

CONSUMER PACKAGED GOODS & RETAIL

SUSTAINABLE PACKAGING IN THE AGE OF EXPERIENCE

INTRODUCTION

Today, packaging companies are challenged with sustainability objectives, personalization trends and regulatory demands as well as a myriad of potential disruptions.

While they need to respond with speed and innovation, many are still relying on traditional processes and legacy systems that promote both operational and management silos, resulting in an inability to accelerate new ideas to market.

This is unsustainable in an industry that faces continuous challenges to reduce costs, improve efficiencies and responsiveness, and increase value-added services.

The only way companies in the packaging industry can truly address these pressing concerns and improve speed is to digitalize their operations.

An end-to-end digital transformation solution delivers value by providing visibility to the current state of manufacturing operations and potential bottlenecks and improving processes ranging from concept ideation and materials research to packaging design and manufacturing.

Fully connected digital manufacturing delivers efficiency from end to end. It provides packaging companies with the streamlined processes and support they need to realize their business goals.

A centralized solution that standardizes processes can help packaging companies streamline operations and scale as their businesses grow. Importantly, they will benefit from data continuity by unifying product design and manufacturing seamlessly to bring their best ideas to market faster.

Dassault Systèmes is committed to helping packaging suppliers innovate faster, smarter and more sustainably. Through our **3DEXPERIENCE®** platform, we provide digital solutions that are tailored to your unique business needs.

In this ebook, gain the perspective you'll need to improve in areas such as:

- Sustainable packaging design
- Digital manufacturing
- Eco-efficient supply chains
- Market differentiation

CHAPTER 1

DESIGN TO WIN



ADAPT TO MARKET TRENDS

The packaging industry is highly competitive. Companies need to cope with fast-changing consumer preferences and fluctuating consumer behavior to continuously innovate to retain consumer interest. Speed is critical to stay ahead of the competition.

“ Companies invest in technology for time advantage. Compression of the whole packaging research and development is a key potential benefit to decrease time as much as 50 percent over traditional work practices. ”



Raymond Wodar
Director and Global Business Consultant, Consumer
Packaged Goods & Retail Industry, Dassault Systèmes

Plastic Technologies Inc. (PTI), a plastic container manufacturer, uses our realistic simulation solution to design and deliver lighter-weight plastic packaging that consumers want. By utilizing virtual testing technology, PTI manages to deliver optimal designs that do not compromise on material composition and product performance requirements.





“Our solutions give you the ability to predict the performance of packaging before you commit to large-scale manufacturing. This way, you can mitigate and lower the risk or damage that you may experience in the marketplace.”

– Raymond Wodar

REUSE DESIGN ASSETS

The virtual world provides a better way to develop new packaging that avoids time-consuming and costly mistakes. It minimizes iteration loops and reduces expenses by limiting the use of physical prototypes while delivering high-quality products at lower overall costs.

Digital design and simulation can quickly and accurately determine the strength and viability of preformed products. This enables packaging suppliers to propose various alternatives to customers before physical manufacture.

RETAL, a global PET preform manufacturer, leverages an integrated digital environment to launch a product straight into production based solely on its digital model. The **3DEXPERIENCE** platform helps RETAL produce more sustainable packaging and save material costs to serve its customers better.

The company's beverage packaging expert, Anton Sugoniaev, elaborated, "CATIA helps us design the best package because we can rapidly come up with many different alternatives that customers can visualize in a digital environment before choosing the best one for physical prototyping."

When designers across the globe can access extensive design libraries on a single platform, overall design time is reduced and products can be launched faster. On the same platform, they also can digitally reverse engineer a product.

Anton added, "Putting measurements on a new preform can take between one to two hours. But if I reuse something that was done earlier, it takes me less than ten minutes to produce the final drawing."

REDUCE DESIGN AND TESTING LEAD TIMES

Packaging designers need an efficient way of working that allows them to design and test packaging ideas anywhere and anytime. A cloud-based platform makes it possible to accelerate new product development and reduce time to market.

