K.I.E ADVISORY · CASE STUDY · E-COMMERCE LOGISTICS

A 25.20% return rate hidden inside a 45.54% margin business.

A logistics and fulfilment audit for a pan-European e-commerce operation across 20 countries, 5 carriers, and 10 product lines. Built end-to-end in Power BI Desktop on raw orders, products, and customers data, turning shipping noise into a carrier reallocation and returns reduction plan.

€204.7K
Sales analyzed across 1,000 orders, 20 EU markets

25.20%
Portfolio return rate, with country level spread of 15.52% to 38.89%

5 carriers
Compared by region, return rate, and average delivery time

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Simulated portfolio piece. Methodology demonstration on synthetic European e-commerce logistics data. No client data used.

01 · THE PROBLEM

A healthy P&L sitting on top of a returns problem.

On the income statement, the business looked strong. **€204.7K in sales** across 1,000 orders, a **45.54% profit margin**, and an **average delivery time of 3.97 days**, comfortably inside the 2 to 8 day European benchmark. By the numbers most operators look at, there was nothing wrong.

The returns picture told a different story. One in four parcels was coming back. The country level data ranged from **15.52% in Sweden to 38.89% in Romania**, more than a 2x spread. Carrier performance varied just as much: **GLS at 31.91% return rate against PostNL at 21.96%**, despite GLS posting a competitive 3.96 day average delivery time. Speed alone was not explaining returns.

The operator did not have a way to look at carrier, region, and product together. Carrier reports came from each provider in a different format. Product profitability was visible at a portfolio level, but not by country, not by carrier, and not in a way that could answer: *where is the next 5 percentage points of return rate going to come from*.

> **THE AUDIT QUESTION**
>
> Which combinations of carrier, region, and product are driving the 25.20% return rate, and where would a single reallocation of shipping volume produce the biggest reduction without changing the product mix?

What the operator was working with

THE DATA THEY HAD

- Three CSV exports: orders (13 columns of transactional data), products (catalogue with supplier and category), customers (region and order type).
- 1,000 orders across 20 European countries spanning calendar year 2026.
- Five carriers in rotation: DHL, FedEx, GLS, UPS, PostNL.

THE QUESTIONS THEY COULDN'T ANSWER

- Which carrier is best for which region, accounting for both return rate and delivery time?
- Are high return rates driven by carrier handling, product factors, or geography?
- Is delivery time getting worse over time, and does it correlate with returns?
- Which products are profitable enough to absorb their return rate, and which are not?

02 · THE BUILD

A 6-page operational decision report.

The report is structured as a top-down narrative. Page 1 sets the headline picture. Pages 2 and 3 isolate the product and profitability story. Pages 4 and 5 isolate the logistics and carrier story. Page 6 closes with five concrete recommendations, each one tied to a measure on an earlier page.

