



Unlock Operation Insights – Analyze Supply Chain Data!

Ly Tan Phat

APRIL 2, 2025

Ho Chi Minh

Contents

Unlock Operation Insights – Analyze Supply Chain Data!	0
I. Dataset:	3
Sales & delivery dataset:	3
II. Sales analysis:	3
Total revenue and profit trends over time (2014 – 2017):	3
Revenue by Location:	5
Revenue by Segment:	6
Revenue by Product:	7
Revenue by Ship Mode:	9
III. Customer analysis:	9
IV. Order analysis:	12
Overview:	12
Return rate by Product:	13
Return by Region:	13
Number of returned orders by Ship mode:	14
V. Conclusion:	14
VI. Reference:	15

Figures

Figure 1. Revenue, cost, profit and profit margin by year.....	3
Figure 2. Revenue, cost, profit and profit margin by quarter	4
Figure 3. Revenue, cost, profit and profit margin by month	4
Figure 4. Revenue by region and city.....	5
Figure 5. Top cities has smallest revenue.....	6
Figure 6. Top cities has largest revenue	6
Figure 7. Revenue by segment and year	7
Figure 8. Revenue by category	7
Figure 9. Profit by category and year	8
Figure 10. Information about furniture	8
Figure 11. Information about product with the largest revenue.....	9
Figure 12. Revenue by Ship mode.....	9
Figure 13. The number of customer by segment	10
Figure 14. RFM score table.....	10
Figure 15. Potential Loyalist' s revenue by year.....	10
Figure 16. Potential Loyalist' s category	11
Figure 17. Lost customers' s quantity by category.....	11
Figure 18. Lost customers' s profit by year	12
Figure 19. Overview of orders analysis	12
Figure 20. Delivery time and return rate by time	13
Figure 21. Top products have 100% return rate	13
Figure 22. Delivery time and return rate by region.....	14
Figure 23. Number of returned orders by ship mode	14

I. Dataset:

Sales & delivery dataset:

- **Time:** 01/02/2014 – 12/30/2017
- **Category:**
 1. Furniture
 2. Office Supplies
 3. Technology
- **Country:** United States

II. Sales analysis:

Total revenue and profit trends over time (2014 – 2017):

- **2014 – 2017:** Revenue growth is relatively fast and slow down in **2015** (**470.53K**), the growth from **2015 to 2017** is **29.47%** and **20.36%**. From **2014 to 2015**, the profit margin decreases **13.43%->12.74%** respectively:

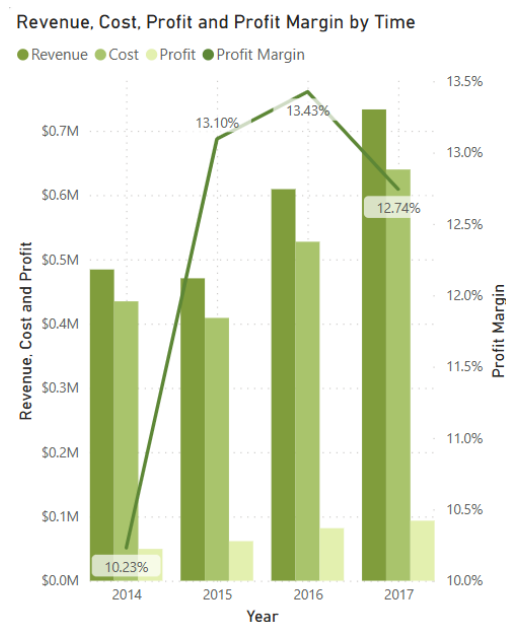


Figure 1. Revenue, cost, profit and profit margin by year

- **Quarter 1 – Quarter 4:** Revenue growth is relatively fast and slow down in **Q2** (**458.34K**), the growth from **Q2 to Q4** is **35.31%** and **13.65%**. From **Q1 to Q4**, the profit margin decreases and increases slightly in the **Q4** (**11.51%**) respectively:

