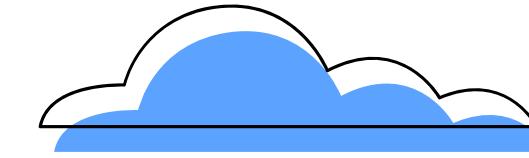


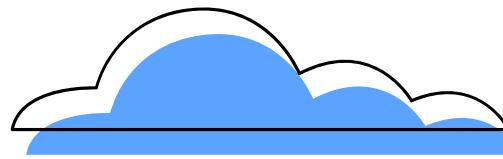
# E-Commerce Supply Chain



## 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**

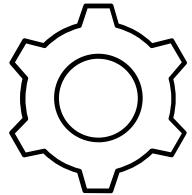
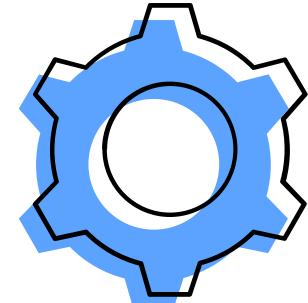
Inventory Management & Stock

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

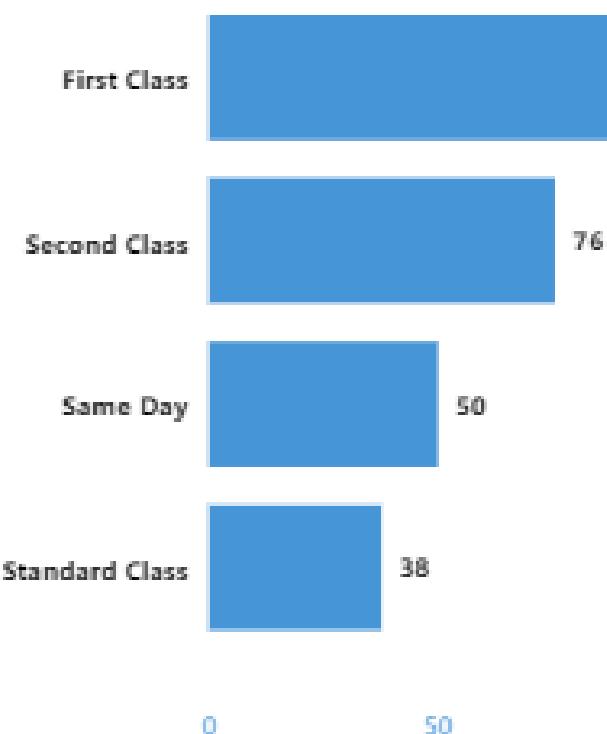
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Late Delivery Rate

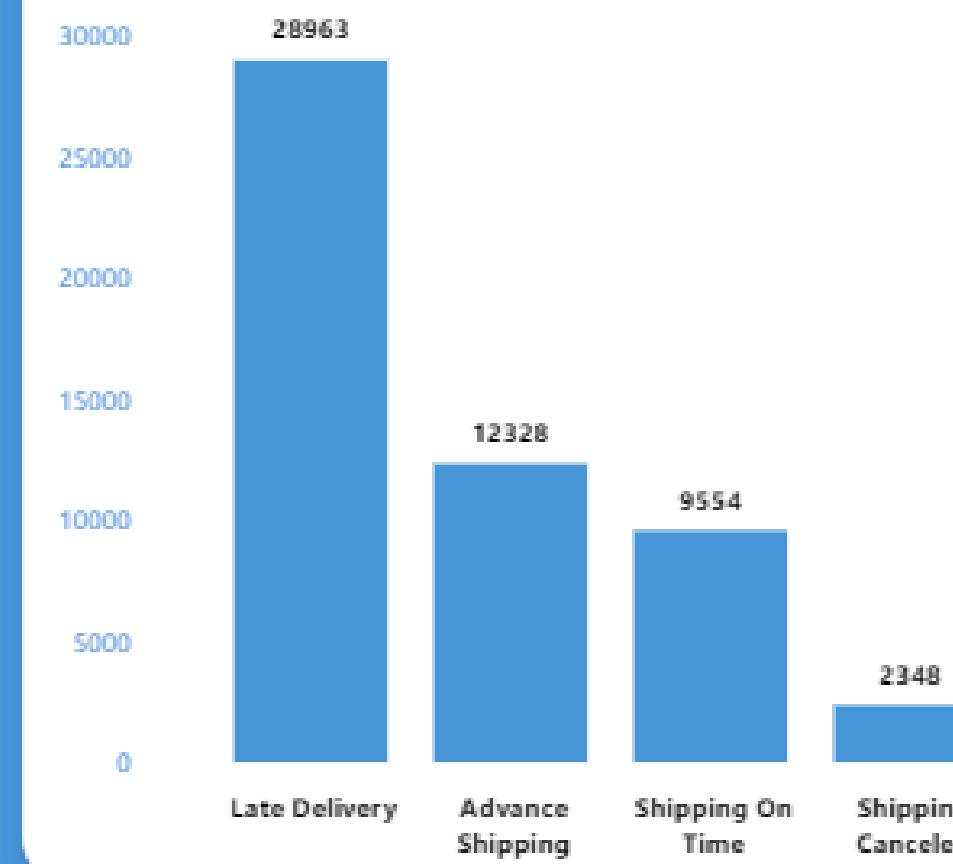
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Avg Delay Late Deliveries

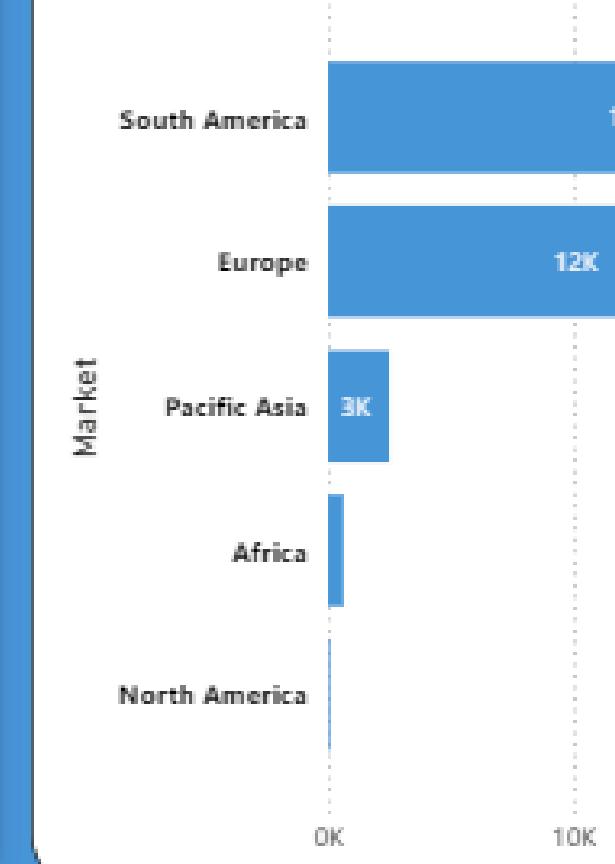
Late delivery Rate By Shipping Mode

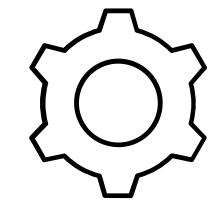
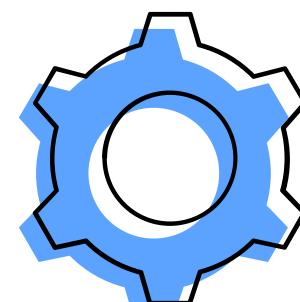


Delivery Status



Late Deliveries By Region





## Shipping Mode Performance

53K

Total Orders

28.96K

Late Deliveries

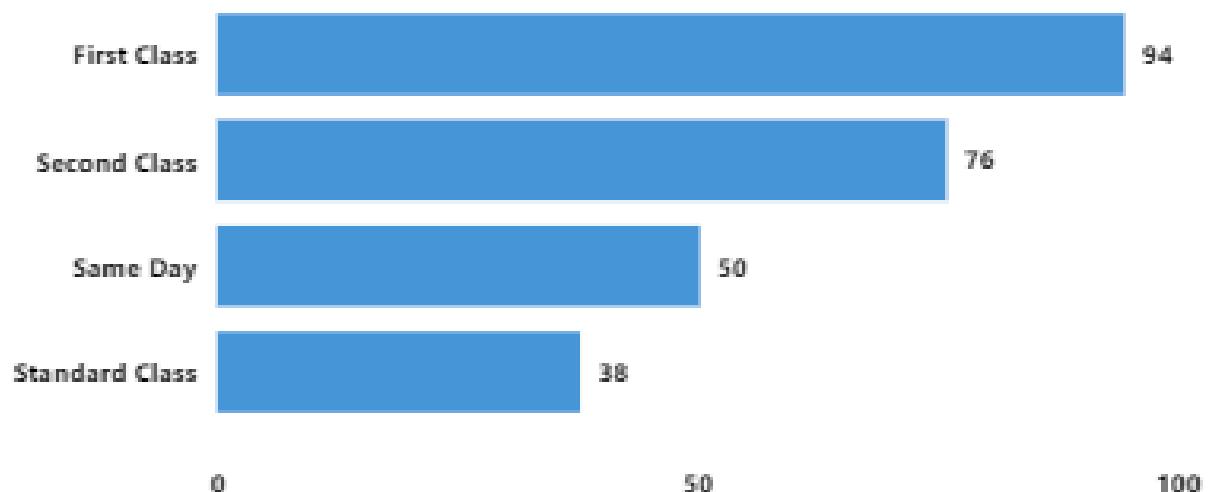
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Late Delivery Rate

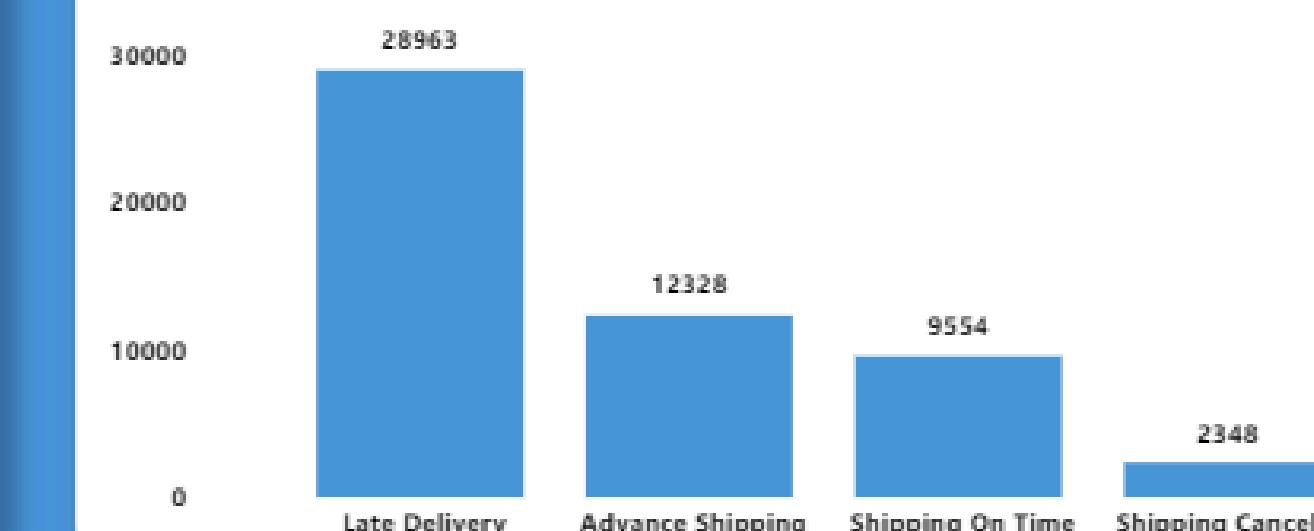
1.61

Avg Delay Late Delivery

Late delivery Rate By Shipping Mode



Delivery Status



Avg Scheduled Shipping Days

2.47

Avg Actual Shipping Days

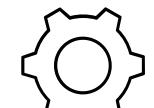
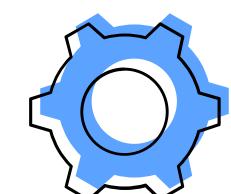
4.09

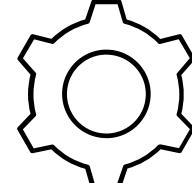
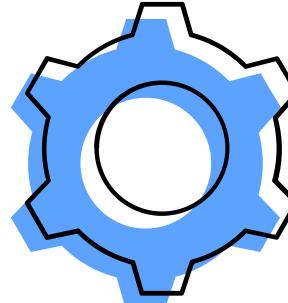
Advanced Shipping

23.18

Shipping On Time

17.96

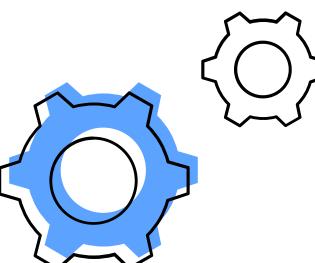


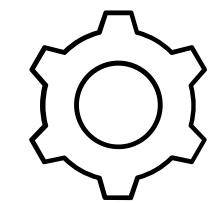
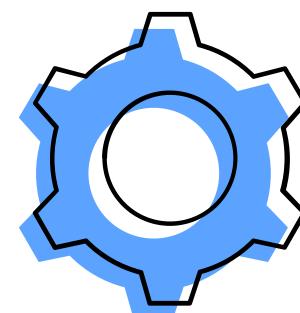