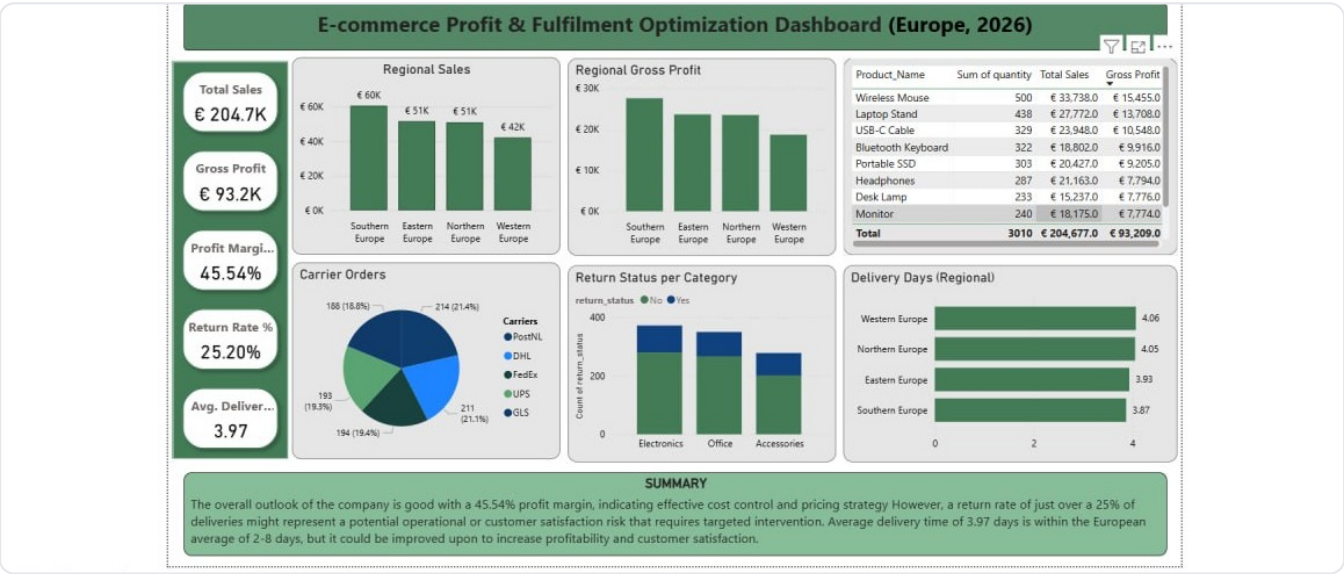


Figure 1, Executive Summary. *The landing page surfaces the five operating KPIs (Total Sales, Gross Profit, Profit Margin, Return Rate, Avg. Delivery Days) alongside regional sales, regional gross profit, the product profitability table, carrier order mix, return status by category, and average delivery days per region. The full six page structure of the audit is covered across the figures that follow.*

€204.7K	€93.2K	45.54%	25.20%	3.97
TOTAL SALES	GROSS PROFIT	PROFIT MARGIN	RETURN RATE	AVG. DELIVERY DAYS

RETURNS CONCENTRATION (SURFACED ON PAGE 1)

1 in 4 parcels comes back. Regional delivery time ranges from 3.87 days (Southern Europe) to 4.06 days (Western Europe), a tight 0.19 day band, but return rate spread across countries reaches 23 percentage points. This means returns are not being driven by speed.

MARGIN ENGINE (SURFACED ON PAGE 1)

Southern Europe leads on both sales (€60K) and gross profit, while the top three SKUs (Wireless Mouse, Laptop Stand, USB-C Cable) account for 42% of total sales and 42% of gross profit. The portfolio is healthy, the leakage is operational not commercial.

03 · THE DIAGNOSIS, PRODUCT

High margin and high return rate are correlated.

The product views break the catalogue open. Margin and return rate get plotted side by side, and a counter intuitive pattern shows up: four of the six SKUs with above average return rates are also among the most profitable products in the portfolio.