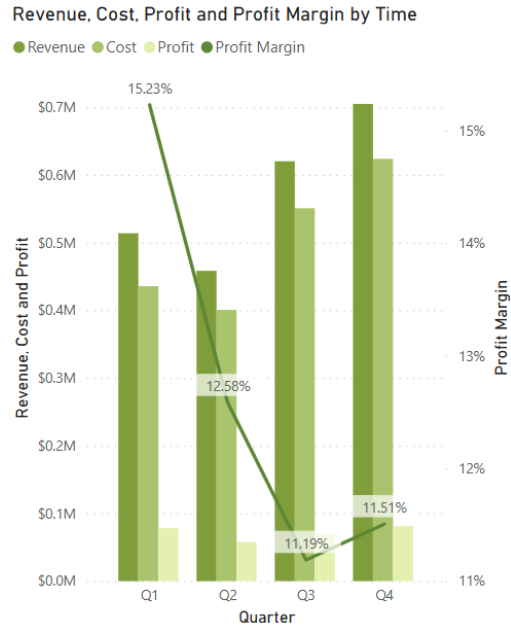


Figure 2. Revenue, cost, profit and profit margin by quarter

- January – December:** The months with the highest and lowest revenue are **November (271.69K)** and **February (132.72K)** respectively. However, **February** has the highest profit margin (**17.90%**):

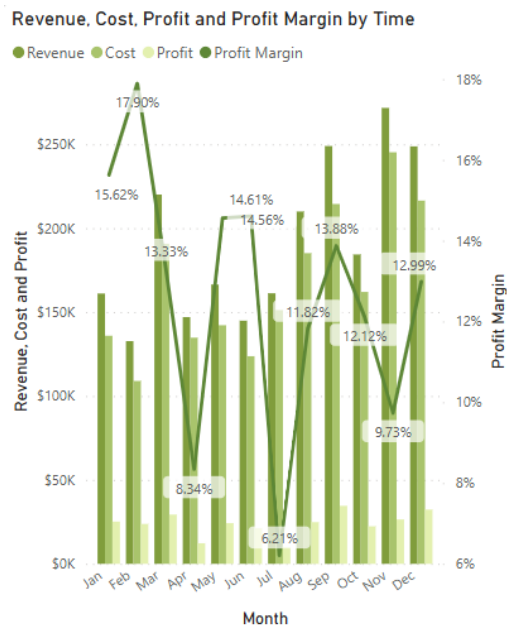


Figure 3. Revenue, cost, profit and profit margin by month

- **Suggestion:** Revenues mostly peak in the **final months** of the year. On the other hand, revenues and profits are lowest in the **middle months** of the year:
 - **Boost year-end promotions** for Black Friday, Cyber Monday, Christmas, New Year's Eve, etc.
 - Take advantage of the end of the year to **clear inventory**, launch strong incentives to attract customers.
- **Forecast:** The next quarter, Q1 of 2018, will be a quarter with not too much business activity, so revenue will be close to the average revenue of the year.

Revenue by Location:

- The **West** region has the largest revenue (**725.46K**) but the city with the largest revenue is **New York City (256.37K)** in the **East**:

