# Category and Regional Sales & Profitability Analysis Project

The objective of this project is to deliver a clear, actionable understanding of sales and profit performance across product categories and regions. By leveraging Power BI dashboards with interactive visualizations that reveal trends, highlight strengths and weaknesses, and support strategic recommendations, the analysis was designed to answer key business questions:

- Which categories and regions drive the most value?

- Where are profit margins lagging?

- How do discounts and customer segments impact profitability?

- What actions can maximize future growth and efficiency?
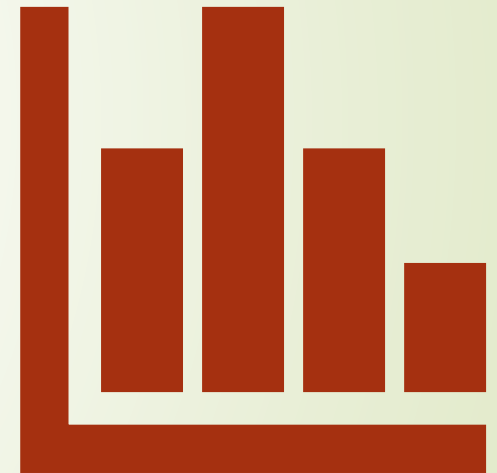
My Process

- First, I found a public dataset that could be suitable for this project (Sample Superstore.csv). I chose this dataset because it included order date, sales, profit, quantity, discount amount, categories, and region so I could drill down and combine different datapoints to extract insights and answer common business questions. It also included 10,000+ rows initially to show my ability to use syndicated data efficiently.

- After downloading the dataset, I had to clean and prepare it for visualizations. I added columns- profit margin, average order value, then formatted the columns to correlate with date, numeric, text, or percentage to enable calculations.

- Once the data was imported into Power BI, I used Dax formulas to create new calculations and data measures to unlock new insights- I added Cumulative Sales %, total profit, total sales, and 3-month moving average.

- Finally, I created four separate dashboards to showcase region performance, category performance, discount impact on profit, and YOY trends analysis to then tell a story of each based on the data. Each dashboard allows for filtering to drill down into specific region, category, year, or segment for more microscoped analysis.

Insights

I created the overview dashboard to give a high-level view over the entire business showing total sales, profit, top products and regions, and trends through the past years for all available data.

Insights on this overview inform me of what I may want to dig deeper into my segmented dashboards for specific recommendations.

- Technology leads in sales across all regions, while also producing the highest profit and margin overall.

- Furniture profits and margins are lowest across all regions.

- Central region has 3rd highest sales yet lowest profit and a negative 10% margin.

Power BI Dashboard

Filters

Year

| 2014 | 2017 |
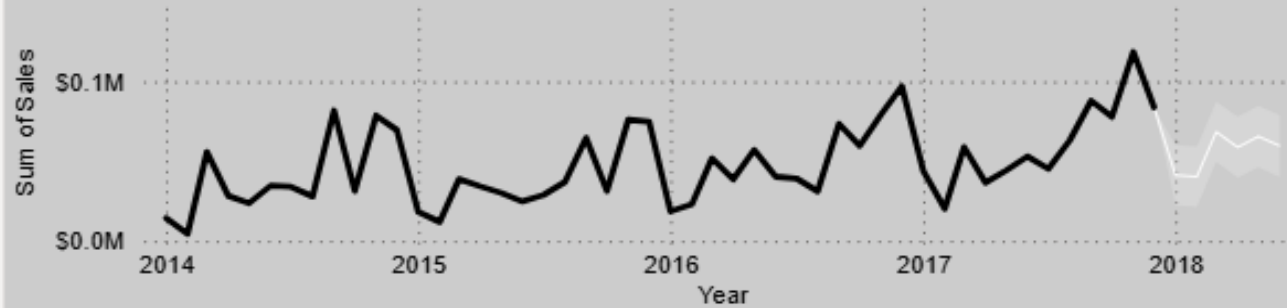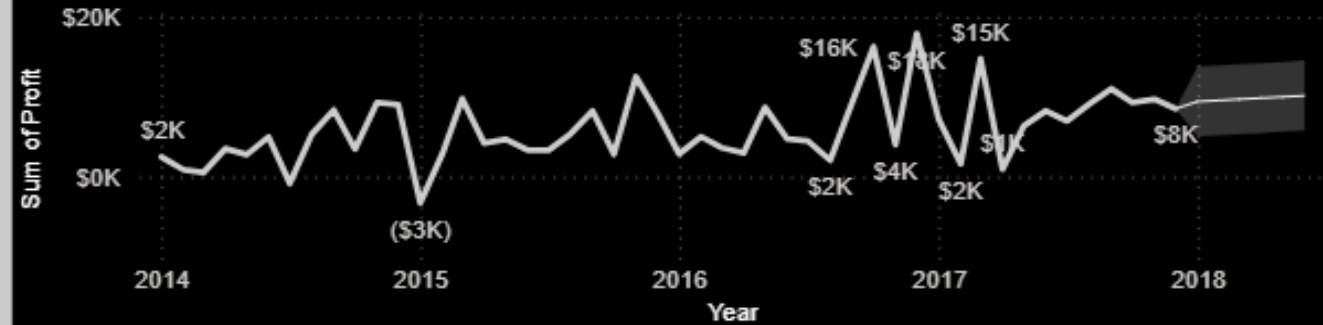
Category
- ☐ Furniture
- ☐ Office Supplies
- ☐ Technology

