

## Purpose of the Analysis

The purpose of this analysis is to conduct a comprehensive performance assessment of the firm over the past six years across all departments, with a particular focus on the 2025 financial year. The review is based on detailed analysis of financial and operational data, with specific emphasis on sales performance, collections efficiency, and overall profitability.

The objective is to identify key strengths, structural weaknesses, and performance gaps, assess the sustainability of current results, and evaluate the effectiveness of sales and collection practices. The findings of this analysis will be used to generate strategic insights and practical recommendations aimed at improving operational efficiency, strengthening financial controls, and supporting the firm's long-term growth and value creation.

Out[2]:

|   | Full Name                   | MFG       | Product Name        | Size      | Qty. | Unit Selling Price | Total Selling Price | Supplier     | Buying Price |
|---|-----------------------------|-----------|---------------------|-----------|------|--------------------|---------------------|--------------|--------------|
| 1 | بلاستر طبي ٥سم<br>Silkplast | Silkplast | بلاستر طبي ٥سم      | 5cm       | 25   | 16                 | 400                 | Abd El Hamid | 15           |
| 2 | برولين ٣/٠<br>راوند         | NaN       | برولين ٣/٠<br>راوند | 3/0 round | 1    | 95                 | 95                  | Abd El Hamid | 85           |

**NB. Most of the data has been cleaned in excel files before processing**

Out[3]:

|   | Date                | Type              | Description | Destination | Client                | Invoice no. | Name    |
|---|---------------------|-------------------|-------------|-------------|-----------------------|-------------|---------|
| 1 | 2020-01-01 00:00:00 | Marketing & Sales | Survey      | Banha       | Alaa, Hassan, Ghareeb | NaN         | Company |
| 2 | 2020-01-01 00:00:00 | Marketing & Sales | Training    | Cairo       | Room Square           | NaN         | Company |

Out[4]:

|   | Date                   | Invoice No. | Cogs | Creditor | Debitor | Balance | Client   |
|---|------------------------|-------------|------|----------|---------|---------|----------|
| 1 | 2020-01-01<br>00:00:00 | 1           | 7405 | 8192.5   | NaN     | 8192.5  | El Mahdy |
| 2 | 2020-01-01<br>00:00:00 | NaN         | NaN  | NaN      | 1000    | -1000   | El Mahdy |

check if all products categorized or not

Out[7]:

|      | Full Name             | MFG  | Product Name  | Size | Qty. | Unit Selling Price | Total Selling Price | Supplier | Buying Price |
|------|-----------------------|------|---------------|------|------|--------------------|---------------------|----------|--------------|
| 8864 | معصم لارج<br>Zola     | Zola | معصم لارج     | L    | 4    | 20                 | 80                  | Kareem   | 12.45        |
| 8865 | معصم ميديم<br>Zola    | Zola | معصم ميديم    | M    | 3    | 20                 | 60                  | Kareem   | 12.45        |
| 8866 | معصم اكس لارج<br>Zola | Zola | معصم اكس لارج | XL   | 3    | 20                 | 60                  | Kareem   | 12.45        |
| 8871 | ركبه لارج<br>Zola     | Zola | ركبه لارج     | L    | 4    | 30                 | 120                 | Kareem   | 27           |
| 8872 | ركبه ميديم<br>Zola    | Zola | ركبه ميديم    | M    | 3    | 30                 | 90                  | Kareem   | 27           |
| 8873 | ركبه اكس لارج<br>Zola | Zola | ركبه اكس لارج | XL   | 3    | 30                 | 90                  | Kareem   | 27           |
| 8885 | عكاز ثابت             | NaN  | عكاز ثابت     | NaN  | 2    | 600                | 1200                | Kareem   | 455          |
| 8896 | ترنوكيه               | NaN  | ترنوكيه       | NaN  | 3    | 30                 | 90                  | Heba Lab | 30           |
| 8946 | سيبرجي سيل            | NaN  | سيبرجي سيل    | NaN  | 20   | 125                | 2500                | Kareem   | 110          |
| 8973 | حاويه نفايات          | NaN  | حاويه نفايات  | NaN  | 2    | 850                | 1700                | Heba Lab | 700          |

recheck for uncategorized products again

Out[10]:

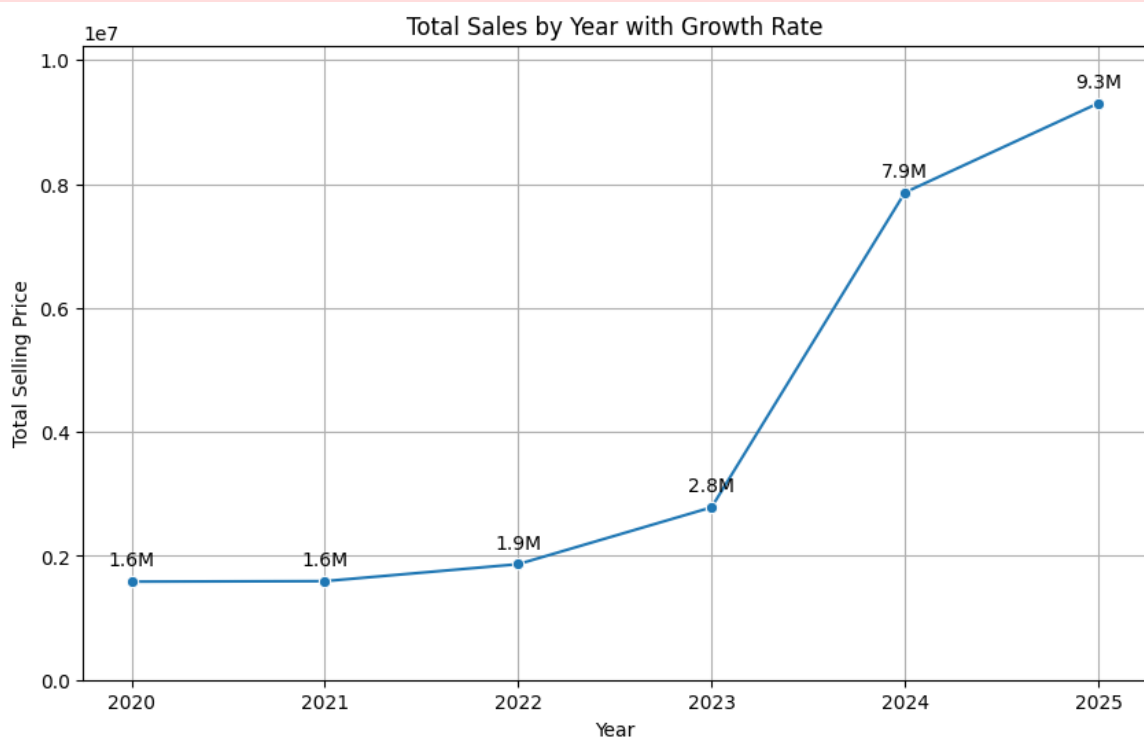
| Full Name | MFG | Product Name | Size | Qty. | Unit Selling Price | Total Selling Price | Supplier | Buying Price | Client |
|-----------|-----|--------------|------|------|--------------------|---------------------|----------|--------------|--------|
|-----------|-----|--------------|------|------|--------------------|---------------------|----------|--------------|--------|

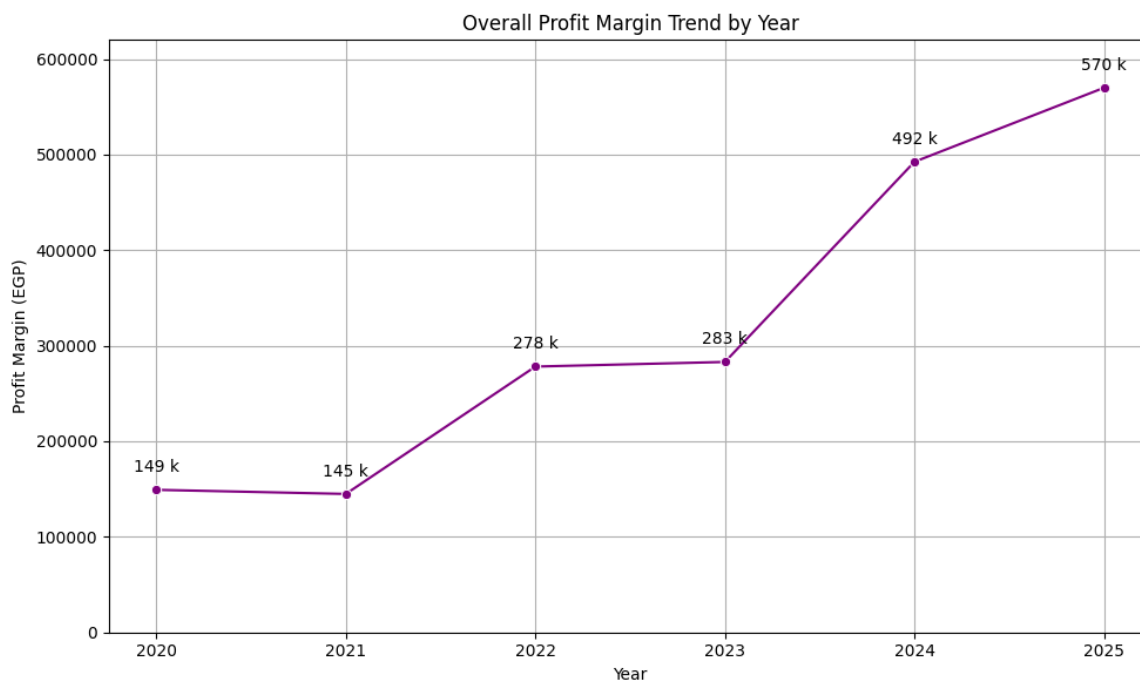
Quarterly Based

## Phase 1 – Business Problem Framing

### 1. High-level Revenue / Profit KPIs

```
/var/folders/vf/sz32t6rx7635wcdmj4ydx580000gn/T/ipykernel_47296/2857288171.py:2: FutureWarning: Downcasting object dtype arrays on .fillna, .ffill, .bfill is deprecated and will change in a future version. Call result.infer_objects(copy=False) instead. To opt-in to the future behavior, set `pd.set_option('future.no_silent_downcasting', True)`  
total_sales_by_year['Growth Rate'] = total_sales_by_year['Creditor'].pct_change() * 100
```





Overall consumables Profit Percentage: 10.59%

Overall Profit Percentage: 7.67%

```
/var/folders/vf/sz32t6rx7635wcdmj4ydx580000gn/T/ipykernel_47296/2525905349.py:1: FutureWarning: DataFrameGroupBy.apply operated on the grouping columns. This behavior is deprecated, and in a future version of pandas the grouping columns will be excluded from the operation. Either pass `include_groups=False` to exclude the groupings or explicitly select the grouping columns after groupby to silence this warning.
```

```
original_df.groupby('Year').apply(lambda x: x['Profit'].sum() / x['Total Selling Price'].sum() * 100).reset_index(name='Profit Percentage')
```

Out[19]:

|   | Year | Profit Percentage |
|---|------|-------------------|
| 0 | 2020 | 9.708338          |
| 1 | 2021 | 8.936348          |
| 2 | 2022 | 14.135879         |
| 3 | 2023 | 11.723882         |
| 4 | 2024 | 9.863316          |
| 5 | 2025 | 9.724260          |

## Insight 1: Sales and Gross Profit Performance and Capital Structure Considerations

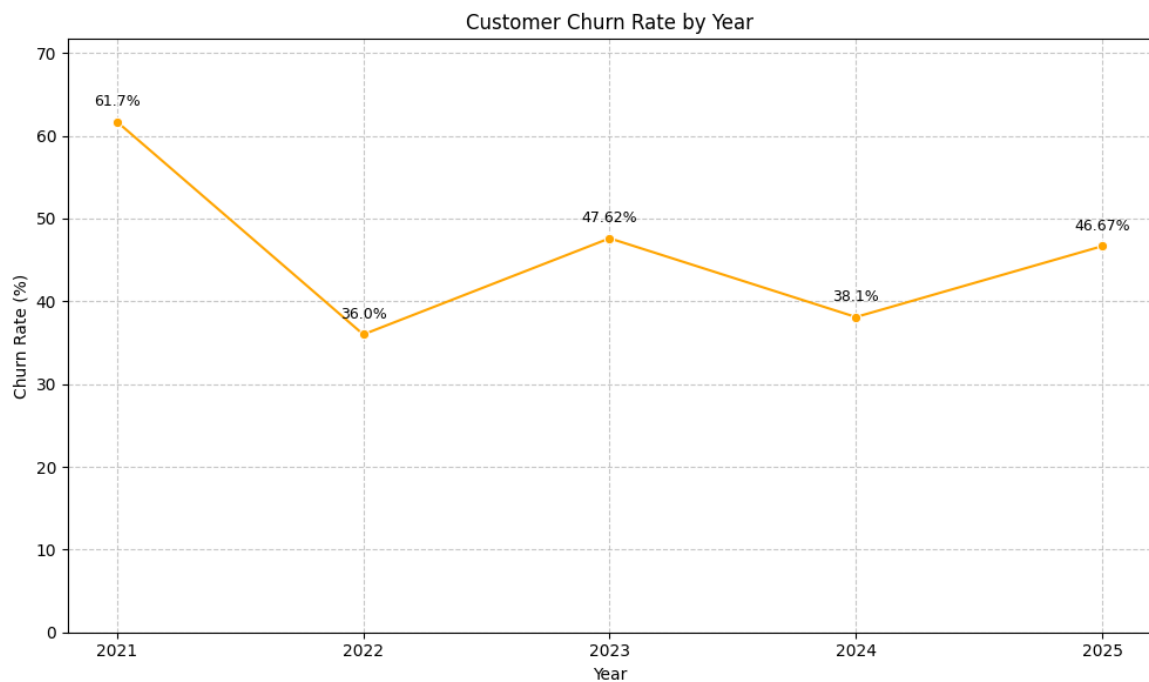
The entity has demonstrated strong sales performance, marked by a significant surge in 2024 following the successful entry of the pharmaceutical segment alongside the consumables

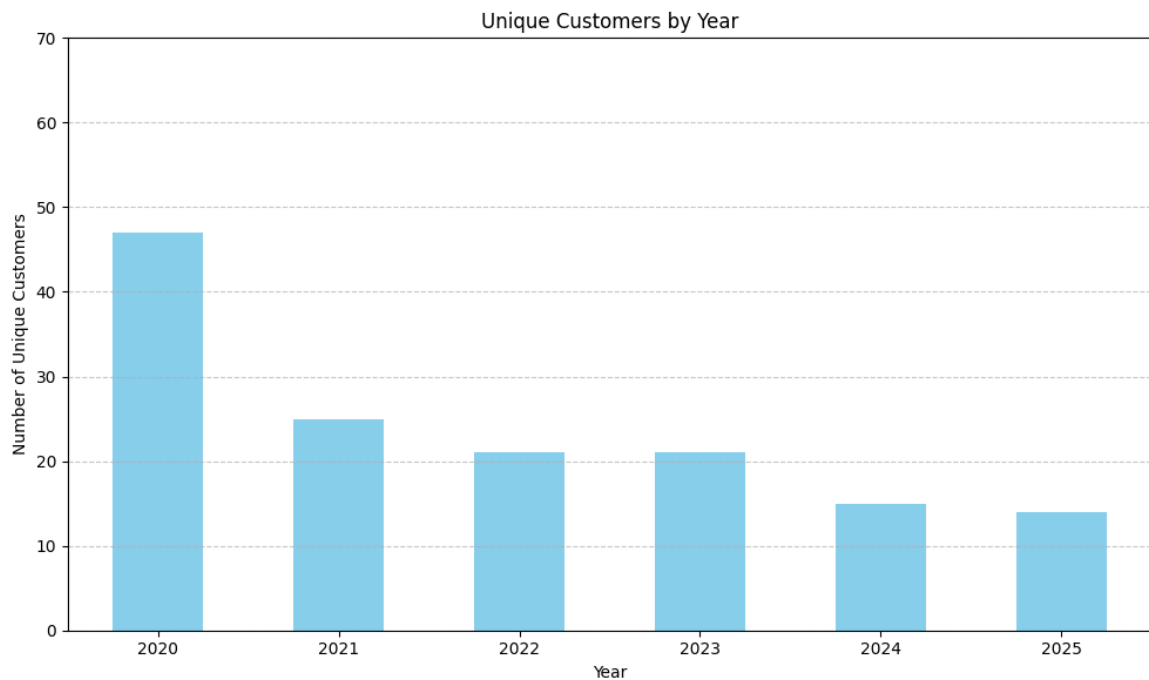
business. This expansion resulted in an approximate 182% increase in sales and was accompanied by a substantial improvement in gross profit, which rose by 73% in the same year.

In 2025, growth has continued, albeit at a more moderate pace, with sales and gross profit increasing by approximately 20% and 16% respectively. While these results indicate sustained operational momentum, a notable concern arises from the 75% increase in equity during 2025, which is disproportionately high relative to the growth in sales and profitability.

This divergence suggests potential inefficiencies in capital deployment, funding structure, or retained earnings utilization. These issues warrant further analysis to identify underlying causes and to develop appropriate strategic and financial solutions to optimize equity growth in line with operational performance.

## Customer Count & Retention





## Insight 2: Customer Base and Retention

The firm saw a strong influx of customers in its first year. This is expected as the firm was still in the process of identifying its most valuable customers. Over time, the firm has refined its customer segmentation and adapted to market dynamics, resulting in more stable customer numbers in 2024 and 2025, with an average of 15 loyal customers. While the churn rate appears high, it is largely a result of the firm's proactive market strategy. Importantly, customer retention for the most valuable clients is nearing 100%, which reflects positively on the firm's relationship with its key customers.

Out[23]:

|   | Year | Cost      |
|---|------|-----------|
| 0 | 2020 | 141835    |
| 1 | 2021 | 174540    |
| 2 | 2022 | 239157    |
| 3 | 2023 | 304903    |
| 4 | 2024 | 351370    |
| 5 | 2025 | 509553.62 |

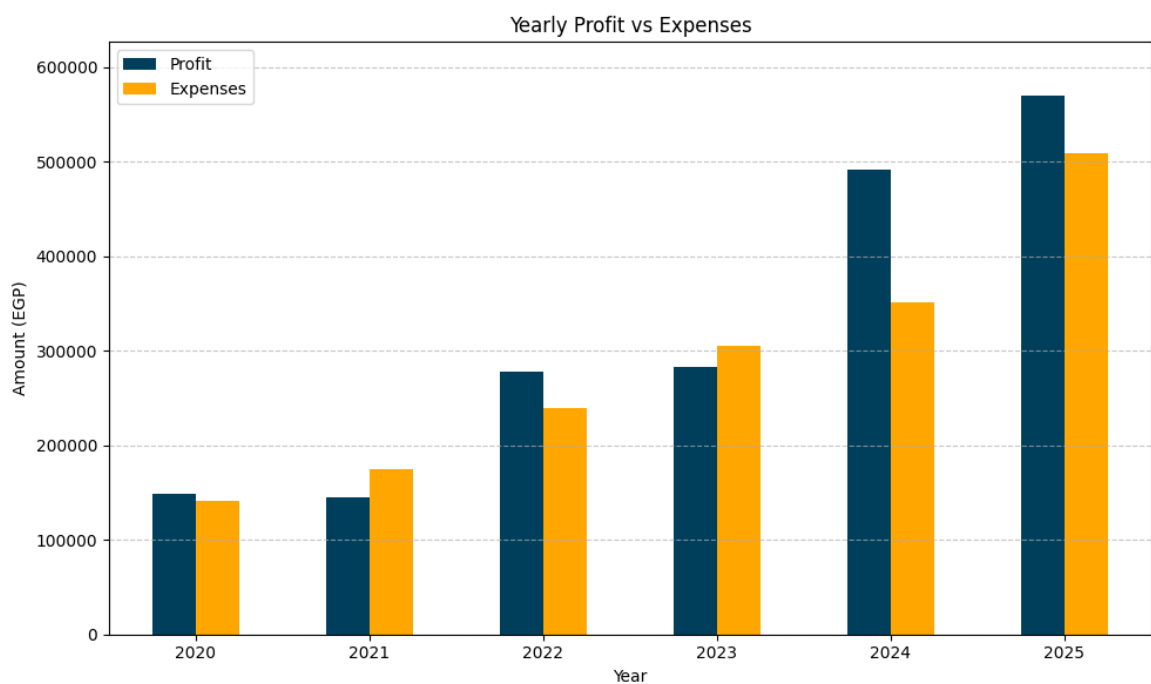
Out[24]:

|   | Year | revenue      | cogs         | Profit        | Profit Margin | Growth Rat |
|---|------|--------------|--------------|---------------|---------------|------------|
| 0 | 2020 | 1.584815e+06 | 1.435610e+06 | 149205.897500 | 9.414717      | Na         |
| 1 | 2021 | 1.592423e+06 | 1.447531e+06 | 144891.838431 | 9.098831      | -2.89134   |
| 2 | 2022 | 1.866294e+06 | 1.588133e+06 | 278160.851800 | 14.904448     | 91.97827   |
| 3 | 2023 | 2.783624e+06 | 2.500628e+06 | 282996.425000 | 10.166474     | 1.73840    |
| 4 | 2024 | 7.863257e+06 | 7.370826e+06 | 492430.773130 | 6.262427      | 74.00600   |
| 5 | 2025 | 9.303422e+06 | 8.733532e+06 | 569889.729500 | 6.125593      | 15.72991   |

Out[25]:

Profit Total Expenses

| Year | Profit        | Total Expenses |
|------|---------------|----------------|
| 2020 | 149205.897500 | 141835         |
| 2021 | 144891.838431 | 174540         |
| 2022 | 278160.851800 | 239157         |
| 2023 | 282996.425000 | 304903         |
| 2024 | 492430.773130 | 351370         |
| 2025 | 569889.729500 | 509553.62      |



Out[27]:

|      | Profit        | Total Expenses |
|------|---------------|----------------|
| Year |               |                |
| 2020 | 149205.897500 | 141835         |
| 2021 | 144891.838431 | 174540         |
| 2022 | 278160.851800 | 239157         |
| 2023 | 282996.425000 | 304903         |
| 2024 | 492430.773130 | 351370         |
| 2025 | 569889.729500 | 509553.62      |

```
Out[28]: Profit          1917575.515361
Total Expenses      1721358.62
dtype: object
```

### Insight 3: Cost Management and Expense Growth

While the firm has shown positive growth in gross profit (16% increase from 2024 to 2025), expenses have risen significantly, with an increase of 43% in 2025. The major driver behind this is salary expenses, which have heavily impacted profit margins. A potential solution to this issue is to either reduce salary costs or focus on strategies to boost profitability. One effective action would be to launch a new branch, which could generate additional sales and profits without the need for new hires, thus keeping salary costs stable. Alternatively, focusing on the pharmaceutical branch, which showed promising indicators in October 2025, could also yield positive results.