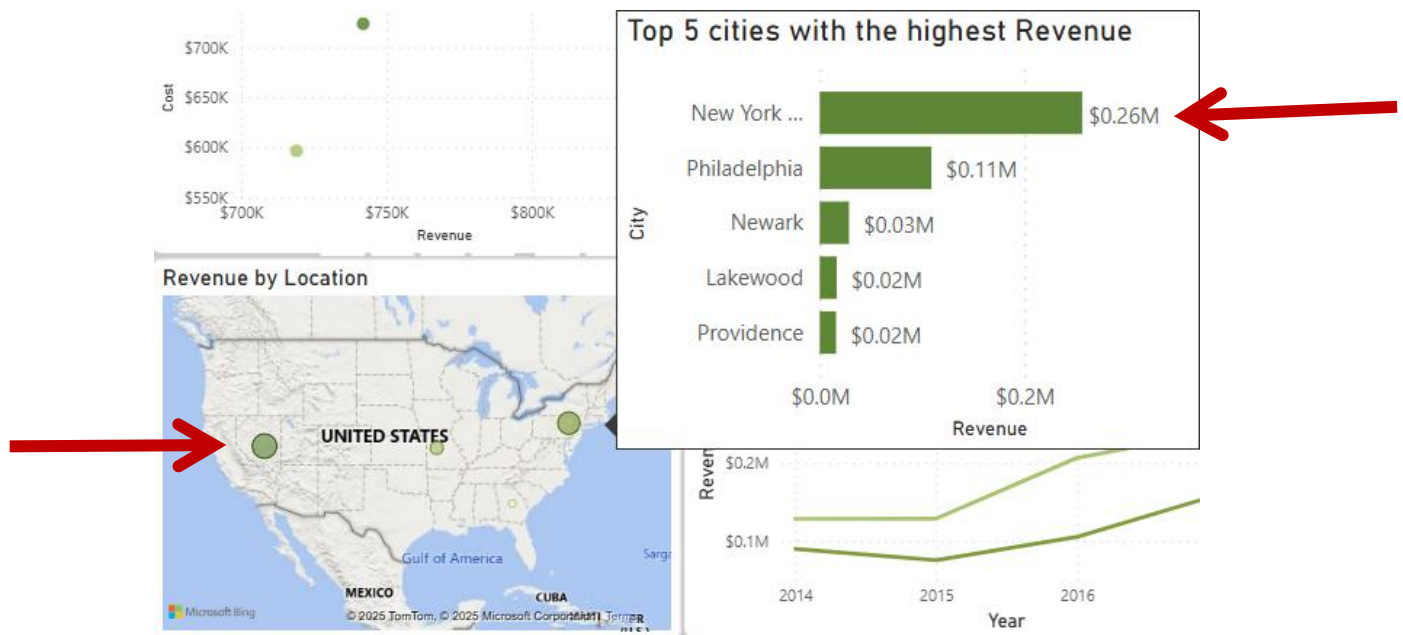


Figure 4. Revenue by region and city

- The top 5 cities with the lowest revenue are **Abilene, Elyria, Jupiter, Pensacola and Ormond Beach**, respectively. Most of the cities are in the **South** region (3 cities):

City	Average of latitude	Average of longitude	Revenue
Port Orange	27.66	-81.52	\$7.82
Deer Park	31.97	-99.90	\$6.92
Missouri City	31.97	-99.90	\$6.37
Keller	31.97	-99.90	\$6.00
Layton	39.32	-111.09	\$4.96
Springdale	35.20	-91.83	\$4.30
San Luis Obispo	36.78	-119.42	\$3.62
Ormond Beach	27.66	-81.52	\$2.81
Pensacola	27.66	-81.52	\$2.21
Jupiter	27.66	-81.52	\$2.06
Elyria	40.42	-82.91	\$1.82
Abilene	31.97	-99.90	\$1.39

Figure 5. Top cities has smallest revenue

- **Suggestion:** Because the largest revenue cities are located in the West region. Focus marketing, sales and human resources on big cities in **West** region and some cities in **East (New York city and Philadelphia):**

City	Average of latitude	Average of longitude	Revenue
New York City	43.30	-74.22	\$256,368.16
Los Angeles	36.78	-119.42	\$175,851.34
Seattle	47.75	-120.74	\$119,540.74
San Francisco	36.78	-119.42	\$112,669.09
Philadelphia	41.20	-77.19	\$109,077.01

Figure 6. Top cities has largest revenue

Revenue by Segment:

- From 2014 to 2017, **Consumer** averages nearly **50%** and the lowest is **Home Office**.
- **Consumer and Corporate** both have increasing revenue every year, but **Home Office** in particular decreases in 2015 at the lowest loss (**75.24K**).