Key Metrics

$2.3M	$286.4K	12.03%
Sum of Sales	Sum of Profit	Average of Profit Margin

Sum of Sales by Region

- $725.46K (31.58%)
- $678.78K (29.55%)
- $501.24K (21.82%)
- $391.72K (17.05%)

Region
- ● West
- ● East
- ● Central
- ● South

Region Table
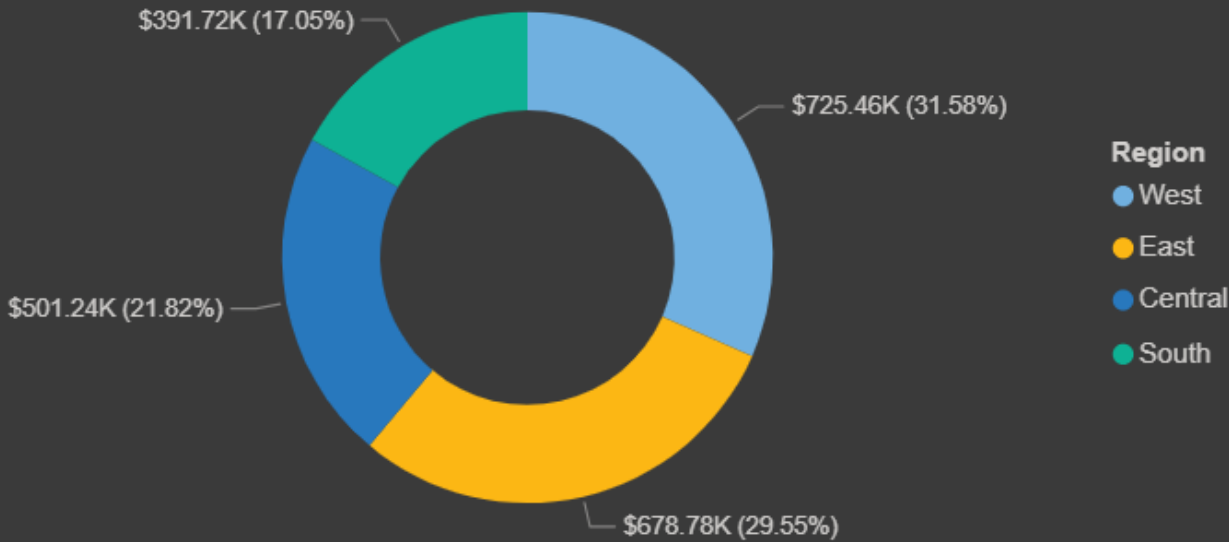
Region	Furniture	Office Supplies	Technology	Total
⊟ **West**	**$252,612.7435**	**$220,853.249**	**$251,991.832**	**$725,457.8245**
Los Angeles	$54,000.041	$48,821.514	$73,029.786	**$175,851.341**
Seattle	$40,995.878	$36,038.492	$42,506.372	**$119,540.742**
San Francisco	$36,357.308	$42,253.152	$34,058.632	**$112,669.092**
San Diego	$20,031.237	$7,735.516	$19,754.276	**$47,521.029**
Denver	$4,088.56	$3,633.647	$4,476.586	**$12,198.793**
Phoenix	$3,761.971	$3,692.092	$3,546.194	**$11,000.257**
North Las Vegas	$2,529.922	$6,129.546	$1,141.534	**$9,801.002**
Anaheim	$3,752.284	$3,812.25	$422.336	**$7,986.87**
Fresno	$5,519.7465	$949.752	$1,419.03	**$7,888.5285**
Sacramento	$1,595.452	$5,171.518	$544.308	$7,311.278
Total	**$741,999.7953**	**$719,047.032**	**$836,154.033**	**$2,297,200.8603**

Sales and Profit by Region

- ● Sum of Sales
- ● Total Profit

Region	Sum of Sales	Total Profit
West	$0.73M	$0.11M
East	$0.68M	$0.09M
Central	$0.50M	$0.04M
South	$0.39M	$0.05M