## Phase 2 – Data Preparation & Quality Check (Pandas)



```

Out[29]: 0
Full Name      0
MFG            5191
Product Name   0
Size          2432
Qty.           0
Unit Selling Price 0
Total Selling Price 0
Supplier       4
Buying Price   0
Client         0
Invoice        0
Date           0
Invoice No     0
Profit         0
Category       0
Year           0
Month          0
Quarters       0
dtype: int64

```

```

Out[30]:

```

|      | Full Name             | MFG | Product Name          | Size | Qty. | Unit Selling Price | Total Selling Price | Supplier | Buying Price |
|------|-----------------------|-----|-----------------------|------|------|--------------------|---------------------|----------|--------------|
| 2376 | ماسك N95              | NaN | ماسك N95              | NaN  | 50   | 65                 | 3250                | NaN      | 60           |
| 2501 | ماسك طبي ٣ طبقات استك | NaN | ماسك طبي ٣ طبقات استك | NaN  | 3    | 28                 | 84                  | NaN      | 40           |
| 2514 | ماسك طبي ٣ طبقات استك | NaN | ماسك طبي ٣ طبقات استك | NaN  | 3    | 30                 | 90                  | NaN      | 40           |
| 2554 | ماسك طبي ٣ طبقات استك | NaN | ماسك طبي ٣ طبقات استك | NaN  | 1    | 28                 | 28                  | NaN      | 40           |

Out[31]:

|      | Full Name        | MFG | Product Name     | Size | Qty. | Unit Selling Price | Total Selling Price | Supplier     | Buying Price |
|------|------------------|-----|------------------|------|------|--------------------|---------------------|--------------|--------------|
| 1802 | ماسك طبي ٣ طبقات | NaN | ماسك طبي ٣ طبقات | NaN  | 6    | 50                 | 300                 | Abd El Hamid | 40           |
| 1804 | ماسك طبي ٣ طبقات | NaN | ماسك طبي ٣ طبقات | NaN  | 20   | 50                 | 1000                | Abd El Hamid | 40           |
| 1817 | ماسك طبي ٣ طبقات | NaN | ماسك طبي ٣ طبقات | NaN  | 21   | 50                 | 1050                | Abd El Hamid | 40           |
| 1840 | ماسك طبي ٣ طبقات | NaN | ماسك طبي ٣ طبقات | NaN  | 20   | 45                 | 900                 | Abd El Hamid | 40           |
| 2024 | ماسك طبي ٣ طبقات | NaN | ماسك طبي ٣ طبقات | NaN  | 10   | 45                 | 450                 | Abd El Hamid | 40           |
| 2054 | ماسك طبي ٣ طبقات | NaN | ماسك طبي ٣ طبقات | NaN  | 2    | 50                 | 100                 | Abd El Hamid | 40           |

Out[33]:

|      | Full Name | MFG | Product Name | Size | Qty. | Unit Selling Price | Total Selling Price | Supplier             | Buying Price |
|------|-----------|-----|--------------|------|------|--------------------|---------------------|----------------------|--------------|
| 382  | ماسك N95  | NaN | ماسك N95     | NaN  | 210  | 56.25              | 11812.5             | El Tayseer Purchaser | 55           |
| 1954 | ماسك N95  | NaN | ماسك N95     | NaN  | 40   | 90                 | 3600                | El Tayseer Purchaser | 85           |
| 2376 | ماسك N95  | NaN | ماسك N95     | NaN  | 50   | 65                 | 3250                | NaN                  | 60           |

```

Out[35]: 0
Full Name          0
MFG                5191
Product Name       0
Size              2432
Qty.              0
Unit Selling Price 0
Total Selling Price 0
Supplier           4
Buying Price       0
Client            0
Invoice           0
Date              0
Invoice No        0
Profit            0
Category          0
Year              0
Month             0
Quarters          0
dtype: int64

```

```

Out[36]:

```

|      | Full Name                      | MFG         | Product Name             | Size  | Qty. | Unit Selling Price | Total Selling Price |
|------|--------------------------------|-------------|--------------------------|-------|------|--------------------|---------------------|
| 3550 | ماسك<br>اكسجين بالباچ<br>Ultra | Ultra       | ماسك<br>اكسجين<br>بالباچ | NaN   | 5    | 28                 | 140                 |
| 6399 | جهاز وريد<br>بكاوتشه كيو       | كيو         | جهاز وريد<br>بكاوتشه     | NaN   | 50   | 4.3                | 215                 |
| 6400 | رول تعقيم<br>20سم GMS          | GMS         | رول<br>تعقيم<br>20سم     | 20cm  | 1    | 700                | 700                 |
| 6401 | اليكترود                       | NaN         | اليكترود                 | NaN   | 100  | 1.4                | 140                 |
| 6402 | بكر رسم قلب<br>6.3سم           | NaN         | بكر رسم<br>قلب<br>6.3سم  | 6.3cm | 10   | 10                 | 100                 |
| 6403 | شرايط سكر<br>Glucodactor       | Glucodactor | شرايط<br>سكر             | NaN   | 1    | 215                | 215                 |
| 6404 | وصله ثلاثية<br>Ultra           | Ultra       | وصله<br>ثلاثية           | NaN   | 75   | 5.2                | 390                 |
| 6405 | مشرط جراحي<br>22 مقاس          | NaN         | مشرط<br>جراحي<br>22 مقاس | 22    | 3    | 95                 | 285                 |
| 6406 | جيسونا 10سم<br>صيني            | صيني        | جيسونا<br>10سم           | 15cm  | 12   | 17.5               | 210                 |

|      |                   |     |                   |                |     |      |      |      |
|------|-------------------|-----|-------------------|----------------|-----|------|------|------|
| 6410 | كوب تعقيم         | NaN | كوب<br>تعقيم      | NaN            | 500 | 1.25 | 625  | Mota |
| 7075 | جرکن کحول         | NaN | جرکن<br>کحول      | 20L            | 10  | 400  | 4000 |      |
| 7701 | فکریل ۰/۲<br>قاطع | NaN | فکریل ۰/۲<br>قاطع | 2/0<br>cutting | 10  | 750  | 7500 |      |
| 7702 | فکریل ۰/۲<br>قاطع | NaN | فکریل ۰/۲<br>قاطع | 2/0<br>cutting | 10  | 750  | 7500 |      |
| 7703 | فکریل ۰/۲<br>قاطع | NaN | فکریل ۰/۲<br>قاطع | 2/0<br>cutting | 10  | 750  | 7500 |      |
| 7704 | فکریل ۰/۲<br>قاطع | NaN | فکریل ۰/۲<br>قاطع | 2/0<br>cutting | 10  | 750  | 7500 |      |
| 7705 | فکریل ۰/۲<br>قاطع | NaN | فکریل ۰/۲<br>قاطع | 2/0<br>cutting | 10  | 750  | 7500 |      |
| 7706 | فکریل ۰/۲<br>قاطع | NaN | فکریل ۰/۲<br>قاطع | 2/0<br>cutting | 10  | 750  | 7500 |      |
| 7707 | فکریل ۰/۲<br>قاطع | NaN | فکریل ۰/۲<br>قاطع | 2/0<br>cutting | 10  | 750  | 7500 |      |
| 7708 | فکریل ۰/۲<br>قاطع | NaN | فکریل ۰/۲<br>قاطع | 2/0<br>cutting | 10  | 750  | 7500 |      |

```
Out[38]: np.int64(0)
```

## Insight 4: Data Quality

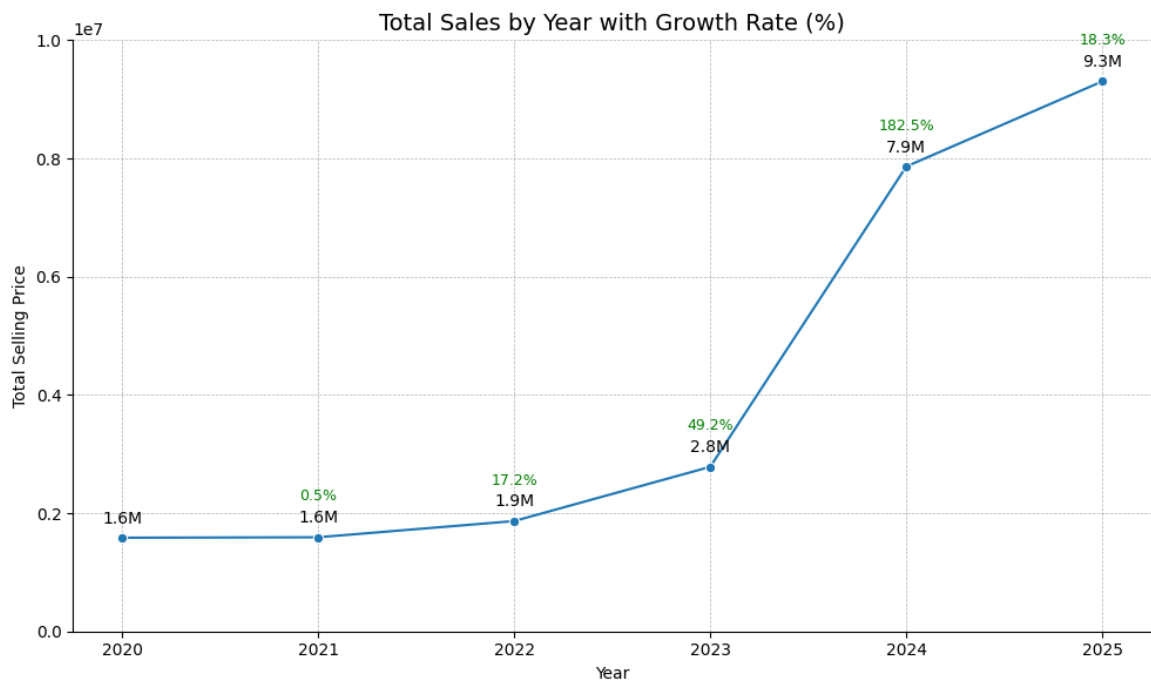
The data quality is generally satisfactory, with some issues related to duplicate values and missing items. These have been addressed, and the data is now clean and reliable for further analysis.

## Phase 3: Descriptive Analytics (What Happened?)

The goal here is to summarize past performance clearly and visually. Each metric will highlight a specific part of business (sales, customers, suppliers, finance).

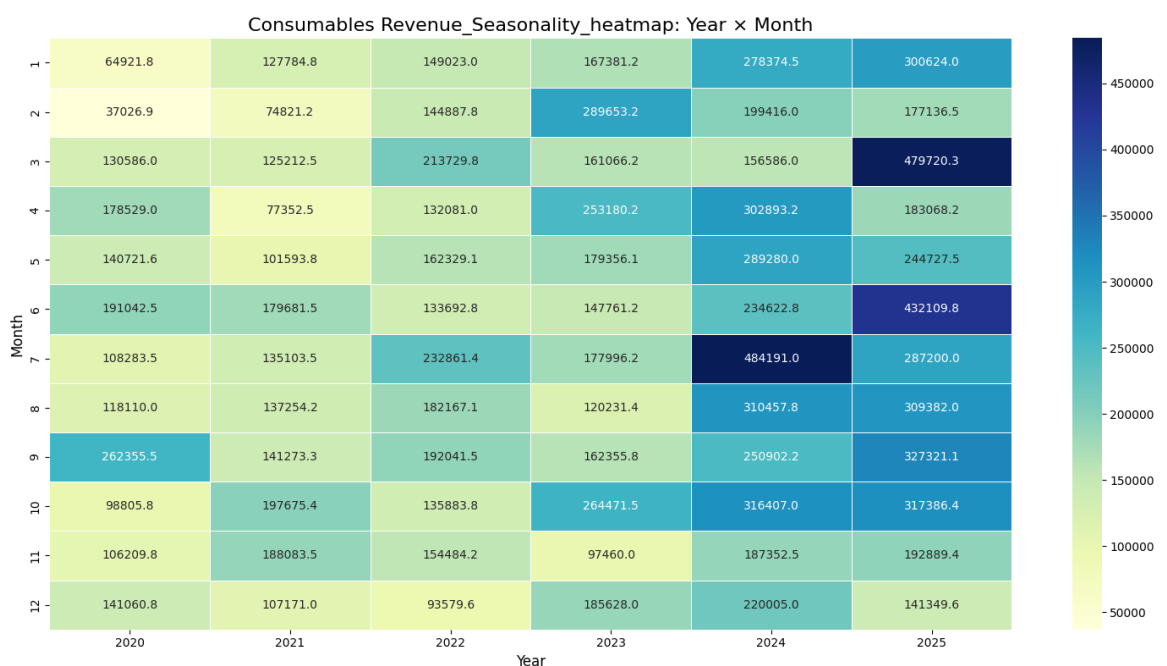
## 🔑 Sales Metrics

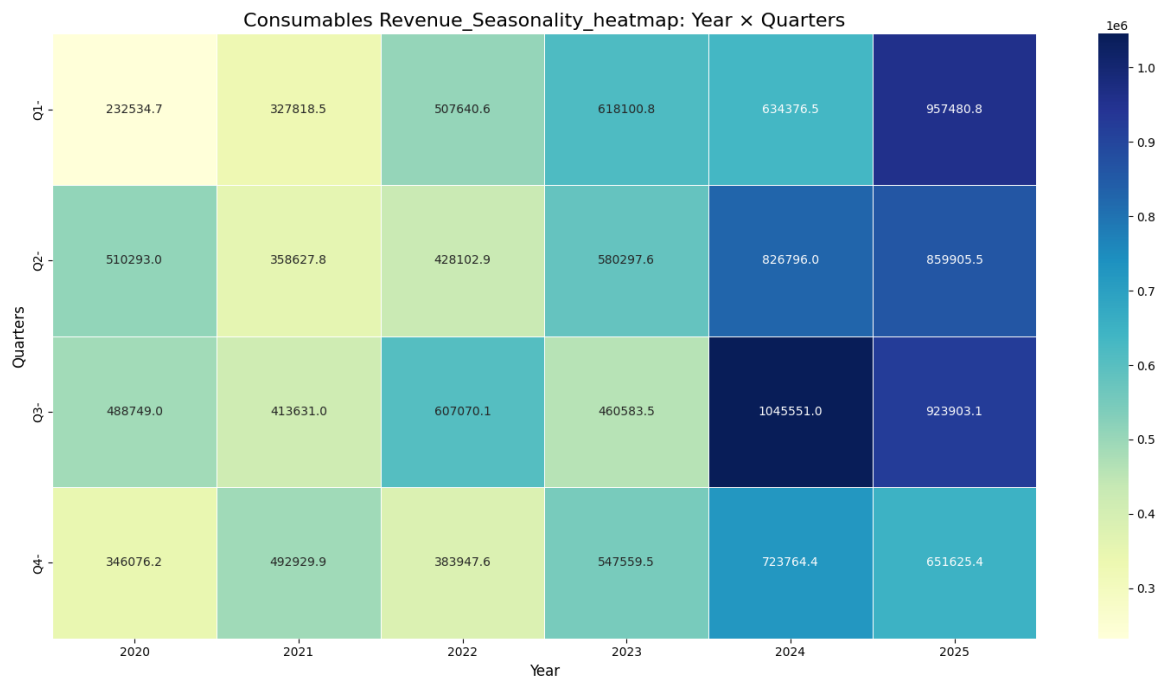
### Total Sales Revenue (per Year/Quarter/Month)



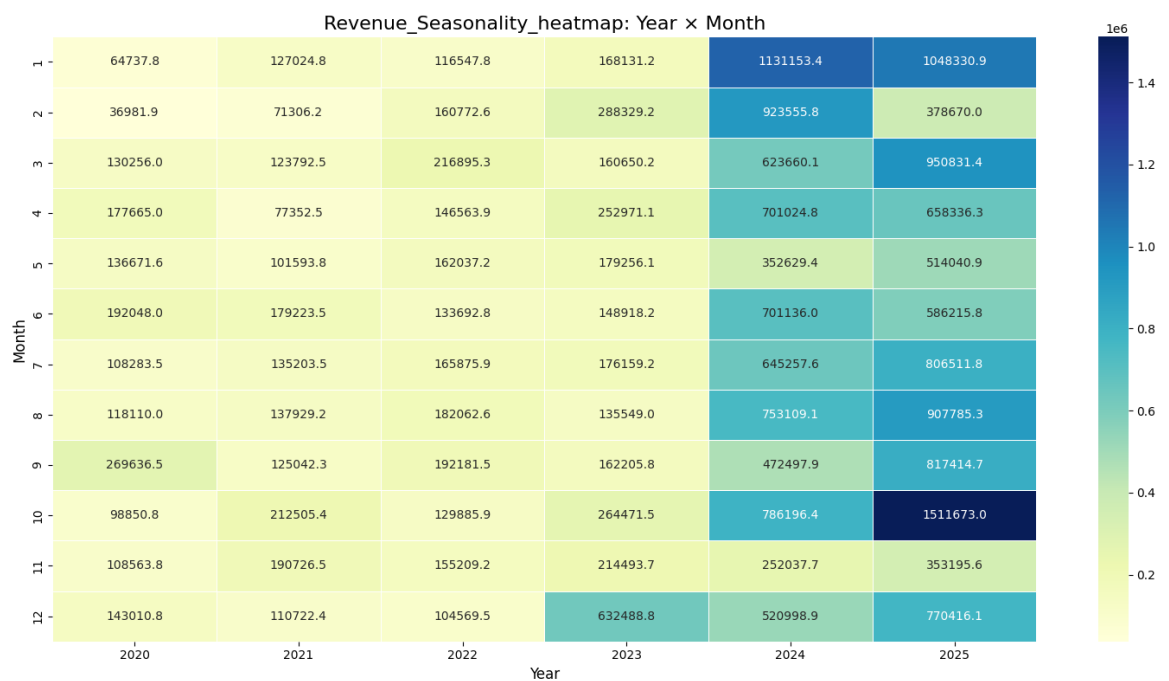
### Seasonality Heatmap → Revenue by Month vs Year.

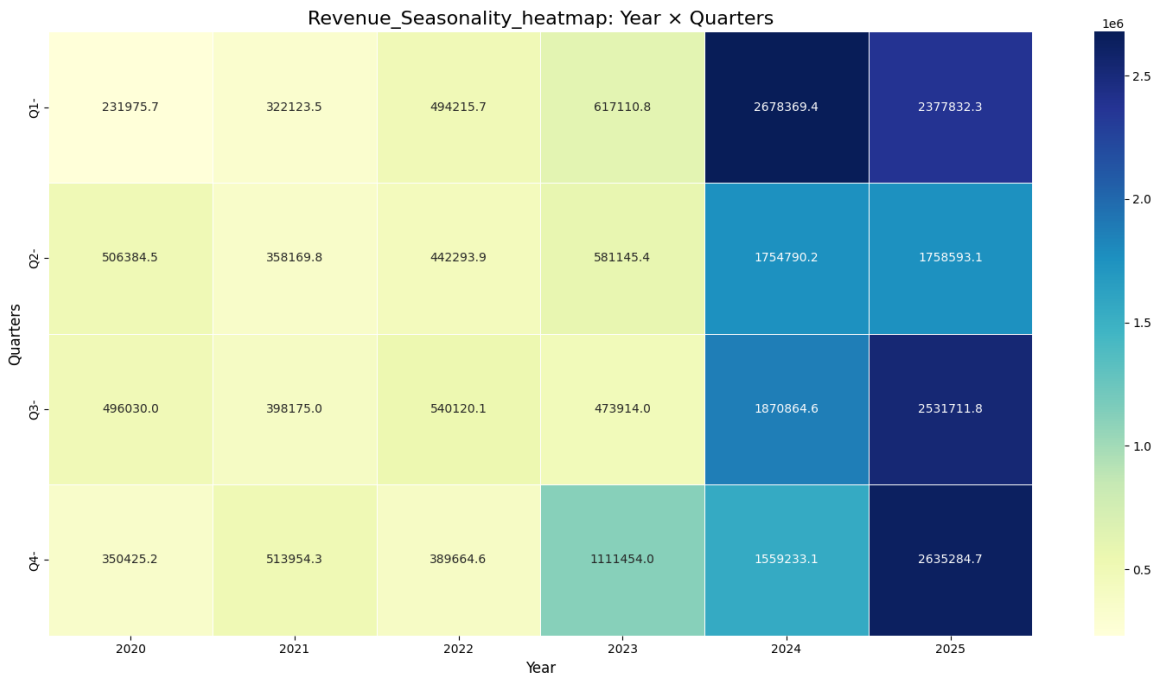
## Consumables





## Consumables + Pharmaceuticals

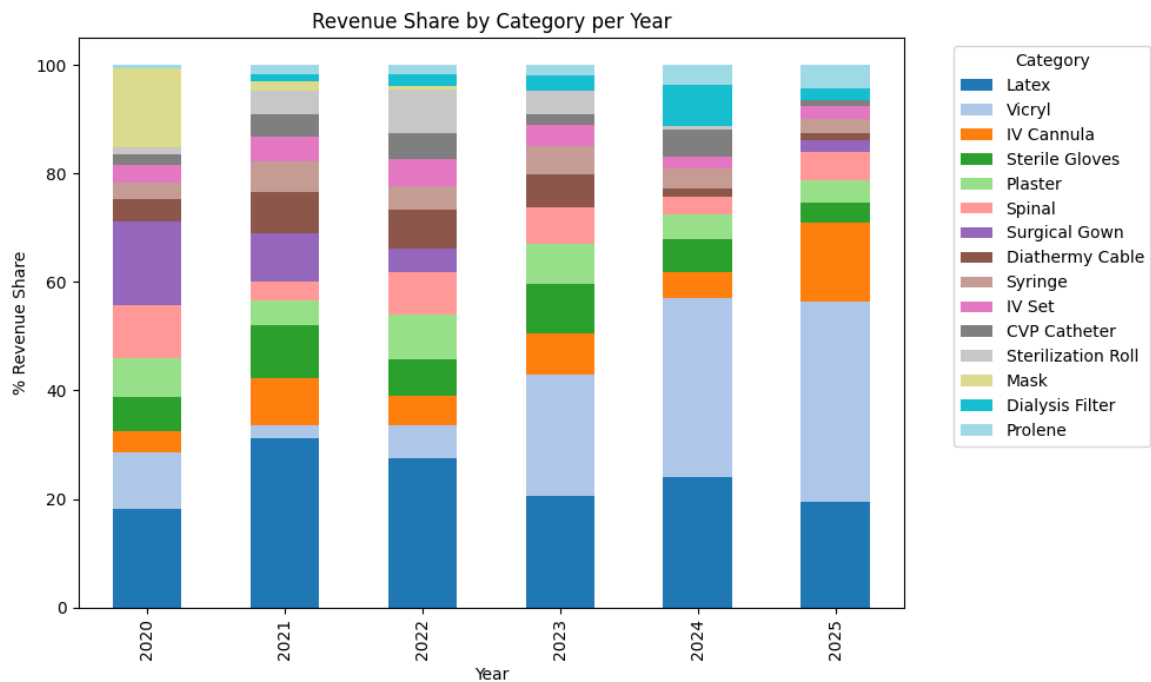




### Insight 5: Performance in Pharmaceutical vs. Consumables Branches

The pharmaceutical branch performed exceptionally well, especially in Q3 and Q4 of 2025, suggesting the emergence of a new strategic direction. In contrast, the consumables branch showed stable performance, with no growth in sales from 2024 to 2025. This lack of growth indicates the need for a renewed strategy for the consumables branch in 2026 to avoid potential losses. It is recommended that the sales team for the consumables branch be restructured and that additional sales force be added to drive future growth.

