WHITE PAPER

THE CHALLENGES OF PRODUCT DEVELOPMENT IN THE FASHION INDUSTRY

LECTRA

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Summary

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Future-proofing fashion product development

Product development for fashion is the series of processes that transform a design into a final product ready for commercialization. During this phase, everything from the fit to the fabrics, design elements like finishes and seams, and more is translated from conceptual sketches into pattern files, prototypes and detailed tech packs of information for manufacturers.

Despite fashion's reputation for innovation and rapid evolution, product development processes have remained largely unchanged for decades. **Outdated systems and manual tasks have yet to be truly modernized and streamlined.** Instead, they are fractured and inefficient, leading to wasted time and resources, higher-than-necessary development costs, and the inability to capture valuable data generated during this process—an increasingly important consideration for the industry as it grapples with incoming regulatory requirements.

The fashion industry has navigated a challenging five years, rocked by the COVID-19 pandemic, geopolitical unrest, supply chain shocks, tariffs, rising costs of raw materials, and a wave of incoming laws set to mandate increased visibility and responsibility for products and their production methods.

As we enter the second half of the 2020s, the industry recognizes that **unpredictability is the new normal.** To survive and succeed in this turbulent world, fashion businesses must focus on increasing operational efficiencies to build more resilient and future-proof systems. **Product development has untapped potential for a system-wide overhaul, which could yield notable benefits for businesses, teams, and suppliers.**

Technology, particularly artificial intelligence (AI), can **unlock new opportunities for fashion's product development professionals** to speed up development, capture more data, and refine their tasks, while freeing up what would have been administrative time for more meaningful work. Experts believe it can also unlock new opportunities within 2D and 3D technologies, optimizing existing tools for greater efficiencies.

Before we can revolutionize product development through technology, it is essential to identify the tasks and roles that are in need of reimagining through the use of these tools. This white paper looks at three core factors, including human resources and knowledge transfer, the role of data, and the links between design and production to hone in on the biggest areas of opportunity for fashion's product development evolution.

PART ONE

Human resources and knowledge transfer

Supporting technology adoption for product developers

Product development often includes tasks that are done manually, including patternmaking, the creation of measurement charts and diagrams, and size grading. Historically, these tasks have been completed by skilled technicians, but as the pace and requirements of apparel production have evolved, computer-aided design (CAD) technology has emerged to support these tasks. Often, CAD tools are specialized to perform a particular task, meaning brands end up with a suite of different solutions that can be disconnected from each other.

Technology will play a leading role in the future of product development to improve inefficient processes from design through to production, but businesses must be careful to ensure that it is intuitive and accessible for both young tech-savvy generations and existing teams, who could be resistant to the transition from tried-and-tested manual experience to tech-supported tasks. The balance between human touch and technology must also be found, as one will not exist without the other.

Similarly, product lifecycle management (PLM), which tracks processes from sampling through to production, have traditionally been managed through a disjointed mix of systems. This leads to "disconnected handoffs between merchandising, design, materials and sourcing teams," says Liza Amlani, Principal and Co-Founder of **Retail Strategy Group**, whose book on innovating how product is created, The Material Life: Process Innovation for Retailers and Brands was released in December 2025. "As you go through the concept-to-market process, there's a heavy reliance on spreadsheets and on emailing back and forth. A lot of those disconnects are because of the manual ways of working."

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Matteo Secoli
President of Istituto Secoli

Experts don't see these analog skills disappearing at all. Instead, they believe that emerging generations will benefit from learning technology-based as well as conceptual and manual product design skills, explains Matteo Secoli, President of Istituto Secoli, the Milan-based school & knowledge center highly specialized in product development. "There are some activities or topics we decide that it's better to teach by hand, and some things are better to teach directly on software," says Secoli. "The idea is that inside the mind of a young designer or pattern maker, the digital dimension and the physical dimension should not have any kind of borders, they are inherently linked together."

About the Istituto Secoli

Often described by industry insiders as one of the "best-kept secrets" of Made in Italy,Istituto Secoli, founded in Milan in 1934, is a fully accredited Fashion Academy and a highly specialised **knowledge centre dedicated to fashion product development.** This dual role keeps the Institute close to real industry constraints and needs and continuously aligned with evolving tools and practices.

