

REWIRING LOGISTICS FOR A DIGITAL FUTURE

A TRANSFORMATION PERSPECTIVE



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EXECUTIVE SUMMARY

The logistics industry stands at the intersection of transformation and opportunity. As global supply chains grow more complex, incremental improvements are no longer enough—bold digital reinvention is required. **This white paper explores** how integrated networks, AI, IoT, edge computing, and cloud platforms can optimize operations across fleets, warehouses, ports, and customer touchpoints, enabling **real-time visibility, predictive insights, and autonomous workflows.**

From network planning and multimodal transportation to warehousing, fulfillment, and customer engagement, organizations are seeing measurable benefits in efficiency, resilience, and customer satisfaction. **This paper outlines a clear business case for change,** showing how a strategic partner can help transform fragmented logistics operations into a connected, intelligent ecosystem by providing:



Seamless, secure, high-performance connectivity across distributed operations.



Real-time customer engagement with omnichannel visibility, proactive notifications, and AI-assisted support.



Operational automation and AI-driven insights for faster, data-driven decision-making.



Strengthened resilience and risk mitigation, ensuring continuity across IT and operational technology environments.



Enhanced cost efficiency, including optimized cloud usage and potential egress savings of 20-40%.

The continuous flow of data and insights enables logistics to move from a back-end function to a **strategic differentiator and value driver** in the digital economy, supporting growth, agility, and customer-centric operations.



1. LOGISTICS INDUSTRY OVERVIEW

Smart logistics is transforming how goods move across borders, regions, and industries. By 2025, the global logistics sector has reached a valuation of \$10.5 trillion, driven by the explosive growth of e-commerce and rising customer expectations for speed and transparency. Today, logistics is no longer just about transportation and warehousing—it's a dynamic, intelligent network powered by AI, 5G connectivity, robotics, and digital platforms. From sourcing raw materials to last-mile delivery, smart logistics leverages real-time data, automation, and predictive analytics to optimise every step of the supply chain.



INSIGHT BOX

🔗 *Gartner finds 92% of logistics leaders now see logistics as a strategic value driver. Nearly 80% are deploying TMS and 74% WMS, signaling rapid digitisation across the value chain.*

TRANSFORMATION DRIVERS

1. Fragmented ecosystems and integration complexity

Modern logistics operations depend on multiple specialised partners—suppliers, shippers, 3PLs, customs agencies, transporters, and distributors—each using different systems and processes. While this model improves scalability, it also creates major challenges around integration, visibility, and tracking.

These challenges often arise between suppliers and shippers, customs and logistics providers, and between multiple shipping agencies. The result is poor end-to-end visibility, process/ documentation exception handling, and manual workarounds. Technically, this leads to interoperability issues, delays due to uploading of unstructured data, lack of standardised protocols, no centralised data hub, and growing cybersecurity risks.



INDUSTRY OBSERVATIONS

According to 🔗 *Maersk's Logistics Trend Map 2024*, visibility has become a cornerstone for improving decision-making and managing disruptions. However, achieving full visibility is challenging due to integration and data consistency issues.

2. Rising customer expectations

Customers now expect fast delivery, real-time updates, easy returns, and flexible delivery slots. Logistics systems must be faster, smarter, and more transparent to meet these growing demands.



EXAMPLE

🔗 *Amazon, Alibaba, and JD Logistics* have set the global benchmark for speed and transparency, offering same-day or even next-hour delivery, real-time tracking, and seamless return experiences. These capabilities are pushing logistics providers across industries to upgrade fulfillment models and digital infrastructure.



3. Cyber risks and operational resilience

As logistics technology ecosystems expand, they are becoming prime targets for cyberattacks. The growing reliance on interconnected partner systems significantly increases third-party risk—where even a single unsecured vendor can compromise the entire supply chain. This calls for robust cybersecurity governance, investment in advanced defenses, and the adoption of Zero Trust frameworks across the ecosystem.



EXAMPLE

↻ *NotPetya attack on Maersk (2017)* serves as a historic anchor: malware crippled its global operations, costing an estimated \$300 million and shutting down ports and IT systems.

4. Infrastructure capacity, legacy IT and ageing assets

While physical bottlenecks remain a concern, many logistics companies struggle with legacy IT systems and fragmented digital infrastructure, challenges that directly limit visibility, real-time responsiveness, and partner collaboration. These outdated systems are often not built for:

- High-speed, secure connectivity across distributed sites (e.g., warehouses, ports, and fleets)
- Integration with partner platforms and customer ecosystems
- Scalable IoT deployments and real-time edge data processing
- Centralised visibility and analytics for control towers
- Secure data transmission across a growing digital ecosystem



INDUSTRY OBSERVATIONS

↻ *Reports show ageing infrastructure* contributing to recurring maintenance

5. Localised supply chains

Localised supply chains refer to sourcing, manufacturing, and distributing goods closer to the point of demand, reducing dependency on long, global shipping routes. However, many logistics networks still rely heavily on centralised global hubs (e.g., China or Southeast Asia). This lack of localisation leads to several operational challenges:

- Longer lead times and frequent shipping delays
- Higher fuel and transportation costs
- Greater exposure to customs and trade regulations
- Limited agility in responding to local demand fluctuations



EXAMPLE

↻ *Samsung* has diversified its manufacturing footprint by shifting parts of its production from China to countries like Vietnam, India, and Mexico, enabling it to manufacture closer to demand centres and enhance supply chain resilience.

6. Cost volatility and demand fluctuation

Rates and margins are unstable—freight volumes and pricing are bouncing, with rising inflation and currency fluctuations exacerbating the issue.