### Sales by Product Category

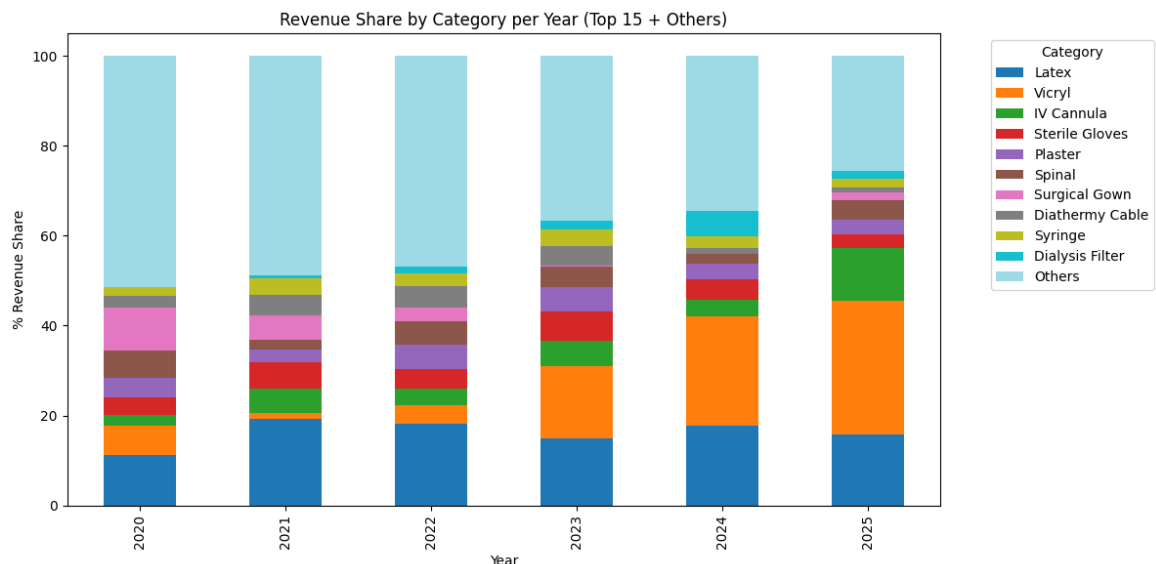


Out[45]:

|     | index | Category              | Total Selling Price |
|-----|-------|-----------------------|---------------------|
| 0   | 205   | Vicryl                | 2360092.8112        |
| 1   | 106   | Latex                 | 2265399.4           |
| 2   | 95    | IV Cannula            | 835313.8            |
| 3   | 171   | Sterile Gloves        | 629604.35           |
| 4   | 139   | Plaster               | 565979.601373       |
| ... | ...   | ...                   | ...                 |
| 201 | 143   | Potassium Permengnate | 53.352              |
| 202 | 124   | Nose Filler           | 50                  |
| 203 | 89    | Hegama Cups           | 35                  |
| 204 | 99    | Ice Bag               | 25                  |
| 205 | 107   | Linor                 | 25                  |

206 rows × 3 columns





Out[47]:

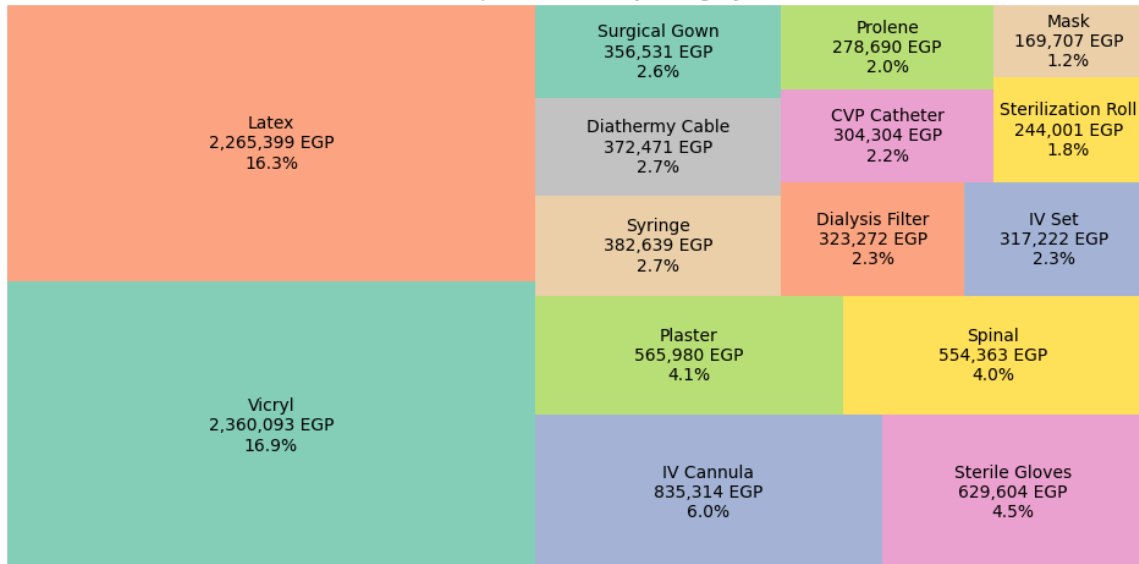
| Category_Grouped | Latex     | Vicryl    | IV Cannula | Sterile Gloves | Plaster  |     |
|------------------|-----------|-----------|------------|----------------|----------|-----|
| Year             |           |           |            |                |          |     |
| 2020             | 11.18161  | 6.480386  | 2.424266   | 3.879424       | 4.480944 | 6.0 |
| 2021             | 19.182775 | 1.378336  | 5.35528    | 5.943507       | 2.898978 | 2.0 |
| 2022             | 18.246808 | 4.039884  | 3.61571    | 4.453925       | 5.467851 | 5   |
| 2023             | 14.849167 | 16.08318  | 5.638018   | 6.497159       | 5.406085 | 4.0 |
| 2024             | 17.716054 | 24.455915 | 3.654556   | 4.417676       | 3.461551 | 2.0 |
| 2025             | 15.675873 | 29.860211 | 11.778251  | 3.00121        | 3.319859 | 4.0 |

## Insight 6: Category Performance

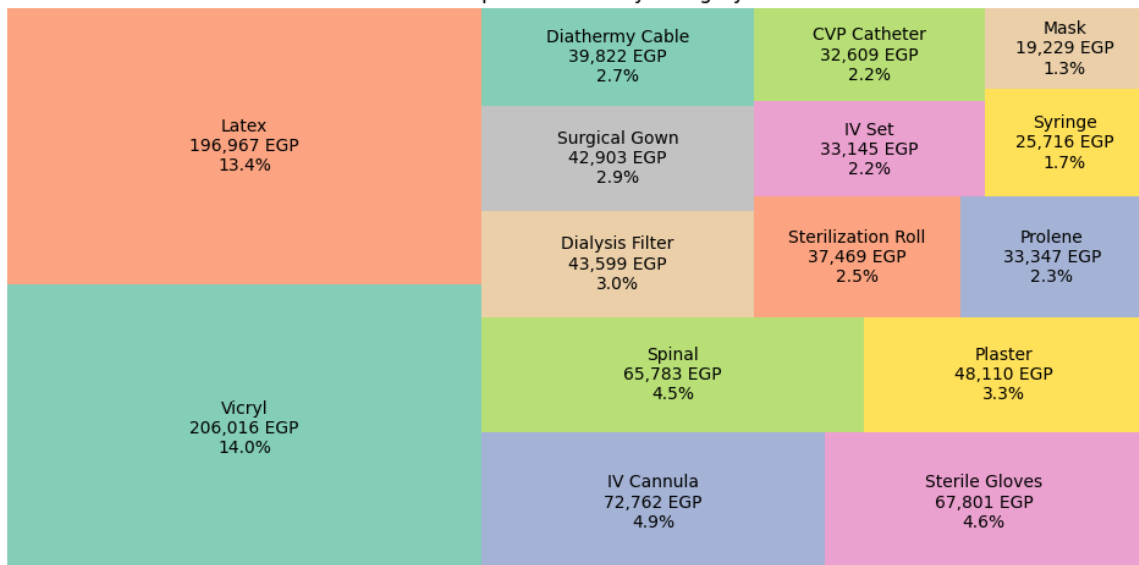
The Vicryl and IV Cannula categories have shown significant growth, with a 5% increase in Vicryl and an 8% increase in IV Cannula market share. Latex, on the other hand, has maintained a stable share of approximately 16%, while Spinal products have seen a notable increase from 2% to 4%. To further enhance profitability in 2026, it is recommended to either increase the gross profit from these categories or negotiate better deals with suppliers to lower costs.

Requirement already satisfied: squarify in /Users/mohamad/opt/anaconda3/envs/discount-env/lib/python3.10/site-packages (0.4.4)

Treemap: Total Sales by Category



Treemap: Total Profit by Category

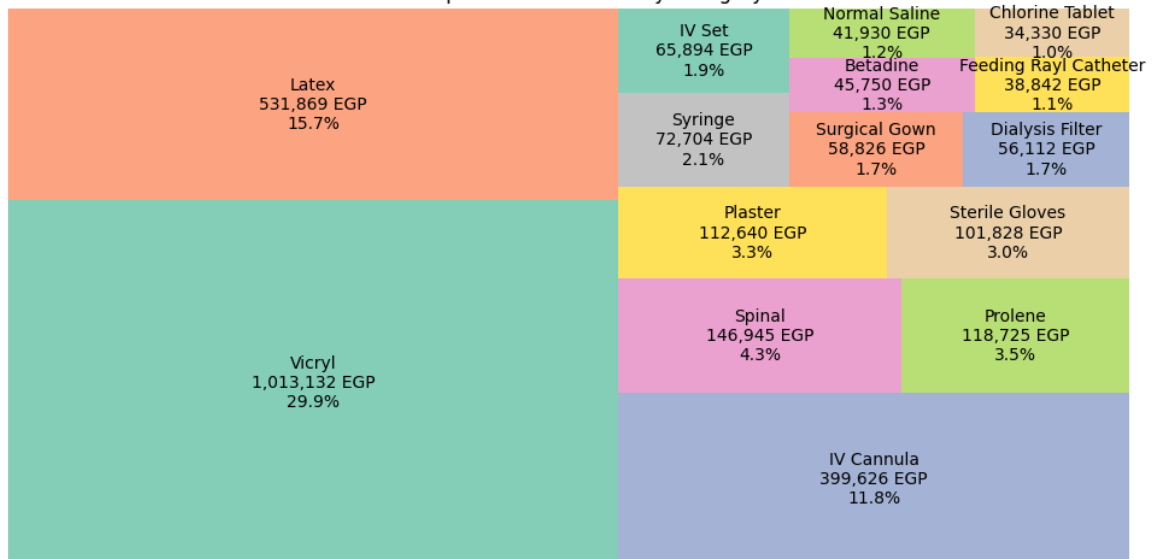


## Insight 7: Profitability from Main Categories

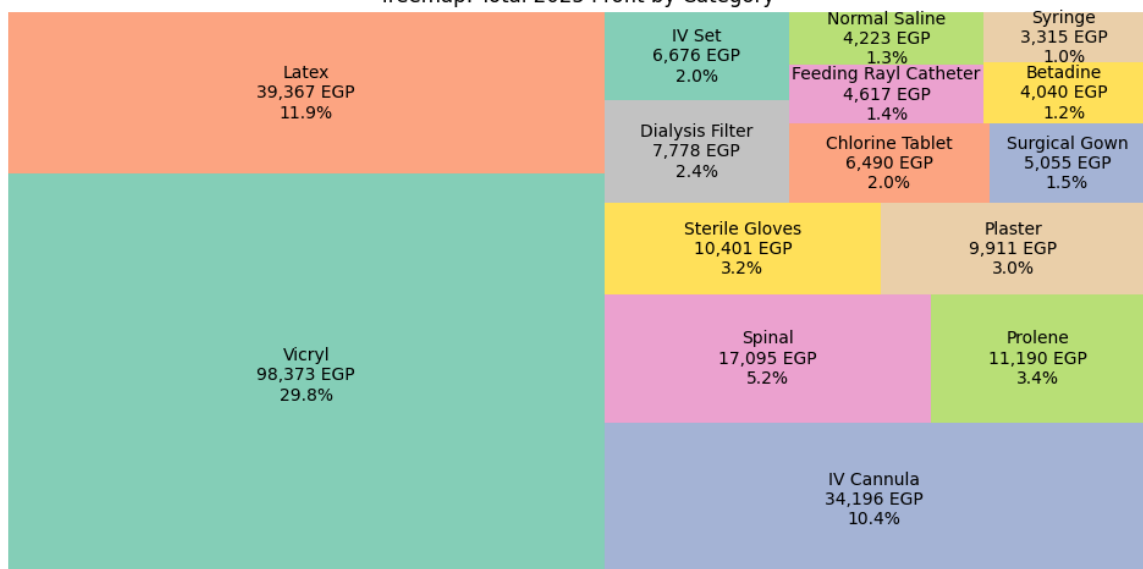
The top three categories—Latex, Vicryl, and IV Cannula—account for nearly 40% of total sales in the consumables branch, which is significant. However, the profitability from these categories is currently around 32%, which suggests there is room for improvement. A strategic focus on maximizing profits from these high-volume categories is necessary.

2025

Treemap: Total Sales 2025 by Category



Treemap: Total 2025 Profit by Category



## Insight 8: Sales vs. Profit for Top Categories

In 2025, approximately 60% of consumables sales came from the top three categories, yet the profit from these categories represented only 52% of total profits. While this shows that the firm is on the right track, it is essential that the profit percentage surpasses the sales percentage in these categories in the upcoming year to further optimize profitability.

Out[52]:

|   | Product Name                       | Client        | Total_Selling_Price | profit | percentage | Profit_Margin |
|---|------------------------------------|---------------|---------------------|--------|------------|---------------|
| 0 | ابر<br>اسبائنال<br>اسود<br>مقاس ٢٢ | Sharqia       | 4200                | 250    | 0.123787   | 5.95238       |
| 1 | ابر<br>اسبائنال<br>اسود            | Taha<br>Yasen | 13420.0             | 2020.0 | 0.39553    | 15.05216      |

|                  |   |                 |         |        |          |          |
|------------------|---|-----------------|---------|--------|----------|----------|
| مقاس ٢٢          |   |                 |         |        |          |          |
| 4                | ابر<br>اسبائنال<br>برتقالي<br>مقاس ٢٥   | Montazah        | 3775    | 100    | 0.111261 | 2.64900  |
| 2                | ابر<br>اسبائنال<br>برتقالي<br>مقاس ٢٥   | Eman<br>Khairy  | 3950    | 100    | 0.116419 | 2.53164  |
| 5                | ابر<br>اسبائنال<br>برتقالي<br>مقاس ٢٥   | Sharqia         | 4200    | 350    | 0.123787 | 8.33333  |
| 6                | ابر<br>اسبائنال<br>برتقالي<br>مقاس ٢٥   | Taha<br>Yasen   | 27100.0 | 4575.0 | 0.798723 | 16.88191 |
| 3                | ابر<br>اسبائنال<br>برتقالي<br>مقاس ٢٥   | Jasmin          | 90300   | 9700   | 2.661428 | 10.74197 |
| 7                | اسورة<br>تعريف<br>أطفال                 | Amina           | 425     | 25     | 0.012526 | 5.88235  |
| 8                | اسورة<br>تعريف<br>كبار                  | Arkan<br>Center | 100     | 20     | 0.002947 | 20       |
| 9                | اليكترود                                | Taha<br>Yasen   | 2100    | 210    | 0.061894 | 10       |
| 10               | انبوبة<br>حنجرية<br>بدون كف<br>مقاس ٣   | Jasmin          | 4050    | 675    | 0.119366 | 16.66666 |
| 11               | انبوبة<br>حنجرية<br>بدون كف<br>مقاس ٣.٥ | Jasmin          | 6250    | 1250   | 0.184207 | 20       |
| 12               | انبوبة<br>حنجرية<br>بدون كف<br>مقاس ٥.٥ | SHARQA          | 880     | 80     | 0.025936 | 9.09090  |
| 13               | انبوبة<br>حنجرية<br>بكف<br>مقاس ٤.٥     | Arkan<br>Center | 70      | 10     | 0.002063 | 14.28571 |
| انبوبة<br>حنجرية |   |                 |         |        |          |          |

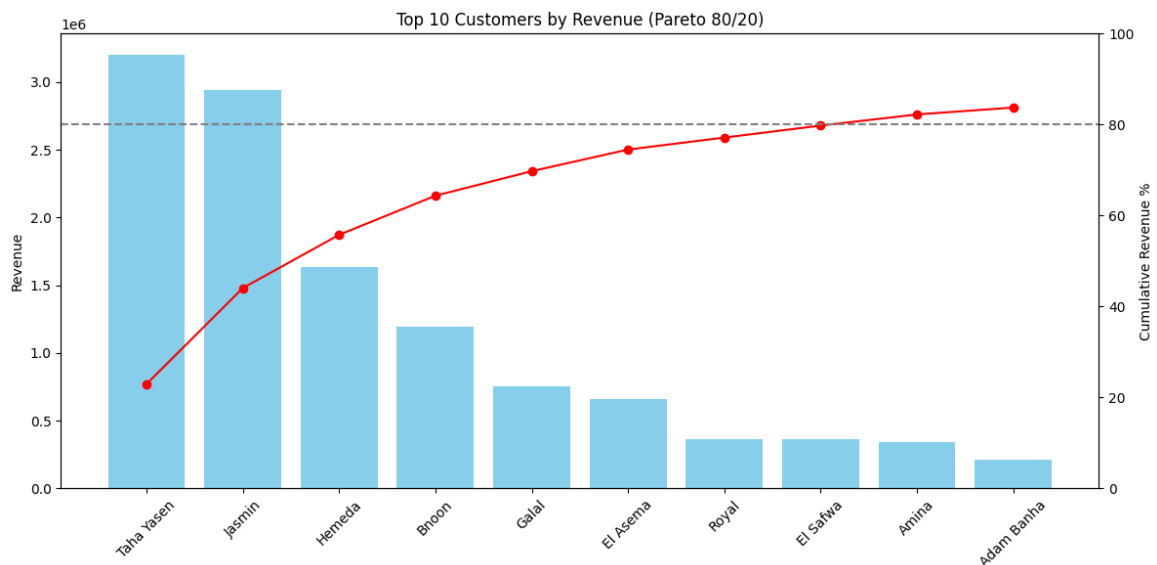
|    |                                   |                             |       |      |          |          |
|----|-----------------------------------|-----------------------------|-------|------|----------|----------|
| 14 | بكف<br>مقاس ٤.٥                   | SHARQA                      | 330   | 30   | 0.009726 | 9.09090  |
| 16 | انبوبة<br>حنجرية<br>بكف<br>مقاس ٧ | Arkan<br>Center             | 350   | 30   | 0.010316 | 8.57142  |
| 17 | انبوبة<br>حنجرية<br>بكف<br>مقاس ٧ | SHARQA                      | 640   | 30   | 0.018863 | 4.687    |
| 15 | انبوبة<br>حنجرية<br>بكف<br>مقاس ٧ | Amina                       | 1320  | 40   | 0.038905 | 3.03030  |
| 18 | اوفر شوز                          | SHARQA                      | 300   | -150 | 0.008842 | -50      |
| 19 | اي باتش<br>كبار                   | Arkan<br>Center             | 154   | 14   | 0.004539 | 9.09090  |
| 20 | ايجي<br>كريل رابيد<br>٠/٢ قاطع    | Jasmin                      | 4550  | 400  | 0.134103 | 8.79120  |
| 21 | ايجي<br>كريل رابيد<br>٠/٣ قاطع    | Jasmin                      | 4600  | 550  | 0.135577 | 11.95652 |
| 22 | ببرونه<br>١٥٠ملي                  | Jasmin                      | 10584 | 762  | 0.311944 | 7.19954  |
| 23 | برولين<br>زيرو قاطع               | Jasmin                      | 750   | 120  | 0.022105 | 16       |
| 24 | برولين<br>واحد<br>راوند           | Taha<br>Yasen               | 4195  | 1585 | 0.12364  | 37.78307 |
| 25 | برولين<br>واحد<br>قاطع            | Jasmin                      | 2625  | 370  | 0.077367 | 14.09523 |
| 26 | برولين ٠/٢<br>راوند               | Jasmin                      | 1875  | 250  | 0.055262 | 13.33333 |
| 27 | برولين ٠/٢<br>راوند               | Royal                       | 2345  | 120  | 0.069115 | 5.11727  |
| 29 | برولين ٠/٢<br>قاطع                | MEDECA<br>HOSPITAL<br>SHARM | 370   | 60   | 0.010905 | 16.21621 |
| 28 | برولين ٠/٢<br>قاطع                | ADAM                        | 390   | 20   | 0.011495 | 5.12820  |

## Insight 9: Product Portfolio Optimization

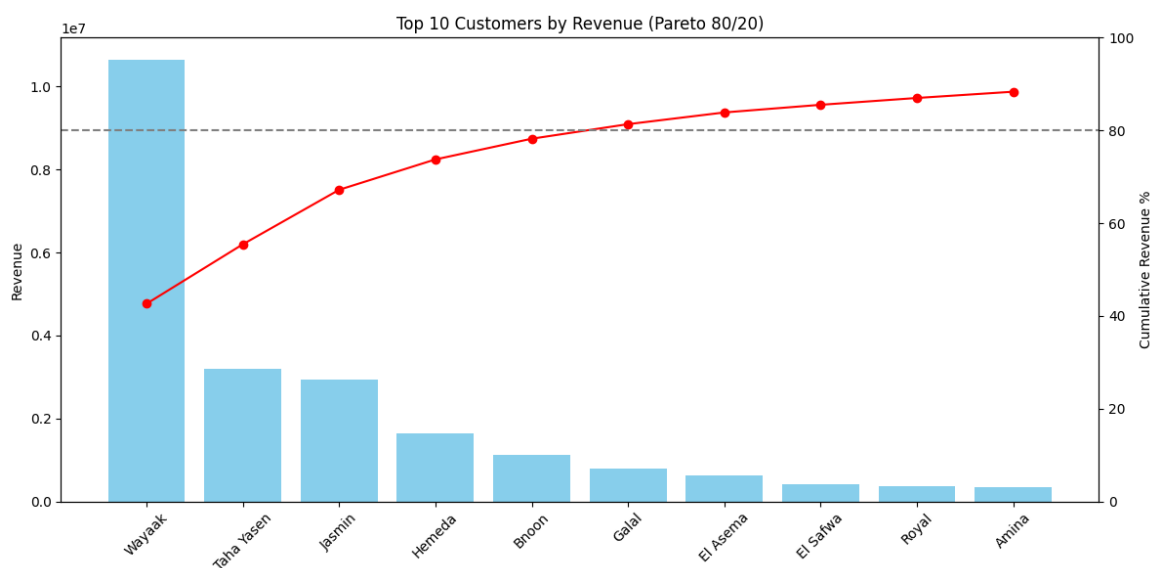
Over the years, the number of products offered has decreased, with just three main categories now accounting for over 50% of total sales. This indicates that the firm has successfully identified its core market segments. To capitalize on this, the firm should consider building stronger relationships with suppliers for these categories and revisiting the profitability of these products to ensure they are targeting the right market segments.