Team members in different locations and time zones can collaborate to create innovative and sustainable packaging designs. They can rely on easily accessible, secure and up-to-date design data and work with various stakeholders on a single platform. This includes testing for shelf stability through a complete virtual modeling and simulation environment.

By virtually testing the product, together with all its incorporated materials, packaging companies can also adhere to health and safety regulations and select the most optimal materials before finalizing the design.

An end-to-end digital solution provides companies the virtual tools they need to accelerate the testing and validation of new packaging designs. Virtual simulation gives packaging engineers the ability to find the perfect balance between the amount of material needed and the strength of the package. Reducing just a fraction of material for reduced product weight can translate to massive cost savings, lower shipping costs and better sustainability metrics.

Our integrated platform also enables generative design capabilities that can support new packaging ideas without compromising on structural integrity or performance.



ERROR-PROOF ARTWORK AND LABELING

Typically, the timeline for new package development ranges from 12 to 18 months. However, a leader in the packaging industry managed to compress its timeline to just six months.

The company's success is owed to more efficient business processes and streamlined 3D data from product design to manufacturing.

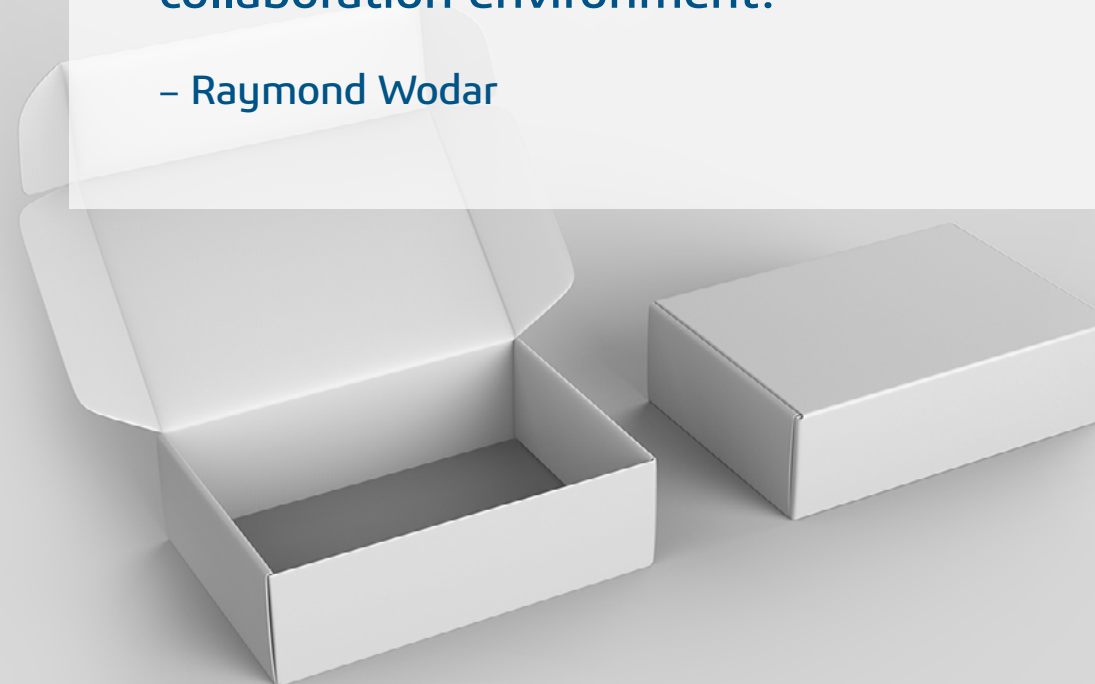
The **3DEXPERIENCE** platform enables the reconfiguration of an existing machine to produce new packages. This cuts 50 to 60 percent of customers' time and saves them money.