INDUSTRY OBSERVATIONS

↻ *Reuters report* on container shipping rates notes a “tariff-fueled surge” followed by anticipated normalisation and volume decline in 2025.

OPPORTUNITIES AHEAD FOR LOGISTICS LEADERS

Today's logistics challenges—fragmented systems, cyber threats, and rising costs—are also opening the door for breakthrough innovation, operational resilience, and competitive differentiation. Forward-thinking logistics leaders are using these inflection points to build intelligent, sustainable, and future-ready supply chains. Key opportunity areas include:

1. Connected ecosystems and platform-based transformation

Move from siloed systems to integrated Digital Platforms that unify data, processes, and workflows across suppliers, shippers, warehouses, and customers. This platform-driven approach enhances collaboration, enables real-time responses, and minimises friction during process transfers.



INSIGHT BOX

IDC's Worldwide Supply Chain Predictions highlight that by 2026, 50% of logistics teams will deploy AI/ML visibility platforms, enabling logistics cost savings and faster decisions.

2. Digital transformation and automation

The drive toward automation is reshaping logistics operations. Leaders are integrating AI, IoT, robotics, and edge computing to streamline workflows, improve delivery speed, and reduce errors across the value chain. Key areas include:

- **IoT and edge computing:** Real-time data capture from fleets, ports, and warehouses, with seamless edge-cloud integration for immediate decision-making.
- **AI and predictive analytics:** Enables anomaly detection, demand forecasting, route simulation, and inventory optimisation using scalable data pipelines.
- **Robotic automation at scale:** Deploys warehouse robotics, AGVs, drones, and RPA to reduce manual tasks and boost efficiency across logistics hubs.



INSIGHT BOX

IDC's Worldwide Supply Chain Predictions highlight that by 2025, 40% of G2000 companies will implement broad robotics automation in warehouses, improving order pick speed by 10% and reducing errors.

3. Route simulation

Leverage AI-powered digital twins and simulation engines to test multiple routing scenarios before execution. By modelling factors like weather, traffic, fuel usage, delivery time windows, and vehicle capacity, logistics leaders can proactively select the most efficient and resilient routes.

- Enhances delivery predictability and SLA compliance
- Reduces fuel consumption, empty miles, and carbon footprint
- Improves exception planning by simulating disruptions in advance
- Supports faster onboarding of new distribution zones or partners
- Aligns with sustainability and cost-efficiency mandates



4. Nearshoring and agile supply networks

Logistics leaders could re-architect supply chains by localising sourcing, manufacturing, and distribution closer to the point of demand. By designing modular, regionally distributed logistics networks, companies can

- Improve responsiveness to local market needs
- Reduce lead times and transportation costs
- Reduce reliance on long, global supply routes
- Strengthen compliance with local regulations



INSIGHT BOX

🔗 *IDC's Worldwide Supply Chain Predictions highlight that by end of 2025, 25% of firms will relocate final assembly near demand centres, cutting logistics costs by 10%.*

5. Cyber - resilient digital infrastructure

As logistics ecosystems become increasingly digital and interconnected, they face growing exposure to cyber threats, ranging from ransomware and phishing to attacks on IoT devices and operational systems. Logistics firms must secure both their Information Technology and Operational Technology environments, including warehouse control systems, fleet telematics, and cloud-based logistics platforms.

To ensure end-to-end protection, forward-looking logistics companies are adopting:

- Zero Trust Architecture - Verifying every device and user across the network, with no implicit trust
- Endpoint Detection and Response (EDR) - Protecting field devices, sensors, and handhelds from malware and breaches
- Incident Response Readiness - Establishing clear escalation paths and protocols to respond to cyberattacks quickly
- Security Operations Centres (SOCs) - Centralised command hubs for 24/7 monitoring, threat detection, and rapid response across the supply chain

6. Sustainable logistics as a differentiator

ESG compliance is evolving into a source of competitive advantage. Investments in EV fleets, solar-powered warehouses, and low-emission transport improve brand trust, attract ESG-aligned capital, and meet regulatory expectations.



2. WHERE THE REAL CHALLENGES LIE: THE LOGISTICS VALUE CHAIN EXPLAINED

The logistics value chain consists of five interconnected stages. Each stage plays a pivotal role in the movement of goods and the generation, transport, and analysis of operational data. However, each stage also presents unique challenges that need to be addressed to ensure efficient and agile operations.

LOGISTICS VALUE CHAIN



STAGE 1: Logistics network planning

This is the strategic backbone of logistics, involving planning routes, capacity, asset utilisation, procurement, and network design. Data from predictive models, historical performance, and real-time feeds shape these decisions.

Key challenges:



Siloed systems and legacy tools limit unified planning.



Lack of end-to-end visibility restricts scenario modelling.



Difficulty aligning logistics with sourcing and ESG goals.

STAGE 2: Multimodal transportation

Covers both port and terminal operations and inland operations.

(a) Port and terminal operations: Focuses on loading/unloading, customs, crane automation, and documentation. These hubs generate data from IoT sensors, video analytics, and automation systems.

(b) Inland operations: Handles movement of goods across road and rail, involving yard management, fleet tracking, and gate entry/exit.

Key challenges:



Customs delays and paperwork bottlenecks.



Infrastructure limitations impact automated handling.



Real-time tracking gaps across modes and geographies.



Rising theft and spillage incidents in inland transit.

