THIRD EYE ADVISORY

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Agentic AI for Intelligent Retail Operations

How autonomous AI agents enable faster decision-making, operational resilience, and measurable business outcomes across modern retail enterprises.

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Executive Summary

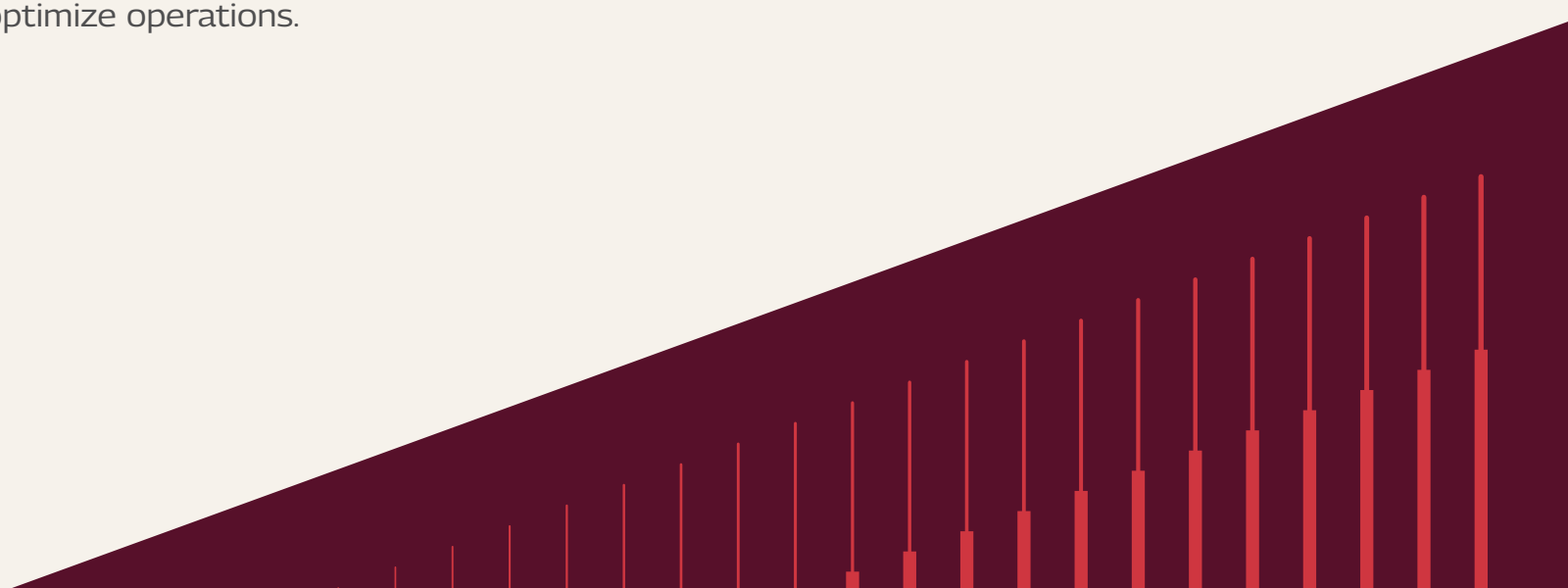
In the past, retailers depended on data received from traditional shopping experiences. Today and over the next decade, AI is redefining the purchase journey as retailers embed AI agents at the center of product discovery and decision-making. Instead of relying solely on brand preference or promotions, these agents will assess factors such as availability, price, reviews, reliability, provenance, sustainability, delivery confidence, return policies, and how well a product aligns with a customer's stated preferences. This shift toward agentic commerce requires retailers to rethink how decisions are made across merchandising, supply chain, stores, and customer engagement.

Discover how Agentic AI enables autonomous, real-time decision-making through a closed-loop operating model, outlines a phased implementation approach, and highlights the governance and technology foundations needed to build intelligent, resilient retail

Introduction

Retail is undergoing a period of significant change. Legacy systems increasingly struggle to keep pace with the speed, scale, and complexity of modern-day commerce. Converging pressures, including margin compression, escalating labor costs, persistent out-of-stock incidents, and fragmented customer journeys, mean that human-intensive operations create challenges as retailers scale. At the same time, a new generation of AI has emerged that does not merely assist humans but reasons, plans, and acts autonomously: Agentic AI. Unlike conventional AI tools that respond to prompts, agentic AI systems perceive their environment, set goals, orchestrate multi-step workflows, and adapt in real time, with or without human initiation. In retail, this translates into operational systems that respond, not in days or weeks, but in minutes.