Sum of Sales and Total Profit

Avg. Profit Margin vs. Avg Discount by Region

- ● Average of Profit Margin
- ● Average of Discount

| Region	Average of Profit Margin	Average of Discount
West	21.95%	10.93%
East	16.72%	14.54%
South	16.35%	14.73%
Central	-10.41%	24.04%
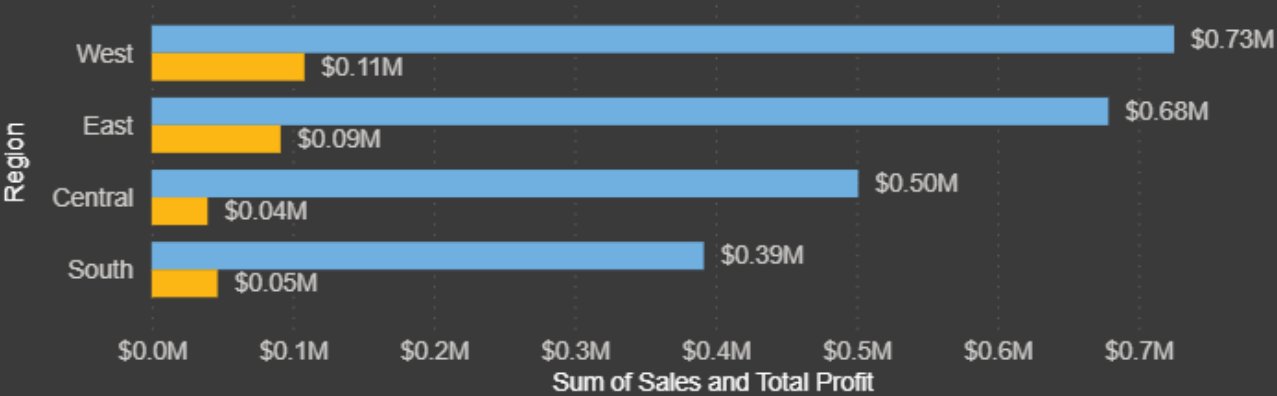
Insights and Recommendations

The regional performance dashboard shows performance by region (Obviously ☺). It provides how the business is performing in different regions based off sales and profit, unlocking insights of where and how the business is performing well or lacking. Slicer/filters were added for ability to drill down into specific categories and cities in each region to drill down deeper by region.

- Central region is third in sales but has the lowest profit and margin (-10.4%) while yielding the largest discount amount. Discount being highest yet profit being lowest is a red flag that promotional strategies and potential operational inefficiencies are at play in Central region. (Central KPIs Shown below) **Serious review of Central operations, discount/promotions and store strategy is needed to uncover what Central is doing differently than the other regions which leads it to be the only region with negative margin.**

$501.24K $39.71K   -10.41%
Sum of Sales   Sum of Profit   Average of Profit Margin
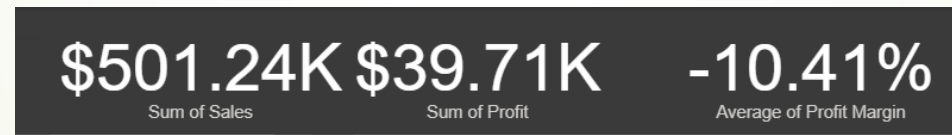
- West Region leads in sales, profit, and profit margin. This should **prompt a review and analysis of operations, promotional strategy, and marketing in this region and standardize across the other regions since there are clearly some best practices here. To implement strategies that translate across regions, do a phased rollout by region to see which are most impactful.**

- South has the lowest sales ($391,721.91) but a reasonable margin (14.54%). **I recommend launching targeted campaigns and reasonable promotions to boost volume without sacrificing much margin.**

Year

| 2014 | 2017 |

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Region | **Category** | **Segment**