## What the Data Shows (Findings):

### 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.

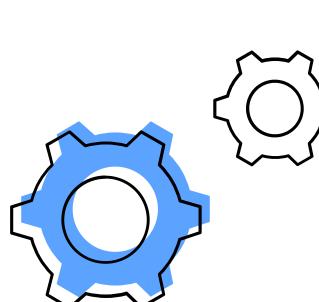
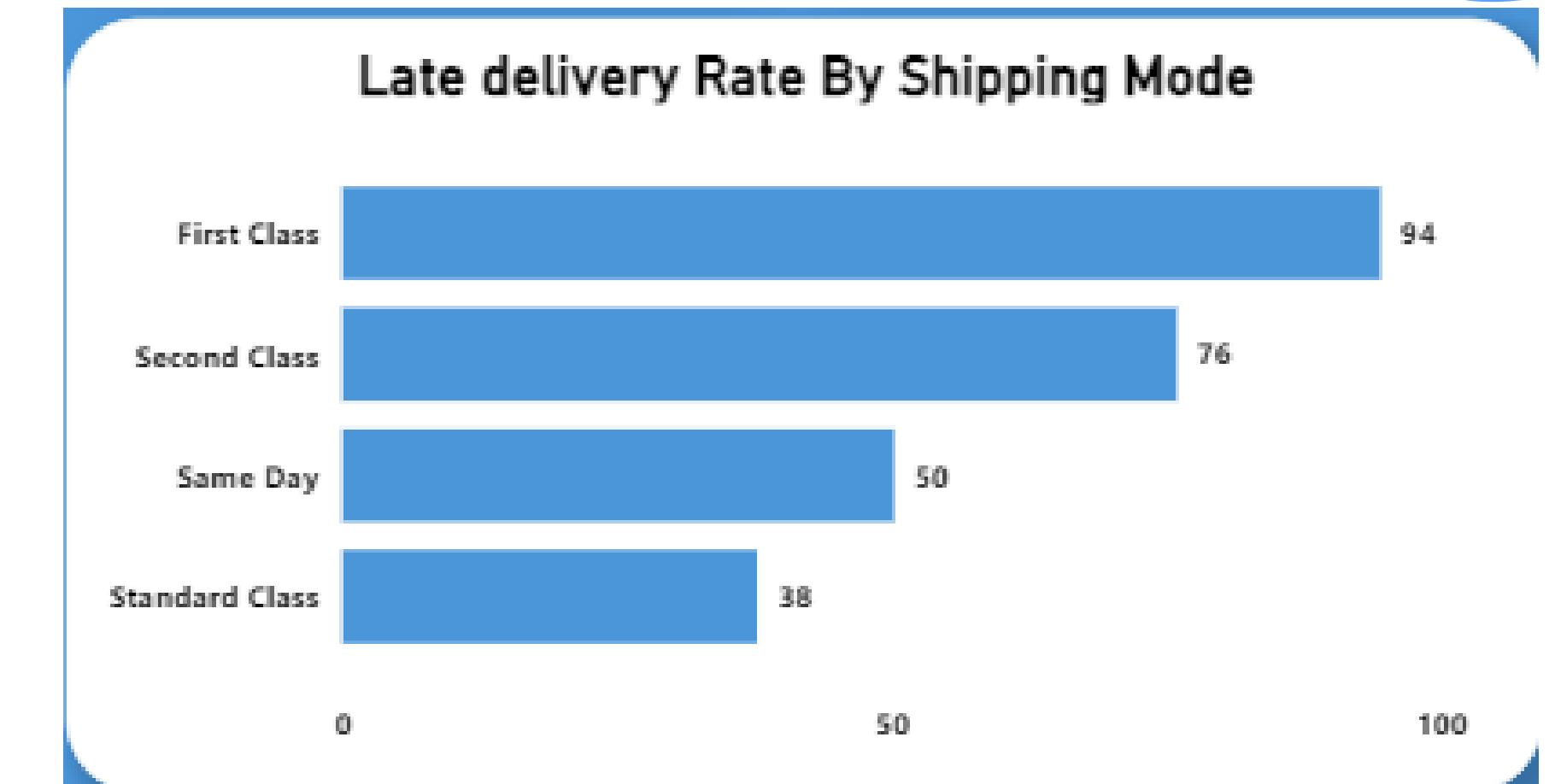


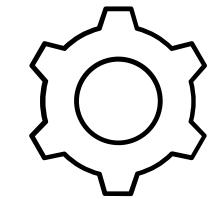
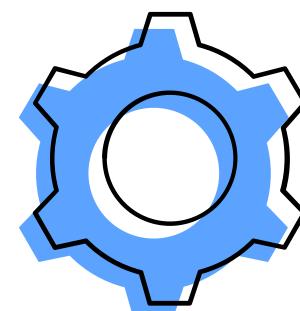


# What the Data Shows (Findings):

## 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.





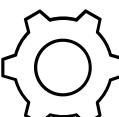
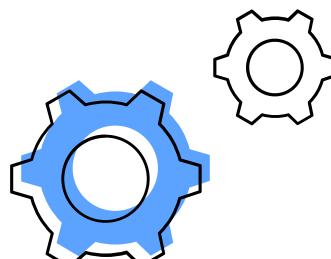
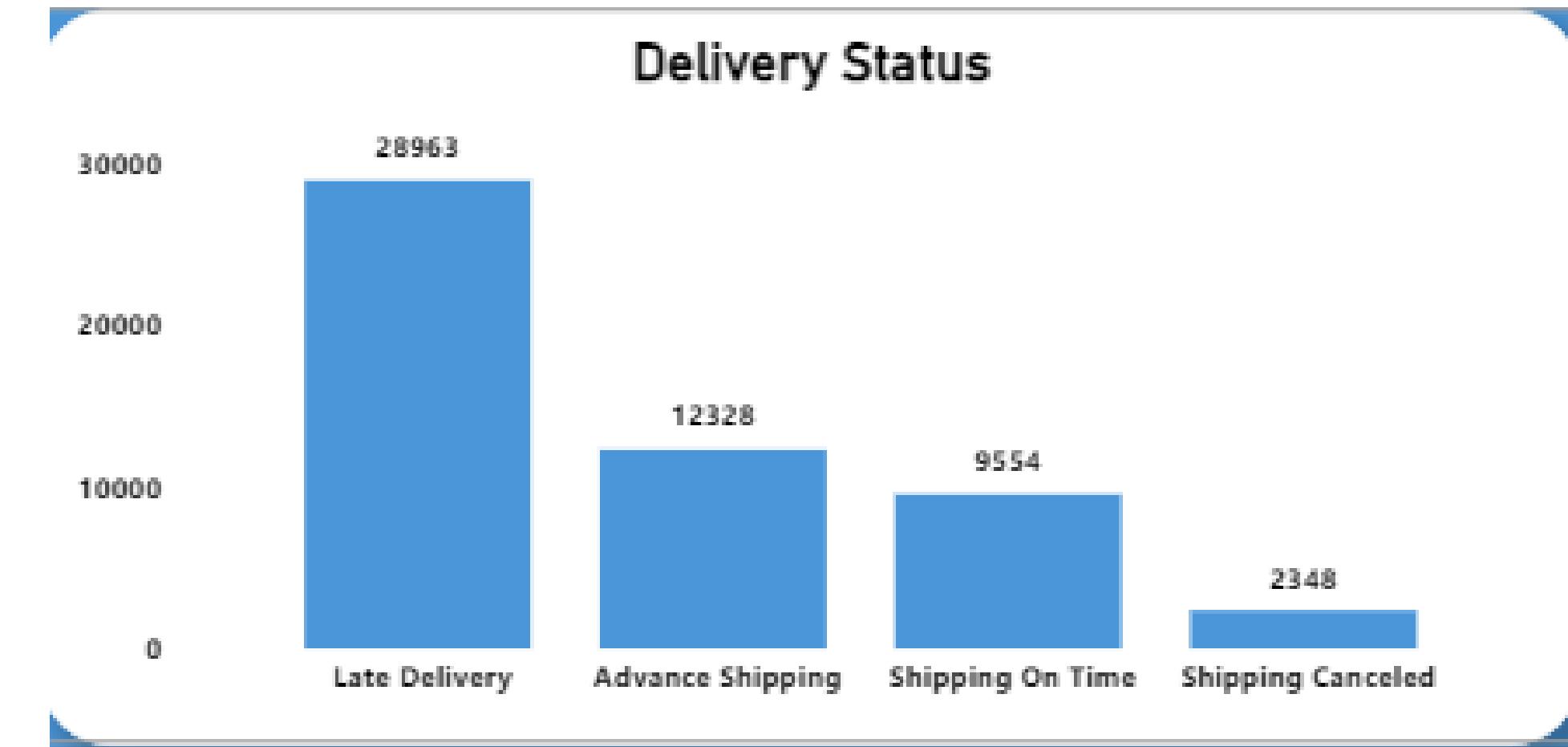
# What the Data Shows (Findings):

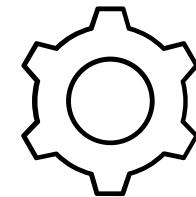
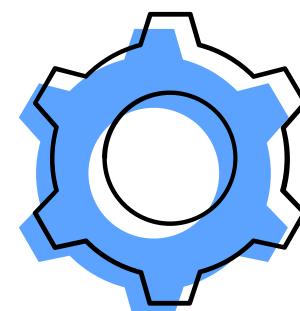
## 2. Delivery Status Percentage

- 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 )

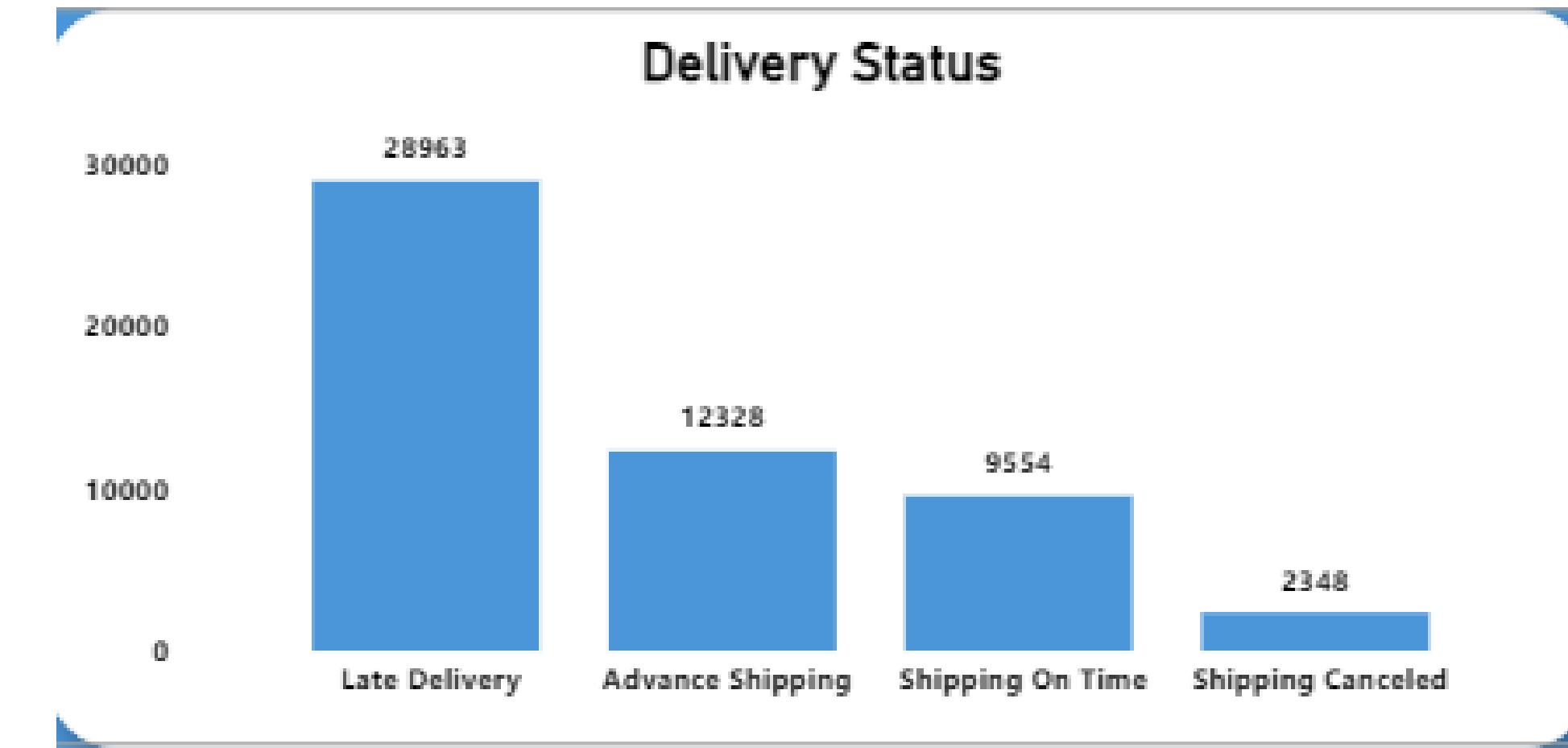




# What the Data Shows (Findings):

## 2. Delivery Status Percentage

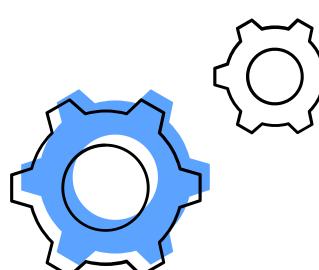
- Late Delivery Rate 54.45%
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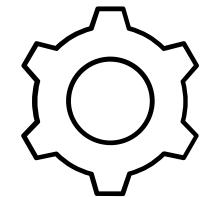
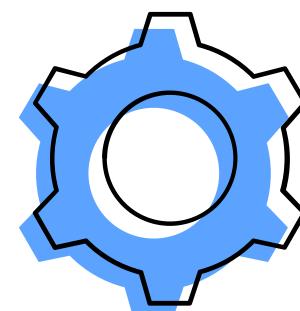


## 2.2 Recommendation

Identifying the Root Cause:

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

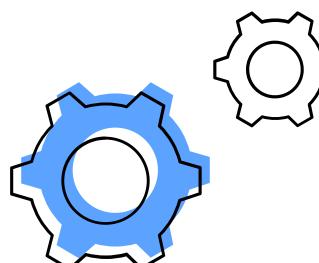
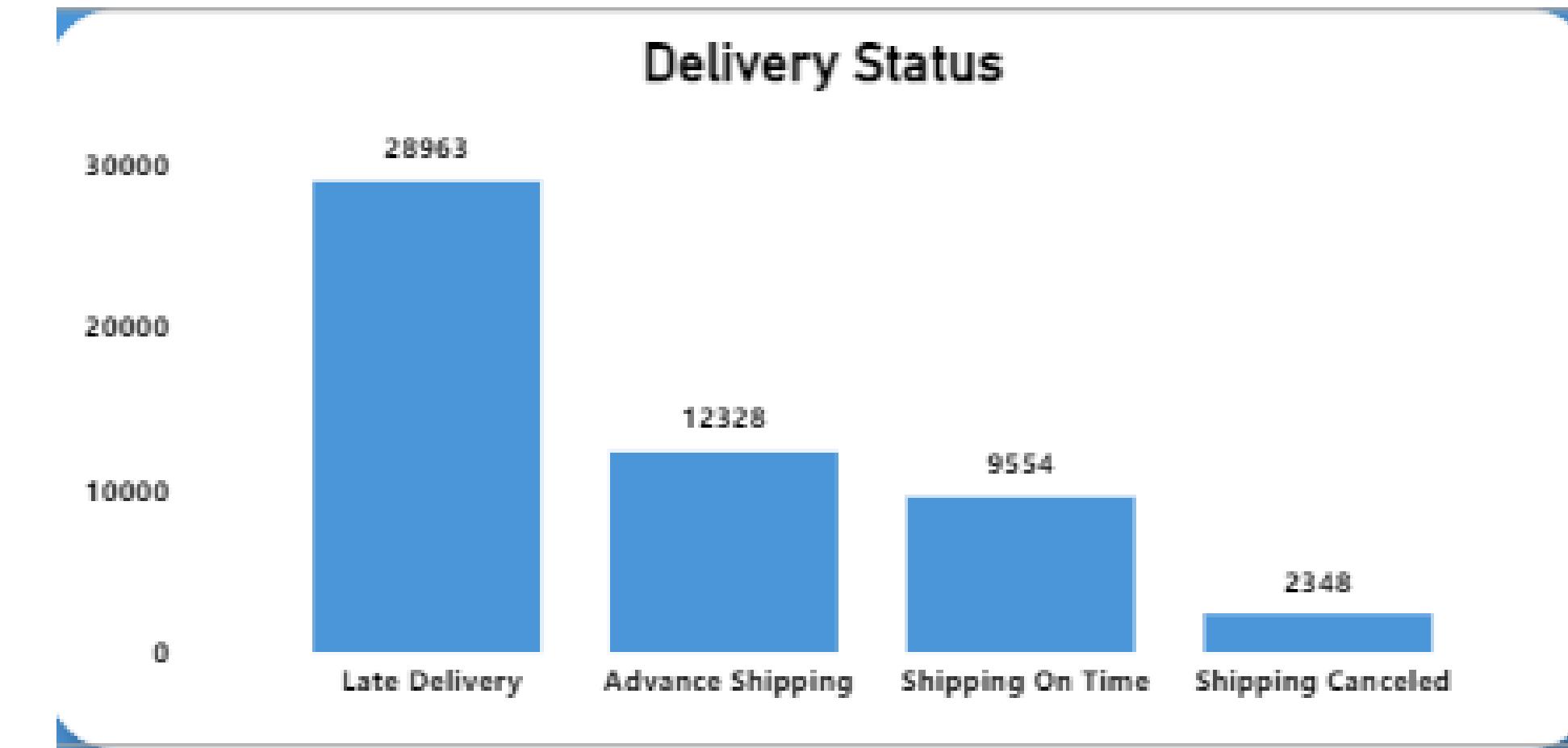