Agentic AI is helping retailers achieve measurable, definitive outcomes. Early adopters typically report measurable improvements, including higher engagement and better forecast accuracy. Agentic AI is also gaining momentum because many retailers still lack autonomous, real-time decisioning that can sense issues, act instantly, and continuously optimize operations.



The Hidden Cost of Operational Failures in Retail and CPG

Revenue Erosion from Operational Failures

Operational failures erode revenue across the entire business. Inventory distortion alone costs the global retail industry over $1.7 trillion annually and drives 5–15% revenue loss for mid-to-large retailers, excluding further impacts like returns, abandoned carts, and customer churn[1].

In the field, we keep witnessing the same problems recur: stockouts and overstocks, pricing and promotion misses, inconsistent customer service, and slow manual workflows for planning, allocation, and returns.

These failures propagate across the value chain: a stockout in-store pushes demand to e-commerce, triggering 10–20% more backorders, 5–10% higher returns, and 5–12% lower customer lifetime value (CLV).[1]

Margin Squeeze via Labor, Cost, and Efficiency Constraints

Retail labor is a structural pain point: Turnover sits near 60%, entry-level roles are hard to fill, and wage inflation keeps pressure on margins.

Retailers wrestle with overstaffing during quiet periods (burning margin) and understaffing during peaks or promotions (hurting service and conversion), with labor averaging 12–18%[2] of sales and inefficiencies adding another 1.5–4%.[2] On top of that, rising energy, logistics, and compliance costs tack on 2–5% more margin pressure—a squeeze traditional tools can't easily fix.[2]

Agentic AI helps by automating routine decisions, optimizing workforce allocation in real time, and reducing cognitive load so teams focus on higher-value work, enabling double-digit gains in sales per labor hour through dynamic scheduling.[6]

Retail performance improves when routine operational decisions move from manual execution to intelligent, real-time automation.

CX as a Hidden Revenue Driver

CX isn't a back-office nice-to-have anymore—it's a revenue driver that hits conversion, basket size, and lifetime value.

Gartner says 85% of retail CIOs prioritize CX, yet 47% admit they're not meeting CEO expectations[3]; when CX is not optimal, you see lower conversion, more abandoned carts, smaller baskets from missing personalized recommendations, and reduced CLV as customers churn.

Agentic AI changes that by delivering hyper-personalized, context-aware journeys that adapt in real time to customer intent and inventory, directly boosting sales: conversion up 15–25%, basket size up 10–20%, and CLV up 10–20%[3].

Structured Root Cause: Decision Latency and Operational Friction

Decision Latency as a Core Constraint

Retail inefficiencies often stem from decision latency, the gap between identifying a business signal and responding to it. Traditional retail operations rely on batch processing, siloed systems, and manual approvals, causing delays that affect pricing, inventory, promotions, and customer service. These delays reduce responsiveness during periods of changing demand and increase the cost of operational decisions.

The business impact is measurable. Delays of more than one hour in dynamic pricing can reduce revenue by 5 to 15%, while response times exceeding four hours during demand spikes can increase stockouts by 10 to 25%.[4] Reducing decision latency enables retailers to respond faster to market conditions, improve inventory availability, and capture revenue opportunities that would otherwise be lost.

Operational Friction Across the Value Chain

Operational friction kicks in when processes, systems, and data don't line up: data is scattered across POS, CRM, WMS, ERP, and e-commerce (slowing decisions by 15–25%)[7], planning and execution aren't connected (dropping order fill rates 10–20%), and inconsistent rules/KPIs across functions cause 5–12% margin erosion[4]. That makes retail operations reactive instead of proactive.

Agentic AI supports data unification efforts across core systems with governed live access, coordinating actions across functions to lift order fill rates 10–20%, and aligning rules and KPIs to cut margin erosion by 5–12%.[4]

> **In modern retail, a major operational risk is the inability to act on data quickly. It is the inability to act on that data quickly and consistently**

