

INDEPENDENT INDUSTRY WHITE PAPER

AI in Fashion, Beauty and Retail

From Search to Merchandising

How consumer brands are using AI to reshape discovery, product selection, content production, inventory and retail execution.



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FASHION | BEAUTY | RETAIL

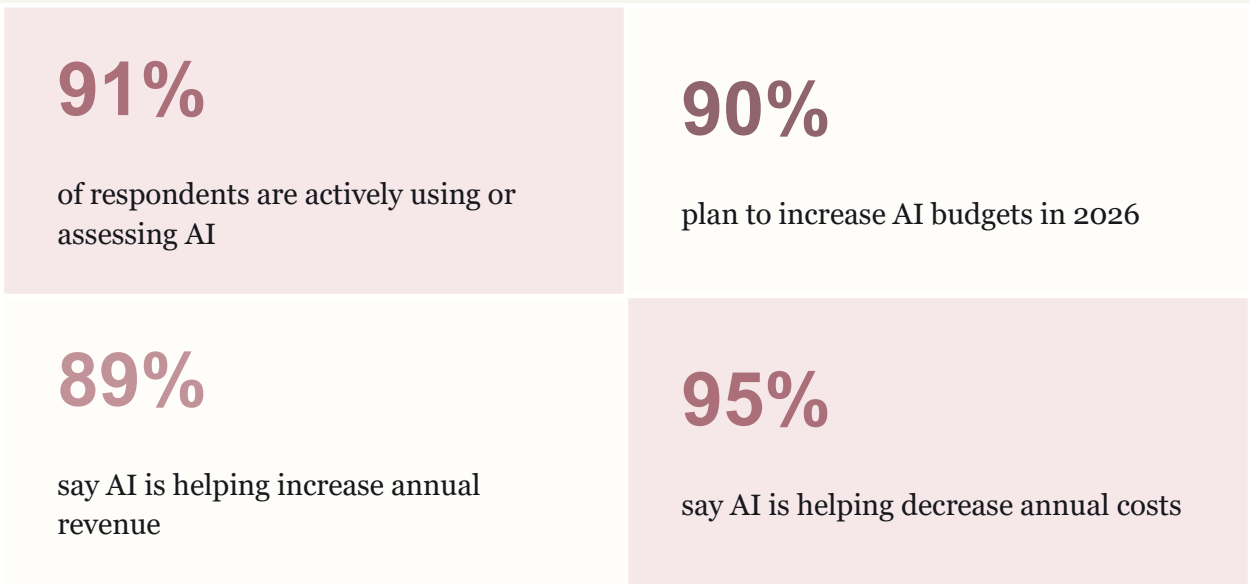
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A practical map of where AI is creating value across the consumer-commerce chain.

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Executive Snapshot

Retail AI has moved beyond experimentation. The strongest signal is not novelty, but measurable impact on revenue, cost and operating speed.



Source: NVIDIA, State of AI in Retail and CPG 2026

WHERE VALUE IS MOVING

01 DISCOVERY Search, recommendation and guided selection	02 DECISION Merchandising, forecasting and pricing	03 EXECUTION Inventory, service, stores and fulfillment
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The competitive advantage is shifting from access to AI tools toward clean data, connected workflows and faster human decisions.

Executive Summary

FOUR STRUCTURAL SHIFTS

01 FROM FEATURES TO OPERATING SYSTEM

Artificial intelligence in consumer industries is moving beyond front-end recommendation widgets. In fashion, beauty and retail, AI is becoming a connective layer between search, content, product selection, inventory planning, customer service and store execution.

02 FROM CUSTOMER INTERFACE TO DECISION SUPPORT

The first wave of retail AI was mostly visible to shoppers: recommendation engines, search bars, virtual try-on, chatbots and personalization. The next wave is more operational. Retailers are applying AI to demand forecasting, assortment planning, catalog enrichment, product imagery, markdown decisions, store labor, inventory rebalancing and localized ecommerce execution.