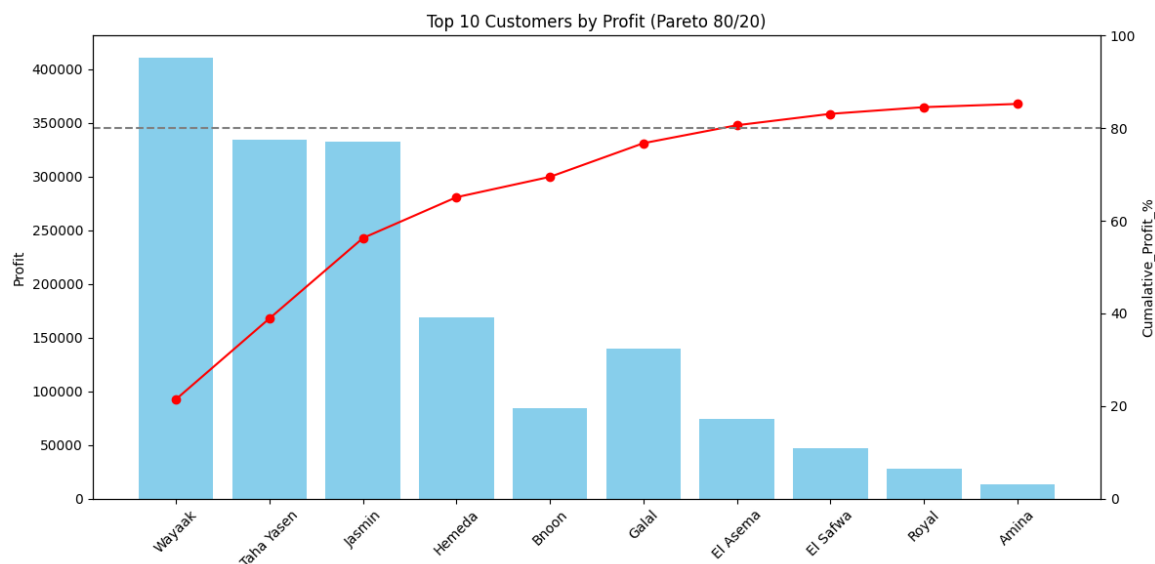
## Top 10 Customers by Revenue (Pareto 80/20)

### Consumables



### All Customers (Consumables + Pharmaceuticals)





## Insight 10: Customer Concentration

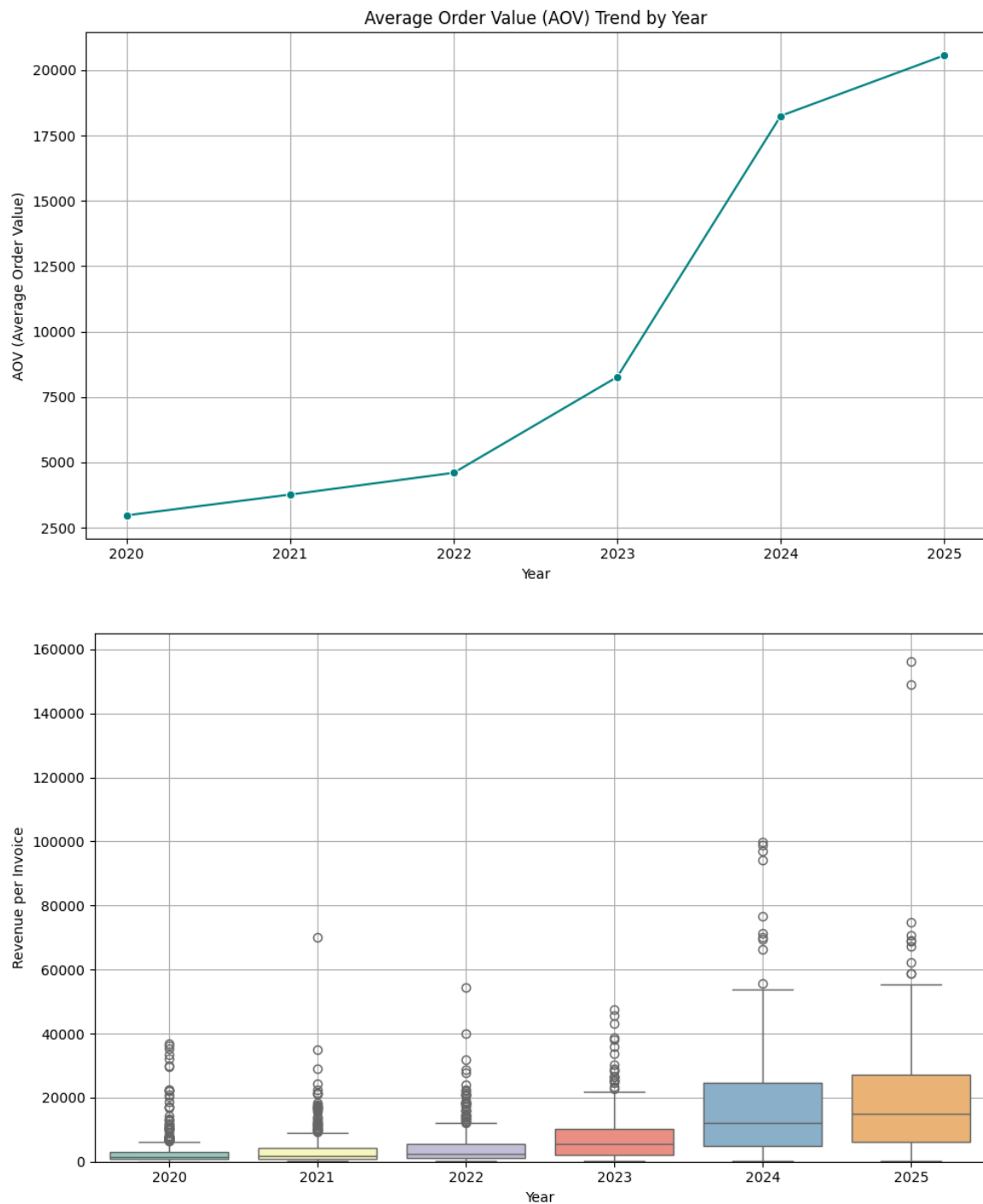
A large proportion of sales—approximately 80%—comes from just six customers. While the firm has successfully retained four of these customers, two were lost due to their financial difficulties. This concentration of sales presents a risk to stability, and it is highly recommended to diversify the customer base by adding either two large accounts or four smaller ones to mitigate this risk. Additionally, the pharmaceutical branch, which serves only one customer, has proven more profitable than the consumables branch, signaling its strong potential in 2026.

## AVG order per year

### Consumables only

Out[57]:

|   | Year | Unique_Customers_per_Year | Sales_sum      | Profit_sum    | Produ |
|---|------|---------------------------|----------------|---------------|-------|
| 0 | 2020 | 47                        | 1577652.9625   | 153163.8875   |       |
| 1 | 2021 | 25                        | 1593007.228431 | 142354.188431 |       |
| 2 | 2022 | 21                        | 1926761.1328   | 272364.6228   |       |
| 3 | 2023 | 21                        | 2206541.3      | 258070.41     |       |
| 4 | 2024 | 15                        | 3230487.95     | 319351.23     |       |
| 5 | 2025 | 14                        | 3392914.76     | 329935.86     |       |

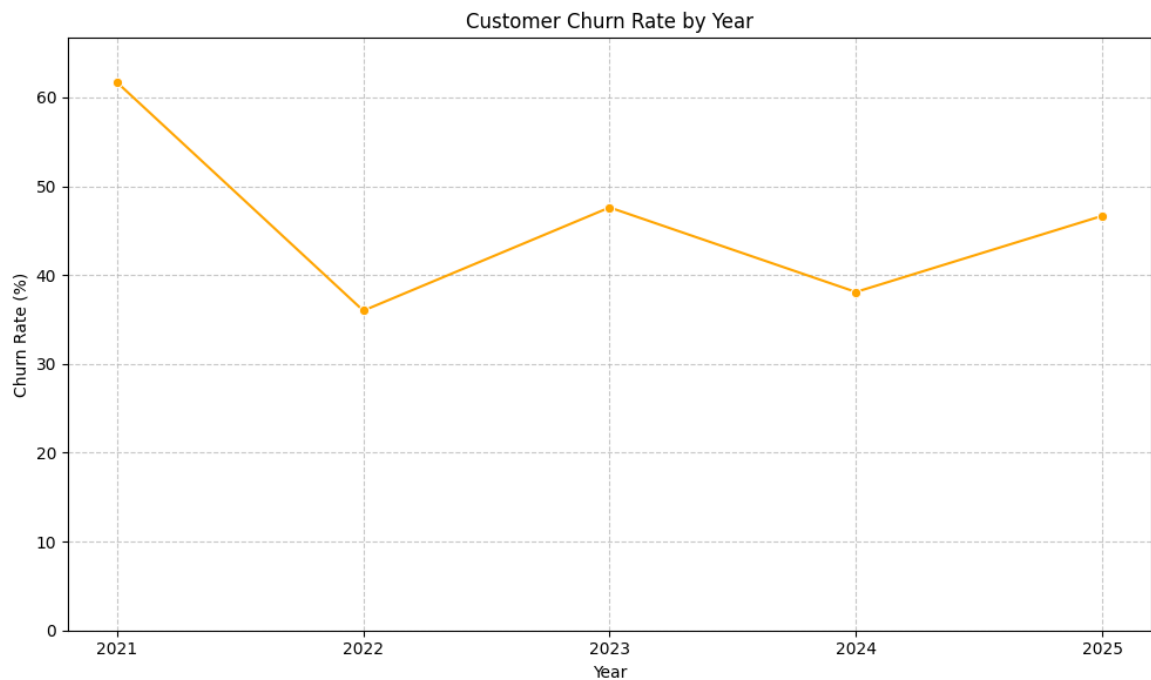


## Insight 11: Order Value and Operational Efficiency

The average order value and number of orders have shown a favorable trend, with the firm successfully eliminating undesirable sales and focusing on high-value customers. As a result, the average order value has increased while the number of orders has slightly decreased, leading to savings in operational expenses. It is recommended to further diversify the supplier base by adding one or two new suppliers to mitigate risk.

### Customer Metrics





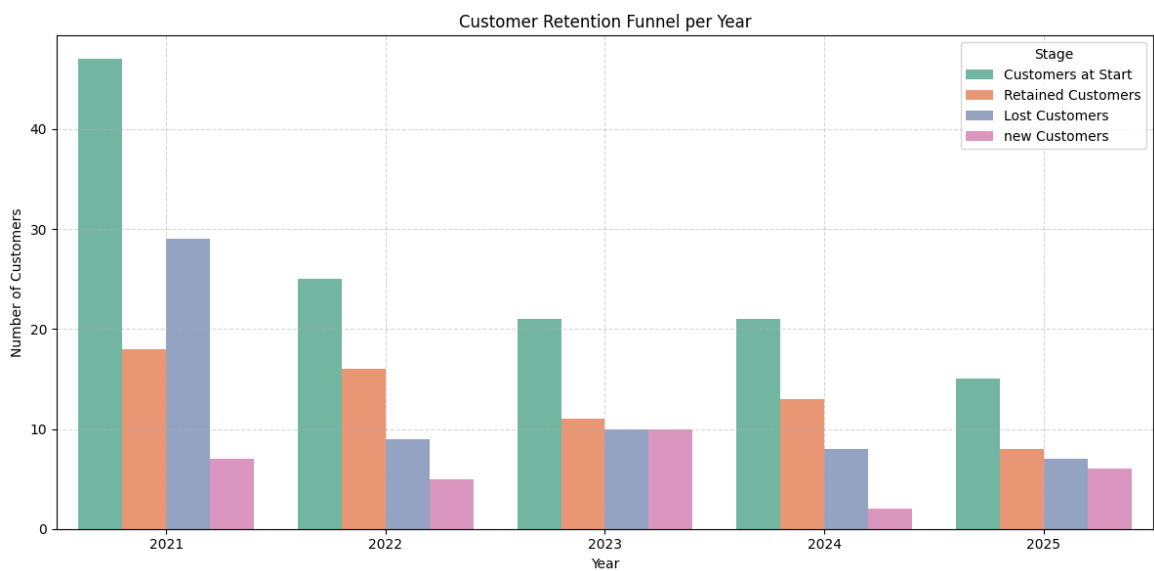
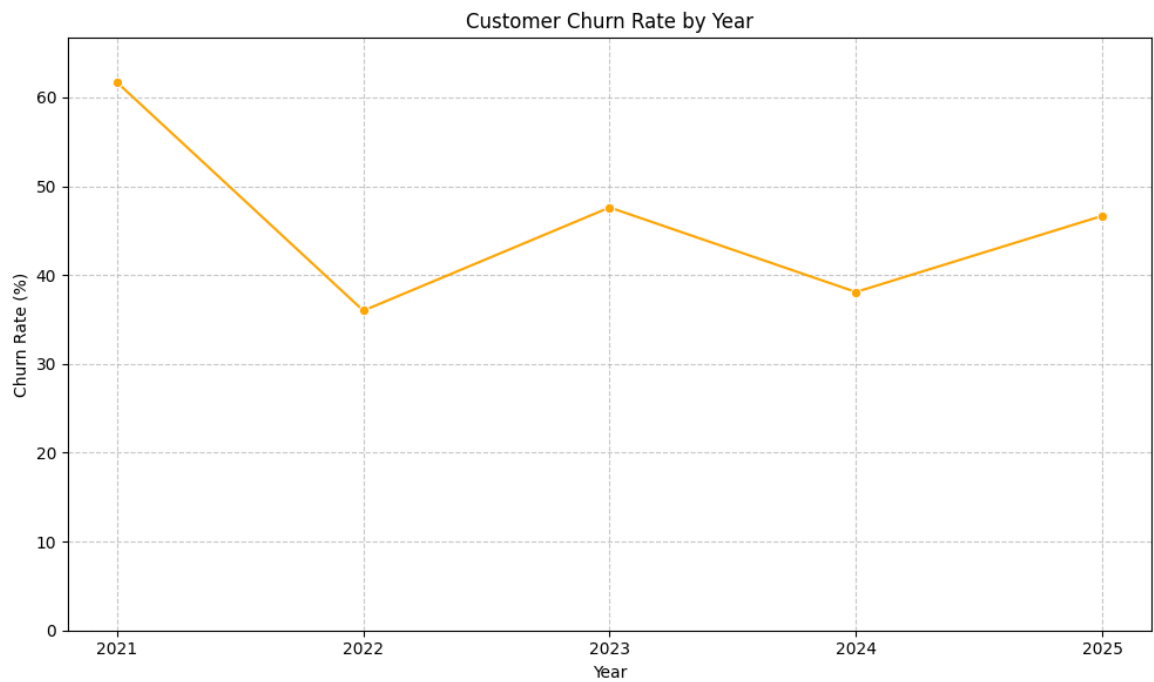
## Customer Churn Rate

Out[61]:

|   | Year | Client  |
|---|------|---|
| 0 | 2020 | {Montazah Pediatric, Taha Yasen, Maghraby Banh... |
| 1 | 2021 | {Montazah Pediatric, Taha Yasen, Abd El Hamid,... |
| 2 | 2022 | {Taha Yasen, Maghraby Banha, Abd El Hamid, SHA... |
| 3 | 2023 | {Taha Yasen, EL Mahd, Shourok, Amina, Delta, M... |
| 4 | 2024 | {Wady El Tip, Taha Yasen, El Asema, Bnoon, EL ... |
| 5 | 2025 | {MEDECA HOSPITAL SHARM, Taha Yasen, Arkan Cent... |

Out[62]:

|   | Year | Customers at Start | Retained Customers | Lost Customers | new Customers | Churn Rate (%) |
|---|------|--------------------|--------------------|----------------|---------------|----------------|
| 0 | 2021 | 47                 | 18                 | 29             | 7             | 61.70          |
| 1 | 2022 | 25                 | 16                 | 9              | 5             | 36.00          |
| 2 | 2023 | 21                 | 11                 | 10             | 10            | 47.62          |
| 3 | 2024 | 21                 | 13                 | 8              | 2             | 38.10          |
| 4 | 2025 | 15                 | 8                  | 7              | 6             | 46.67          |



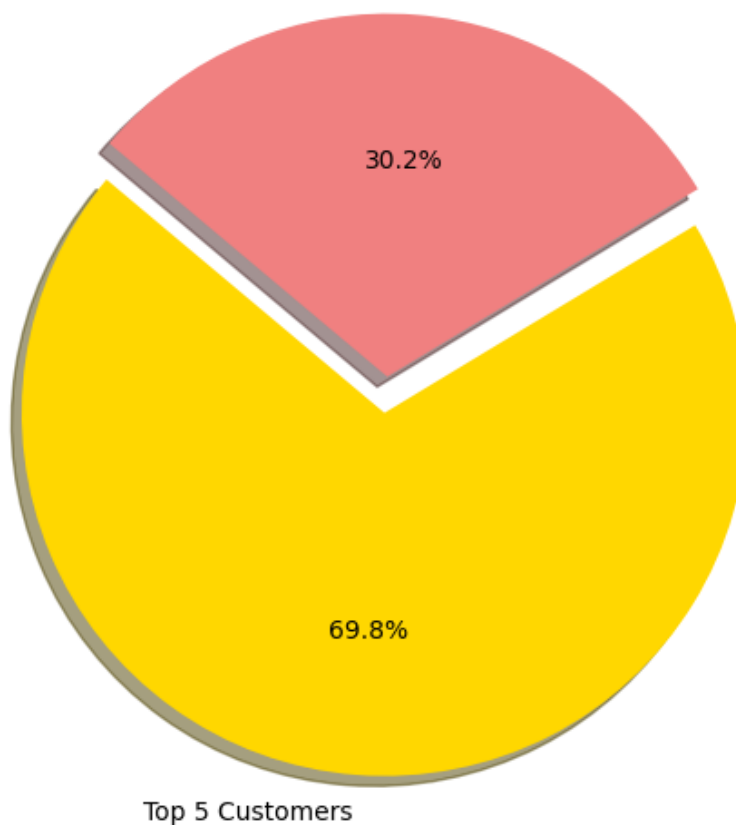
## Customer Concentration Risk

Out[65]:

|     | Client           | Sales_sum   | Profit_sum  | Transactions_count | Products_No | C |
|-----|------------------|-------------|-------------|--------------------|-------------|---|
| 63  | Taha Yasen       | 3197157.06  | 344915.64   | 351                | 238         |   |
| 38  | Jasmin           | 2939293.25  | 335280.1    | 112                | 118         |   |
| 36  | Hemeda           | 1631108.9   | 170082.97   | 238                | 238         |   |
| 9   | Bnoon            | 1196362     | 90045.5     | 54                 | 23          |   |
| 33  | Galal            | 751274.2228 | 128073.3928 | 82                 | 335         |   |
| ... | ...              | ...         | ...         | ...                | ...         |   |
| 43  | Madina           | 900         | 225         | 1                  | 1           |   |
| 18  | Dr. Salah        | 512.5       | 42.5        | 2                  | 5           |   |
| 16  | Dr. Islam Sameer | 383         | 36.0        | 1                  | 3           |   |
| 37  | Ibn Sina         | 321         | 30          | 1                  | 1           |   |
| 51  | Rabbat           | 107         | 10          | 1                  | 1           |   |

70 rows x 10 columns

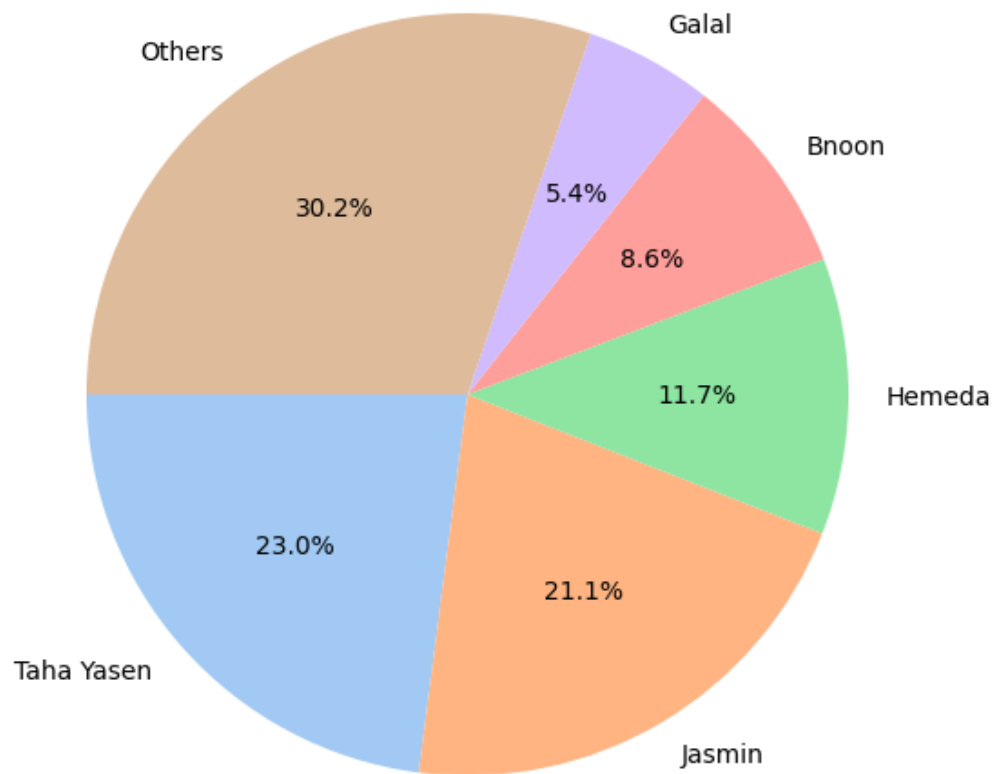
Sales Distribution: Top 5 Customers vs Others



