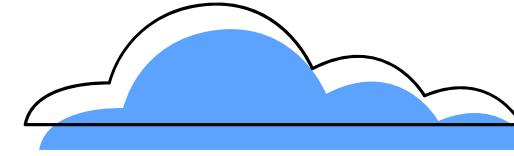


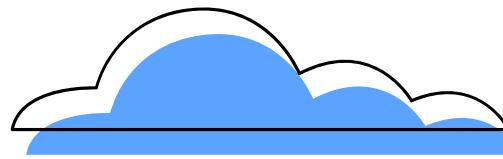
E-Commerce Supply Chain



Team: The Forecasters

- Pola Sabry
- Hager Hassan
- Marco George
- Malak AlaaEldin

Presented BY



Team: The Forecasters

- **Pola Sabry**

Delivery Performance

- **Hagar Hassan**

Customer Analytics & Profitability

Analysis

- **Marco George**

Inventory Management & Stock

Optimization

- **Malak AlaaEldin**

Demand Forecasting & Predictive

Analytics

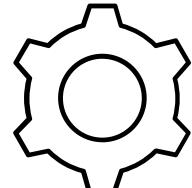
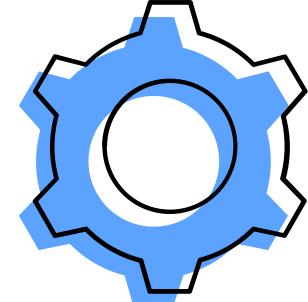


Table of content

This is the material point that will be delivered in the presentation.

01 Delivery Performance

02 Customer Behavior, Loyalty Analysis

03 Sales & Profit Analysis

04 Order Pattern Analysis

05 Inventory Metrics

06 Product Classification

07 Demand Forecast

Delivery Performance

Next Slide



Delivery Performance Summary

53K

Total Orders

28.96K

Late Deliveries

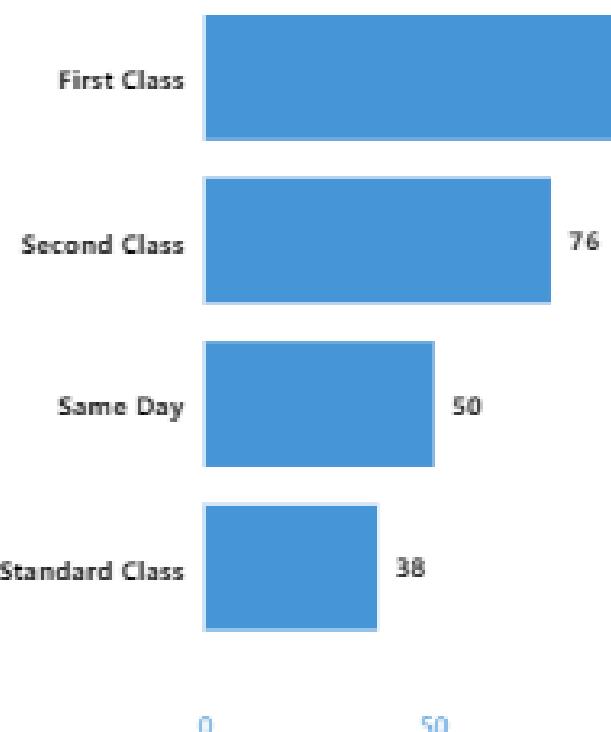
54.45

Late Delivery Rate

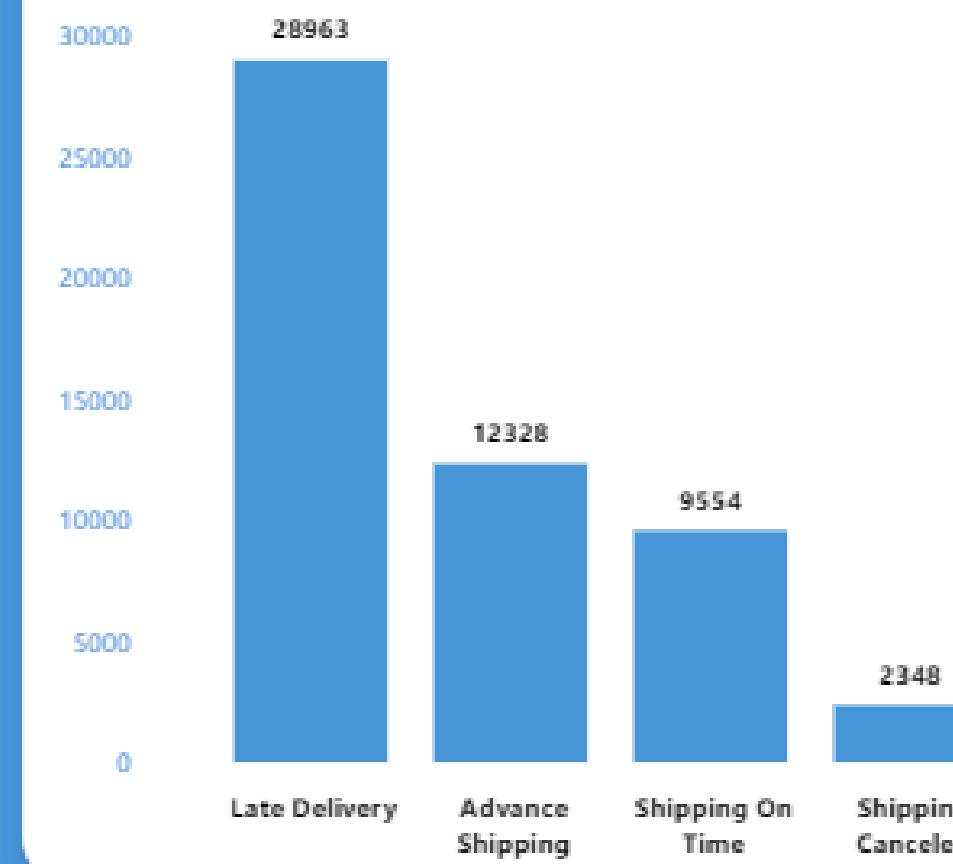
1.61

Avg Delay Late Deliveries

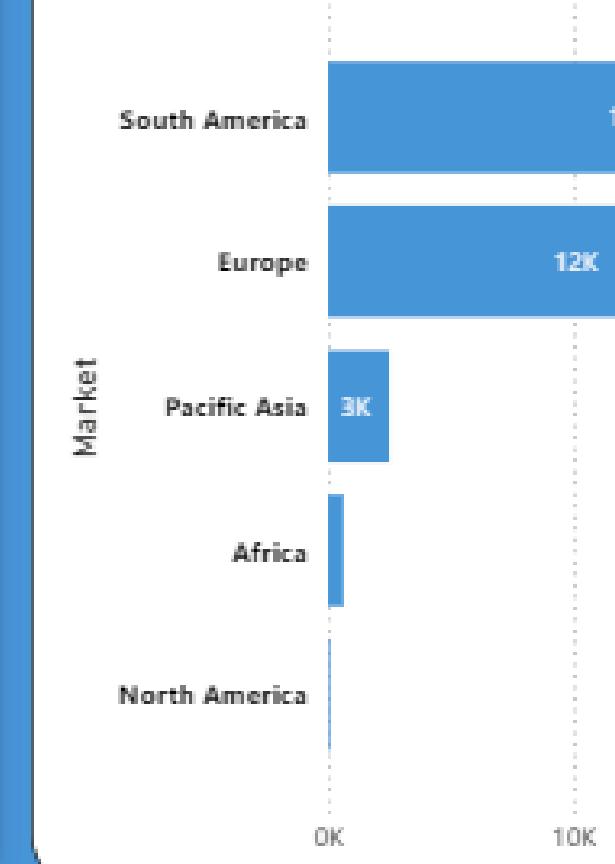
Late delivery Rate By Shipping Mode

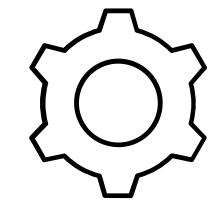
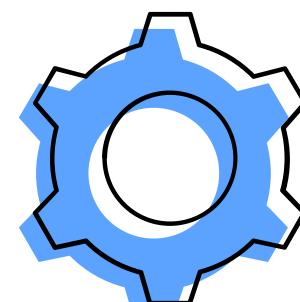


Delivery Status



Late Deliveries By Region





Shipping Mode Performance

53K

Total Orders

28.96K

Late Deliveries

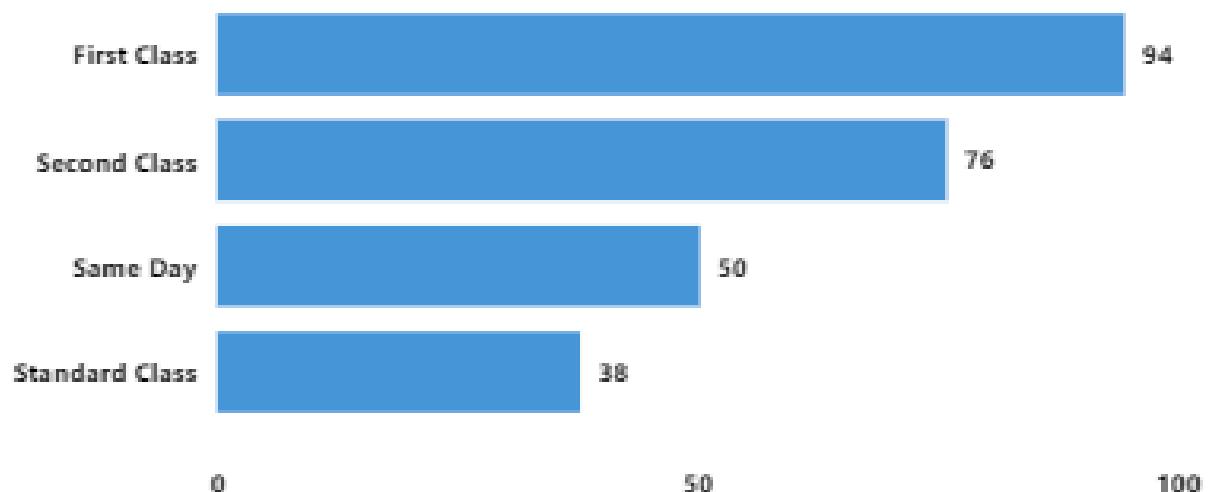
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Late Delivery Rate

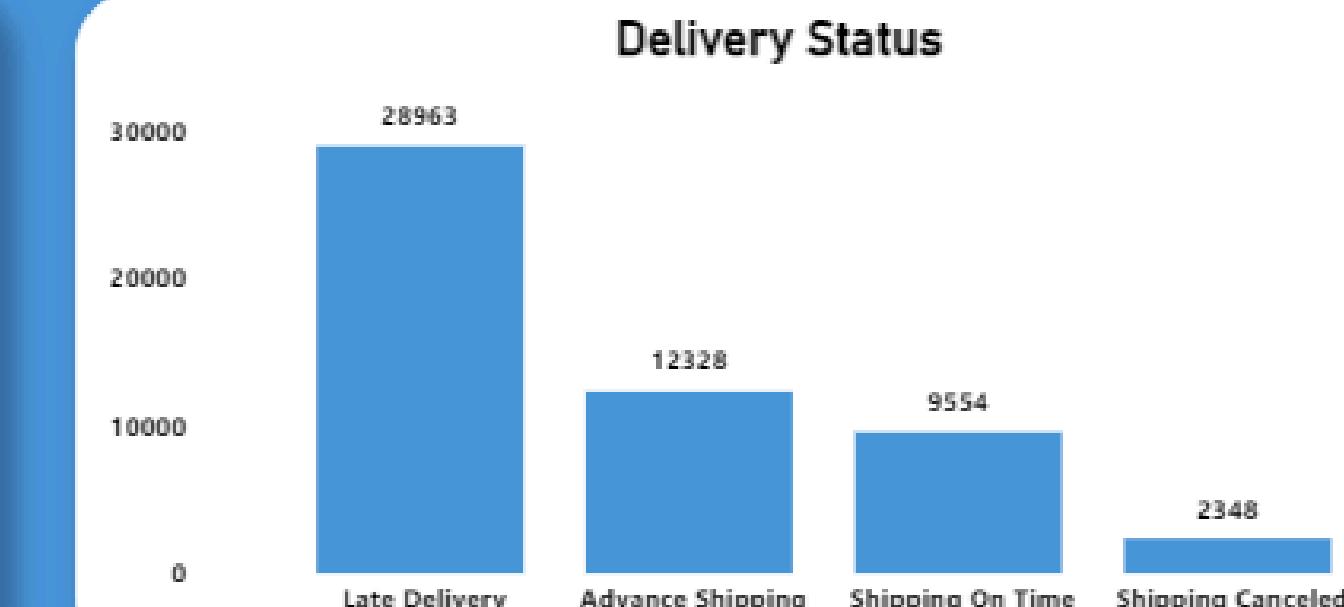
1.61

Avg Delay Late Delivery

Late delivery Rate By Shipping Mode



Delivery Status



Avg Scheduled Shipping Days

2.47

Avg Actual Shipping Days

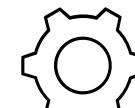
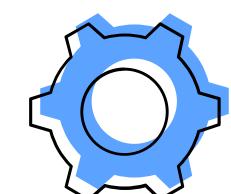
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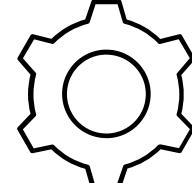
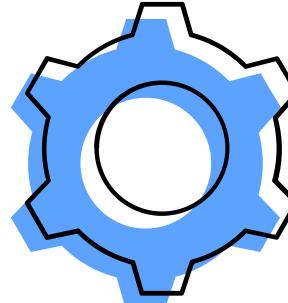
Advanced Shipping

23.18

Shipping On Time

17.96

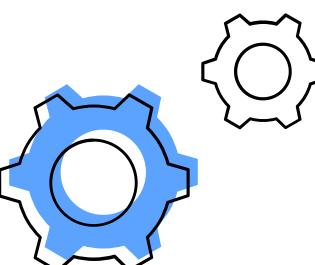


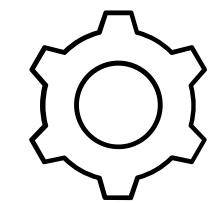
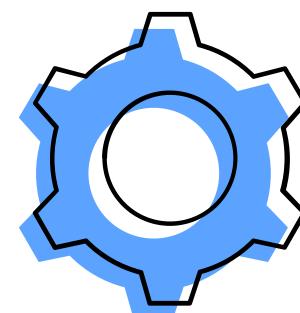


What the Data Shows (Findings):

1. Late Deliveries Are Extremely High Across All Shipping Modes

The overall Late Delivery Rate reaches 54%, meaning more than half of all orders arrive behind schedule.

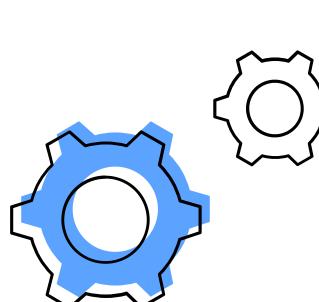
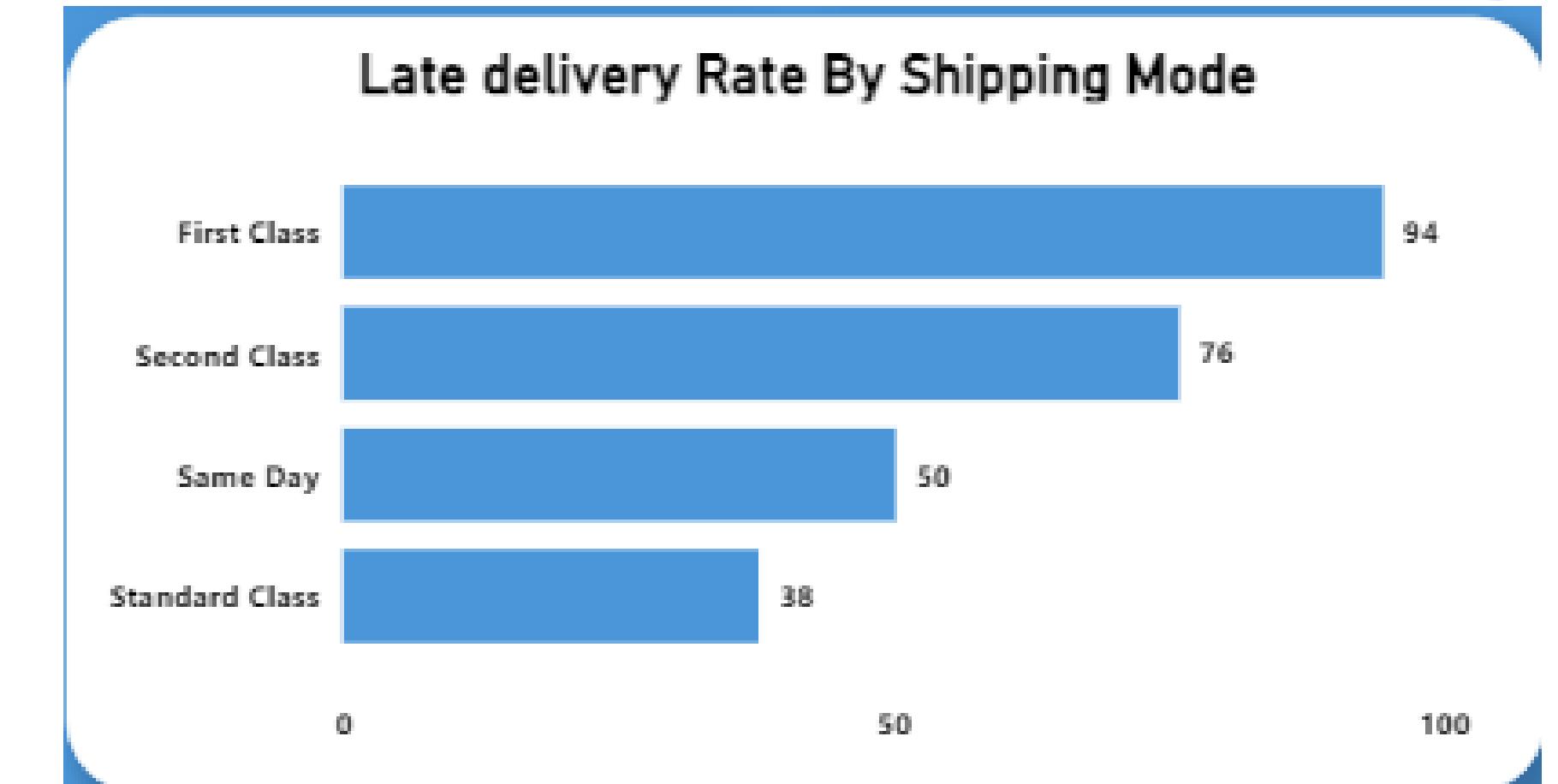


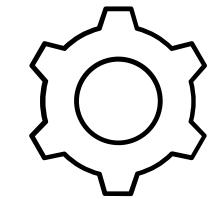
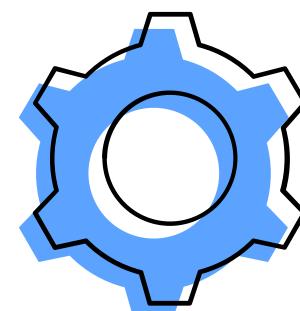


What the Data Shows (Findings):

1. Late Deliveries Rate Shipping Modes

- First class and second class are the highest late delivery rate
- **Recommendation**
- Should be stop temporary and replace it to standard Class.