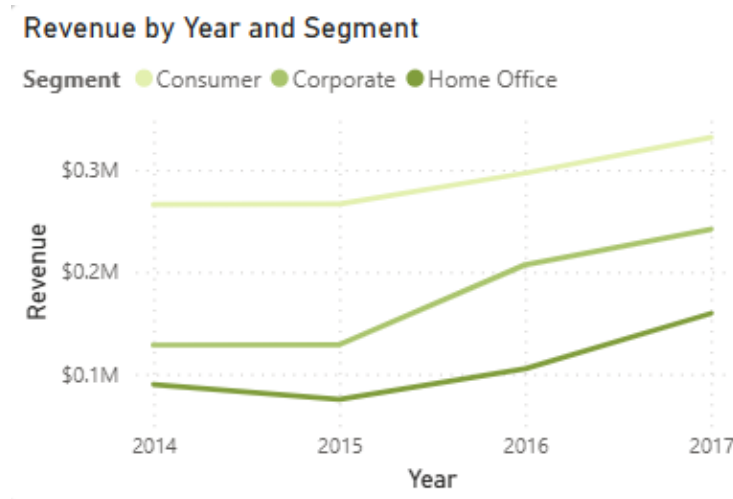


Figure 7. Revenue by segment and year

Revenue by Product:

- The industries are distributed quite evenly, in general over the years
- Technology** category always accounts for a large percentage of revenue and profit.

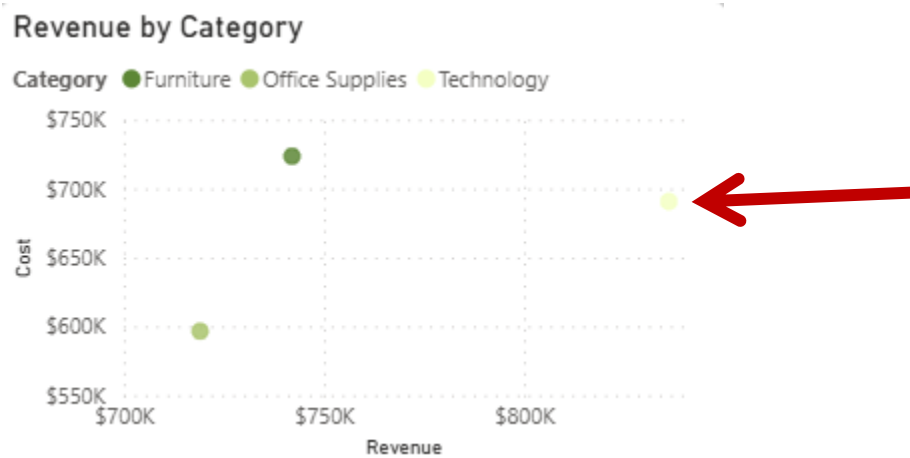


Figure 8. Revenue by category

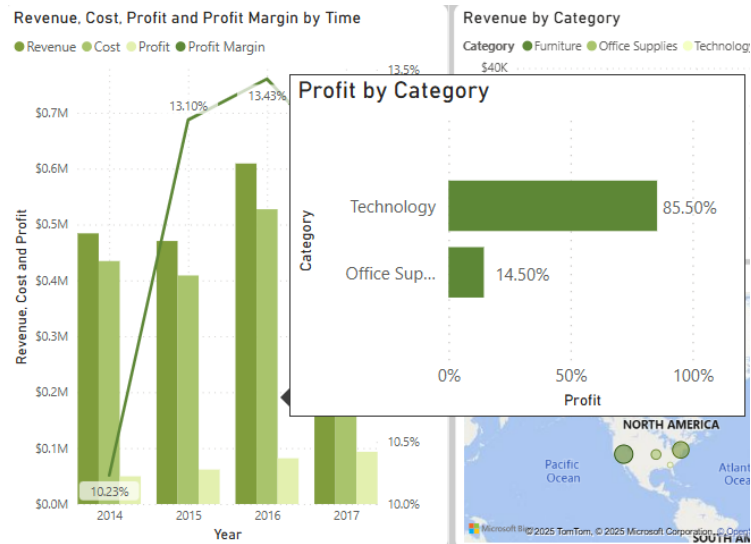


Figure 9. Profit by category and year

- **Furniture** has costs almost equal to revenue:

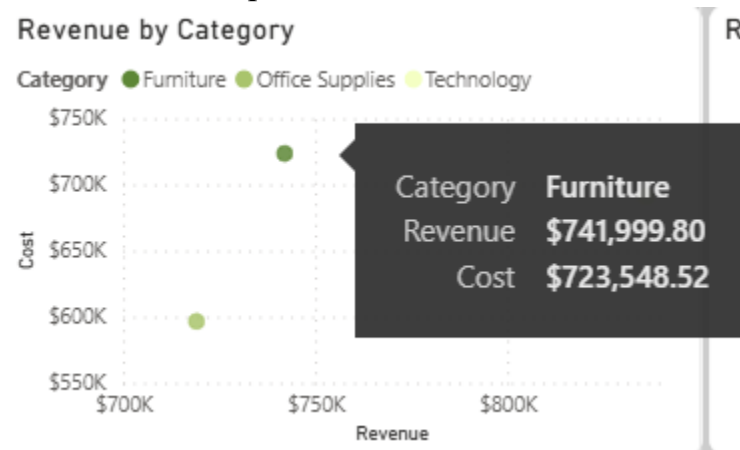


Figure 10. Information about furniture

- In particular, the product "**Canon imageCLASS 2200 Advanced Copier**" in the **Technology** category has outstanding cost and revenue. In addition, the product with the smallest revenue is "**Hoover Replacement Belt for Commercial Guardsman Heavy-Duty Upright Vacuum**" in the **Office Supplies** category.

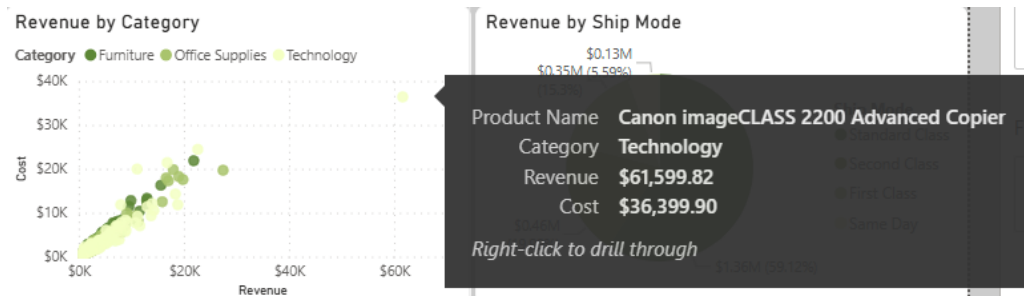


Figure 11. Information about product with the largest revenue

- **Suggestion:**
 - Leverage **Technology's** strengths by expanding product portfolio similar to the "**Canon imageCLASS 2200 Advanced Copier**" or increasing production.
 - **Furniture** has very low profit margins and can even lose money if there are unexpected costs. To improve the situation, we need to reduce production costs, increase selling prices or boost sales through marketing.

Revenue by Ship Mode:

- Revenue is mainly concentrated on customers using **Standard class**, accounting for **59.12%**, because this is the default shipping method and low cost, so many customers choose it.

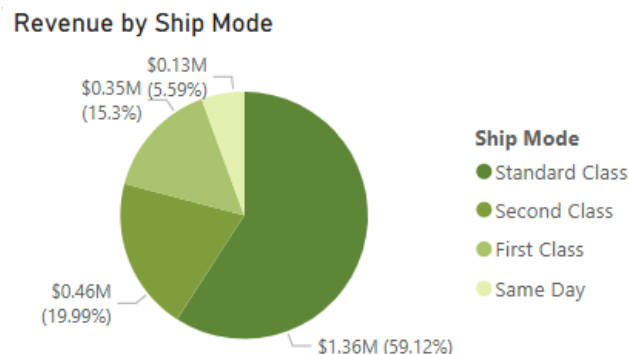


Figure 12. Revenue by Ship mode

III. Customer analysis:

- "**Potential Loyalist**" accounts for the largest proportion (**17%**) and has the largest number of customers (**138**).

- **"Promising"** accounts for the smallest proportion (2%) and has the smallest number of customers (17).