Led by President Matteo Secoli, it develops the capabilities and competences that **turn creative intent into premium-to-luxury products**—pattern engineering, prototyping, fit culture, construction logic and industrialisation—where quality is built and repeatability is secured at premium-to-luxury standards.

Beyond education, Istituto Secoli operates as a consulting and applied-projects hub, working with brands and manufacturers to strengthen methods, workflows and organizationalt capability building—highly relevant for premium-to-luxury players whose distinctive production excellence remains strongly rooted in Italy and Europe.

Secoli's long-standing technology mindset, underscored by its nearly **50-year partnership with Lectra**, reinforces its role as a bridge between craft, method and modern workflows. In a context of accelerating digital tools and AI-supported workflows, Secoli's pragmatic view is that—particularly in competence-intensive productions—**technology will amplifies expertise rather than replacing it.**

The World Economic Forum's Future of Jobs report 2025 found that consumer product industries like fashion have a higher than average uptake of robots and autonomous systems (71%, compared to 58% across all sectors), however 67% of organizations see skills gaps as the biggest barrier to this transformation. Businesses will be looking to graduates to fill AI and technology-shaped skills gaps as they become increasingly necessary in the product development process, says Justin Newlin, Director of Executive Search for **PVH Corp**, which owns Calvin Klein and Tommy Hilfiger. "There is a skills gap, because AI hasn't been fully adopted yet," he says. "People in full-time roles have not received the investment from their company to go get the training…I know that schools are starting to dive into this more and more, and that's in a transitional phase right now."

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CAD and PLM tools have helped to increase efficiency and decrease time spent on product development, but haven't always kept up with the sophistication of daily tech tools like smartphones that digital native generations use. As the next wave of product development professionals enter the industry, a key challenge will be meeting their tech expectations, says Giulio Romanelli, Technical Engineering Project Coordinator for **Oniverse**, the parent company of Italian brands like Calzedonia, Intimissimi, Tezenis, Falconeri and others. "For the new generations that are now coming into our brands, they want to have the technologies that are immediately understandable, easy to use, and accessible from everywhere," he says. "If you don't have the latest state of art of the technology, the new generation will have difficulty understanding the logic when they are using software built on legacy systems."

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Oniverse

Similarly, existing teams have to be supported through a technological transition to ensure smooth and willing adoption. A perceived threat that AI or other technologies will replace their expertise or role entirely could prevent businesses from successfully implementing new tools. "The main resistance that we found was related to the change management of the technologies," says Romanelli of new tech tools that have been introduced into Oniverse brands over the last five years. "You have to work together with [teams] to show them the benefits, to show them why they are doing things in a different way compared to the previous processes."

Just as businesses have to balance the introduction of technology for the new and old guard, so too does a business have to consider the balance of human-to-tech ratio for tasks.

Identifying the key motivation behind tech adoption for product development can help businesses delineate what jobs should be predominantly human-led or technology-led. "Technology is not going to solve all of your problems, so you need to determine what is the right balance of technology and human touch," says Amlani. "Balancing art and science is table stakes. We need to shift our focus on how we are using and balancing technology in retail."

Establishing key performance indicators for success can help businesses define the role of tech within product development, she says. "Layering technology on top of the process with specific measures of success and clearly defined outcomes—that's when will see improvements in product creation."

Translating and preserving brand DNA and expertise

As brands transition their product development processes from manual to tech-enabled, it will be necessary to ensure the translation of formerly human-centric skills and know-how into digital platforms in order to preserve their unique brand DNA. "Craftsmanship is deeply rooted in this industry—the touchy-feely nature makes it a very physical, analog world," says Nicolas Favreau, Vice President Offer Strategy at Lectra. "Now, we are coming into something that is much more compelling, extending the physical with digital, and extending the digital with the physical."

But why is this fusion of worlds important for the future of product development? The evolving nature of employment means that knowledge holders don't stay with a business long term in the same way that they might have decades ago. "Building empirical knowledge over time is not as common or as valued as before," says Favreau. "Because you're missing out on empirical knowledge, especially with the younger generation, you need to find ways to compensate. How can you do that? You need data."

