PLM & 3D

DESIGNING YOUR TEMPLATE FOR DIGITAL TRANSFORMATION
We’re all tired of hearing that even the longest journey starts with a single step. That old saying might be true, but it assumes you already know in which direction your feet should be facing.

In retail, though, market forces and in-house pressures are probably pulling you in ten different directions at once.

Your customers want things quicker. Your shareholders want new product categories for new markets. Your margins are getting narrower by the season. Your sourcing and manufacturing processes are hitting bottlenecks. You desperately need to develop some standout styles or conduct R&D and field testing on new performance materials.

Any one of those areas is packed with processes that are potential candidates for digital transformation – turning time-consuming, manual tasks into automated, digitalized ones.

So where do you start? We recommend a step back first.

They all have their own individual elements, but every one of the challenges we mentioned can be solved to some degree by creating the right environment to generate great product ideas, refining and road-testing them in a collaborative way, and getting them onto the racks as quickly as possible without sacrificing quality. So, it makes good sense to begin by digitalizing the key links that hold your product creation processes together: design, sampling, and a speedy route to market.

And luckily you should be able to make a material difference to all of them at once, by integrating one or more best-in-class 3D solutions with PLM.
If it feels like you’ve been hearing about 3D for a long time, you’re not alone. Compared to other industries, retail is late to that game – but for good reason.

In discrete manufacturing and engineering, 3D took off much quicker. Before, industrial designers relied on manual drafting: drawing different two-dimensional perspectives to visualize a product or a component from various angles. With 3D, the same task could happen many times faster, by spinning a digital model of the product to check whether drill holes were aligned.

In these industries, 3D computer-aided design (CAD) very quickly became two things: a massive time-saving device, and a tool to unlock new ways of innovating that hadn’t been feasible working by hand.

But the technology still had its limitations. Until the last few years, software simulations and hardware were not quite up to the computationally-intensive task of simulating the movement of soft materials, like fabrics and leathers, in real-time. And in an industry like fashion, where the different weights of cotton, the compositions of synthetics, and the behaviors of bonded materials are essential to nailing the look, fit, and feel of a product, accurately depicting the drape of a fabric was a “make or break” factor in the adoption of 3D. This is the reason 3D remained, for many years, a bit of a novelty, while 2D sketching with Adobe Illustrator became a de facto standard.

But in the last few years, 3D technology has caught up quickly. And suddenly everything has changed. Now, 3D models of garments are approaching to total technical accuracy, with complex parameters like torsion mapping, weight, and warp getting simulated in real-time. At the same time, offline rendering (where lighting, texture mapping and other models are given multiple passes and more time to run) began to produce photorealistic results of not just handbags and boots, but flowing garments – believable enough to stand in for real prototypes in marketing campaigns.

Even more: some 3D solutions can straddle both design and development. It’s now possible to build a great-looking 3D version of an initial product design and have every part of it linked to underlying 2D pattern pieces. So you know that what you see in the simulation, on a digital avatar, is going to be exactly what you’ll get from your physical prototype – down to the individual stitch.
Call it a coincidence, but 3D for apparel and retail came of age right when it was needed. In a short span of time, retailers and brands all over the world flocked to 3D as a way to tackle several serious challenges and manage different market pressures in a single go.

When 3D really hit the market, creative teams were struggling with the disconnect between digital sketches and physical prototypes - so products were going through countless rounds of sample iterations before they came close to the designer’s original intent. Every year, the industry was spending millions of dollars in aggregate on producing, shipping, and then revising three or even four samples per style. 3D could deliver significant cost and time savings into the cycle of time it took to conceive an idea and bring it to market. Even a single physical sample taken out of that cycle could have a transformative impact on profitability.

And in a market where speed is everything, merchandisers and marketers found they could populate their online catalogues and give consumers the chance to purchase upcoming stock using 3D assets. 3D put the power back in their hands and even opened the door to testing new ideas on the open market before any factory commitment was made.

As a result, 3D for fashion and retail picked up the pace very quickly. Unlike engineering, where the outcome of design and development is a single product or a small batch with a long gestation time, fashion and retail rely on quick turnarounds across tens or hundreds of SKUs. So every small edge gained in speed, agility, and accuracy to design intent at the style level counts towards a big combined impact on the total bottom line.