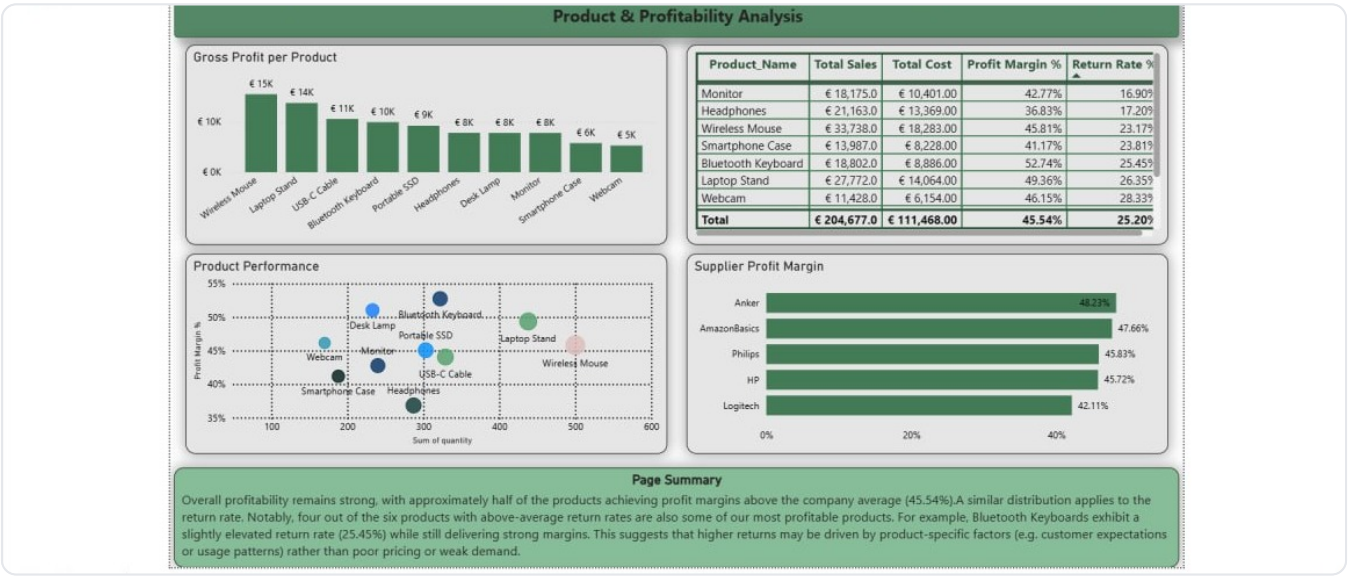


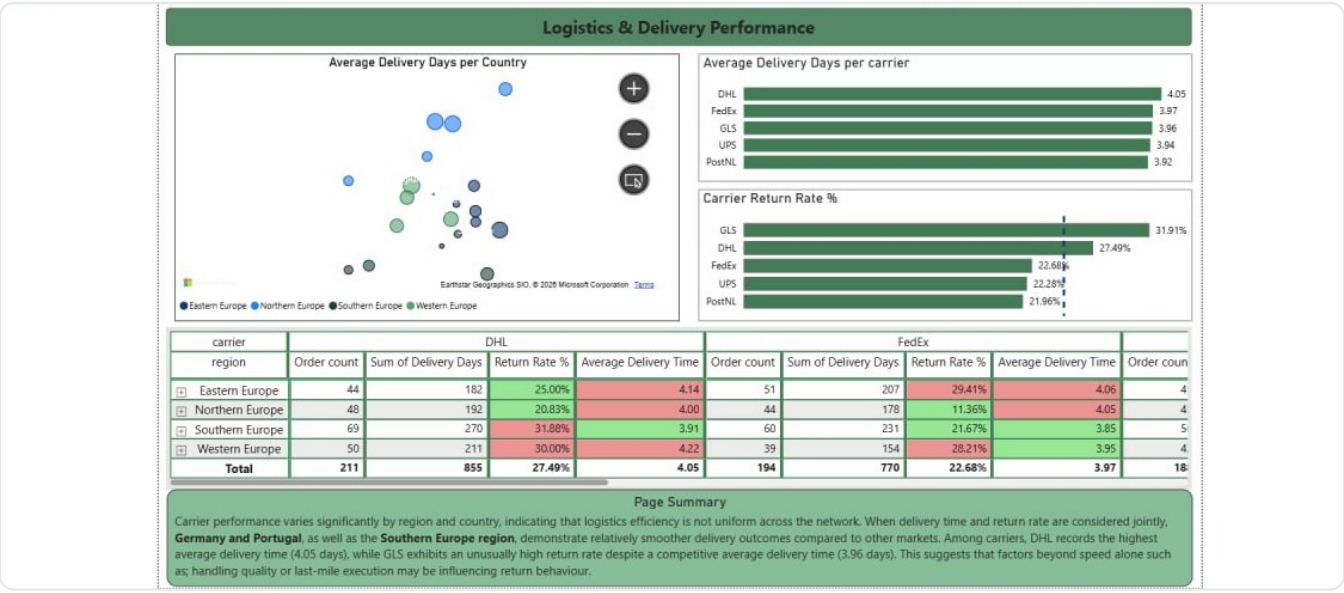
Figure 2, Product and Profitability Analysis. *Gross profit per product, the SKU level profitability table sorted by profit margin, a margin versus quantity scatter, and supplier level margin. Bluetooth Keyboards post a 52.74% margin while sitting at a 25.45% return rate. Desk Lamps are the highest return rate product at 29.87% but still hold a 51.03% margin.*

