

Sharing of Fashion Enterprise – Solutions in Design and Manufacturing

From AI-Driven Design to Smart Manufacturing & Sustainable Innovation

The Apparel Value Chain Today

Legacy models rely on intuition, long lead times, and disconnected processes—creating waste, cost overruns, and missed trends.



**(8) 12–18
Months**
Avg.
Design-to-shelf Cycle

30–50%
Online Apparel
Return Rate
30% unsold inventory

92M Tons
Textile Waste
per Year (2022)

~10%
Global CO₂ from
Fashion

AI-Powered Trend Forecasting & Design

Source : *Heuritech* 、 *McKinsey* 、 *Fibre2Fashion* 、 *StyTrix 2026*



Real-Time Trend Intelligence

- Machine learning models analyze social media, search queries, and sales data to identify emerging patterns before they peak
- 78% of major Paris Fashion Week brands use AI forecasting tools like Heuritech (2024)
- Zara achieves 92% demand forecast accuracy with predictive analytics
- Shift from seasonal planning to continuous real-time intelligence



Generative AI Design

- Text-to-garment models create production-ready designs from natural language prompts in seconds
- 30% faster prototypes, 40% reduction in time-to-market (Adidas case)
- McKinsey: generative AI could add \$150–275B in operating profit to apparel & luxury
- Designers become "creative operators" — guiding AI with prompts and curating outputs

3D Design & Digital Twins

Virtual replicas eliminate physical sampling, compress R&D cycles, and simulate the full apparel lifecycle.

 **3-4×**

R&D efficiency gain with 3D
+ AI solutions

 **50%+**

Reduction in physical
samples needed

 **Zero**

Inventory micro-order
development achieved

Key Applications



Virtual Prototyping

AI-driven fabric simulation and drape rendering replace physical samples, with brands like Adidas and Tommy Hilfiger leading adoption.



Supply Chain Digital Twins

Virtual replicas of production systems identify bottlenecks, test workflows, and optimize inventory placement in real time.



Lifecycle Simulation

From material sourcing to end-of-life, digital twins track garment performance under real-world conditions for smarter design decisions.

Supply Chain Digitization & Transparency

Source : Publicis Sapient 、 歐盟DPP 倡議 、 Noatum Logistics 、 AATCC



Digital Product Passports (DPP)

- *EU mandates traceability data: durability score, carbon footprint, QR-linked supply chain info*
- *Nobody's Child piloting DPPs — customers scan labels for full sourcing details*
- *UK CMA cracking down on greenwashing with penalties up to 10% of global turnover*



Blockchain & PLM

- *Patagonia uses blockchain-integrated AI to trace 100% of cotton supply*
- *Cloud PLM platforms connect all stakeholders with real-time production data*
- *Levi's Project F.L.X. replaced manual finishing with digital workflows*

Sustainability & Circular Economy

Technology is enabling fashion's shift from linear "take-make-waste" to circular models

70%

of fashion emissions occur
upstream in textile production
and processing

US\$1 Trillion

investment needed in supply
chains to meet sustainability
targets



Extended Producer Responsibility

France and Belgium already enforce EPR fees for textiles; EU standardizing system-wide



Circular Supply Chains

Rental, resale, and repair models replacing linear consumption. EU bans destroying unsold stock by 2026



Digital Waste Reduction through Digitalization

3D printing and AI pattern-cutting reduce fabric waste by 21%+; virtual sampling slashes physical prototypes



Sustainable Materials Innovation

Bio-based fabrics from mushroom leather (Mirum) to recycled cellulose — scaling from premium to mass market

Consumer-Facing Innovations

Source: Fytted · CTO Magazine · GITNEX · Style3D



Virtual Try-On & AR

\$14.86B

Projected market by 2030 (20.5% CAGR)

92%

Gen Z consumers want AR in e-commerce

30%+

Conversion rate increase with virtual fitting

40%

Reduction in return rates



Hyper-Personalization

- **AI-driven Recommendations:** Nike personalizes 70% of app recommendations, boosting sales by 20%
- **Dynamic Pricing AI:** Gap Inc. adjusts prices 15× daily, increasing margins by 12%
- **NLP Chatbot:** Levi's LeviFit handles 85% of customer queries automatically
- **3D Body Scanning:** Custom-fit garments from zero-waste 3D knitting (Ministry of Supply)

Thank you!

