Delivery Performance Analysis

Indonesian Courier Services — E-Commerce Dataset

Group 4 | Section A | February 2026

1. Project Overview

This report presents a comprehensive analysis of courier delivery performance across major Indonesian cities. The dataset captures 8,449 e-commerce orders placed between 2022 and 2023, spanning five courier services and twenty destination cities.

The primary objective is to evaluate delivery efficiency, identify geographic performance trends, assess customer satisfaction, and provide actionable recommendations for logistics improvement.

8,449	2.81 Days	3 / 5
Total Orders	Grand Avg Delivery Time	Avg Product Rating

The analysis is structured around four key dimensions: courier-level delivery time, delivery type performance, product rating consistency, and city-level delivery speed benchmarking.

2. Data Dictionary

The dataset contains the following eight fields:

Column	Data Type	Description
product_id	Integer	Unique identifier for each product/order
order_date	Date (DD/MM/YY)	Date the order was placed
courier_delivery	Text	Courier service used (J&T Express, Jne, Ninja Xpress, Pos Indonesia, Sicepat)

city	Text	Destination city of delivery
district	Text	Specific district within the destination city
type_of_delivery	Text	Delivery tier: Express, Next Day, Reguler, Same Day
estimated_delivery_time_days	Integer	Estimated delivery duration in days
product_rating	Integer (1–5)	Customer rating of the product after delivery

3. Data Cleaning Notes

The raw dataset required several corrections and standardizations before analysis could begin. The following transformations were applied:

- order_date: Reformatted to a consistent YYYY format. Original entries were inconsistent in date structure.
- estimated_delivery_time_days: Removed all non-numeric characters including letters, filler words, and entries with missing values to ensure accurate numeric aggregation.
- courier_delivery: Standardized all values to proper case (e.g., 'jne' → 'Jne', 'j&t express' → 'J&T Express').
- city: Standardized to proper case for consistent grouping in pivot analysis.
- district: Standardized to proper case to eliminate duplicates caused by formatting inconsistencies.
- Removed duplicate and irrelevant rows that could skew aggregated results.

All cleaned data is stored in the Cleaned/ folder. A change log documents each transformation applied to the original dataset.

4. Analysis & Key Findings

4.1 Courier Delivery Time Performance

Across all five couriers, average delivery times are remarkably similar, ranging from 2.73 to 2.87 days. The grand average is 2.81 days. This uniformity suggests that the Indonesian courier market operates under similar logistical infrastructure and constraints, with no single courier holding a meaningful speed advantage.

Courier	Avg Delivery Time (Days)	Order Count	Order Share
J&T Express	2.84	1,653	19.6%
Jne	2.80	1,671	19.8%

Ninja Xpress	2.73	1,665	19.7%
Pos Indonesia	2.87	1,715	20.3%
Sicepat	2.83	1,745	20.7%
Grand Total	2.81	8,449	100%

Ninja Xpress records the fastest average delivery time at approximately 2.73 days, while Pos Indonesia is the slowest at 2.87 days. However, the 0.14-day difference is negligible in practical terms and does not represent a significant competitive advantage.

Order distribution is nearly perfectly balanced across all five couriers (19.6%–20.7%), indicating that no courier dominates market share. Customers do not show strong loyalty to any single provider, and platform defaults or pricing likely influence courier selection more than performance.

4.2 Delivery Type Analysis

The dataset includes four delivery types: Express, Next Day, Reguler, and Same Day. Their average estimated delivery times are as follows:

Delivery Type	Grand Avg Delivery Time (Days)
Express	2.74
Next Day	2.81
Reguler	2.84
Same Day	2.86

Express is the fastest at 2.74 days, which aligns with expectations. However, Same Day deliveries record the longest average at 2.86 days — a counterintuitive finding. This may reflect real-world constraints such as order cut-off times causing same-day bookings to be fulfilled the next day, or it may indicate that estimated delivery times in the dataset do not fully reflect the same-day promise.

The narrow spread across all four delivery types (only 0.12 days between fastest and slowest) suggests that delivery type classification may not strongly predict actual delivery speed in this dataset.

4.3 Product Rating by Courier

Average product ratings are consistent across all couriers, ranging narrowly from 2.99 to 3.03 out of 5. This consistency implies that the choice of courier does not significantly influence how customers rate their experience.

Courier	Avg Product Rating
J&T Express	2.99
Jne	2.98
Ninja Xpress	2.97
Pos Indonesia	3.03
Sicepat	3.01
Grand Total	3.00

Pos Indonesia leads with an average rating of 3.03, while Ninja Xpress records the lowest at 2.97. The 0.06-point spread is statistically insignificant. This finding suggests that product quality, pricing accuracy, and seller performance are stronger drivers of customer ratings than the courier selected.

4.4 City-Level Delivery Performance

At the city level, meaningful variation in delivery speed is observed. Cities with faster delivery times likely benefit from proximity to distribution hubs, better road infrastructure, or lower order volumes reducing congestion.

City	Avg Delivery Time (Days)	Performance
Malang	2.61	□ Fastest
Surakarta	2.66	□ Fast
Pekanbaru	2.72	□ Fast
Palembang	2.73	□ Fast
Tangerang	2.70	□ Fast
Makassar	2.69	□ Fast
Medan	2.83	□ Average
Jakarta	2.88	□ Average
Surabaya	2.92	□ Slow
Bogor	2.93	□ Slow
Depok	2.95	□ Slow
Semarang	2.97	□ Slowest

Malang (2.61 days) and Surakarta (2.66 days) are the top-performing cities for delivery speed. Semarang (2.97 days) and Depok (2.95 days) are the slowest, suggesting infrastructure or routing inefficiencies that merit attention from courier networks.

5. Conclusions

This analysis of 8,449 delivery orders reveals a highly competitive and uniform courier landscape in Indonesia. The key conclusions are:

- All five couriers deliver within a very tight performance band (2.73–2.87 days), indicating no single courier holds a decisive operational advantage.
- Express delivery is the most efficient tier and should be promoted as the default recommendation for time-sensitive orders.
- Same Day delivery paradoxically shows the highest estimated delivery time, pointing to a potential gap between customer expectations and operational reality that couriers should address.
- Product ratings are uniformly average (~3/5) and appear unaffected by courier selection — product-side improvements would yield greater impact on customer satisfaction.
- Geographic disparities exist: Malang and Surakarta are delivery hotspots with efficient turnaround, while Semarang and Depok lag behind and represent opportunities for infrastructure investment.
- Balanced order distribution across couriers suggests customer decisions are price- or platform-driven rather than performance-driven.

6. Recommendations

- Promote Express delivery as the go-to tier for efficiency; clarify Same Day service SLAs to manage customer expectations.
- Invest in distribution infrastructure in underperforming cities — particularly Semarang, Depok, and Bogor — to close the gap with faster cities.
- Leverage Malang and Surakarta as fulfilment centre models; replicate their routing and hub strategies in slower regions.
- Focus customer satisfaction improvement efforts on product quality and seller performance rather than courier optimization, given the uniform rating scores across all couriers.
- Conduct deeper analysis with actual delivery time data (vs. estimated) to uncover real performance gaps masked by uniform estimates.