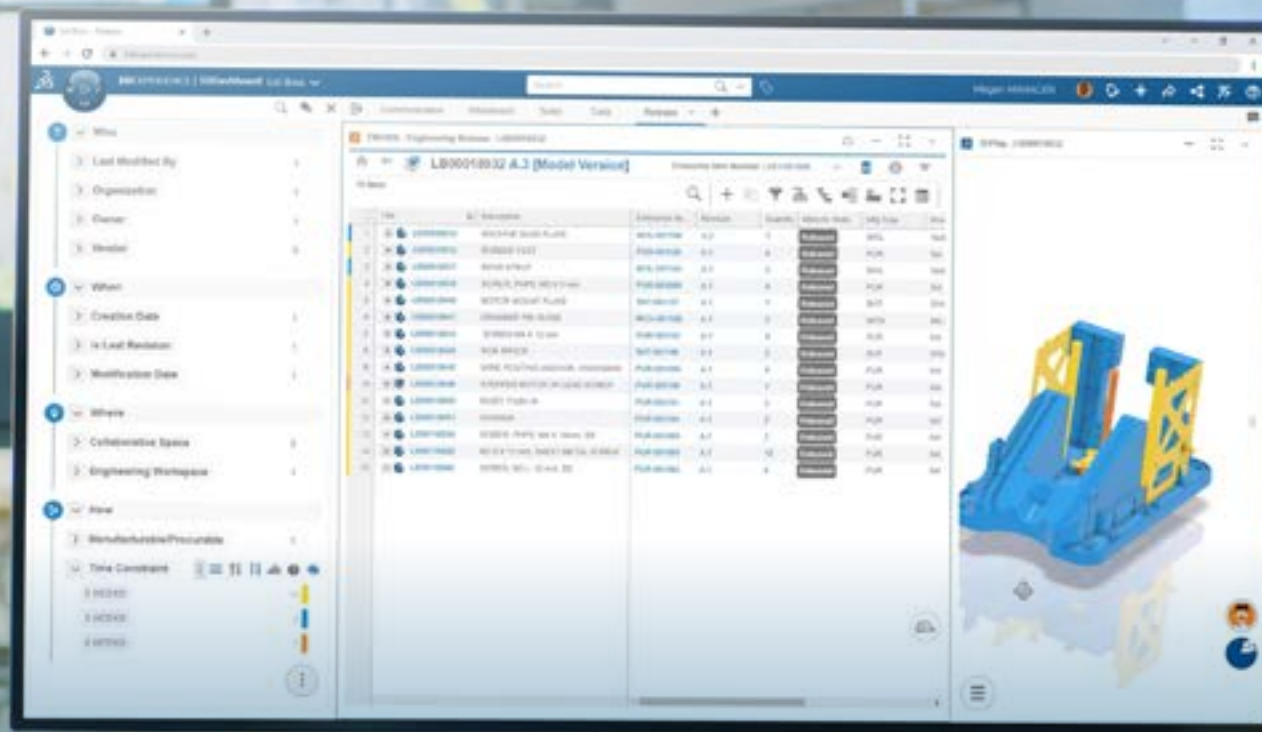




MODERNIZE YOUR BOM PROCESS

Create a virtual product definition

TODAY'S COMPLEXITY STRAINS TRADITIONAL BOM PRACTICES

The bill of materials (BOM) is a tool that has served the manufacturing industries well for decades. A typical manufacturer creates a collection of designs that make up a product, and then communicates a list of what the company needs to build or buy to produce it. Although the BOM is still the most common practice, the approach was designed in the age of mass-produced, mechanical goods and isn't sufficient for today's complex products.

BOMs still play a critical role in defining and communicating product information. But the process has long suffered from inefficiency and significant non-value-added administrative time that could be better spent on design. As product development has become more complex, BOMs have continued to work as a communication tool, but no longer support a world-class engineering process.

The traditional BOM is no longer equipped to handle the current pace of innovation, the increased demand for product personalization, or today's product complexity. It was never designed to cross design disciplines, forcing companies to design mechanical and electrical components and software separately. In much the same way, it wasn't intended to span from design through to manufacturing, creating a need for companies to translate and reconcile engineering BOMs (EBOMs) to manufacturing BOMs (MBOMs). The traditional approach of designing in silos and merging into a common BOM later in the process is no longer effective as the industry continues to raise the bar with faster, more agile, new products.

This e-book examines the challenges manufacturers face with their current BOM processes and explains how the **3DEXPERIENCE®** platform supports a better approach: the holistic virtual product definition.



