GSDC
Global Skill Development Council

GENERATIVE AI IN SUPPLY CHAIN MANAGEMENT

REAL WORLD CASE STUDIES

Case Study 1 — Walmart: AI-Driven Replenishment & Supplier Negotiations

Problem:

Walmart operates one of the largest and most complex supply chains with hundreds of thousands of SKUs. Manual demand forecasting and supplier negotiations were time-intensive and often sub-optimal, leading to higher inventory costs and occasional stockouts.

How Gen AI Was Used:

- Ingested historical sales, supplier performance metrics, seasonal trends, and external variables (e.g., weather, market insights).

- Generated dynamic demand forecasts for thousands of SKUs.

- Assisted in autonomous supplier negotiations by recommending optimal pricing, payment terms, and delivery conditions.

- Ran inventory simulations to model stock behavior under multiple scenarios.

- Suggested inventory placement strategies across distribution centers.

Results:

Efficient Negotiations

Achieved consistent and optimized contract terms.

Cost Reduction & Availability

Reduced inventory costs and fewer stockouts through better demand forecasting.

Market Responsiveness

Enabled faster response to market shifts with trend-based scenario planning.

Operational Improvement

Improved overall operational efficiency and shelf availability.
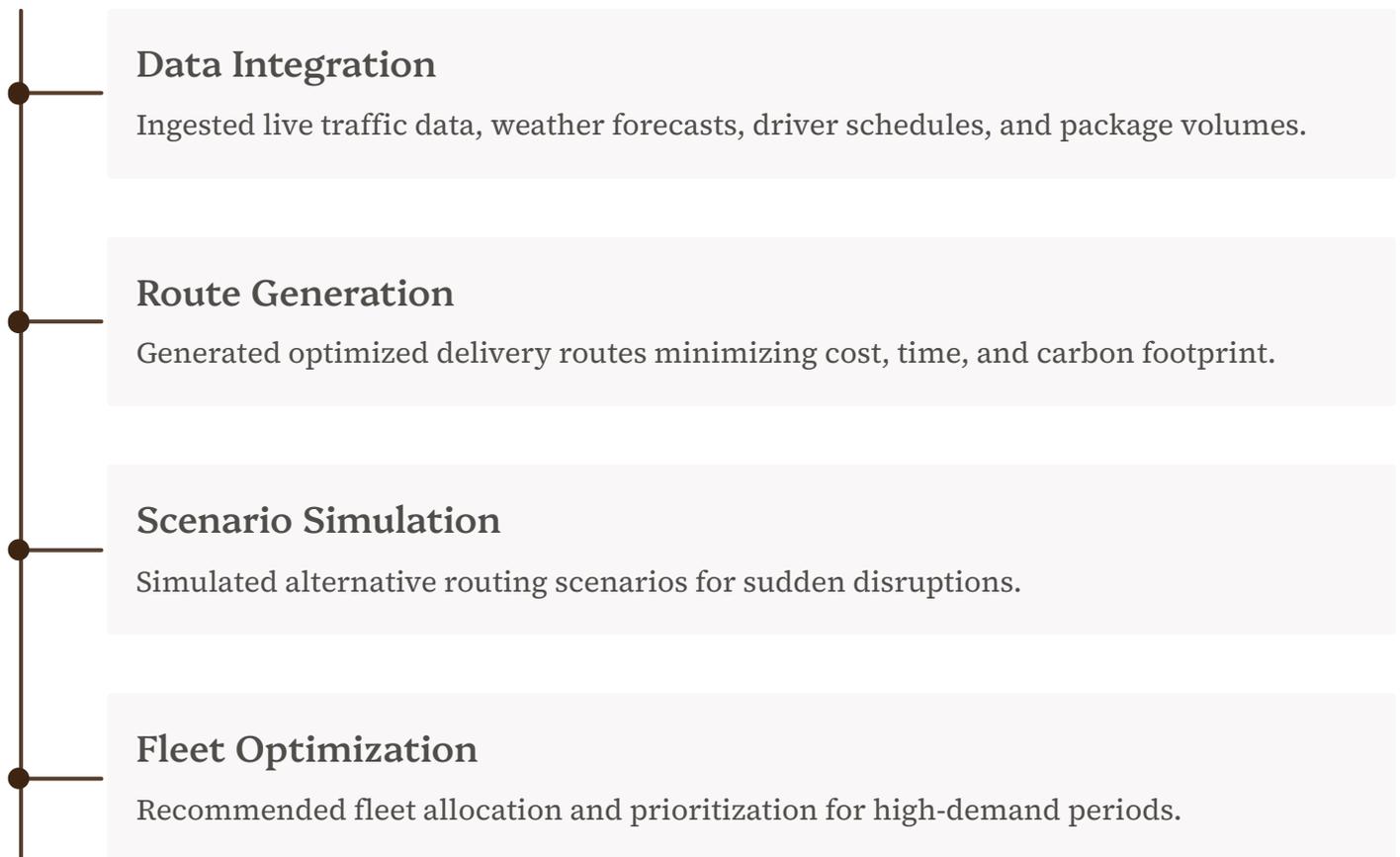
▢ Key Takeaways:

Generative AI can automate complex procurement and negotiation processes. Scenario forecasting helps reduce operational risks and improve inventory placement. Combining internal data with external variables enhances forecast reliability.

Case Study 2 — DHL: Logistics & Route Optimization

Problem:

DHL needed to minimize transportation costs while meeting tight delivery windows across unpredictable urban environments. Traditional route planning could not adapt quickly to real-time disruptions like traffic and weather.

How Gen AI Was Used:

Data Integration

Ingested live traffic data, weather forecasts, driver schedules, and package volumes.

Route Generation

Generated optimized delivery routes minimizing cost, time, and carbon footprint.

Scenario Simulation

Simulated alternative routing scenarios for sudden disruptions.

Fleet Optimization

Recommended fleet allocation and prioritization for high-demand periods.

Results:

Optimized Routes

AI-optimized routes led to reduced delivery times and fuel consumption.

Enhanced Performance

On-time delivery performance and service levels were significantly improved.

Real-time Adaptability

The system enabled real-time adaptability, handling peak periods and unexpected disruptions effectively.

Cost Savings & Sustainability

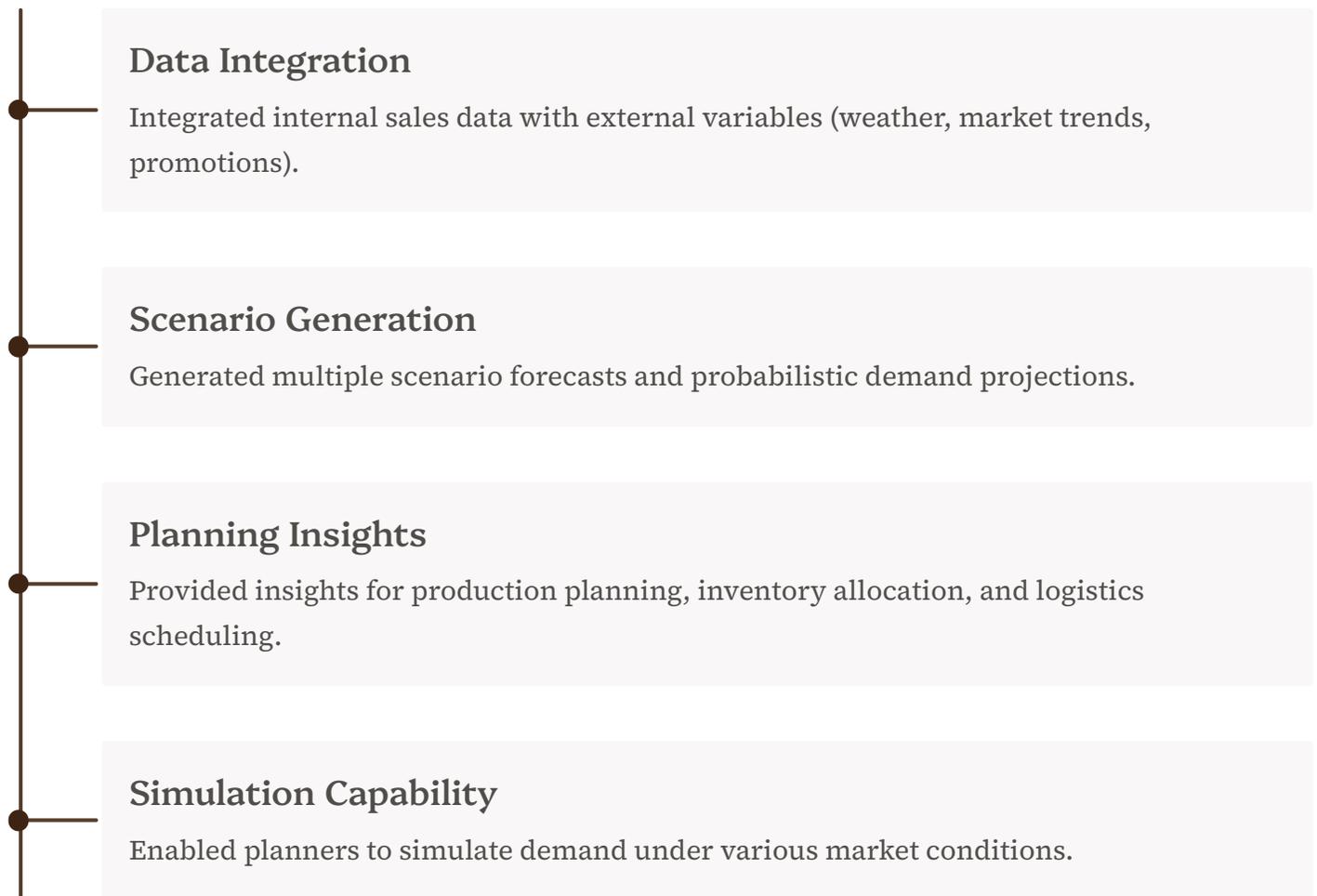Measurable cost savings and sustainability improvements were achieved.

🗒 Key Takeaways:

Generative AI effectively combines real-time and historical data for complex optimization. Dynamic route simulation improves efficiency, cost-effectiveness, and sustainability. Real-time scenario planning enhances operational resilience.

Case Study 3 — Procter & Gamble: Enhanced Demand Forecasting

Problem:

Traditional statistical demand forecasting could not fully account for external factors like weather, economic trends, or promotional campaigns, leading to forecast errors, excess inventory, and lost sales.

How Gen AI Was Used:

Data Integration

Integrated internal sales data with external variables (weather, market trends, promotions).

Scenario Generation

Generated multiple scenario forecasts and probabilistic demand projections.

Planning Insights

Provided insights for production planning, inventory allocation, and logistics scheduling.

Simulation Capability

Enabled planners to simulate demand under various market conditions.

Results:

Improved Forecast Accuracy

Improved forecast accuracy and alignment of inventory with actual consumption.

Reduced Inventory Costs

Reduced excess inventory and lowered carrying costs.

Enhanced Contingency Planning

Enhanced ability to prepare contingency strategies for unexpected demand changes.