STAGE 3: Warehousing and inventory management

Centres around storage, cross-docking, cold chain, and smart inventory systems. Warehouses today are becoming data-driven hubs with automation and IoT-enabled operations.

Key challenges:

-  Inefficiencies due to manual processes and lack of robotics.
-  Safety risks for workers due to poor visibility and asset tracking.
-  Difficulty in managing diverse inventory types across networks.
-  Cold chain failures due to poor temperature monitoring.

STAGE 4: Logistics and fulfilment management

Encompasses pick, pack, sort, and deliver for B2B and B2C operations. Also includes emerging use cases like drone delivery and autonomous last mile.

Key challenges:

-  Managing last-mile delivery with real-time accuracy.
-  High SLA failure rates due to route unpredictability.
-  Regulatory uncertainty around drone-based logistics.
-  Difficulty integrating multiple fulfilment nodes and partners.
-  Limited transparency beyond Tier 1 suppliers.

STAGE 5: Distribution and customer support

This stage focuses on customer-facing visibility, issue resolution, and continuous performance tracking through dashboards and help centres.

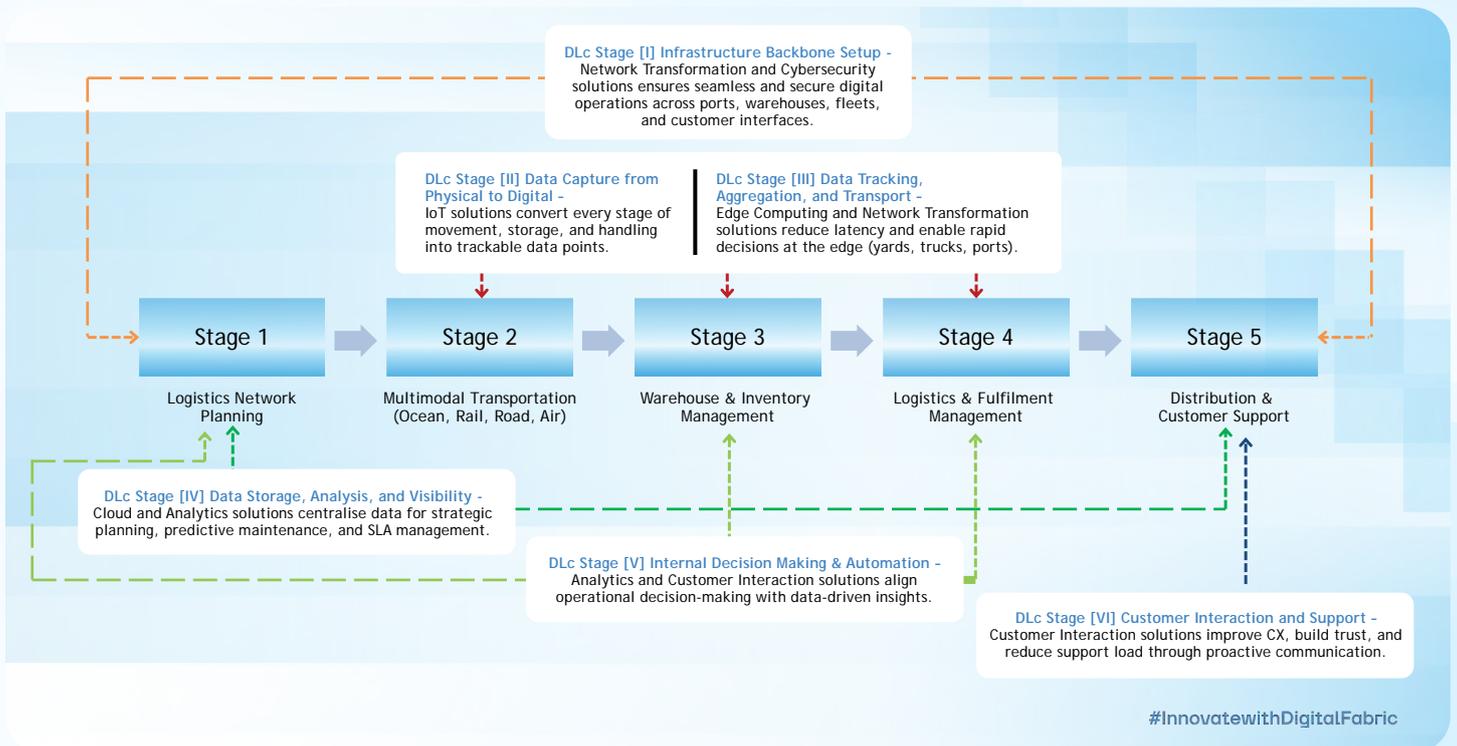
Key challenges:

-  Disjointed communication with customers.
-  Lack of proactive alerts and exception management.
-  Rising demand for personalised and omnichannel support.

Together, these stages form a continuous loop of data generation, interpretation, and action. Addressing the challenges at each stage is critical to achieving logistics agility, resilience, and responsiveness in today's complex global landscape.

3. ENABLING THE DATA LIFECYCLE TO FLOW FRICTIONLESSLY ACROSS THE LOGISTICS VALUE CHAIN

The logistics industry thrives on data—captured, processed, and acted upon at every step of the value chain. Enabling this end-to-end flow requires an integrated portfolio of solutions that align with each phase of the data lifecycle, driving efficiency and impact across all stages of logistics operations.



DLC stage [I] Infrastructure backbone setup: Network Transformation and Cybersecurity solutions establish a secure, high-performance digital backbone, ensuring reliable connectivity, visibility, and protection across all stages—from logistics planning to last-mile delivery.



