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MICRAFT INTELLIGENCE SERIES — LOGISTICS OPERATIONS

The Indian Last-Mile Logistics Challenge

Multi-Carrier Management, COD Economics, and Technology Adoption in India's Growing E-commerce Ecosystem

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Executive Summary

The Multi-Carrier Imperative

No single courier covers all of India's 19,000+ serviceable pin codes with equal cost efficiency and delivery success rates. Businesses defaulting to one carrier are systematically leaving money or service quality on the table. Systematic multi-carrier management is a financial and operational necessity, not a technology preference.

The COD Challenge

Cash-on-delivery represents 40 to 60% of order value in many Indian e-commerce categories. Managing COD accurately across multiple carriers — with different settlement frequencies, remittance formats, and collection success rates — is one of the most underappreciated operational challenges in Indian logistics.

The Technology Gap

The primary barrier to logistics technology adoption is integration complexity — connecting order management, warehouse operations, carrier APIs, and accounting systems. Courier aggregator platforms address this gap directly, allowing multi-carrier logistics without dedicated engineering resources.

SECTION 1

India's E-commerce Logistics Landscape — Scale and Structure

1.1 Scale and Growth

India's e-commerce market has grown from a niche segment to a significant share of retail consumption over the past decade. Smartphone penetration, UPI infrastructure, improving rural internet connectivity, and a young, digitally native consumer base have driven e-commerce growth into Tier 2, Tier 3, and semi-urban geographies previously outside the e-commerce addressable market.

This geographic expansion has fundamentally changed the logistics challenge. Early Indian e-commerce was concentrated in the top 8 to 10 metro cities — well-served by existing courier infrastructure. The current growth vector is into the next 500 cities and towns — with highly variable carrier coverage, higher delivery failure rates, and different requirements for successful delivery execution.

1.2 Structural Complexity Unique to Indian Logistics

- **Geographic diversity:** India spans dense urban centres (30-minute delivery viable) to remote locations (weekly deliveries realistic). A strategy that works for Pune does not transfer to rural Maharashtra without material modification.
- **COD dominance:** Despite rapid UPI adoption, COD remains primary in many categories and geographies, adding a cash management and reconciliation layer absent from Western markets.
- **Carrier fragmentation:** Unlike the US and European markets where 2–3 major carriers serve the majority of e-commerce volume, India's carrier market is fragmented across dozens of providers with non-identical coverage and service quality profiles that vary significantly by geography.

SECTION 2

The Indian Carrier Ecosystem — Coverage, Strengths, and Trade-offs

2.1 The Major Players and Their Operational Profiles

Carrier	Profile	Best For
Delhivery	18,000+ pin codes. Largest integrated network. Strong Tier 2/3 reach.	Broad geography, standard delivery, high-volume e-commerce
Bluedart (DHL)	Premium express. Strong metro SLA. Higher pricing reflects service.	Time-sensitive, high-value, express SLA requirements
Ecom Express	Purpose-built for e-commerce. Strong bulk booking capability.	High daily volume e-commerce brands
Shadowfax	Hyperlocal and same-day. Strong metro and Tier 1 city focus.	Same-day, hyperlocal, quick commerce
DTDC	Oldest franchise-based network. Deep Tier 2/3 penetration.	Smaller cities, towns, B2B document delivery
Xpressbees	Growing national e-commerce carrier. Competitive pricing.	E-commerce standard delivery, expanding reach

Table 1: Indian Courier Carrier Profiles

2.2 The Case Against Single-Carrier Dependence

- For non-metro PIN codes, delivery success rates vary by 15 to 25 percentage points between best and worst-performing carriers for specific geographic clusters.
- Cost varies significantly for the same origin-destination pair and weight — often by 20 to 40%. The cheapest carrier for a 500g metro delivery is frequently not the cheapest for a 2kg Tier 3 delivery.

- Actual transit times vary by carrier and lane independent of stated SLAs. A carrier's stated 3-day transit may be achieved consistently by one and achieved 60% of the time by another.

SECTION 3

Multi-Carrier Management — The Case for Systematic Optimisation

Effective multi-carrier management requires carrier selection decisions based on data: destination serviceability, historical delivery success rate for the specific PIN code cluster, current live rate from the carrier API, delivery timeline against order SLA, and COD collection track record for COD shipments. Not familiarity. Not habit.