And that’s why we believe 3D offers such a ready source of value to almost any brand or retailer. As well as transforming your core production ideation processes, the right 3D platform(s) can add real value everywhere from supplier collaboration to eCommerce.

But 3D can’t do all that heavy lifting alone. And that’s where we make our move from just implementing a new solution to taking a meaningful step towards building a template for digital transformation.
Like any individual piece of the big digital transformation puzzle, 3D needs to become part of an end-to-end digital ecosystem to realize its full potential. The right solution can do a lot on its own, but it can also do much more when it’s integrated into the right PLM platform.

Let’s take the humble material library as an example. When your design and development teams are working on a 3D design, they will choose one or more materials to use for a virtual garment, shoe, or accessory. This works great for creative purposes, giving the designer insight into the aesthetics of the design with the chosen material(s). But what about cost? For example, if a chosen fabric only contains characteristics describing the “physics” of the fabric for 3D representation, and lacks other key data, that material can’t be used to seamlessly populate a bill of materials in PLM. Nor can that material be used for cost comparisons to determine the commercial viability of the style. And what about critical workflow stages such as understanding whether or not the fabric has approved lab dips, or has passed a myriad of other approvals necessary for commercialization?

And that’s just one example of where the value of 3D is limited if you choose an isolated approach instead of an integrated one. Once you’ve created a 3D model of a garment (and it’s been draped over a standardized digital avatar stored in PLM) it can deliver real benefits across the entire enterprise. The map of where you find those benefits will be as unique as your business is, but here are a few real-world examples to get you thinking:

- Supplement your technical specifications with technical-grade 3D models, tied to 2D patterns, so nothing is left open to interpretation for your suppliers. By properly implementing PLM to ensure adoption throughout the international supply chain, your 3D assets can become a common visual language—preserving design integrity, powering digital collaboration, and making sure nothing is lost in translation.

- Take your 3D models and use them in augmented reality, to bring static line reviews and assortment plans to life. Working digitally here might mean making smarter merchandising decisions because your teams can better visualize the impact of their choices.

- Pick up the same 3D assets and see how they’d look as collections and displays in-store, using either augmented or virtual reality. It’s one thing to see a flat plan of a proposed layout, and another to step into it and walk around.

- After replacing one or more physical sample rounds with a 3D prototype, use PLM to better organize your sample request and approval processes, so crucial decisions about fit and finish aren’t left to the last minute. Suddenly, your reliance on expensive air freight will drop, meaning not only less material waste but also a lower carbon footprint per style—improvements to two big sustainability metrics at once.

And we haven’t even mentioned the often overlooked benefit of integrating 3D and PLM: improving the lives of your creative teams. When they no longer need to manually re-enter bill of material information, dip into different solutions to update style data, or work to match 2D patterns to 3D designs, user satisfaction and adoption rates are both likely to skyrocket.
You should now have an idea of how 3D, integrated to PLM, can be useful as a model for other steps on the digital transformation journey. It’s a powerful example of how a digital tool designed to improve the daily lives of one group of users – in this case designers, garment technicians, and key suppliers – can be made part of a complete digital ecosystem, where it can then deliver value for everyone.

This is a strategy that’s underpinned digital transformation in many other industries: use best-in-class digital technologies and best practices to optimize your operations in one area, then maximize the return on that investment by mapping out opportunities to add value elsewhere through integration.

And this same principle can be applied to almost any other retail-specific business system you might be considering adding to your digital ecosystem – from machine learning to material sourcing.

It’s going to be vital, though, that you build an integrated digital ecosystem that expands your future horizons, rather than narrowing them.

Because what’s best-in-class today might change tomorrow, and you will want to leave your options open as you move from single steps towards total digital transformation.

This is especially important in 3D, where best-in-class means different things depending on the product categories you need to cover. Today, the market still hasn’t settled on one open 3D standard, which means your internal teams, design partners and supply chain partners may all be using different 3D tools.