A photograph of two men in a modern industrial or manufacturing environment. The man on the left, who is Black, is wearing a dark blue blazer over a light blue shirt and a lanyard. He is gesturing with his hands while speaking. The man on the right, who is white, is wearing a white shirt and glasses, and is holding a tablet computer. They are standing in front of large computer monitors. The background shows a complex industrial structure with metal beams and glass panels, illuminated by overhead lights.

BOMS ARE NO LONGER SUFFICIENT TO SUPPORT ENGINEERING

BOMs have been around for centuries, playing a critical role in defining and communicating product structures. The BOM has served as the master, single source of truth for purchasing, manufacturing, and the rest of the enterprise.

An EBOM is typically created by engineering, often linked to the MCAD and ECAD files that contain detailed product data including geometry specifications, and then extended with additional information to support downstream functions, such as sourcing and purchasing. It is also usually recreated entirely into separate MBOMs to support manufacturing processes and planning.

While any type of BOM is a useful documentation tool to connect enterprise stakeholders and contributors, a traditional BOM is no longer dynamic and comprehensive enough to serve as the master definition of the product or the manufacturing processes.



A BOM can serve as a record of a specific product configuration, but it doesn't allow engineers to predict the product experience as designs are developed. Today's products are not inanimate items—they are interactive systems that offer customers a compelling experience.

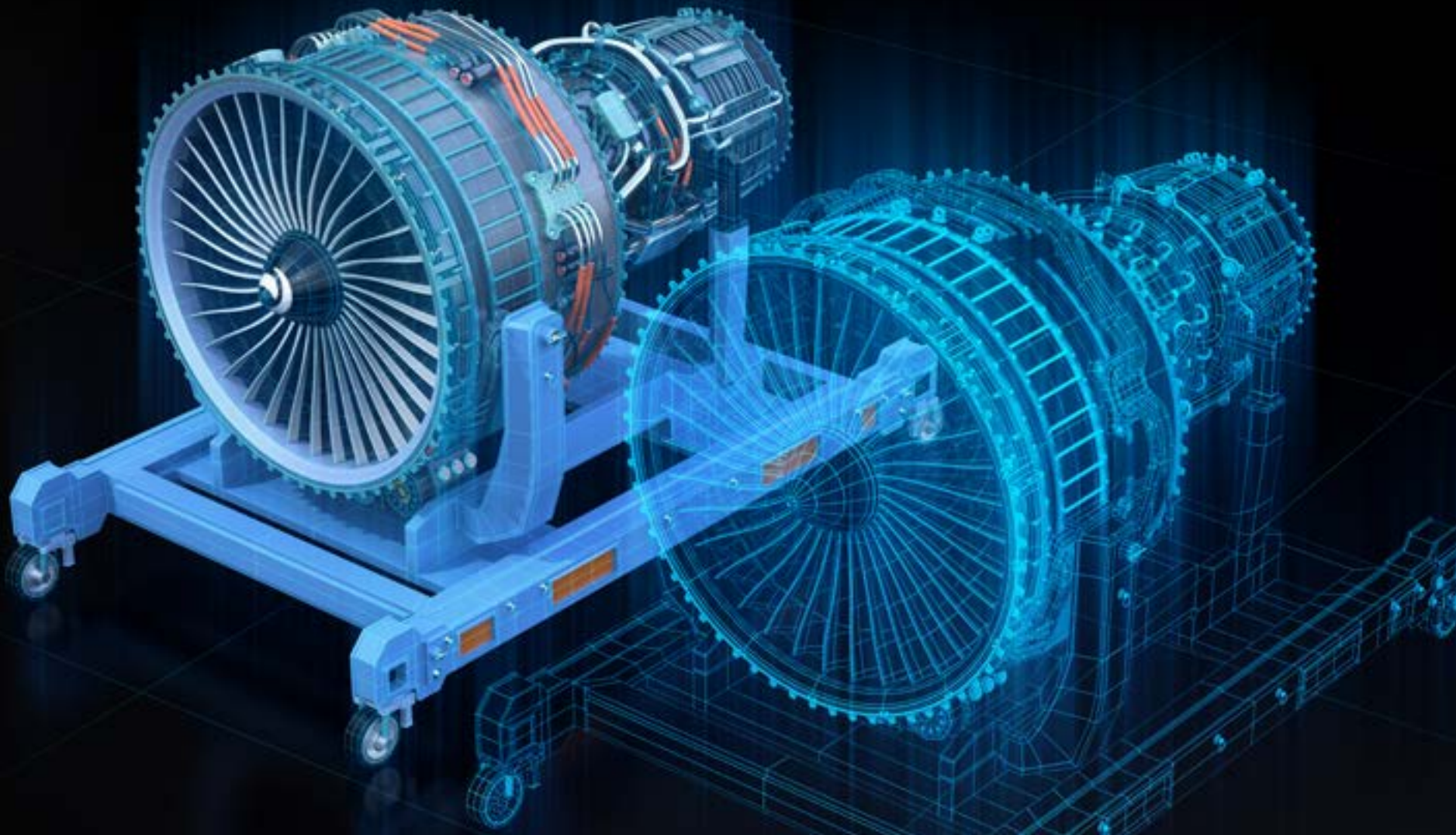
This experience needs to be designed, simulated, optimized, validated, and shared within—and beyond—engineering. A list of designs simply can't show the behavior that needs to be optimized and validated in order to deliver a high-quality product experience that customers are demanding.