Better Decision-Making

Supported better decision-making across production and logistics functions.
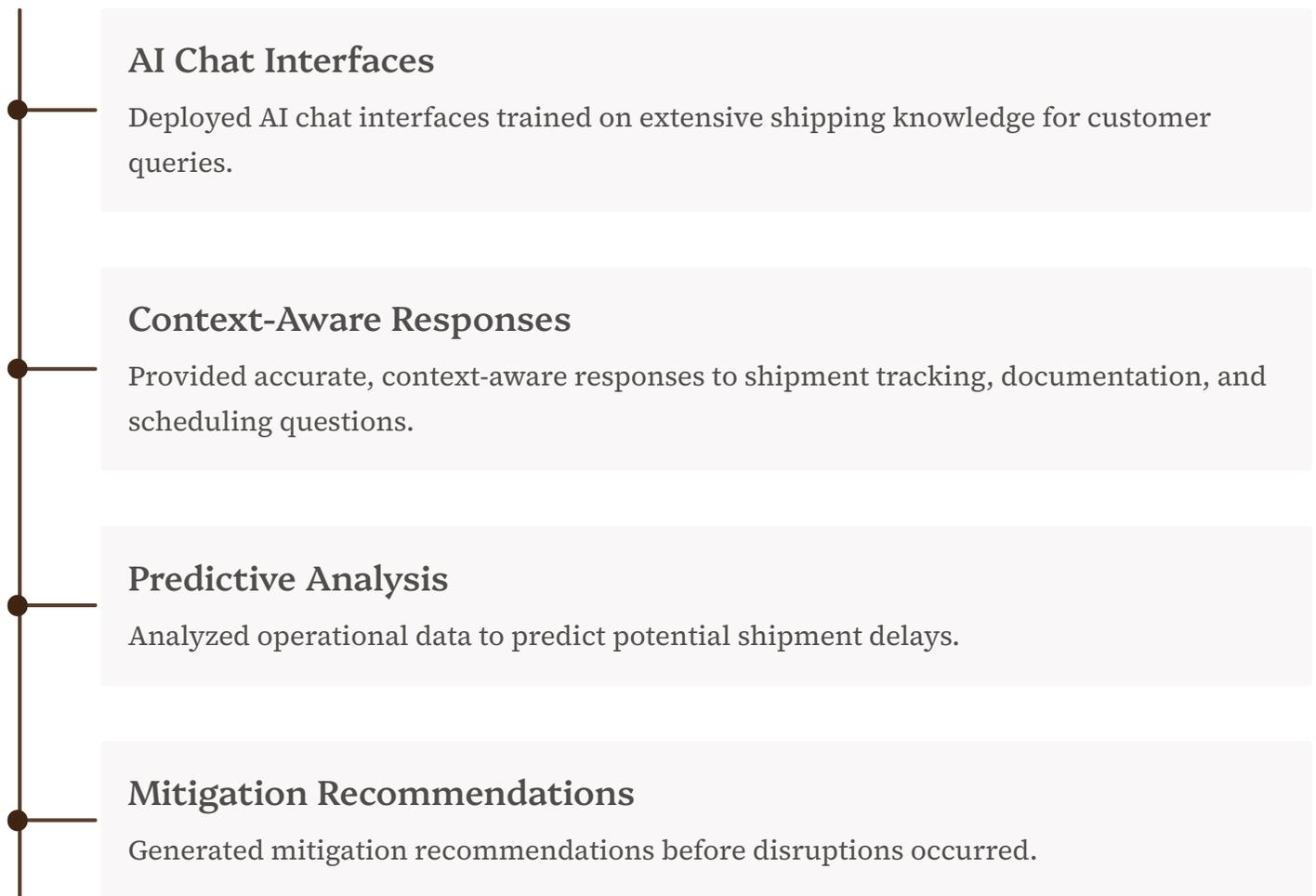
🗌 Key Takeaways:

External signals significantly improve forecast precision. Scenario-based forecasting enables proactive operational adjustments. Forecast optimization directly improves inventory and capacity planning.

Case Study 4 — Maersk: Customer Service & Predictive Operations

Problem:

Maersk needed scalable solutions to handle high volumes of customer inquiries and anticipate logistics disruptions. Manual support was inconsistent and slow, while operations lacked predictive insights.

How Gen AI Was Used:

AI Chat Interfaces

Deployed AI chat interfaces trained on extensive shipping knowledge for customer queries.

Context-Aware Responses

Provided accurate, context-aware responses to shipment tracking, documentation, and scheduling questions.

Predictive Analysis

Analyzed operational data to predict potential shipment delays.

Mitigation Recommendations

Generated mitigation recommendations before disruptions occurred.

Results:

Reduced Manual Workload

Improved response consistency and speed for customer inquiries.