Figure 3, Product and Profitability, continued. *Regional profit margin (Northern Europe leads at 46.12%), a conditionally formatted product table flagging which SKUs sit above or below the 25.20% portfolio return rate, and a monthly margin and gross profit dual axis showing margin range from 41.5% (September) to 48.43% (August).*

> "The most profitable products carry the highest returns. That is not a pricing problem, it is a customer expectation, packaging, or product description problem, and it gets solved on the operations side, not the marketing side."

Carrier choice is doing more damage than carrier speed.

The logistics views isolate carrier performance from regional performance, then layer them. The headline finding falls out immediately: the fastest carriers are not the best carriers, and one specific carrier is dragging the entire portfolio's return rate up on its own.



carrier	DHL				FedEx				
region	Order count	Sum of Delivery Days	Return Rate %	Average Delivery Time	Order count	Sum of Delivery Days	Return Rate %	Average Delivery Time	Order coun
Eastern Europe	44	182	25.00%	4.14	51	207	29.41%	4.06	4
Northern Europe	48	192	20.83%	4.00	44	178	11.36%	4.05	4
Southern Europe	69	270	31.88%	3.91	60	231	21.67%	3.85	5
Western Europe	50	211	30.00%	4.22	39	154	28.21%	3.95	4
Total	**211**	**855**	**27.49%**	**4.05**	**194**	**770**	**22.68%**	**3.97**	**18**

Figure 4, Logistics and Delivery Performance. *Average delivery days per country (geo scatter), per carrier (DHL 4.05 days, PostNL 3.92 days), carrier return rate (GLS 31.91%, PostNL 21.96%), and a carrier by region breakdown showing DHL at 31.88% return rate in Southern Europe versus 20.83% in Northern Europe.*