03 FROM TOOL ACCESS TO WORKFLOW ADVANTAGE

For fashion, the near-term impact is strongest in visual production, styling, demand sensing, sizing and inventory risk. For beauty, AI is advancing through skin analysis, shade matching, ingredient explanation, personalized routines and diagnostic shopping. For retail more broadly, AI is becoming a planning and execution system: it can ingest customer signals, product data, pricing, stock and external demand cues, then help teams decide what to buy, where to place it, how to describe it and when to promote it.

04 FROM AUTOMATION TO HUMAN ACCOUNTABILITY

This shift does not remove human merchants or brand teams. It changes their job. The strategic advantage moves from having AI tools to having clean product data, reliable signals, clear decision rights and workflows that let teams act quickly without losing brand control.

Core Findings

01 AI is moving from discovery to decision-making. Search, recommendation and virtual try-on remain important, but growth is shifting toward merchandising, demand forecasting, inventory optimization and operational productivity.

02 Fashion is using AI to compress the content and merchandising cycle. AI-generated product imagery, styling assistance and trend signal detection can reduce time between product intake, campaign creation and ecommerce launch.

03 Beauty is becoming a diagnostic retail category. Skin analysis, shade finding, virtual try-on and ingredient explanation are turning product discovery into a guided consultation flow.

04 Retailers are prioritizing measurable use cases over novelty. The highest-value AI applications often sit in unglamorous operating areas: inventory allocation, markdowns, catalog quality, customer service and demand planning.

05 AI raises the value of proprietary data. Retailers with accurate product attributes, clean customer histories, store-level inventory visibility and content governance will be better positioned than those relying on generic tools.

06 Consumer trust is becoming a constraint. AI-generated recommendations, synthetic imagery, data-driven personalization and automated service must be transparent enough to avoid undermining brand credibility.

07 The next competitive divide is workflow integration. Companies that connect AI to real merchandising and ecommerce processes will outperform those using AI only as a standalone experiment.

Market Context

THREE FORECASTS, ONE DIRECTION

Market definitions differ, so the forecasts are shown separately rather than combined.



Sources: Mordor Intelligence; Precedence Research; Fortune Business Insights.

Figure 1. Retail AI forecasts point in the same direction despite differing market definitions.

Retail AI investment is accelerating. NVIDIA's 2026 State of AI in Retail and CPG survey found that most respondents were already using or assessing AI, with many increasing budgets and reporting revenue, cost and productivity impact. The report also highlights agentic AI, physical AI and supply-chain intelligence as rising priorities for retailers and consumer packaged goods companies.

Market estimates vary, but most point in the same direction. Mordor Intelligence estimates the generative AI market for retail demand forecasting and merchandising at \$4.69 billion in 2026, growing to \$16.41 billion by 2031. Precedence Research estimates the broader applied AI in retail and ecommerce market at \$72.42 billion in 2026, reaching \$376.48 billion by 2035. Fortune Business Insights estimates the AI in retail market at \$16.54 billion in 2026, reaching \$105.88 billion by 2034.

The New Retail AI Stack

Seven connected layers link consumer intent, product intelligence and retail execution.