DLC stage [II] Data capture from physical to digital: IoT solution transforms physical movements into digital insights, tracking assets, monitoring conditions, and enabling real-time visibility across multimodal transportation, warehousing, and fulfilment.



DLC stage [III] Data tracking, aggregation, and transport: Edge Computing and Network Transformation solutions aggregate sensor data, process it closer to the source, and enable rapid transport of insights across systems, reducing latency and improving efficiency in multimodal transportation, warehousing and fulfilment stages in value chain.



DLC stage [IV] Data storage, analysis, and visibility: Cloud and Analytics solutions provide scalable storage, predictive insights, and centralised visibility, empowering logistics leaders to optimise network planning and enhance customer service.



DLC stage [V] Internal decision making and automation: Analytics and Customer Interaction solutions leverage AI, automation, and advanced collaboration tools to enable proactive decisions, intelligent routing, inventory optimisation, and process automation.



DLC stage [VI] Customer interaction and support: Customer Interaction solutions, including CPaaS, CCaaS, Kaleyra AI, and omnichannel platforms, enhance customer engagement and transparency at the distribution stage through real-time updates, proactive communication, and seamless support.

4. BRINGING THE LOGISTICS VALUE CHAIN TO LIFE WITH APPLIED USE CASES

This section explores stage-wise use cases specific to the logistics industry. Each use case is powered by integrated solutions—spanning network connectivity, IoT, edge and cloud computing, and customer experience platforms—driving measurable benefits and improving how data is captured, processed, analysed, and acted upon across the logistics value chain.

SMART LOGISTICS



STAGE 1: LOGISTICS NETWORK PLANNING

1. Route optimisation:

Utilises real-time traffic, vehicle telemetry, and weather data to recommend the most efficient delivery routes.



Enabled by
Network Transformation, IoT, Analytics, Cloud solution



Business benefits

- Minimises fuel costs and CO2 emissions
- Increases on-time delivery and reliability
- Enhances fleet efficiency and vehicle utilisation



Data lifecycle value
Real-time vehicle IoT → Edge filtering → Cloud-based routing engine → Visualisation and dynamic replanning

2. Digital Twin:

Creates a virtual replica of logistics networks (routes, fleets, capacity, warehouse flows) for simulation and disruption planning.



Enabled by
IoT, Cloud solution, Analytics



Business benefits

- Simulates supply chain scenarios and tests optimisation strategies
- Reduces capital expenditure by modelling instead of trial-and-error
- Enhances planning resilience during disruptions



Data lifecycle value
Asset IoT → Cloud simulation engine → Predictive modeling → Continuous learning loop



INSIGHT BOX

🔗 IDC's Worldwide Supply Chain Predictions highlight that by 2028, 35% of companies will use digital twin orchestration platforms, boosting supply chain responsiveness by 15%.

STAGE 2: MULTIMODAL TRANSPORTATION

■ Port and terminal operations

1. Gate automation:

Automates vehicle identification and access with IoT sensors, cameras, and RFID.



Enabled by
Network Transformation, Edge, IoT



Business benefits

- Reduces gate delays and wait time
- Minimises manual errors and labour costs
- Improves traffic throughput and security compliance



Data lifecycle value
Sensor/RFID input → Edge validation → Access decision → Integration with TMS/WMS

2. Autonomous fleet:

Enables self-driving vehicles for cargo movement within port premises.



Enabled by
5G, IoT, Edge Computing



Business benefits

- 24/7 operations without driver constraints
- Reduces collisions and improves safety
- Enhances turnaround time



Data lifecycle value
Lidar/sensor feeds → Edge inference → Navigation feedback loop → Cloud fleet monitoring

3. Crane automation:

AI-powered cranes using real-time sensor data for precision lifting, loading, and placement.



Enabled by
AI, IoT, Network Transformation



Business benefits

- Boosts operational speed and accuracy
- Minimises human error and downtime
- Enhances utilisation of equipment



Data lifecycle value
Load sensors → Edge control → Operational logs → Maintenance dashboards

4. Mission Critical Push-to-Talk (MCPTT):

Provides secure, real-time voice coordination for ground staff and crane operators.



Enabled by
GSIP, Customer Interaction solutions



Business benefits

- Enhances safety and coordination
- Reduces downtime during crane or cargo exceptions
- Enables instant team-wide broadcast



Data lifecycle value
Voice packets → Low-latency secure transmission → Team feedback loop

5. Drone inspection:

Uses drones to inspect cargo stacks, containers, and high-risk infrastructure.



Enabled by

IoT, Edge AI, Cloud solution



Business benefits

- Reduces inspection time by 60%+
- Improves maintenance frequency and early fault detection
- Enhances safety for inspection teams



Data lifecycle value

Visual feed → Edge recognition → Analytics insights → Alerting and audit logs

6. Container tracking:

Monitors real-time container location, condition, and movement.