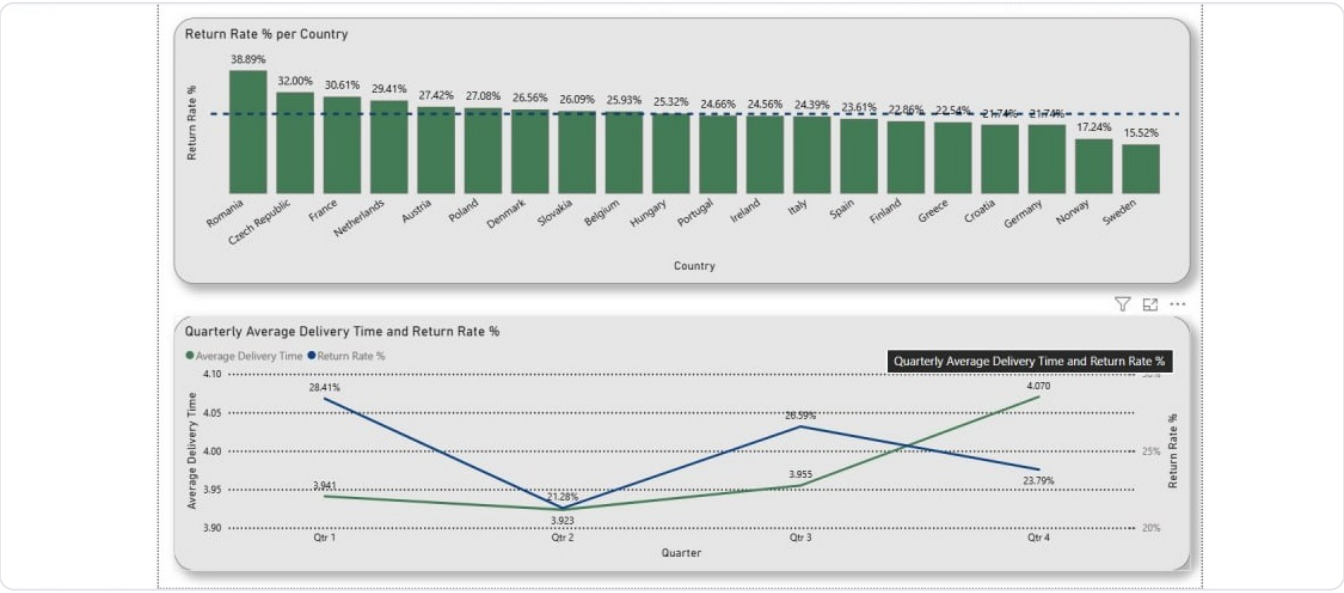


Figure 5, Logistics and Delivery Performance, continued. *Country level return rate ranking (Romania 38.89% at the top, Sweden 15.52% at the bottom), and a quarterly view of average delivery time (3.92 to 4.07 days) versus return rate (21.28% to 28.41%). Q4 shows delivery time creeping up while return rate trends down, suggesting the seasonal pressure point is operational capacity, not customer behaviour.*

GLS ANOMALY

GLS has the highest return rate in the network at 31.91%, despite a competitive 3.96 day average delivery time, only 0.04 days slower than the fastest carrier. Speed is not the issue. Handling, damage, or last mile execution is the most likely cause and is the highest impact place to investigate first.

ROMANIA CONCENTRATION

Romania alone runs at a 38.89% return rate, more than 2x the lowest country in the network. The country has shared coverage between GLS and FedEx. Reallocating Romanian volume to UPS, which already covers all of Eastern Europe, is the single highest leverage carrier change available.

05 · THE METHODOLOGY

How it was built.

The audit is built on three CSV inputs: orders (13 columns of transactional data), products, and customers. Every metric on every page is a calculated measure, not a stored value. The full data architecture is summarized below.

DATA MODEL

A three table star schema with **orders** as the fact table joined to **products** and **customers** dimensions. Both relationships are Many-to-One, single direction filter, on `product_id` and `customer_id` respectively. Auto date hierarchies are attached to the three date fields on the orders table (`order_date`, `ship_date`, `delivery_date`) so the same set of measures works across order based, ship based, and delivery based time slicing.

POWER QUERY TRANSFORMATIONS

- CSV ingestion with explicit type coercion across all 13 order columns (text, date, Int64) so downstream measures never silently coerce strings to numbers.
- Header promotion and column renames on the customers table to convert generic column headers into business readable names (Customer ID, Country, Region, Order type).
- Cost and price columns standardized as Int64 for clean numeric aggregation.

CALCULATED COLUMNS

Delivery Days

`DATEDIFF(orders[ship_date], orders[delivery_date], DAY)`. Turns two raw timestamps into a usable lead time metric, which then powers the per region, per carrier, per quarter delivery visuals.

IsDelayed

`IF(DATEDIFF(ship_date, delivery_date, DAY) > [Average Delivery Time], 1, 0)`. Flags any order shipped slower than the dataset's own average. Dynamic benchmark, not a hard coded SLA, so the flag self adjusts as the data changes.

KEY DAX MEASURES

Total Sales

`SUMX(orders, orders[price] * orders[quantity])`. Row level revenue rollup, calculated at unit economics level rather than aggregated.

Total Cost

`SUMX(orders, (orders[cost] * orders[quantity]) + orders[ship_cost])`. COGS plus shipping baked into a single cost figure, so margin already includes fulfilment cost.

Gross Profit

`[Total Sales] - [Total Cost]`. Reused across product, country, region, and time visuals.

Profit Margin %

`DIVIDE([Gross Profit], [Total Sales], 0)`. Safe divide pattern with a zero fallback to prevent division by zero errors when filter context produces an empty set.

Return Rate %

VAR driven measure that counts total orders and returned orders separately using `CALCULATE(COUNT(...), orders[return_status] = "Yes")`, then DIVIDE for the ratio. Encapsulating the count logic in VARs keeps the measure readable and testable.

Return Rate Benchmark

`CALCULATE([Return Rate %], ALL(orders))`. Strips filter context to compute a global baseline, so any sliced view can be compared against the portfolio wide rate.