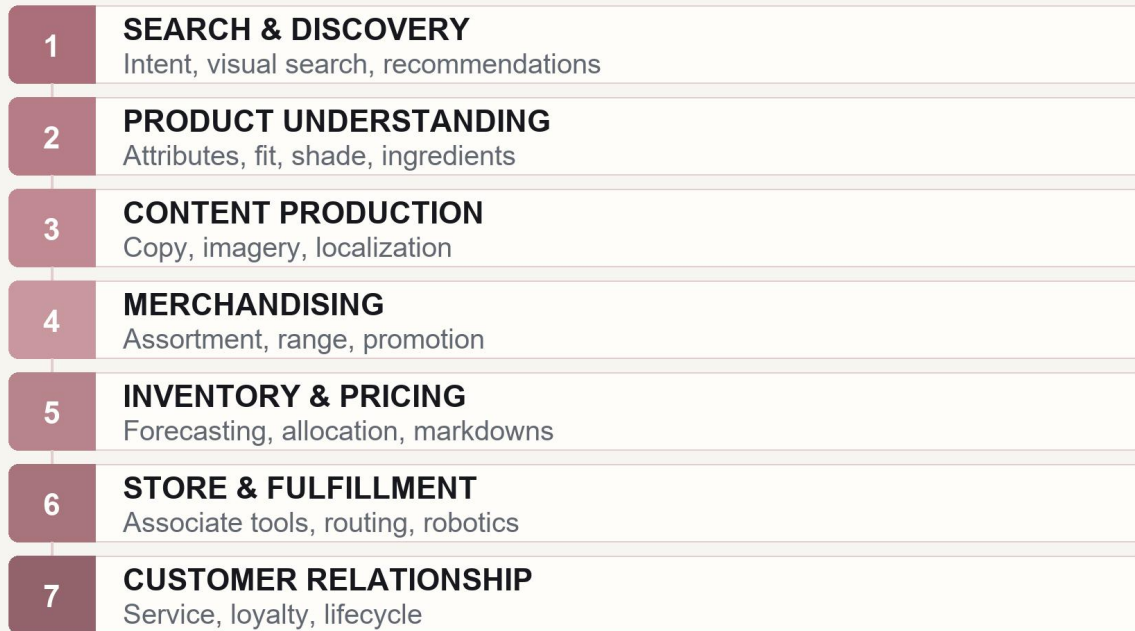


Figure 2. The connected retail AI stack.

The advantage comes from connecting the loop: search improves product data; product data improves recommendations; recommendations shape forecasting, buying and markdown decisions.

Search and Discovery



AI search is moving from keywords toward intent, images and guided product selection.

Search is becoming less literal. In older ecommerce systems, the shopper needed to know the right keyword. In AI-driven commerce, the shopper can express intent: "lightweight moisturizer for humid weather," "office sneakers that look polished," or "airport-friendly gift under \$100." This favors retailers with richer product data and better natural-language understanding.

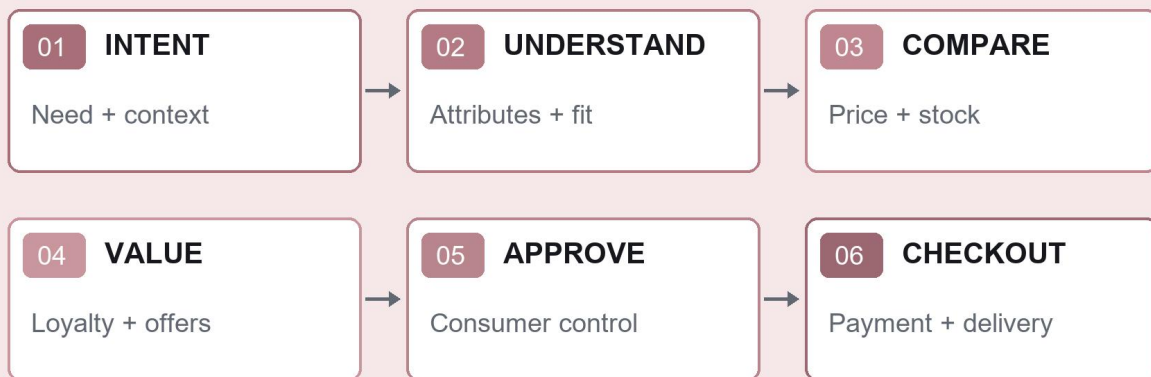
For fashion, visual search and styling recommendations help bridge the gap between inspiration and purchase. Consumers often discover outfits through images, social feeds and creators, not product taxonomies. AI can translate visual inspiration into product clusters, outfit suggestions and substitute recommendations.

