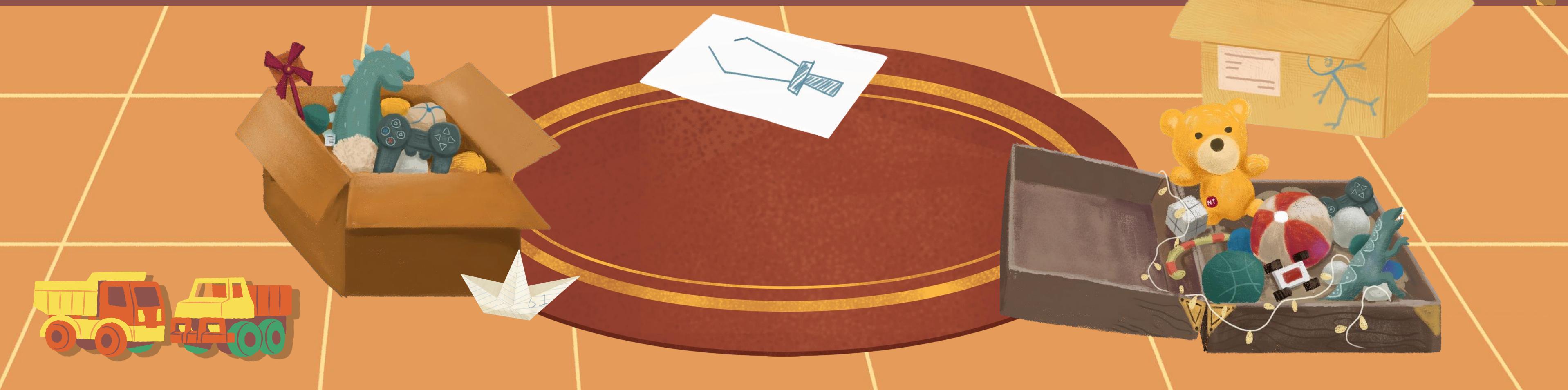




Toys Sales

Report by group E



Agenda

Project Description

Project Objectives

Methodology

Key Findings

Recommendations

Conclusion

Project Description

Toys Co. is a fictitious retail chain company in Mexico that wants to analyze its sales data from January 2022 to September 2023 to identify trends, optimize inventory, and improve decision-making.

The project aims to uncover insights such as top-performing products, seasonal trends, store performance, and forecast sales for the next two months to support strategic planning.



Project Objectives

Using SMART criteria (Specific, Measurable, Achievable, Relevant, Time-bound) to refine objectives:

- Analyze sales trends to identify seasonal patterns and optimize promotional strategies.
- Identify the top 10 products by sales revenue and profit to prioritize marketing and inventory efforts.
- Compare location performance by evaluating revenue contributions across regions to improve strategies.
- Examine inventory levels to identify overstocked and high-demand items for better management.
- Review product categories to focus on high-performing segments and improve weaker ones.