Higher Customer Satisfaction

Achieved through proactive communication regarding logistics.

Enabled Proactive Operations

Operations teams could adjust routes and schedules preemptively.

Reduced Disruption Impact

Improved overall service reliability by lessening disruption frequency and impact.

Key Takeaways:

Combining AI for customer service and operational analytics improves both efficiency and client experience.

Predictive disruption modeling enables proactive mitigation planning.

Generative AI reduces staffing costs while maintaining high service quality.

Case Study 5 — Nestlé: Sustainable Supplier Identification

Problem:

Nestlé wanted to source raw materials from environmentally responsible suppliers, but manual assessment was time-consuming, inconsistent, and difficult to scale.

How Gen AI Was Used:

1 — Analyzed supplier certifications, audit reports, and sustainability scores.

2 — Consolidated disparate data sources into actionable insights.

3 — Generated recommendations for responsible supplier selection based on environmental performance.

4 — Prioritized suppliers aligned with Nestlé's corporate ESG goals.

Results:

Faster Selection

Enabled faster and more consistent supplier selection based on sustainability metrics.

Improved Transparency

Improved supply chain transparency and alignment with ESG targets.

Reduced Impact

Reduced environmental impact by sourcing from high-performing sustainable suppliers.

Enhanced Efficiency

Enhanced procurement efficiency and decision reliability.

Key Takeaways:

AI can automate and scale sustainable supplier assessment. Integrating ESG metrics into supplier evaluation improves decision quality. Sustainable sourcing aligns operations with corporate environmental objectives.

Case Study 6 — BMW: AI-Driven Production & Logistics Quality Control

Problem:

BMW faced challenges maintaining consistent quality and timely delivery across its global manufacturing operations. Manual inspection processes were slow and subject to human errors, and logistics visibility across suppliers and internal warehouses was limited. These issues threatened product quality and operational efficiency.

How Gen AI Was Used:

Real-Time Analysis

Implemented AI systems to analyze real-time production and component data for quality assurance on assembly lines.

Computer Vision

Used computer vision models to detect micro-defects and anomalies in parts such as welds, paint, and structural components.

Predictive Alerts

Integrated AI to monitor material flows and component movement, enabling predictive alerts for potential delays.

Unified Dashboards

Created dashboards that summarize inspection outcomes and logistics status across suppliers and plants.

Results:

AI-Detected Defects

AI detected defects invisible to human inspectors, leading to quicker corrective actions.

Production Quality

Improved production quality consistency, reducing rework and waste.

Logistics Visibility

Enhanced visibility into logistics meant planners could proactively adjust schedules and deliveries.

Reduced Delays

Reduced delay risks and improved on-time production, contributing to higher customer satisfaction.

Key Takeaways:

Generative AI can merge quality inspection with logistics visibility for holistic production improvement. Computer vision and predictive insights reduce reliance on manual checks and reactive responses. Early detection of quality and logistics issues supports stronger operational reliability.

Case Study 7 — Amazon: AI-Enhanced Inventory & Fulfillment Optimization

Problem:

Amazon's massive fulfillment network needed to balance thousands of SKUs with fluctuating demand. Traditional systems struggled with uneven demand patterns, variable lead times, and warehouse congestion, leading to inefficiencies and delivery delays.

How Gen AI Was Used:

1

Integration with Automation
Integrated generative AI with robotics and warehouse automation to analyze order patterns, inventory movements, and storage flows.

2

Optimal Placement
Generated optimal inventory placement recommendations within fulfillment centers to minimize pick-and-pack times.

3

Predictive Pre-Staging
Used predictive models to anticipate demand spikes and pre-stage inventory in strategic zones.

4

Dynamic Task Assignment
Systems recommended dynamic task assignments for robots based on real-time throughput and demand prioritization.

Results:

Significant reduction in order fulfillment times and improved on-time delivery.

Higher inventory accuracy and reduced picking errors.

Smarter task allocation led to better robot utilization and fewer bottlenecks.