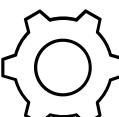
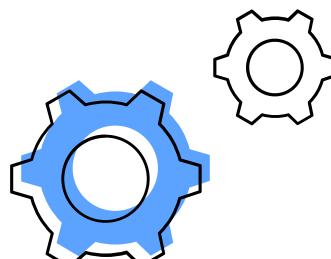
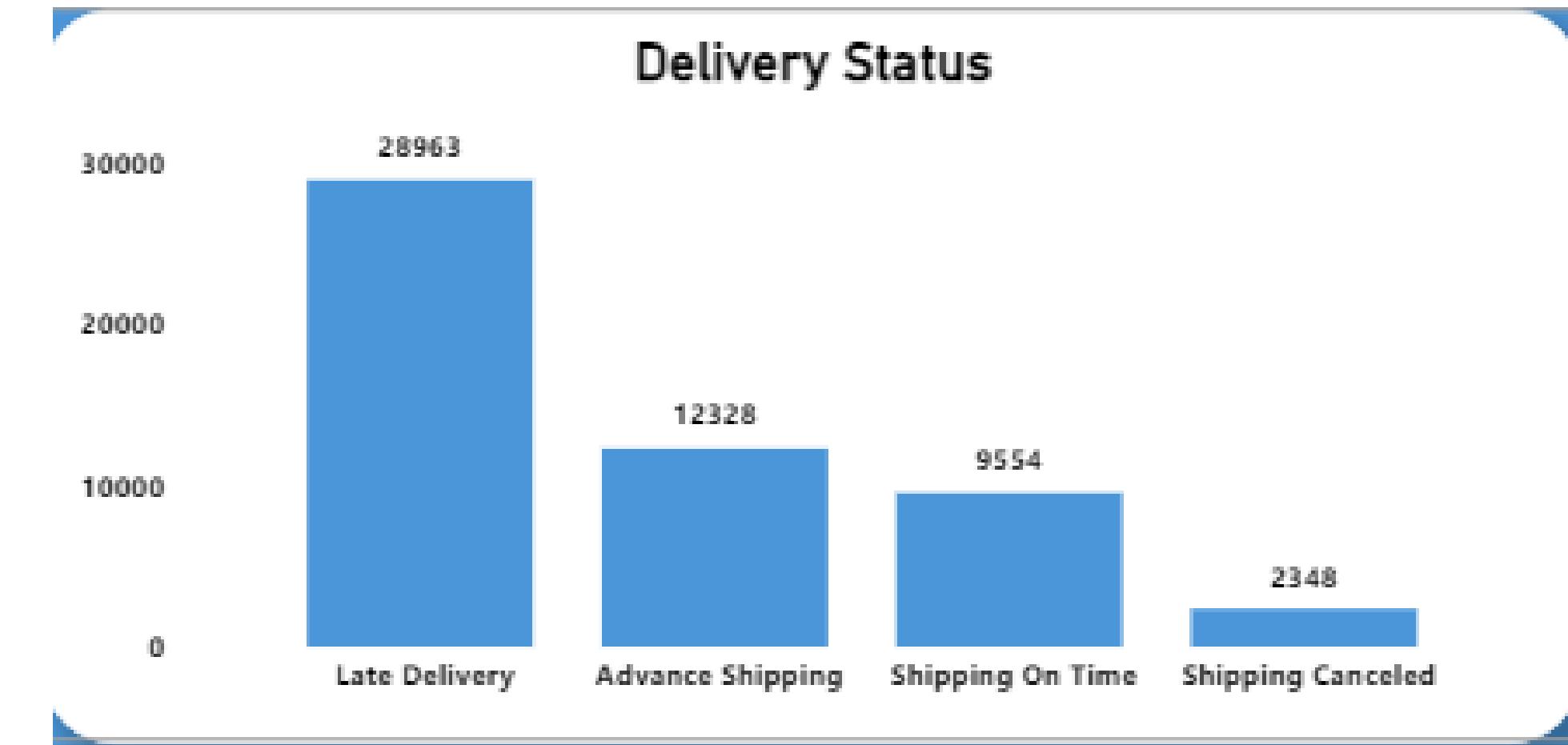
What the Data Shows (Findings):

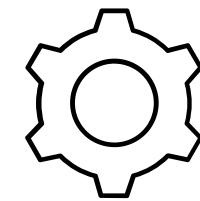
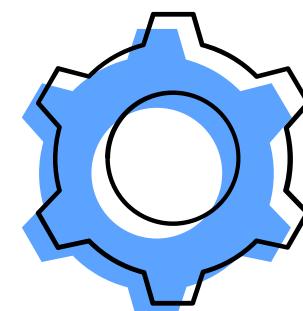
2. Delivery Status Percentage

- Late Delivery Rate 54.45%
- Advanced Shipping 23.18%
- Shipping On Time 17.96%
- Shipping Canceled 4.41%

2.1 Recommendation

shrink advanced ship and replace it to on time
(The main goal is make customer satisfied not delight)

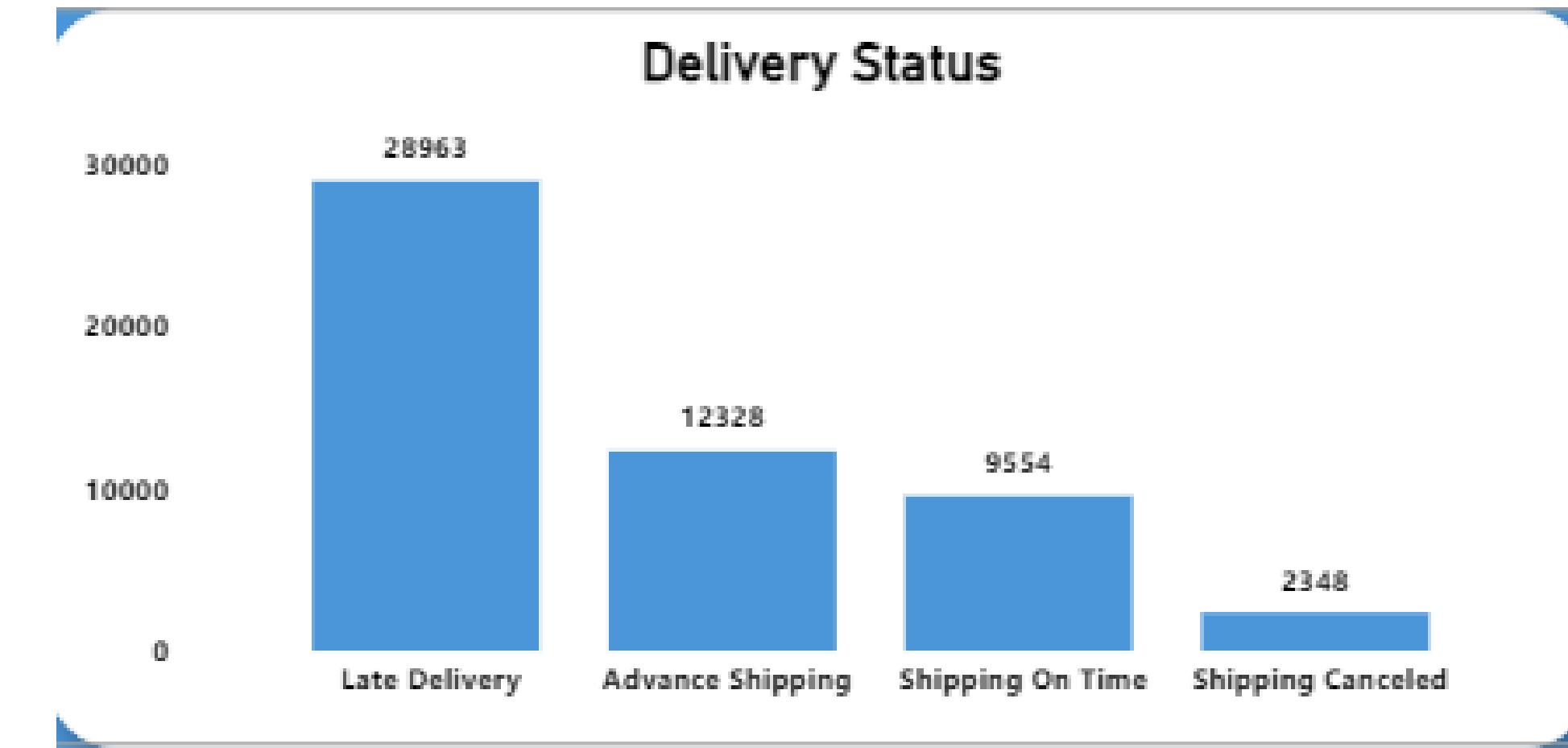




What the Data Shows (Findings):

2. Delivery Status Percentage

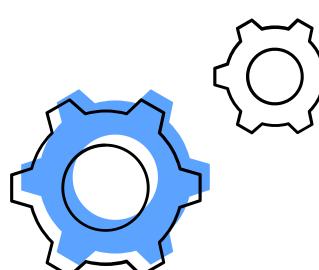
- Late Delivery Rate 54.45%
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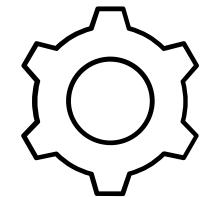
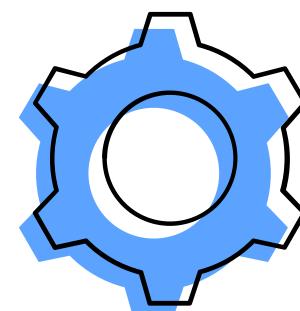


2.2 Recommendation

Identifying the Root Cause:

Operational Issue / Delivery Services or
Planning (scheduling) Issue.

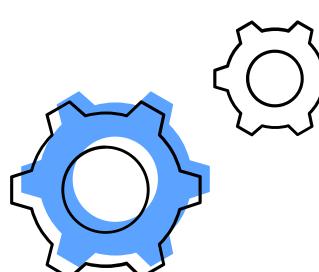
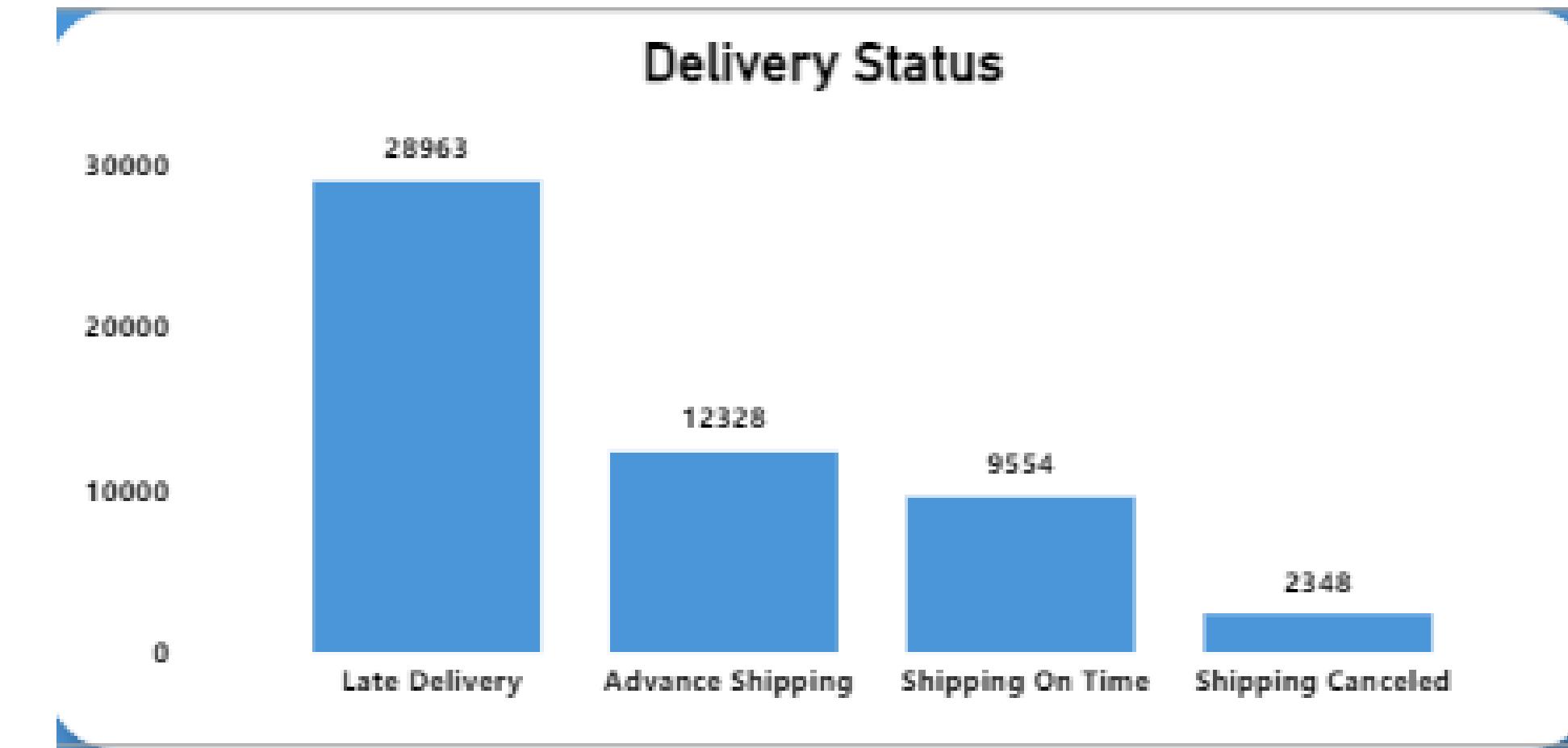


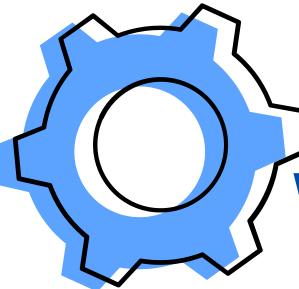


What the Data Shows (Findings):

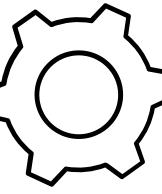
2.2 If Operational Issue

- Warehouse bottlenecks (slow picking/packing, limited staff, workflow congestion)
- Route planning inefficiencies
- Excessive handovers or checkpoints
- Inventory not ready at the time of processing



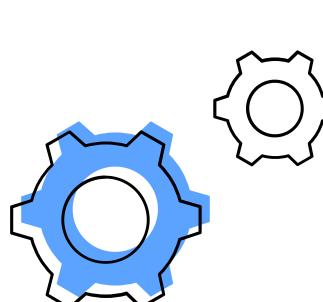
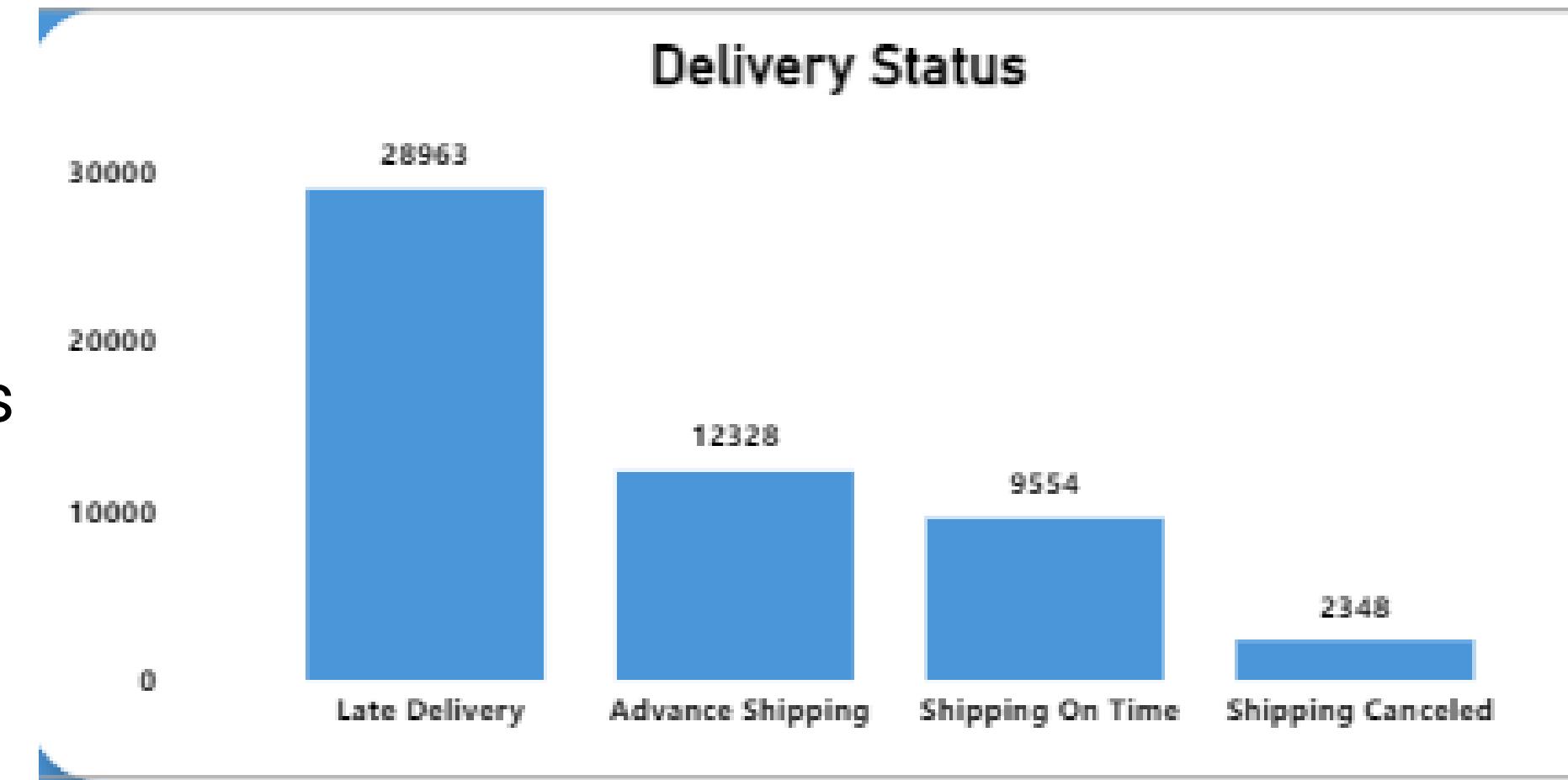


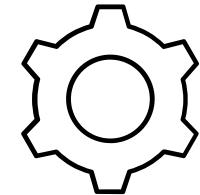
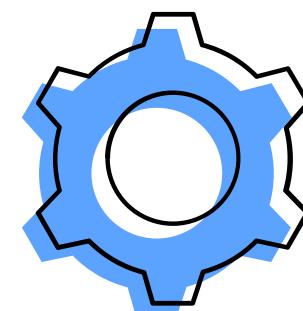
What the Data Shows (Findings):



2.2 If Delivery Services Issue

- Improving Carrier Performance
- Carrier Switching Strategy
- Carrier Optimization Recommendations
 - To improve delivery performance:
- Evaluate carriers by region (some carriers perform well in specific markets only).
- Use a mixed-carrier model to reduce risk.
- Reward high-performing carriers and penalize poor performance.
- Implement a backup carrier for peak seasons.





Geographic Delivery Performance

53K

Total Orders

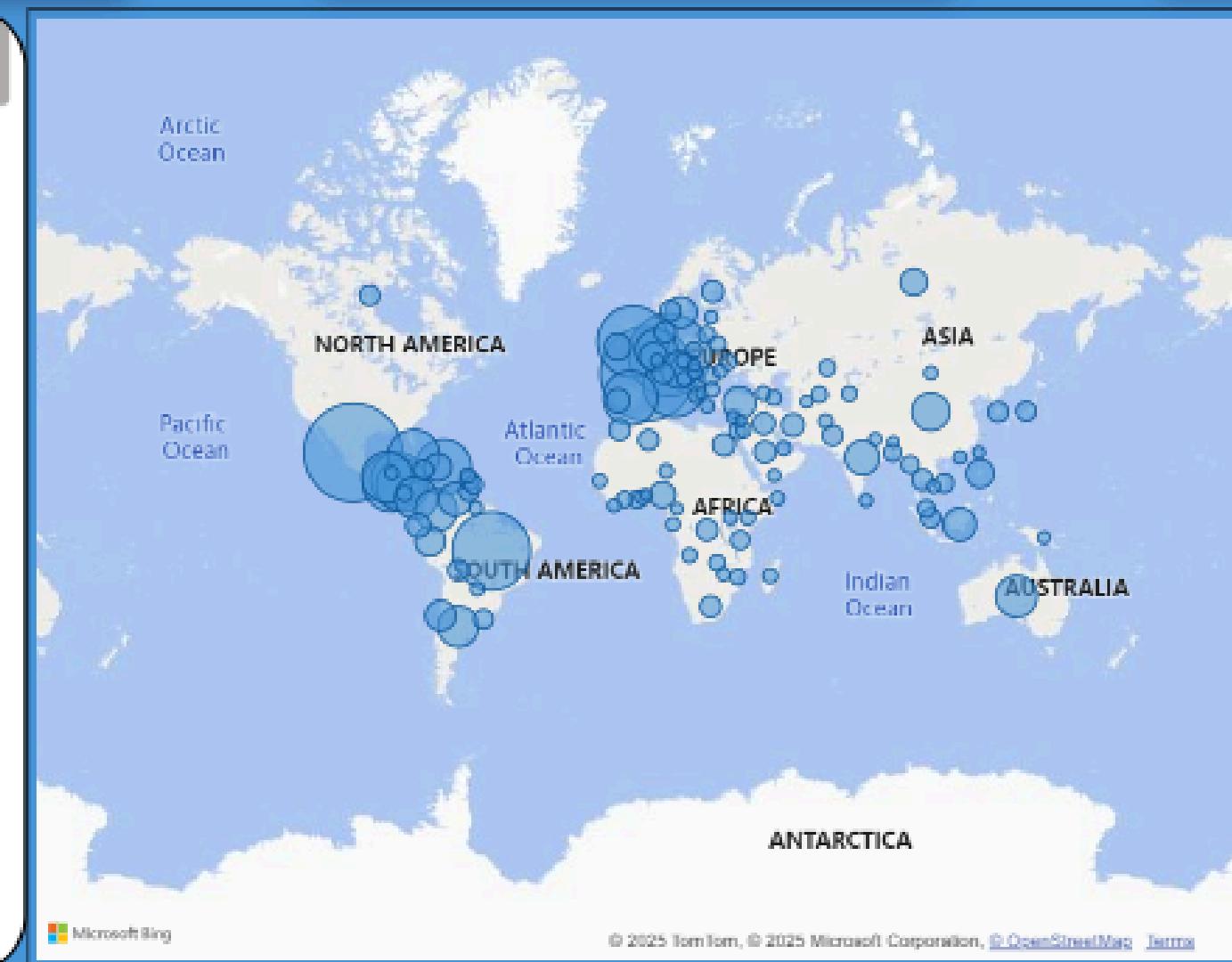
28.96K

Late Deliveries

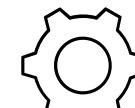
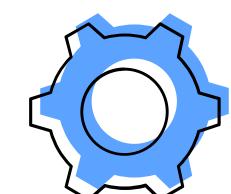
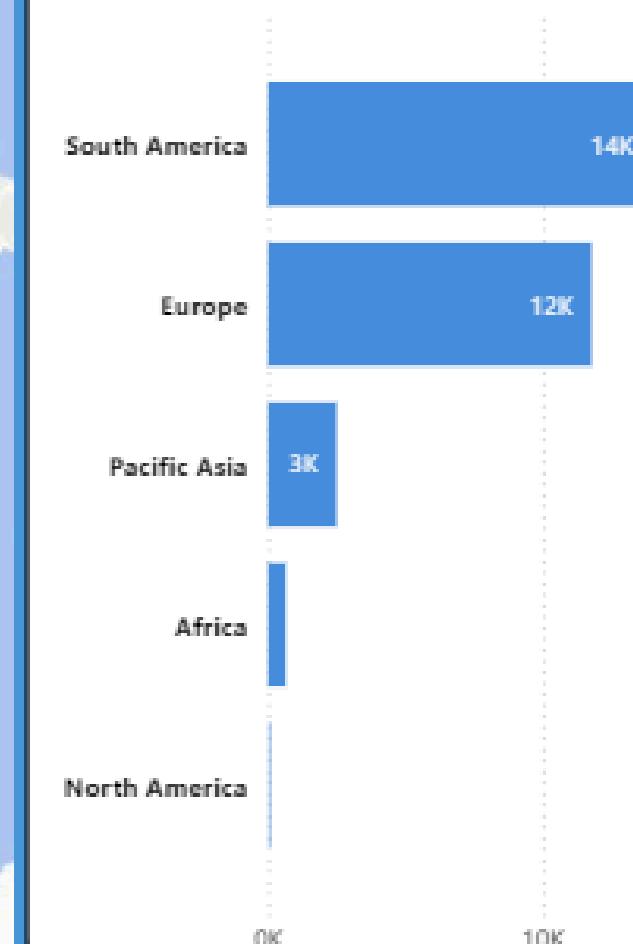
54.21