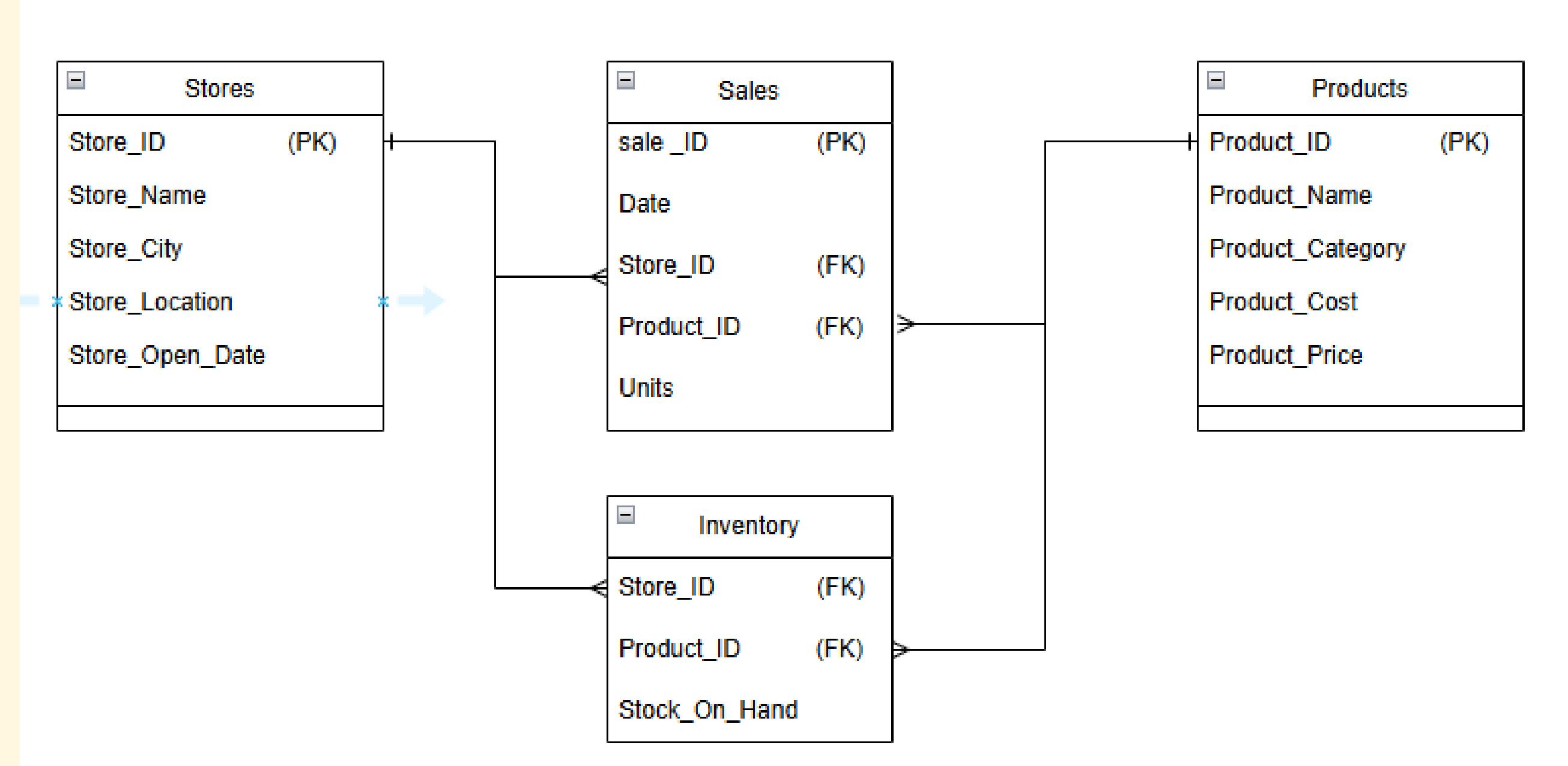


Methodology

- **Data Source:** [Maven Analytics Dataset](#)
- **Tools Used:** Python, SQL, and Tableau
- **Data Structure:** (Details are provided in the next two slides)
- **Data Analysis Strategy:**
 1. Collect Data
 2. Clean and Prepare Data
 3. Exploratory Data Analysis (EDA)
 4. Generate Insights
 5. Report and Visualize



Data Structure



Data Structure

- The dataset consists of four tables, as outlined in the ERD:

1. Stores Table:

- 5 columns: (Store_ID, Store_Name, Store_City, Store_Location, Store_Open_Date)
- 50 rows

2. Sales Table:

- 5 columns: (Sale_ID, Date, Store_ID, Product_ID, Units)
- 829,262 rows

3. Inventory Table:

- 3 columns: (Store_ID, Product_ID, Stock_On_Hand)
- 1,593 rows

4. Products Table:

- 5 columns: (Product_ID, Product_Name, Product_Category, Product_Cost, Product_Price)
- 35 rows

Data Cleaning & Preprocessing

We utilized several functions to clean and prepare the dataset, including:

- **isna()**: Identified missing values.
- **fillna()**: Filled in the missing values.
- **rename()**: Altered axes labels.
- **drop_duplicates()**: Removed duplicate rows and fixed column data types.
- **to_datetime()**: Converted the date column from object type to date format.
- **replace()**: Replaced \$ in the price column and converted it to float numbers.
- **Boxplot** and **quantile** were used to detect outliers.
- Added **Revenue** and **Profit** columns to the sales table for further analysis.