For beauty, discovery is becoming consultative. A shopper may begin with a skin concern, shade uncertainty, ingredient sensitivity or routine goal. AI skin analysis, shade finding and virtual try-on tools turn search into guided selection. Perfect Corp.'s business platform, for example, spans AR makeup try-on, AI skin analysis, AI shade finding, AI clothing try-on and related beauty and fashion tools.

From Discovery to Agentic Commerce

THE AGENTIC COMMERCE JOURNEY

The interface becomes a conversation; the infrastructure still depends on structured product data.



Product data is the operating currency: attributes, availability, price, delivery, returns and rewards.

Figure 3. Agentic commerce compresses the journey but increases the importance of product data.

The next phase of AI shopping goes beyond answering questions or recommending products. In agentic commerce, an AI agent can interpret a consumer's intent, compare products, evaluate price and availability, assemble a basket and help complete the transaction. The shopping journey begins to collapse from a sequence of search pages, product pages and checkout steps into a conversation followed by an approved action.

This shift is moving from theory into infrastructure. OpenAI's Agentic Commerce Protocol and Google's Universal Commerce Protocol are early attempts to establish common connections between AI interfaces, merchants and payment systems. Deloitte reports that analysts project AI agents could enable 25% of global ecommerce sales by 2030. The estimate is directional rather than certain, but it signals that agent-mediated shopping may develop into a meaningful commerce channel.

For fashion and beauty brands, visibility in this environment will depend on whether an agent can understand the product. Accurate attributes, shade and size information, inventory, price, delivery terms, returns policies and product compatibility must be structured and available in real time. Brand storytelling will still matter, but incomplete product data could make a product invisible at the moment an agent compares options.

Agent-Ready Commerce

SEARCH AND DISCOVERY

Loyalty and promotions also become part of the technical commerce layer. If agents optimize only for the lowest visible price, brands risk losing both margin and differentiation. Retailers will need to make rewards, member benefits, bundles and personalized offers readable by agentic systems so that value can be evaluated beyond headline price. The competitive question is no longer only whether consumers can find a product, but whether their chosen agent can recognize why it is the better purchase.

Examples

EVIDENCE IN PRACTICE

250M+ CUSTOMERS	Amazon Alexa for Shopping Amazon's shopping assistant, previously called Rufus, uses generative and agentic AI to answer product questions, compare options, personalize recommendations, track prices and add products to a cart. Amazon reports that more than 250 million customers used the assistant in 2026 and that shoppers who use it during a journey are more than 60% more likely to purchase.
32 TO 1-2 MINUTES	Central Retail visual search Thailand's Central Retail uses Vertex AI Search for Retail to match customer-uploaded images with catalog products. Its published case study reports that searches involving price, promotion and stock fell from 32 minutes to one or two minutes, while conversion increased by 10%.
SEARCH TO CHECKOUT	Agentic commerce protocols OpenAI's Agentic Commerce Protocol and Google's Universal Commerce Protocol show how search, product data, incentives and checkout are beginning to converge into a single AI-mediated journey.

Content Production and Catalog Enrichment



AI can compress production cycles while human teams retain art direction and approval.

AI is also changing the economics of product content. Fashion and beauty ecommerce require large volumes of product imagery, descriptions, translations, fit notes, shade information, ingredient explanations and marketplace-ready assets. The traditional production model is slow: studio scheduling, retouching, copywriting, localization and approvals can delay launches.

Generative AI can shorten this cycle, especially for product descriptions, image variations, model imagery, campaign localization and content testing. But the value is not simply speed. The value is having product content that is more complete, searchable and useful across markets.

Fashion retailers are especially exposed to content bottlenecks because each season creates new SKUs and visual expectations. This makes the category an early testing ground for AI-assisted image production, localization and creative variation.

Examples

CONTENT PRODUCTION AND CATALOG ENRICHMENT

HUMAN

FINAL APPROVAL

Mango Teen campaign

Mango created a campaign for its Sunset Dream collection using generative AI. The workflow started with photographs of the real garments, used AI to place those garments on a model, and retained human art direction, retouching and final approval.