Out[67]:

|    | Client     | Sales_sum  |
|----|------------|------------|
| 63 | Taha Yasen | 3197157.06 |
| 38 | Jasmin     | 2939293.25 |
| 36 | Hemeda     | 1631108.9  |
| 9  | Bnoon      | 1196362    |

Customer Concentration: Top 5 Customers vs Others



Out[69]:

|     | Client     | Year | sales_sum    | cogs_sum     | Collection_sum | Profit_  |
|-----|------------|------|--------------|--------------|----------------|----------|
| 134 | Wayaak     | 2025 | 5.506207e+06 | 5.286821e+06 | 5380648        | 219386.1 |
| 133 | Wayaak     | 2024 | 4.572897e+06 | 4.404701e+06 | 4382553.87     | 168196.0 |
| 88  | Jasmin     | 2025 | 1.287282e+06 | 1.134701e+06 | 1155000        | 152580.5 |
| 87  | Jasmin     | 2024 | 1.113075e+06 | 9.912499e+05 | 1055600        | 121825.3 |
| 80  | Hemeda     | 2024 | 7.142908e+05 | 6.634810e+05 | 726844         | 50809.7  |
| 125 | Taha Yasen | 2025 | 7.090525e+05 | 6.250782e+05 | 708386         | 83974.2  |
| 124 | Taha Yasen | 2024 | 6.986865e+05 | 6.017658e+05 | 690910         | 96920.7  |
| 21  | Bnoon      | 2025 | 5.799300e+05 | 5.416230e+05 | 579930         | 38307.0  |
| 132 | Wayaak     | 2023 | 5.672195e+05 | 5.440473e+05 | 567219.5       | 23172.2  |
| 86  | Jasmin     | 2023 | 5.351440e+05 | 4.769010e+05 | 485640         | 58243.0  |

&lt;Figure size 1200x600 with 0 Axes&gt;

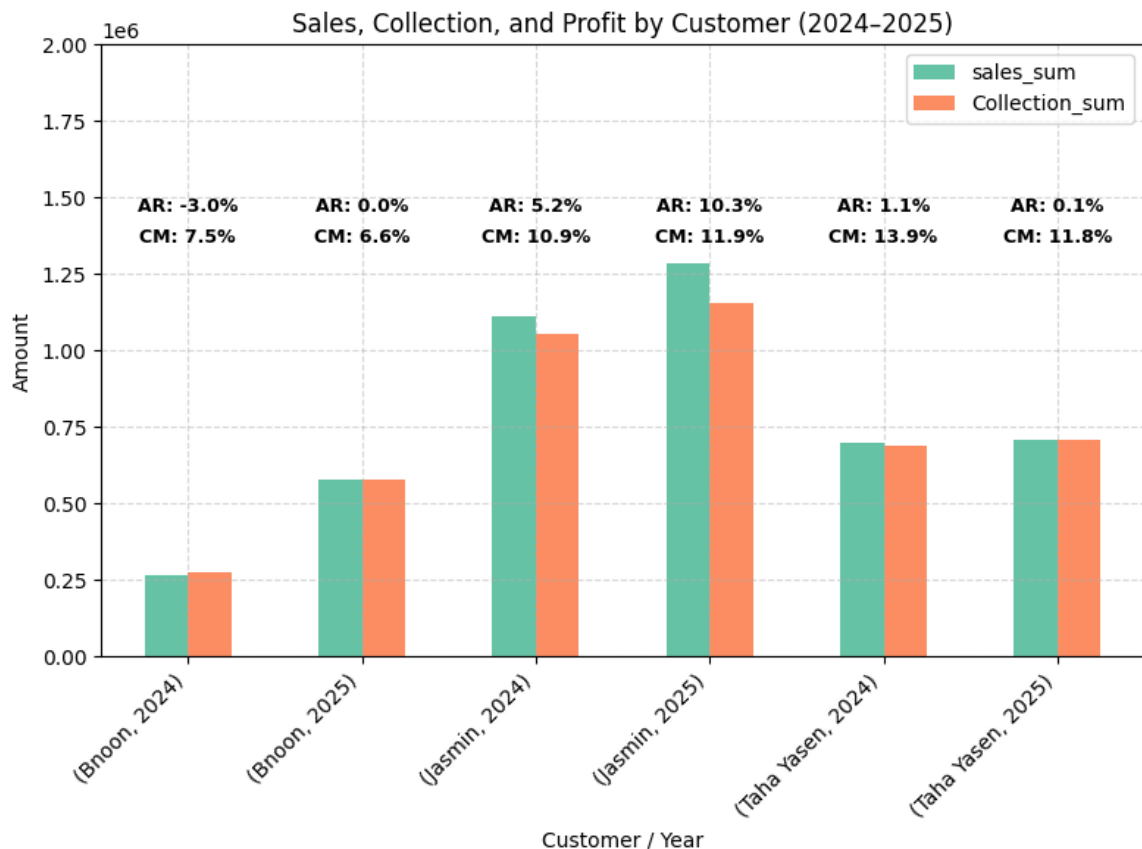


```

/var/folders/vf/sz32t6rx7635wcdmj4ydx580000gn/T/ipykernel_47296/533
031895.py:5: SettingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: https://pandas.pydata.org/pand
as-docs/stable/user_guide/indexing.html#returning-a-view-versus-a-co
py
    filtered_df['AR %'] = filtered_df['AR'] / filtered_df['sales_sum']
    * 100

```



Out[72]:

|               |      | sales_sum  | Collection_sum | Contribution<br>Margin % | AR %      |
|---------------|------|------------|----------------|--------------------------|-----------|
| Client        | Year |            |                |                          |           |
| Bnoon         | 2024 | 267910.00  | 275915         | 7.458661                 | -2.987944 |
|               | 2025 | 579930.00  | 579930         | 6.605452                 | 0.0       |
| Jasmin        | 2024 | 1113075.25 | 1055600        | 10.944934                | 5.163645  |
|               | 2025 | 1287281.50 | 1155000        | 11.852924                | 10.276035 |
| Taha<br>Yasen | 2024 | 698686.50  | 690910         | 13.871845                | 1.113017  |
|               | 2025 | 709052.46  | 708386         | 11.843167                | 0.093993  |

## Insight 12: Consumables Branch Customer Analysis

In the consumables branch, Bnoon has shown over 100% growth,

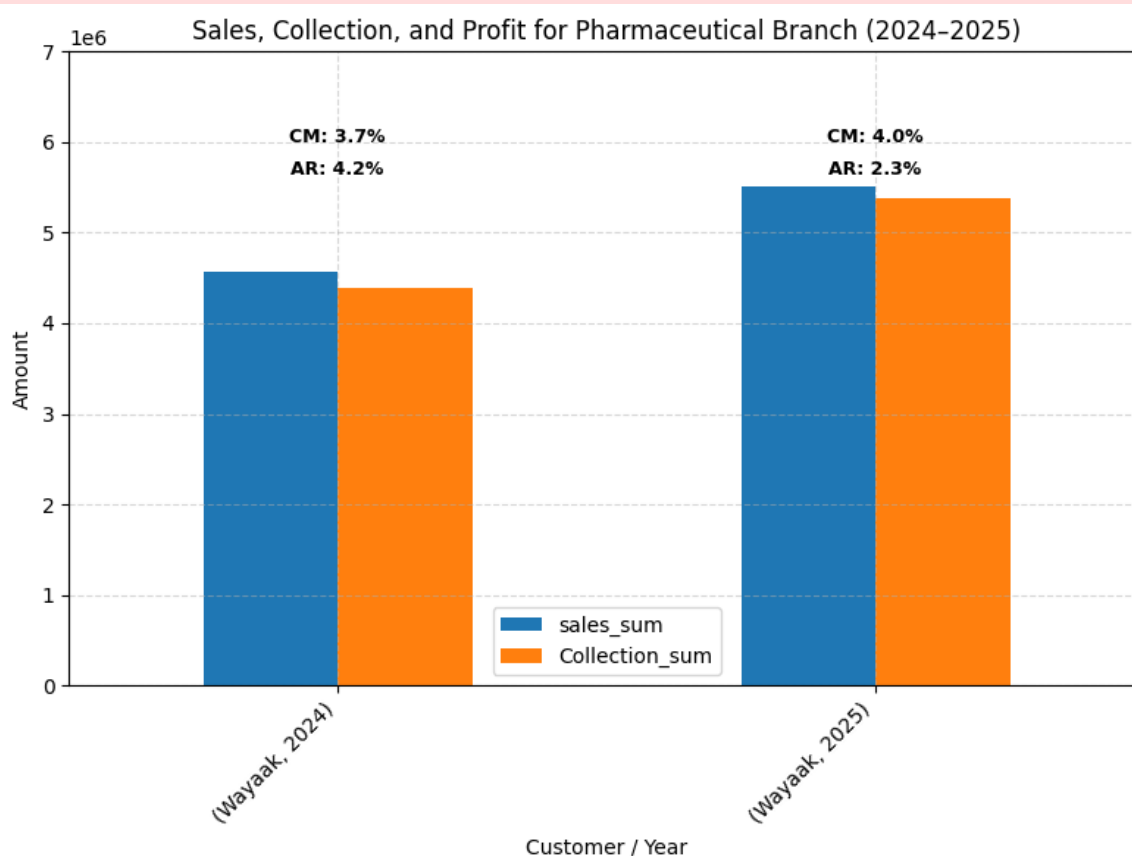
though profits have decreased by 1%. Jasmin, which contributes significantly to consumables sales, saw a 19% sales growth with a 1% profit increase, though accounts receivable (AR) has increased from 5% in 2024 to 10% in 2025. This requires attention to prevent future cash flow issues. For Taha Yaseen, sales remained steady, but the contribution margin has decreased by 2%, likely due to the cessation of kidney consumables. A deeper analysis is recommended to understand if a new vendor has taken market share.

```
/var/folders/vf/sz32t6rx7635wcdmj4ydx580000gn/T/ipykernel_47296/220
0809315.py:5: SettingWithCopyWarning:
```

```
A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead
```

See the caveats in the documentation: [https://pandas.pydata.org/pandas-docs/stable/user\\_guide/indexing.html#returning-a-view-versus-a-copy](https://pandas.pydata.org/pandas-docs/stable/user_guide/indexing.html#returning-a-view-versus-a-copy)

```
filtered_df['AR %'] = filtered_df['AR'] / filtered_df['sales_sum']
* 100
```



Out[74]:

|        |      | sales_sum    | Collection_sum | Contribution Margin % | AR %     |
|--------|------|--------------|----------------|-----------------------|----------|
| Client | Year |              |                |                       |          |
| Wayaak | 2024 | 4.572897e+06 | 4382553.87     | 3.678106              | 4.162427 |
|        | 2025 | 5.506207e+06 | 5380648        | 3.984342              | 2.280312 |

## Insight 13: Pharmaceutical Branch Performance

The pharmaceutical branch, represented by Wayaak, showed strong growth (23%) from 2024 to 2025, with a reduction in accounts receivable and a slight increase in the contribution margin. It is recommended to focus on increasing sales in this branch by 8 million in 2026 while maintaining current AR and CM percentages.

## Supplier Metrics

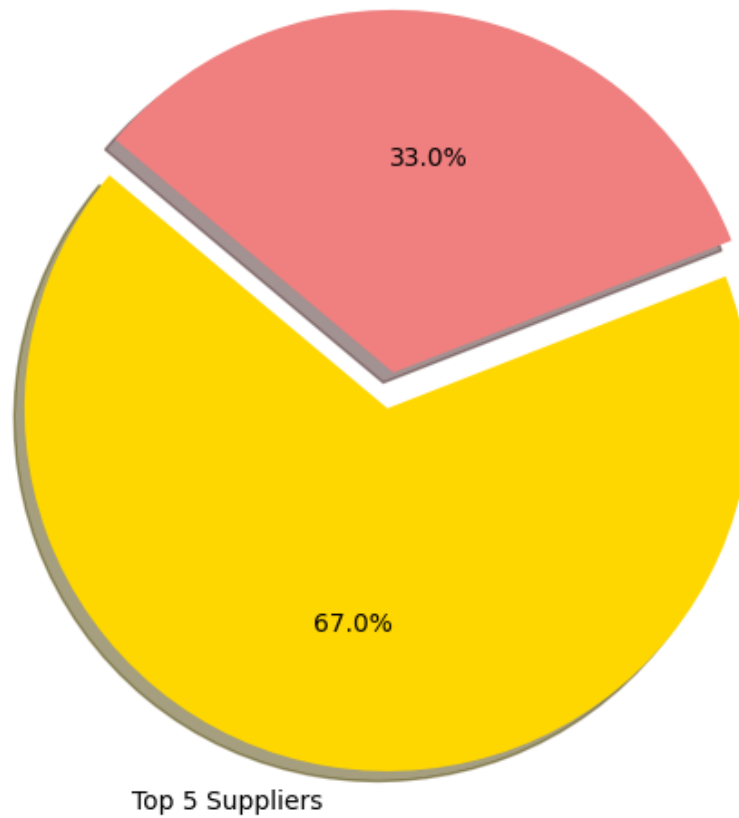
### Supplier Concentration Risk

Out[75]:

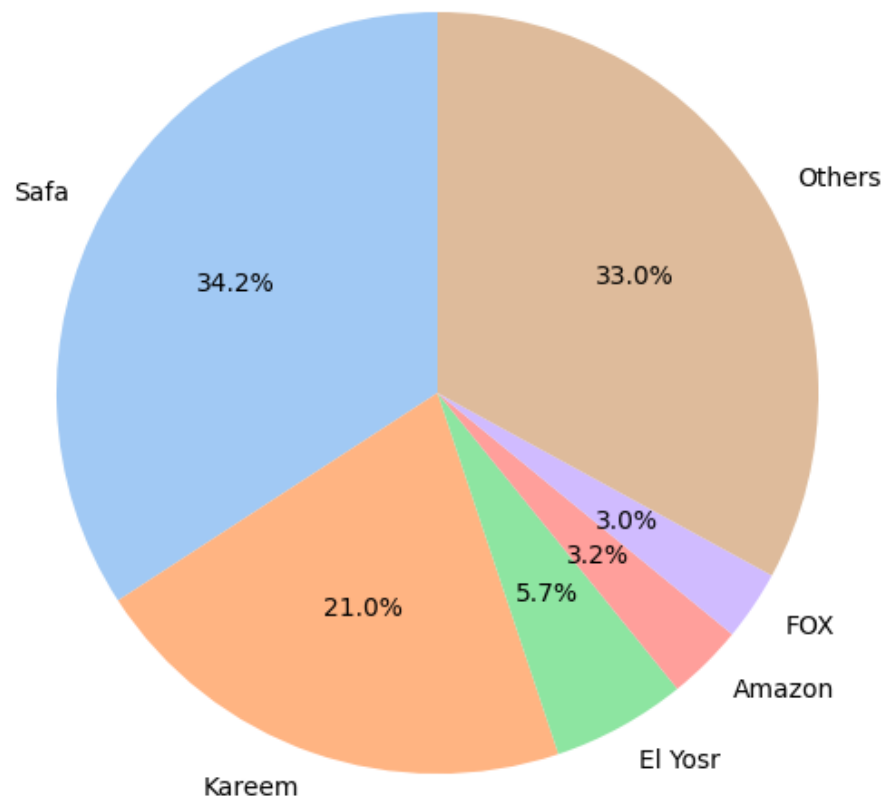
|   | index | Supplier        | Total<br>Buying<br>Price | Cumalative_Supplier_% | share_of_total_I |
|---|-------|-----------------|--------------------------|-----------------------|------------------|
| 0 | 80    | Safa            | 4254067.03               | 34.172383             | 34.1             |
| 1 | 57    | Kareem          | 2610658.86               | 55.143476             | 20.9             |
| 2 | 39    | El Yosr         | 708964.45                | 60.838498             | 5.6              |
| 3 | 9     | Amazon          | 403125.75                | 64.076756             | 3.2              |
| 4 | 46    | FOX             | 369255.75                | 67.042941             | 2.9              |
| 5 | 2     | Abd El<br>Hamid | 342505.98                | 69.794248             | 2.7              |
| 6 | 5     | Ahmed<br>Mongey | 342421.5                 | 72.544876             | 2.7              |
| 7 | 26    | El Hanafy       | 293793.5                 | 74.904882             | 2.3              |
| 8 | 7     | Al Moaez        | 287530.76                | 77.214581             | 2.3              |
| 9 | 67    | Motakhssoon     | 283454.5                 | 79.491535             | 2.2              |



Purchasing Distribution: Top 5 Suppliers vs Others



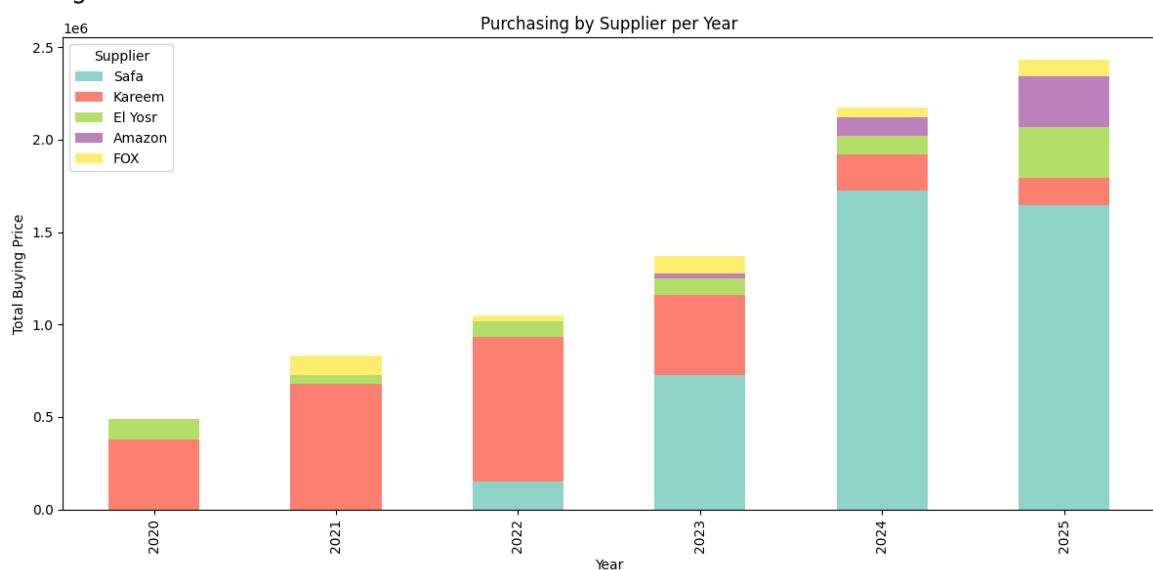
Supplier Concentration: Top 5 Suppliers vs Others



Out[78]:

|   | index | Supplier     | Profit_sum    | Buying_sum | revenue_sum    | contril |
|---|-------|--------------|---------------|------------|----------------|---------|
| 0 | 80    | Safa         | 438662.32     | 4254067.03 | 4692729.35     |         |
| 1 | 57    | Kareem       | 317013.673329 | 2610658.86 | 2927672.533329 |         |
| 2 | 39    | El Yosr      | 75179.614     | 708964.45  | 784144.064     |         |
| 3 | 9     | Amazon       | 35662.0       | 403125.75  | 438787.75      |         |
| 4 | 46    | FOX          | 33103.02      | 369255.75  | 402358.77      |         |
| 5 | 2     | Abd El Hamid | 47746.663922  | 342505.98  | 390252.643922  |         |
| 6 | 5     | Ahmed Mongey | 59325.5       | 342421.5   | 401747.0       |         |
| 7 | 26    | El Hanafy    | 52732.95      | 293793.5   | 346526.45      |         |
| 8 | 7     | Al Moaez     | 36996.33      | 287530.76  | 324527.09      |         |
| 9 | 67    | Motakhssoon  | 45548.4       | 283454.5   | 329002.9       |         |

<Figure size 1200x600 with 0 Axes>



## Insight 14: Supplier Concentration Risk

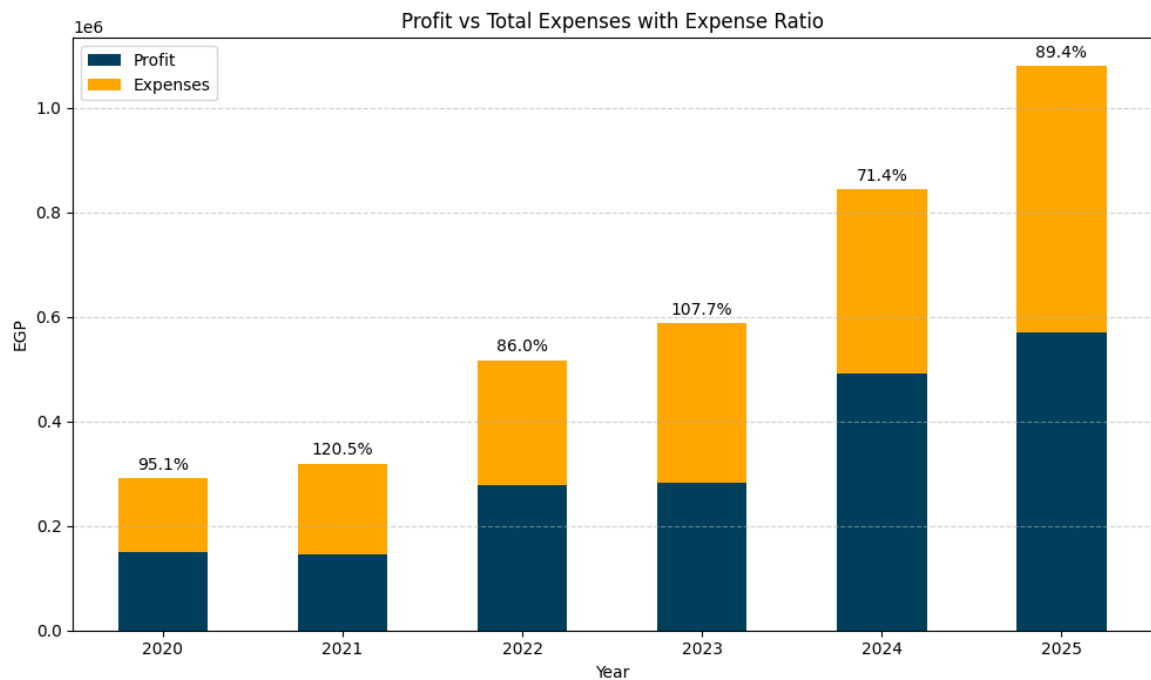
The firm currently relies on a limited supplier base, with more than 70% of its cost of goods sold sourced from only five suppliers. While this concentration supports strong supplier relationships and enhances the firm's ability to negotiate favorable commercial terms, it also increases dependency risk. To mitigate potential supply chain disruptions and reduce operational risk, it is recommended that the firm strategically onboard one or two additional qualified suppliers without compromising cost efficiency or quality standards.