Return Rate Color

VAR driven hex code measure that compares current Return Rate % to the Benchmark and returns `"#ED9494"` (red) or `"#97E797"` (green). Drives dynamic conditional formatting on the country and product level tables, so visuals update automatically as the underlying data changes.

Average Delivery Time

`AVERAGE(orders[Delivery Days])`. Powers the per region, per carrier, and quarterly trend views, and feeds back into the IsDelayed calculated column.

% Delayed Deliveries

`DIVIDE(SUM(orders[IsDelayed]), [Order count], 0)`. Share of orders breaching the dynamic benchmark, expressed as a portfolio level KPI.

REPORT ARCHITECTURE

- **Six page report structure**: Executive Summary, Product and Profitability Analysis, Product and Profitability Analysis continued, Logistics and Delivery Performance, Logistics and Delivery Performance continued, Recommendations and Next Steps.
- **Conditional formatting via DAX measure**, not static rules, on the carrier by region and product level tables. The Return Rate Color measure means the green and red flags follow whatever filter the user applies.
- **Dual axis time series visuals** on the quarterly view, plotting Average Delivery Time and Return Rate % on independent scales to expose correlations and divergences.
- **Geographic scatter** on the logistics page, mapping average delivery days per country with the four region colour grouping carried through every visual for consistent legend interpretation.

Power BI | DAX · SUMX · CALCULATE · ALL | VAR / DIVIDE | Star Schema | Power Query (M) | Calculated columns | Dynamic conditional formatting | Time intelligence

06 · THE OUTCOME

From dashboard to decision.

The deliverable does not stop at numbers. The final page of the report translates the analysis into five operational recommendations and a four item next steps list. Each recommendation is tied directly to a measure or visual on an earlier page so any claim can be re derived live.

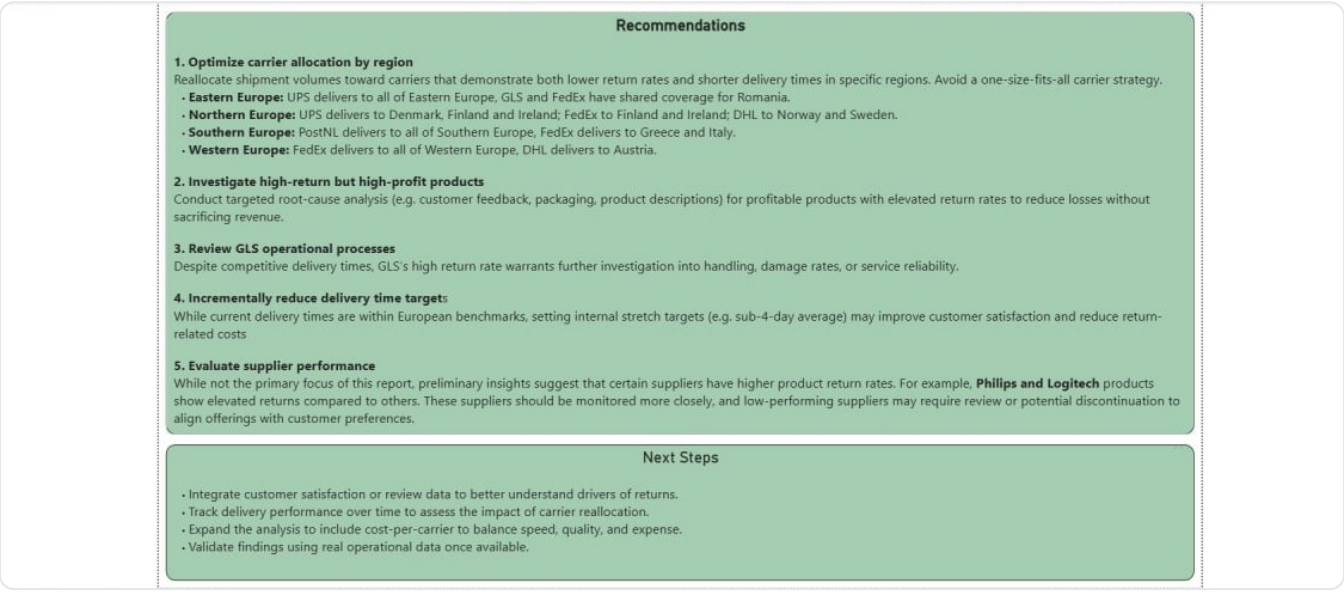


Figure 6, Recommendations and Next Steps. *Five ordered recommendations, each one written in operator language, each one referenceable back to a measure on an earlier page.*