For **Oniverse**, the adoption of PLM and CAD tools allows team members to hand off time-consuming administrative tasks in favor of more rewarding and challenging initiatives. "Technology is playing a supportive role in helping us maintain and reinforce our brand DNA by improving efficiency and optimizing internal processes. It allows us to focus on what really makes our brands unique: their identity and creativity," says Romanelli. "We consider technology a facilitator that allows our team to focus on what really matters. All our teams, both here in our headquarters in Verona, Italy, and also in the production plants, can now dedicate time to higher-value activities such as design innovation, rather than getting bogged down by operational details."

Favreau believes AI has the potential to take over mundane, repetitive or technical tasks that humans have historically done. "When working with fabric, you spend a lot of time inspecting the fabric for defects. If you do that for eight hours a day, you're probably less efficient at the end of the day. But AI is never bored; AI is never tired." he says. "AI is a unique opportunity to unleash the capacity of people so they can refocus on their art, their craftsmanship."

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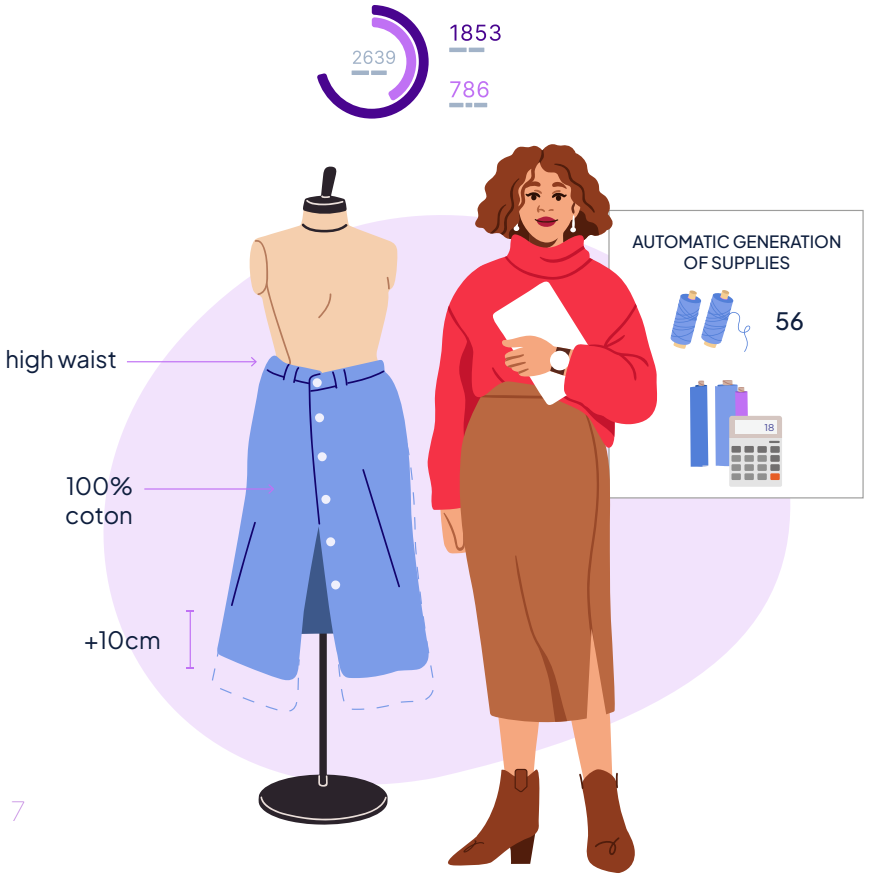

PART TWO

The role of data

Embedding traceability from the design stage

When the phrase “data is the new oil” was coined in 2006 by British mathematician Clive Humby, the fashion industry could not have fully appreciated how pertinent that statement would become over the next 20 years. For fashion’s complex product supply chains that span the globe and intersect with several other industries, such as agriculture and shipping, data has become a vital decision-making tool.