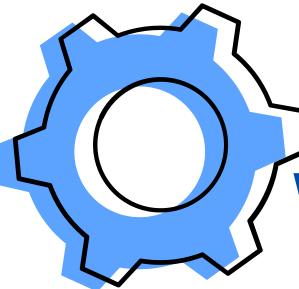


# What the Data Shows (Findings):

## 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

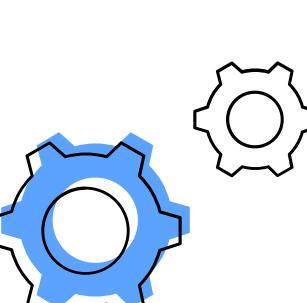
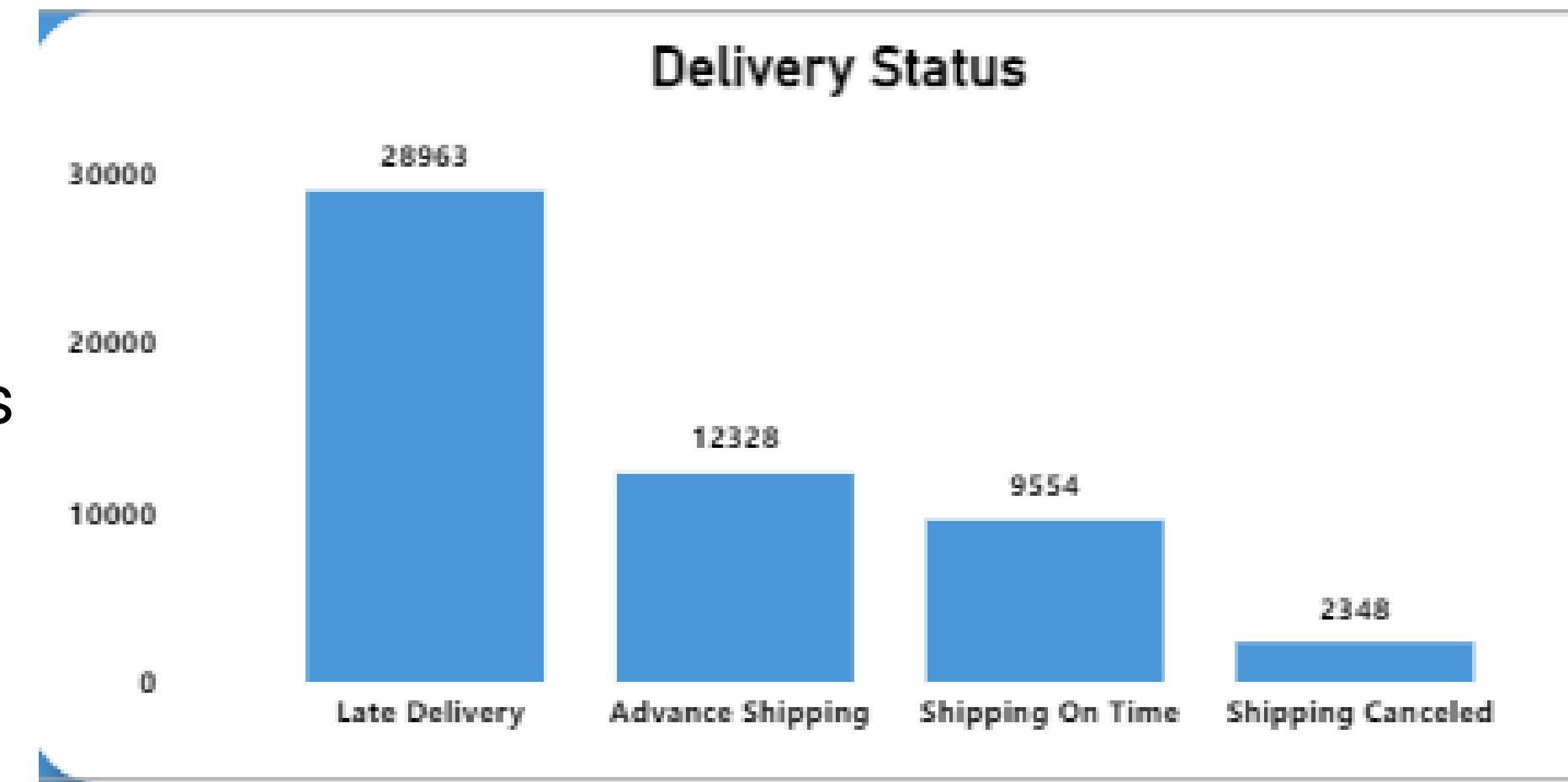


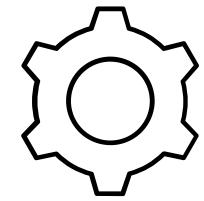
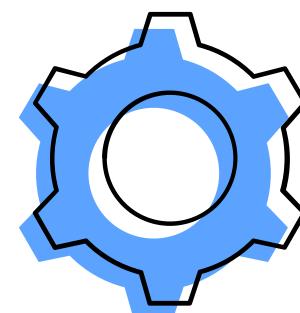


# What the Data Shows (Findings):

## 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

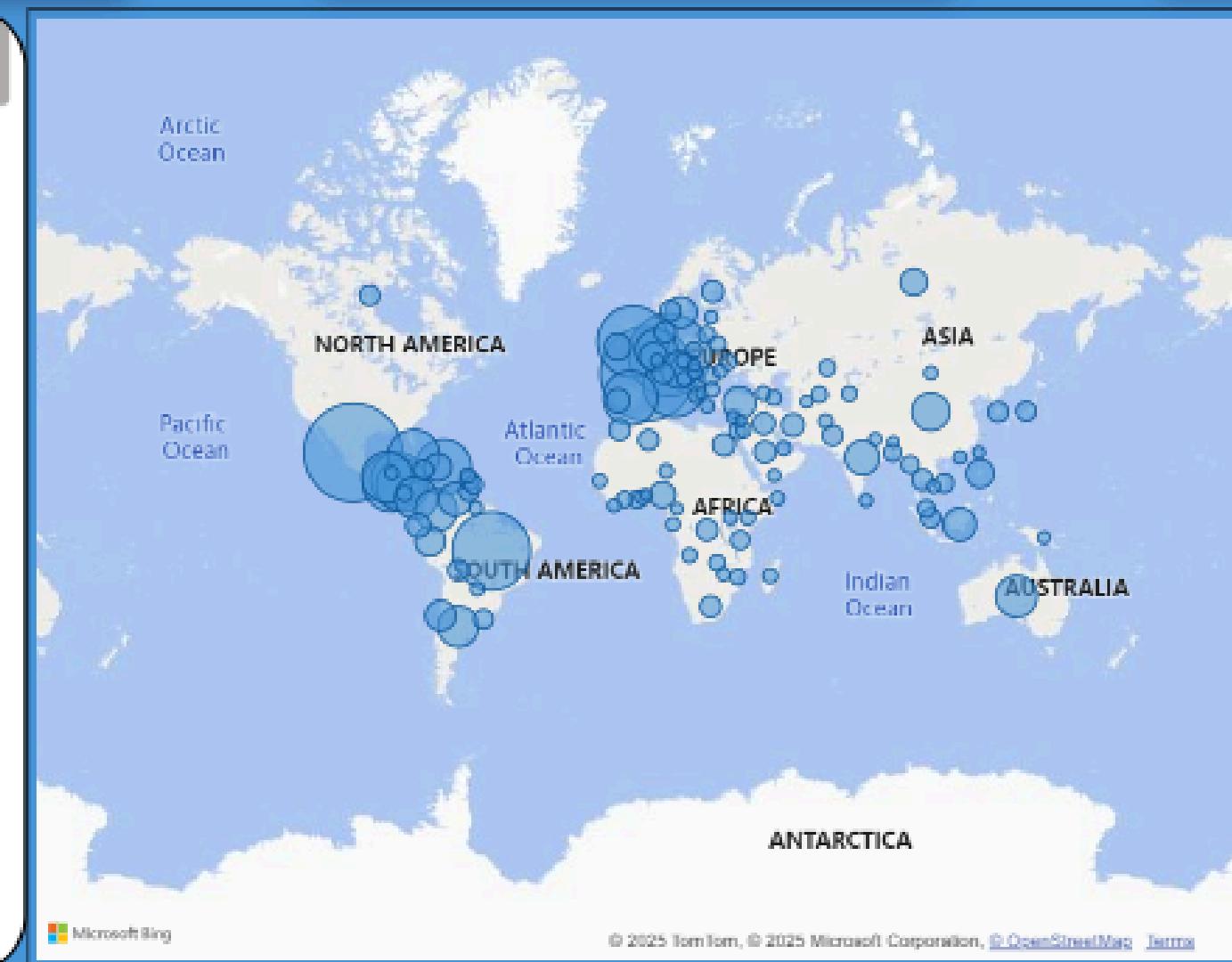
28.96K

Late Deliveries

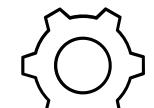
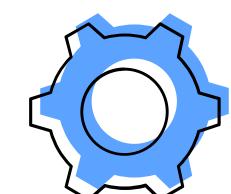
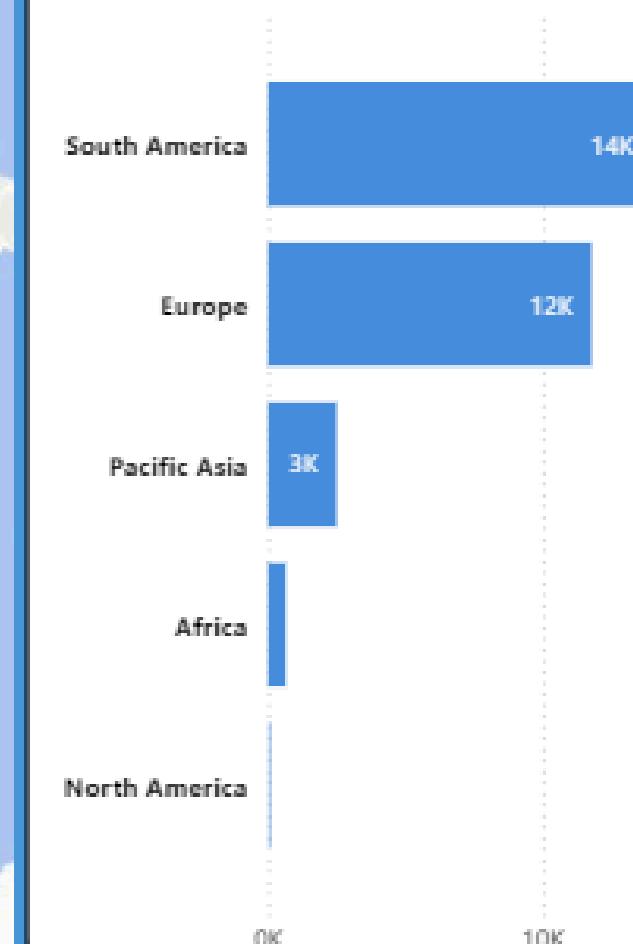
54.21

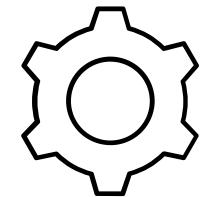
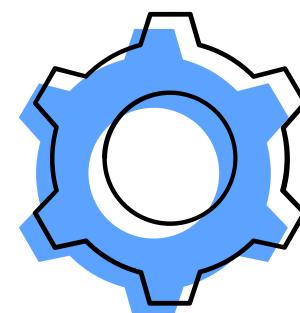
Late Delivery Rate

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):

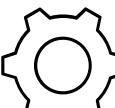
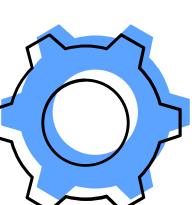
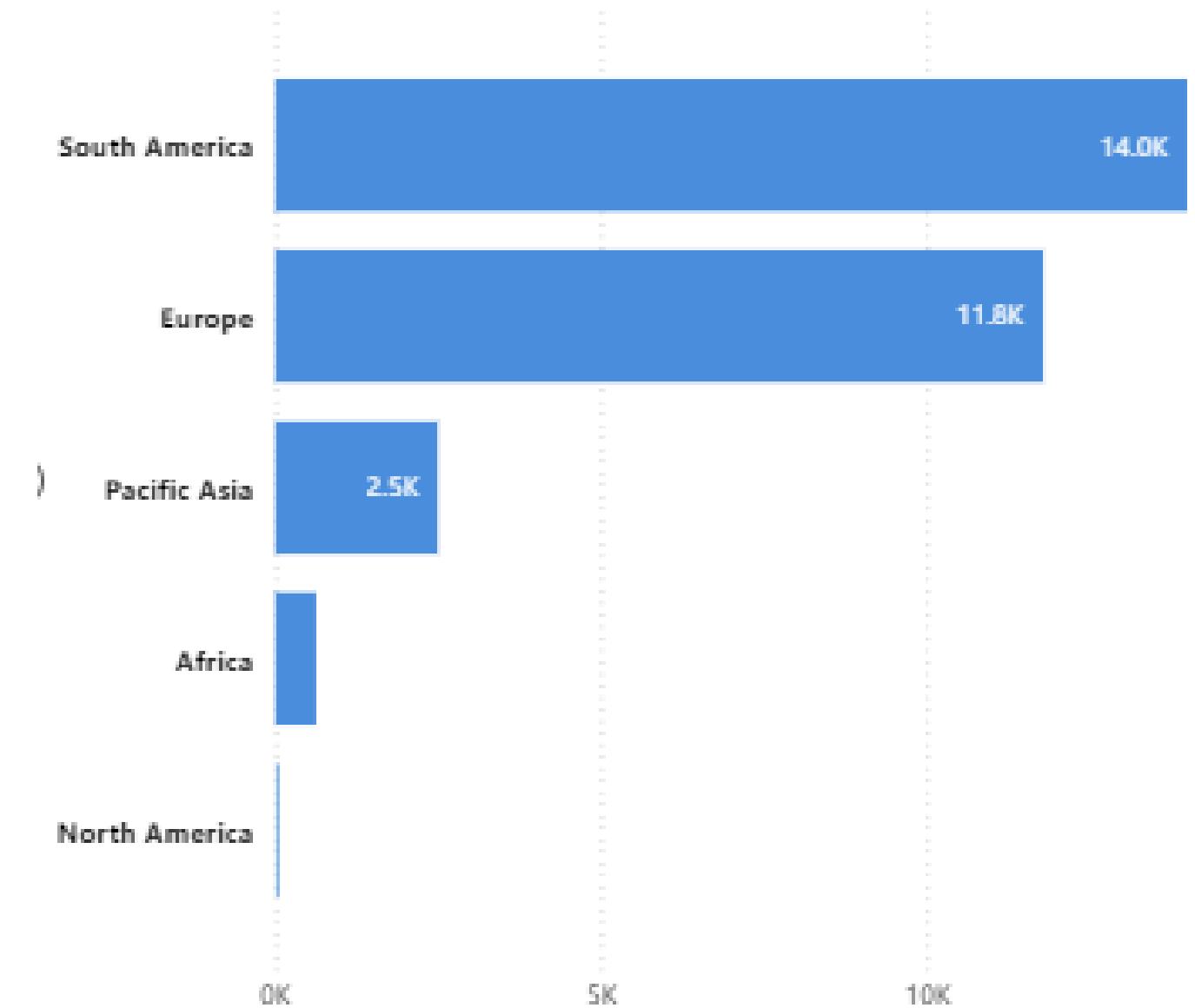
## Regions With the Highest Late Delivery Rates

- 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.