120,000+

IMAGES ONLINE

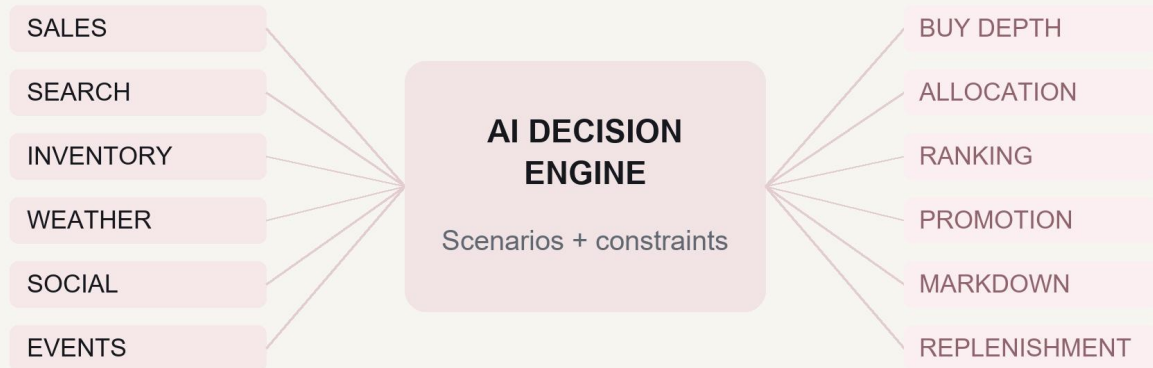
SCAYLE Studios

The AI content engine used by About You generates fashion product and lifestyle imagery without a conventional physical shoot. SCAYLE reports that more than 120,000 generated images are already online, providing a concrete example of AI content production moving into scaled ecommerce workflows.

Implication: product content is becoming a merchandising asset, not a back-office task. Teams that can create, test and localize content faster can respond faster to demand signals.

Merchandising and Assortment Planning

FROM SIGNALS TO MERCHANDISING DECISIONS



The merchant remains accountable. AI expands the signal set and shortens the decision cycle.

Figure 4. AI expands the signal set and shortens the merchandising decision cycle.

Merchandising is where AI moves from customer experience to commercial decision-making. The core questions are familiar: what should we buy, how deep should we buy it, where should it appear, how should it be priced, and when should it be marked down?

AI can support these questions by analyzing historical sales, current inventory, search behavior, social signals, weather, events, competitor pricing and regional differences. The goal is not a fully automated merchant. The goal is a faster decision cycle with more signals and clearer scenario testing.

Mordor Intelligence's retail demand forecasting and merchandising report describes a shift from periodic forecasting to systems that use sales, pricing, inventory and external demand signals more frequently. That is exactly the workflow change fashion and beauty retailers need: moving from seasonal hindsight to closer-to-real-time planning.

Merchandising Use Cases

FASHION, BEAUTY AND RETAIL

ONE DECISION SYSTEM, THREE CATEGORY LENSES

The underlying signals overlap, but each category applies different commercial constraints.