Data helps product developers to manage their processes better than ever before, harnessing numerical evidence to inform decisions once driven primarily by human instinct. This can help reduce costly mistakes that lead to issues like over-sampling, production delays, and over-ordering. “There are many accidents in fashion because you go the wrong way, and data helps you to build a map,” says Favreau. “Only data can bring a GPS capability to support decision making.”

Over the last decade, the fashion industry has made significant progress in building out these ‘maps of fashion’, enabled by the emergence of the traceability technology sector. However, the industry still has a long way to go before data is being collected, analyzed, and acted upon effectively. The industry lacks a unique platform that can harness this data and embed it into the product development process to refine and optimize decisions.

“There's still very limited visibility into what's happening with sourcing, product development, and materials around availability, cost changes, lead times, and risks,” says Amlani, who has worked within and consulted for a number of global fashion brands through product development systems change.

Establishing traceability for products is hampered by a systemic siloing of teams within a brand who are likely to be using different systems and working on different timelines, Amlani says. “Because the teams are so siloed, they do not understand how the inputs and outputs of a decision will impact another team. And that's why looking under the hood of the concept to market process is critical.”

Addressing data storage and PLM usage

Data can go from being a vital source of insights to a logistical headache if it is spread across too many different disconnected systems. Often, brands will have some data stored in a PLM system, data about the pattern of garments stored in CAD systems, and data about fabric design on yet another system. Before the adoption of traceability tech platforms, a significant amount of data was, and sometimes still is, stored in emails and spreadsheets. But product development data is dynamic and ever-evolving. Not only does a spread of data across multiple systems make understanding its interconnectedness extremely difficult, but it also increases the risk of losing valuable data insights.

"Today's retailers and brands have a huge tech stack—layers and layers of technology," says Amlani. "But adding technology piecemeal doesn't work." Onboarding some but not all relevant teams to PLM systems can further amplify siloing and create unintentional hierarchies between those who get to use new tech and those who are still using old, archaic systems.

When teams are all adopting PLM systems collectively, the results for brands can be profoundly positive, beyond creating efficiencies. "Collaboration levels have gone up simply because of the emphasis on technology and getting multiple teams to train on it," says Newlin from PVH Corp. "You might have a tech design program that helps build out and map products to get the sizing right. But it's still important for the merchants and the designers to understand these programs at a high level, so that they can also speak to them and tweak them."

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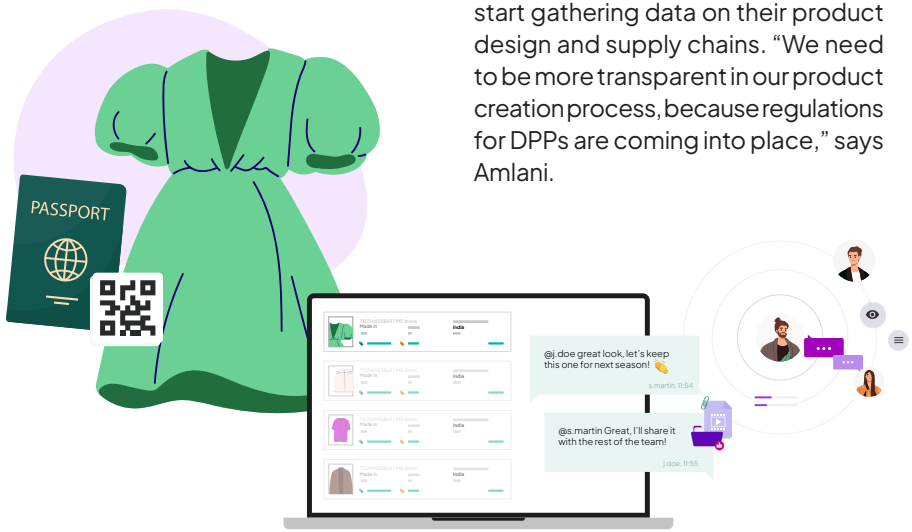
Director of Executive Search
PVH Corp

As the era of data evolves, AI will be able to help product developers cut through the noise and find the data most relevant to them, says Favreau. "There will be a wealth of data in this industry, like in any other. Equipment and software will consume and generate data, and it will be much more about providing the exact data that is actionable for the user and what they need to do," he says. "This is where AI can help. There will be tons of data collected, and it will be about providing the right people with the right data. It's about preparing the data, selecting what is meaningful, and exposing only this, because the rest is noise."