☐ Central ☐ Furniture ☐ Consumer

☐ East ☐ Office Supplies ☐ Corporate

☐ South ☐ Technology ☐ Home Office

☐ West

Category	Sum of Sales	Sum of Profit	Average of Profit Margin
⊟ **Technology**	**$836,154.033**	**$145,454.9481**	**15.61%**
Canon imageCLASS 2200 Advanced Copier	$61,599.824	$25,199.928	38.47%
Cisco TelePresence System EX90 Videoconferencing Unit	$22,638.48	($1,811.0784)	-8.00%
Hewlett Packard LaserJet 3310 Copier	$18,839.686	$6,983.8836	32.83%
HP Designjet T520 Inkjet Large Format Printer - 24" Color	$18,374.895	$4,094.9766	9.33%
Lexmark MX611dhe Monochrome Laser Printer	$16,829.901	($4,589.973)	-36.11%
3D Systems Cube Printer, 2nd Generation, Magenta	$14,299.89	$3,717.9714	26.00%
Samsung Galaxy Mega 6.3	$13,943.668	$1,822.7566	13.67%
Apple iPhone 5	$12,996.6	$1,611.5784	4.69%
Canon PC1060 Personal Laser Copier	$11,619.834	$4,570.9347	37.06%
Cubify CubeX 3D Printer Double Head Print	$11,099.963	($8,879.9704)	-95.28%
Plantronics CS510 - Over-the-Head monaural Wireless Headset System	$10,822.36	$3,085.0325	26.30%
Logitech P710e Mobile Speakerphone	$10,196.604	$1,645.3611	12.25%
Plantronics Savi W720 Multi-Device Wireless Headset System	$9,367.29	$3,696.282	40.00%
Bady BDG101FRU Card Printer	$9,279.884	$1,327.9834	8.29%
Canon Imageclass D680 Copier / Fax	$8,959.872	$2,799.96	29.42%
Total	**$2,297,200.8603**	**$286,397.0217**	**12.03%**

Average Profit Margin by Category
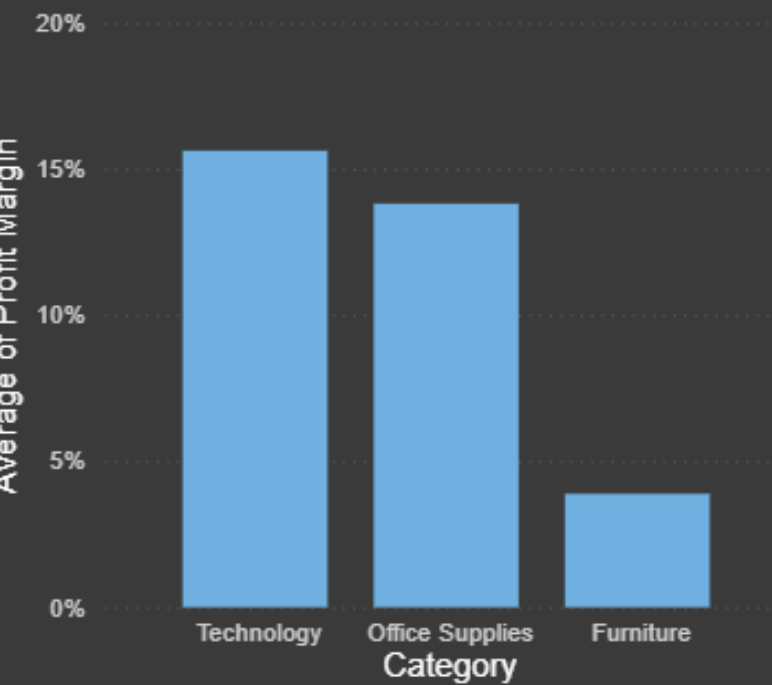
Total Sales and Profit by Catgeory

● Sum of Sales ● Sum of Profit
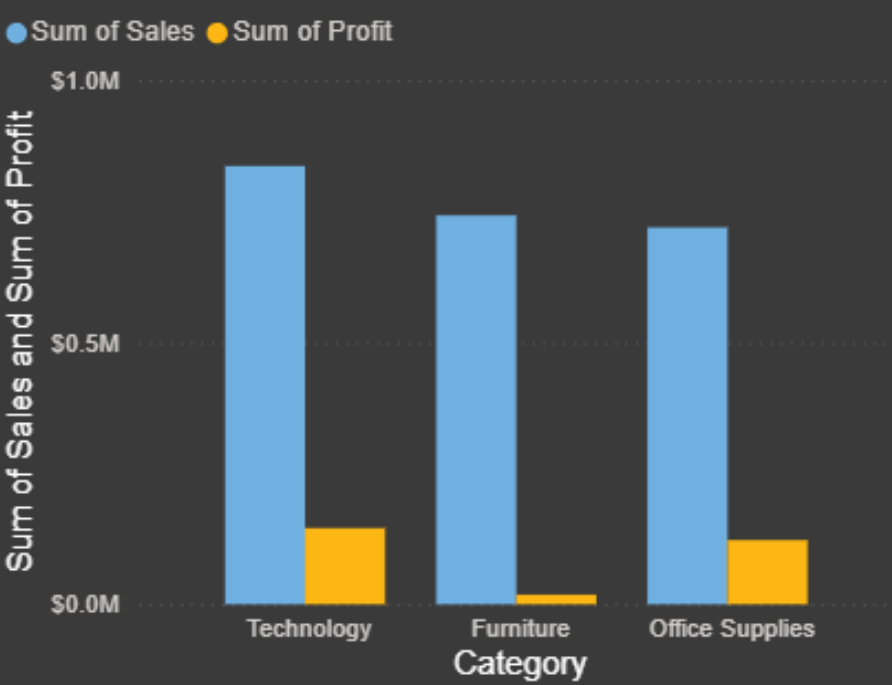
Sales and % of sales by Category