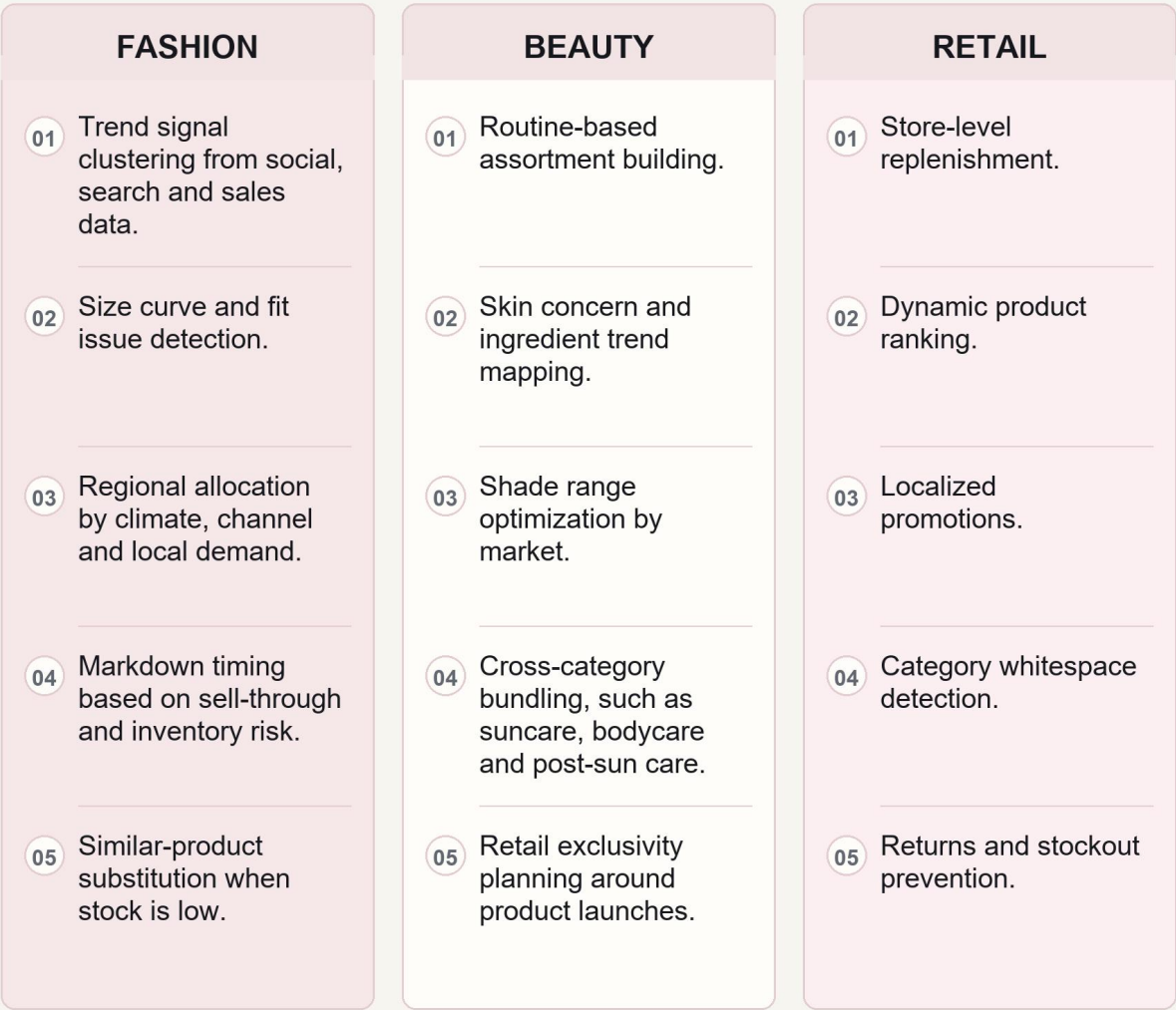


Figure 5. One merchandising decision system serves three distinct category lenses.

Examples

MERCHANDISING AND ASSORTMENT PLANNING

6M+

FORECASTS / DAY

Tchibo demand forecasting

The German retailer built an AI forecasting service with Vertex AI and BigQuery for its fast-changing online assortment. The system generates more than six million forecasts a day and estimates demand up to 84 days ahead, helping reduce overstocks and stockouts.

50%-90%INVENTORY
ACCURACY**Super-Pharm inventory and merchandising**

The beauty and pharmacy retailer uses Vertex AI for demand forecasting and ecommerce decisions. Its published case study reports a tenfold improvement in forecasting efficiency and an increase in inventory accuracy from 50% to 90%.