Virtual collaboration with customers enables the company to test the performance of modifications without needing to be physically present at the customers' sites. The platform also allows for an entire production process simulation, including optimal die-cutting and palletization. This practical solution saves a significant amount of time.

It might take three weeks to physically debug a machine on the customer's floor. Now, we can accomplish the same process in a virtual setting and do it much faster, without ever setting foot at the customer's sites.

“ Sometimes, it is only the artwork that is changed and adapted for a local market. In those instances, our solutions quicken design processes – be it design variations or a complete redesign – in an integrated collaboration environment.”

– Raymond Wodar



CHAPTER 2

THRIVE WITH DIGITALIZED MANUFACTURING





OPTIMIZE SUPPLY CHAIN PLANNING

An integrated platform enables company-wide transparency and cooperation. This is how companies can better utilize their existing production capacities.

Total transparency allows companies to balance production capacities with ease. The right planning solution helps clear bottlenecks by enabling companies to predict, locate and compare scenarios for relieving bottlenecks. This, in turn, helps keep production running as smoothly as possible across all plants.

Our global clients have leveraged our optimization solutions from DELMIA Quintiq to great effect. One such client, SIG Combibloc, a leading provider of carton packaging, manages to reduce supply chain planning time by 50 percent.

SIG's head of global resource management described, "Previously, plant managers couldn't always see when a problem was developing. Now everyone sees a bottleneck coming and deals with it much better, for example, by shifting the volume to another plant or notifying customers of a change in the delivery times. DELMIA Quintiq supports us in making fast decisions to find a better solution."



CONNECT INTELLIGENCES

Idle machines mean lost production, forfeited return on investment and wasted human resources. Packaging companies cannot afford to have their high-value people (or high-tech machines) stuck completing low-value tasks.

With a single, integrated software environment for design and simulation of machining processes, packaging product development is accelerated.

“Our solutions can template constraints for design engineering, optimizing thousands of different design outcomes. Having identified which of those designs performs best, you can bring that design iteration to market faster.”

– Raymond Wodar

Synchronizing maintenance across operations by maximizing uptime requires manufacturers to optimize preventive maintenance while managing and controlling reactive maintenance. The **3DEXPERIENCE** platform’s single architecture gives them real-time visibility and control across their entire extended enterprises so that they can modulate inspections based on machine events.



“ We provide operations management across an entire manufacturing enterprise via a single, unified solution that also operates as a manufacturing platform. It manages and executes enterprise-wide manufacturing operations processes, including those associated with production, quality, warehouse, maintenance, labor and the supply chain.”



Thomas Muth
Industry Marketing Director,
Consumer Packaged Goods & Retail
– Dassault Systemes DELMIA

STREAMLINE OPERATIONAL AND MANAGEMENT PROCESSES

With fully digitalized manufacturing, companies can extend streamlined production beyond the factory floor and integrate insights into other parts of their operations.

ARMOR, a leading manufacturer in thermal transfer ribbons, is empowered to streamline expanded operations and plan production needs to avoid material shortages and improve responsiveness.

Tony Conrardt, ARMOR's digital manufacturing systems manager, said, "The system lets us re-compute the schedule every day so we can dedicate the scheduling teams to real value-added tasks while giving the schedulers flexibility in certain choices or certain situations, such as with test working orders (WOs) or rush WOs which are injected into the daily schedule."

By using our solutions, ARMOR also benefits from having less human involvement in machine updates and saving precious time for planning.

“Our platform helps packaging companies manage all the constraints across their manufacturing facilities and use finite-capacity resource optimization to determine the most efficient production schedule. This is how each production line is optimized for maximum efficiency.”

– Thomas Muth

Additionally, our platform can synchronize production flows — from raw materials to the finished products — while considering real-time constraints of equipment, people and materials to develop the most optimal plan and schedule.

CHAPTER 3

DELIVER SUSTAINABLE DESIGNS WITH ECO-EFFICIENT SUPPLY CHAINS




REDUCE MATERIALS AND COSTS

Integrated application capabilities and end-to-end project visibility enable streamlined product development for accelerated launch times, higher quality, fewer recalls and lower materials consumption. Here, you can achieve cost savings, environmental benefits and customer loyalty.