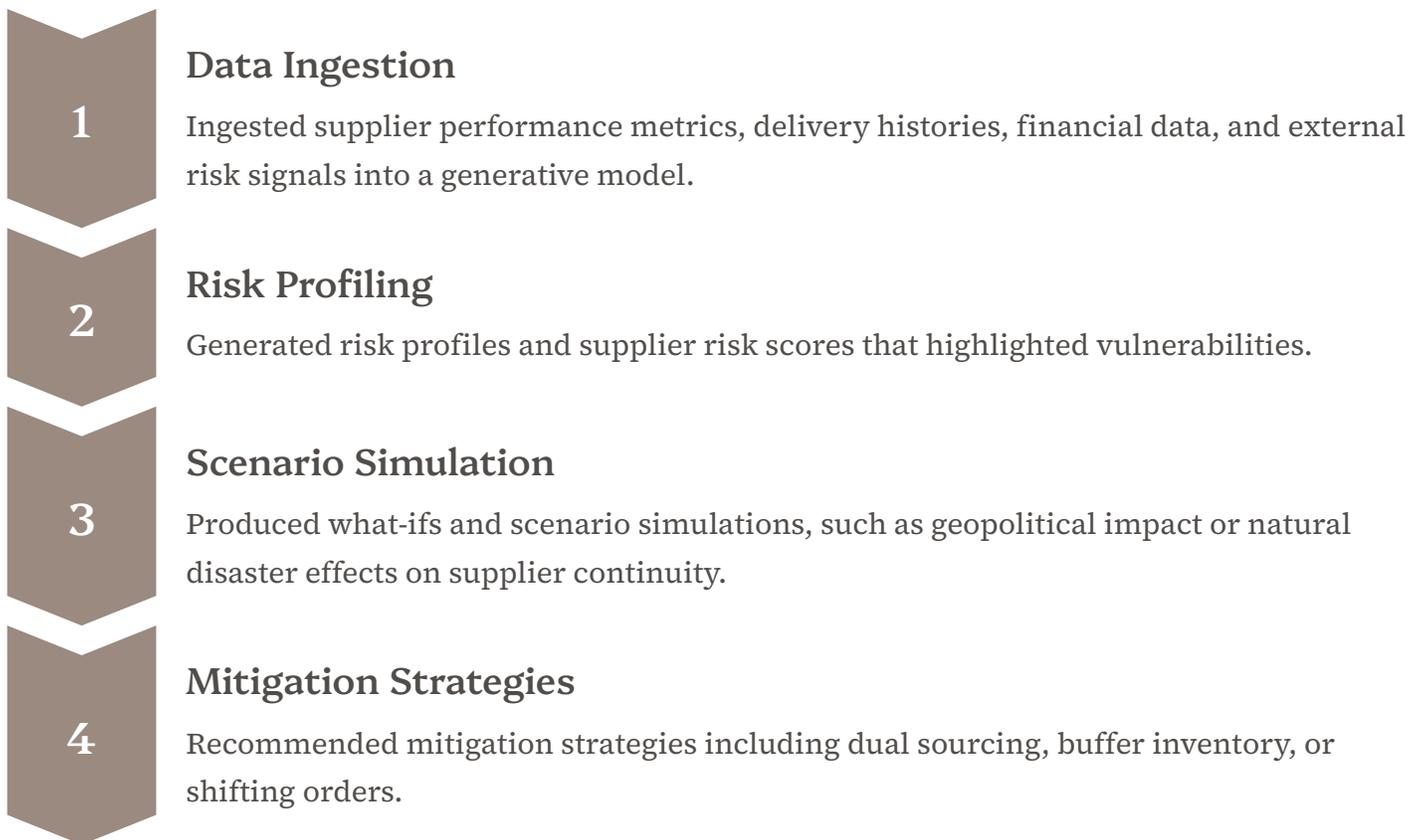Faster response to seasonal demand spikes with improved throughput.

🗒 Key Takeaways:

Combining generative AI with automation improves efficiency and speed across the fulfillment lifecycle. Predictive inventory placement supports better demand-supply alignment. Continuous adjustment of robotic tasks minimizes operational friction.