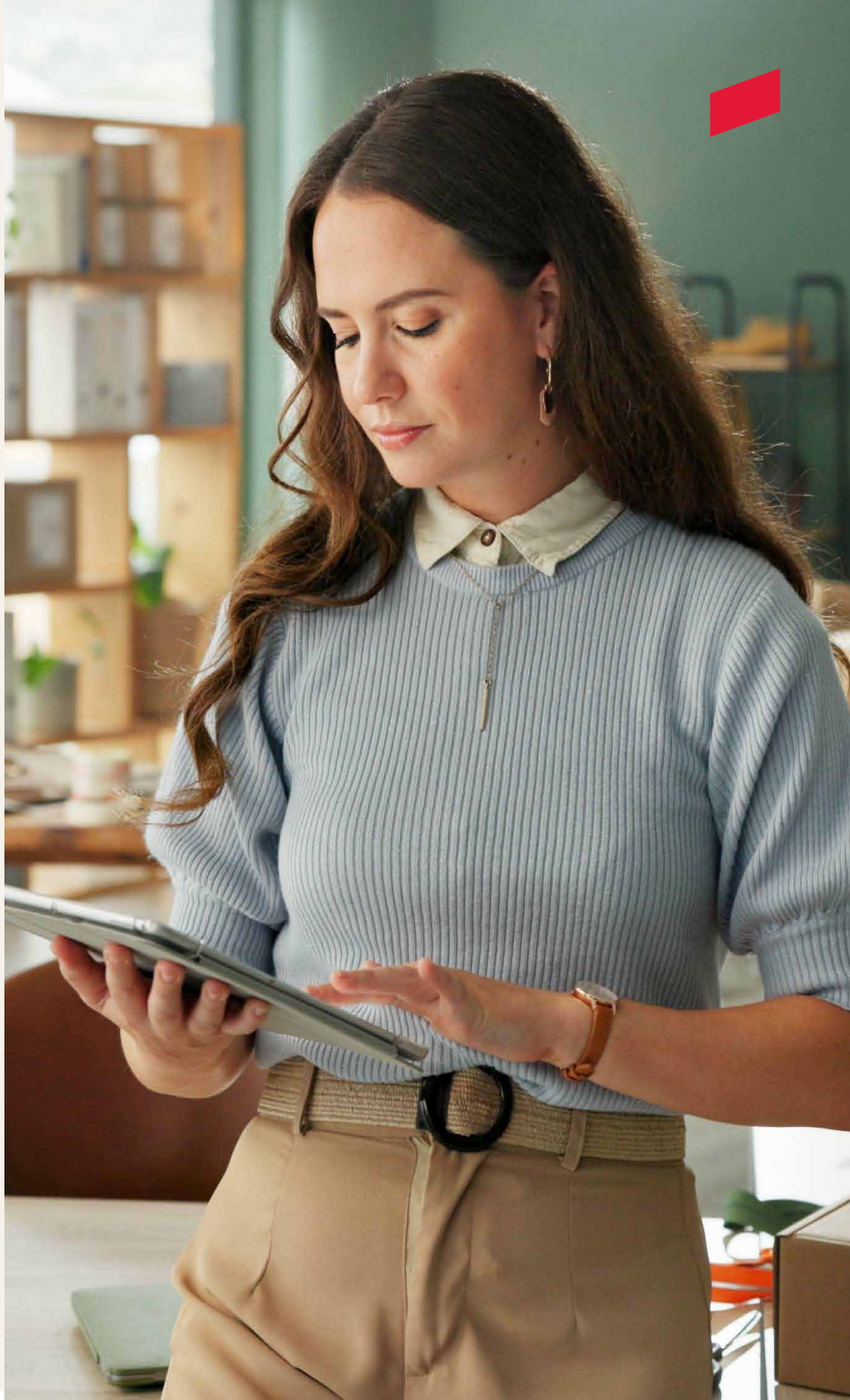
Key KPIs at Risk in Traditional Retail Operations

The KPIs below are the ones we typically see at risk in non-agentic retail environments. These are the metrics that CXOs care about and that define the success of retail operations.

Agentic AI directly targets these stated KPIs by reducing decision latency from hours/days to seconds/minutes, coordinating actions across functions, and enabling autonomous execution with guardrails. Impact on KPIs shown below:

The Closed-Loop Operating Model

The defining architectural principle of agentic retail operations is the closed loop: a continuous cycle in which real-world signals are captured, enriched, acted upon, and outcome-tracked without manual handoffs breaking the chain. This is the fundamental departure from the current state, where insight generation (analytics), decision-making (planning), action execution (operations), and outcome measurement (reporting) are disconnected processes performed by different teams on different timelines.