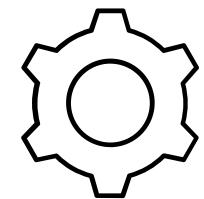
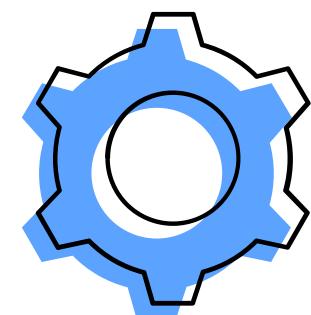
Late Delivery Rate

Country	State	late_deliveries
Reino Unido	Inglaterra	1,667.00
Francia	Isla De Francia	1,185.00
El Salvador	San Salvador	909.00
Alemania	Renania Del Norte-Westfalia	863.00
México	Distrito Federal	678.00
República Dominicana	Santo Domingo	598.00
Guatemala	Guatemala	586.00
Brasil	São Paulo	556.00



Late Deliveries By Region





What the Data Shows (Findings):

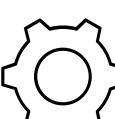
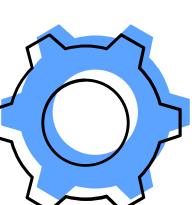
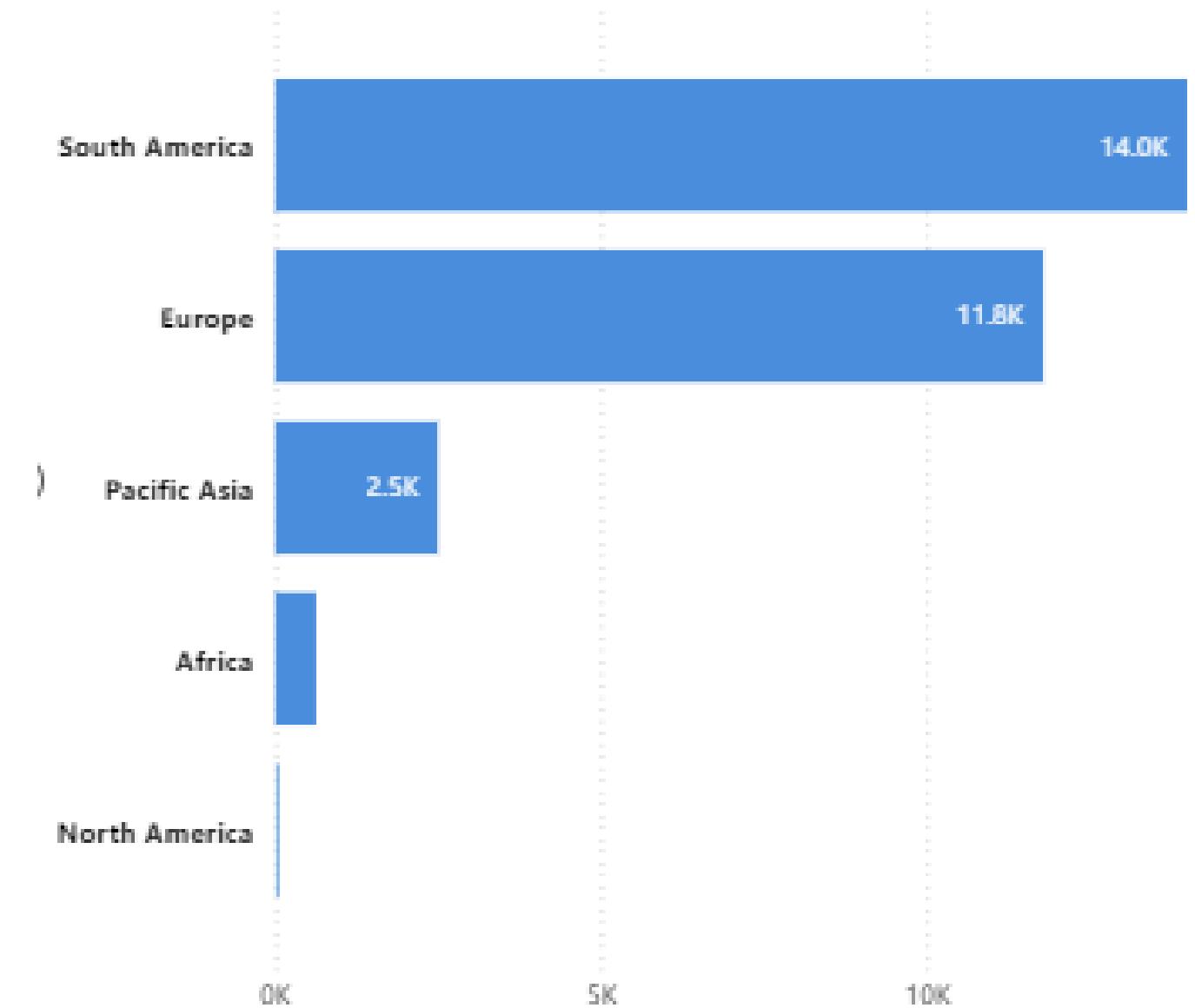
Regions With the Highest Late Delivery Rates

- Latin America Total_orders 25819 / Rate 54.21%
- Europe Total_orders 21464 / Rate 54.91%

Recommendation

Focus should be on Europe and South America, as they have the highest number of late deliveries, in order to maintain customer satisfaction.

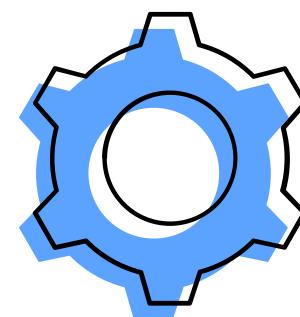
Late Deliveries By Region



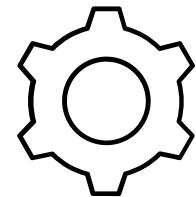
Customer Behavior, Loyalty Analysis

Next Slide





-Based on the [RFM](#) model that I used to measure customer loyalty,
I conclude that :



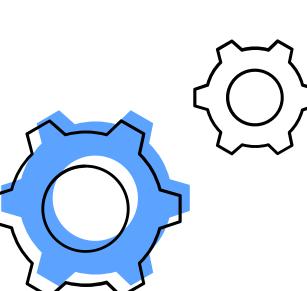
What the Data Shows (Findings):

1. Low Loyalty Dominates All Segments

- Across the three segments, around [75–76%](#) of all customers fall into the Low Loyalty category.
- High-loyalty customers represent only [6–7%](#), which indicates extremely weak retention.

2. Repeat Rates Are Low

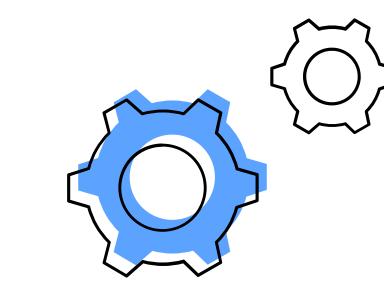
- Repeat rates fall between [12–14%](#), meaning most customers purchase once or twice and do not return.

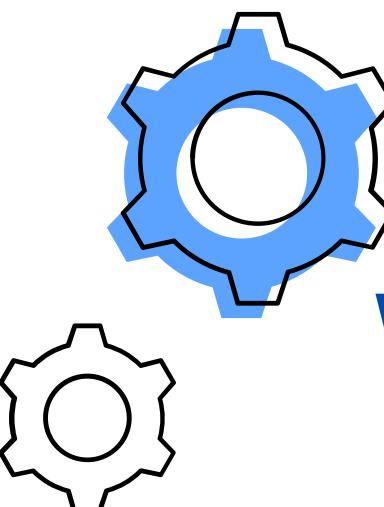




What the Data Shows (Findings):

3. Delivery Performance Is a Major Issue

- Late-delivery rates remain consistently high across all loyalty levels:
 - Consumer: 54–60%
 - Corporate: 54–63%
 - Home Office: 56–64%
 - Even high-loyalty customers experience very high delays.
This means the customer experience does not support the development of long-term loyalty.
- 



What the Data Shows (Findings):

4. High-Loyalty Customers Receive the Highest Discounts

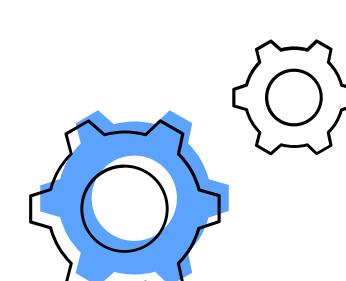
-Across all segments, the customers with the highest loyalty receive the highest average discount amounts:

- Home Office: 172
- Corporate: 165
- Consumer: 159

-This shows that loyalty is driven by discounts, not customer satisfaction or service quality.



The chart displayed here represents the overall view



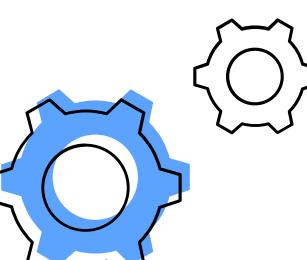
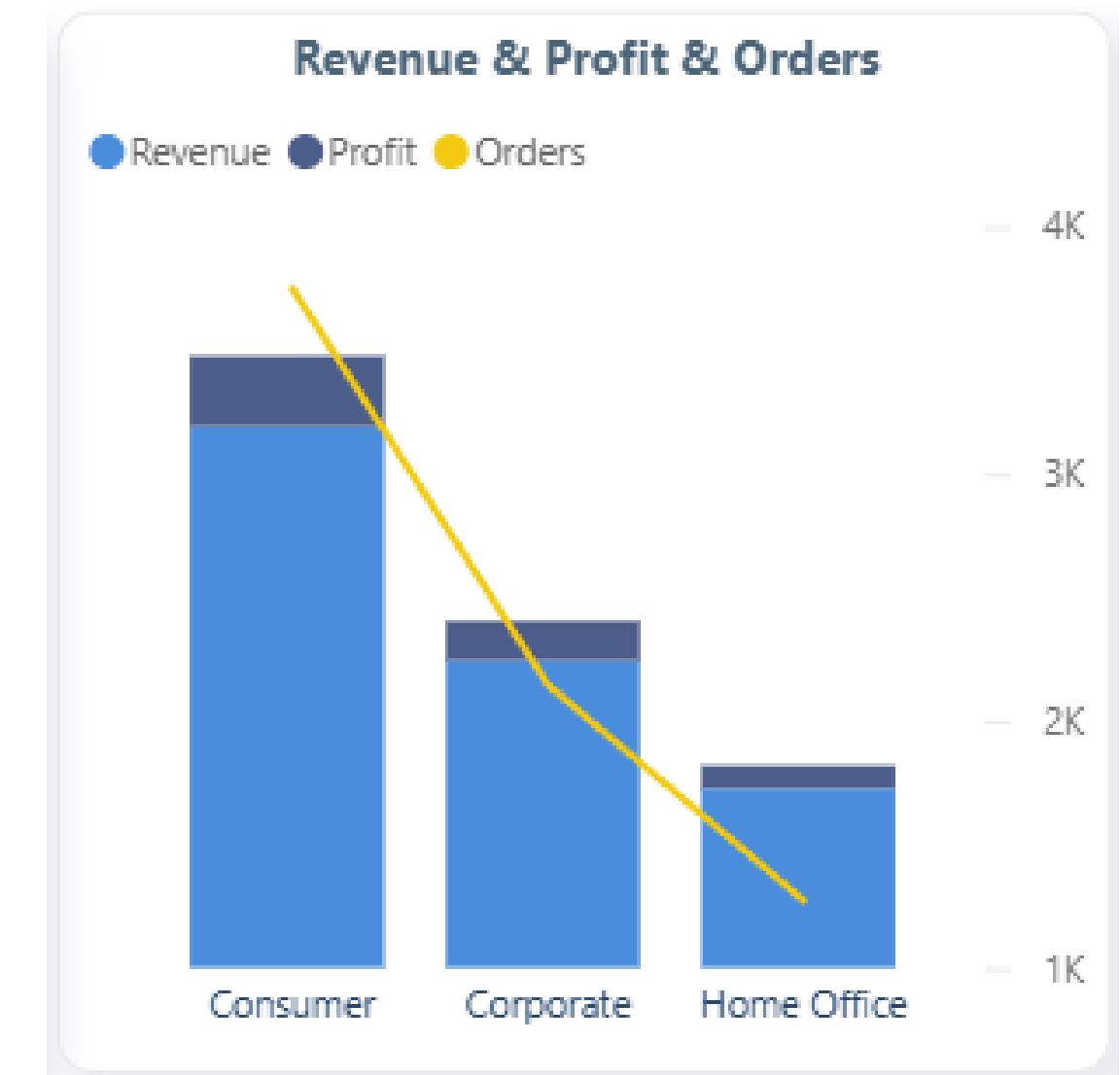
What the Data Shows (Findings):

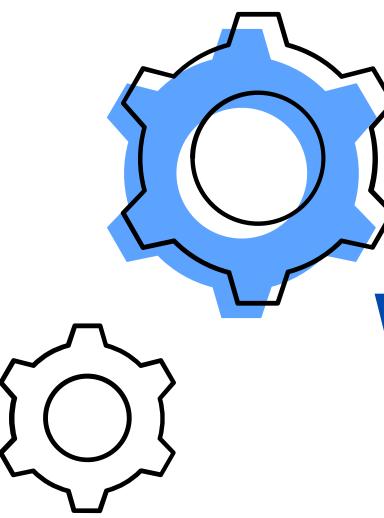
5. Consumer Segment Has the Best Value

- Highest customer base (3,243)
- CLV and AOV **above benchmark**
- Biggest contributor to revenue
Despite this, loyalty is still low.

6. Home Office Has the Strongest Repeat Behavior

- It has the highest repeat rate **13.88%**,
but it also has :
 - The highest discount cost
 - High delaysSo its loyalty is expensive to maintain.





What This Actually Means (Insights):

1) We do not have real loyalty.

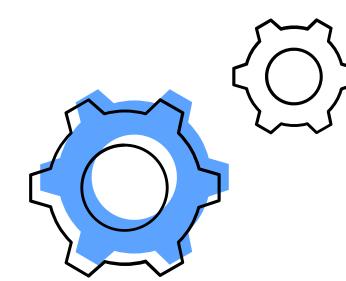
Customers classified as “High loyalty” are primarily staying because of high discount levels, not because they love the service.

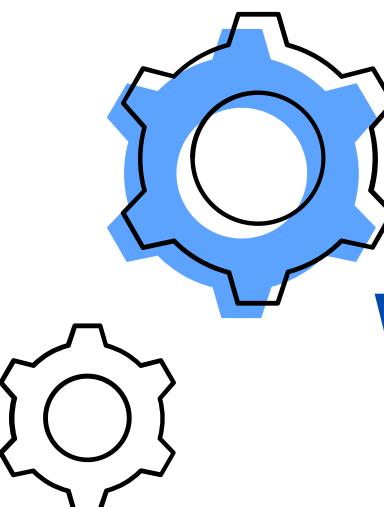
2) Delivery performance is damaging customer retention.

The consistently high late-delivery rates (56–64%) prevent Low-loyalty customers from moving up the loyalty ladder and threaten to push High-loyalty customers back down.

3) Profitability is under pressure due to discount dependency.

Discounts are heavily used to maintain High-loyalty customers, reducing margins even though profit margins already hover around (12–13%).





What This Actually Means (Insights):

4) The retention problem is system-wide.

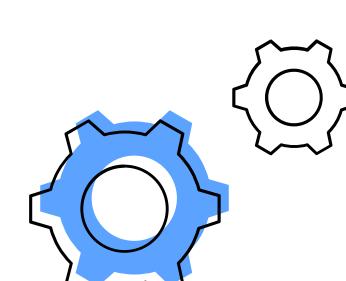
All segments show the same pattern:

- Low loyalty is the majority
- High loyalty is minimal
- Discounts are used to **buy loyalty**
- Delivery delays are common

This means the issue is not segment-specific it is operational.

5) High-value segments are not fully utilized.

The Consumer segment performs above benchmark in CLV & AOV, but weak retention means we are not capturing the full value potential.



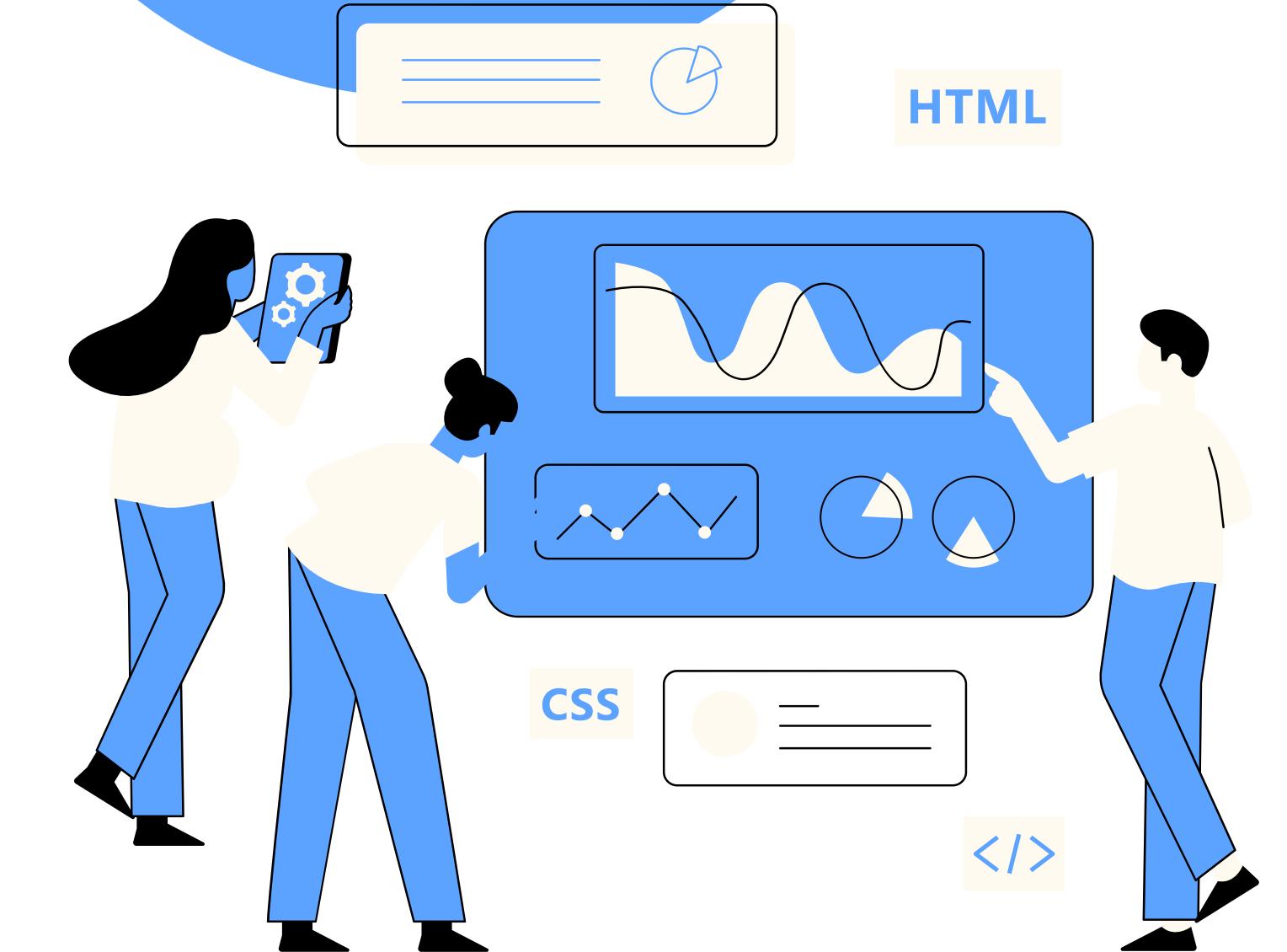
Strategic Recommendations

A. Improve Delivery Performance

- Reduce late-delivery rates by 10–15% to strengthen loyalty.
- Prioritize fast delivery for high-value products and VIP customers.