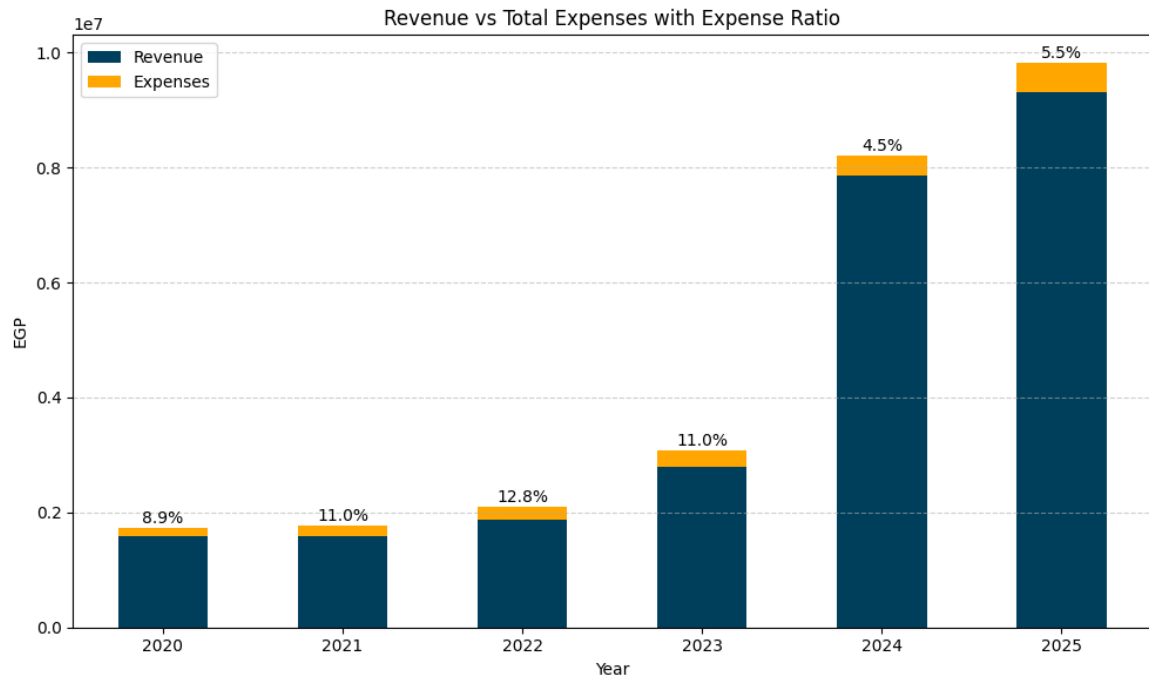
## Financial Metrics

### Expense Ratio

Out[80]:

|   | Year | revenue      | cogs         | Profit        | Profit Margin | Growth Rat |
|---|------|--------------|--------------|---------------|---------------|------------|
| 0 | 2020 | 1.584815e+06 | 1.435610e+06 | 149205.897500 | 9.414717      | Na         |
| 1 | 2021 | 1.592423e+06 | 1.447531e+06 | 144891.838431 | 9.098831      | -2.89134   |
| 2 | 2022 | 1.866294e+06 | 1.588133e+06 | 278160.851800 | 14.904448     | 91.97827   |
| 3 | 2023 | 2.783624e+06 | 2.500628e+06 | 282996.425000 | 10.166474     | 1.73840    |
| 4 | 2024 | 7.863257e+06 | 7.370826e+06 | 492430.773130 | 6.262427      | 74.00600   |
| 5 | 2025 | 9.303422e+06 | 8.733532e+06 | 569889.729500 | 6.125593      | 15.72991   |





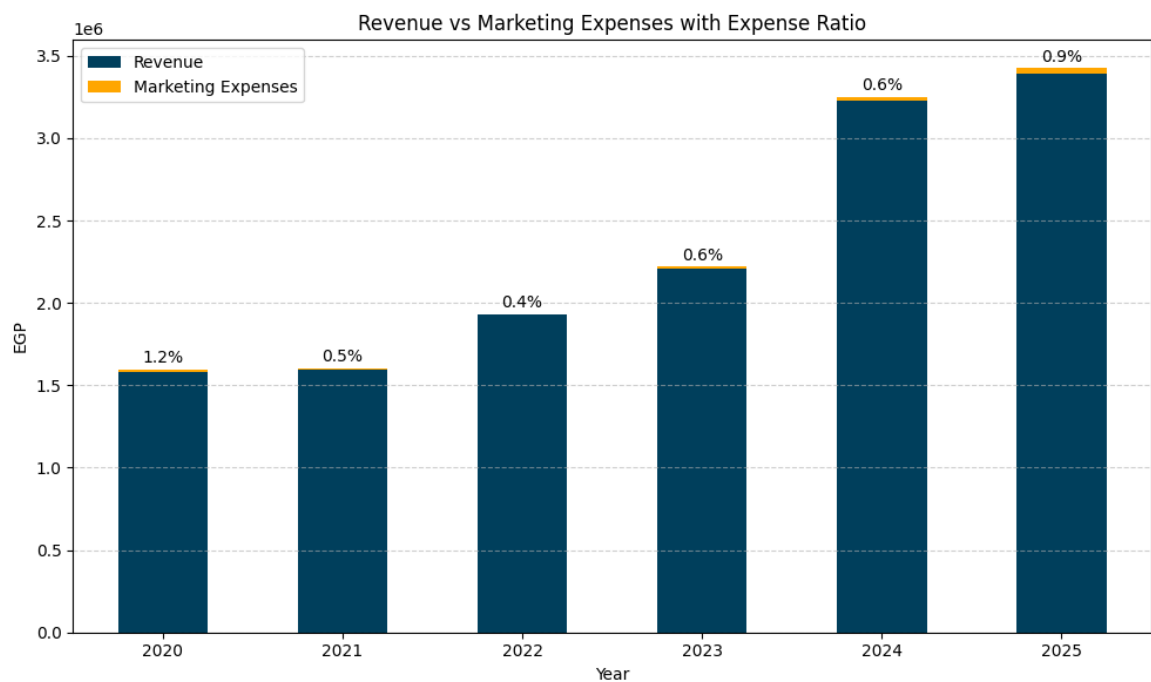
## Insight 15: Expense Management

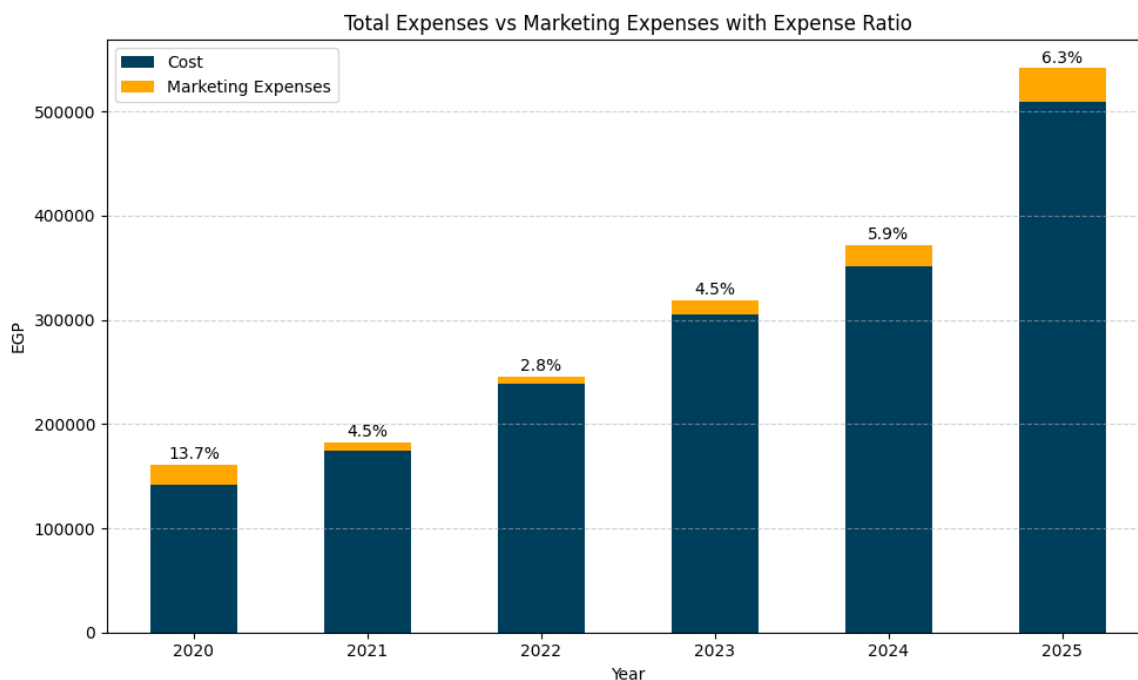
Expenses have been a significant challenge, consuming a large portion of gross profit, particularly in 2024 (67%) and 2025 (82%). To improve financial health, it is recommended to reduce the expense ratio to 60% in 2026. One potential solution to this would be to introduce a new branch with the same number of employees, as previously recommended. Additionally, increasing sales and improving the profit margin while optimizing the cash flow cycle would help address these issues.

## Marketing Spend Ratio

Out[83]:

|   | Date                | Type              | Description | Destination      | Client                | Invoice no. | Name    |
|---|---------------------|-------------------|-------------|------------------|-----------------------|-------------|---------|
| 1 | 2020-01-01 00:00:00 | Marketing & Sales | Survey      | Banha            | Alaa, Hassan, Ghareeb | NaN         | Company |
| 2 | 2020-01-01 00:00:00 | Marketing & Sales | Training    | Cairo            | Room Square           | NaN         | Company |
| 3 | 2020-01-01 00:00:00 | Operation         | Transfer    | Shbeen El Knater | El Mahdy              | 1           | Safwat  |
| 4 | 2020-01-01 00:00:00 | General           | Boxes       | Shbeen El Kom    | El Khawaga            | NaN         | Company |
| 5 | 2020-01-01 00:00:00 | General           | Cards       | NaN              | NaN                   | NaN         | Khaled  |





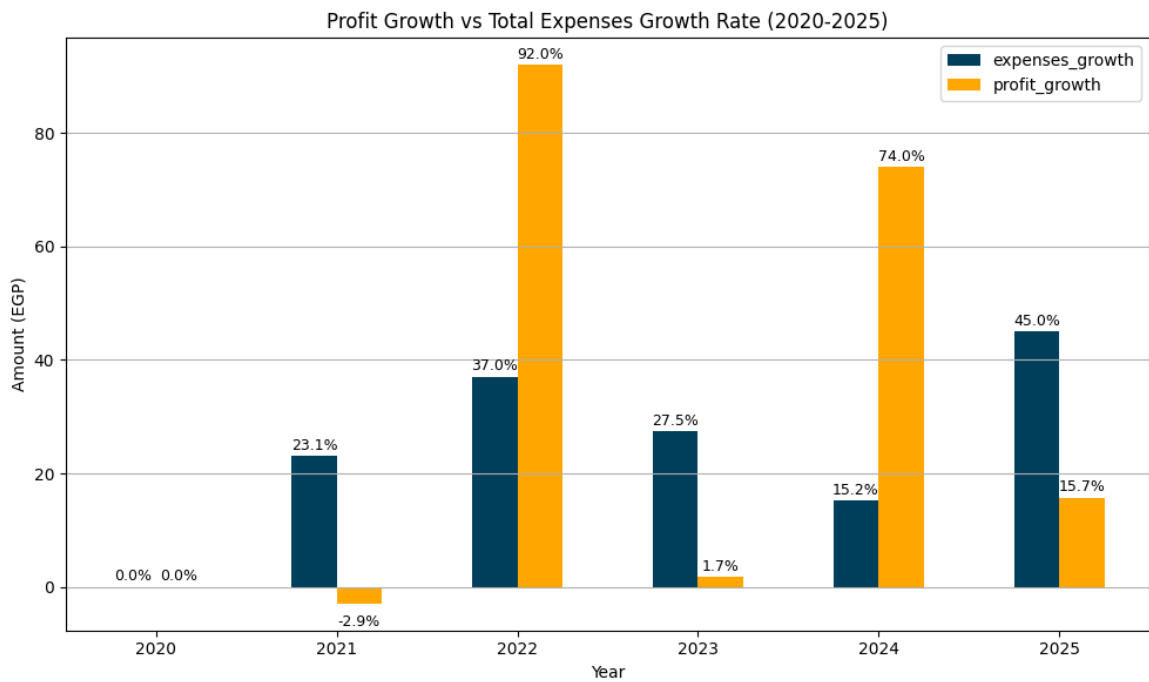
Out[87]:

|      | Profit        | Total Expenses | Expense ratio % |
|------|---------------|----------------|-----------------|
| Year |               |                |                 |
| 2020 | 149205.897500 | 141835         | 95.059915       |
| 2021 | 144891.838431 | 174540         | 120.462272      |
| 2022 | 278160.851800 | 239157         | 85.977951       |
| 2023 | 282996.425000 | 304903         | 107.740937      |
| 2024 | 492430.773130 | 351370         | 71.354192       |
| 2025 | 569889.729500 | 509553.62      | 89.412669       |

```

/var/folders/vf/sz32t6rx7635wcdmj4ydx580000gn/T/ipykernel_47296/199
4945302.py:2: FutureWarning: Downcasting object dtype arrays on .fil
lna, .ffill, .bfill is deprecated and will change in a future versio
n. Call result.infer_objects(copy=False) instead. To opt-in to the f
uture behavior, set `pd.set_option('future.no_silent_downcasting', T
rue)`
  profit_expenses['expenses_growth'] = profit_expenses['Total Expens
es'].pct_change() * 100

```



Out[89]:

|      | Selling_sum    | Profit_sum    | Marketing<br>& Sales<br>Expenses | Marketing<br>Expense<br>ratio % | Cost      | exp  |
|------|----------------|---------------|----------------------------------|---------------------------------|-----------|------|
| Year |                |               |                                  |                                 |           |      |
| 2020 | 1577652.9625   | 153163.8875   | 19442                            | 1.232337                        | 141835    | 13.1 |
| 2021 | 1593007.228431 | 142354.188431 | 7820                             | 0.490895                        | 174540    | 4.4  |
| 2022 | 1926761.1328   | 272364.6228   | 6772                             | 0.351471                        | 239157    | 2.8  |
| 2023 | 2206541.3      | 258070.41     | 13767                            | 0.623918                        | 304903    | 4.8  |
| 2024 | 3230487.95     | 319351.23     | 20850                            | 0.645413                        | 351370    | 5.9  |
| 2025 | 3392914.76     | 329935.86     | 32110                            | 0.946384                        | 509553.62 | 6.3  |

Overall Marketing to Sales Ratio: 0.72%

Overall Marketing to Profit Ratio: 6.83%

Out[91]:

|      | Selling_sum    | Profit_sum    | Operation Expenses | operation Expense ratio % |
|------|----------------|---------------|--------------------|---------------------------|
| Year |                |               |                    |                           |
| 2020 | 1577652.9625   | 153163.8875   | 15925              | 1.009411                  |
| 2021 | 1593007.228431 | 142354.188431 | 23285              | 1.461701                  |
| 2022 | 1926761.1328   | 272364.6228   | 22018              | 1.142747                  |
| 2023 | 2206541.3      | 258070.41     | 30269              | 1.371785                  |
| 2024 | 3230487.95     | 319351.23     | 53910              | 1.668788                  |
| 2025 | 3392914.76     | 329935.86     | 79275              | 2.336487                  |

Overall Operation to Sales Ratio: 1.61%

Overall Operation to Profit Ratio: 15.23%

Out[93]:

|      | Selling_sum    | Profit_sum    | General Expenses | operation Expense ratio % |
|------|----------------|---------------|------------------|---------------------------|
| Year |                |               |                  |                           |
| 2020 | 1577652.9625   | 153163.8875   | 106468           | 6.748506                  |
| 2021 | 1593007.228431 | 142354.188431 | 143435           | 9.004039                  |
| 2022 | 1926761.1328   | 272364.6228   | 210367           | 10.918167                 |
| 2023 | 2206541.3      | 258070.41     | 260867           | 11.822439                 |
| 2024 | 3230487.95     | 319351.23     | 276610           | 8.562484                  |
| 2025 | 3392914.76     | 329935.86     | 398168.62        | 11.735297                 |

Overall General Expenses to Sales Ratio: 10.02%

Overall General Expenses to consumables Profit Ratio: 94.62%

## Insight 16: Profit Growth vs. Expense Growth

In 2025, while profit increased by 15%, the substantial rise in expenses (43%) effectively offset this growth. The primary factors contributing to this were a significant increase in salary costs (an additional 80,000 EGP) and a sharp rise in fuel prices, which doubled operational expenses. Addressing these cost drivers is essential for future profitability.

## Operational Efficiency Ratio



## Phase 4 – Diagnostic Analytics (Why it happened?)



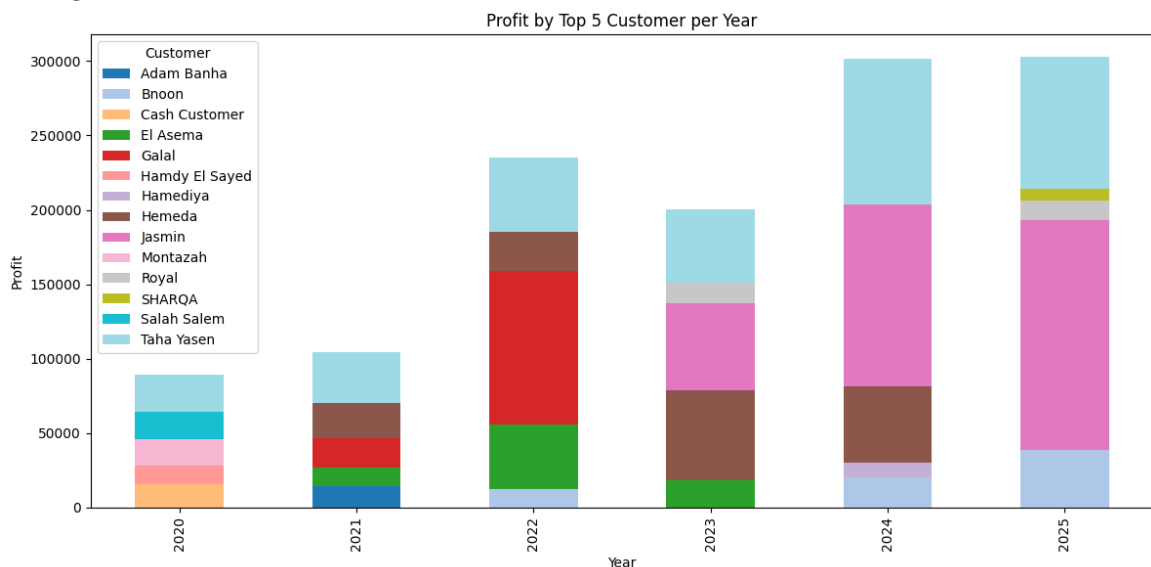
# 🔑 KPIs / Metrics with Explanations + Charts

## 1. Profitability by Customer Segment

```
/var/folders/vf/sz32t6rx7635wcdmj4ydx580000gn/T/ipykernel_47296/3247820784.py:5: FutureWarning: DataFrameGroupBy.apply operated on the grouping columns. This behavior is deprecated, and in a future version of pandas the grouping columns will be excluded from the operation. Either pass `include_groups=False` to exclude the groupings or explicitly select the grouping columns after groupby to silence this warning.
```

```
top_5_customers_yearly_profit = yearly_customer_profit.groupby('Year').apply(lambda x : x.nlargest(5, 'Profit')).reset_index(drop=True)
```

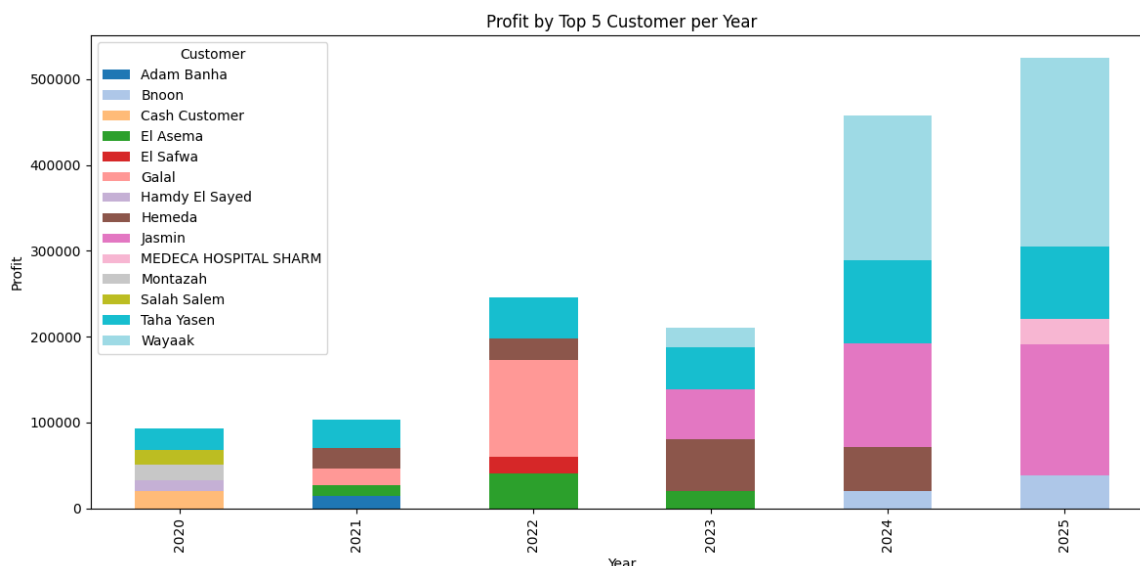
<Figure size 1200x600 with 0 Axes>



```
/var/folders/vf/sz32t6rx7635wcdmj4ydx580000gn/T/ipykernel_47296/550168636.py:8: FutureWarning: DataFrameGroupBy.apply operated on the grouping columns. This behavior is deprecated, and in a future version of pandas the grouping columns will be excluded from the operation. Either pass `include_groups=False` to exclude the groupings or explicitly select the grouping columns after groupby to silence this warning.
```

```
top_5_customers_yearly_profit = yearly_customer_profit.groupby('Year').apply(lambda x : x.nlargest(5, 'Profit')).reset_index(drop=True)
```

<Figure size 1200x600 with 0 Axes>



Out[97]:

| Client | Adam Banha | Bnoon   | Cash Customer | El Asema     | El Safwa | Galal       |
|--------|------------|---------|---------------|--------------|----------|-------------|
| Year   |            |         |               |              |          |             |
| 2020   | NaN        | NaN     | 20175.0       | NaN          | NaN      | NaN         |
| 2021   | 13873.55   | NaN     | NaN           | 12742.948431 | NaN      | 19723.4200  |
| 2022   | NaN        | NaN     | NaN           | 40566.900000 | 19492.39 | 112700.5818 |
| 2023   | NaN        | NaN     | NaN           | 20431.000000 | NaN      | NaN         |
| 2024   | NaN        | 19982.5 | NaN           | NaN          | NaN      | NaN         |
| 2025   | NaN        | 38307.0 | NaN           | NaN          | NaN      | NaN         |

## Insight 17: Customer Profitability and Retention

Three key customers—Wayaak, Taha Yaseen, and Jasmin—have shown strong profitability, with Wayaak experiencing 30% growth, Jasmin at 25%, and Taha Yaseen declining by 13% due to the cessation of its kidney department. Despite this, the collection cycle for these customers remains strong, indicating good retention. It is recommended to increase the marketing budget for these high-performing customers to sustain their growth.