Function	Traditional Approach	Data Impact
Merchandising	Static assortment, periodic promotions	5–15% margin loss from misaligned assortment
Supply Chain	Batch planning, limited visibility	10–25% higher stockout rate
Store Operations	Manual scheduling, reactive inventory checks	15–25% slower decision cycles
Customer Service	Rule-based chatbots, siloed interactions	10–30 min first response time, 10–25 NPS pts lower
Marketing	Broad campaigns, limited personalization	5–12% smaller basket sizes

In the agentic closed loop:

- **Sensing agents** capture demand signals, field observations, inventory status, and competitive intelligence in real time.
- **Intelligence agents** classify, enrich, correlate, and prioritize signals across SKUs, channels, and locations.
- **Action agents** execute decisions, replenishing inventory, adjusting prices, personalizing offers, and routing tasks, autonomously within defined guardrails.
- **Outcome agents** track the impact of actions, update performance dashboards, and feed learnings back to improve future agent decisions.

The real advantage of Agentic AI lies in integrating sensing, reasoning, execution, and continuous learning into a single operational system.

Implementation Approach: The Agentic Retail Maturity Journey

Successful agentic AI deployment in retail requires a disciplined, phased approach. The failure rate for agentic AI projects is high — 40%+ fail due to poor governance and unclear ROI — but the survivors deliver an average ROI of 171%. The difference lies in the implementation methodology, which must be carried out in phases.

Phase 1: Foundation — Data, Architecture, and Governance

The first phase establishes key prerequisites for agent deployment. Around 21% of enterprises fully meet readiness criteria before beginning AI agent work; addressing gaps early prevents downstream failures.

Data Foundation: Audit all existing data assets across POS, ERP, WMS, e-commerce, CRM, loyalty, and supply chain systems, and implement a unified cloud-based data lakehouse platform with real-time event streaming capabilities; define a comprehensive retail knowledge graph that connects products, locations, customers, and suppliers, while establishing robust data quality standards and governance frameworks to ensure freshness, completeness, accuracy, and full lineage tracking for all agent-accessible data.

Governance and AI Responsibility Framework:
Define clear human-in-the-loop thresholds to distinguish actions that require approval from those that can run autonomously, and establish a cross-functional governance board spanning IT, operations, finance, compliance, and legal. Implement robust observability with full logging, auditability, and reversibility of agent actions.

Phase 2:
Pilot — Validate High-Impact Use Cases

This phase focuses on activating high-impact, bounded pilots across key retail functions, for example, starting with three prioritized deployments: an Inventory Intelligence Agent for demand forecasting and automated replenishment across a limited SKU-store scope, a Store Associate Copilot for frontline staff in select flagship stores, and a Customer Service Orchestration Agent for handling order status, returns, and standard queries in digital channels.

Phase 3:
Scale — Enterprise-Wide Agent Orchestration

This phase prioritizes on scaling Agentic AI across the retail enterprise through multi-agent deployment and cross-functional orchestration.

In the supply chain, agents expand demand sensing, supplier collaboration, disruption response, and promotion management across the full assortment. In e-commerce, agents support personalization, dynamic pricing, checkout optimization, and fraud detection across customer touchpoints. Store operations extend the associate copilot across locations while introducing planogram compliance, staffing optimization, and loss prevention agents.

Merchandising adds agents for assortment planning, category performance, markdown optimization, and competitive intelligence.

At this stage, agents begin collaborating across business functions, enabling a closed loop operating model that continuously improves retail decision making.