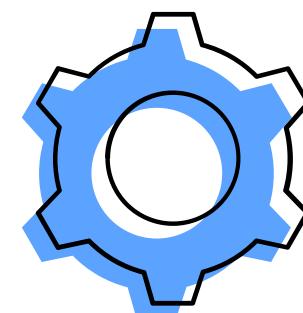
Late Deliveries By Region



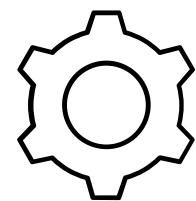
# Customer Behavior, Loyalty Analysis

Next Slide





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



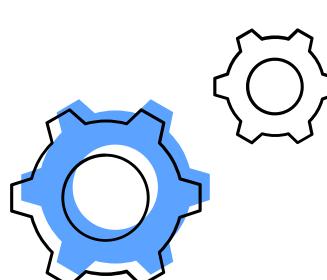
## What the Data Shows (Findings):

### 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

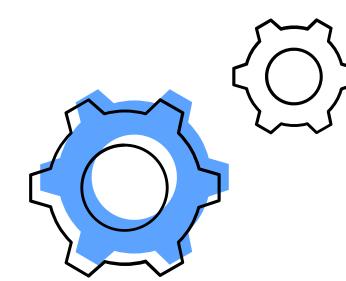
- Repeat rates fall between [12–14%](#), meaning most customers purchase once or twice and do not return.

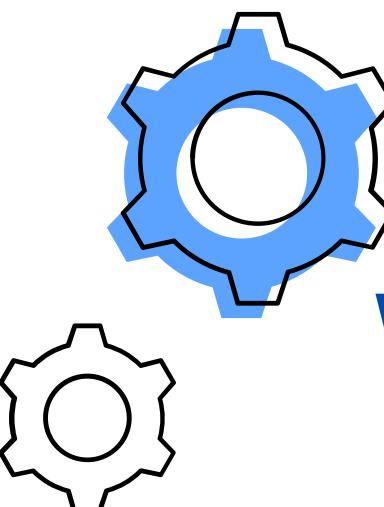




# What the Data Shows (Findings):

## 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

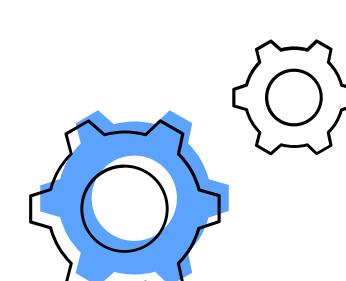
-Across all segments, the customers with the highest loyalty receive the highest average discount amounts:

- 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



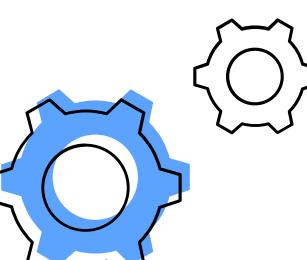
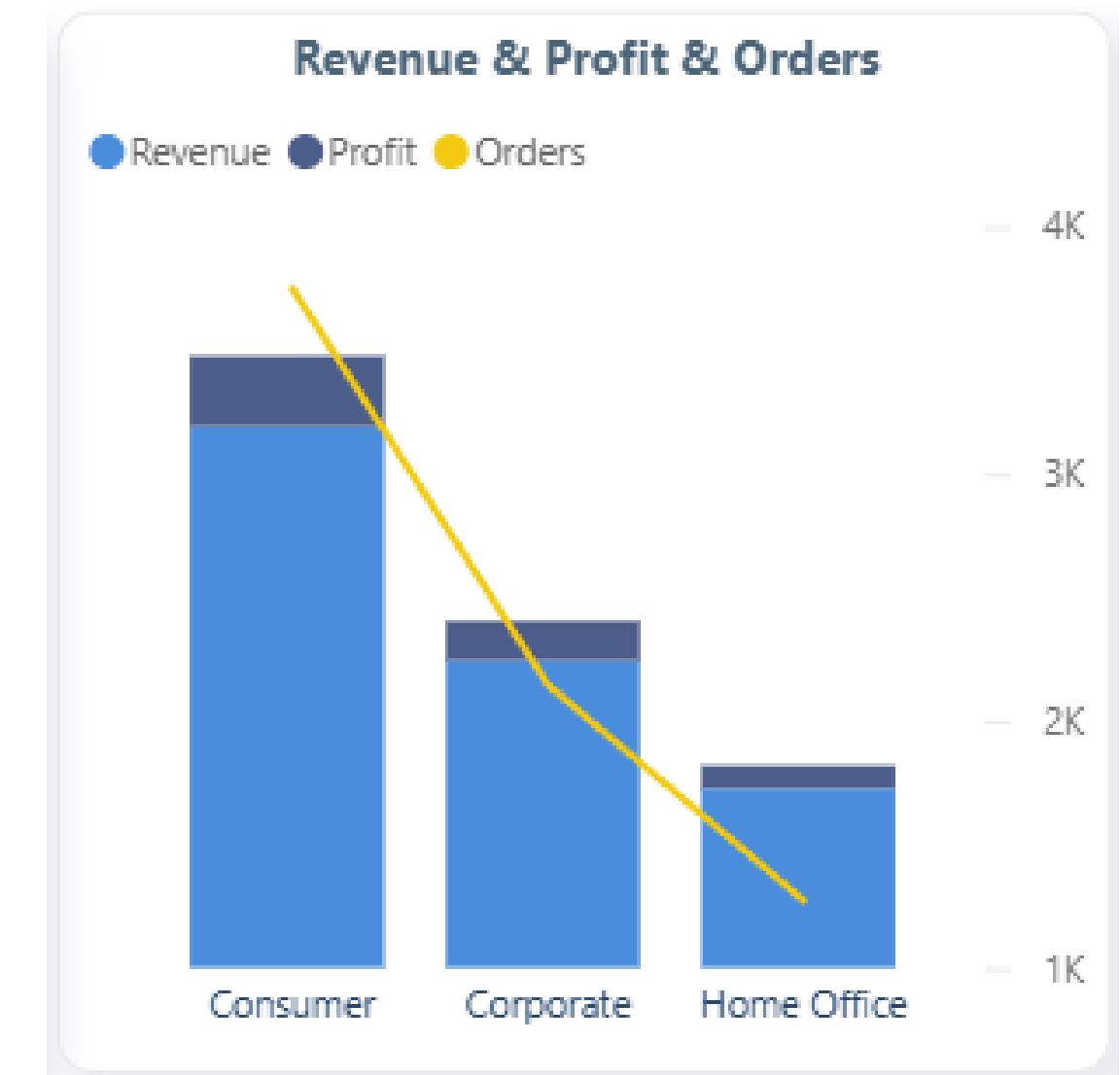
# What the Data Shows (Findings):

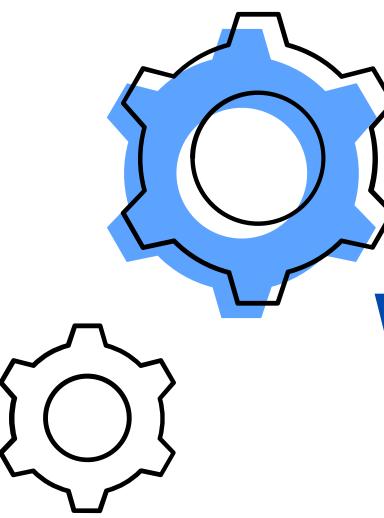
## 5. Consumer Segment Has the Best Value

- 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.

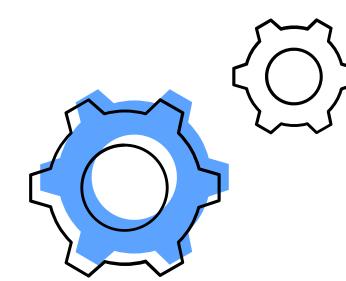
Customers classified as “High loyalty” are primarily staying because of high discount levels, not because they love the service.

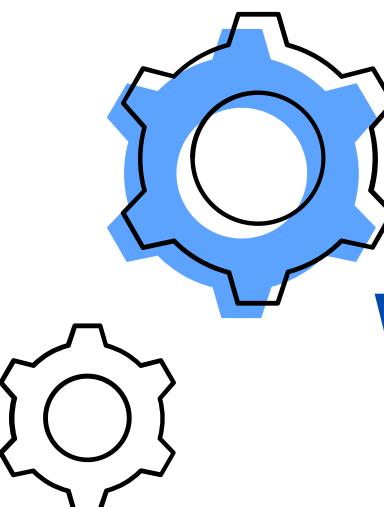
### 2) Delivery performance is damaging customer retention.

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.

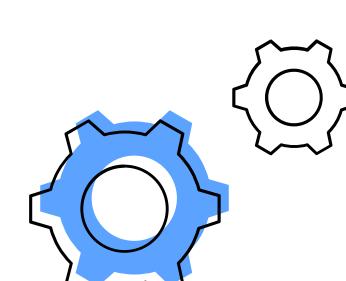
All segments show the same pattern:

- 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.