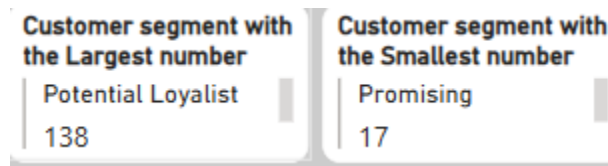


Figure 13. The number of customer by segment

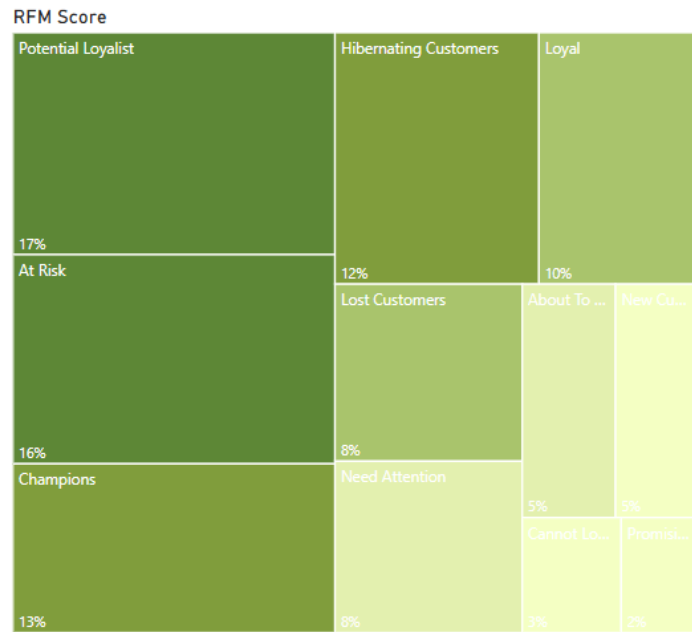


Figure 14. RFM score table

- Feature of **"Potential Loyalist"** customer: Recent customers, but who have already spent a lot:



Figure 15. Potential Loyalist's revenue by year

- **“Potential Loyalist”** customers buy only furniture and office supplies:

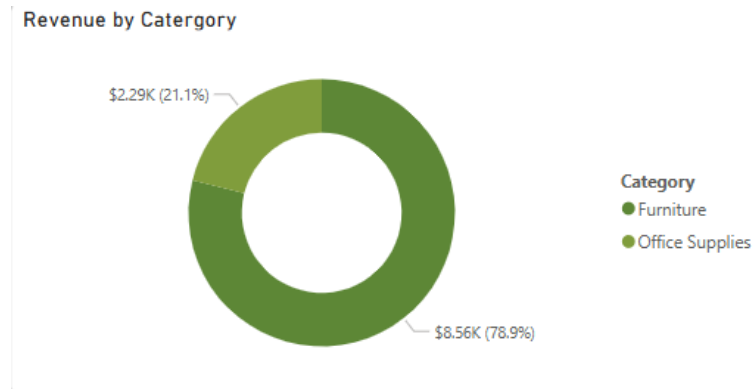


Figure 16. Potential Loyalist's category

- **Feature of "Lost customers":** They haven't bought in a long time, they only bought once (or very few times) and they spent very little.
- They buy all 3 industries but the most is furniture (48.48%) - the least profitable industry. Therefore, they cause a lot of losses (*negative profit margin*) in **2014 and 2017**.