B. Build Experience-Based Loyalty

- Create a loyalty program focused on value, not discounts.
- Examples: early access to products, points per order, free shipping after X orders, priority support.



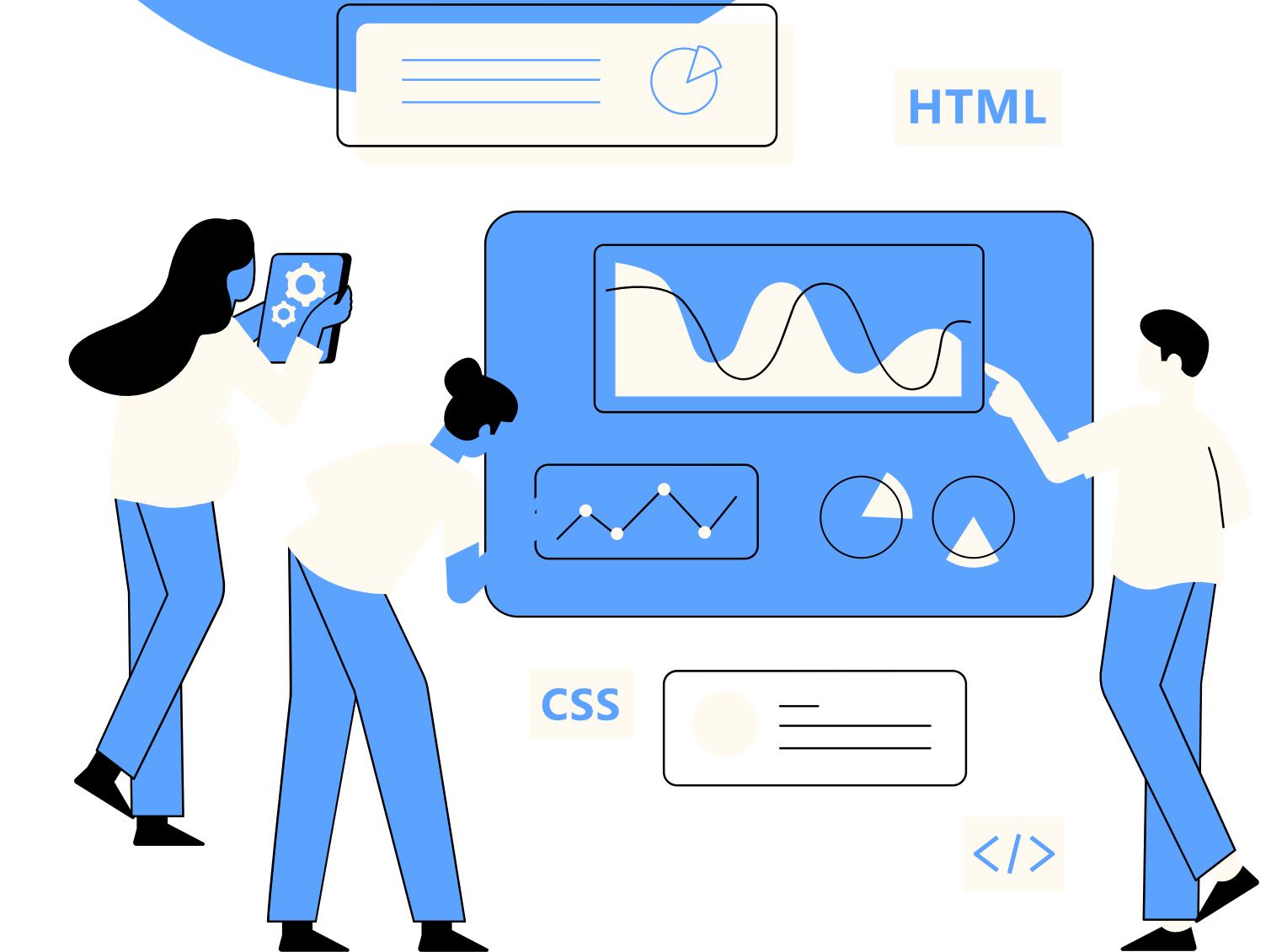
Strategic Recommendations

C. Retain Low-Loyalty Customers

- Use targeted RFM-based campaigns:
- re_engagement emails, repeat-purchase reminders, and personalized product bundles.

D. Leverage Top 10 Best-Selling Products

- Create bundles using the top 10 products—no discounts needed.
- Give loyal customers early access and bundle upgrades.
- For new customers: offer a “Top Products Starter Pack” to boost second-purchase rates.



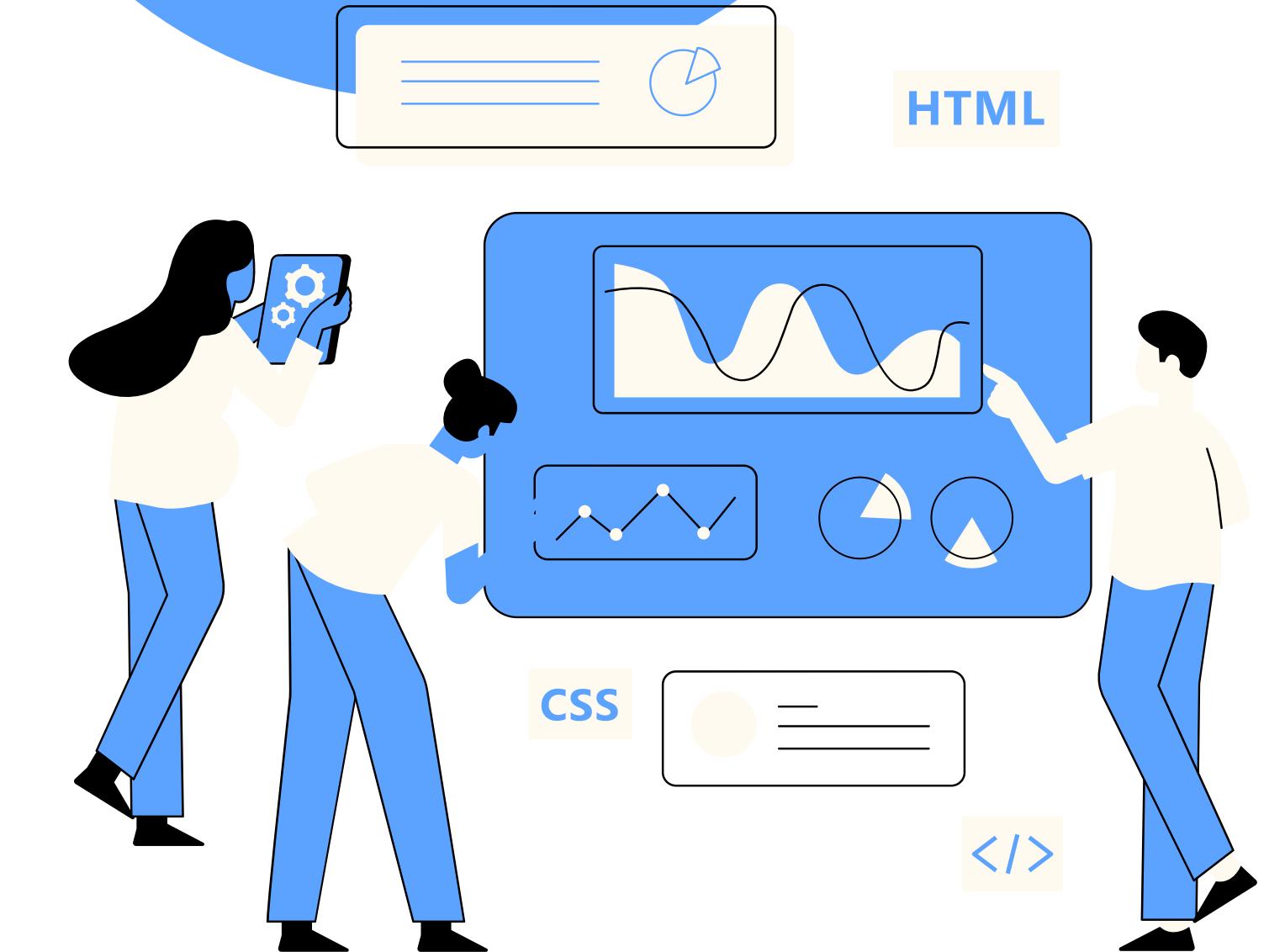
Strategic Recommendations

E. Improve Onboarding for New Customers

- Send welcome emails with personalized product suggestions (use top 10 products).
- Offer a small first-order incentive or bundle to encourage a second purchase.

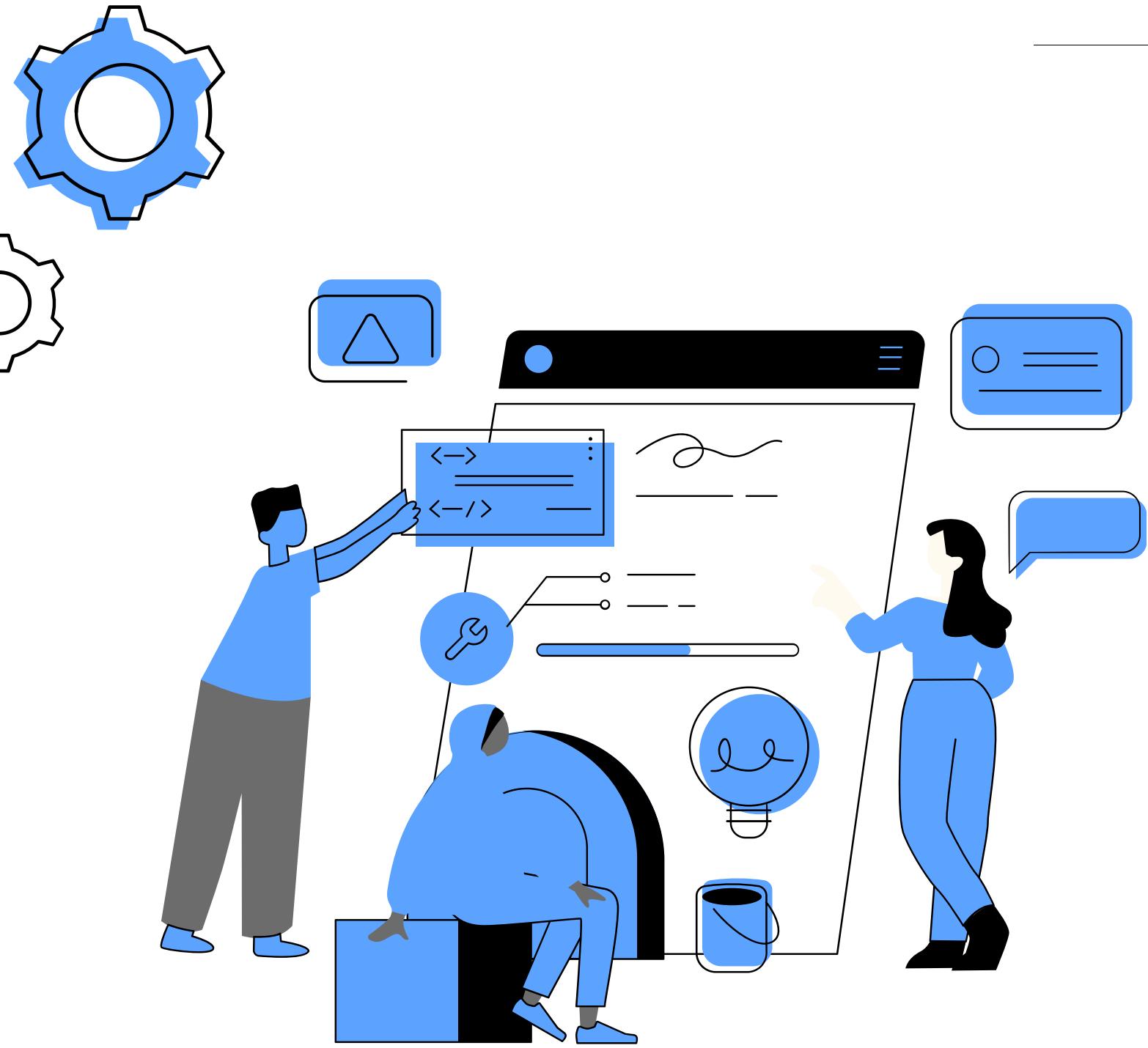
F. Monitor and Act on Customer Feedback

- Regularly collect feedback from Low and Moderate loyalty customers.
- Use insights to fix pain points (delivery, product quality, experience).



Sales & Profit Analysis

Next Slide

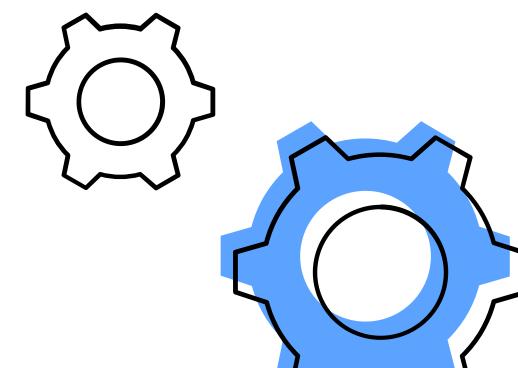


What the Data Shows (Findings):

-Top Categories By Sales & Profit

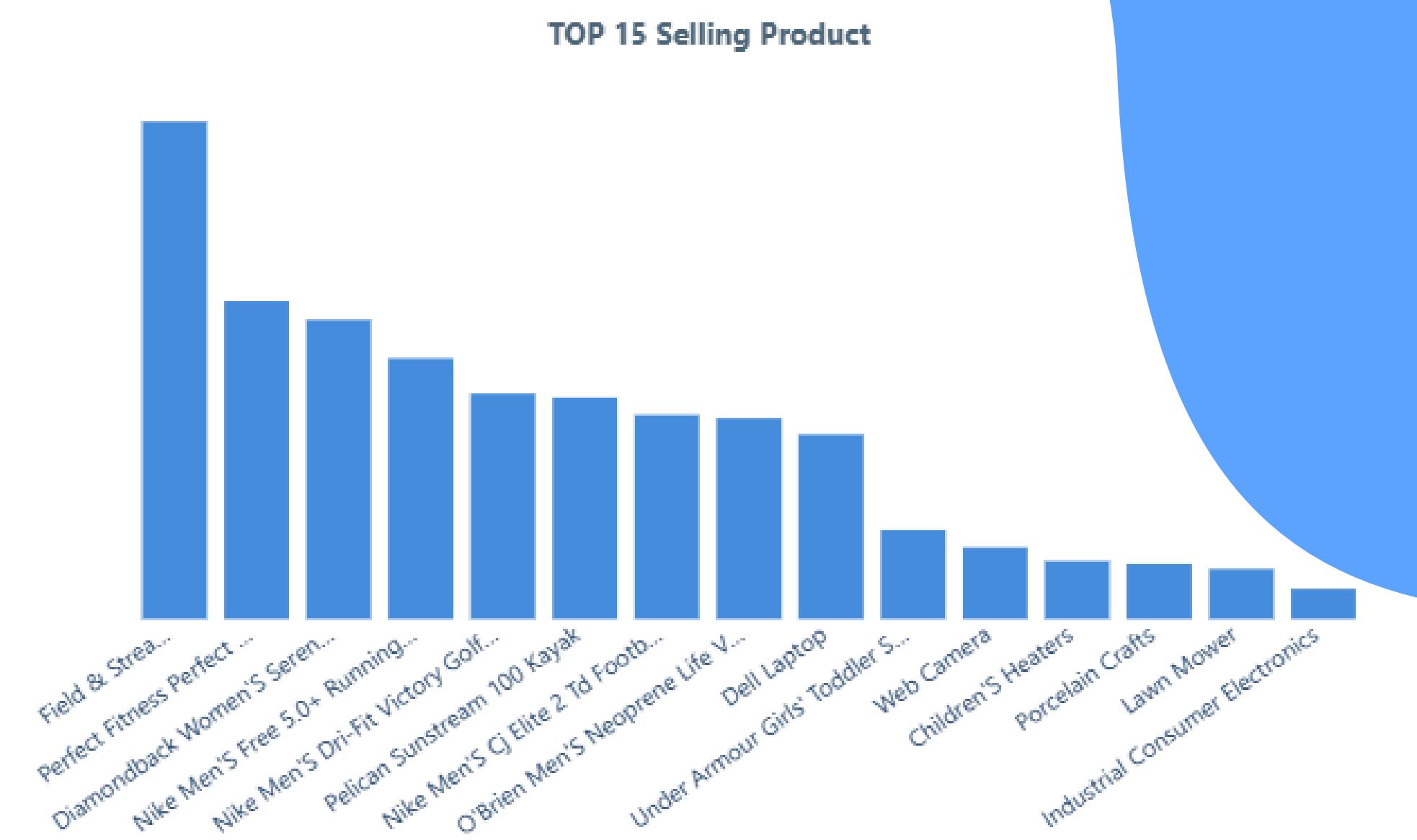
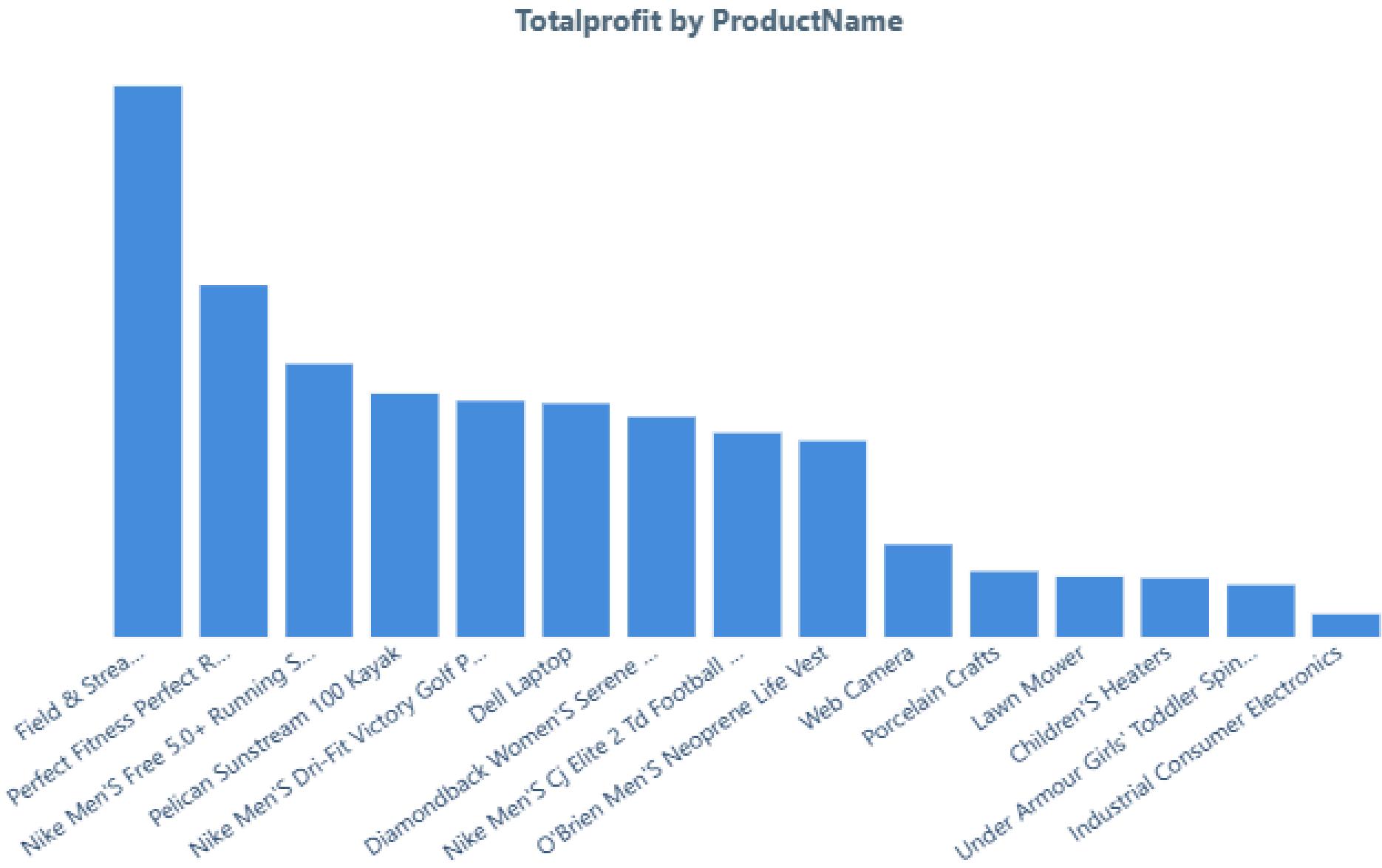


-This mismatch indicates that high-selling categories are not always the most profitable. Some categories sell well but **have lower margins or higher costs**, while others generate stronger profit despite lower sales volume.