Case Study 8 — Unilever: AI-Powered Supplier Risk & Resilience

Problem:

Unilever needed to constantly evaluate supplier risks including quality, delivery delays, and compliance with sustainability standards. Manual risk assessments across thousands of suppliers were inconsistent and slow, exposing the company to disruptions.

How Gen AI Was Used:

1

Data Ingestion

Ingested supplier performance metrics, delivery histories, financial data, and external risk signals into a generative model.

2

Risk Profiling

Generated risk profiles and supplier risk scores that highlighted vulnerabilities.

3

Scenario Simulation

Produced what-ifs and scenario simulations, such as geopolitical impact or natural disaster effects on supplier continuity.

4

Mitigation Strategies

Recommended mitigation strategies including dual sourcing, buffer inventory, or shifting orders.

Results:

Faster identification of high-risk suppliers and proactive mitigation planning.	Reduced supplier-induced disruptions through early warnings and contingency actions.	Better alignment of sourcing decisions with performance and sustainability criteria.	Increased end-to-end supply chain confidence among planners.

🗋 Key Takeaways:

Generative AI helps synthesize disparate risk signals into clear supplier insights. Scenario simulation aids in building supply chain resilience plans. Automated risk scoring fosters proactive risk management.

Case Study 9 — Flexport: Real-Time Supply Chain Visibility & Disruption Forecasting

Problem:

Freight forwarding and global logistics depend on complex, multi-modal routes. Visibility into end-to-end shipments was historically limited, and planners lacked tools to predict disruptions before they happened.

How Gen AI Was Used:

1	**Real-Time Data Integration** Ingested real-time shipment data, port statuses, weather forecasts, and customs information.

2	**Predictive Analytics** Generated predictive analytics to forecast disruptions ahead of arrival windows.

3	**Risk Alerts** Produced clear risk alerts and recommended alternate routes or shipment strategies.

4	**Client Visibility** Provided clients with detailed visibility dashboards and narrative explanations of risk predictions.

Results:

Improved Shipment Reliability

Disruptions could be anticipated and mitigated early.

Enhanced Client Confidence

Transparent tracking and scenario forecasts improved planning.

Faster Decision Making

Rapid routing changes and contingency sourcing.

Reduced Delays & Improved Accuracy

Better delivery performance compared to traditional reactive systems.

🗌 Key Takeaways:

Real-time visibility combined with predictive simulation strengthens global logistics planning. Clients benefit from both numeric forecasts and narrative insights into risk. Generative AI delivers actionable alerts rather than only retrospective analysis.

Case Study 10 — McDonald's & Domino's: Gen AI for Quick-Service Food Supply Chains

Problem:

Fast-food chains like McDonald's and Domino's face highly variable demand tied to time of day, local events, and weather. Traditional forecasting and inventory systems struggled with waste, stockouts, and fluctuating labor needs.

How Gen AI Was Used:

1 **Granular Forecasting**
Combined internal POS data with external signals such as weather, local events, and promotions to generate highly granular demand forecasts.

2 **Intelligent Assistants**
Powered intelligent assistants to help managers with inventory ordering, staffing planning, and prep schedules.

3 **Pattern Simulation**
Used generative models to simulate shifts in demand patterns and recommend adjustments.

4 **Real-Time Operations**
Provided real-time dashboards and alerts to shift operations dynamically.

Results:

Reduced Waste

More accurate predictions helped reduce food waste and stockouts.

Better Alignment

Better alignment of ingredient ordering with actual demand patterns.

Responsive Labor

Labor planning became more responsive to predicted customer flows.

Improved Satisfaction

Faster, data-driven decisions led to improved customer satisfaction and profitability.

⬜ Key Takeaways:

Retail and food-service supply chains benefit from contextual forecasting that includes external data. Intelligent assistants support day-to-day operational decisions. Generative AI reduces waste and improves service responsiveness in fast-paced environments.

CERTIFIED GENERATIVE AI FOR SUPPLY CHAIN MANAGEMENT (CGAISCM)

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