“The 3DEXPERIENCE platform offers simulation capabilities to help speed up innovation, enrich portfolio and reduce costs by eliminating time and costs of physical prototypes.”



Walid Darghouth
Industry Solution Experience Director, Consumer
Packaged Goods & Retail Industry, Dassault Systèmes



PTI uses SIMULIA for realistic simulation to reduce development costs, achieve faster time to market for its customers, create more sustainable designs and proactively troubleshoot any production issues. Simulation enables the PTI design team to greatly reduce the amount of time and resources spent on building and testing physical prototypes, giving it a strong competitive edge.

“With a single platform solution, companies have visibility into their production operations to quickly trace possible issues. With the ability to manage and monitor all operational activities, it is a realistic expectation to have ‘right-first-time’ metrics increase and have full traceability of products 10 times faster than before.”

– Thomas Muth

LOWER ENVIRONMENTAL IMPACT

Today, we’re witnessing a dramatic increase in e-commerce, hastening the need for product packaging designed to survive more high-touch warehouse and delivery environments. The physical amount of packaging, coupled with increased shipping, delivery time and costs, is putting additional pressures on the packaging industry to deliver products that help minimize environmental impact.

Digital capabilities available on the 3DEXPERIENCE platform enable packaging to provide more functionality with less material.

A leading plastic container manufacturer employs our solutions to explore new polymer materials made from renewable sources. Their properties are simulated to predict performance, as well as cost, in a realistic context.

More holistic thinking is rewriting the sustainable narrative. If the packaging industry wants to remain competitive, players need to consider packaging features and characteristics that will perform in an omnichannel environment.

“ Packaging companies are starting to design products that are purposely built for e-commerce journeys. With increased touchpoints, they must ensure that materials will perform to a level that satisfies both the consumer and the planet.”

– Raymond Wodar





STREAMLINE LOGISTICS

Packaging companies know that achieving logistics efficiency means being equipped with comprehensive planning that enables them to optimize their resources.

Amid increased supply chain complexity, they need to leverage real-time data to execute successful logistics planning that reduces their carbon footprint. Companies that rely on spreadsheets or legacy planning tools are lacking supply chain visibility and flexibility to adapt the plan when last-minute changes occur.

This is another way our integrated planning tools can help. It connects different planning layers on a single solution so that planners, no matter their location, can collaborate immediately, determine the best delivery routes, implement any last-minute changes and keep their customers in the loop.

Importantly, our solutions allow companies to simulate the outcomes of what-if scenarios. Perfectly suited for when disruptions happen, a company can visualize how their decisions will impact production and delivery capabilities. This one-of-a-kind capability has helped our customers hit core KPIs such as reducing transportation costs between 5 and 10 percent.

Underpinned by powerful routing algorithms and planner input, our planning solution enables distribution networks to meet customer expectations while minimizing environmental impact.

CHAPTER 4

DELIVER DIFFERENTIATION WITH AN EXPANDED PORTFOLIO



Beyond satisfying expanding consumer demands, packaging companies now need to create brand-centric packaging strategies that meet and exceed expectations of the consumer, the retailer and the brand.

A global packaging leader collaborates with well-known CPG companies on the **3DEXPERIENCE** platform to analyze trends, gather market intelligence and identify consumer insights.

With this accelerated collaboration, the company reaps the benefits of packaging designs that differentiate on the shelf while providing its customers with speed to market, flexibility and agility. It now enjoys strengthened brand experience and loyalty with continued access to market insights.

“By innovating and validating new ideas at the design stage, companies can bring their products into the market more quickly. With reduced design time, our solutions help them expand their portfolio to win in a competitive landscape.”