Enabled by

IoT, Smart SIMs, Cloud Analytics



Business benefits

- Prevents cargo loss, theft, or spoilage
- Improves intermodal visibility and predictive ETA
- Reduces detention penalties



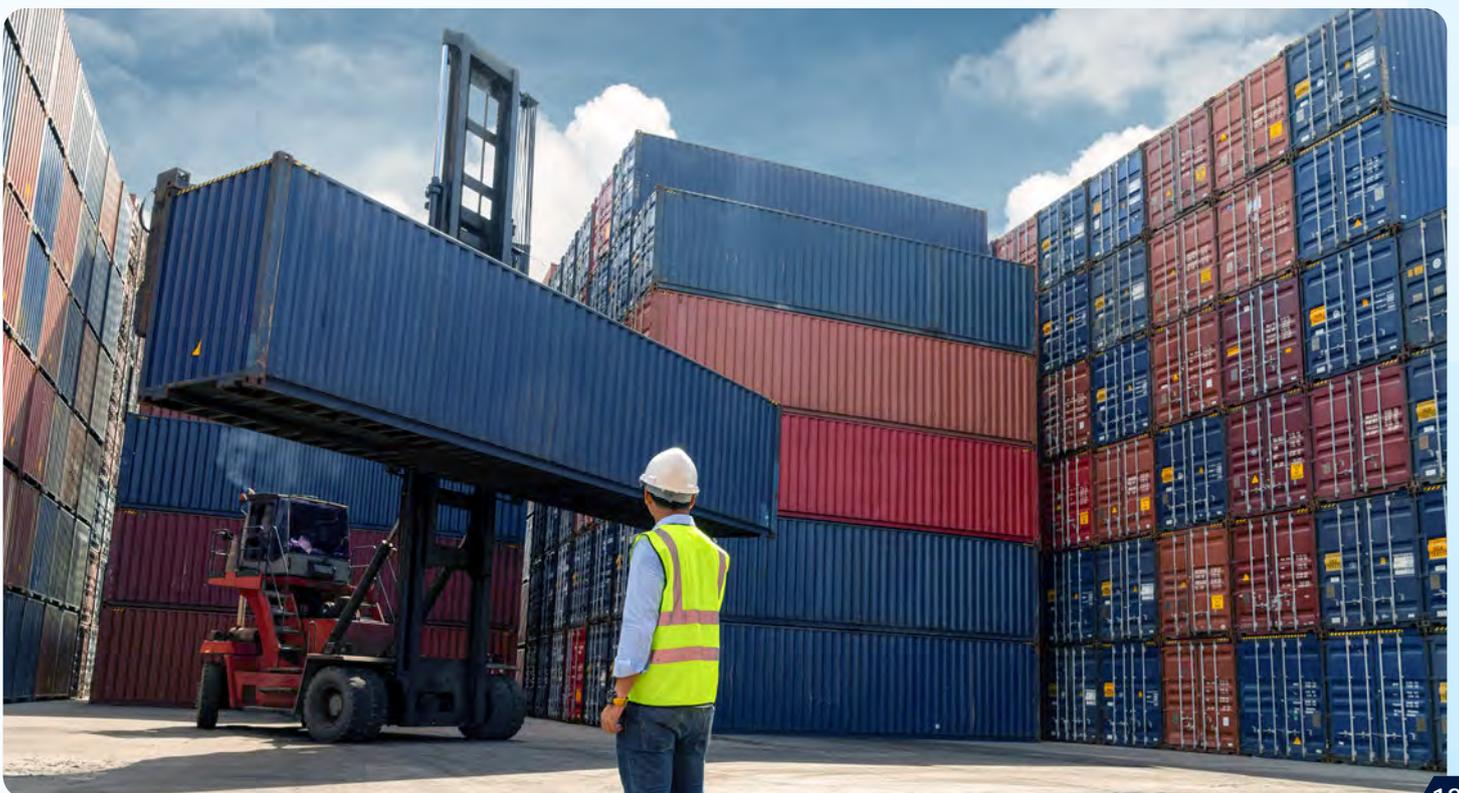
Data lifecycle value

IoT GPS + sensor → Cloud platform → Dashboard and customer alerts



INSIGHT BOX

India's Logistics Transformation is backed by PM Gati Shakti and the National Logistics Policy. India is driving 434 projects worth ₹11.17 lakh crore. Multi-modal initiatives are set to cut transport times by 66%, positioning the country to become the world's 4th largest economy by 2026 and accelerating demand for digitally integrated logistics.



—■ Inland operations

1. Truck-in truck-out:

Digital verification manages and schedules truck entry/exit at warehouses and yards.

 **Enabled by**
IoT, Network Transformation

 **Business benefits**

- Reduces idle time and traffic congestion
- Enhances traceability and automated logging
- Improves truck throughput

 **Data lifecycle value**
RFID scan → Instant validation → Dock sync → Historical truck audit

2. Logistics fleet tracking:

Provides real-time fleet health, location, and driver behaviour analytics.

 **Enabled by**
IoT, Cloud solution

 **Business benefits**

- Enhances on-road safety and compliance
- Improves fleet availability through proactive maintenance
- Enables predictive dispatching

 **Data lifecycle value**
Telemetry sensors → Real-time dashboard → Alerts + ML insights

3. Spillage prevention:

Uses IoT pressure/flow sensors to detect leakages during transport.

 **Enabled by**
IoT, Edge Alerts

 **Business benefits**

- Prevents hazardous material exposure
- Reduces product loss and insurance claims
- Enables real-time shut-off mechanisms

 **Data lifecycle value**
Sensor anomaly → Instant trigger → Notification + response log

4. Yard management:

Tracks vehicles, trailers, and containers within yards to improve throughput.

 **Enabled by**
IoT, Edge AI, Video Analytics

 **Business benefits**

- Optimises space allocation and slotting
- Reduces dwell time and driver search time
- Enables dynamic yard orchestration

 **Data lifecycle value**
GPS/camera input → AI routing → Visualisation + slot match

5. Vehicle classification detection:

Uses AI-driven video analytics to classify vehicle types (e.g., trucks, vans, bikes) entering or exiting logistics hubs.