● Sum of Sales ● Cumulative %
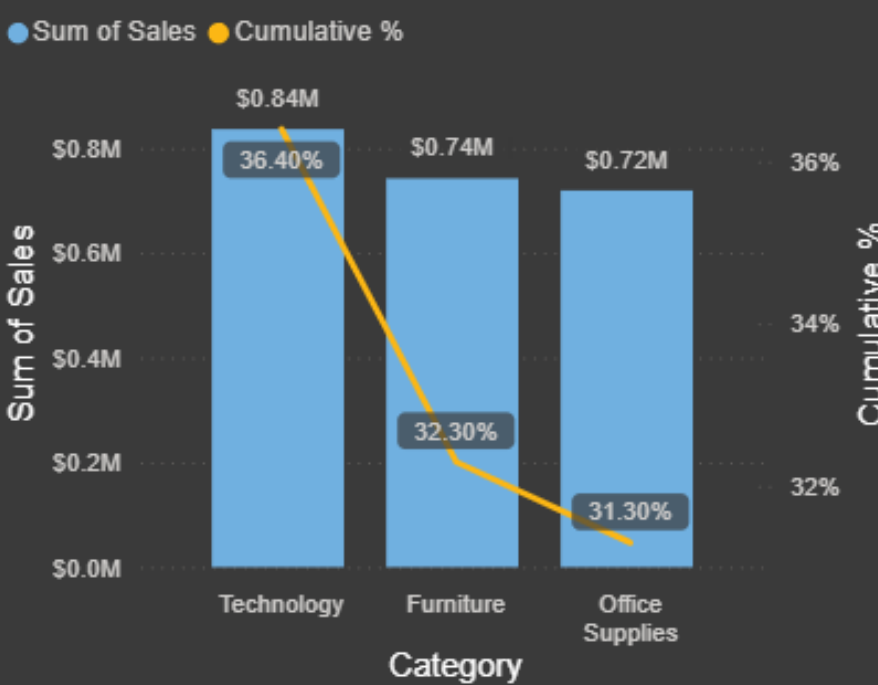
Insights and Recommendations

The category performance dashboard shows performance by category- furniture, technology, and office supplies. KPIs of sales, profit, and % of sales for each can provide insight on which categories do well and why. Slicers to segment by specific region, category, and customer segment being sold to are added to drill into performance as specific as you can get. The table also allows you to drill down by specific products in each category to show sales and profit for each.

Sales by Category:

- Technology: $836,154.03 (36.4%)

- Furniture: $741,999.80 (32.3%)

- Office Supplies: $719,047.03 (31.3%)

Profit by Category:

- Technology: $145,454.95 (15.61% margin)

- Office Supplies: $122,490.80 (13.8% margin)

- Furniture: $18,451.27 (3.88% margin)

- Technology has the best sales and profit/profit margin. **Increase marketing spend to further accelerate sales growth.**

- The second highest technology product in sales yields a -8% profit margin. **After further investigation, the average discount on this product is 50%. I would recommend a reduction to a maximum 40% discount, then the profit margin would be a minimum 2% or greater depending on the disco   unt reduction spread.**