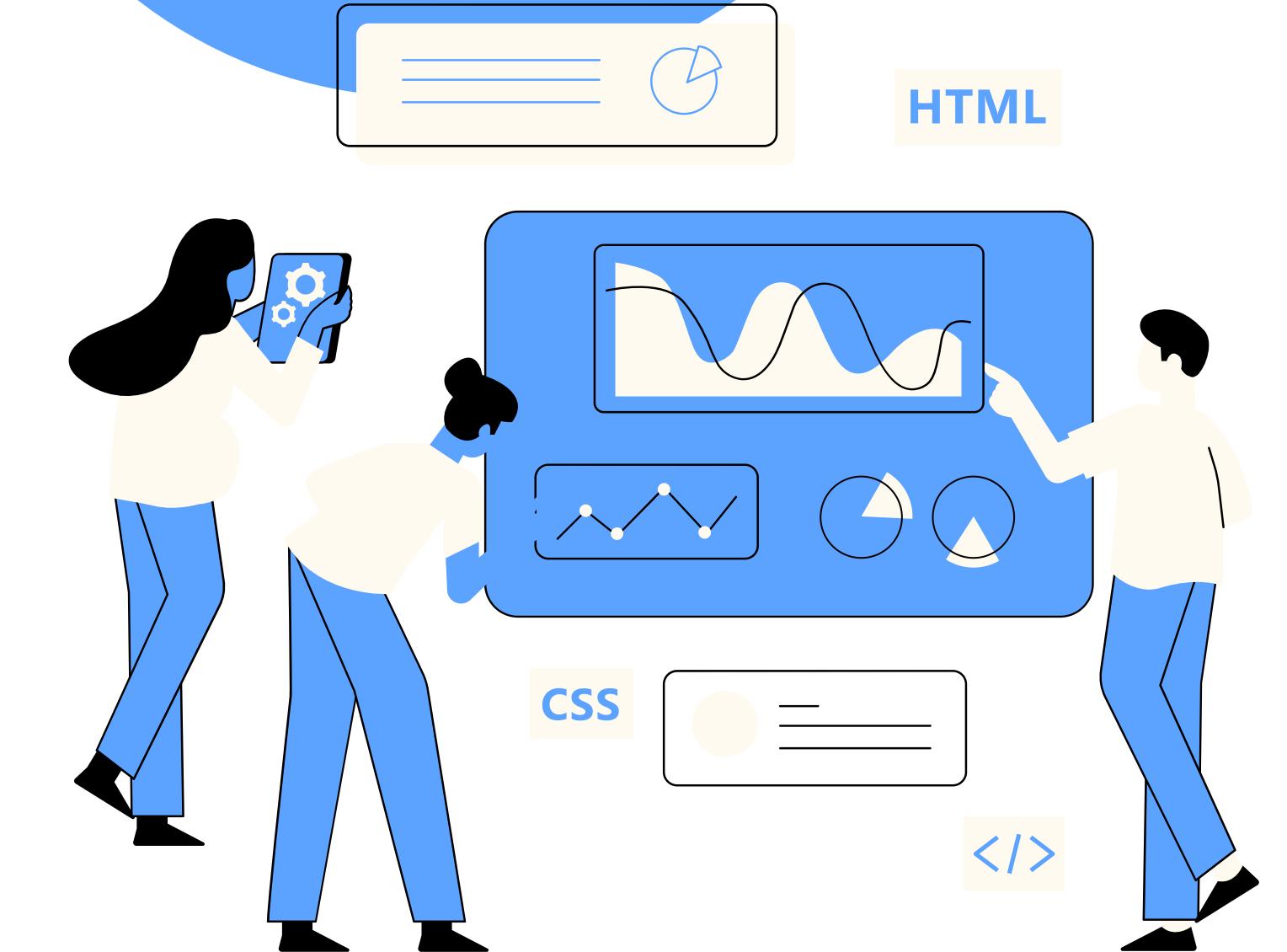
# Strategic Recommendations

## 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.



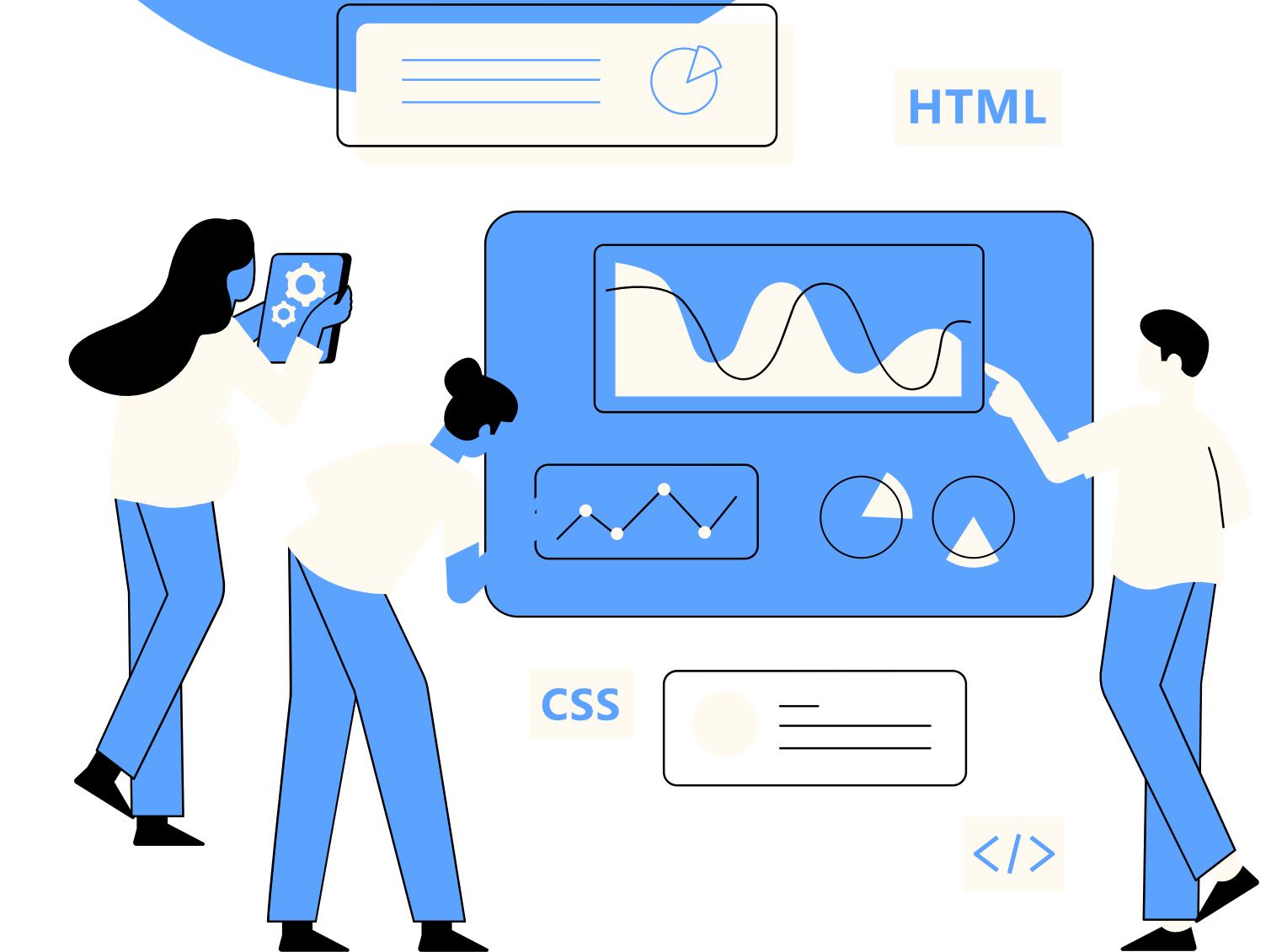
# Strategic Recommendations

## 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.



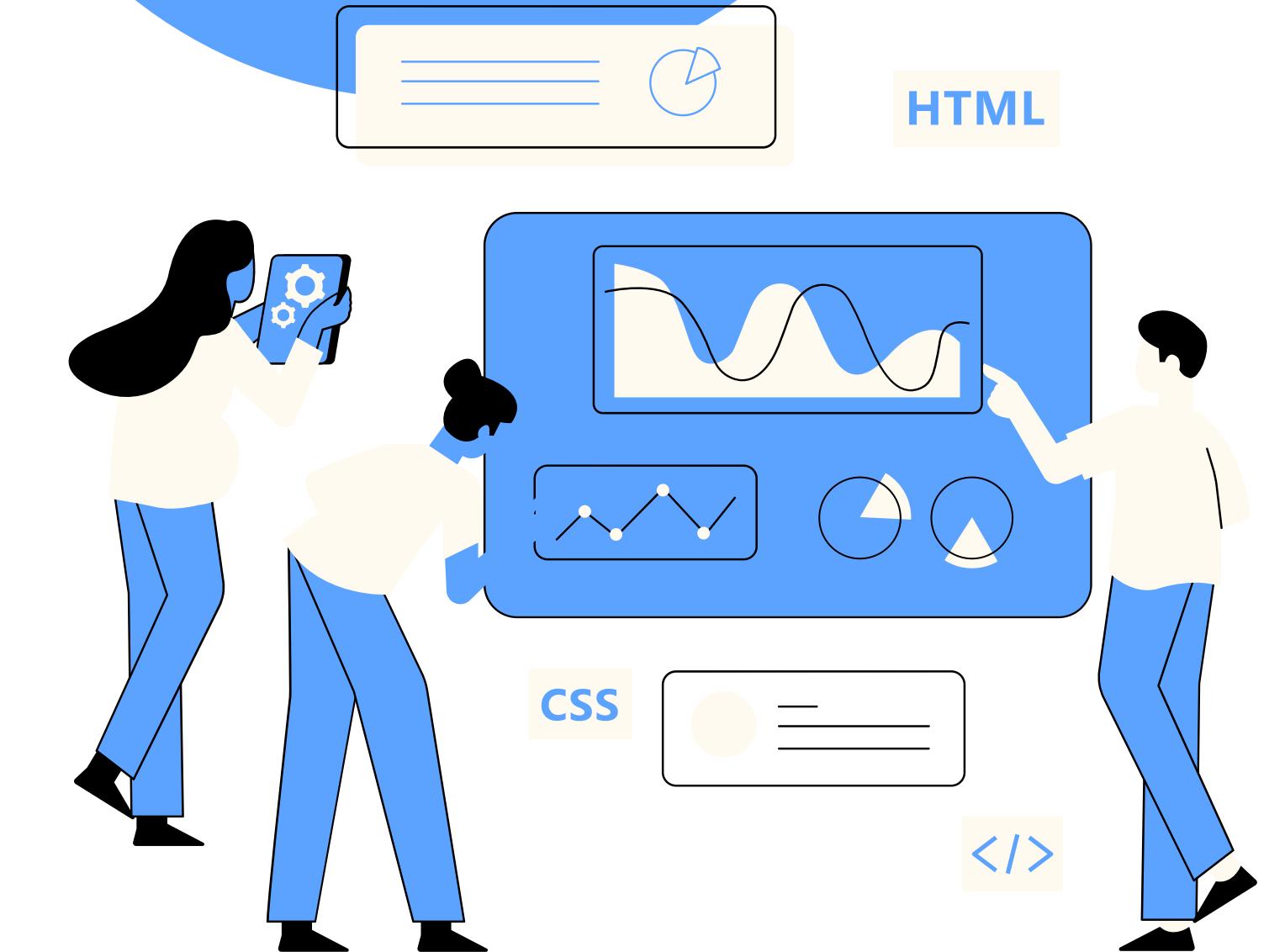
# Strategic Recommendations

## 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.

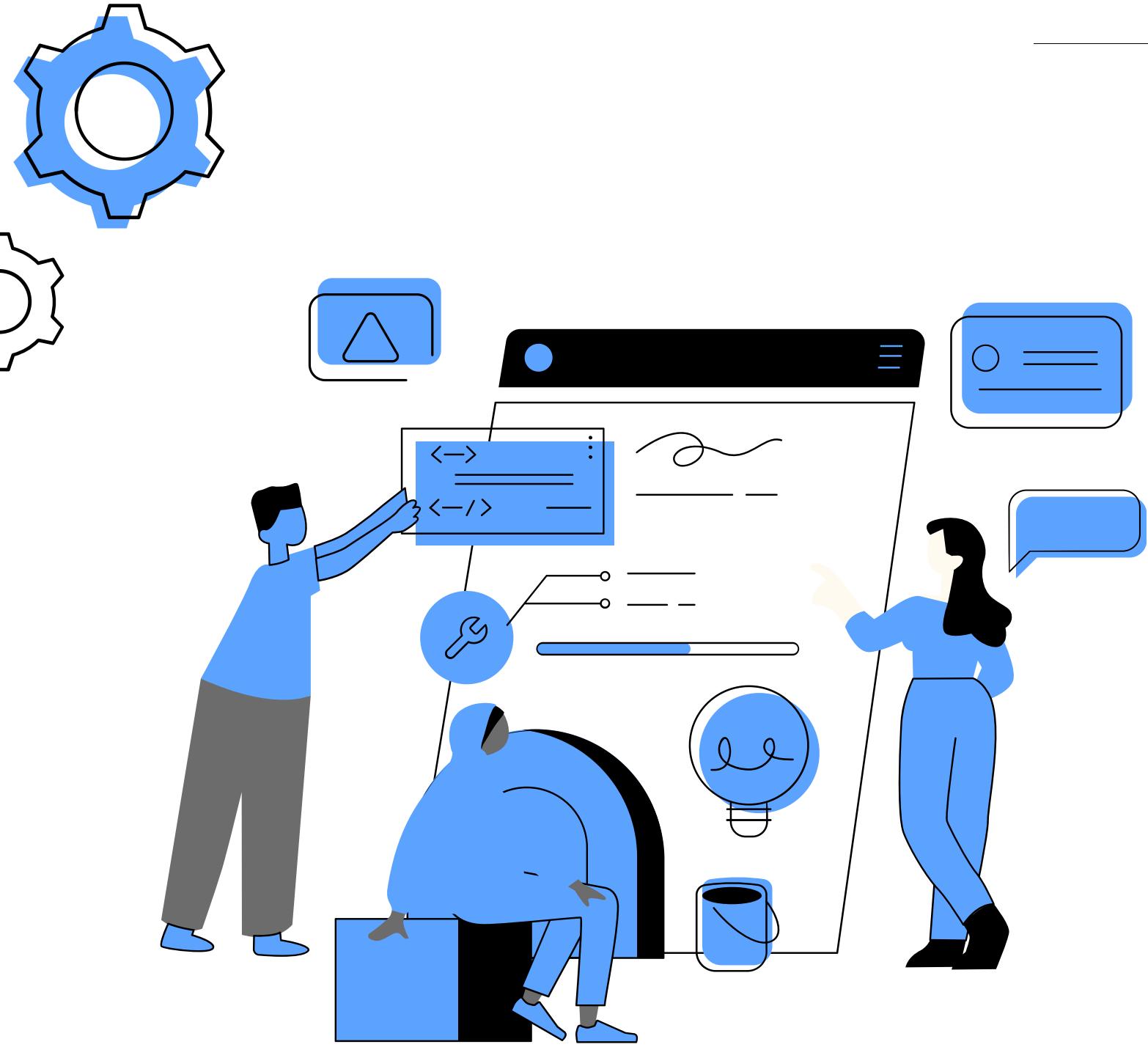
## F. Monitor and Act on Customer Feedback

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



# Sales & Profit Analysis

Next Slide

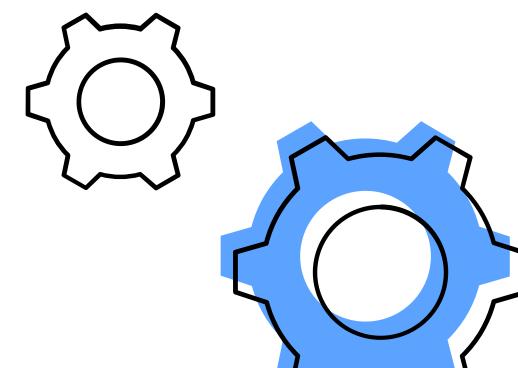


# What the Data Shows (Findings):

## -Top Categories By Sales & Profit

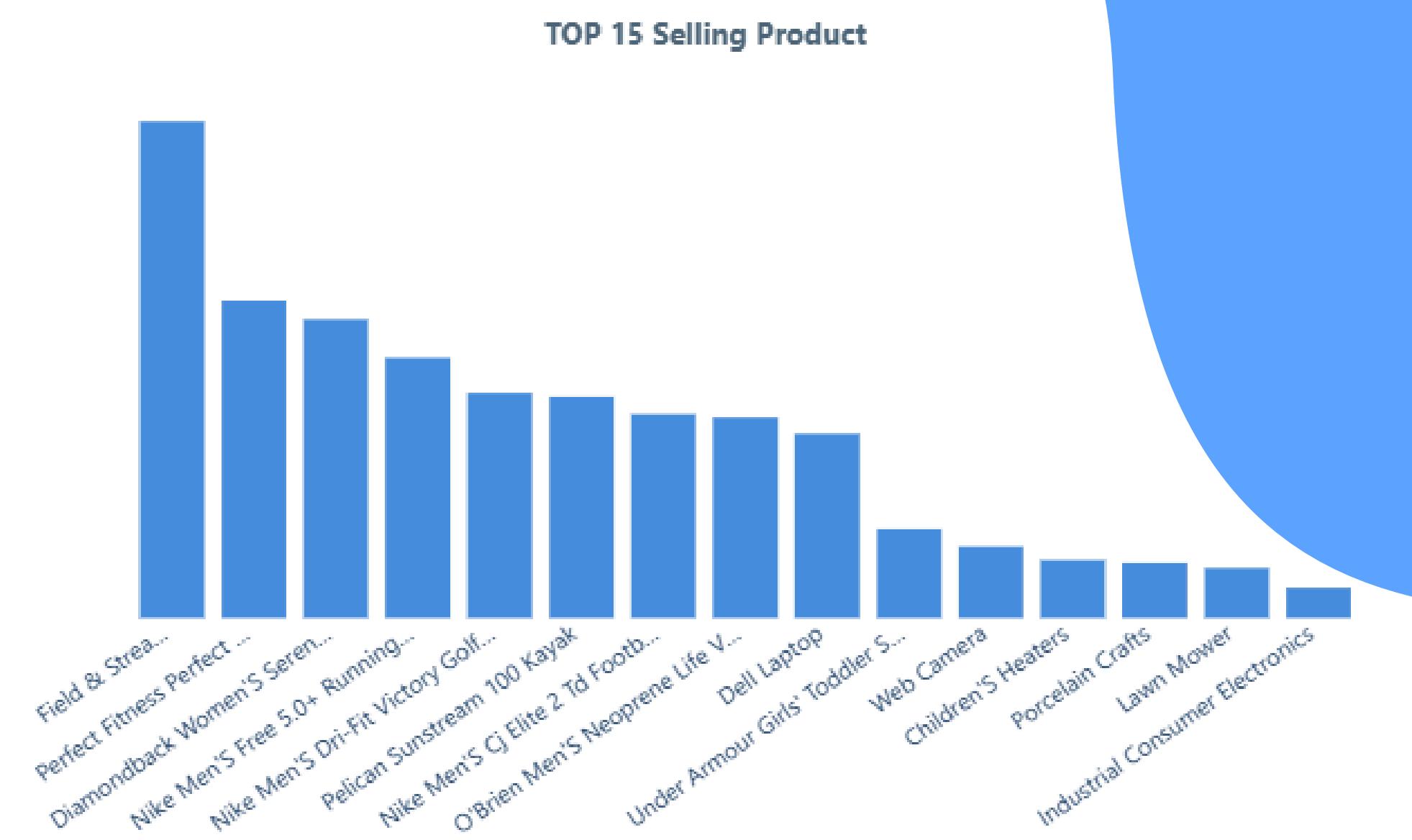
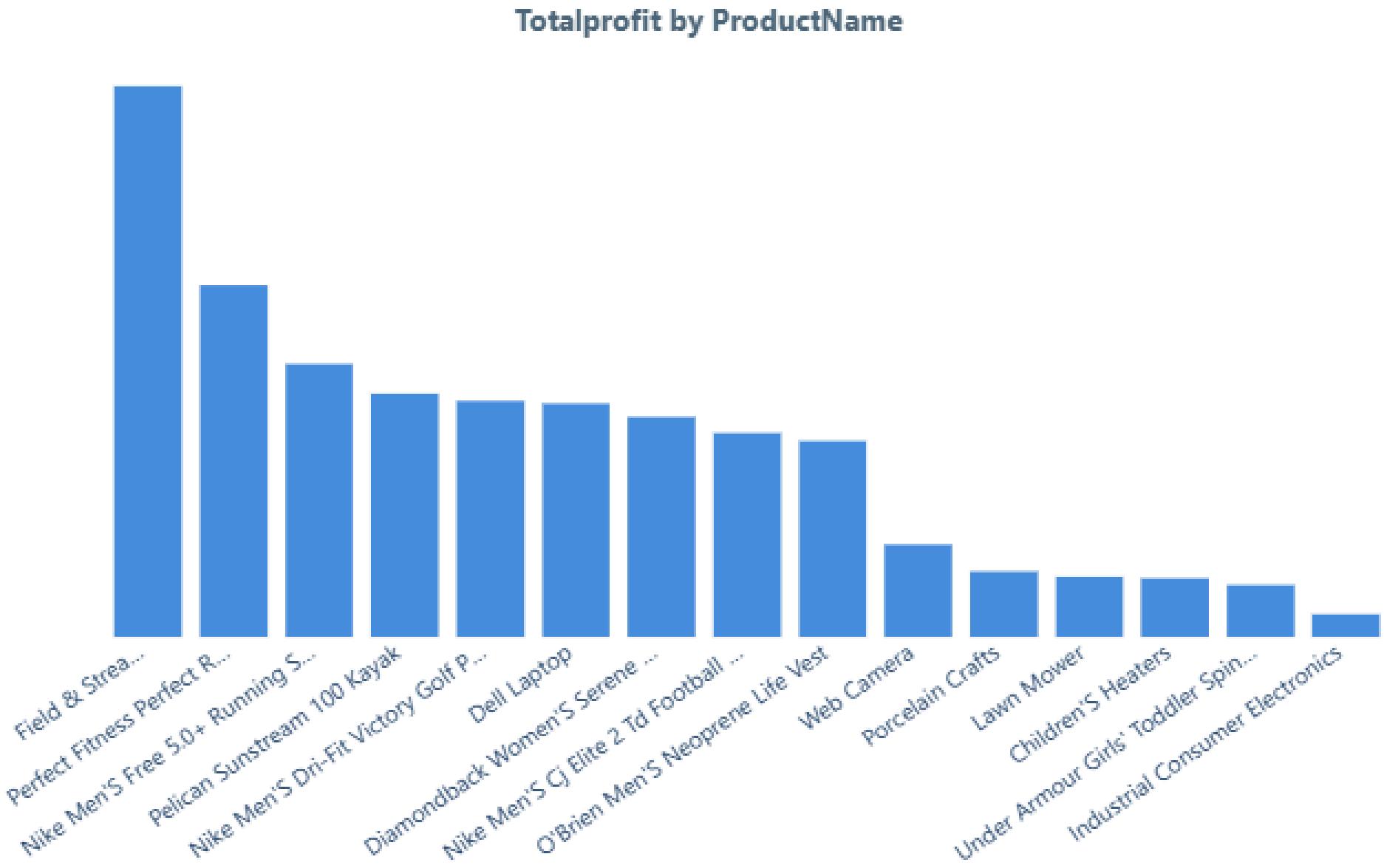