Benefit	Mechanism	Typical Impact
Shipping cost reduction	Selecting lowest-cost carrier meeting delivery requirements	12–22% reduction in average cost per order
RTO cost reduction	Routing to higher-performing carriers for high-RTO geographies	1–3 percentage point reduction in RTO rate
COD write-off reduction	Higher delivery success reduces both re-delivery and RTO on COD orders	Proportional to COD share of order volume

Table 2: Financial Benefits of Systematic Carrier Optimisation

SECTION 4

COD Economics — Managing India's Dominant Payment Method

For many Indian e-commerce businesses, COD represents 40 to 60% of order value. Managing it creates three challenges: a float period between shipment and settlement; remittance reconciliation complexity across multiple carrier formats and cycles; and COD fraud exposure without shipment-level tracking.

For a business with 300+ daily orders at 50% COD across three carriers, manual COD reconciliation typically consumes 5–8 hours of finance and operations time per week. Automated reconciliation through a courier aggregator reduces this to under 30 minutes.

SECTION 5

The Last-Mile Challenge in Tier 2, Tier 3, and Rural India

Non-metro delivery operates under fundamentally different conditions: lower geocoding accuracy, lower recipient availability during working hours, higher COD preference, and significantly greater carrier performance variation for the same geography. Performance-based routing for non-metro PIN codes is more valuable than cost-based routing. A ₹20 saving per shipment from selecting the cheapest carrier for a Tier 3 destination is more than offset by a 10-percentage-point higher RTO rate.

SECTION 6

Technology Adoption in Indian Logistics — The Integration Gap

The primary barrier to technology adoption is not cost or awareness — it is integration complexity: connecting order management, warehouse operations, carrier APIs, tracking, COD reconciliation, and accounting into a coherent operational flow. Courier aggregator platforms address this by providing a single API layer connecting to multiple carriers. The business builds and maintains one integration regardless of how many carriers it uses.

SECTION 7

The 3PL Opportunity and Multi-Client Complexity

India's 3PL market is growing rapidly as e-commerce brands outsource logistics complexity. 3PLs managing multiple clients need: client-level inventory separation at the WMS level; client-specific carrier selection rules at the aggregator level; client-level reporting independent of other clients' data; and consolidated operational visibility for management. Generic platforms handle this through workarounds that scale poorly.

SECTION 8

A Framework for Logistics Technology Evaluation

Prior ity	Technology	Primary Benefit	Implementation
1	Courier Aggregator	Shipping cost optimisation, COD automation, dispatch labour reduction	2–4 weeks
2	Warehouse Management (WMS)	Picking accuracy, dispatch speed, inventory accuracy	2–4 weeks

Prior ity	Technology	Primary Benefit	Implementation
3	Carrier Performance Analytics	RTO reduction, COD write-off reduction via data-driven routing	Ongoing
4	Courier Management Software	For own-fleet operators: route optimisation, digital POD, COD accountability	2–4 weeks

Table 3: Logistics Technology Investment Priority Framework

SECTION 9

Conclusion

India's e-commerce logistics market presents both significant opportunity and distinctive operational challenge. The combination of geographic diversity, COD complexity, carrier fragmentation, and rapid non-metro expansion creates a management problem that is genuinely more complex than comparable e-commerce markets globally.

The businesses that manage this complexity profitably invest in technology infrastructure to make multi-carrier logistics systematic: carrier selection based on live rates and performance data; COD management with shipment-level tracking and automated reconciliation; and operational analytics that generate the data required for continuous improvement. The technology is accessible, implementable within weeks, and generates measurable returns within the first quarter of operation.

About Aircraft Solutions

Aircraft Solutions Private Limited is an enterprise software company headquartered in Pune, India. Aircraft's logistics product suite — Courier Aggregator, Courier Management Software, and Mate TMS (Transport Management System) — is designed specifically for the operational characteristics of Indian e-commerce and logistics.

Aircraft's Courier Aggregator integrates with India's major carriers — Delhivery, Bluedart, DTDC, Ecom Express, Shadowfax, Xpressbees, Ekart, FedEx, and DHL — providing rate comparison, automated booking, unified tracking, and COD reconciliation from one platform.

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Product: Courier Aggregator — www.aircraft.co.in/products/courier-aggregator-software/