 **Enabled by**
Edge Video Analytics, IoT Sensors

 **Business benefits**

- Enables customised routing, slotting, or priority access
- Enhances security by flagging unauthorised vehicle types
- Helps optimise yard and dock planning

 **Data lifecycle value**
Real-time video input → Edge-based classification → Automated log update and dashboard sync

6. Automatic Number Plate Recognition (ANPR):

Captures and reads license plates using edge AI for real-time vehicle identification.



Enabled by
Edge AI, Video Analytics, Network Transformation



Business benefits

- Reduces manual logging and gate delays
- Enhances security and traceability
- Supports compliance and audit trails



Data lifecycle value
Live camera feed → Edge plate recognition → Entry/exit validation → Access control integration

7. Vehicle detection and count:

Tracks vehicle flow at entry/exit points to manage yard capacity and plan traffic.



Enabled by
Edge Video Analytics, IoT, Cloud Analytics



Business benefits

- Prevents bottlenecks and improves vehicle flow
- Aids in shift and workforce planning
- Provides data for efficiency KPIs



Data lifecycle value
Motion detection → Edge counting → Historical trend analysis → Report generation

8. Speed violation detection:

Monitors vehicle speed within premises to ensure safety compliance.



Enabled by
Video Analytics, Edge AI, IoT Speed Sensors



Business benefits

- Prevents accidents and damage to goods/infrastructure
- Reinforces safety policies for drivers
- Supports automated violation alerts



Data lifecycle value
Speed sensor input → Violation flag → Alert + driver profile update

9. Safe reversal of heavy vehicle:

Uses sensors and cameras to detect objects or humans in the reversing path of heavy-duty vehicles.



Enabled by
Edge AI, IoT Cameras, Private LTE



Business benefits

- Reduces collision risks and damage
- Enhances pedestrian safety in yards
- Prevents downtime due to accidents



Data lifecycle value
Proximity sensors → Real-time risk alert → Assistive feedback to driver → Safety log entry

10. Usage of designated pathway:

Ensures vehicles and pedestrians follow pre-marked routes using geofencing and camera analytics.



Enabled by
Video Analytics, Smart Mapping, IoT



Business benefits

- Maintains traffic discipline and operational order
- Enhances compliance with OSHA/safety regulations
- Reduces chaos in high-traffic logistics hubs



Data lifecycle value
Real-time camera input → Path deviation detection → Alert + digital audit trail

11. Garbage / littering detection:

AI models identify waste dumping or littering in unauthorised areas.



Enabled by
Video Surveillance
+ Edge AI



Business benefits

- Improves cleanliness and hygiene standards
- Supports facility maintenance and ESG reporting
- Enables early detection and automated alerts



Data lifecycle value
Image feed → AI detection →
Alert trigger → Incident record

12. Intrusion detection:

Detects unauthorised entry into restricted zones.



Enabled by
Surveillance, Edge
Video Analytics



Business benefits

- Protects sensitive inventory or hazardous areas
- Minimises loss or sabotage risk
- Reduces reliance on manual surveillance



Data lifecycle value
Camera feed → Real-time
alert → Guard dashboard +
incident log

13. Crowd detection:

Monitors crowd density and footfall in logistics areas for safety and capacity management.



Enabled by
Edge AI Video
Analytics



Business benefits

- Prevents safety violations and congestion
- Aids emergency evacuation planning
- Supports optimal staff deployment



Data lifecycle value
Visual input → Density
estimation → Threshold
alert → Real-time crowd
control

14. Person talking on cell phone detection:

Identifies staff or drivers using mobile phones in high-risk operational zones.



Enabled by
Edge Video AI
with behaviour
analysis models



Business benefits

- Reduces distraction-related incidents
- Supports safety compliance enforcement
- Enables corrective training and intervention



Data lifecycle value
Image pattern recognition →
Behaviour flag → Alert +
HR/operations record



STAGE 3: WAREHOUSING AND INVENTORY MANAGEMENT

1. Integrated fleet and warehousing coordination:

Aligns truck arrivals with dock availability to avoid bottlenecks.



Enabled by
Network Transformation, IoT, Cloud Analytics



Business benefits

- Improves inbound/outbound sync
- Reduces demurrage and loading delays
- Enhances warehouse resource efficiency



Data lifecycle value
Arrival telemetry → Slot matching logic → Real-time visibility

2. Warehouse automation:

Robotics and conveyors automate pick-pack-ship operations.



Enabled by
Private 5G, Edge Computing



Business benefits

- Increases throughput and reduces error rates
- Reduces labour dependency
- Scales seasonal capacity



Data lifecycle value
Task queue → Robotic command → Fulfilment analytics

3. Cold chain monitoring:

Tracks real-time temperature and humidity inside storage zones.



Enabled by
IoT, Cloud solution



Business benefits

- Ensures compliance with pharma/FMCG standards
- Prevents spoilage and returns
- Enables corrective action through predictive alerts



Data lifecycle value
Sensor stream → Analytics rule engine → Alert + audit record

4. Pallet theft monitoring:

Tags and geofences pallets to prevent unauthorised movement.



Enabled by
IoT, Edge AI



Business benefits

- Reduces asset loss and inventory shrinkage
- Enables real-time incident response
- Lowers cost of insurance and claims



Data lifecycle value
Movement pattern → Boundary rule → Alarm trigger + log

5. Inventory management and asset tracking:

Tracks every item in the warehouse using RFID/barcodes.