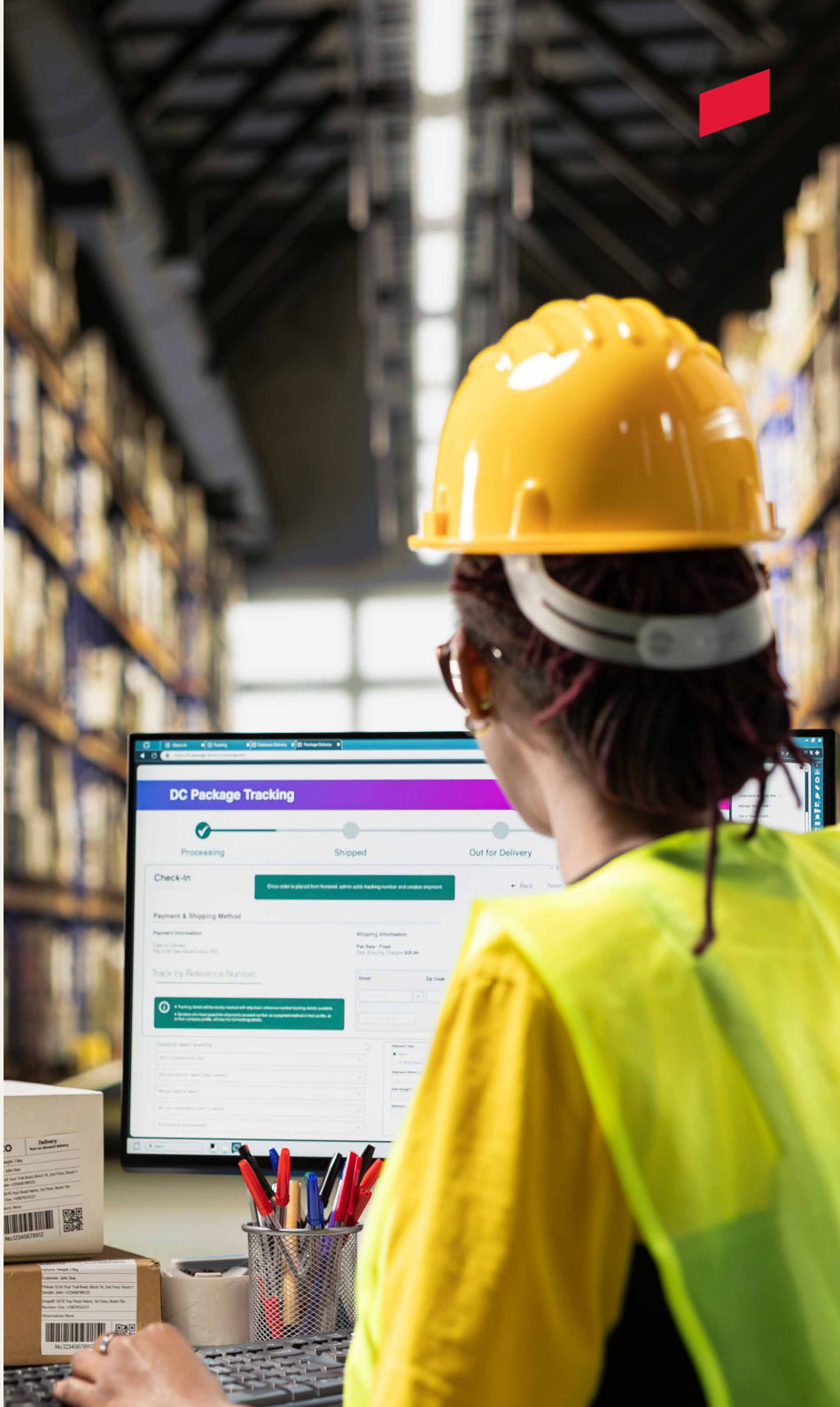
Phase 4: Optimize — Autonomous Continuous Improvement

Phase 4 is characterized by increasing agent autonomy, expanding decision authority thresholds based on demonstrated reliability, and continuous model improvement through reinforcement learning from outcomes.

Key activities:

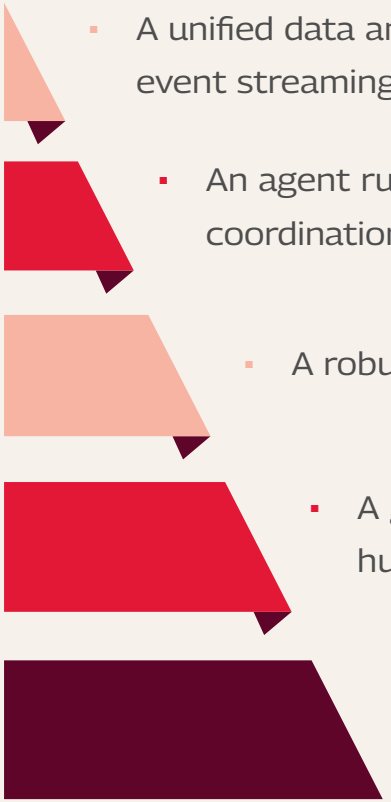
- **Autonomous Threshold Expansion:** Based on Phase 3 performance data, expand the categories of decisions agents can execute without human approval.
- **Agent Learning Loops:** Implement feedback mechanisms where outcome agents continuously retrain demand, pricing, and personalization models on actual results.