Data Cleaning & Preprocessing

Changing date columns from object to datetime

Changing Store_Open_Date from Object to datetime

```
stores['Store_Open_Date'] = pd.to_datetime(stores['Store_Open_Date'])  
stores
```

	Store_ID	Store_Name	Store_City	Store_Location	Store_Open_Date
0	1	Maven Toys Guadalajara 1	Guadalajara	Residential	1992-09-18
1	2	Maven Toys Monterrey 1	Monterrey	Residential	1995-04-27
2	3	Maven Toys Guadalajara 2	Guadalajara	Commercial	1999-12-27
3	4	Maven Toys Saltillo 1	Saltillo	Downtown	2000-01-01
4	5	Maven Toys La Paz 1	La Paz	Downtown	2001-05-31
5	6	Maven Toys Mexicali 1	Mexicali	Commercial	2003-12-13
6	7	Maven Toys Monterrey 2	Monterrey	Downtown	2003-12-25
7	8	Maven Toys Pachuca 1	Pachuca	Downtown	2004-10-14
8	9	Maven Toys Ciudad de Mexico 1	Cuidad de Mexico	Downtown	2004-10-15
9	10	Maven Toys Campeche 1	Campeche	Downtown	2005-01-14
10	11	Maven Toys Cuernavaca 1	Cuernavaca	Downtown	2005-04-19
11	12	Maven Toys Chetumal 1	Chetumal	Downtown	2006-05-05
12	13	Maven Toys Mexicali 2	Mexicali	Downtown	2006-08-30

Data Cleaning & Preprocessing

Removing dollar sign from product price and product cost columns

Remove \$ from Product_Cost and Product_Price and change the format to float

```
products['Product_Cost'] = products['Product_Cost'].str.replace('$', '', regex=False).astype(float)

products['Product_Price'] = products['Product_Price'].str.replace('$', '', regex=False).astype(float)

products
```

	Product_ID	Product_Name	Product_Category	Product_Cost	Product_Price
0	1	Action Figure	Toys	9.99	15.99
1	2	Animal Figures	Toys	9.99	12.99
2	3	Barrel O' Slime	Art & Crafts	1.99	3.99
3	4	Chutes & Ladders	Games	9.99	12.99
4	5	Classic Dominoes	Games	7.99	9.99
5	6	Colorbuds	Electronics	6.99	14.99
6	7	Dart Gun	Sports & Outdoors	11.99	15.99
7	8	Deck Of Cards	Games	3.99	6.99
8	9	Dino Egg	Toys	9.99	10.99
9	10	Dinosaur Figures	Toys	10.99	14.99
10	11	Etch A Sketch	Art & Crafts	10.99	20.99
11	12	Foam Disk Launcher	Sports & Outdoors	8.99	11.99



Data Cleaning & Preprocessing

Add revenue column to store table

```
sales_product['Revenue'] = sales_product.Units * sales_product.Product_Price  
sales_product
```

	Sale_ID	Date	Store_ID	Product_ID	Units	Product_Name	Product_Category	Product_Cost	Product_Price	Revenue
0	1	2022-01-01	24	4	1	Chutes & Ladders	Games	9.99	12.99	12.99
1	2	2022-01-01	28	1	1	Action Figure	Toys	9.99	15.99	15.99
2	3	2022-01-01	6	8	1	Deck Of Cards	Games	3.99	6.99	6.99
3	4	2022-01-01	48	7	1	Dart Gun	Sports & Outdoors	11.99	15.99	15.99
4	5	2022-01-01	44	18	1	Lego Bricks	Toys	34.99	39.99	39.99
...
829257	829258	2023-09-30	24	19	1	Magic Sand	Art & Crafts	13.99	15.99	15.99
829258	829259	2023-09-30	16	35	1	Uno Card Game	Games	3.99	7.99	7.99
829259	829260	2023-09-30	22	19	1	Magic Sand	Art & Crafts	13.99	15.99	15.99
829260	829261	2023-09-30	13	2	2	Animal Figures	Toys	9.99	12.99	25.98
829261	829262	2023-09-30	32	6	1	Colorbuds	Electronics	6.99	14.99	14.99



Data Cleaning & Preprocessing

Add profit column to store table

```
sales_product['Profit'] = sales_product.Revenue - (sales_product.Product_Cost * sales_product.Units)
sales_product
```