BOM CONSOLIDATION IS A THING OF THE PAST

BOMs also suffer from a fatal flaw related to multidisciplinary products. BOMs are typically developed and optimized by designers and then consolidated later in the development lifecycle. Today's products now rely on the dynamic interplay of mechanics, electronics, and software to deliver advanced capabilities.

These design elements can't be validated and optimized independently; they must be viewed as an integrated whole in order to understand the experience they offer. Companies can't wait to integrate mechanical, electrical, software, and manufacturing perspectives at the end of product design without wasting valuable time reconciling data and risking costly integration issues.



EVOLVING FROM BOMS TO VIRTUAL PRODUCT MODELS

It's time for companies to recognize that using the BOM as the product master definition is no longer the best way to do things. Spreadsheets simply can't support the pace of increasing complexity of design. The **3DEXPERIENCE ENOVIA®** solutions provide a better way to model products and experiences.

Industry-leading companies are adopting more comprehensive, virtual product modeling approaches. Integrated, virtual models are the next level of maturity for designing, documenting, and communicating product details. Dynamic, living models go beyond documentation and can be leveraged for simulation to allow engineers to optimize product behavior and validate experiences to meet ever-increasing customer expectations early in the development process when designs are still flexible.



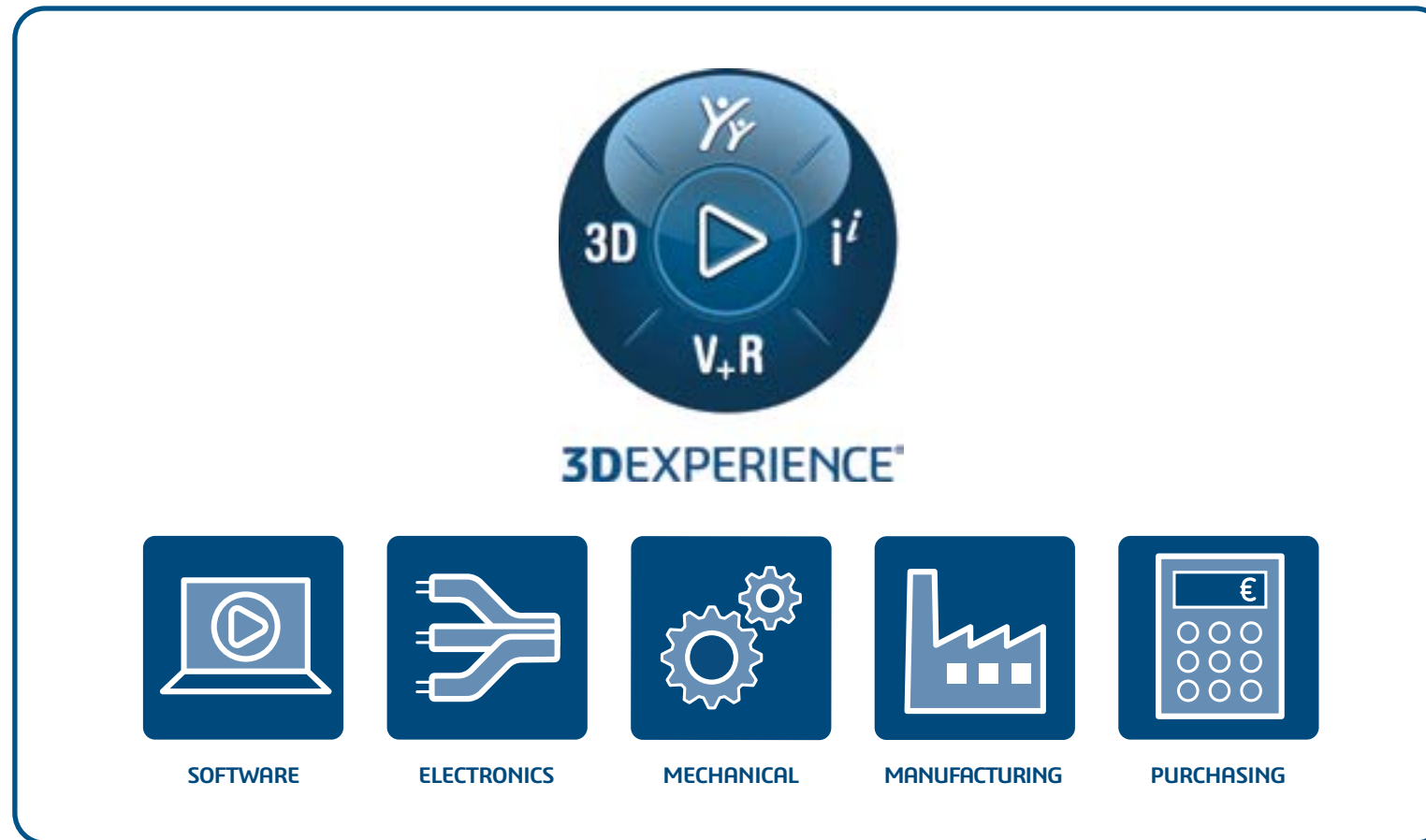
TRANSITIONING TO VIRTUAL PRODUCT DEFINITION