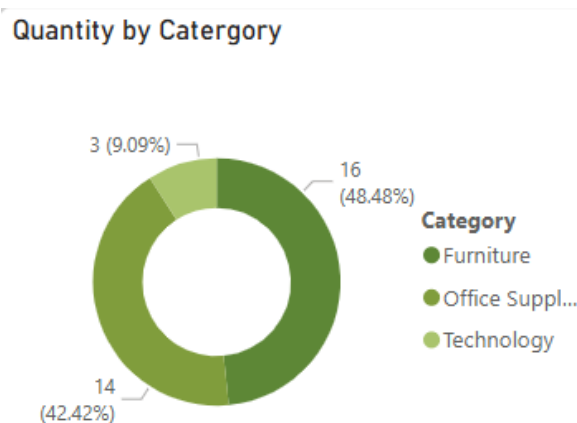


Figure 17. Lost customers' quantity by category

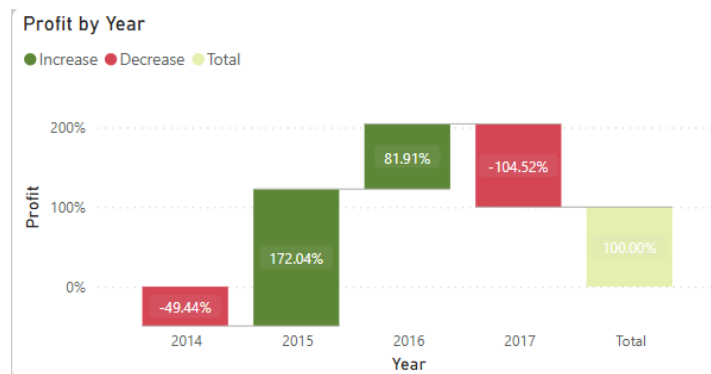


Figure 18. Lost customers' s profit by year

- **Suggestion:** “**Lost Customers**” often buy **Furniture**, but then do not return, indicating that the product is not of good quality. Therefore, **Furniture** products need to improve quality to attract customers.

IV. Order analysis:

Overview:

- For a company that specializes in selling **Technology and Furniture** (products that often have technical errors or are damaged during transportation), the return rate is quite low (**5.91%**):
- The average delivery time is **34 days**, showing that the order processing time and shipping time are quite slow:



Figure 19. Overview of orders analysis

- Delivery time decreases from **Quarter 1 to Quarter 4** (2014 - 2017):

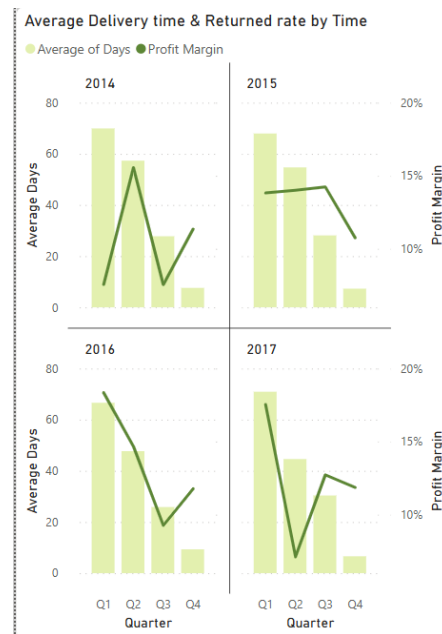


Figure 20. Delivery time and return rate by time

Return rate by Product:

- Products with 100% return rate are mostly **Technology** products, especially "**Okidata B401 Printer**" which has high shipping time (**61 days**):

Top Products with 100% returned rate			
Category	Product Name	Delivery time	Returned Rate
Technology	Okidata B401 Printer	61.00	100.00%
Office Supplies	Acco Glide Clips	34.00	100.00%
Technology	Zebra GK420t Direct Thermal/Thermal Transfer Printer	30.00	100.00%
Furniture	Bush Saratoga Collection 5-Shelf Bookcase, Hanover Cherry, *Special Order	5.00	100.00%
Office Supplies	Avery 500	2.00	100.00%
Technology	Canon Color ImageCLASS MF8580Cdw Wireless Laser All-In-One Printer, Copier, Scanner	0.00	100.00%
Technology	Cisco SPA 501G IP Phone	0.00	100.00%
Technology	Hewlett-Packard Deskjet F4180 All-in-One Color Ink-jet - Printer / copier / scanner	0.00	100.00%

Figure 21. Top products have 100% return rate

- Suggestion:** With **technology** products, the return rate is often higher because the product is prone to defects or customers are not satisfied with the features. Companies need to check the stages before delivery, support customers or adjust reasonable warranty and return policies.