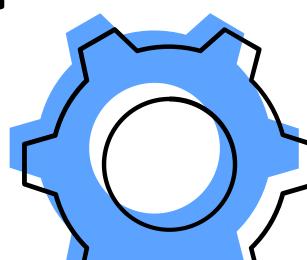
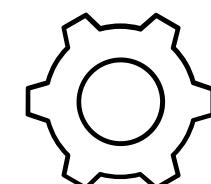
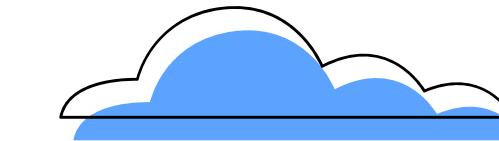


What the Data Shows (Findings):

-Top Product By Sales & Profit



This mismatchWhy ??



Why the Ranking Is Different?



01

High-Selling Items May
Have Higher Costs

02

Heavy Discounts Reduce
Profitability

03

High-Profit Items Lack
Visibility

04

Cost Structure Varies by
Category

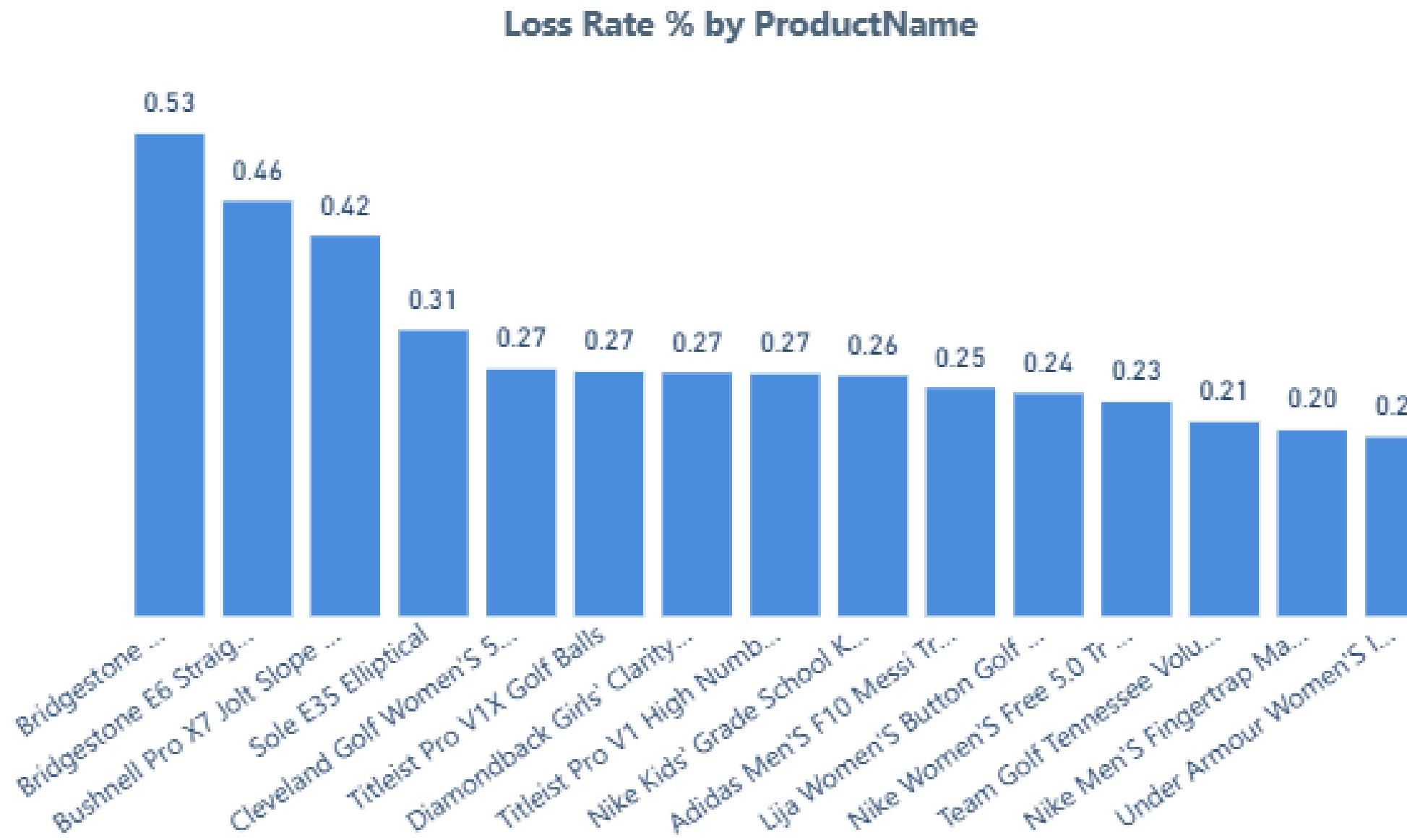
Strategic Recommendations

1. Improve Margins for High-Sales / Low-Profit Item
2. Increase Visibility for High-Profit / Low-Sales Items
3. Bundle Smartly
4. Strengthen Inventory & Supply for Top Performers



What the Data Shows (Findings):

-Top Loss Product

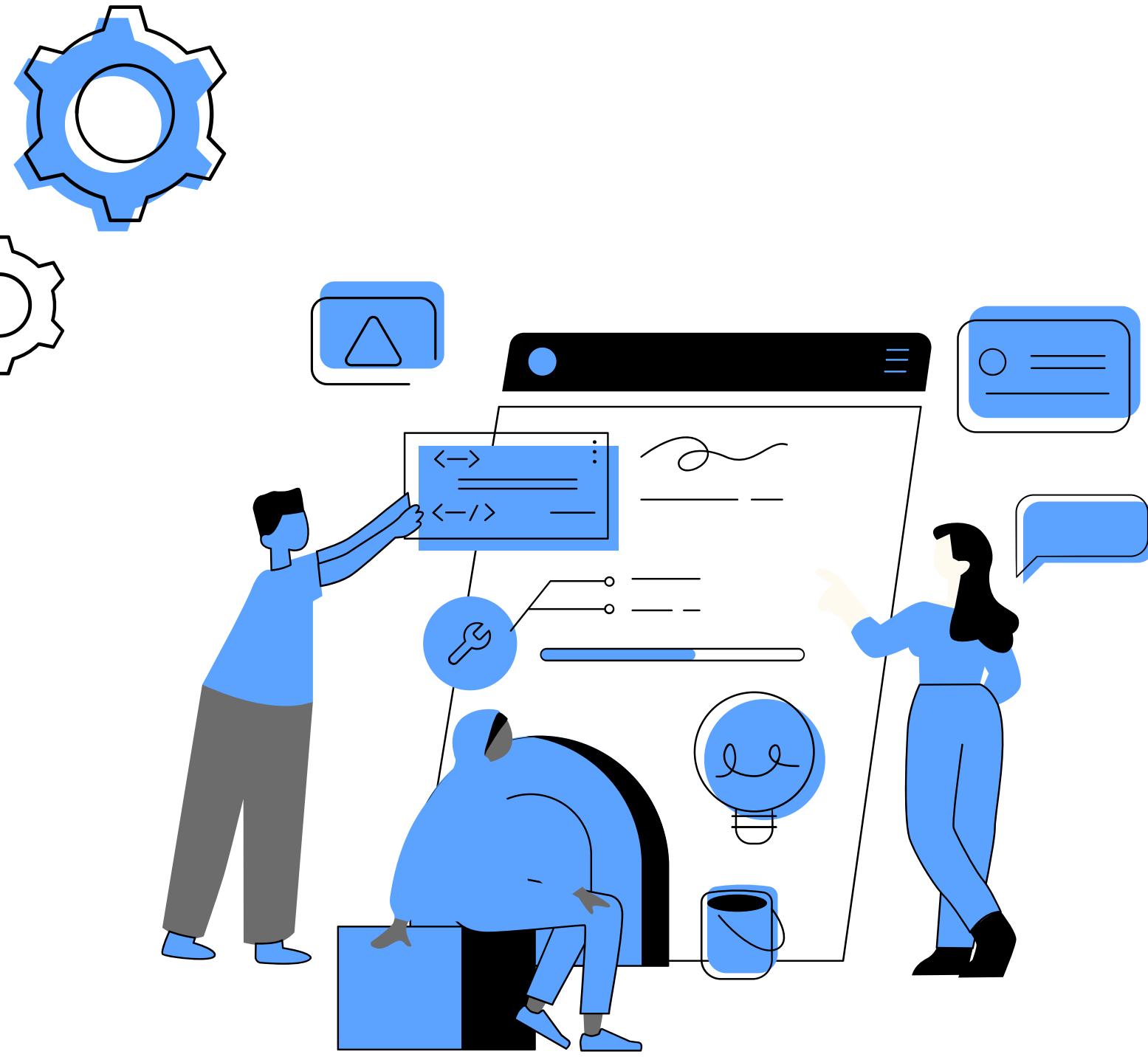


Recommendations :

- Review Cost Structure
- Adjust Pricing Strategy
- Optimize Inventory1.
- Consider Product Discontinuation

Order Pattern Analysis

Next Slide





0.56

Average Lead Time

145.73

Average Orders per Day

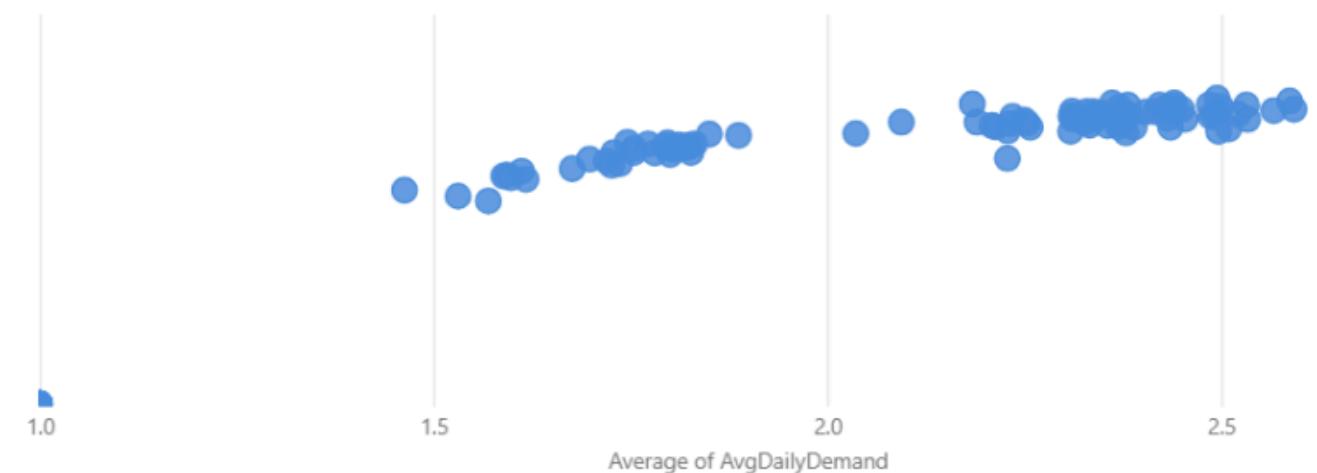
374K

Total Quantity Sold

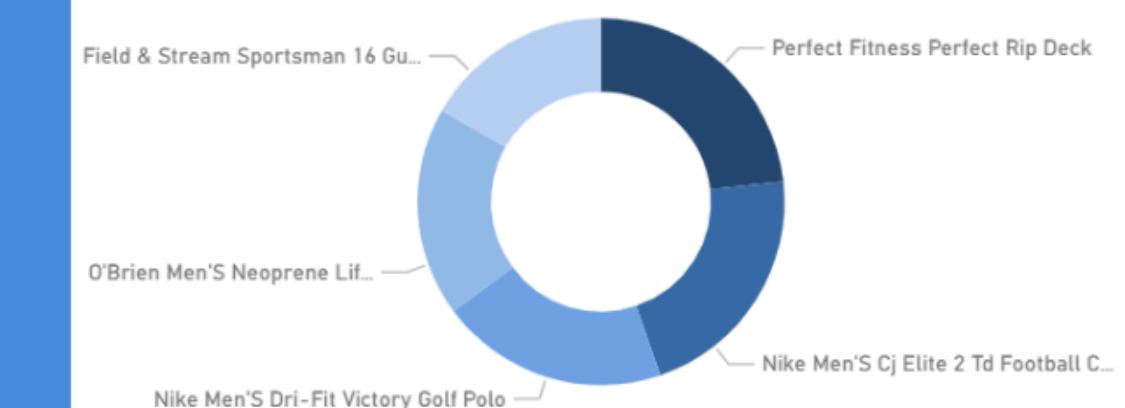
53K

Total Orders

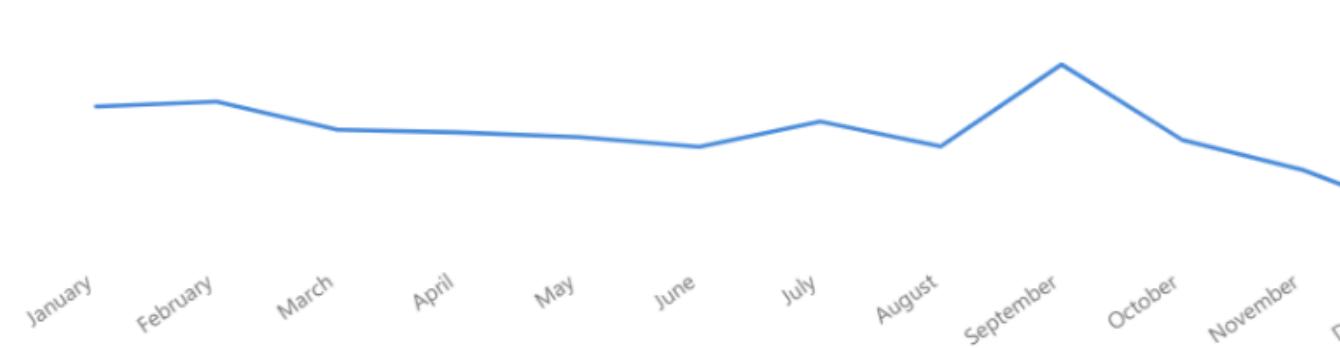
Demand variability per product



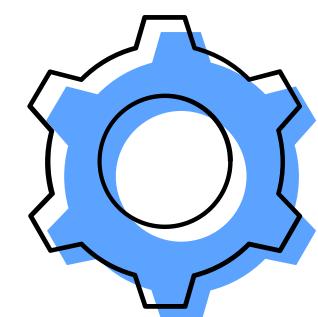
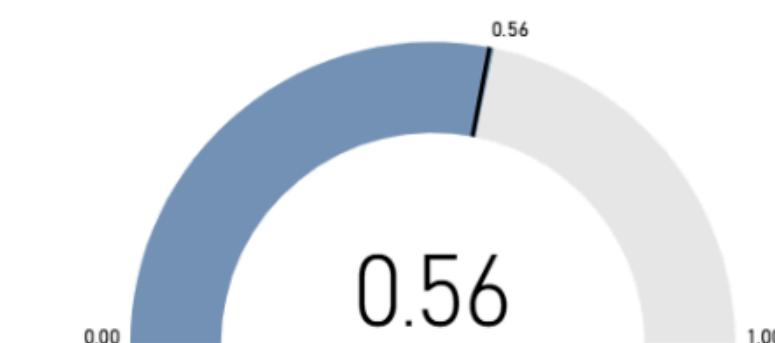
Top 5 Products by Order Frequency

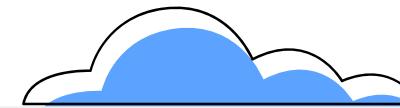


Monthly order trend per product



Lead time variance





0.56

Average Lead Time

145.73

Average Orders per Day

374K

Total Quantity Sold

53K

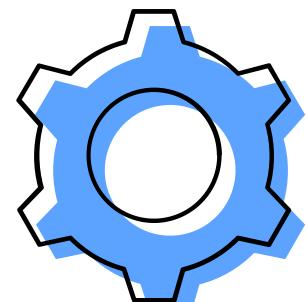
Total Orders

FINDINGS

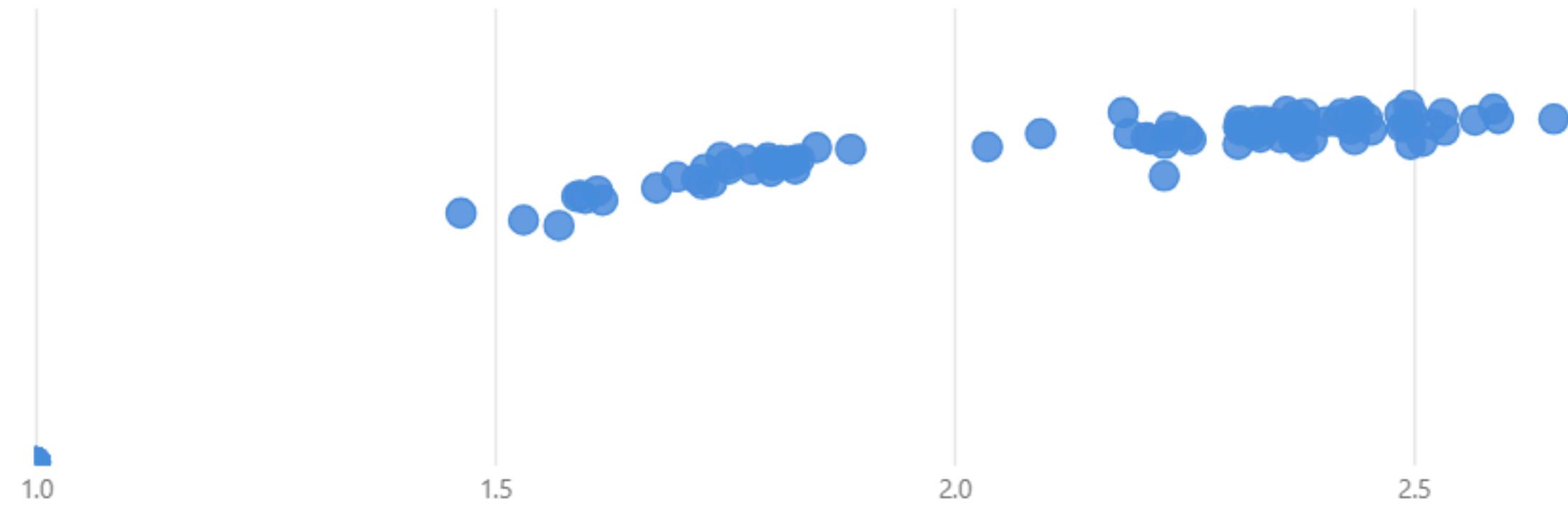
- The average lead time is low (**0.56 days**), which is very positive for responsiveness.
- High daily order volume (**145+ orders/day**) indicates steady demand.
- Total quantity sold (**374K**) and total orders (**53K**) show strong business activity.

RECOMMENDATION

- Maintain or review supplier performance to ensure lead time remains stable.
- Consider expanding capacity or automation to support increasing order volume.
- Increase stock levels of high-demand items by **20–25%** during peak days.



Demand variability per product

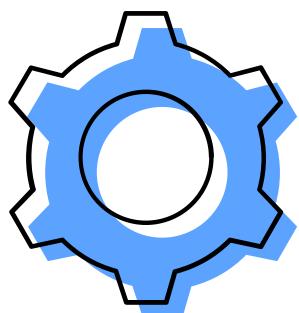


FINDINGS

- Most products cluster around moderate variability, with average daily demand between **1.5–2.5 units**.
- A few outliers show higher variability, posing forecasting challenges.

RECOMMENDATION

- Apply safety stock adjustments for high-variability items.
- Use advanced forecasting models (e.g., exponential smoothing or machine learning) for volatile products.
- Increase safety stock for high-variability SKUs.
- Reduce order quantities to avoid overstocking.