Digital Product Passports

Integrating technology into the product development process will expedite the creation of Digital Product Passports (DPPs) — unique digital records linked to each physical product. These passports can store information such as the materials used in a garment, how and where it was manufactured, care instructions, its environmental footprint, and more. DPP is a requirement of the European Union's Ecodesign for Sustainable Product Regulation (ESPR), which will enable a circular economy for textiles to emerge. DPPs will be enforced on every product sold in the EU from 2028, and has proved to be a strong catalyst for fashion businesses to start gathering data on their product design and supply chains. "We need to be more transparent in our product creation process, because regulations for DPPs are coming into place," says Amlani.



Businesses that have already begun the time-consuming process of tracing their supply chains and collecting product data for their own responsible sourcing strategies will more easily meet DPP requirements. As a predominantly vertically integrated business, Oniverse has an advantage in supply chain visibility, says Romanelli, and is collecting data for both compliance and to meet its own sustainability targets. "Because we own our manufacturing plants, we can have greater control and visibility over the process," he says. "But technology is also helping us to track data on external suppliers for raw materials, and we are tracking all the different information related to where the fibers are coming from."

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Oniverse

By collecting data for DPP compliance, brands have the opportunity to compare and contrast the environmental impacts of materials and strategically increase their use of more responsible materials, including certified, recycled and recyclable, or organic options. This will help brands to adopt ecodesign practices by evaluating resource consumption after each product update. Materials are also becoming a key buying consideration for conscious shoppers, who will be able to scan QR codes to read more product information than ever before, thanks to the implementation of DPPs.

Bringing materials to the forefront of product development

Product developers typically have little control over the choice of materials, operating with a design-centric approach where materials can be an afterthought. Adding to this is the competitive and fast-paced nature of fashion trends, meaning they might make rushed decisions without full visibility of all production considerations. “Brands are subject to [competitive] pressure, and often decisions to rush through the product development processes are taken without being informed on its actual feasibility, on the real cost, and the availability of suppliers to make it at this right timing,” says Matteo Secoli, of Istituto Secoli. “So eventually, brands end up developing lots of styles that never make it onto the line. That process could be much more efficient.”

Amlani believes that making materials central to product development processes can deliver a number of benefits, in addition to the compliance and sustainability wins that emerge from establishing this level of raw material traceability. “With most of our clients, we have touched on the value of elevating materials in product development,” says Amlani, whose Material Direction™ approach flips the typical product development process as a way to break down the aforementioned silos and hierarchies between different teams. “Materials teams, sourcing teams, and even supply chain teams are often set up as a support function to serve the needs of design, product development, and merchandising,” she says. “But that isolates these functions even more, because they're looked at as a service provider versus a partner in the organization.”

The knock-on effects of starting product development from the materials available within a designated material library can be significant. “It leads to faster and more accurate forecasting, will reduce overdevelopment and waste, it will reduce overassorting, overproduction, and it will improve visibility into material demand,” says Amlani. “Working with raw material planners early in your supply chain will strengthen your vendor relationships, which will in turn reduce the cost of that material. Brands will have more predictable supply chains that can support their sustainability goals.”

PART THREE

The links between design and production

Manufacturable by design

Product developers have to balance a range of important considerations in the concept-to-market process, including nonnegotiables like desirability, profitability, wearability and sustainability. Ensuring the preservation of stylistic intent that aligns with the brand DNA, while navigating budgetary constraints and the capacity of suppliers, is also vital to achieving this elusive balance.