THE FIVE RECOMMENDATIONS DELIVERED

- **Optimize carrier allocation by region.** Reallocate volume toward carriers with both lower return rates and shorter delivery times in each region. UPS already covers all of Eastern Europe and is the obvious destination for Romanian volume currently split between GLS and FedEx. Western Europe is dominated by FedEx with DHL covering Austria. The "one carrier everywhere" model is the wrong default.
- **Investigate high return, high profit products.** The four SKUs sitting above the 25.20% return benchmark while still posting margins above 45.54% are the priority for root cause review. Customer feedback, packaging, and product description audits, not pricing changes.
- **Review GLS operational processes.** 31.91% return rate against a competitive 3.96 day delivery time means the issue is downstream of speed. Handling, damage rates, and last mile execution are the candidates for review.
- **Set internal stretch targets on delivery time.** The 3.97 day portfolio average is inside the 2 to 8 day European benchmark, but a sub 4 day internal target on Western and Northern Europe would close the gap to Southern Europe (3.87 days) and remove the Q4 capacity drag visible in the quarterly trend.
- **Evaluate supplier performance.** Philips and Logitech show elevated return rates in the supplier view. Ongoing monitoring with the option to discontinue the lowest performing supplier lines if returns do not normalize after the carrier reallocation lands.

NEXT STEPS AS DELIVERED

- Integrate customer satisfaction or review data to better understand the drivers of returns at the SKU and carrier level.
- Track delivery performance over time to assess the impact of the carrier reallocation, with a quarterly review cadence.
- Expand the analysis to include cost per carrier, so the speed and quality reallocation decisions also factor in fulfilment cost.
- Validate findings on real operational data once available, in particular country level return rates, which are the most volatile metric in the model.

Recommendations are based on the orders, products, and customers data available in this engagement. Before executing any carrier reallocation or supplier review, the following context is verified with the operator: contractual carrier commitments, regional service level agreements, customer service complaint logs, and product category packaging standards. The carrier and country return rate analysis identifies *where to investigate first*, it does not replace operational judgement.

07 · WORK WITH ME

If your fulfilment data lives across five carrier portals, you have an audit waiting to happen.

The Logistics and Fulfilment audit was built in Power BI Desktop from three CSV inputs, with no enterprise data warehouse required on the client side. Most ops heavy e-commerce operators have everything they need to run this analysis. They just do not have it in a form that produces decisions.

That is the gap I close. Audit grade Power BI deliverables for ops heavy companies that have outgrown their spreadsheets but have not yet committed to enterprise BI tooling. You get a .pbix file you own, unit economics you can defend to your board, and no infrastructure burden on your side.

WHAT A TYPICAL ENGAGEMENT LOOKS LIKE

- **Discovery (free, 20 min).** What numbers do you make decisions on, what data do you actually have, and where is the biggest blindspot.
- **Profit or Ops Audit.** Same depth and structure as the deliverable in this document, scoped to your portfolio and your data shape. Delivered as a .pbix file you keep, no licensing dependency on me.
- **Optional retainer.** Monthly refresh, scenario re runs, and quarterly review when your category or cost structure shifts.

Book a 20-minute discovery call.

Bring one report you currently use to make a decision. I will show you what is missing from it and what an audit would surface, no commitment, no slide deck.

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Logistics and Fulfilment Optimization is a simulated portfolio piece built on synthetic European e-commerce logistics data. All figures, country level rates, carrier statistics, and findings in this document are derived from the simulated dataset. The methodology, DAX architecture, and report structure are identical to those used on real client engagements.