- Furniture, accounts for 32% of sales (2nd highest) yet has 3.88% profit margin. This prompts a review of the cost of goods, pricing, or promotional issues within Furniture. **Target an incremental increase in profit margin by shopping for different suppliers/manufacturers, adjusting price, and reducing discounts.**
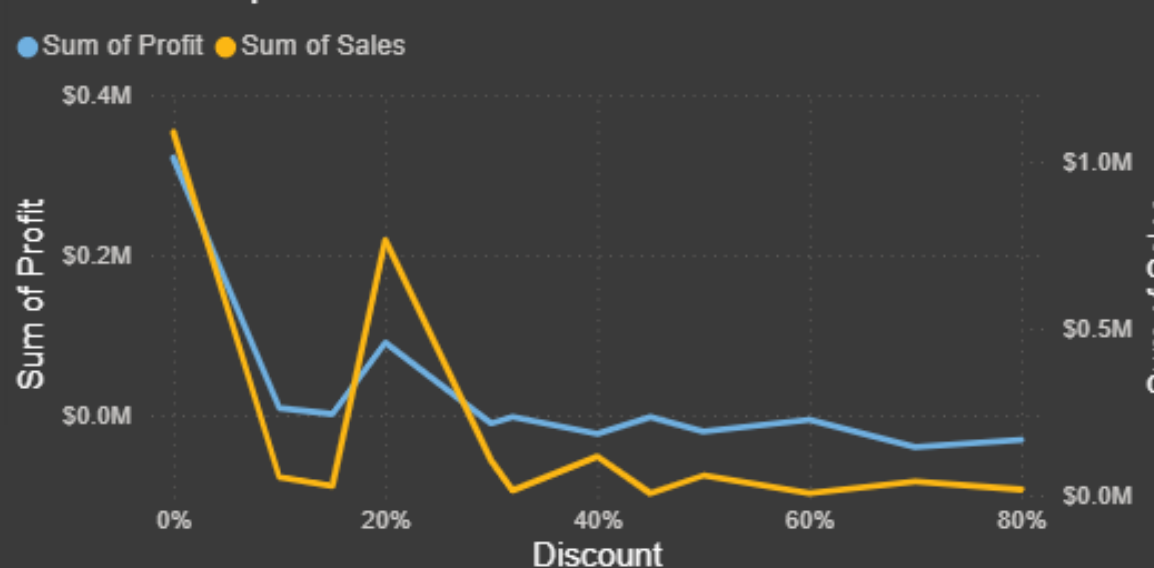
Discount Impact Dashboard
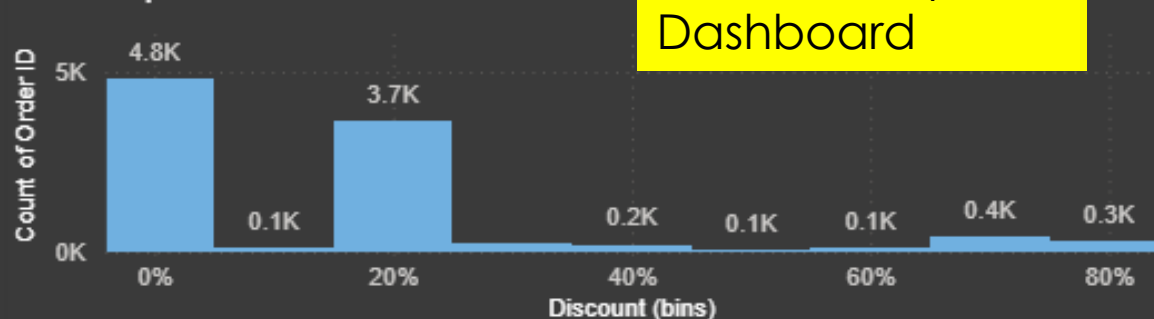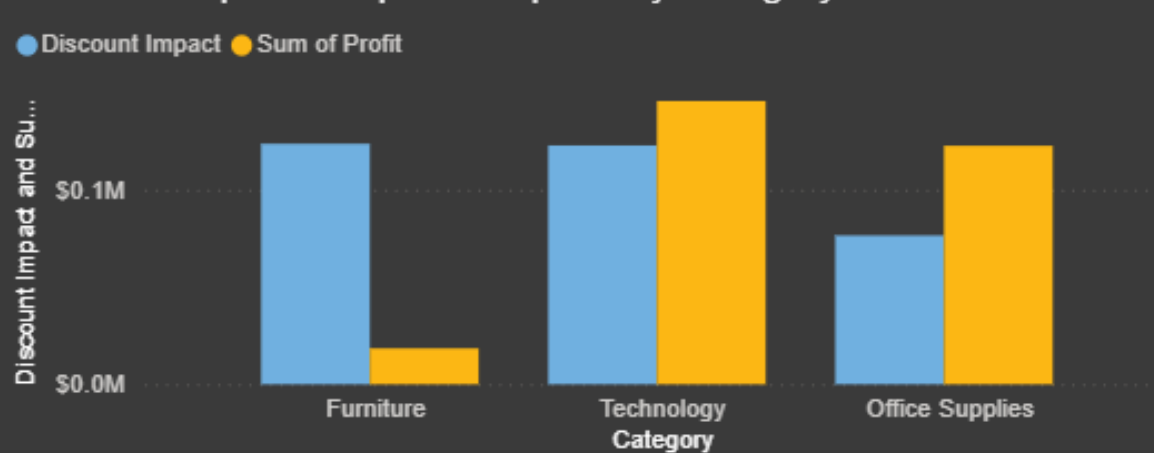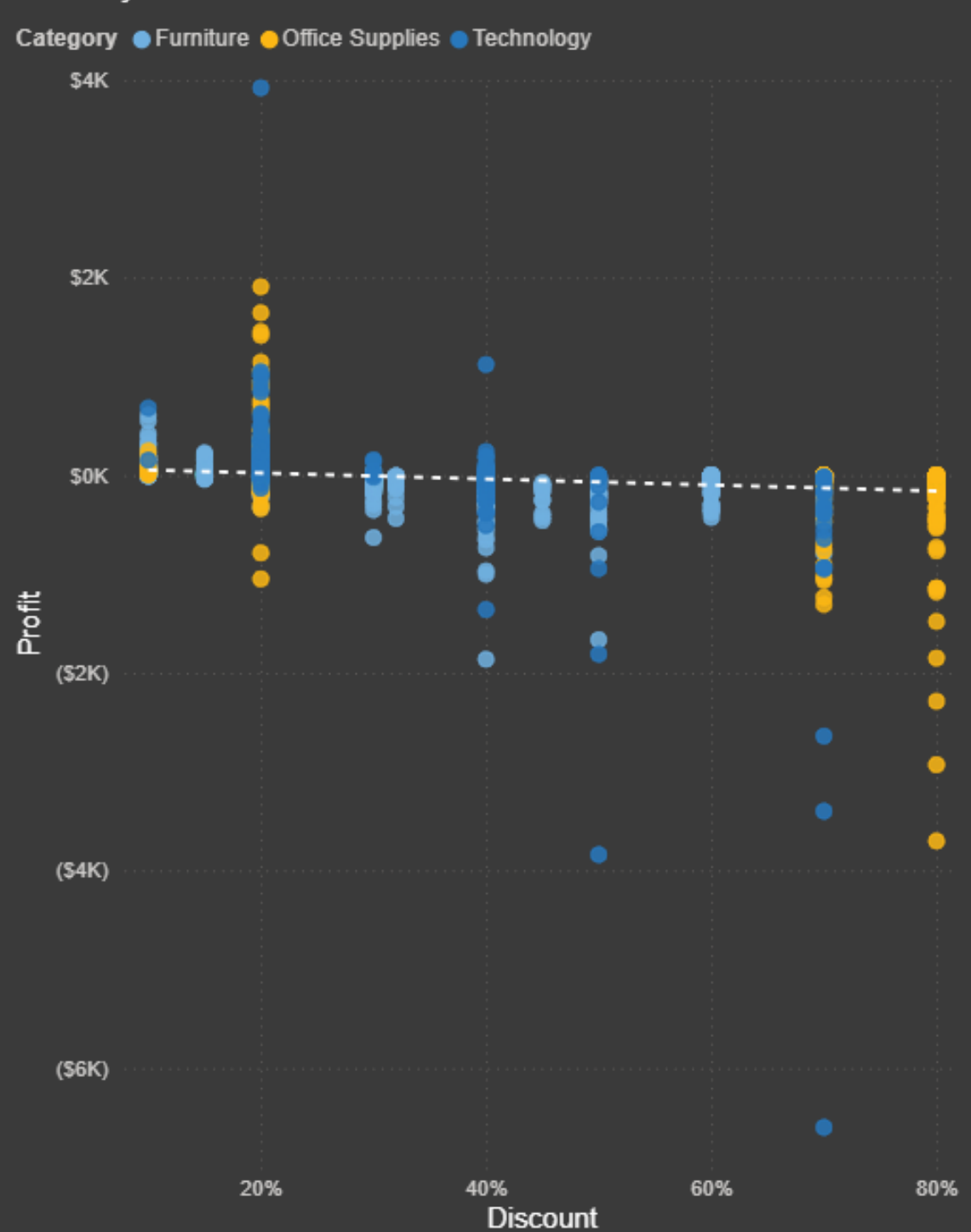
Insights and Recommendations