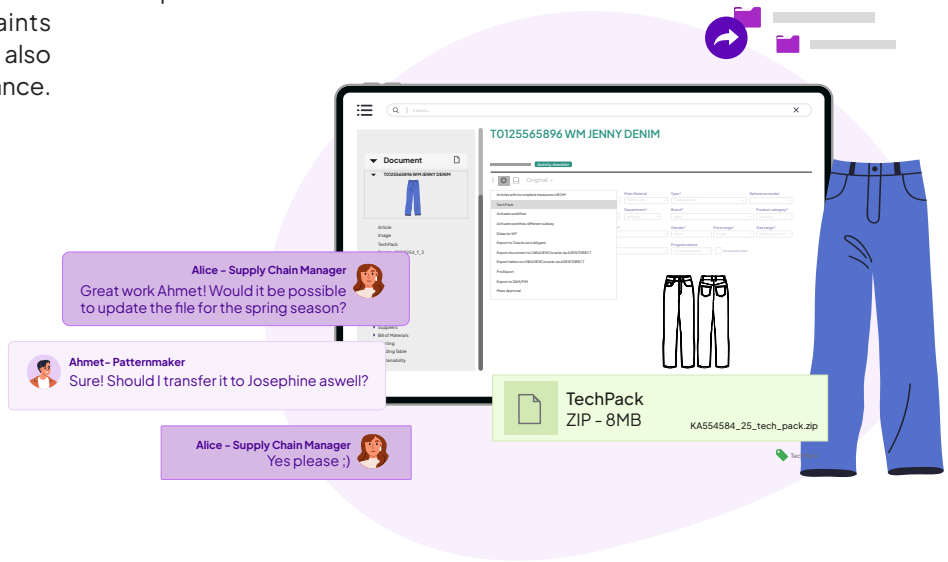
"We buy garments because they have this subtle balance that resonates with us," says Lectra's Favreau. "When you achieve the right balance, your products resonate with your specific consumer audience."

The information needed to balance these priorities includes data on fit, suppliers and their manufacturing teams and processes capabilities, and brand-specific design features. "Fit is extremely important because it is a considerably underrated component of a brand identity," says Secoli from Istituto Secoli. "Equally, product development has to be done according to your supply chain: what you can do and what you can't do with the price and time that your market requires."

Currently, there is no single platform or technology that can collect all these vital data points and embed them into the product development process from the design stage. This means that product developers are still starting this process without full visibility of vital information that could save them time and resources. Certainly, the industry would benefit from a "manufacturable by design" product development approach—one that transforms the workflow by giving developers all the critical information they need to make more accurate decisions and to rapidly create tech packs optimized for manufacturing.

Alongside accurate and detailed tech packs, strong and effective partnerships between internal teams and their manufacturing partners is crucial to avoid miscommunication, mistakes, over-sampling, and delays. But with supply chains spread across the world, language barriers, time differences, and the wide variety of different PLM systems used by each supplier can create significant barriers to achieving this cohesion.

Oniverse, which owns and operates factories in countries such as Sri Lanka, Bulgaria, Serbia, Ethiopia, and Tunisia, uses standardized systems to maintain strong communication between its product development teams and suppliers. "We have to find the best industrialization for our products to reduce the time for the production and to use materials in the best possible way," says Romanelli of the standard forms and data requirements that help Oniverse capture and manage supplier information. "Technology has helped us in this communication between the production plants and the headquarters. These synergies can have a great added value in terms of cost reduction and higher quality products."



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The roles of 2D, 3D, and AI

As discussed earlier, the potential of AI for product development is yet to be fully realized. For now, experts agree that 2D CAD technology and manual craftsmanship skills will still play an important role in the process, and can be supported by 3D technology for select elements.