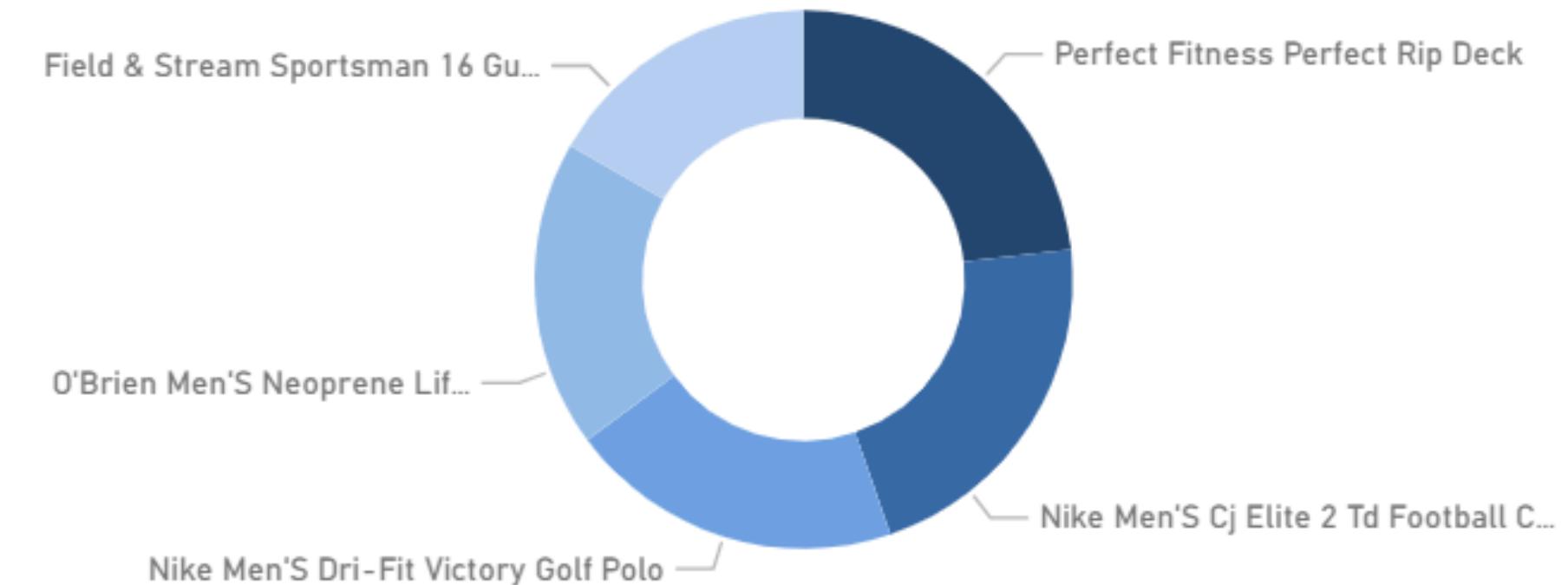


FINDINGS

- Specific products (e.g., sports and apparel items) dominate order frequency.
- Demand is concentrated among a small set of fast-moving SKUs.

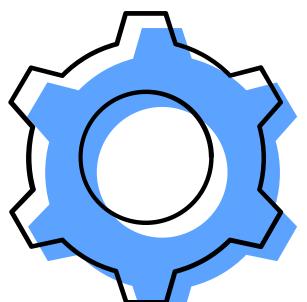


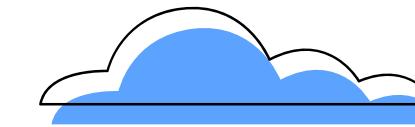
Top 5 Products by Order Frequency



RECOMMENDATION

- Prioritize stock availability for these top sellers.
- Negotiate bulk purchasing agreements with suppliers to reduce cost.
- Review secondary items to identify cross-selling opportunities.
- Increase Safety Stock for the Top 5 by **25%**.
- Secure secondary suppliers for these items.





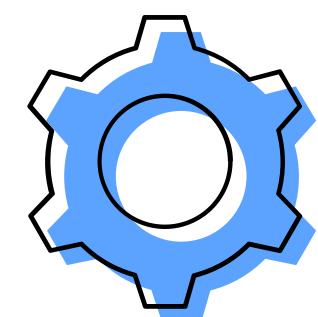
FINDINGS

- Orders fluctuate moderately across months.
- Slight peaks occur during September–October, suggesting seasonal demand.



RECOMMENDATION

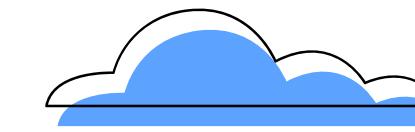
- Prepare seasonal inventory strategies for peak months.
- Analyze promotional campaigns during high-order periods to replicate success.
- Build seasonal stock 3 weeks before peak months.
- Increase inventory by **30–40%** during high-demand months.
- Reduce purchases by **20%** in low-demand months.



Inventory Metrics

Next Slide





1.20

Average of demand variability

0.56

Average lead time

7.05

Average of ROP

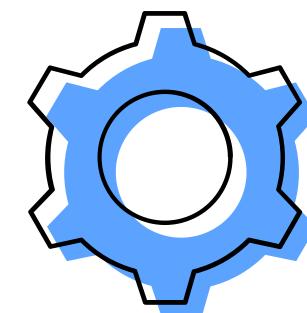
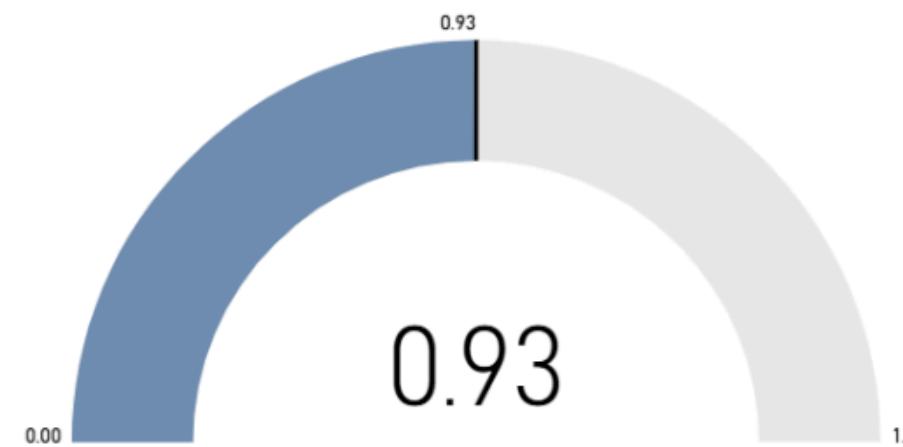
49.29M

Total inventory value

Distribution of safety stock across items



Stockout Probability





1.20
Average of demand variability

0.56
Average lead time

7.05
Average of ROP

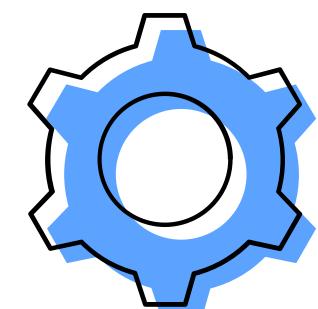
49.29M
Total inventory value

FINDINGS

- Average variability is moderate (**1.20**).
- Average reorder point (**7.05**) aligns with demand patterns.
- Total inventory value is very high (**49.29M**) indicates large cash tied in inventory.

RECOMMENDATION

- Perform an inventory optimization audit to reduce excess stock.
- Introduce Just-In-Time strategies for stable-demand items.



FINDINGS

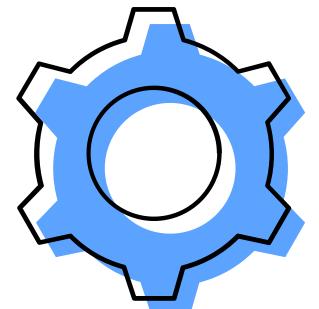
- Safety stock is heavily concentrated in certain SKUs.
- Many items have very low or zero safety stock, which may increase stockout risk if demand shifts.

Distribution of safety stock across items



RECOMMENDATION

- Redistribute safety stock more evenly based on product criticality.
- Increase SS for high-demand/high-variability items.
- Reduce SS for slow-moving items.





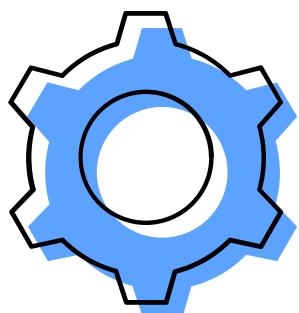
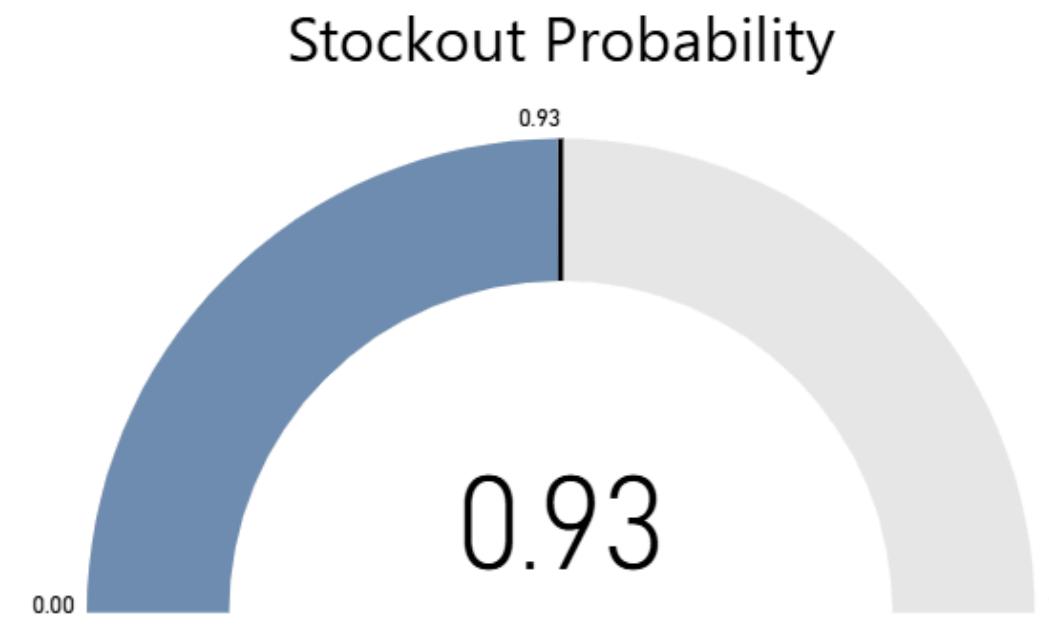
FINDINGS

- The dashboard indicates an extremely high stockout probability (**0.93**).
- This shows inventory levels are insufficient relative to demand.



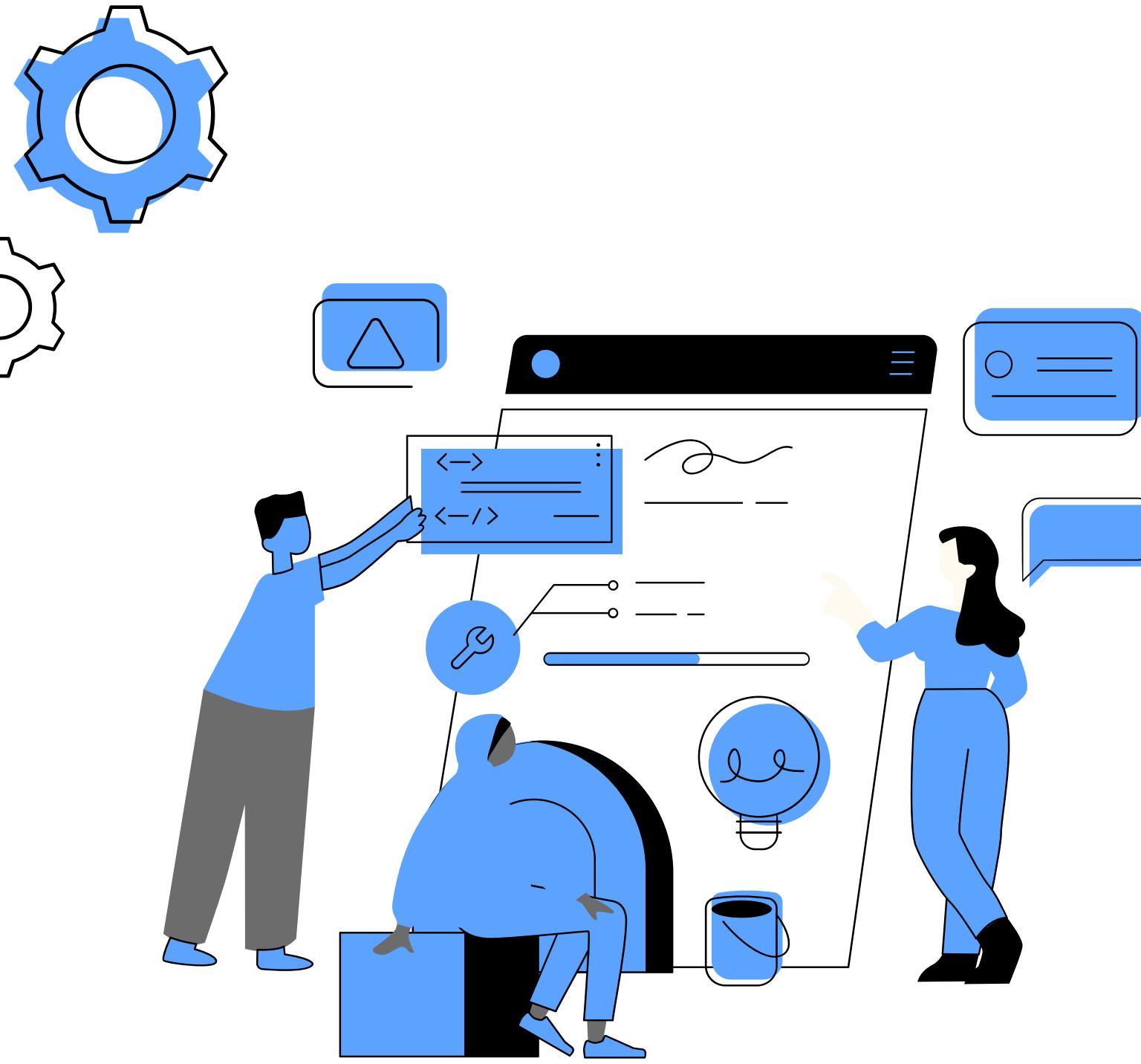
RECOMMENDATION

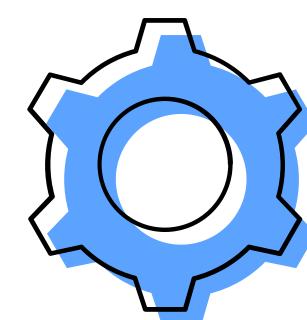
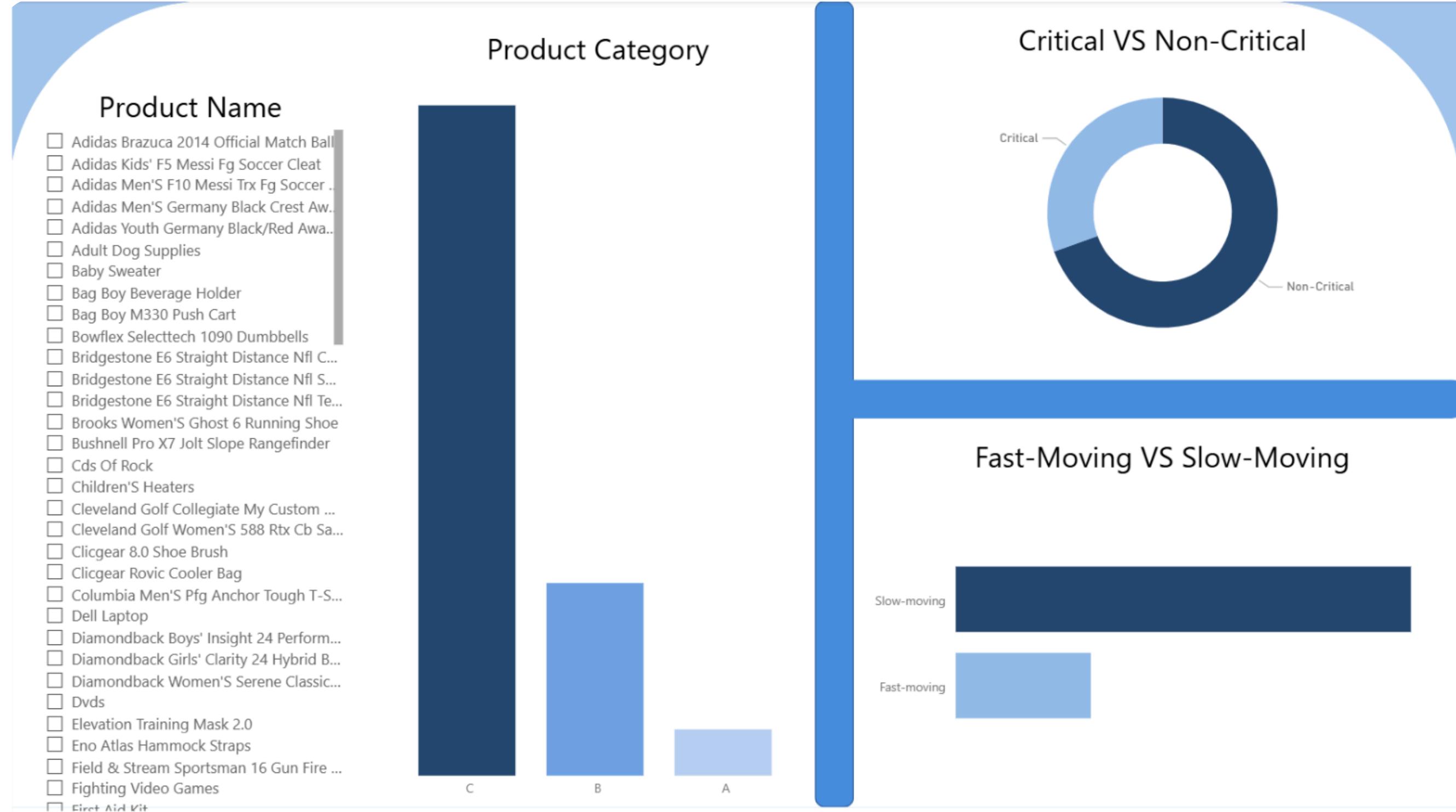
- Immediately increase safety stock for fast-moving items.
- Reassess reorder points and batch quantities.
- Implement real-time demand monitoring to reduce forecast errors.



Product Classification

Next Slide







Product Category

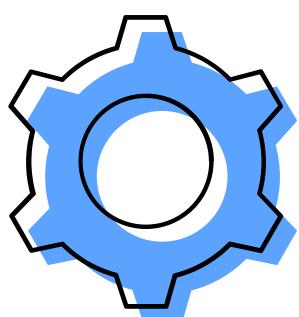
FINDINGS

- Category C items dominate the assortment.
- Category A items are limited, indicating concentration of value in a few SKUs.



RECOMMENDATION

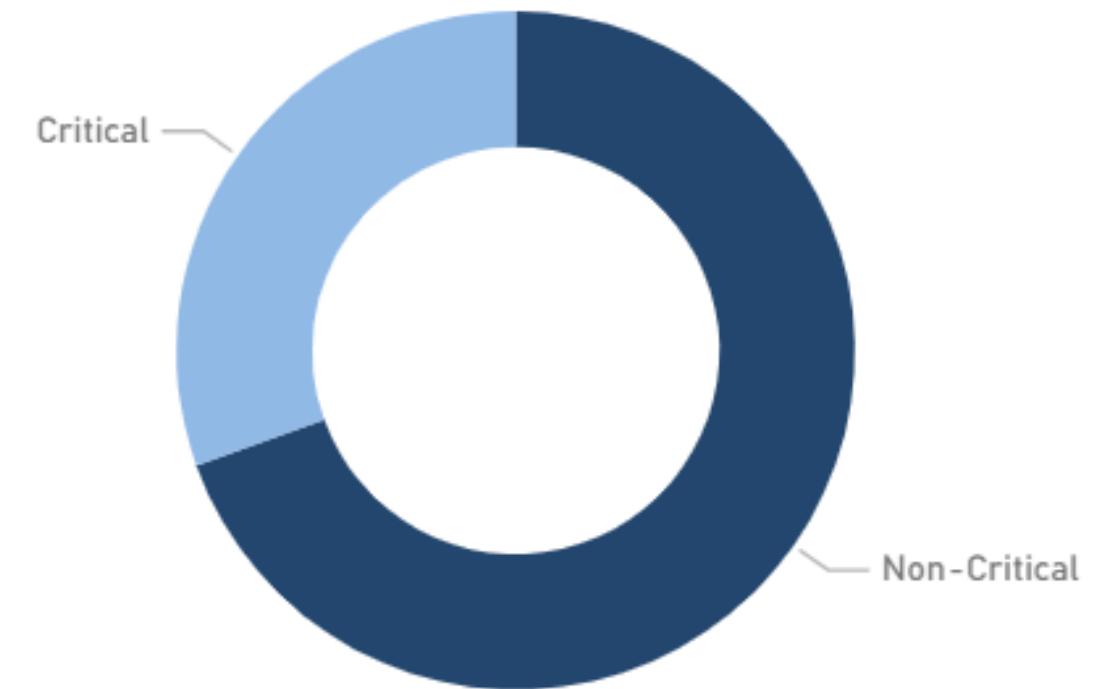
- Cut purchasing of C-items by **50%**.
- Move C-items to cheaper storage locations.
- Review A-items weekly due to their financial impact.



FINDINGS

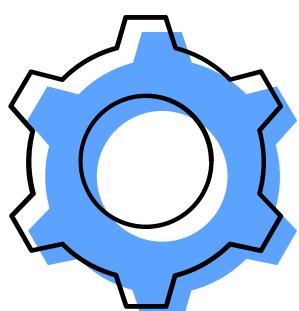
- Most inventory consists of non-critical items, which may not need high stock levels.
- Critical items form a smaller portion but require tighter control.