> **Successful Agentic AI programs are built through phased adoption, strong governance, and measurable business outcomes, not enterprise-wide deployment on day one.**



Technology Architecture for Agentic Retail

A production-grade agentic retail platform is built across five layers:



- A unified data and intelligence foundation combining real-time ingestion, event streaming, a retail knowledge graph, and semantic search capabilities
- An agent runtime and orchestration layer with advanced reasoning models, multi-agent workflow coordination, standardized tool access to enterprise systems, and structured memory management
- A robust integration layer connecting ERP, retail systems, IoT/edge devices, and secure APIs
- A governance and observability layer enforcing compliance through monitoring agents, human-in-the-loop controls, full auditability, and explainability
- An underlying cloud infrastructure layer enabling scalable deployment

Together, these layers support a resilient, secure, and scalable agentic ecosystem capable of end-to-end automation and closed-loop decisioning across retail operations. Select an agentic AI platform and establish an integration mesh with pre-built connectors to core enterprise systems, while defining a streamlined agent taxonomy covering tool-enabled agents (APIs/data access), reasoning agents (analysis and planning), orchestrator agents (workflow coordination), and guardian agents (monitoring and compliance).

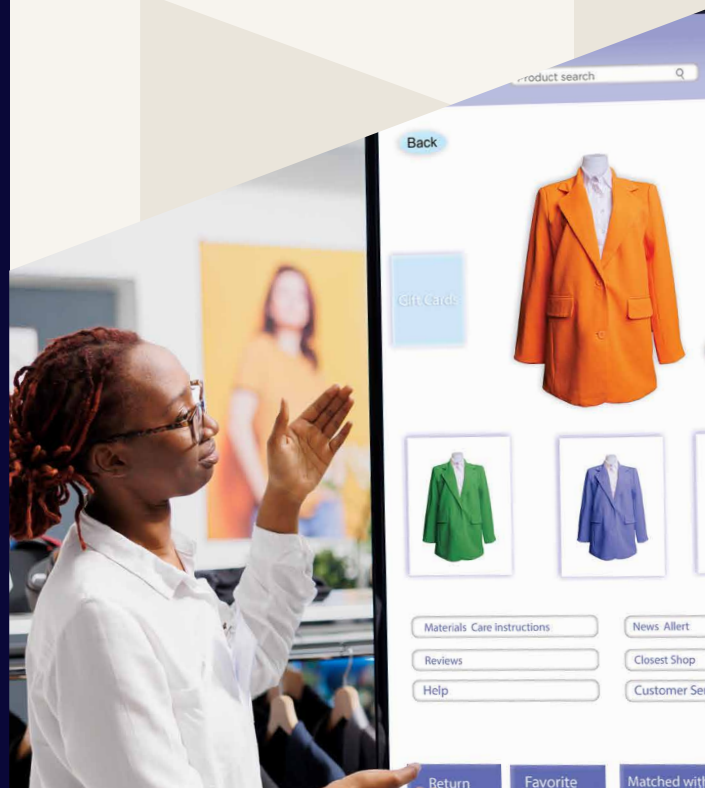
Challenges and Risk Mitigation

- **Data Quality and Integration:** Poor, fragmented data reduces agent accuracy and trust; requires a strong data audit, monitoring, and governance upfront.
- **Change Management:** Adoption depends on trust, not tech; use phased rollout, quick wins, and clear messaging (assist, not replace).
- **Governance and Risk:** Autonomous errors can cause financial/reputation damage; enforce controls, monitoring, audit trails, and staged autonomy.
- **Production Gap:** Most agents fail before scale; success needs strong ops, infrastructure, and clear production-readiness criteria.
- **Cost Management:** Costs rise with scale/complexity; track cost per outcome and enforce disciplined usage models.
- **Skills and Talent:** Requires new capabilities (AI, data, workflows); the best approach is internal upskilling + external partner support.

Conclusion

Retail is entering a new phase of operational transformation as agentic AI moves beyond experimentation into enterprise adoption. Organizations that successfully deploy agent-based operating models are already reporting measurable improvements in forecasting accuracy, customer engagement, operational efficiency, and delivery performance. As adoption accelerates across the industry, the competitive advantage will increasingly depend on how effectively retailers scale autonomous decision- making with strong governance and business oversight.

Tech Mahindra views agentic AI as an important capability for retail and CPG clients. The focus moving forward is practical implementation, building a strong data foundation, deploying focused pilots, and scaling with robust governance and human-AI collaboration. We believe that the retailers that start building agentic AI capabilities today will be better positioned to shape emerging approaches to improving retail performance.



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