-This mismatch indicates that high-selling categories are not always the most profitable. Some categories sell well but **have lower margins or higher costs**, while others generate stronger profit despite lower sales volume.

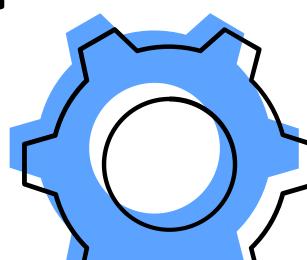
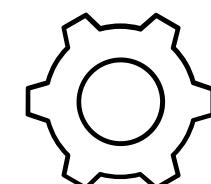
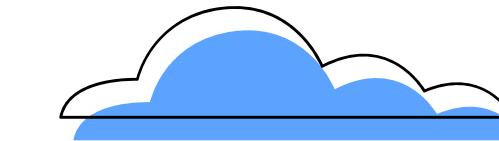


# What the Data Shows (Findings):

## -Top Product By Sales & Profit



This mismatch ....Why ??



# 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

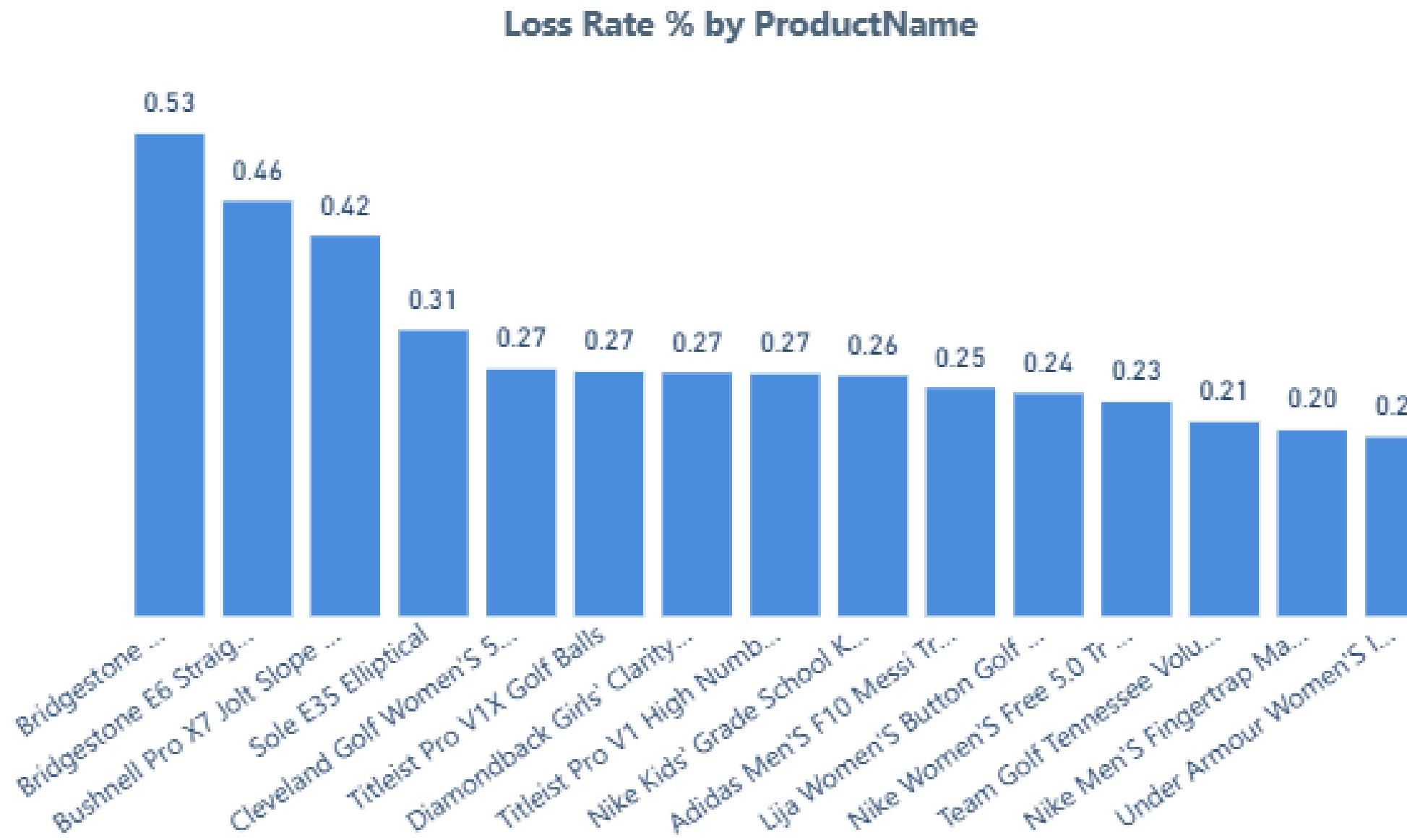
# Strategic Recommendations

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

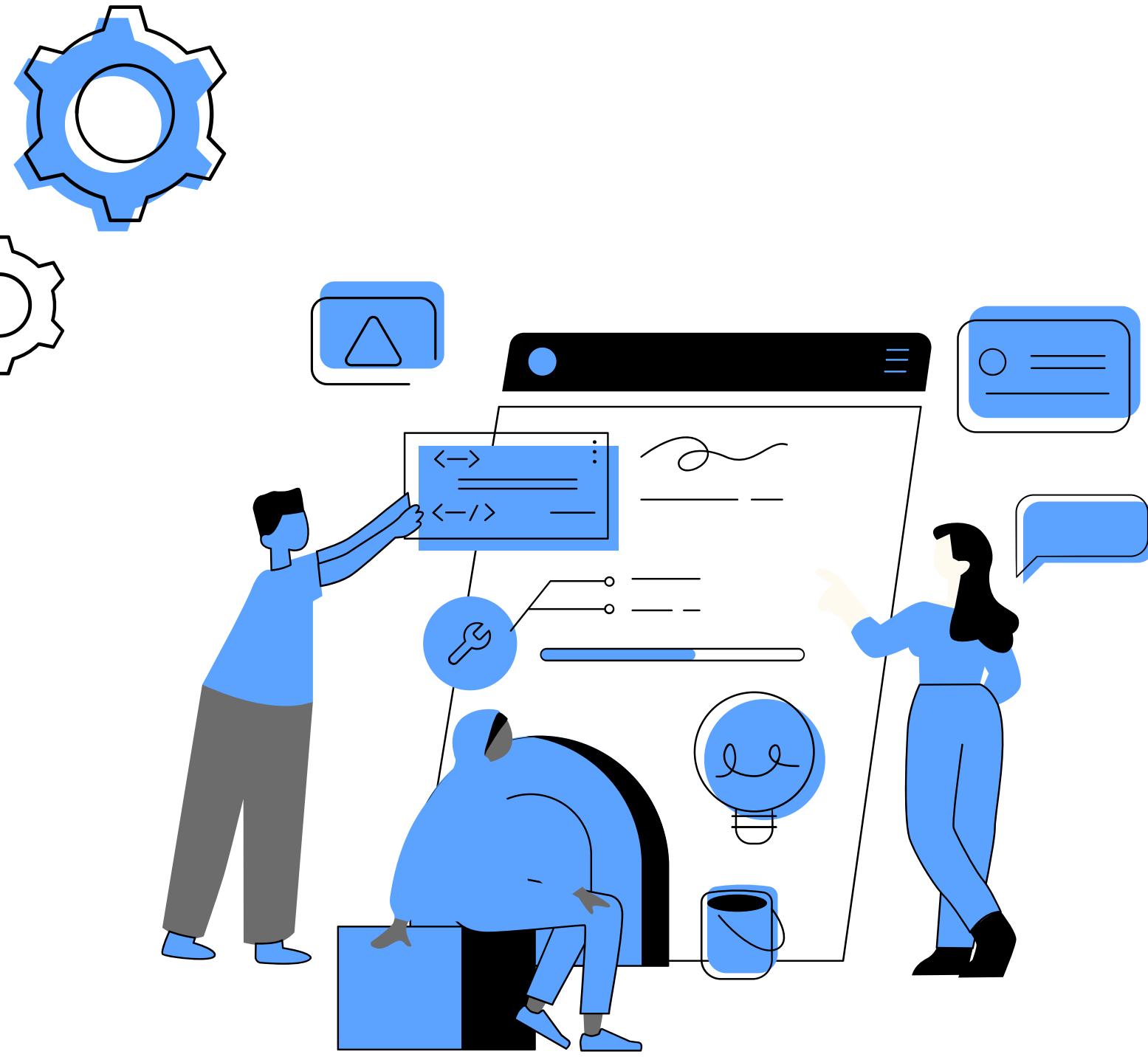


## Recommendations :

- 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

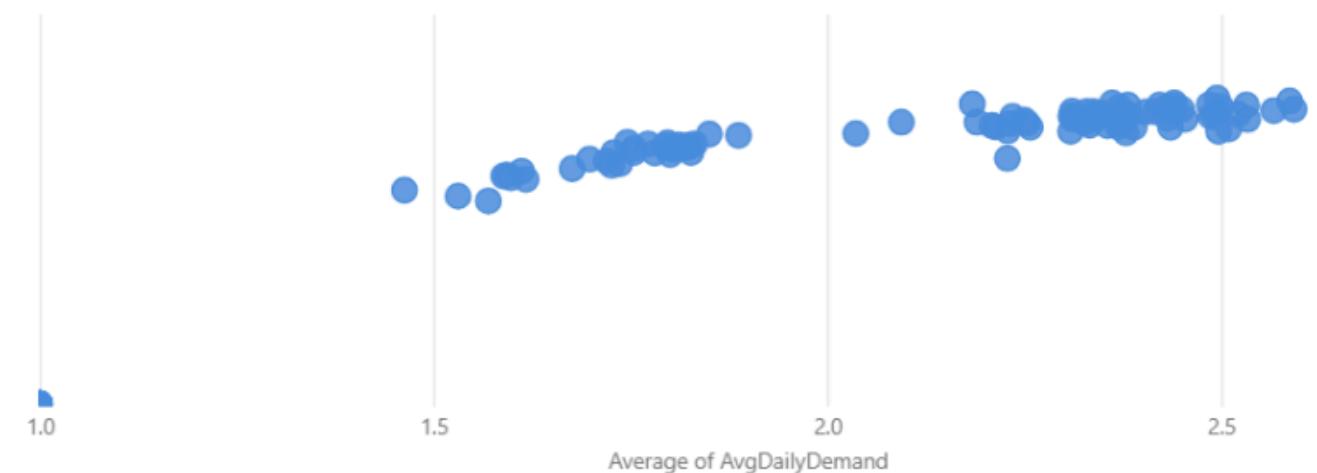
374K

Total Quantity Sold

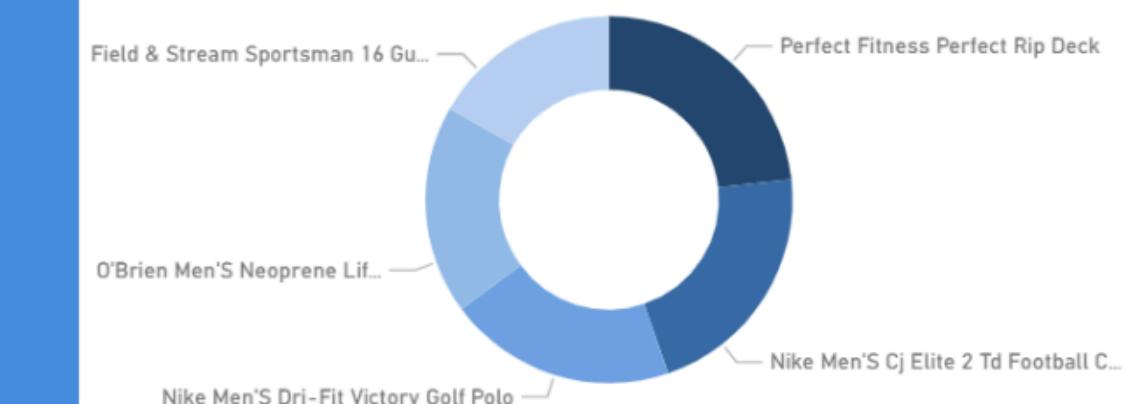
53K

Total Orders

### Demand variability per product



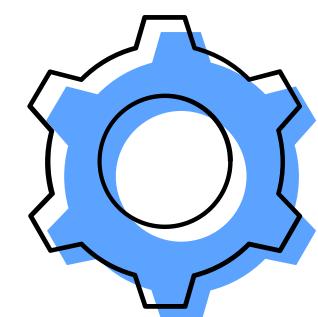
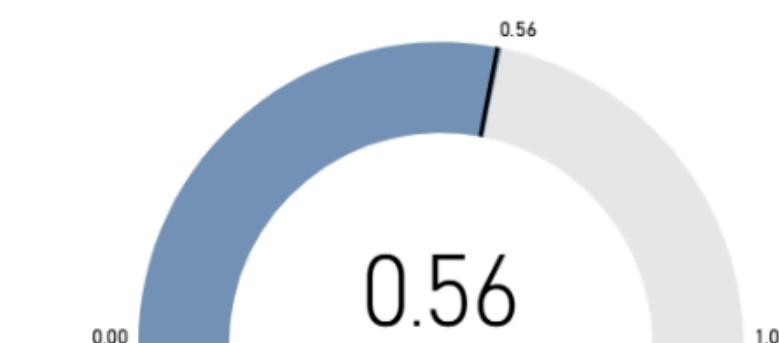
### Top 5 Products by Order Frequency