Enabled by
IoT, Network Transformation, Cloud Integration



Business benefits

- Increases inventory accuracy to 99%+
- Prevents overstocking/stockouts
- Enhances order fulfilment accuracy



Data lifecycle value
Item scan → WMS integration → Real-time reconciliation

6. Automated Storage and Smart Shelves:

Uses shelf weight/volume sensors and AI logic for dynamic inventory slotting.



Enabled by
Edge Computing,
IoT



Business benefits

- Maximises vertical space usage
- Reduces manual stocking time
- Supports product traceability



Data lifecycle value
Shelf sensor → Algorithm logic →
Re-slotting command



INSIGHT BOX

↻ *IDC's Worldwide Supply Chain Predictions highlight that by 2027, 90% of organisations will augment operational roles with automation, improving worker efficiency by 30%.*

7. Worker Safety in Warehouse:

Sensors and wearables monitor fatigue, hazardous zones, and movements.



Enabled by
IoT, Video Analytics



Business benefits

- Reduces injuries and ensures OSHA compliance
- Triggers real-time alerts to safety teams
- Monitors air quality and heat zones



Data lifecycle value
Wearable + camera feed → Risk analysis → Response workflows

8. Connected Employees:

Unified communications tools for mobile workforce management.



Enabled by
GSIP, CPaaS



Business benefits

- Improves real-time coordination
- Reduces task turnaround time
- Enables mobile notifications and escalations



Data lifecycle value
Voice/text command → Real-time routing → Task completion logs

9. Video Analytics:

Monitors theft, efficiency, and process compliance across warehouse.



Enabled by
Edge AI, Video Surveillance



Business benefits

- Detects anomalies automatically
- Reduces cost of manual audits
- Enhances compliance reporting



Data lifecycle value
Camera input → Pattern matching → Event detection + report

10. PPE Helmet Detection:

Uses computer vision to identify whether warehouse personnel are wearing safety helmets in designated zones.



Enabled by
Edge Video Analytics, Smart Surveillance



Business benefits

- Enforces safety compliance and minimises accident risks
- Reduces manual supervision burden
- Supports automated reporting for audits and training



Data lifecycle value
Camera input → PPE detection model → Alert + compliance dashboard

11. PPE Jacket Detection:

Detects high-visibility safety jacket usage in operational areas through AI-based vision systems.



Enabled by
Edge AI, IoT
Cameras



Business benefits

- Enhances safety standards in hazardous areas
- Triggers alerts in real time for non-compliance
- Documents historical trends for continuous improvement



Data lifecycle value
Image capture → Edge processing → Non-compliance alert → Logging and escalation

12. No Man Area Around Machinery Detection:

Identifies human presence in restricted operational zones near machinery.



Enabled by
Edge Video Surveillance, IoT Sensors



Business benefits

- Prevents unauthorised or accidental access
- Reduces risk of injury near automated or dangerous equipment
- Provides proactive alerts to avoid disruptions



Data lifecycle value
Motion detection → Zone violation logic → Alert + incident report

13. Person Detection:

Identifies human presence in restricted operational zones near machinery.



Enabled by
Video Analytics, Edge AI



Business benefits

- Enables perimeter and zone monitoring
- Supports crowd control and security validation
- Tracks movement trends for workflow optimisation



Data lifecycle value
Live video → Person ID recognition → Real-time count + access validation

14. Bar Code and QR Code Identification:

Automatically scans and validates codes for inventory, assets, or documentation.



Enabled by
IoT Scanners, Edge Systems, Cloud Integration



Business benefits

- Improves inventory accuracy and transaction speed
- Reduces manual input errors
- Enables real-time system updates



Data lifecycle value
Code scan → ERP/WMS sync → Inventory update logs

15. Inventory Detection and Count:

Uses video + sensor analytics to detect and quantify inventory on shelves or pallets.



Enabled by
IoT Sensors, Edge Video Analytics



Business benefits

- Enhances real-time inventory visibility
- Reduces miscounts and shrinkage
- Enables proactive restocking decisions



Data lifecycle value
Sensor/video input → Object recognition → Count + system sync

16. Detecting illumination levels:

Monitors ambient lighting to ensure safe and productive working conditions.



Enabled by
IoT Light Sensors,
Edge Processing



Business benefits

- Prevents workplace accidents due to poor visibility
- Enables automated lighting control
- Supports energy efficiency and sustainability goals



Data lifecycle value
Sensor data → Threshold logic → Alert or control command

17. Detecting absence of barricade:

Identifies if safety barricades or markings are missing or displaced in critical areas.



Enabled by
Edge Video AI,
Smart Cameras



Business benefits

- Prevents entry into hazardous or incomplete zones
- Reduces operational hazards
- Supports facility safety audits



Data lifecycle value
Visual scan → Pattern recognition → Violation alert + audit entry

18. Fire detection:

Early identification of flame or excessive heat in the facility.



Enabled by
Infrared Cameras,
IoT Smoke/Heat
Sensors



Business benefits

- Triggers real-time alarms to minimise damage
- Prevents injury and product loss
- Enhances compliance with fire safety norms



Data lifecycle value
Thermal input → Edge signal analysis → Instant alert → Emergency protocol initiation

19. Smoke detection:

Detects smoke and airborne particulates through camera or IoT-based systems.



Enabled by
Smart Sensors,
Edge Analytics



Business benefits

- Enables faster emergency response
- Minimises damage and health risks
- Integrates with evacuation and suppression systems



Data lifecycle value
Sensor reading → Real-time classification → Alert and facility-wide broadcast



INSIGHT BOX

🔗 *IDC's Worldwide Supply Chain Predictions highlight that by 2027, omni-channel and AI-enabled fulfillment will improve last-mile profitability by 15%.*

STAGE 4: LOGISTICS AND FULFILMENT MANAGEMENT

1. Order tracking:

Real-time visibility into order status across transport, fulfilment, and delivery.