### 1. Waterfall Chart - Showing how Revenue flows to Net Profit

Out [98]:

|      | Date                | Type              | Description | Destination      | Client                | Invoice no. | Na   |
|------|---------------------|-------------------|-------------|------------------|-----------------------|-------------|------|
| 1    | 2020-01-01 00:00:00 | Marketing & Sales | Survey      | Banha            | Alaa, Hassan, Ghareeb | NaN         | Comp |
| 2    | 2020-01-01 00:00:00 | Marketing & Sales | Training    | Cairo            | Room Square           | NaN         | Comp |
| 3    | 2020-01-01 00:00:00 | Operation         | Transfer    | Shbeen El Knater | El Mahdy              | 1           | Sai  |
| 4    | 2020-01-01 00:00:00 | General           | Boxes       | Shbeen El Kom    | El Khawaga            | NaN         | Comp |
| 5    | 2020-01-01 00:00:00 | General           | Cards       | NaN              | NaN                   | NaN         | Kh.  |
| ...  | ...                 | ...               | ...         | ...              | ...                   | ...         |      |
| 2355 | 2025-12-15 00:00:00 | General           | food        | NaN              | NaN                   | NaN         | Sai  |
| 2356 | 2025-12-18 00:00:00 | Marketing & Sales | Jasmin      | NaN              | NaN                   | NaN         | Kh.  |
| 2357 | 2025-12-18 00:00:00 | Operation         | Transfer    | Mnya El Kamh     | NaN                   | NaN         | Ha   |
| 2358 | 2025-12-18 00:00:00 | Operation         | Shipping    | NaN              | NaN                   | NaN         | Ha   |
| 2359 | 2025-12-20 00:00:00 | General           | Padel       | NaN              | NaN                   | NaN         | Sai  |

2359 rows × 10 columns

Out [100...

|   | label          | value         | type     |
|---|----------------|---------------|----------|
| 0 | Revenue        | 2.499384e+07  | absolute |
| 1 | COGS           | -2.307626e+07 | relative |
| 2 | Salaries       | -1.135200e+06 | relative |
| 3 | Marketing      | -1.007610e+05 | relative |
| 4 | Operations     | -2.246820e+05 | relative |
| 5 | Other Expenses | -2.617156e+05 | relative |
| 6 | Net Profit     | 1.952169e+05  | total    |

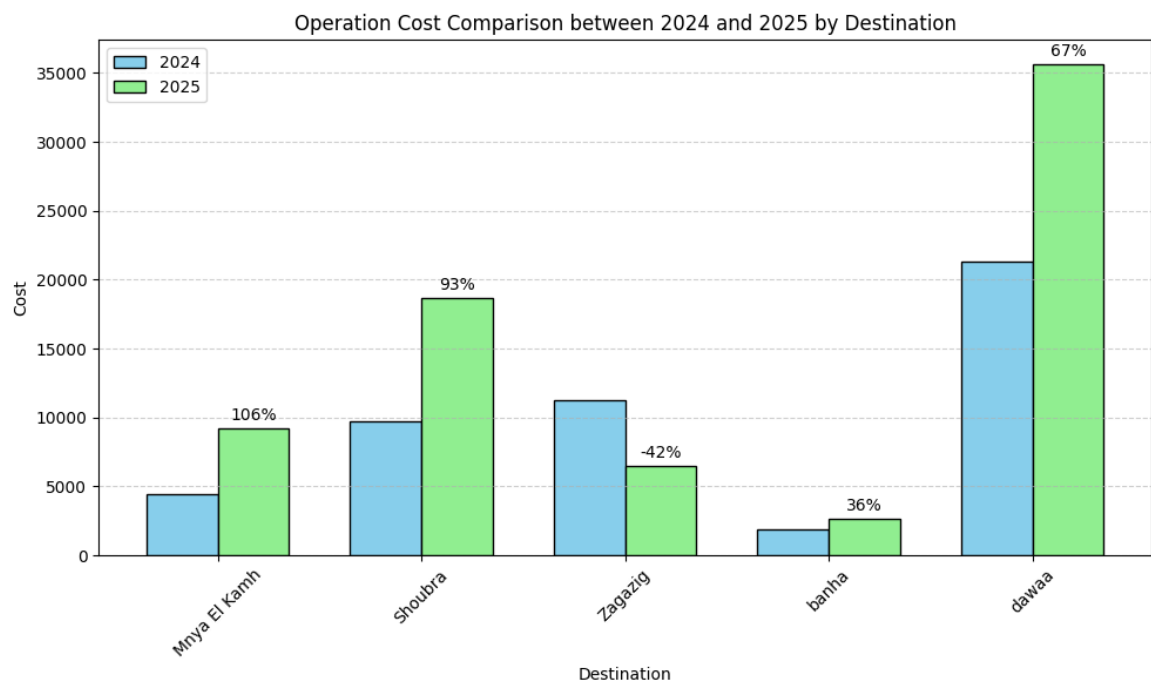
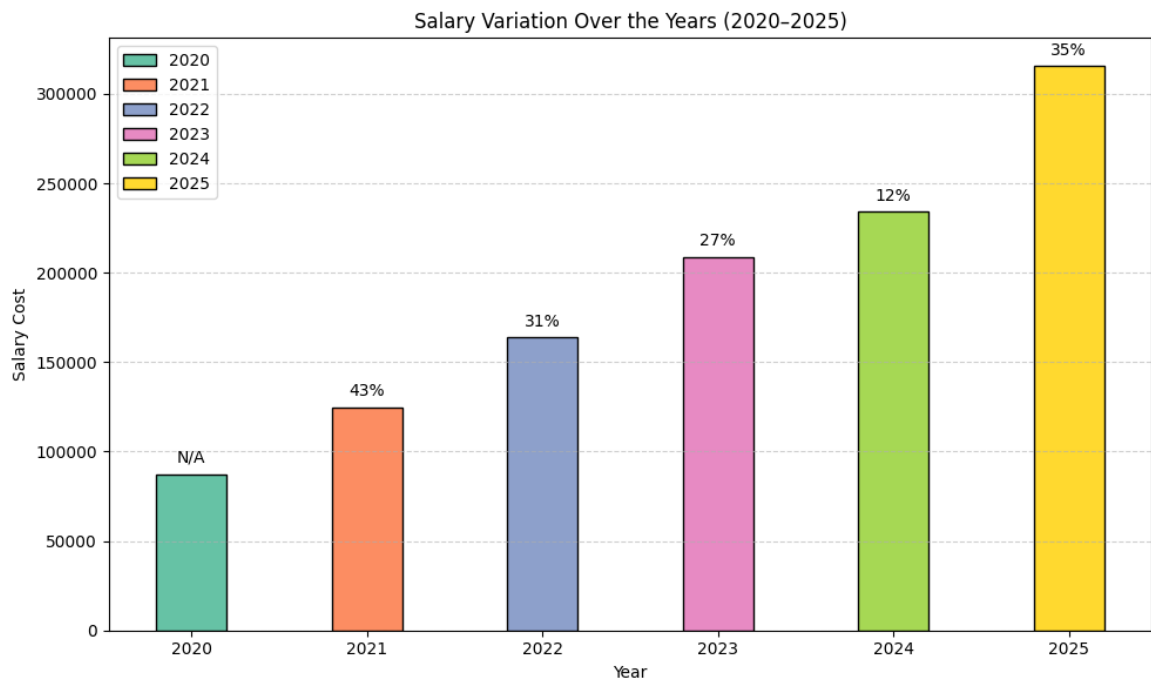
Out [104...

|   | label          | value         | type     |
|---|----------------|---------------|----------|
| 0 | Profit         | 1.917576e+06  | absolute |
| 1 | Salaries       | -1.135200e+06 | relative |
| 2 | Marketing      | -1.007610e+05 | relative |
| 3 | Operations     | -2.246820e+05 | relative |
| 4 | Other Expenses | -2.617156e+05 | relative |
| 5 | Net Profit     | 1.952169e+05  | total    |

&lt;Figure size 640x480 with 0 Axes&gt;

## Insight 18: Net Profit Margin

The firm has demonstrated good performance in sales and gross profit but is struggling with a low net profit margin, which currently accounts for 60% of gross profit. To improve this, it is recommended to increase sales and gross profit while reducing salary-related expenses, aiming for a net profit ratio of 50% in 2026. Additionally, reducing operational expenses slightly would help optimize margins.



## Insight 19: Operational Expense Growth

Operational expenses have seen significant increases, particularly in Shoubra, Mnya El Kamh, and Dawa, with respective growth rates of 106%, 93%, and 67%. Salary expenses have also increased by 35% from 2024. These increases have eaten into profits, with net profit lower than in 2024. This explains why NP decreased however, sales and GP increased. It is recommended to implement a cost reduction strategy for operational expenses and freeze salary increases until the first quarter of 2026 to assess the impact.

## 2. Stacked Bar Chart - Profitability by Customer Segment Over Years

Out [109...

|           | Client                 | Sales_sum   | Profit_sum  | Transactions_count | Products_No | C |
|-----------|------------------------|-------------|-------------|--------------------|-------------|---|
| <b>63</b> | Taha<br>Yasen          | 3197157.06  | 344915.64   | 351                | 238         |   |
| <b>38</b> | Jasmin                 | 2939293.25  | 335280.1    | 112                | 118         |   |
| <b>36</b> | Hemeda                 | 1631108.9   | 170082.97   | 238                | 238         |   |
| <b>9</b>  | Bnoon                  | 1196362     | 90045.5     | 54                 | 23          |   |
| <b>33</b> | Galal                  | 751274.2228 | 128073.3928 | 82                 | 335         |   |
| ...       | ...                    | ...         | ...         | ...                | ...         |   |
| <b>43</b> | Madina                 | 900         | 225         | 1                  | 1           |   |
| <b>18</b> | Dr.<br>Salah           | 512.5       | 42.5        | 2                  | 5           |   |
| <b>16</b> | Dr.<br>Islam<br>Sameer | 383         | 36.0        | 1                  | 3           |   |
| <b>37</b> | Ibn Sina               | 321         | 30          | 1                  | 1           |   |
| <b>51</b> | Rabbat                 | 107         | 10          | 1                  | 1           |   |

70 rows × 10 columns

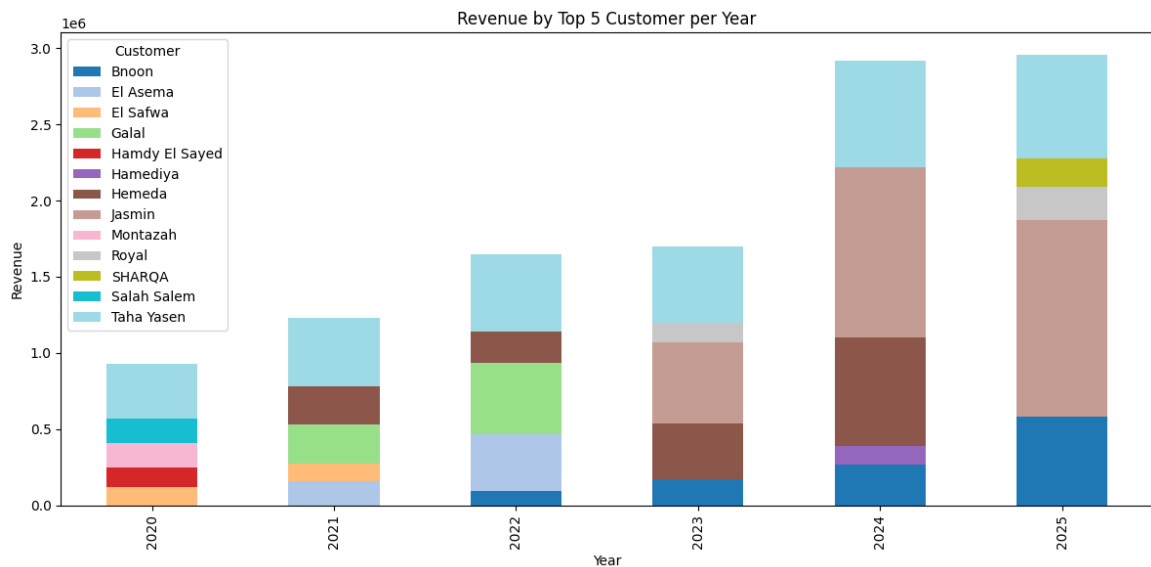
```
/var/folders/vf/sz32t6rx7635wcdmj4ydx580000gn/T/ipykernel_47296/3747789746.py:5: FutureWarning:
```

DataFrameGroupBy.apply operated on the grouping columns. This behavior is deprecated, and in a future version of pandas the grouping columns will be excluded from the operation. Either pass `include\_groups=False` to exclude the groupings or explicitly select the grouping columns after groupby to silence this warning.

Out [110...

|   | Year | Client         | Total Selling Price |
|---|------|----------------|---------------------|
| 0 | 2020 | Taha Yasen     | 360694.400000       |
| 1 | 2020 | Montazah       | 159749.900000       |
| 2 | 2020 | Salah Salem    | 159582.900000       |
| 3 | 2020 | Hamdy El Sayed | 127077.782500       |
| 4 | 2020 | El Safwa       | 122223.250000       |
| 5 | 2021 | Taha Yasen     | 450513.200000       |
| 6 | 2021 | Galal          | 256085.850000       |
| 7 | 2021 | Hemeda         | 249458.450000       |
| 8 | 2021 | El Asema       | 157077.078431       |
| 9 | 2021 | El Safwa       | 118832.450000       |

&lt;Figure size 1200x600 with 0 Axes&gt;



Out [112...

| Client | ADAM    | Abd El<br>Hamid | Adam<br>Banha | AI<br>Forkan | AI<br>Moeazz<br>/ El<br>Kasr El<br>Einy | AI<br>Srour | Amina    | Ark<br>Cen |
|--------|---------|-----------------|---------------|--------------|---|-------------|----------|------------|
| Year   |         |                 |               |              |   |             |          |            |
| 2020   | NaN     | 69339.0         | 50337.00      | NaN          | 7440.0                                  | 2310.0      | NaN      | N          |
| 2021   | NaN     | 16426.2         | 95585.25      | 2422.5       | NaN                                     | NaN         | NaN      | N          |
| 2022   | NaN     | 3374.5          | 64742.75      | NaN          | NaN                                     | NaN         | NaN      | N          |
| 2023   | NaN     | NaN             | NaN           | NaN          | NaN                                     | NaN         | 42680.5  | N          |
| 2024   | NaN     | NaN             | NaN           | NaN          | NaN                                     | NaN         | 117873.0 | N          |
| 2025   | 55666.0 | NaN             | NaN           | NaN          | NaN                                     | NaN         | 180897.5 | 2973       |

6 rows x 70 columns

Out [113...

| Client | ADAM     | Abd El<br>Hamid | Adam<br>Banha | AI<br>Forkan | AI<br>Moeazz<br>/ El Kasr<br>El Einy | AI<br>Srour | Amina    |
|--------|----------|-----------------|---------------|--------------|--------------------------------------|-------------|----------|
| Year   |          |                 |               |              |                                      |             |          |
| 2020   | NaN      | 4.395073        | 3.190626      | NaN          | 0.471587                             | 0.14642     | NaN      |
| 2021   | NaN      | 1.031144        | 6.000302      | 0.152071     | NaN                                  | NaN         | NaN      |
| 2022   | NaN      | 0.175138        | 3.360186      | NaN          | NaN                                  | NaN         | NaN      |
| 2023   | NaN      | NaN             | NaN           | NaN          | NaN                                  | NaN         | 1.934272 |
| 2024   | NaN      | NaN             | NaN           | NaN          | NaN                                  | NaN         | 3.648768 |
| 2025   | 1.640654 | NaN             | NaN           | NaN          | NaN                                  | NaN         | 5.331625 |

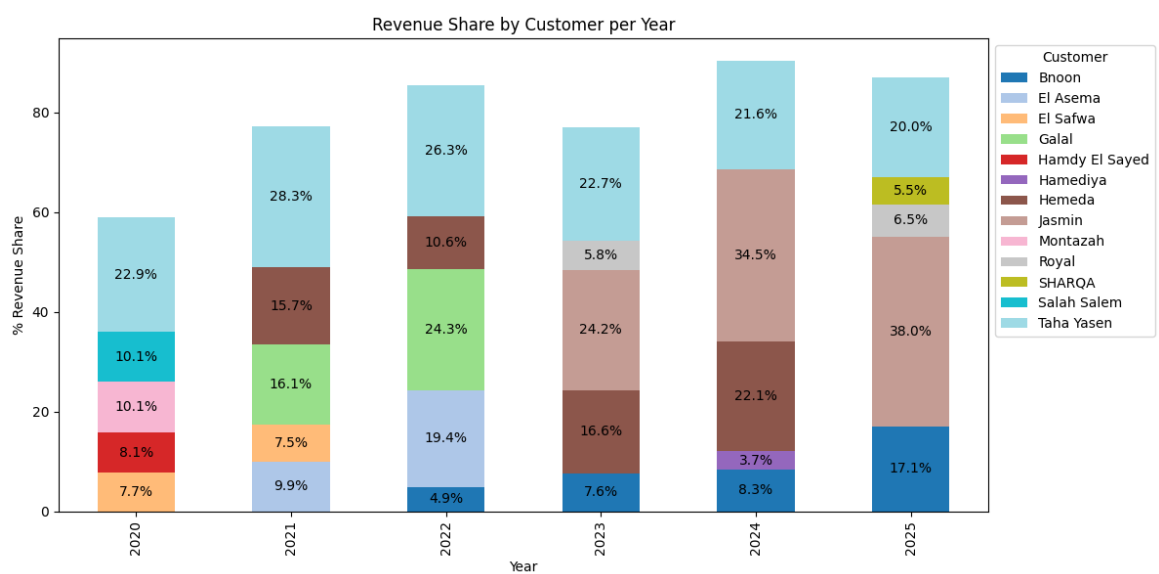
6 rows x 70 columns

Out [114... {2020: ['Taha Yasen', 'Montazah', 'Salah Salem', 'Hamdy El Sayed', 'El Safwa'],  
 2021: ['Taha Yasen', 'Galal', 'Hemeda', 'El Asema', 'El Safwa'],  
 2022: ['Taha Yasen', 'Galal', 'El Asema', 'Hemeda', 'Bnoon'],  
 2023: ['Jasmin', 'Taha Yasen', 'Hemeda', 'Bnoon', 'Royal'],  
 2024: ['Jasmin', 'Hemeda', 'Taha Yasen', 'Bnoon', 'Hamediya'],  
 2025: ['Jasmin', 'Taha Yasen', 'Bnoon', 'Royal', 'SHARQA']}



Out [115...

| Client | Bnoon     | El Asema  | El Safwa | Galal     | Hamdy El Sayed | Hamediya | Hamediya |
|--------|-----------|-----------|----------|-----------|----------------|----------|----------|
| Year   |           |           |          |           |                |          |          |
| 2020   | NaN       | NaN       | 7.747157 | NaN       | 8.054863       | NaN      |          |
| 2021   | NaN       | 9.860412  | 7.45963  | 16.075624 | NaN            | NaN      | 15.6     |
| 2022   | 4.920693  | 19.377514 | NaN      | 24.336469 | NaN            | NaN      | 10.5     |
| 2023   | 7.649075  | NaN       | NaN      | NaN       | NaN            | NaN      | 16.5     |
| 2024   | 8.293174  | NaN       | NaN      | NaN       | NaN            | 3.749457 | 22.1     |
| 2025   | 17.092383 | NaN       | NaN      | NaN       | NaN            | NaN      |          |