So, if your business is already interacting with multiple parties that use different tools, or you’re using different tools based on the various product categories that you develop, then it’s important to remember that integrating PLM and 3D will almost certainly involve linking more than one solution.

DON'T CLOSE ANY DOORS.
Like 3D, systems integration in retail has a complex legacy. For a long time, adding new business systems to your technology environment involved time-consuming, bespoke work that came at a high price. PLM systems themselves were usually heavily customized, and so vendors had built their business models around any change triggering a new and expensive consultancy project.

As you can probably guess, this shortsighted approach has worked against the vision for total digital transformation – which is a topic the two previous papers in this series have dedicated themselves to. After all, the idea of eventually digitalizing every process area of your product lifecycle becomes a lot less attractive when each of them comes with a hefty price tag for necessary integrations.

Luckily, the most forward-thinking PLM vendors have moved away from this restrictive model and towards simple, seamless, and cost-effective connections that require little or no customization work to implement - and that relies on standardized APIs. So, as you build your integration map, using 3D as a template for other integrations, make sure this kind of low-cost, long-term flexibility is available to you.

In some cases, this might mean upgrading to the latest version of your existing PLM platform - or replacing it with a modern alternative - since intuitive, plug-and-play middleware has only recently replaced the bespoke model that previously came as standard.

If that sounds like a tough pill to swallow, it might be worth pausing to reflect on the commercial reality of a replacement or an upgrade. If you’re currently running an older version of PLM, either avenue with likely take you to the cloud – slashing your hosting and staffing costs – as well as offering ready-made (even native) integrations to popular 3D solutions, new improvements to the user experience, and even whole new architectures that will provide you with stronger foundations for future digital transformation.

In the most recent book in this short series we said that “the best modern PLM platforms are built to consolidate data from almost any source” and that “you should try to extend this principle throughout the entire enterprise”. That’s advice we stand by, and it’s a message WhichPLM has been communicating for more than ten years.

When it comes to going digital in the context of technology and processes, there are really only two keys to success: choosing the right PLM platform as your enterprise backbone and picking the right solutions to plug into it.

Using the integration of 3D and PLM as a template, you should already be able to see how the biggest companies in the world have followed a plan that looks a lot like the one set out in this guidebook. Starting with the most compelling return on investment, they have taken confident, measured steps towards total digital transformation. And in that process, they’ve been able to not only improve their immediate productivity and profitability with each new process area they digitalized, but they have also established an onramp to the easy integration of new innovations when they emerge.

So while 3D is the most sensible starting point for most retail businesses – which is why we chose it as the focus for this guidebook – the same principles behind making use of 3D assets everywhere from design to digital marketing can apply to essentially any other process or asset you plan to digitalize.

Because before you know it, a project that starts with digital product creation will become an all-encompassing vision that captures digital customer engagement, digital supply chain transparency, and much more. And from one manageable step, you’ll have already passed several milestones on the road to total digital transformation.

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"PICK THE BEST THE MARKET HAS TO OFFER."

When you take this extra value into account - as well as the possibilities for further integration it offers - then moving to the latest generation of PLM should seem a much smarter choice.
WhichPLM is the premiere online destination for businesses in the retail, footwear, and apparel industry looking to make informed investments in PLM and other technologies. Its print and online publications reach a global fashion audience, and its network of impartial advisors work with brands and retailers around the world. Read all our latest content, for free, at www.whichplm.com

PTC’s retail platform combines the industry-leading FlexPLM solution with both 2D and 3D design, artificial intelligence and augmented reality to enable brands and retailers to digitize and accelerate key development processes and gain insights from across the enterprise to drive better merchandising, design, and sourcing decisions. To find out more, visit: www.ptc.com/en/industries/retail

Browzwear’s pioneering 3D solutions for apparel design, development and merchandising are the key to a successful digital product lifecycle. Through the power of beautiful, true-to-life 3D, designers, developers, production and marketing can now collaborate effectively to get creative products to market faster than ever before. With Browzwear, brands and retailers around the world are connecting people and processes, reducing iterations and samples, and merchandising garments even before they are produced. For more information, visit: www.browzwear.com