Critical VS Non-Critical



RECOMMENDATION

- Reduce non-critical stock levels by **30–40%**.
- Allocate premium storage space only for critical items.
- Review critical inventory daily.



FINDINGS

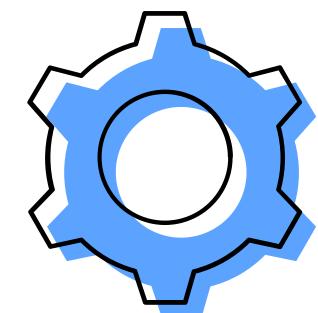
- A large portion of products are slow-moving, resulting in high holding costs.
- Fast-moving items are fewer but drive most of the inventory turnover.

Fast-Moving VS Slow-Moving



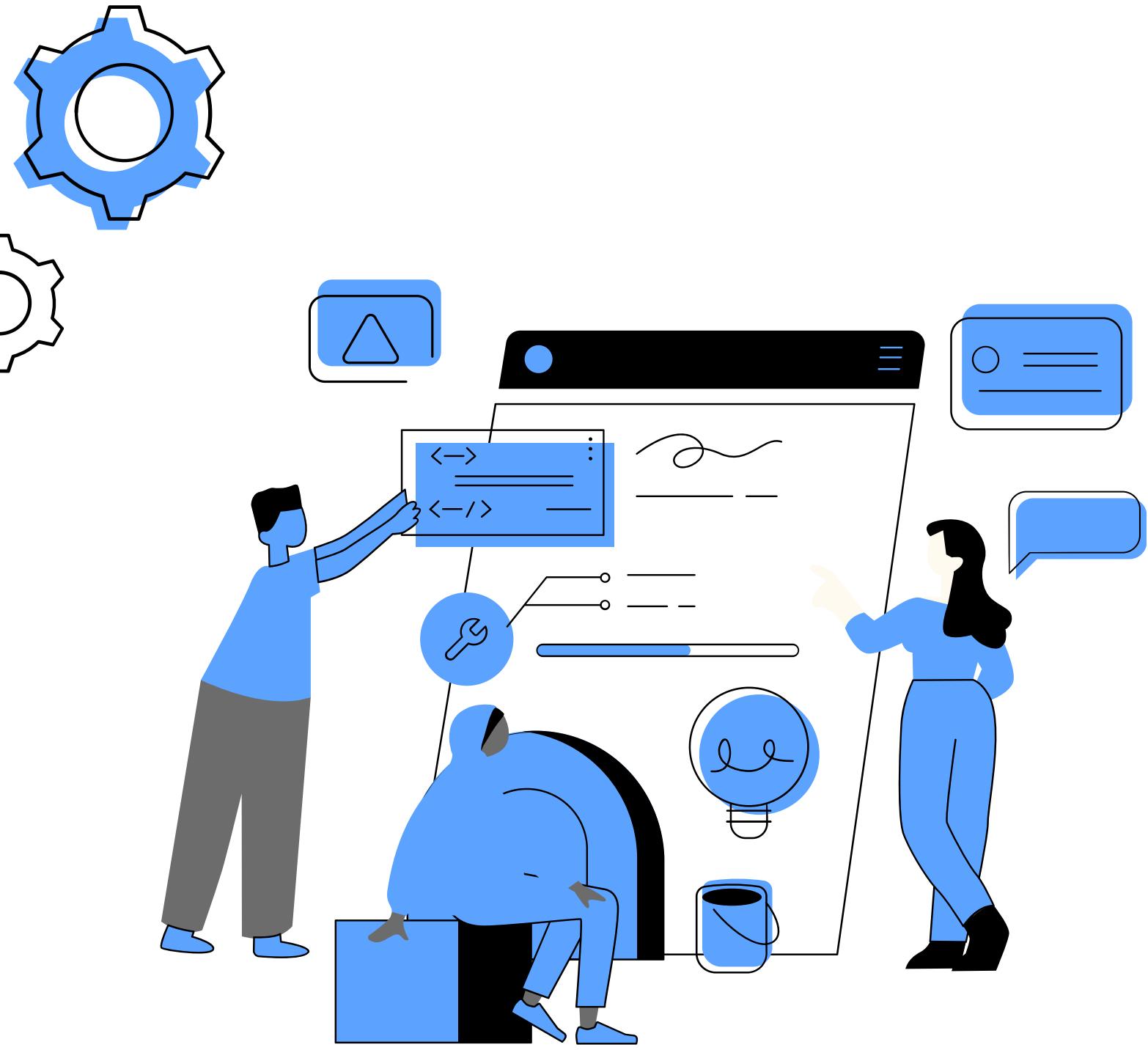
RECOMMENDATION

- Run clearance campaigns (**20–40% discounts**).
- Convert slow movers to Made-to-Order instead of stocking.



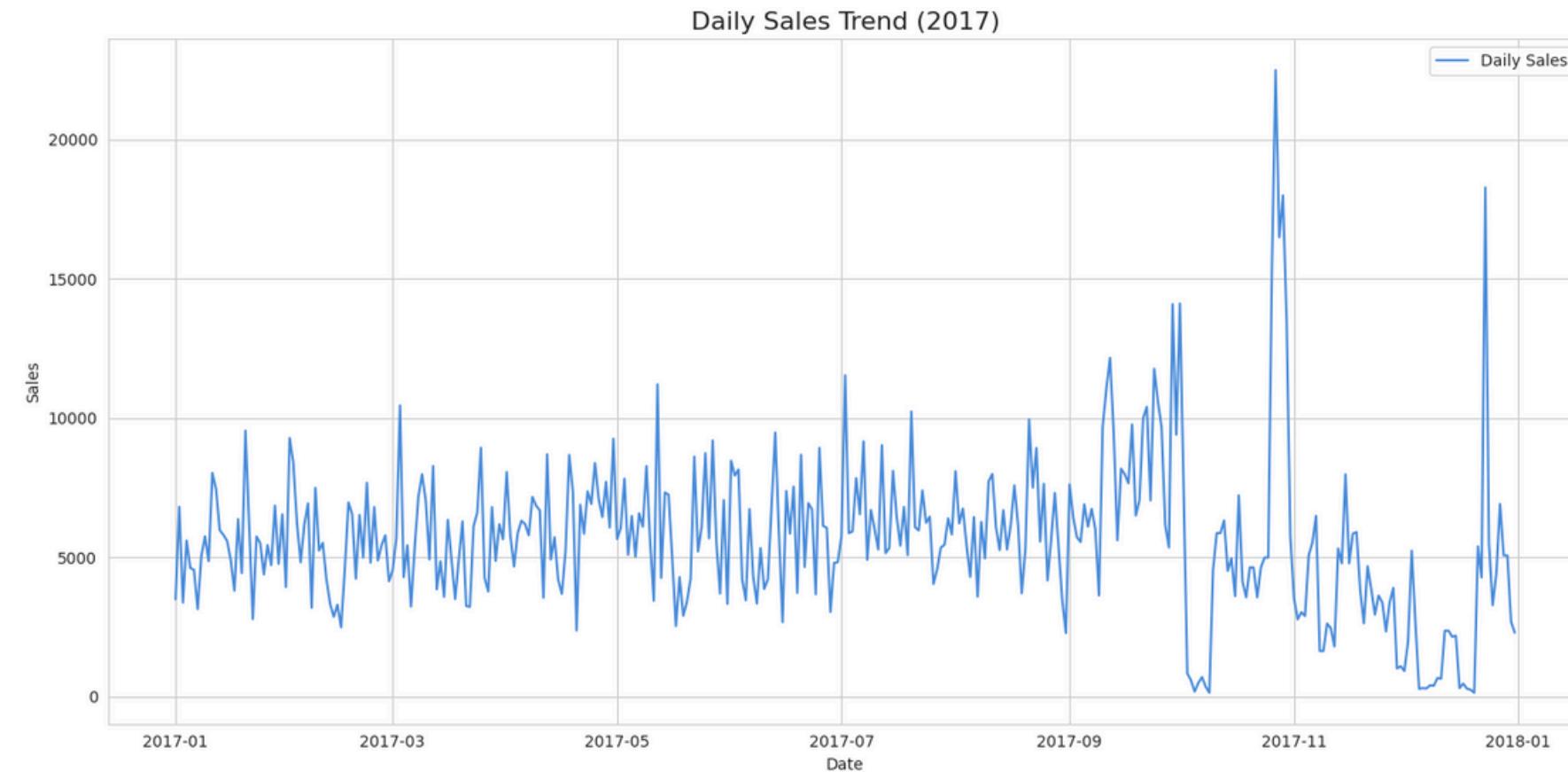
Demand Forecasting & Predictive Analytics

Next Slide



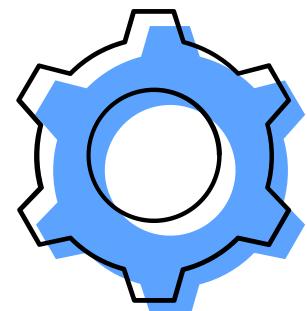
Key findings:

- High daily volatility—sales vary drastically day-to-day.
- A few days show extremely high peaks, again in **late Q3–Q4**.
- Downward dips coincide with possible stockouts or missing logs.



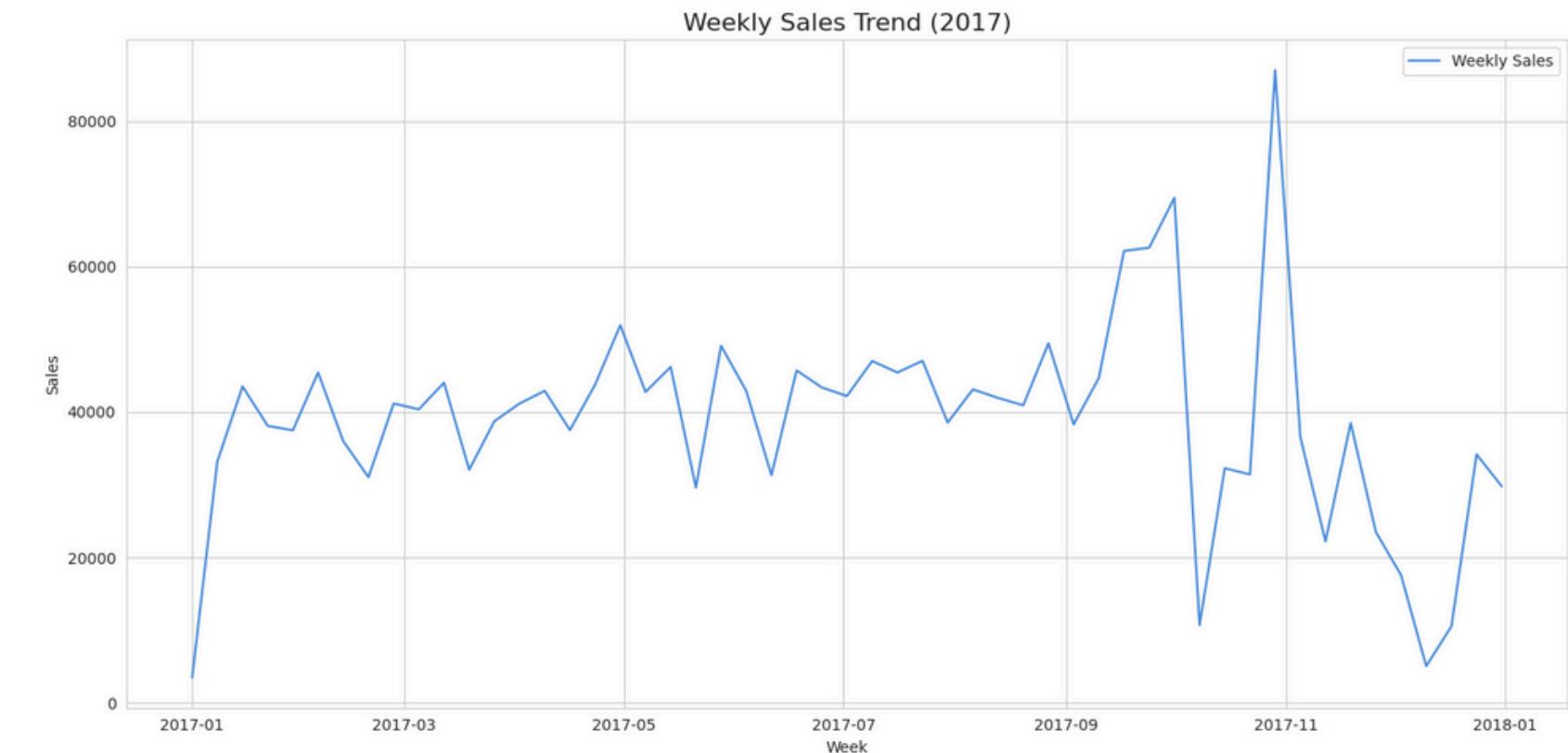
Recommendations:

- Implement **daily demand** forecasting for operational planning, not just weekly.
- Improve inventory availability during **high-demand** days to avoid stockouts.
- Conduct data quality checks for days with **zero or near-zero** sales.



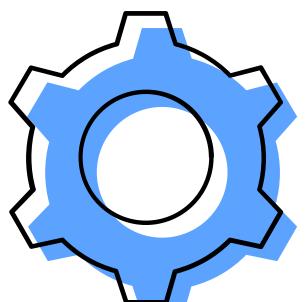
Key findings:

- Weekly sales show notable upward movement **mid-year** followed by instability and major peaks.
- A large spike occurs around **October/November** – likely seasonal promotion or **holiday effect**.
- Sharp decline afterward suggests possible supply shortage or **seasonal end**.



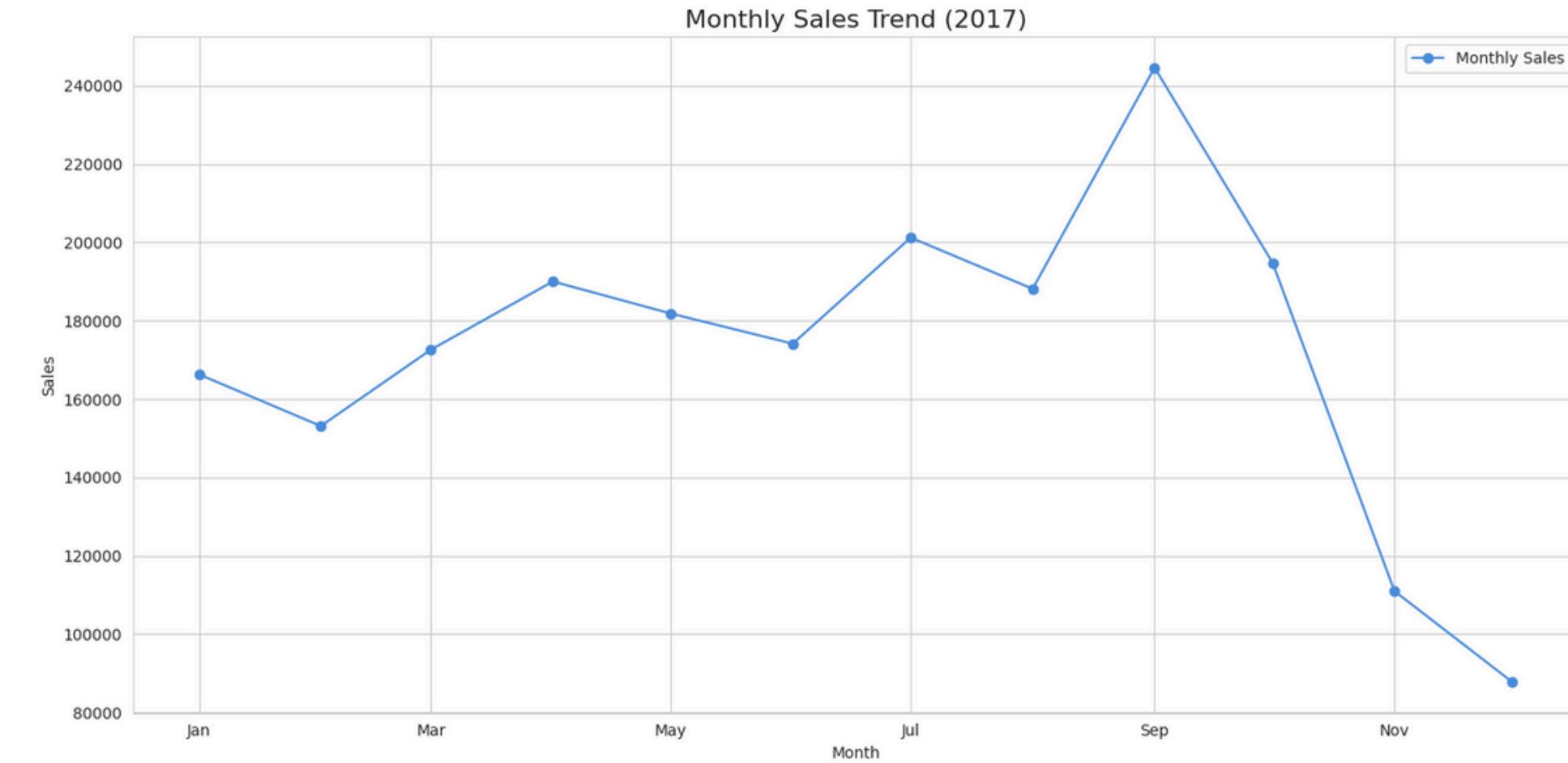
Recommendations:

- Strengthen **mid-year and Q4** supply chain capacity to handle peak demand.
- Forecast peak weeks separately because average-based models will underestimate these spikes.
- Identify root causes behind **sharp late-year** fluctuations.



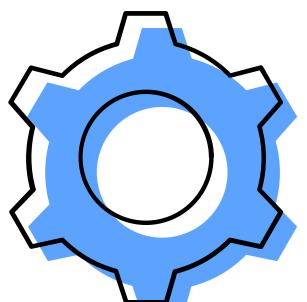
Key findings:

- Sales fluctuate through the year but peak strongly in **September** (highest month).
- Significant drop in **November–December** (could be due to missing data or reduced availability).
- Early-year sales are **moderate** and **gradually improve** into summer.



Recommendations:

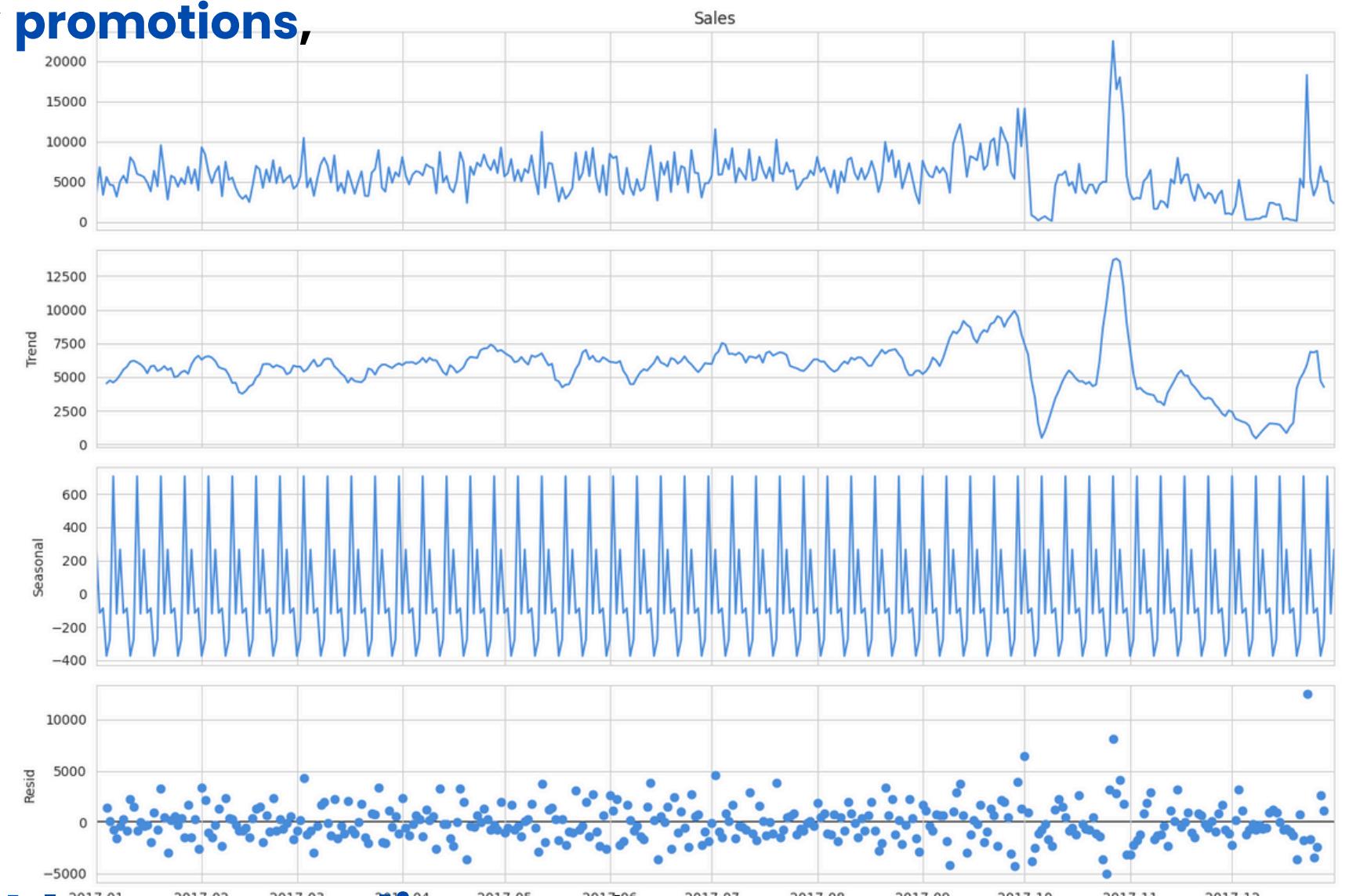
- Stock heavily for **Q3**, as seasonality clearly boosts sales.
- Investigate **Q4** data quality (sharp decline may indicate missing transactions or operational limitations).
- Create seasonal promotions in **low-demand months** (Feb, June).