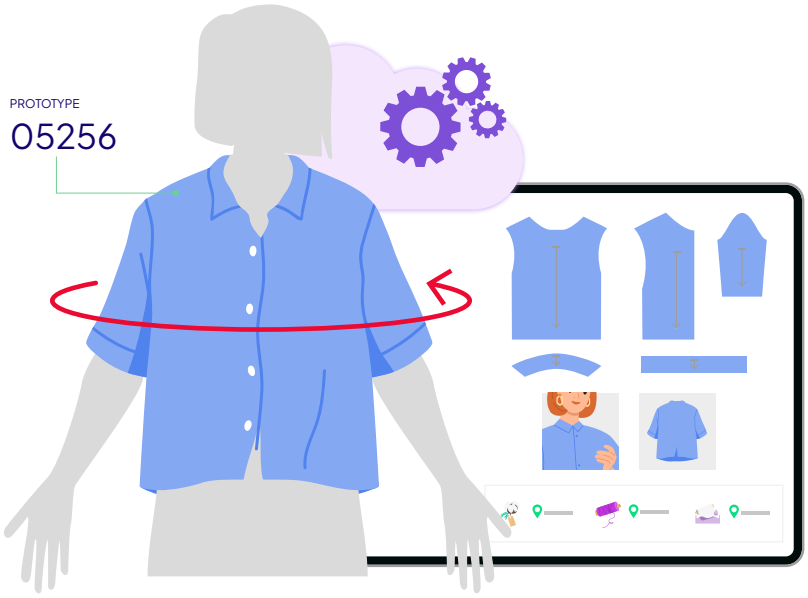
As AI matures, the fusion of these tools will unlock new opportunities for creativity, productivity, and supply chain efficiencies. In isolation, these technologies cannot be a complete solution for product developers.

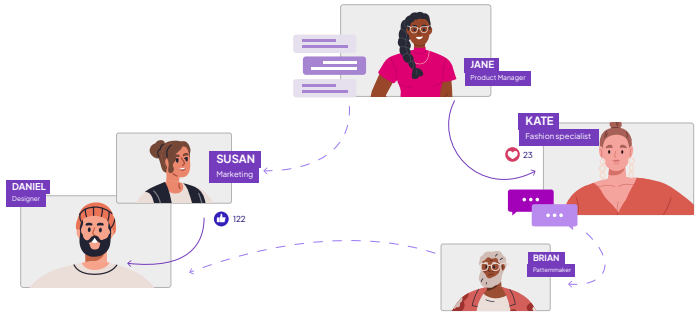
Istituto Secoli, a Lectra partner for 50 years, has been closely following and adopting technology as new platforms and solutions have emerged in this time. "CAD was a very impactful thing for the industry and also in teaching, because it reduced labor activities which were not meaningful," says Secoli.

"When 3D appeared, it was less impactful—it was supporting more than substituting. Nowadays, it is interesting that we are approaching AI in product development processes and the logics we see here are going also to be more in the supporting mode. That's why a structured foundational formation on fashion product development methods and logics is paramount for future professionals to direct AI support where it can really create value and generate a winning human+tech combination."

3D technology can also be a powerful communication tool to ensure organizational alignment between a designer, patternmaker, and manufacturer, but physical prototypes are still necessary to guarantee correct fit for most types of garments.

3D visualization tools are considered a 'nice-to-have' rather than a 'must-have' for product developers, as the technology typically requires specific training and expertise, and the results don't always deliver a clear return on the investment for the brand. "It is a heavily specialized skill set that I think has prevented the fashion industry from truly accelerating 3D," says Joanna Tripp Ortiz, Design Operations Director at lingerie and bra maker **Wacoal America**. "I'm hoping that AI can be the magic pill to get the whole industry there."





Ortiz sees the potential for 2D, 3D and AI to work together in improving sizing and fit for its product ranges. “I don’t think 3D technology has evolved enough to be fully realized in the fit space especially in product categories that are close to the body like bras,” she says. “I’d like to see AI work towards auto-generating parametric 3D models from our 2D pattern files, giving us instant true-to-life visuals on a full size range.”

Generative AI can support the design ideation process and could bolster 3D technologies. But on their own, public AI models don’t have enough data on manufacturability or a brand’s specific DNA and production requirements, to generate garment ideas that are aligned with the reality of production. “Everything I win by using Generative AI, in terms of creativity and time savings, I lose because it’s completely disconnected from producibility,” says Favreau from Lectra.

Where AI currently has the greatest potential for product developers is in the supply chain, says Newlin from PVH. “The supply chain aspects of AI are going to be where things are invested more highly in the immediate future,” he says. This could include validating and clarifying concepts for the benefit of manufacturing partners. “In the past, and this is particularly true for premium to luxury productions which rely on very fragmented supply chains, brands were not efficient in creative development, and they would push all the troubles onto their suppliers, which were [usually] small with little negotiating power,” says Secoli from Istituto Secoli. “Nowadays, brands have to achieve new results. They have to look inside themselves better, to use AI generate new value while providing better transparency about their supply chain now become a critical branding ingredient.”