Return by Region:

- Although the West region has the shortest shipping time, the return rate is the highest (**11.73%**):

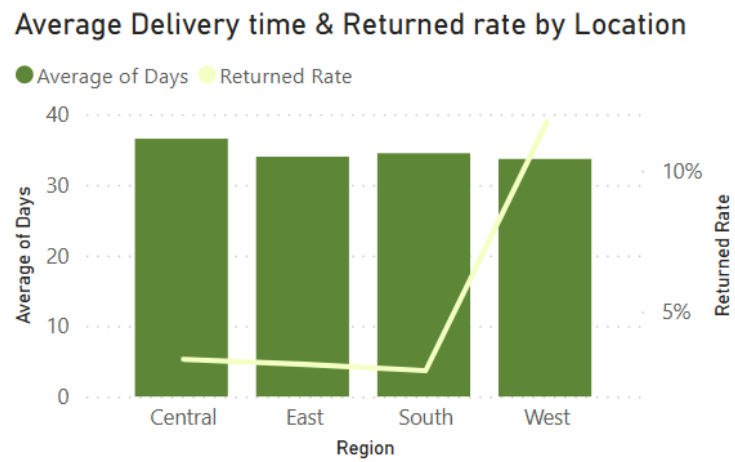


Figure 22. Delivery time and return rate by region

- **Suggestion:** Since the **West** region has the largest revenue, it is necessary to focus on customer service, choose the fastest shipping unit for that region, and avoid customer returns.

Number of returned orders by Ship mode:

- **Standard class:** This is the time-consuming delivery method of all, usually takes a few days or longer depending on the distance and specific service. Therefore, customers often return items when using this method (**56.76%**):

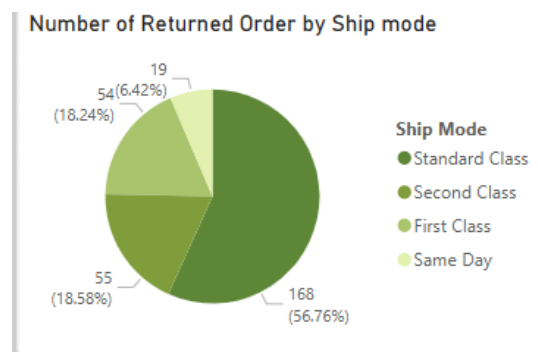


Figure 23. Number of returned orders by ship mode

V. Conclusion:

- For cities with low sales, business scope should be considered.
- Reduce shipping days to attract more customers.
- Increase sales for customers at the end of the year and product warranty policies.

- Increase sales for Technology category through marketing and promotional campaigns, especially in Western regions.

VI. Reference:

Business analyst – Hoang Long:

<https://www.youtube.com/watch?v=EcsaGL3AiTg&list=PLbM4yZFMwzMAdo9kSNSf-32RL5gM8vI5c&index=17>

Remove duplicate – Le Anh:

<https://ketoanleanh.edu.vn/kinh-nghiem-ke-toan/2-cach-xoa-du-lieu-trung-lap-tren-excel-ma-ke-toan-nen-biet.html>

DAX – Datapot:

<https://datapot.vn/ham-if-va-switch-cach-su-dung-va-vi-du-cu-the/?srsltid=AfmBOopgt5gjKKHRuc3ymzU8sWKDt5ayYVNibUWAt3ZnHzyUYy83zURB>

Countif function – Coupler.io:

<https://blog.coupler.io/power-bi-countif/>

MinX – hocexcel.Online:

<https://blog.hocexcel.online/ham-minx-trong-power-bi-dax.html>

Basis DAX function – Power BI training:

<https://powerbitraining.com.au/basic-dax-functions-min-max-and-average/>

RFM – edrone:

<https://help.edrone.me/en/articles/2837109-rfm-analysis>

Show % - BI:

<https://bielite.com/blog/percent-data-labels/>

How To Do RFM Analysis – RetainUp:

<https://retainup.co/rfm-analysis/>

Waterfall – gitiho:

<https://gitiho.com/blog/huong-dan-cach-dung-va-ve-bieu-do-thac-nuoc-waterfall-chart.html>

Area chart – smart data:

<https://tableau.edu.vn/tim-hieu-ve-bieu-do-area-chart-trong-phan-tich-du-lieu/>

Funnel chart – Piktochart:

<https://piktochart.com/tips/funnel-chart-examples>

Drill through – coupler.io:

<https://blog.coupler.io/power-bi-drill-through/>