Key findings:

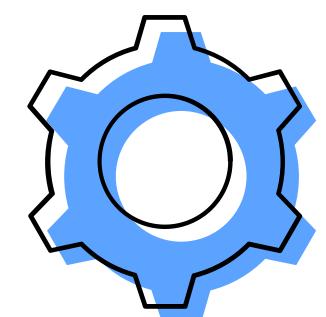
- Trend: Overall weekly sales remain stable with a noticeable demand spike in late **Q3–Q4**.
- Seasonal Pattern: Strong weekly seasonality, meaning demand consistently fluctuates based on day/week patterns.
- Residuals: Some extreme spikes/outliers likely driven by **promotions, holidays, or supply disruptions**.

Seasonal Decomposition (Weekly Pattern)



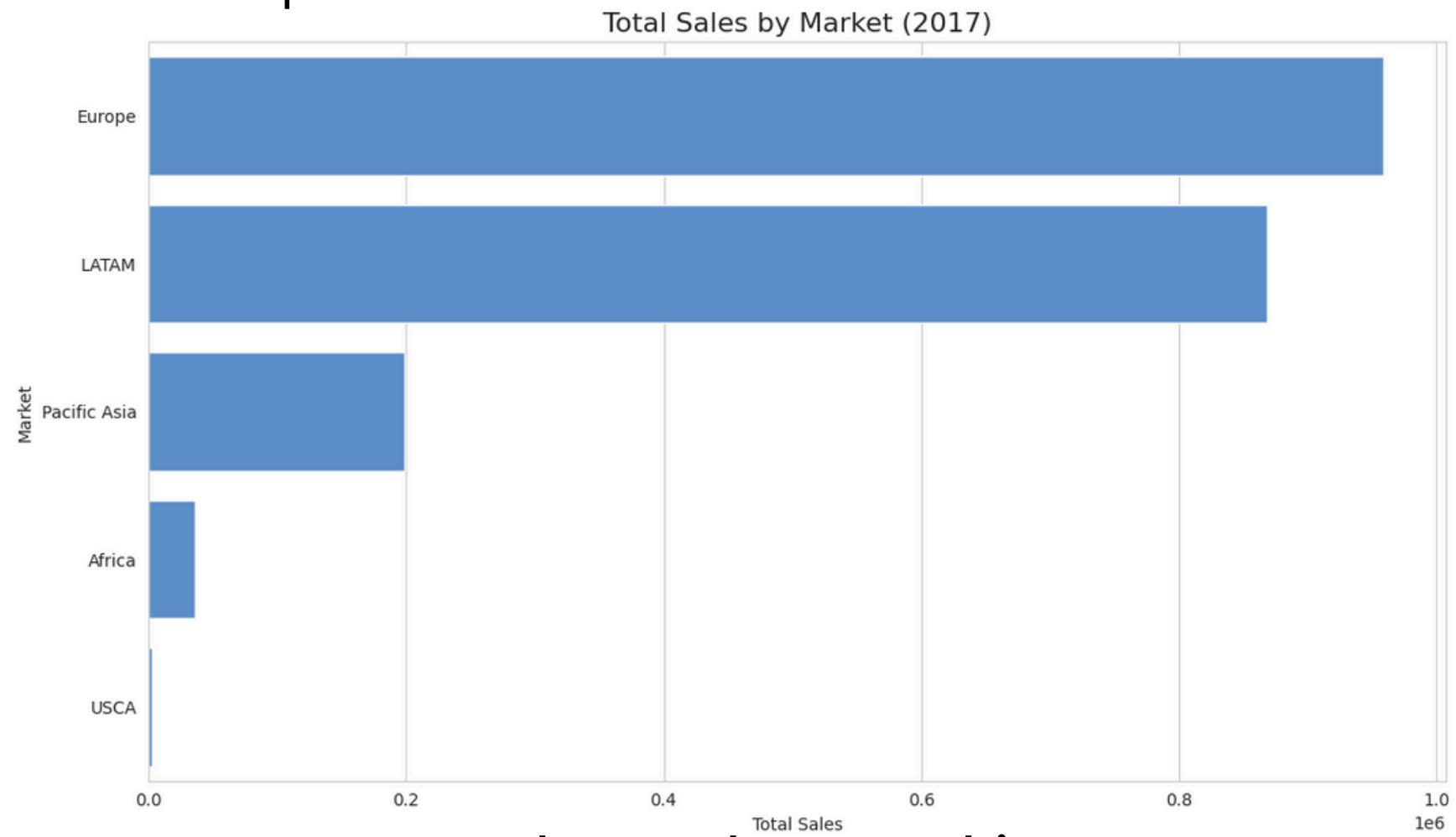
Recommendations:

- Align inventory and staffing with **weekly seasonality** peaks.
- Investigate residual outliers to identify what causes sudden spikes—if promotional, consider scaling these campaigns.



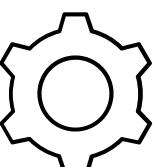
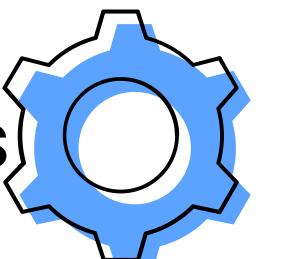
Key findings:

- Europe and LATAM are the **strongest** markets, with Europe slightly leading.
- Pacific Asia shows **moderate** performance, indicating potential but underutilized demand.
- Africa and USCA contribute very little, almost negligible in comparison.



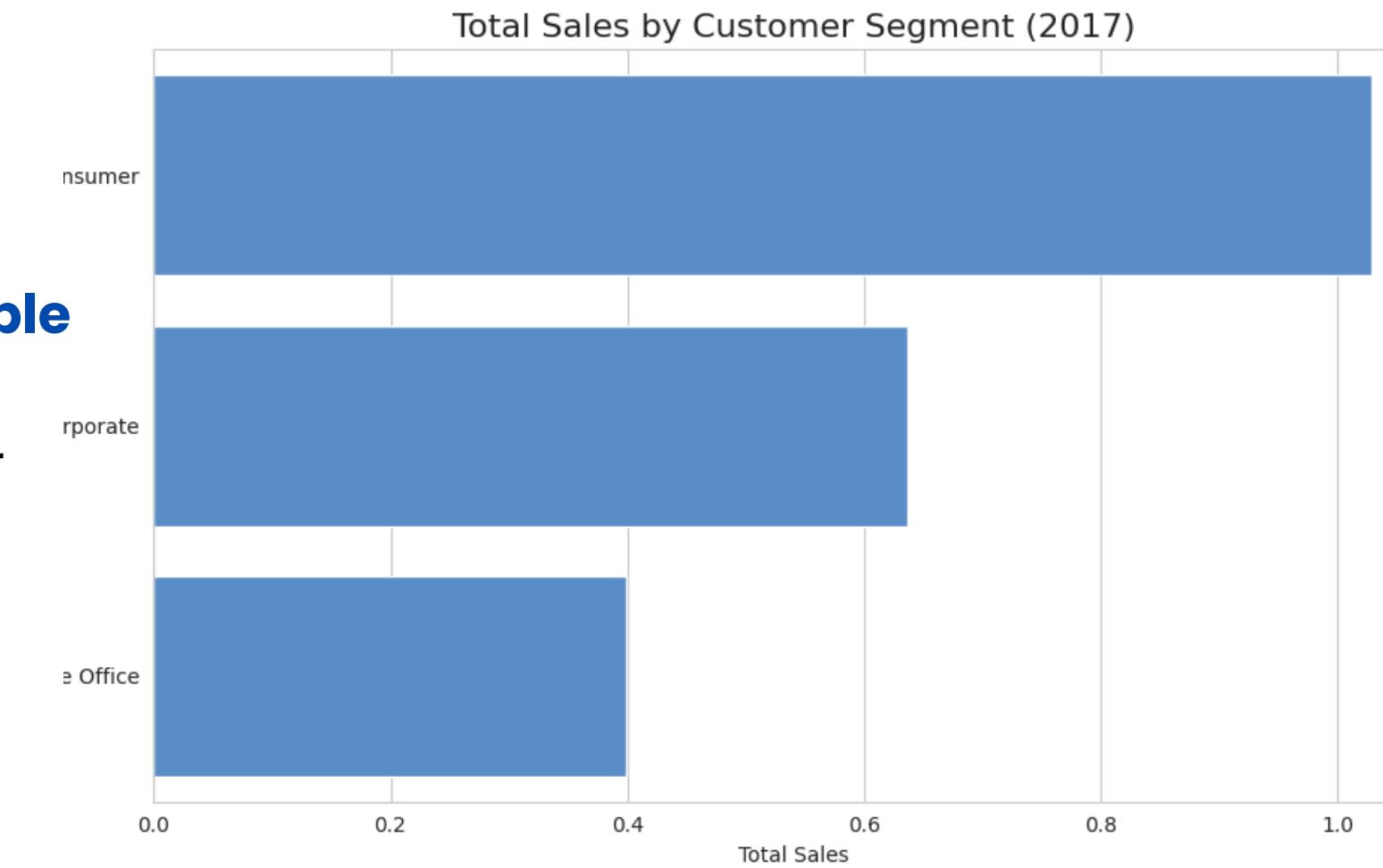
Recommendations:

- Increase supply chain investment in Europe & LATAM, where demand is proven and high.
- Conduct **market expansion analysis** for **Pacific Asia** – demand exists but needs activation (better distribution, pricing, or local partnerships).
- Reassess operations in Africa and USCA – either re-strategize or minimize costs.



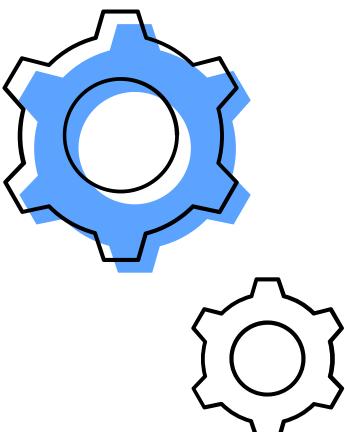
Key findings:

- **Consumer segment** dominates revenue, exceeding **\$1M+**, significantly higher than Corporate and Home Office.
- Corporate is the second largest segment, performing relatively **stable** at **~65%** of Consumer.
- Home Office represents the smallest share at **~40%** of Consumer demand.



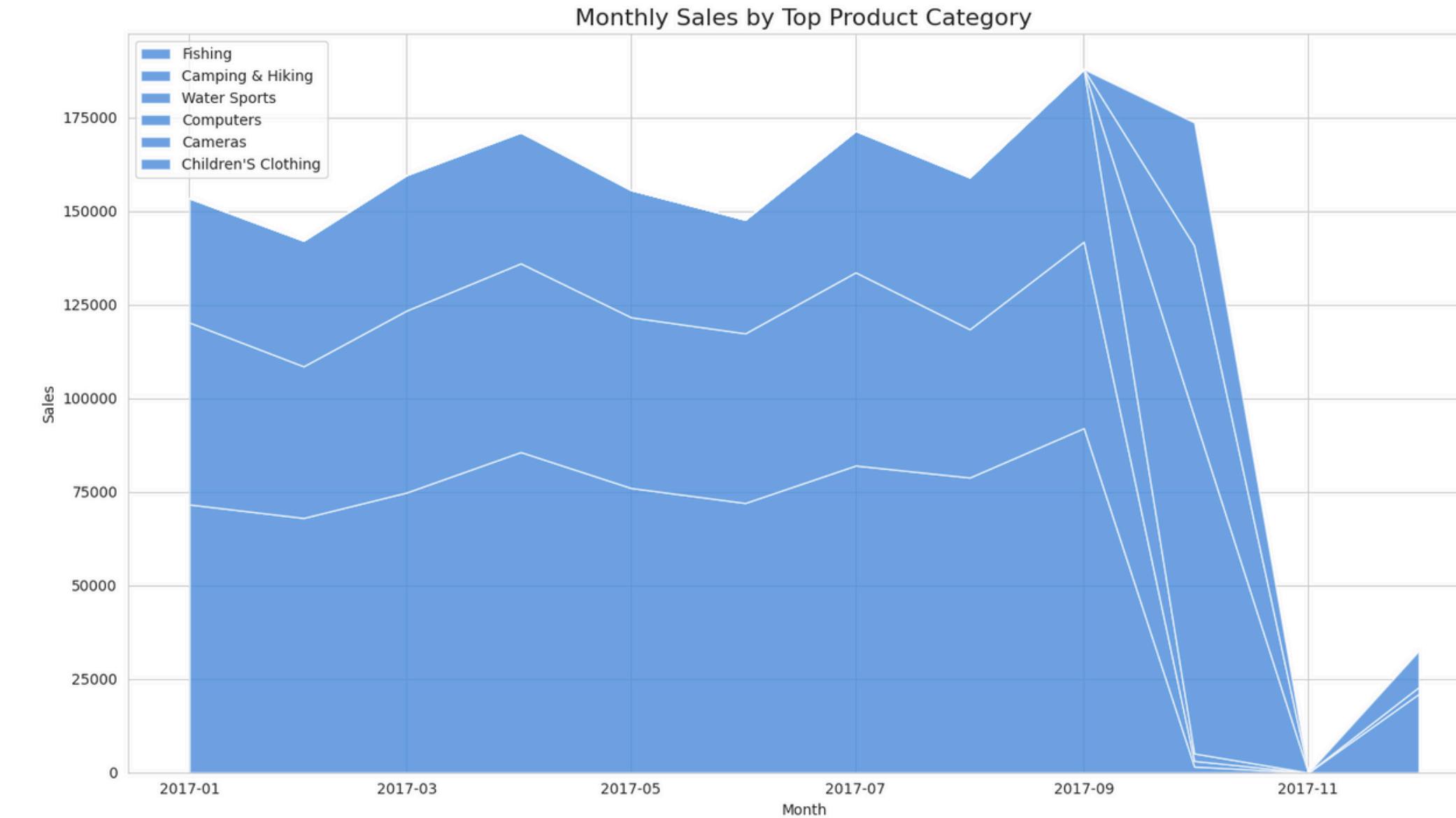
Recommendations:

- Prioritize Consumer-focused marketing and promotions to strengthen the largest revenue base.
- Explore upsell/cross-sell strategies for Corporate customers who show **higher average order value**.
- For Home Office, evaluate whether to:
 - Improve targeted campaigns, or
- Reduce resource allocation to focus on the **higher-performing segments**.



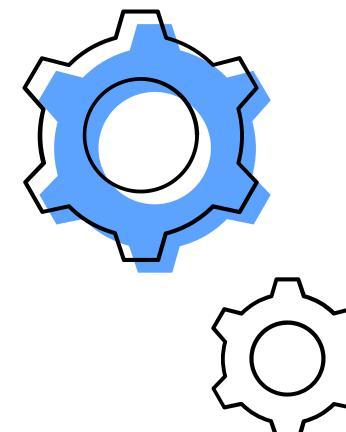
Key findings:

- Fishing, Camping & Hiking, and Water Sports maintain **consistent** month-over-month performance.
- Very sharp decline **across all categories** in October–November .
- Seasonal **peaks** occur around April–September for most categories.



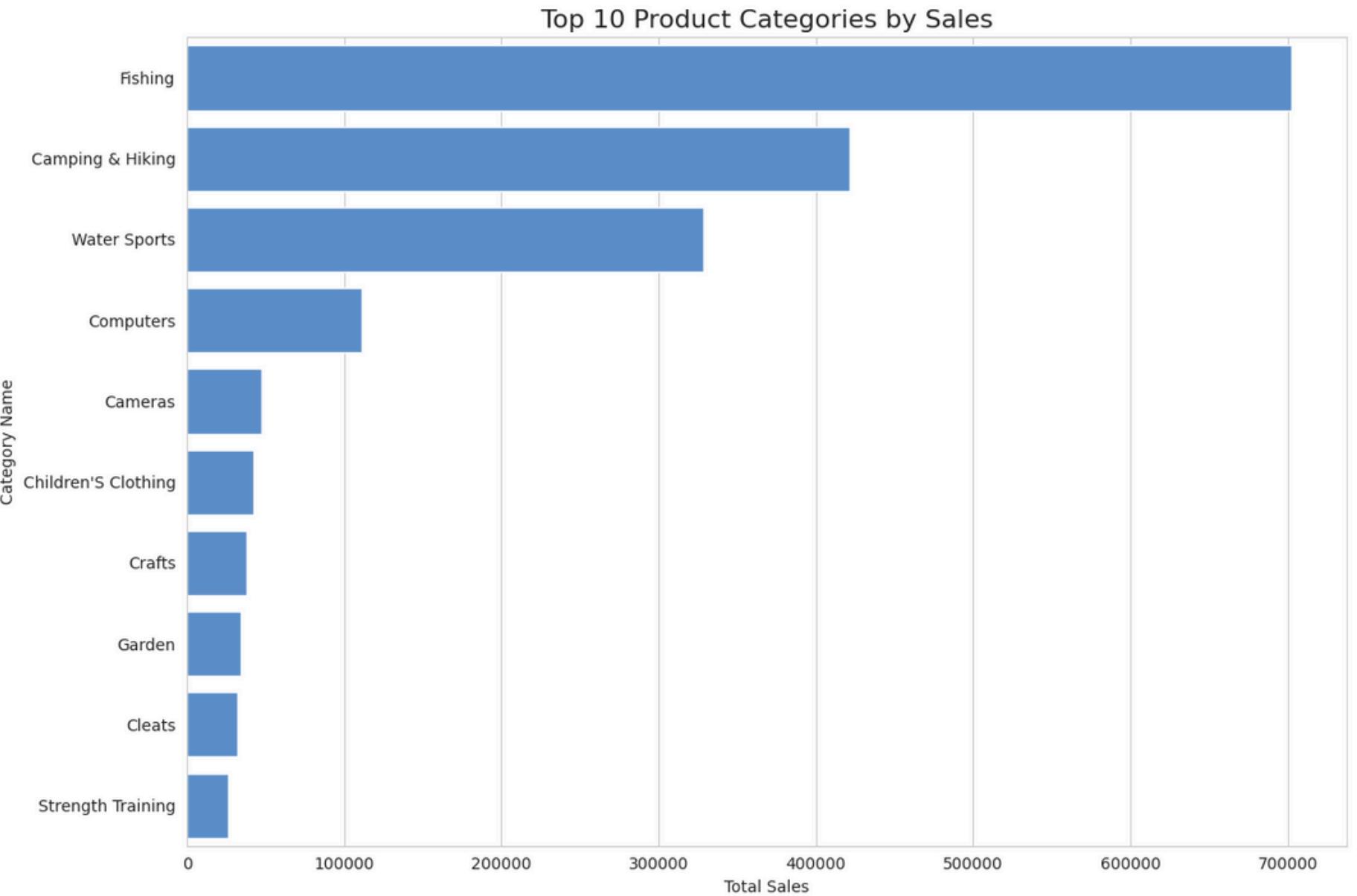
Recommendations:

- Plan **product-specific** seasonal inventories, especially for outdoor sports categories.
- Shift supply chain resources **away** from winter period.
- If Q4 drop is a data logging issue, clean or retrieve missing data before modeling.



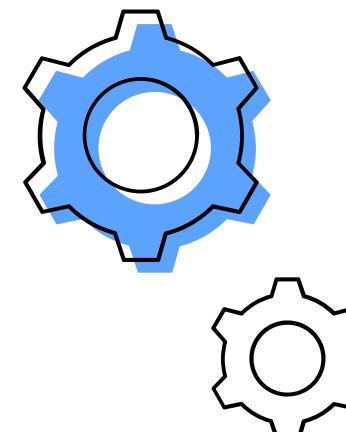
Key findings :

- **Fishing** is the top category (dominant).
- Camping & Hiking and Water Sports follow as **strong** performers.
- Tech categories like Computers still have significant share (**~120,000+**).
- Lower-performing categories (Cameras, Crafts, Children's Clothing) contribute minimally.



Recommendations:

- Increase stock coverage and promotional campaigns for the **top 3 categories** since they drive most revenue.
 - For **lower** categories, investigate:
 - Are they declining categories?
 - Should pricing or assortment change?
 - Or should stock levels be reduced?



Thank You

Hopefully, this year's report can
make our company even better