Discount Impact Dashboard highlights the correlation and impact discounts have on the sales and profitability of a category. Obviously, there is direct correlation with higher discounts leading to lower, and in many cases negative, profits and margins. While the higher discounts may have limited offering, it shows sales volume doesn't increase enough to offset profit.

- Furniture offers the highest volume of relative sales at a 20% discount or above. Some as high as 70%. **I recommend setting a cap at 20%, as everything above is not profitable (with exception). To maintain or increase sales volumes, everyday pricing could be adjusted to eliminate the need for high discounts on select products to mitigate the negative profit margins.**

- **Eliminating all discounts over 20% for office supplies would improve profit margin to 25% from 14%, while only sacrificing 6% of overall sales. The table shown below shows the effect on profit, margin, and sales after eliminating all discounts over 20% for all categories on.**
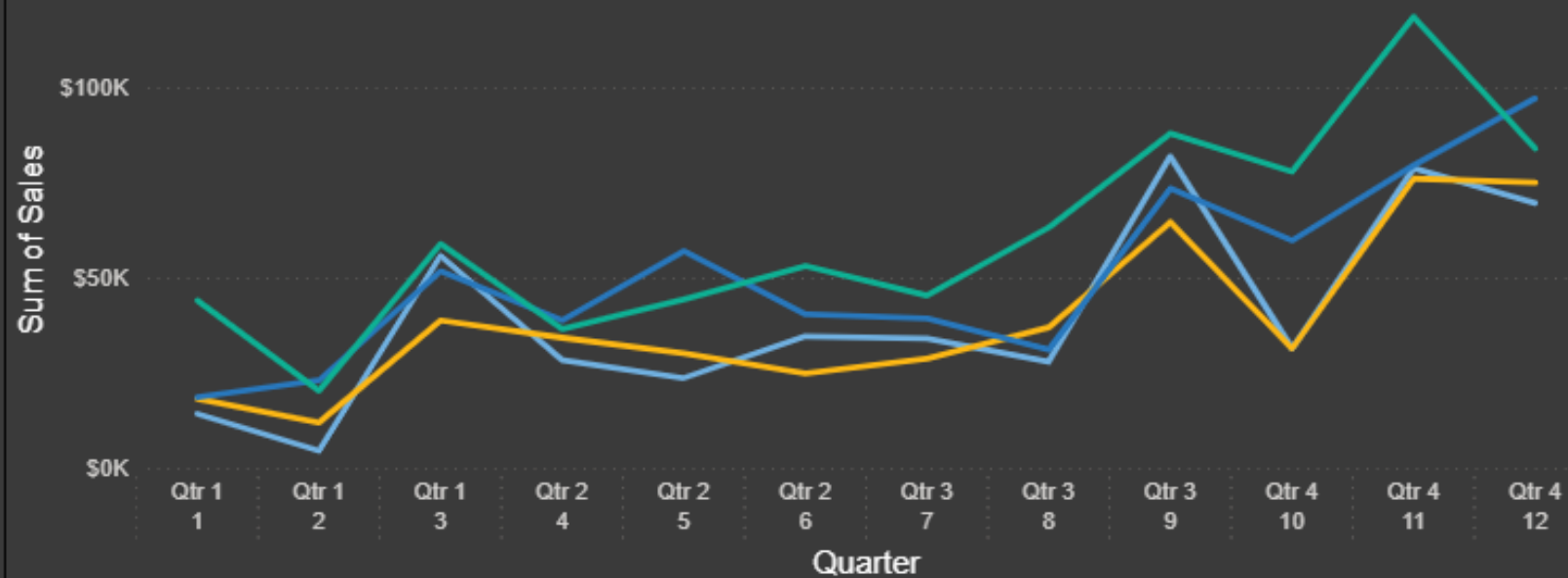
	Old Sales	Old Profit	Old Margin	New Sales	New Profit	New margin	Sales % lost	Profit Gained
Furniture	$ 741,999.80	$ 18,451.27	2%	$ 546,849.05	$ 72,929.03	13%	26.30%	$ 54,477.76
Office Supplies	$ 719,047.03	$ 122,490.80	17%	$ 679,523.89	$ 169,630.94	25%	5.50%	$ 47,140.14
Tech	$ 836,154.03	$ 145,454.95	17%	$ 708,057.77	$ 179,213.11	25%	15.32%	$ 33,758.16
Total	$ 2,297,200.86	$ 286,397.02	12%	$ 1,934,430.71	$ 421,773.08	21%	15.71%	$ 135,376.06
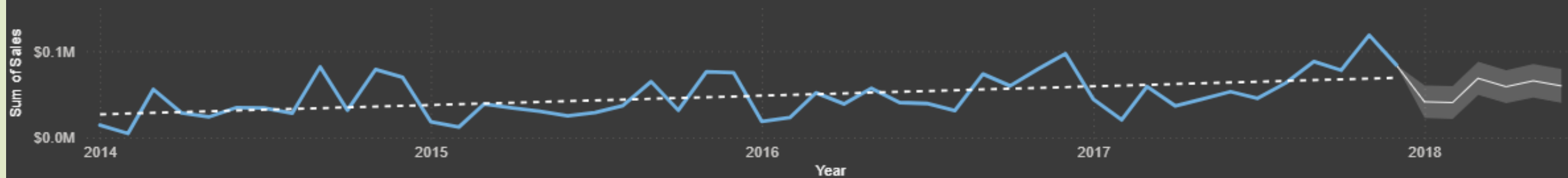
Insights and Recommendations

The trends analysis shows sales and profit chronologically for the entire timeline of this data chronologically. It also shows Year over year overall sales trends for all categories, segments, and regions. However, the slicers allow you to investigate specifics for each of the named for segmented analysis.

- Expected CPG industry Q3 and Q4 spikes around holidays. **Inventory need to account and prepare for spikes, create a demand and inventory forecasting report to reduce risk of stock outs.**

- Sales have been steadily growing year over year. Revisit lacking categories and products to continue to ride the highest performing areas and potentially cutting under performing areas to invest in the best and save on the bad.