BOMs are important to downstream processes like costing and materials planning. But instead of the BOM serving as the master product definition, the virtual model is released from engineering and used directly by others downstream. In essence, the BOM becomes an output that can be generated from the virtual product

model and used by stakeholders who are not involved in designing product, process, and experience definitions. Another benefit of this approach is that different users can format a BOM report in a way that supports their unique processes and needs, yet stays up to date as designs change.



It's time for manufacturers to make the transition to the virtual definition, simulation, planning, and validation capabilities of the **3DEXPERIENCE** portfolio. The evolution of the BOM should follow the evolution of the CAD drawing. The CAD drawing has transitioned from being the master definition to a derivative report of the 3D CAD model. In fact, many companies leverage 3D CAD directly and no longer require CAD drawings. In the same way, using the virtual product model as the single source of the truth is a critical step to support the model-based enterprise.



CREATING VIRTUAL PRODUCT DEFINITIONS WITH THE 3DEXPERIENCE PLATFORM

The **3DEXPERIENCE** platform supports a cohesive, virtual product definition that spans design disciplines and lifecycle stages. It improves the design process by maintaining a single source of truth across disciplines, allowing a central definition that all disciplines can add to. The virtual product definition provides value throughout the engineering process and the product lifecycle by allowing

engineers to design and validate in a holistic, multidimensional context. The model represents a single product definition that can be manipulated, changed, optimized, validated, manufactured, and marketed. Then, when the time comes, the platform can generate a BOM report to support downstream processes as needed without creating disconnected data and unnecessary overhead.



CASE STUDY

KARIS CO., LTD.

By adding **3DEXPERIENCE** collaboration, data management, and communication solutions to its SOLIDWORKS® implementation, Karis has shortened design cycles for its products, such as the Steam Sterilizer shown here; increased design reuse; reduced development costs; and accelerated time to market, despite growing demand for product customization.

DugWoo Lee, managing director of Karis, explains: “Now, all design data and related documentation created in SOLIDWORKS are uploaded to the cloud via **3DEXPERIENCE** solutions.

Managing data in the cloud facilitates design reviews and the sharing of data, and also makes it very easy to collaborate between departments, such as using the Product Release Engineer role to collaborate on BOM work with the production department. Personnel with access and approval rights can access the **3DEXPERIENCE** platform from anywhere and at any time, such as during business travel, in our office, or at home. With this approach, the continuity of work progresses while we keep our data safe and protected.”

NEXT STEPS

Increased product complexity demands new ways of working. Today’s manual and disjointed methods for designing, simulating, optimizing, and validating designs are no longer sufficient for today’s rapidly evolving products. Companies can no longer afford silos of information that can’t predict behavior and experiences. These practices have served manufacturers well, but now hamper innovation.

It’s time to take product definitions to the next level. Companies must break free from the BOM as the master product definition and leverage digital, virtual product modeling and simulation across the enterprise. Today’s manufacturers need this approach to manage complexity, increase agility, and increase customer responsiveness while maintaining quality and dramatically improving engineering productivity.

Learn how a virtual product definition provides a better approach to product development.
Learn more: info@goengineer.com

Our 3DEXPERIENCE® platform powers our brand applications, serving 12 industries, and provides a rich portfolio of industry solution experiences.

Dassault Systèmes, the 3DEXPERIENCE Company, is a catalyst for human progress. We provide business and people with collaborative virtual environments to imagine sustainable innovations. By creating virtual twin experiences of the real world with our 3DEXPERIENCE platform and applications, our customers can redefine the creation, production and life-cycle-management processes of their offer and thus have a meaningful impact to make the world more sustainable. The beauty of the Experience Economy is that it is a human-centered economy for the benefit of all—consumers, patients and citizens.

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