+15-20%

PRODUCT LINES

Wipro Consumer Care assortment recommendations

Wipro Enterprises uses a Vertex AI recommendation engine to combine historical sales, local buying patterns and store purchasing power into a dynamic "must-stock" list. The company reports a 15% to 20% increase in product lines carried per retail outlet.

Beauty: From Recommendation to Diagnosis

BEAUTY AI TURNS SEARCH INTO GUIDED SELECTION



Trust depends on transparent claims, responsible image handling and credible product guidance.

Figure 6. Beauty AI turns product search into guided selection.

Beauty is one of the clearest categories for AI because consumers often need help choosing between products that are visually similar but functionally different. The shopper's problem is not only "find me a product." It is "tell me what my skin needs, what shade works, what ingredients matter, and how this fits my routine."

Beauty AI Application Areas

BEAUTY: FROM RECOMMENDATION TO DIAGNOSIS

AI beauty applications fall into five groups:

1. **Virtual try-on:** makeup, hair color, nails, eyewear and accessories.
2. **Skin analysis:** wrinkles, pores, redness, texture, moisture, acne and other visible concerns.
3. **Shade matching:** foundation, concealer and complexion products.
4. **Routine recommendation:** product sequencing and concern-based regimens.
5. **Ingredient explanation:** translating formulation language into shopper-friendly guidance.

The strategic value is higher conversion confidence. If shoppers believe a recommendation is personalized and credible, they are more likely to buy online and less likely to return or abandon the cart. But the risk is also higher: beauty AI touches personal appearance, sensitive images and sometimes quasi-medical language. Claims must be carefully governed.

Examples

EVIDENCE IN PRACTICE

1:1

GUIDED BEAUTY

L'Oréal Paris Beauty Genius

The generative AI-powered personal beauty assistant provides conversational guidance, personalized diagnostics and product recommendations across beauty categories, turning a broad product catalog into a guided consultation.

20+

PRESTIGE
BRANDS

Estée Lauder Companies AI Innovation Lab

Estée Lauder and Microsoft established a generative AI lab using Azure OpenAI Service across more than 20 prestige beauty brands. The stated goals include faster product and campaign development, stronger local relevance and more responsive consumer experiences.

3-IN-1

ANALYZE,
MATCH, TRY

Perfect Corp. beauty diagnostics

Perfect Corp.'s platform combines AI skin analysis, shade matching and virtual try-on, illustrating how diagnosis, recommendation and product visualization can operate within the same beauty-commerce journey.

Fashion: Visual Scale, Styling and Demand Risk

Fashion has a different AI profile. The category is visual, seasonal, size-sensitive and exposed to inventory risk. The hardest problems are not only discovery but also content scale, fit confidence, trend timing and markdown exposure.

AI can help in four areas:

1. **Visual content:** generate or adapt product imagery, on-model images and campaign assets.
2. **Styling:** suggest outfits, substitutes and occasion-based looks.
3. **Demand forecasting:** connect search, sell-through, regional demand and external trend signals.
4. **Fit and returns:** use product data and customer histories to improve size recommendations.

For mid-market brands, AI may help support expansion into new markets without replicating full creative and merchandising teams in every region. For luxury, the opportunity is more controlled: AI can support internal planning and clienteling, but synthetic visuals and automated recommendations must preserve brand codes.

Examples

EVIDENCE IN PRACTICE

+60%

QUALITY VIEWS

Google generative AI virtual try-on

Google's apparel tool uses a diffusion-based model to render garments on people with different body types while preserving details such as drape, folds, stretch and wrinkles. Google reports that virtual try-on images receive 60% more high-quality views than standard product images.

40 TO 9

DESIGN WEEKS

yoona.ai fashion design and trend prediction

The platform uses AI to help fashion teams analyze trends, develop designs and estimate sales confidence. A published Google Cloud case study reports that customers reduced design time from 40 weeks to nine and improved sell-through by 40% to 50%.

Retail Operations: The Less Visible AI Opportunity



Operational AI connects store visibility, replenishment and service workflows.