Eran Reinshmidt
Industry Solution Experience Director, Consumer
Packaged Goods & Retail Industry, Dassault Systèmes

Another packaging leader, TECKDES, has also benefited from the **3DEXPERIENCE** platform. The Buenos Aires-based packaging design and engineering consulting firm managed to optimize its project lifecycle by leveraging the simulation capabilities of our platform. As a result, the company helped the Coca-Cola Company to reduce plastic consumption in its Aquarius brand water bottles by 25 percent.

Franco Mercado, TECKDES’s design director explained that the company strives to create great and functional designs for its customers, “We put a lot of focus into the technical part of the design process. The simulation capabilities on the **3DEXPERIENCE** platform enabled us to analyze the top load of a bottle and the internal pressure. We analyzed the weight and how that bottle would be transported, stocked and drank.”

Beyond ensuring every design initiative is delivered on time and on budget, our platform accelerates collaboration between TECKDES and its customers in packaging development. The result? Reduced cycles of rework, and strengthened satisfaction and loyalty.

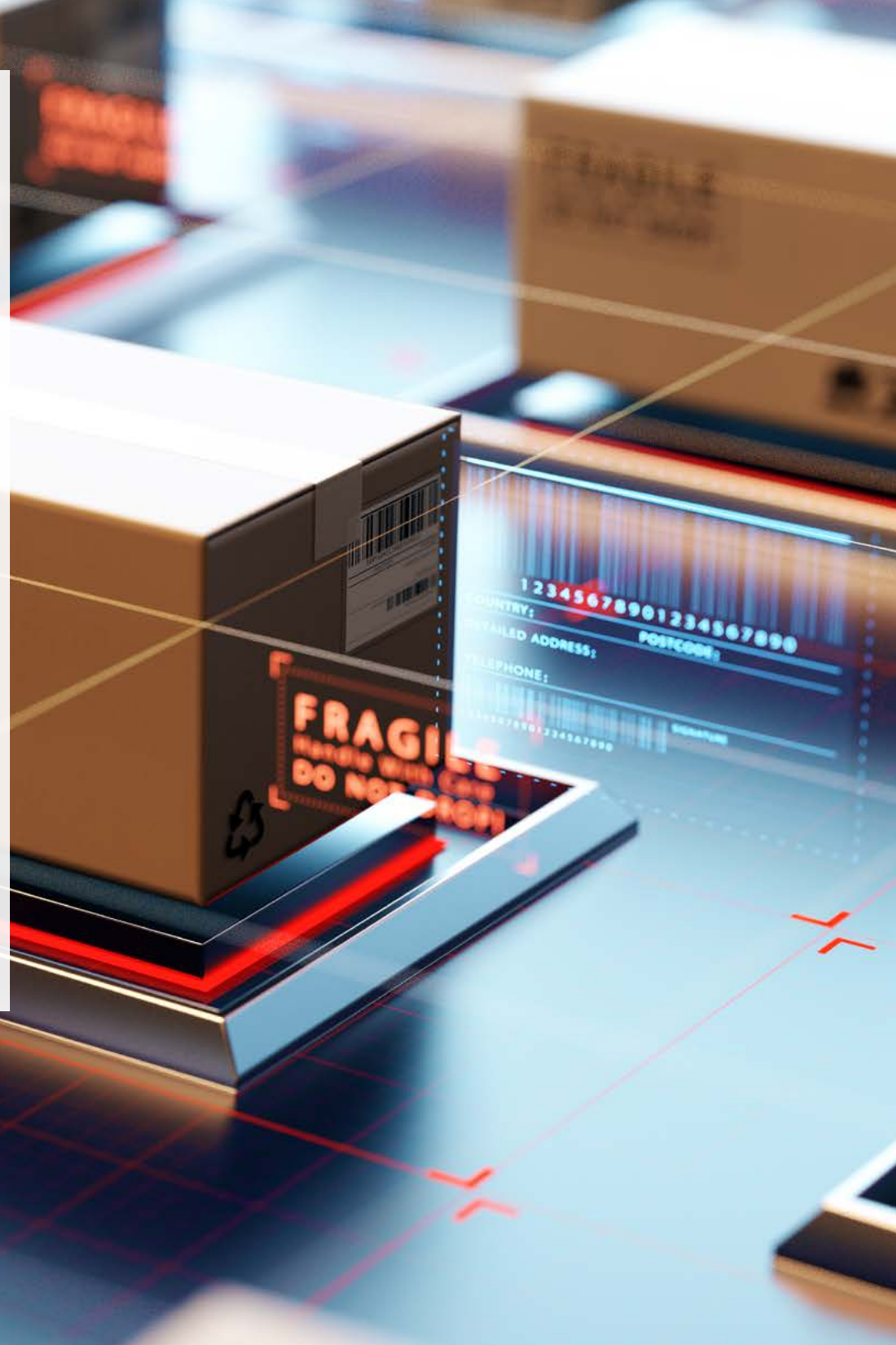
MOVING FORWARD

New trends bring new challenges and new concerns. The packaging industry is under pressure to deliver more sustainable designs, become more eco-efficient in operations and get to market fast. The best way forward lies in digital solutions. They provide all-important capabilities that are good for people, planet and profits.