Enabled by

IoT, CPaaS, Cloud Analytics



Business benefits

- Improves customer satisfaction and confidence
- Reduces missed delivery queries
- Enables real-time alerts for route exceptions



Data lifecycle value

Location ping → Tracking dashboard → Alert and status update

2. Drone delivery:

Autonomous, lightweight drones used for short-distance last-mile delivery.



Enabled by

IoT, Private LTE/5G



Business benefits

- Reduces congestion and delivery times in urban and high-traffic areas
- Lowers last-mile delivery costs by reducing fuel and manual workforce dependency
- Extends delivery reach to remote, rural, or disaster-hit locations where vehicles face limitations
- Improves sustainability by reducing carbon emissions compared to traditional transport modes
- Enhances customer satisfaction with faster, on-demand delivery options



Data lifecycle value

Drone launch → Real-time IoT telemetry and video → Edge AI navigation and obstacle detection → Cloud platform for route monitoring → Instant delivery status updates to customer



STAGE 5: DISTRIBUTION AND CUSTOMER SUPPORT

1. Supply chain visibility:

Provides real-time tracking and exception alerts across the end-to-end logistics journey—from distribution centres to customer delivery points.



Enabled by

IoT, Cloud Analytics, Edge Computing, Network Transformation



Business benefits

- Offers a single pane of visibility for shipments, delays, inventory levels, and supplier performance
- Enables proactive risk mitigation and faster decision-making
- Enhances SLA compliance and operational resilience
- Reduces cost of disruption by minimising unplanned delays and route diversions
- Improves collaboration across 3PLs, freight forwarders, and internal teams



Data lifecycle value

Multi-source IoT and system data → Aggregated via Cloud solution → Analysed at the edge and cloud → Delivered as insights in dashboards and alerts for real-time action

2. Customer support:

Enables seamless, multichannel communication with customers and partners for real-time updates, issue resolution, and service feedback.



Enabled by

CPaaS, Customer Interaction solutions, Cloud Contact Centre, AI Bots



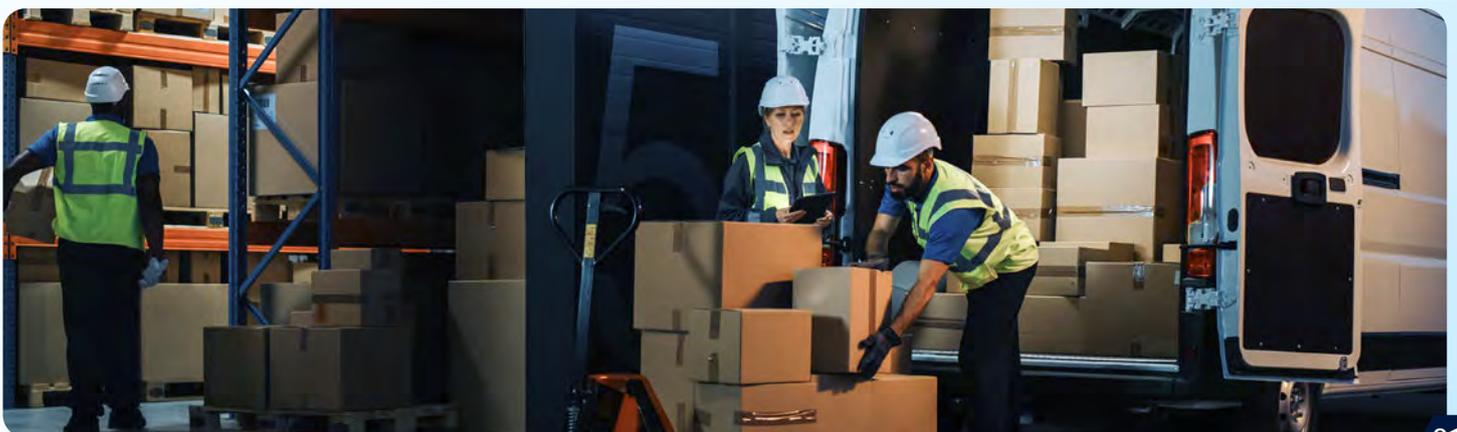
Business benefits

- Reduces first response and resolution times through AI-powered self-service and automation
- Enhances customer satisfaction with proactive alerts and delivery updates
- Minimises support costs by offloading repetitive tasks to intelligent bots
- Improves customer retention and Net Promoter Scores (NPS)
- Enables consistent omnichannel experiences via WhatsApp, SMS, email, and voice



Data lifecycle value

Customer event data (e.g., shipment, delay, query) → Routed through AI engines → Managed in contact centre → Logged for historical reference, analytics, and SLA tracking



5. CONCLUSION

The path forward is clear: by embracing integrated networks, AI-driven insights, automation, and data-centric decision-making, you can guide your organization to not only navigate today's volatility but also shape the future of global logistics. Logistics is no longer a back-end function—it is a **strategic value driver and differentiator**, unlocking efficiency, resilience, and superior customer experience across the enterprise.

For CIOs, the focus is on **building a secure, high-performance, intelligent infrastructure** that connects fleets, warehouses, and customer touchpoints, leverages predictive analytics, and empowers your teams to make faster, smarter decisions—turning digital investments into measurable business impact and enterprise-wide transformation.

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