for global Engineering functions** to connect confidently to the single virtual prototype for collaborative definition and validation of the product to be able to achieve **Zero Prototypes**. All the product development is performed on the centralized database, eliminating local CAD file repositories for **concurrency and real time information across the enterprise**. The ability to manage a single modular 3D platform across all variants enables **concurrent development of all the global variants** to help achieve the goal of launching the products simultaneously across the globe. ENOVIA is transforming product design and development, helping Dassault Systèmes customers address the critical challenges that they are facing on a daily basis.

"The integrated design and development environment is the latest evolution of product innovation and engineering software. These advanced solutions help manufactures continue to meet the challenges of compressing time, improving productivity, and battling complexity by allowing engineers to design concurrently, in context, in real-time."

Tech-Clarity report

Learn more about ENOVIA and/or download the full Tech-Clarity paper.

Our **3D**EXPERIENCE Platform powers our brand applications, serving 12 industries, and provides a rich portfolio of industry solution experiences.

Dassault Systèmes, the **3D**EXPERIENCE Company, provides business and people with virtual universes to imagine sustainable innovations. Its world-leading solutions transform the way products are designed, produced, and supported. Dassault Systèmes' collaborative solutions foster social innovation, expanding possibilities for the virtual world to improve the real world. The group brings value to over 170,000 customers of all sizes in all industries in more than 140 countries. For more information, visit .

3DEXPERIENCE

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