One thing is certain, the future of fashion will be AI-enabled, and the rapidly evolving capacity of AI tools means potentially endless possibilities for product developers to revolutionize not only manual processes, but existing 2D and 3D infrastructure. “There’s no way that we’re going to move forward without AI again,” says Newlin. “It’s like the internet—it’s here to stay.”

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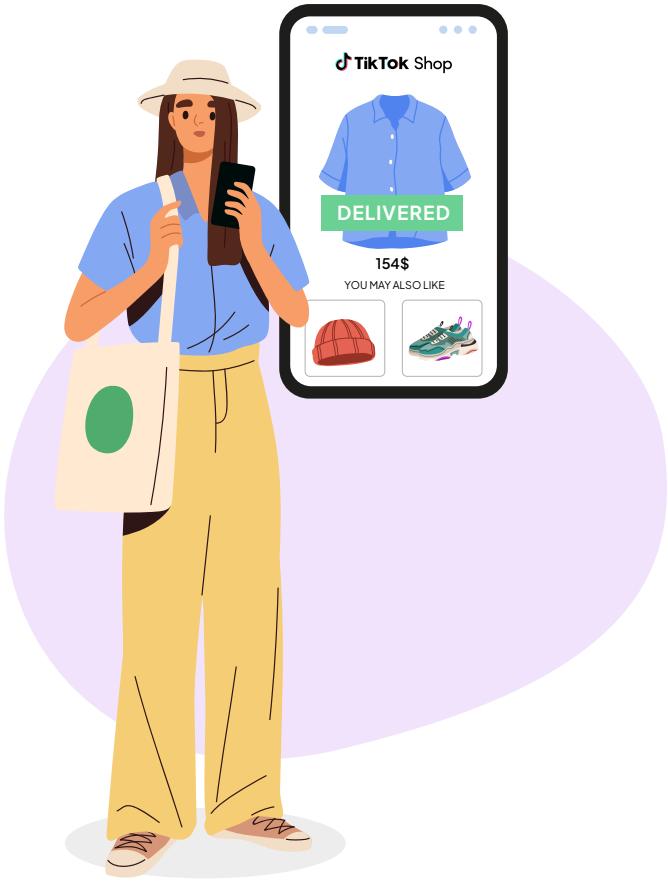

Reimagining fashion product development with technology

To navigate a rapidly evolving and increasingly unpredictable world, fashion's product developers must adapt to succeed. Technology will be central to the biggest shifts in product development processes, helping to digitize previously manual tasks and free up more time for creative work, collect and analyze vast amounts of insight-rich data for optimized decision-making, adopt more responsible materials, create compliance-ready products, and support collaboration between developers and supply chain partners to reduce time and wasted resources. This will result in enhanced efficiency and productivity by ensuring the balance of wearability, manufacturability, and unique brand identity is achieved.

However, the industry has yet to see a platform that has the capacity to embed this vital information into the product development process from the outset. Product developers are using disconnected solutions that aren't optimized with data-rich insights, meaning they're operating at a disadvantage. The concept of "manufacturable by design" has the potential to revolutionize this process and equip developers with all the vital information they need to make more accurate decisions and quickly produce manufacturer-friendly tech packs.

To attract, engage, and retain talent, fashion businesses must consider how to integrate technology in a way that is accessible and appealing to their employees, supporting both new and existing teams through the transition. They should take a considered approach to technology adoption, finding the right balance between human-led and technology-led tasks. A people-first approach that supports rather than replaces the craftsmanship within brands is essential to retain unique brand DNA traits.

It is clear that fashion brands that actively embrace the potential of AI in their product development processes at their interaction with existing technology platforms are building more resilient, future-ready brands. "However, teams and competences must be at the foundation of their activities. Companies have to understand that they should never stop learning and adapting their organizations to market demand and that the value and quality of physical products will always matter, despite the growing importance of intangible components of brands' value propositions" explains Matteo Secoli President of Istituto Secoli.

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