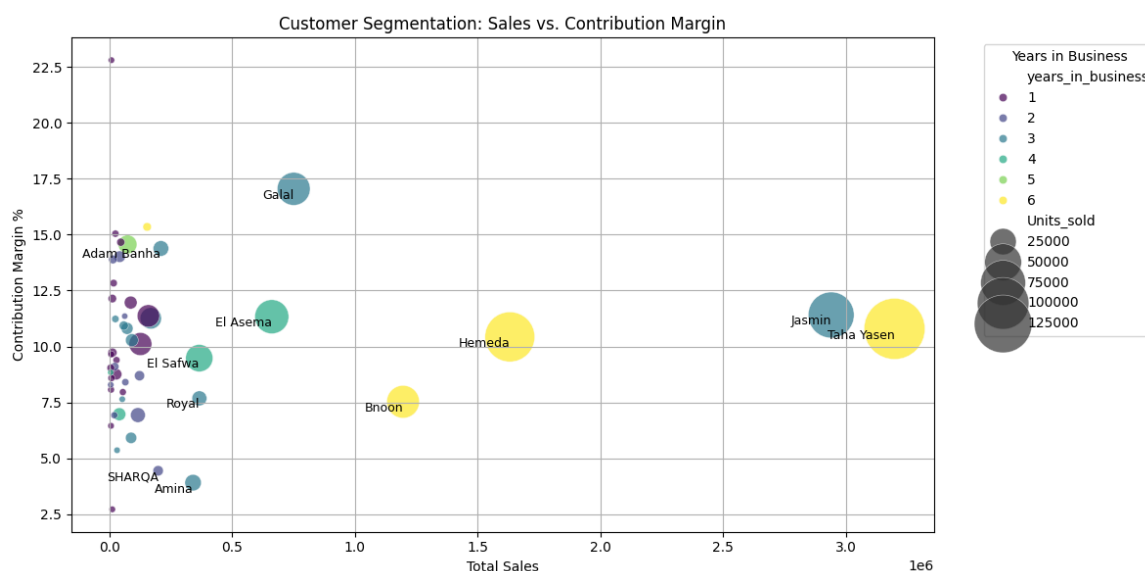


### 3. Scatter Plot - Customer Revenue vs Profit Margin

Out [117...

|     | Client           | Sales_sum   | Profit_sum  | Transactions_count | Products_No | C |
|-----|------------------|-------------|-------------|--------------------|-------------|---|
| 63  | Taha Yasen       | 3197157.06  | 344915.64   | 351                | 238         |   |
| 38  | Jasmin           | 2939293.25  | 335280.1    | 112                | 118         |   |
| 36  | Hemeda           | 1631108.9   | 170082.97   | 238                | 238         |   |
| 9   | Bnoon            | 1196362     | 90045.5     | 54                 | 23          |   |
| 33  | Galal            | 751274.2228 | 128073.3928 | 82                 | 335         |   |
| ... | ...              | ...         | ...         | ...                | ...         |   |
| 43  | Madina           | 900         | 225         | 1                  | 1           |   |
| 18  | Dr. Salah        | 512.5       | 42.5        | 2                  | 5           |   |
| 16  | Dr. Islam Sameer | 383         | 36.0        | 1                  | 3           |   |
| 37  | Ibn Sina         | 321         | 30          | 1                  | 1           |   |
| 51  | Rabbat           | 107         | 10          | 1                  | 1           |   |

70 rows × 10 columns



## Insight 20: Market Share of Key Customers

The market share of the firm's most valuable customers has consistently increased year over year, a positive sign of stability. Bnoon shows a 9% growth, while Jasmin grew by 4%, although Taha Yaseen experienced a slight decline of 1%. This trend is promising, and efforts should be made to continue nurturing these customer relationships. It is recommended to increase the CM of Taha Yasen and Jasmin a little bit higher; this will reflect

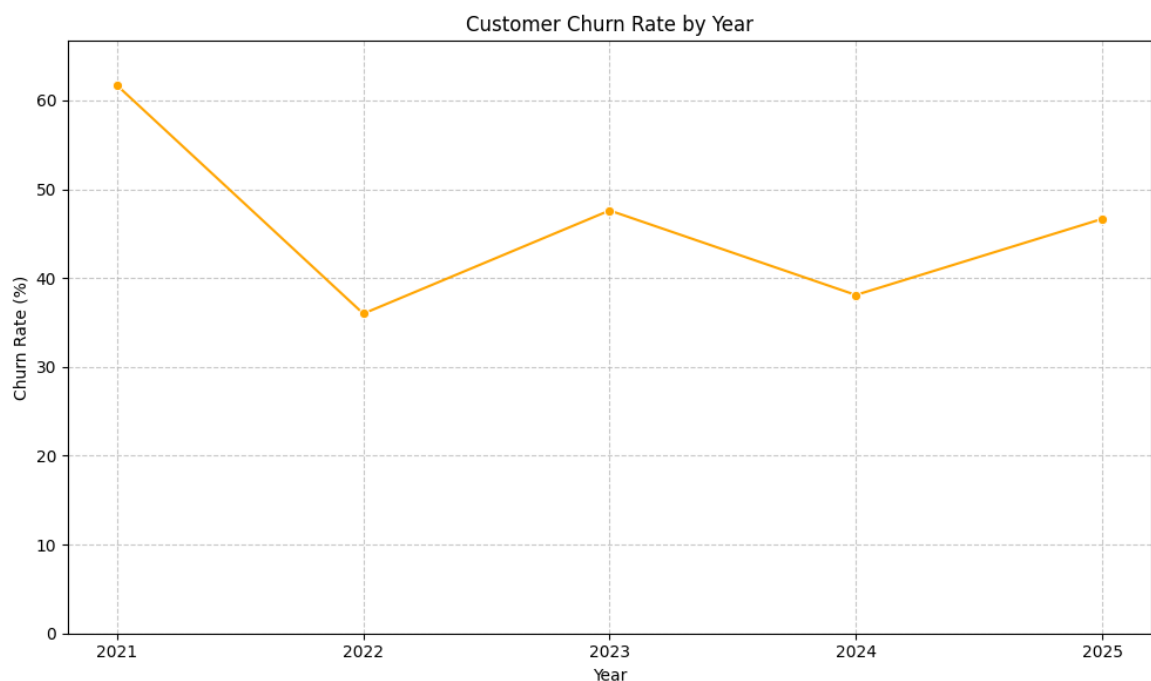
directly on profits.

Out [119...

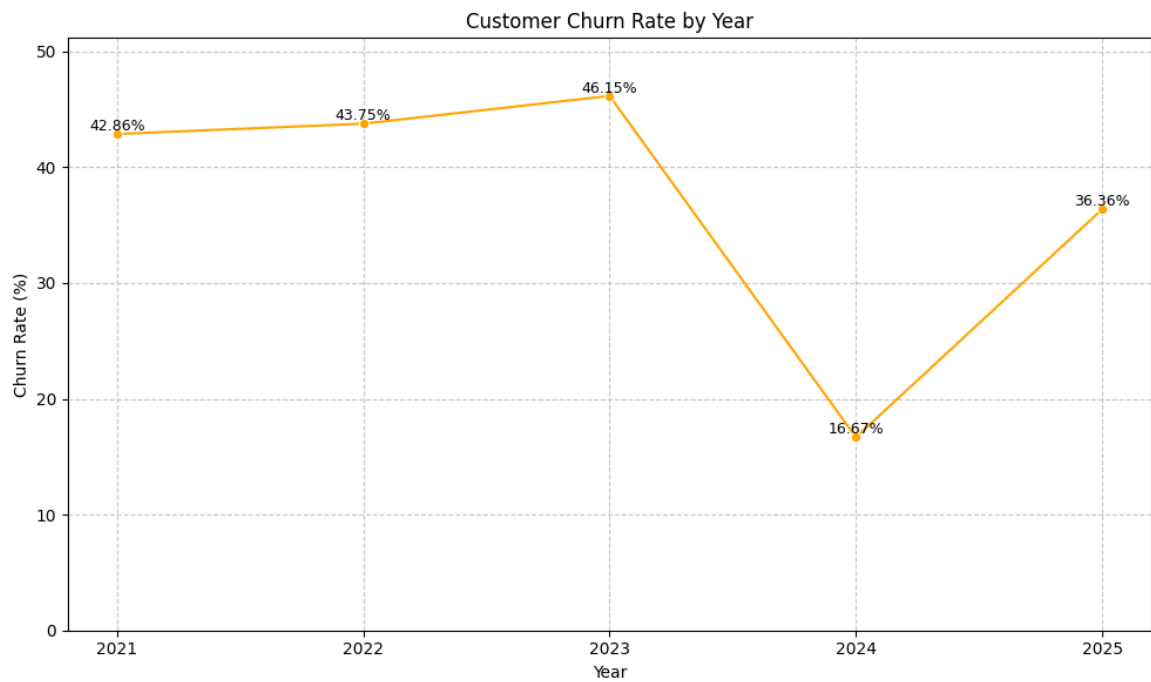
|    | Client                | Sales_sum   | Profit_sum  | Transactions_count | Products_No |
|----|-----------------------|-------------|-------------|--------------------|-------------|
| 2  | Adam Banha            | 210665.0    | 30296.55    | 165                | 17          |
| 32 | Eman Khairy           | 74832.25    | 10897.75    | 56                 | 13          |
| 42 | MEDECA HOSPITAL SHARM | 47191.5     | 6918.85     | 2                  | 58          |
| 59 | Shady                 | 25448.0     | 3827.75     | 8                  | 27          |
| 11 | Cash Customer         | 154423.3    | 23697.55    | 96                 | 49          |
| 3  | Al Forkan             | 2422.5      | 375.0       | 4                  | 4           |
| 33 | Galal                 | 751274.2228 | 128073.3928 | 82                 | 335         |
| 46 | Merchant              | 1250        | 250         | 1                  | 1           |
| 31 | Emad Montazah         | 9234        | 2105.5      | 9                  | 5           |
| 61 | Shourok               | 3460        | 796         | 1                  | 3           |
| 43 | Madina                | 900         | 225         | 1                  | 1           |

## 2. Churn Rate (Lost Customers ÷ Previous Customers)

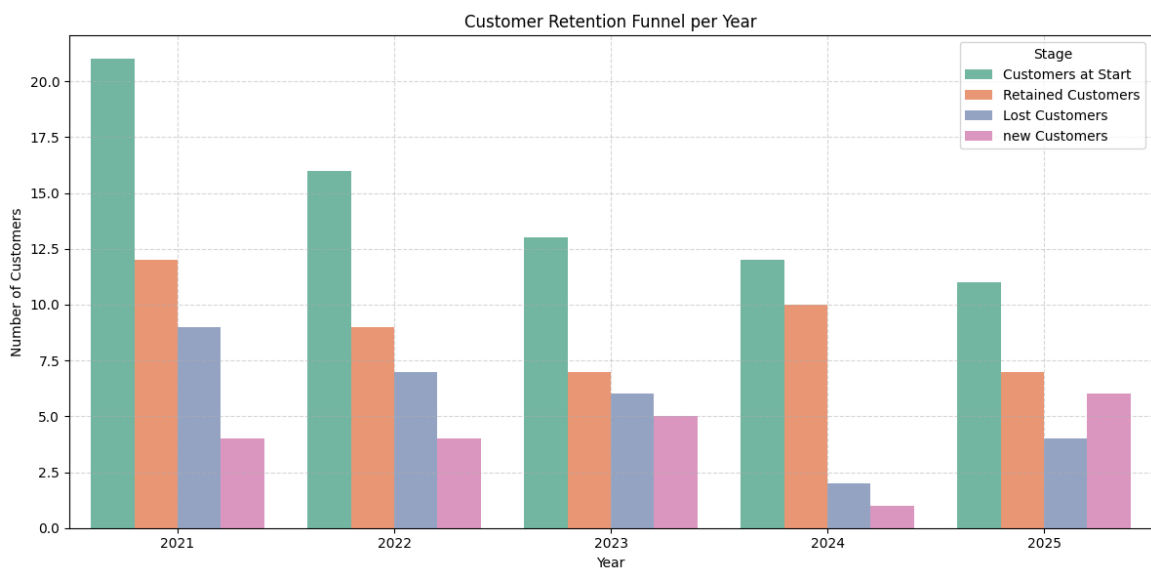
Churn rate trend across 6 years



## Churn Rate after Clients Dropped



## Funnel Chart after dropped clients

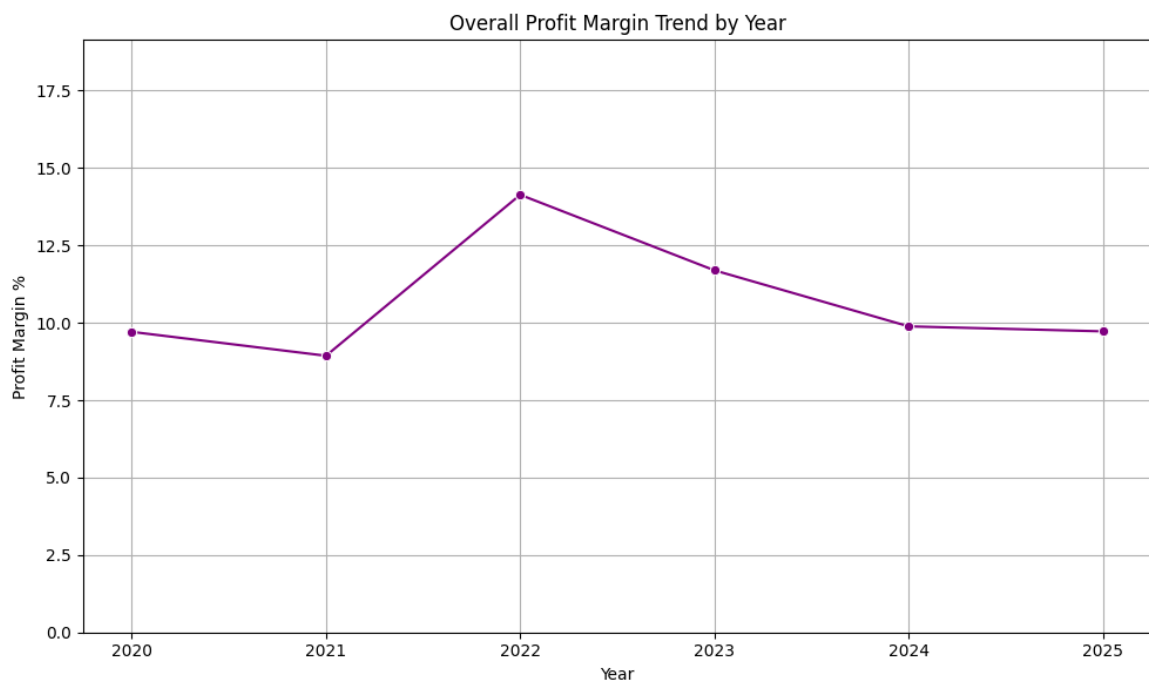


Out [123...

|   | Year | Profit_sum    | Selling_sum    | Profit_Margin |
|---|------|---------------|----------------|---------------|
| 0 | 2020 | 153163.8875   | 1577652.9625   | 9.708338      |
| 1 | 2021 | 142354.188431 | 1593007.228431 | 8.936192      |
| 2 | 2022 | 272364.6228   | 1926761.1328   | 14.135879     |
| 3 | 2023 | 258070.41     | 2206541.3      | 11.695698     |
| 4 | 2024 | 319351.23     | 3230487.95     | 9.885542      |
| 5 | 2025 | 329935.86     | 3392914.76     | 9.72426       |

### 3. Gross Margin % Trend

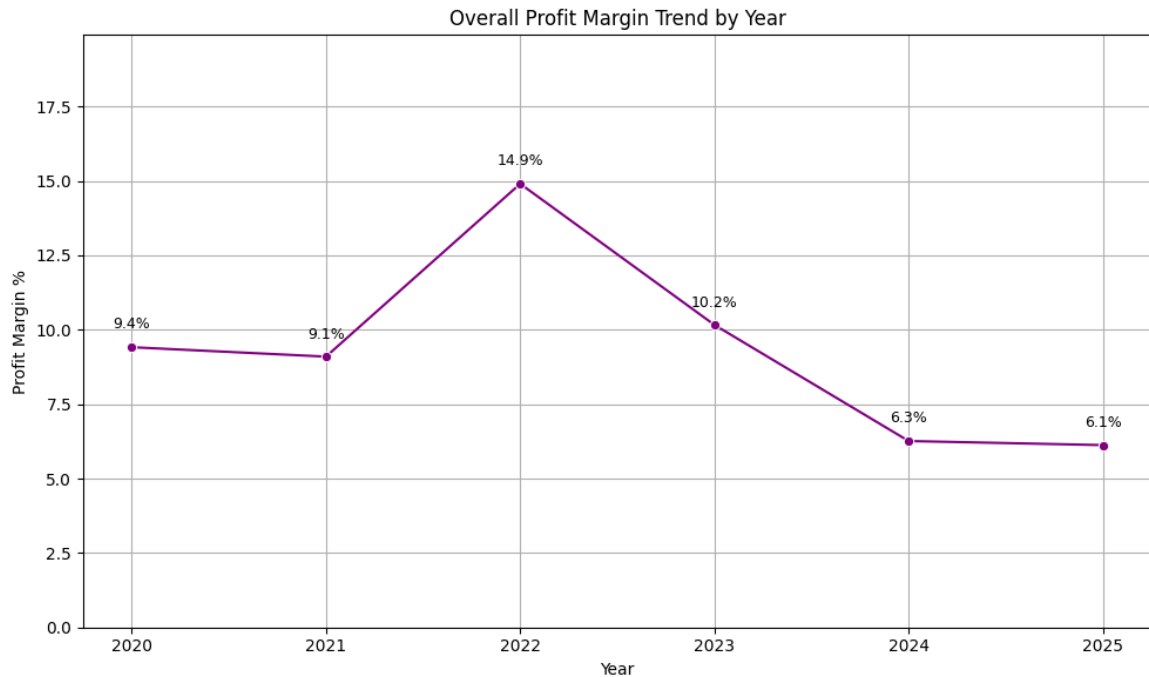
#### Consumables



Out [125...

|     | Year | Client         | revenue     | cogs       | Profit     |
|-----|------|----------------|-------------|------------|------------|
| 41  | 2020 | Taha Yasen     | 360465.4000 | 335198.500 | 25266.9000 |
| 7   | 2020 | Cash Customer  | 114551.5000 | 94376.500  | 20175.0000 |
| 31  | 2020 | Montazah       | 160354.9000 | 142630.430 | 17724.4700 |
| 38  | 2020 | Salah Salem    | 159627.9000 | 142312.020 | 17315.8800 |
| 22  | 2020 | Hamdy El Sayed | 126214.2825 | 113491.035 | 12723.2475 |
| ... | ...  | ...            | ...         | ...        | ...        |
| 136 | 2025 | Cash Customer  | 14675.0000  | 13810.000  | 865.0000   |
| 146 | 2025 | Zinat El Hayat | 8800.0000   | 8600.000   | 200.0000   |
| 148 | 2025 | montazah       | 3875.0000   | 3675.000   | 200.0000   |
| 147 | 2025 | eman khairy    | 4375.0000   | 4275.000   | 100.0000   |
| 137 | 2025 | Hekma          | 2125.0000   | 2100.000   | 25.0000    |

150 rows × 5 columns



## Insight 21: Pharmaceutical Branch Growth

Despite a drop in gross profit percentage in 2024 and 2025, the overall gross profit amount has risen significantly due to the pharmaceutical branch's cost-reduction strategy, which favors higher sales volumes with lower margins. It is recommended to maintain this strategy but ensure that the gross profit percentage remains between 6.5% and 7% in 2026.

Out [127...

|      | Date                | Type      | Description | Destination  | Client | Invoice no. | Name   |
|------|---------------------|-----------|-------------|--------------|--------|-------------|--------|
| 2340 | 2025-12-04 00:00:00 | Operation | Transfer    | dawaa        | NaN    | NaN         | Khaled |
| 2341 | 2025-12-04 00:00:00 | Operation | Transfer    | dawaa        | NaN    | NaN         | Safwat |
| 2342 | 2025-12-06 00:00:00 | Operation | Transfer    | banha        | NaN    | NaN         | Hasan  |
| 2343 | 2025-12-07 00:00:00 | Operation | Transfer    | dawaa        | NaN    | NaN         | Hasan  |
| 2344 | 2025-12-08 00:00:00 | General   | tips        | NaN          | NaN    | NaN         | Hasan  |
| 2345 | 2025-12-10 00:00:00 | Operation | Transfer    | Mnya El Kamh | NaN    | NaN         | Hasan  |
|      | 2025-               |           |             |              |        |             |        |

|             |                            |                      |          |                 |     |     |        |
|-------------|----------------------------|----------------------|----------|-----------------|-----|-----|--------|
| <b>2346</b> | 12-11<br>00:00:00          | Operation            | Transfer | banha           | NaN | NaN | Hasan  |
| <b>2347</b> | 2025-<br>12-11<br>00:00:00 | General              | coffee   | NaN             | NaN | NaN | Hasan  |
| <b>2348</b> | 2025-<br>12-11<br>00:00:00 | Operation            | Transfer | dawaa           | NaN | NaN | Khaled |
| <b>2349</b> | 2025-<br>12-14<br>00:00:00 | Operation            | Shipping | NaN             | NaN | NaN | Hasan  |
| <b>2350</b> | 2025-<br>12-14<br>00:00:00 | Operation            | Transfer | Mnya El<br>Kamh | NaN | NaN | Hasan  |
| <b>2351</b> | 2025-<br>12-14<br>00:00:00 | Operation            | Transfer | dawaa           | NaN | NaN | Khaled |
| <b>2352</b> | 2025-<br>12-15<br>00:00:00 | Operation            | Shipping | NaN             | NaN | NaN | Hasan  |
| <b>2353</b> | 2025-<br>12-15<br>00:00:00 | Operation            | Transfer | Mnya El<br>Kamh | NaN | NaN | Hasan  |
| <b>2354</b> | 2025-<br>12-15<br>00:00:00 | Operation            | Transfer | Shoubra         | NaN | NaN | Hasan  |
| <b>2355</b> | 2025-<br>12-15<br>00:00:00 | General              | food     | NaN             | NaN | NaN | Safwat |
| <b>2356</b> | 2025-<br>12-18<br>00:00:00 | Marketing<br>& Sales | Jasmin   | NaN             | NaN | NaN | Khaled |
| <b>2357</b> | 2025-<br>12-18<br>00:00:00 | Operation            | Transfer | Mnya El<br>Kamh | NaN | NaN | Hasan  |
| <b>2358</b> | 2025-<br>12-18<br>00:00:00 | Operation            | Shipping | NaN             | NaN | NaN | Hasan  |
| <b>2359</b> | 2025-<br>12-20<br>00:00:00 | General              | Padel    | NaN             | NaN | NaN | Safwat |

## Conclusion

The firm is performing well in terms of sales and gross

profit; however, high expenses—particularly related to salaries and operations—are impacting net profit. A more strategic approach to cost management is needed.

## Recommended Actions:

Increase sales modestly across all areas.

Increase gross profit margins slightly.

Introduce a new branch with the same employee base to improve net profit.

Infuse new capital at the start of 2026.

Add two large customers or four smaller ones to mitigate risks.

Add two new suppliers to diversify supply chains.

Revise supplier deals for the top three categories to ensure better margins.

Track key performance metrics to ensure the firm meets its 2026 financial goals.

Set sales targets for the pharmaceutical branch (8 million) and consumables (4 million) in 2026.