The largest AI gains may come from operations rather than the shopper-facing interface. NVIDIA's retail and CPG survey highlights AI's role in productivity, operational efficiency, customer service, supply-chain resilience, agentic AI and physical AI. This aligns with retail economics: small improvements in allocation, replenishment, labor, service and markdowns can matter more than a flashy chatbot.

Operational AI examples:

- Store associate assistants for product information and service.
- Inventory visibility and rebalancing across stores and warehouses.
- Demand forecasting that incorporates local events and external variables.
- Dynamic pricing and markdown recommendations.
- Fraud, returns and post-purchase support automation.
- Robotics or physical AI for warehouse and shelf-level tasks.

Examples

RETAIL OPERATIONS: THE LESS VISIBLE AI OPPORTUNITY

98%+

ON-SHELF
AVAILABILITY

Simbe Robotics inventory monitoring

Simbe's Tally robot combines computer vision, RFID and AI to scan shelves, identify stock gaps and check price and promotion accuracy. Its published case study reports more than 98% on-shelf availability and price and promotion accuracy in the high 90% range among retailers using the platform.

7M+

CALLS HANDLED

Marks & Spencer customer-service routing

M&S uses Google Cloud speech recognition and Contact Center AI to understand and route calls. The system has handled more than seven million calls and reduced call volume to stores by 50%, allowing routine stock and service questions to be resolved more efficiently.

Risks and Limits

AI adoption in fashion, beauty and retail faces five major constraints:

01

Data quality: AI recommendations are only as good as product attributes, stock data, customer records and content metadata.

02

Brand control: automated copy, imagery and recommendations can dilute brand voice if governance is weak.

03

Consumer trust: shoppers may resist opaque personalization, synthetic imagery or intrusive analysis.

04

Regulation and claims: beauty diagnostics, ingredient advice and health-adjacent claims require careful review.

05

IP and content rights: fashion imagery, brand marks, design patterns and model likenesses create legal risk for generative AI.

The risk is not that AI fails entirely. The risk is that teams deploy it in disconnected pilots that create cost, confusion and trust issues without changing commercial outcomes.

12-Month Watchlist

Industry observers should track the following over the next year:

- AI shopping assistants in major search engines, marketplaces and retail apps.
- Visual search and image-to-product matching in fashion ecommerce.
- AI product imagery and synthetic model workflows.
- Beauty skin analysis, shade matching and ingredient explanation tools.
- Agentic AI for inventory rebalancing, vendor negotiation and dynamic pricing.
- Retail media personalization based on first-party shopper data.
- Store associate AI assistants and AI-enabled clienteling.
- Physical AI in warehouses, stores and shelf monitoring.
- Regulatory scrutiny around AI claims, synthetic imagery and personal data.
- Brand policies for AI-generated product content and campaign assets.

Strategic Implications

FOUR AUDIENCES, TWELVE PRIORITIES

The strongest actions connect AI investment to category economics, governance and existing workflows.

FASHION BRANDS

- 01 Treat product imagery and attributes as a growth system.
- 02 Use AI to localize content and support expansion, but keep creative approval human-led.
- 03 Prioritize fit, returns and inventory risk before chasing novelty.

BEAUTY BRANDS

- 01 Build AI experiences around shopper concerns, not technology demos.
- 02 Connect skin, shade and ingredient guidance to credible product claims.
- 03 Use retail exclusivity and diagnostic tools together to improve launch conversion.

RETAILERS

- 01 Start with high-ROI operating use cases: inventory, search quality, catalog quality, service and markdowns.
- 02 Build governance for AI outputs before scaling.
- 03 Connect AI to workflows merchants already use.

TECHNOLOGY VENDORS

- 01 Sell outcomes, not models.
- 02 Integrate with existing commerce, PIM, OMS, CRM and analytics systems.
- 03 Provide explainability, audit trails and approval controls.

Figure 7. Strategic priorities connect category economics, governance and existing workflows.

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