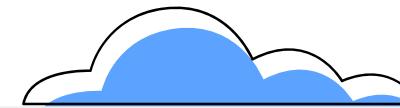


### Monthly order trend per product



### Lead time variance





0.56

Average Lead Time

145.73

Average Orders per Day

374K

Total Quantity Sold

53K

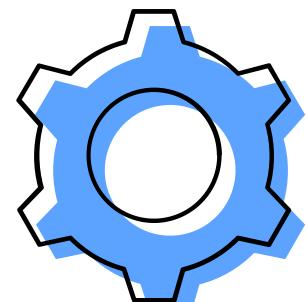
Total Orders

## FINDINGS

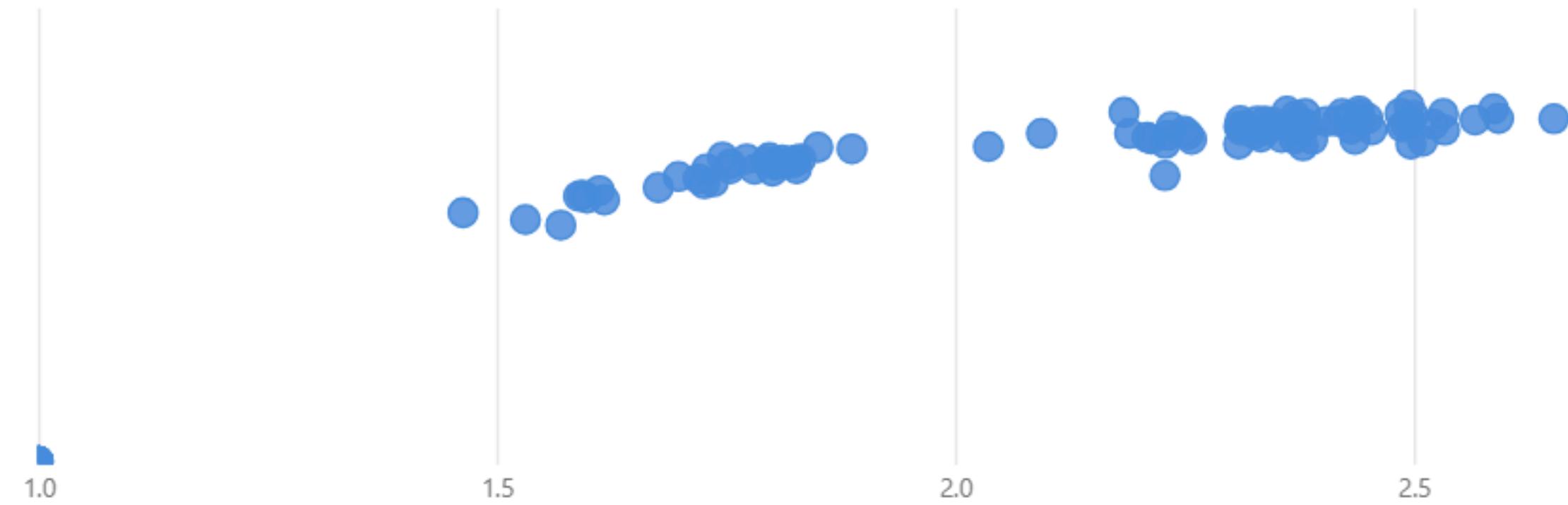
- The average lead time is low (**0.56 days**), which is very positive for responsiveness.
- High daily order volume (**145+ orders/day**) indicates steady demand.
- Total quantity sold (**374K**) and total orders (**53K**) show strong business activity.

## 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

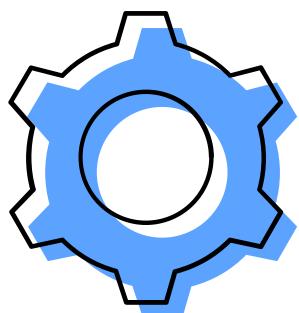


### FINDINGS

- 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.

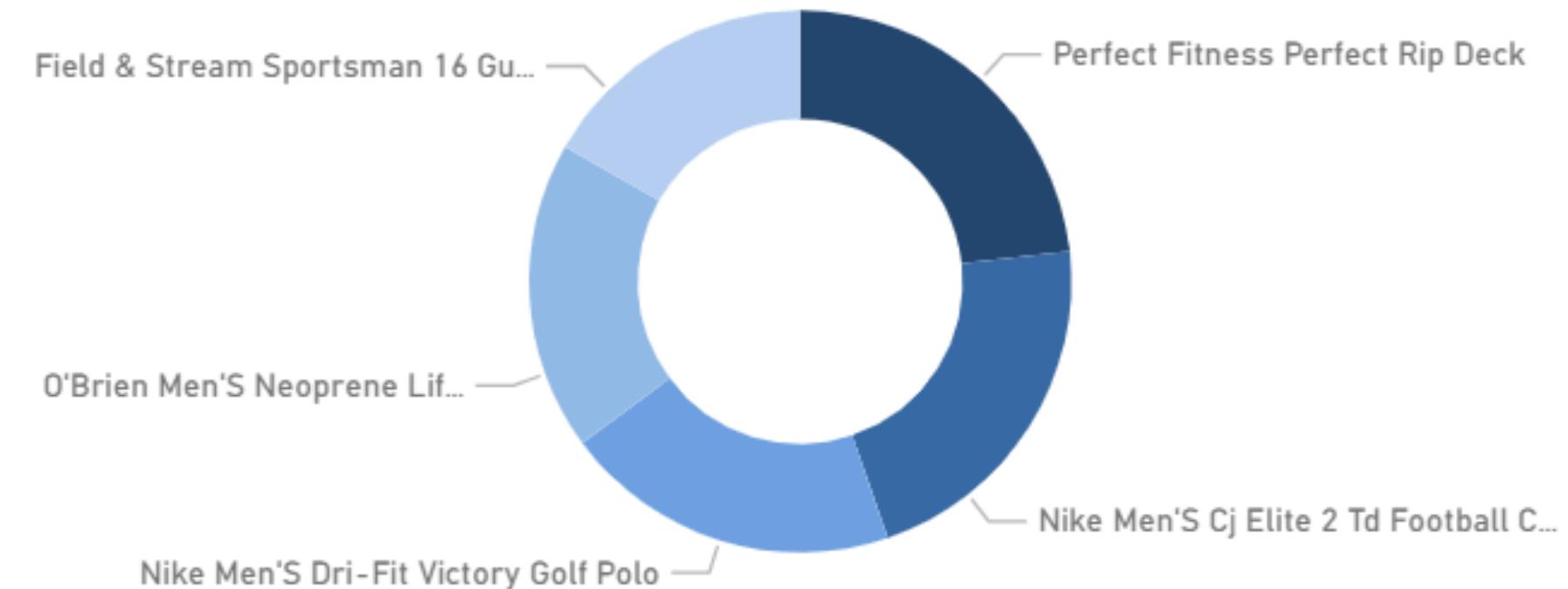


## FINDINGS

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

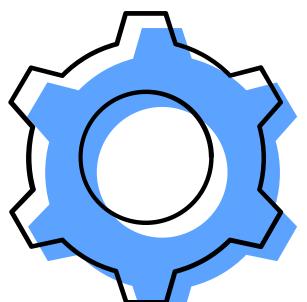


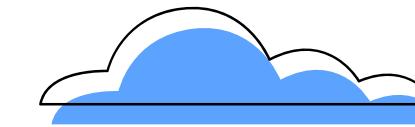
Top 5 Products by Order Frequency



## 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.





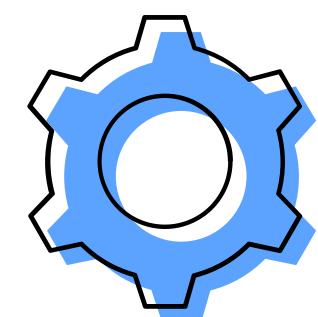
## FINDINGS

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



## RECOMMENDATION

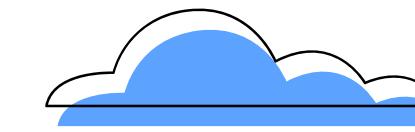
- Prepare seasonal inventory strategies for peak months.
- Analyze promotional campaigns during high-order periods to replicate success.
- Build seasonal stock 3 weeks before peak months.
- Increase inventory by **30–40%** during high-demand months.
- Reduce purchases by **20%** in low-demand months.



# Inventory Metrics

Next Slide





**1.20**

Average of demand variability

**0.56**

Average lead time

**7.05**

Average of ROP

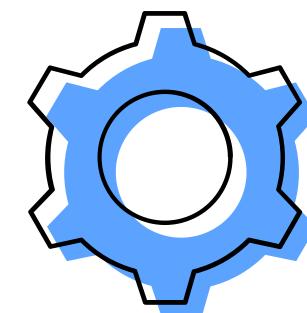
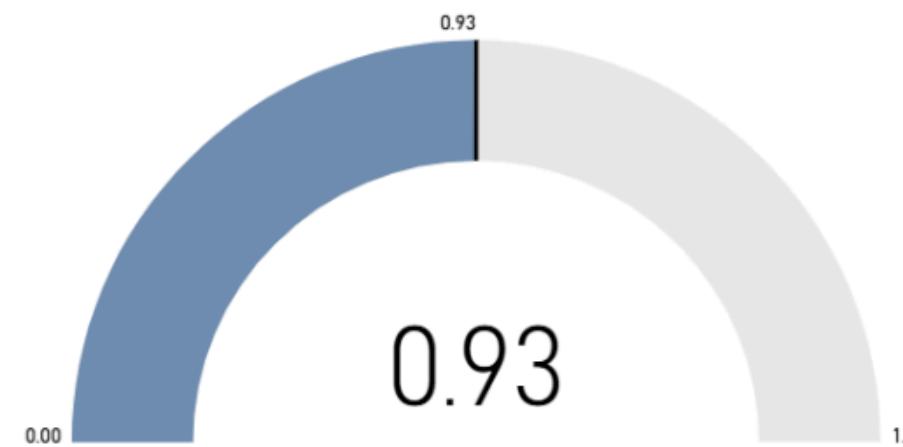
**49.29M**

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

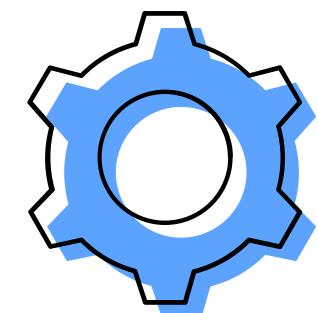
**49.29M**  
Total inventory value

## 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

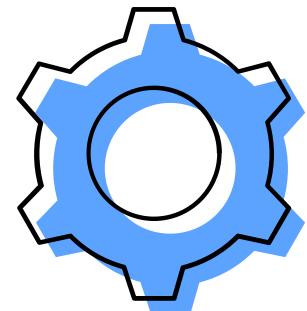
- Safety stock is heavily concentrated in certain SKUs.
- Many items have very low or zero safety stock, which may increase stockout risk if demand shifts.

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.





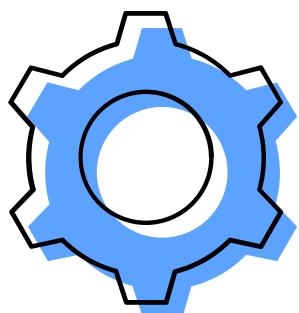
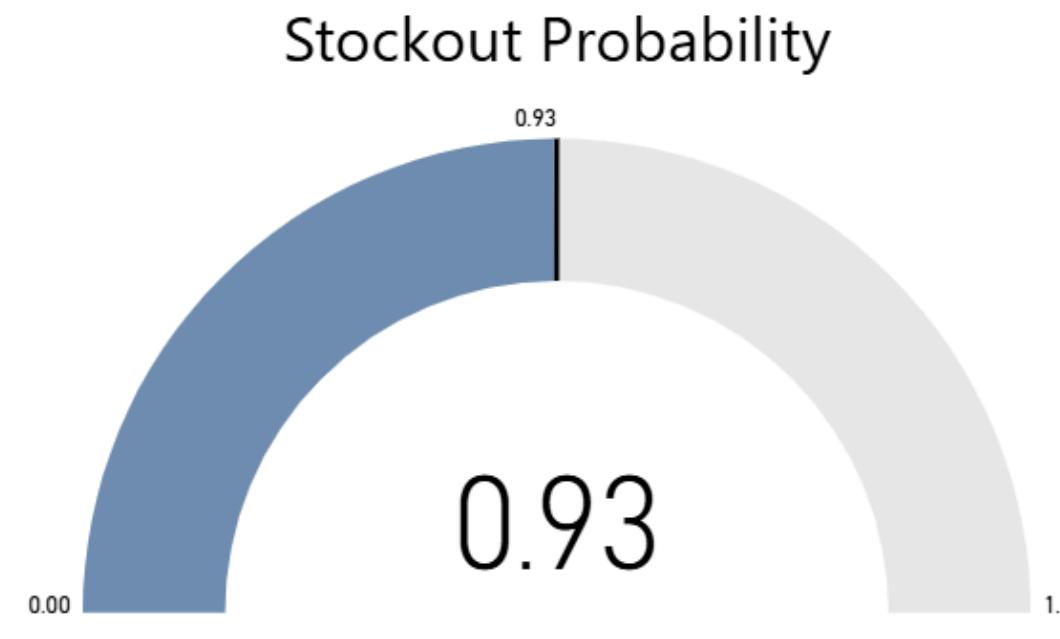
## FINDINGS