The **3DEXPERIENCE** platform makes achieving sustainable and profitable operations simple with its robust, end-to-end digital capabilities. It also offers production tools specific to roles within the same environment to allow team members to collaborate more easily and contribute more effectively.

With the platform, you can experience enterprise-wide accelerated collaboration and communication across the supply chain — in the packaging development, the production and the delivery stages. The platform also serves as a hub that brings packaging players together to share and gain market insights.

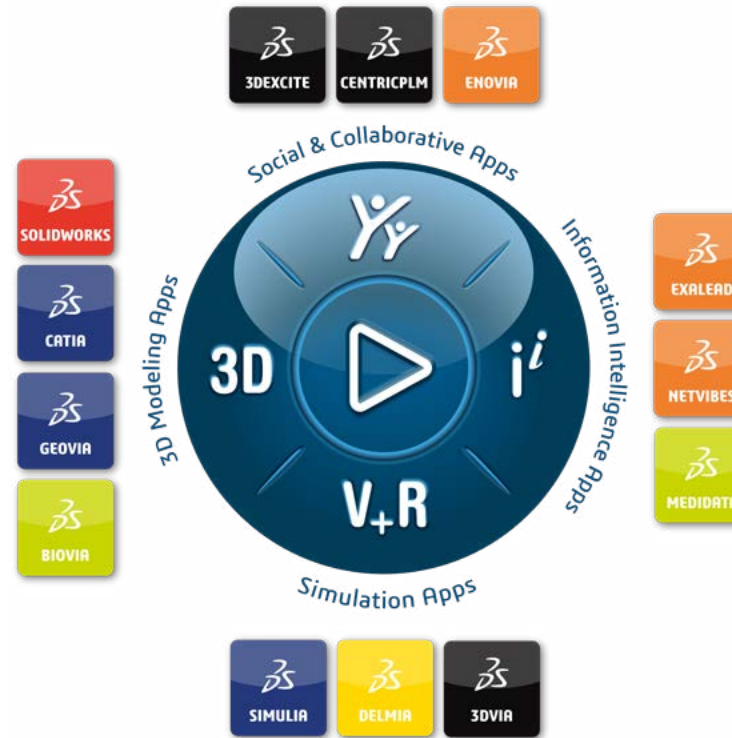
Are you prepared to deliver sustainable packaging in the age of experience? Talk to us at go.3ds.com/cpg



Our **3DEXPERIENCE**® platform powers our brand applications, serving 11 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 experience twins' of the real world with our **3DEXPERIENCE** platform and applications, our customers push the boundaries of innovation, learning and production.

Dassault Systèmes' 20,000 employees are bringing value to more than 270,000 customers of all sizes, in all industries, in more than 140 countries. For more information, visit www.3ds.com.



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