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



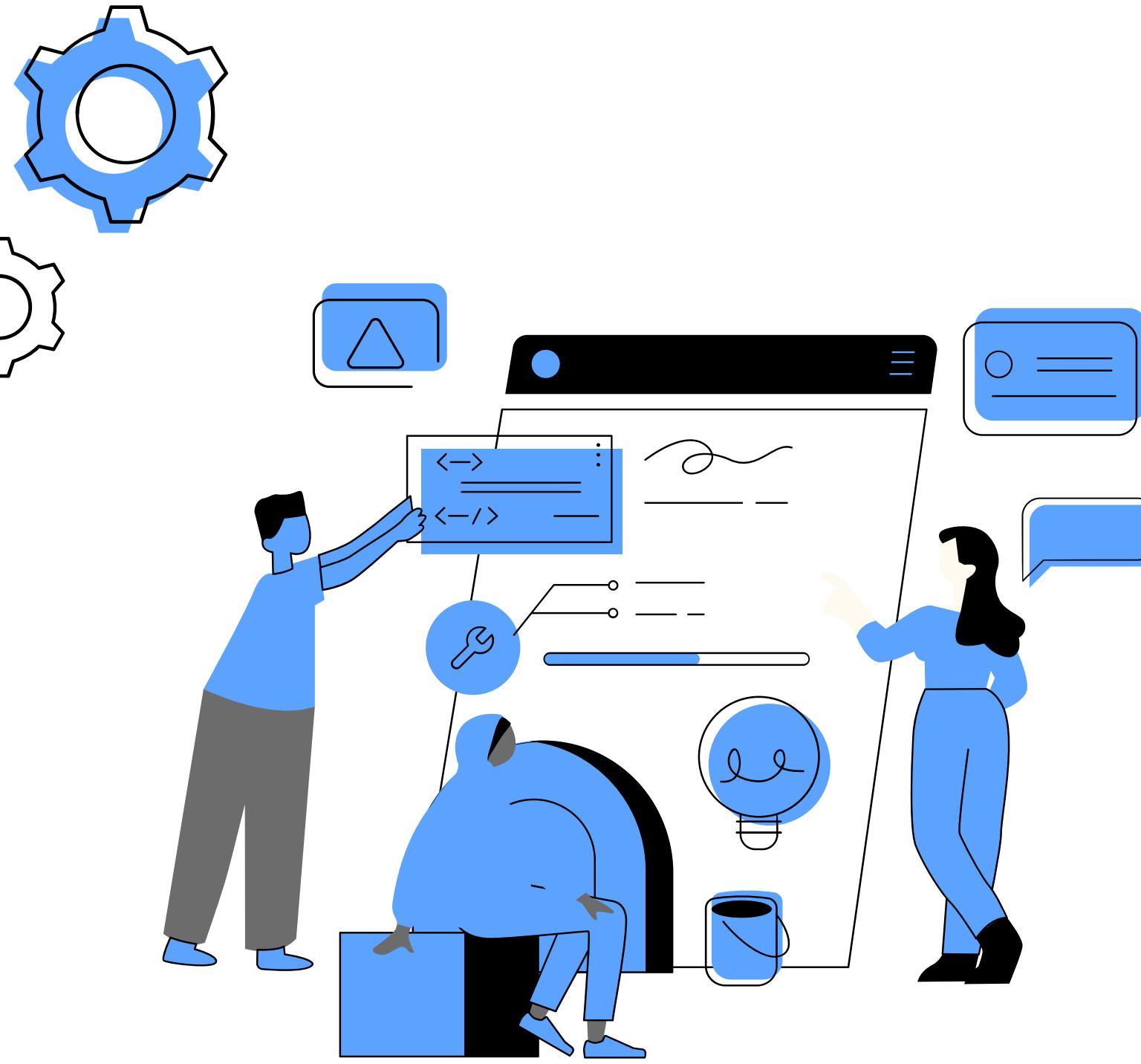
## RECOMMENDATION

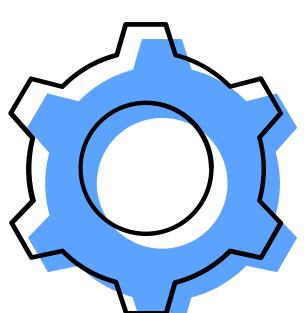
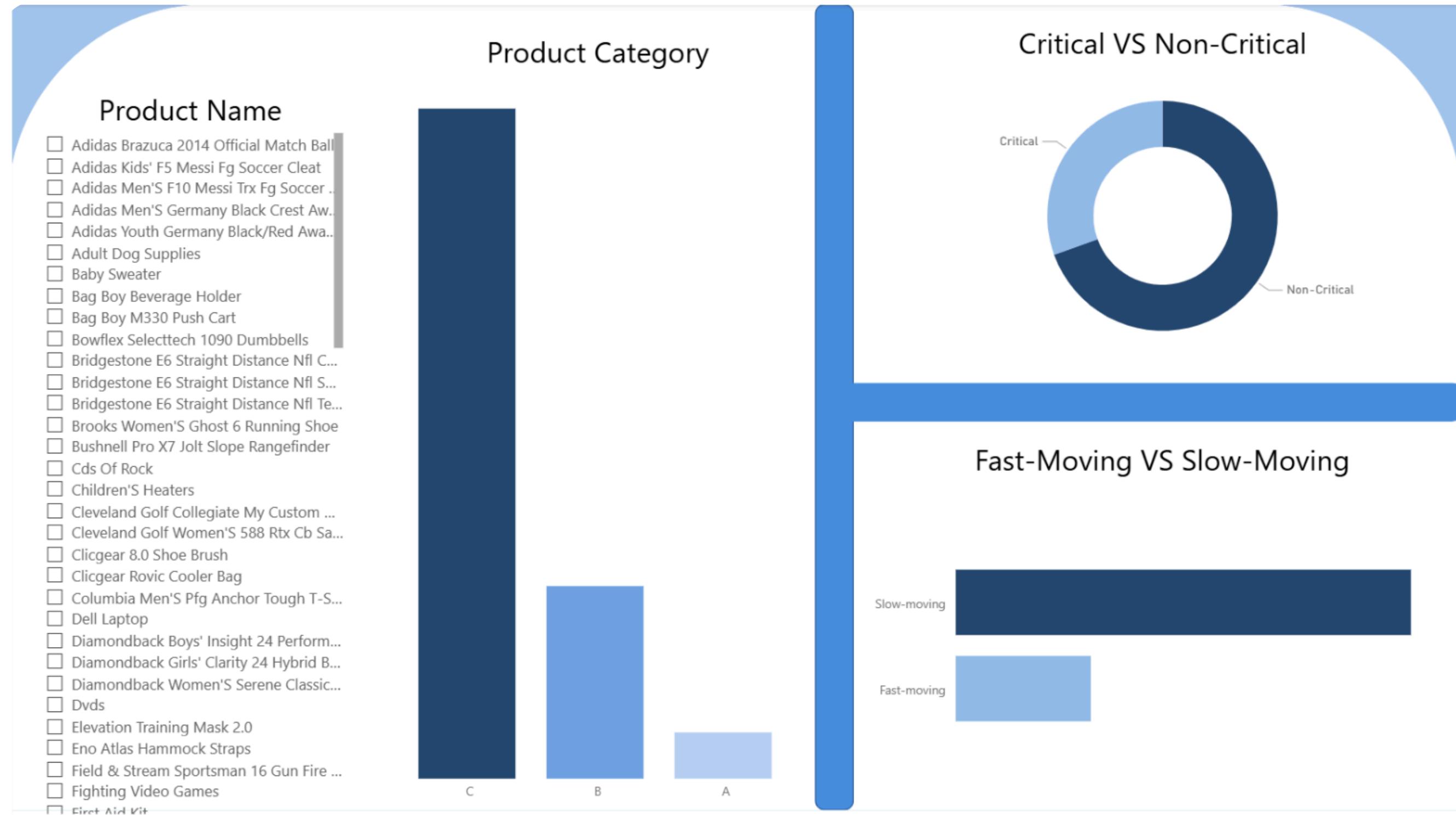
- Immediately increase safety stock for fast-moving items.
- Reassess reorder points and batch quantities.
- Implement real-time demand monitoring to reduce forecast errors.



# Product Classification

Next Slide







## Product Category

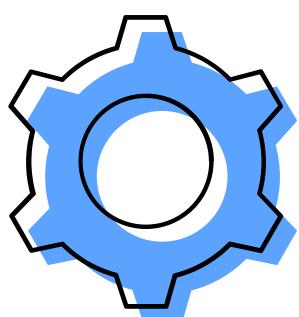
### FINDINGS

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



### RECOMMENDATION

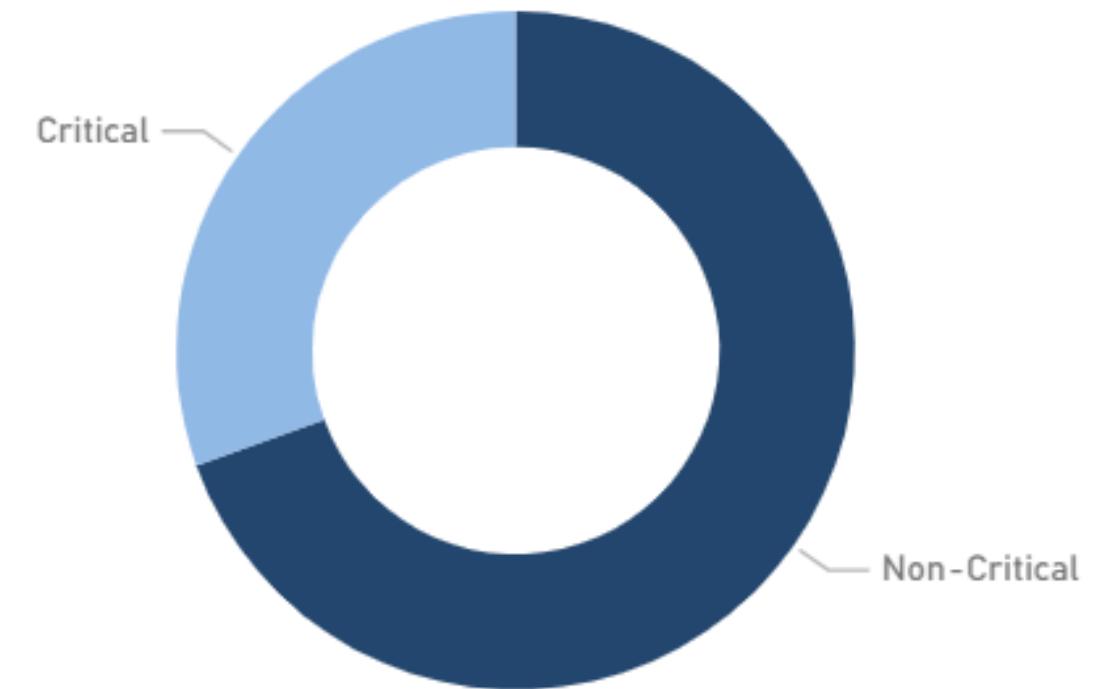
- Cut purchasing of C-items by **50%**.
- Move C-items to cheaper storage locations.
- Review A-items weekly due to their financial impact.



## FINDINGS

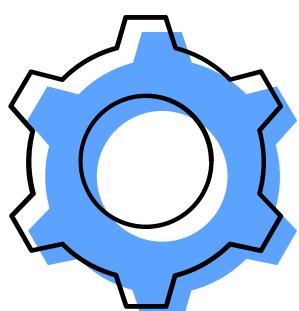
- Most inventory consists of non-critical items, which may not need high stock levels.
- Critical items form a smaller portion but require tighter control.

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

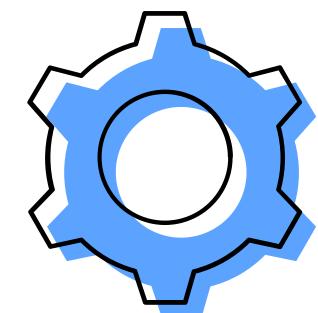
- A large portion of products are slow-moving, resulting in high holding costs.
- Fast-moving items are fewer but drive most of the inventory turnover.

### Fast-Moving VS Slow-Moving



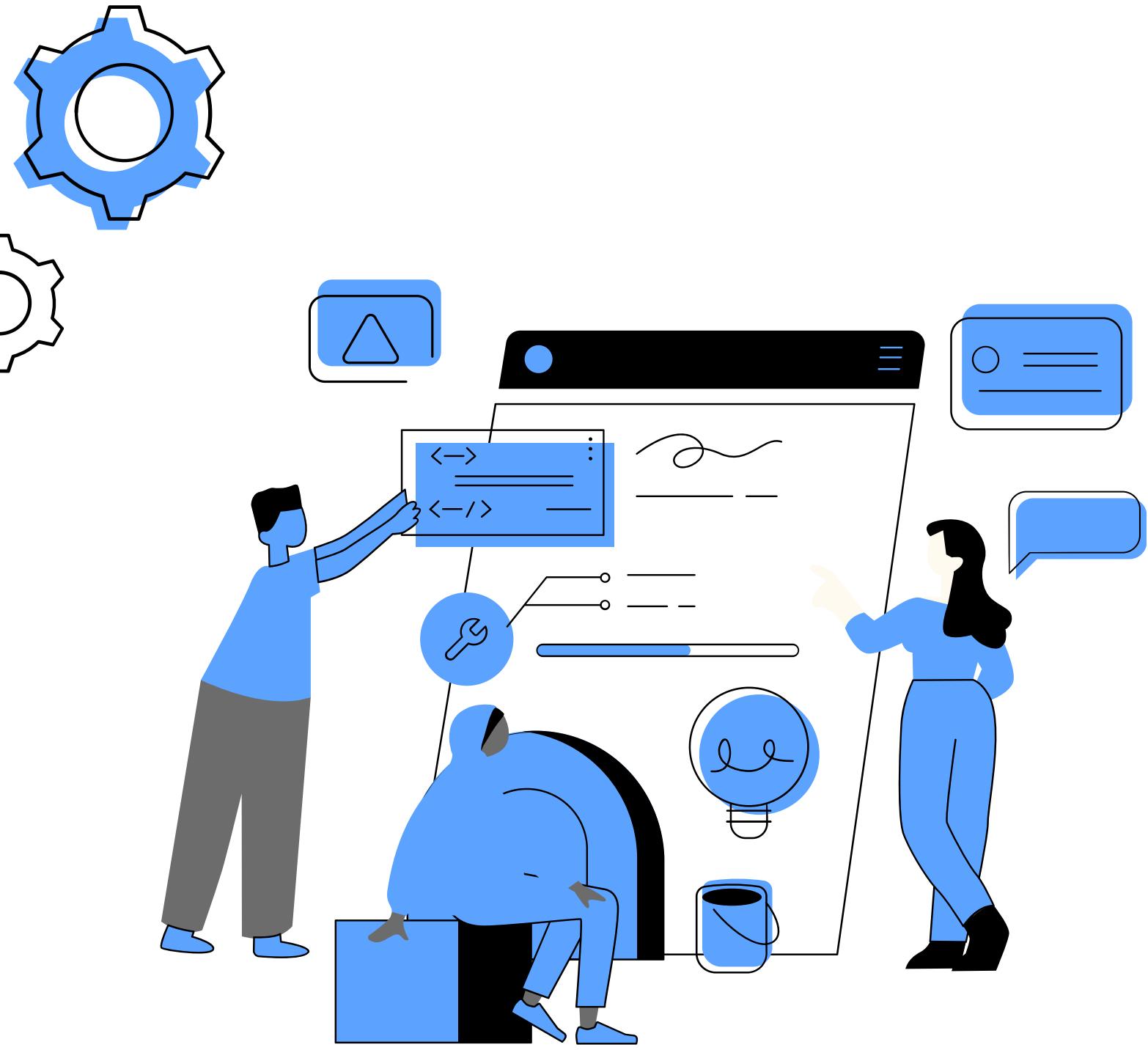
## RECOMMENDATION

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



# Demand Forecasting & Predictive Analytics

Next Slide



# Thank You

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