	Sale_ID	Date	Store_ID	Product_ID	Units	Product_Name	Product_Category	Product_Cost	Product_Price	Revenue	Profit
0	1	2022-01-01	24	4	1	Chutes & Ladders	Games	9.99	12.99	12.99	3.0
1	2	2022-01-01	28	1	1	Action Figure	Toys	9.99	15.99	15.99	6.0
2	3	2022-01-01	6	8	1	Deck Of Cards	Games	3.99	6.99	6.99	3.0
3	4	2022-01-01	48	7	1	Dart Gun	Sports & Outdoors	11.99	15.99	15.99	4.0
4	5	2022-01-01	44	18	1	Lego Bricks	Toys	34.99	39.99	39.99	5.0
...
829257	829258	2023-09-30	24	19	1	Magic Sand	Art & Crafts	13.99	15.99	15.99	2.0
829258	829259	2023-09-30	16	35	1	Uno Card Game	Games	3.99	7.99	7.99	4.0
829259	829260	2023-09-30	22	19	1	Magic Sand	Art & Crafts	13.99	15.99	15.99	2.0
829260	829261	2023-09-30	13	2	2	Animal Figures	Toys	9.99	12.99	25.98	6.0
829261	829262	2023-09-30	32	6	1	Colorbuds	Electronics	6.99	14.99	14.99	8.0

829262 rows × 11 columns



Key Observations

1. Declining Sales and Profit: Sales decreased by 6.7% (from \$7.5M to \$7.0M), and profit decreased by 18.2% (from \$2.2M to \$1.8M).

2. Category Insights:

- Toys remained the top sales category, contributing \$2.3M in 2023, despite a \$0.5M decline.
- Art & Crafts doubled its sales to \$1.8M, rising from the smallest to the second-largest category.

3. Regional Dominance: Downtown locations consistently outperformed, contributing 56% of total sales in 2022 and increasing to 57% of total sales in 2023.



Key Findings

Year-Over-Year Performance

Sales:

2022: \$7.5M

2023: \$7.0M (-6.7%)

Units Sold:

2022: 549.5K

2023: 541.1K (-1.5%)

Profit:

2022: \$2.2M

2023: \$1.8M (-18.2%)

Orders:

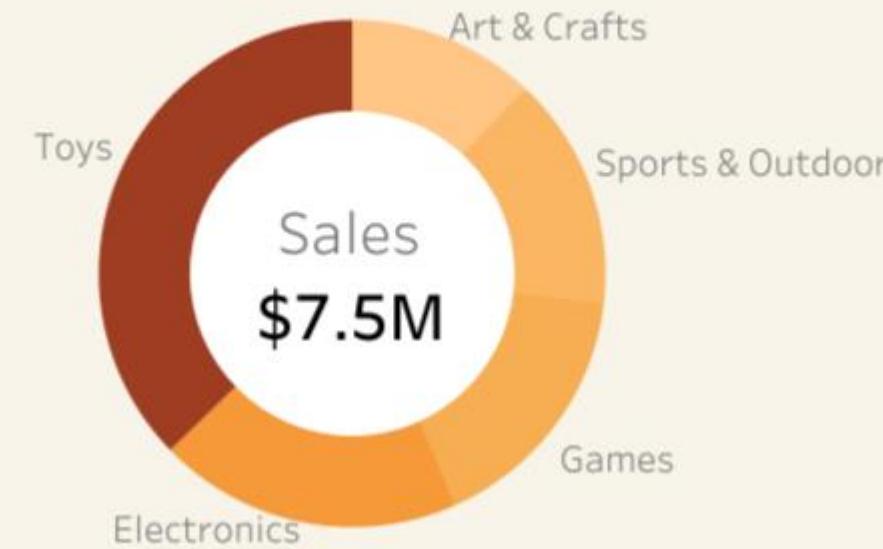
2022: 420.8K

2023: 408.4K (-2.9%)

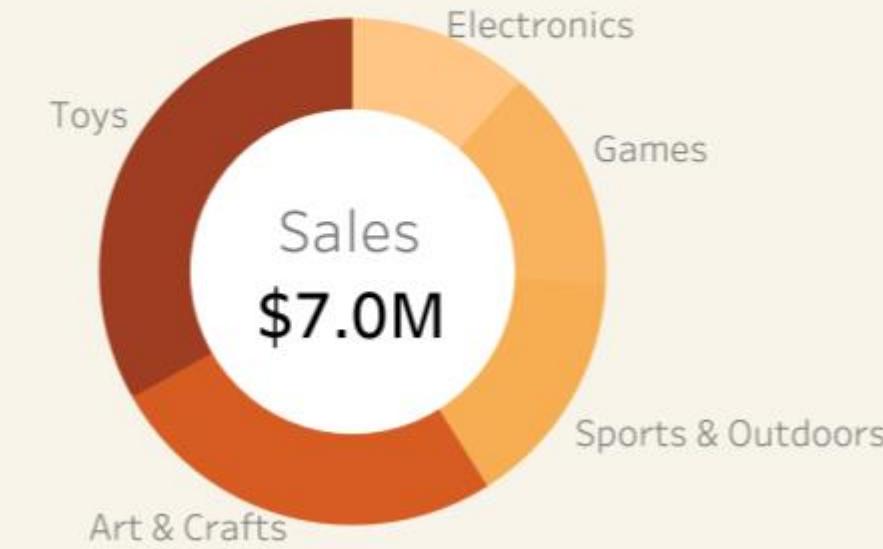


Key Findings

Sales | By Product Category



Sales | By Product Category



Sales by Category

2022:

- Toys: \$2.8M (37.3%)
- Art & Crafts: \$0.9M (12%)

2023:

- Toys: \$2.3M (32.9%)
- Art & Crafts: \$1.8M (25.7%)

Insight:

Toys remained the top sales category with a \$0.5M decline, while Art & Crafts doubled its sales to become the second-largest contributor.



Key Findings

Profit by Category

2022:

- Electronics: \$674.4K (Top Contributor)
- Art & Crafts: \$272.9K (Second Lowest Contributor)

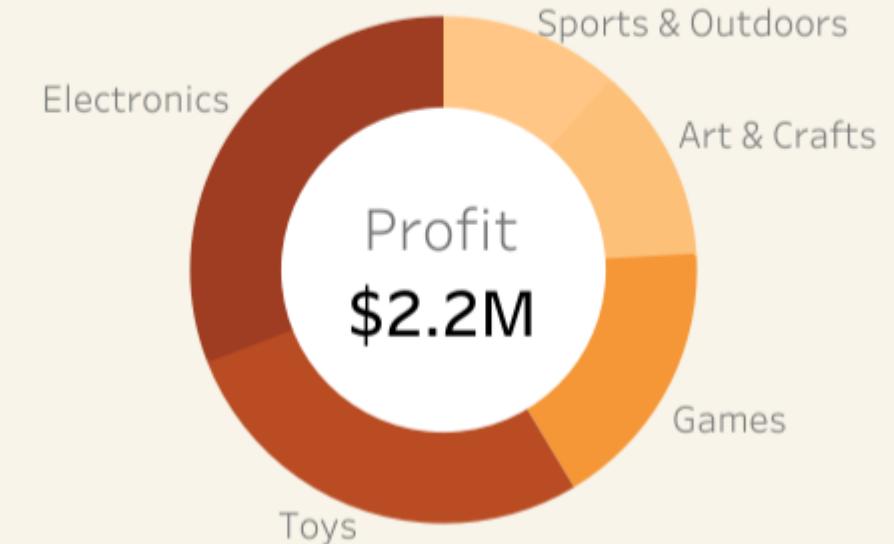
2023:

- Art & Crafts: \$480.4K (Top Contributor)
- Electronics: \$327.0K (Significant Decline)

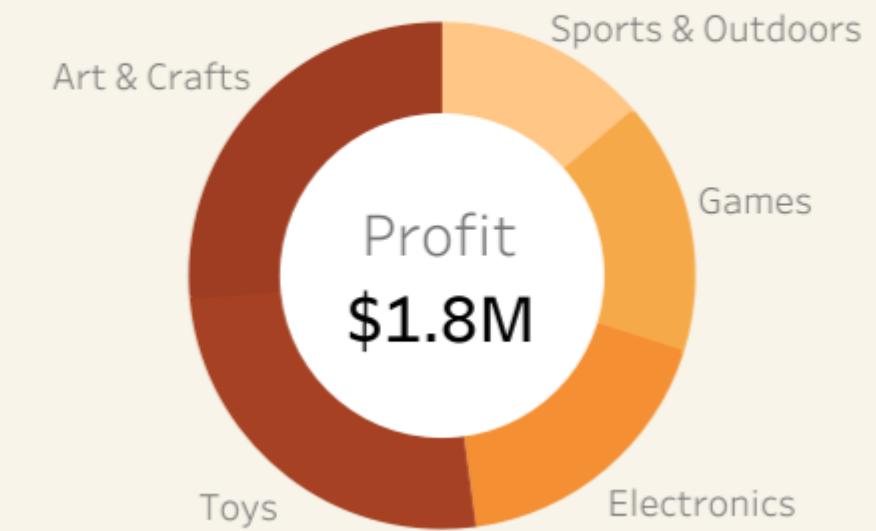
Insight:

Art & Crafts overtook Electronics as the top profit contributor in 2023, reflecting a shift in consumer demand.

Profit | By Product Category



Profit | By Product Category

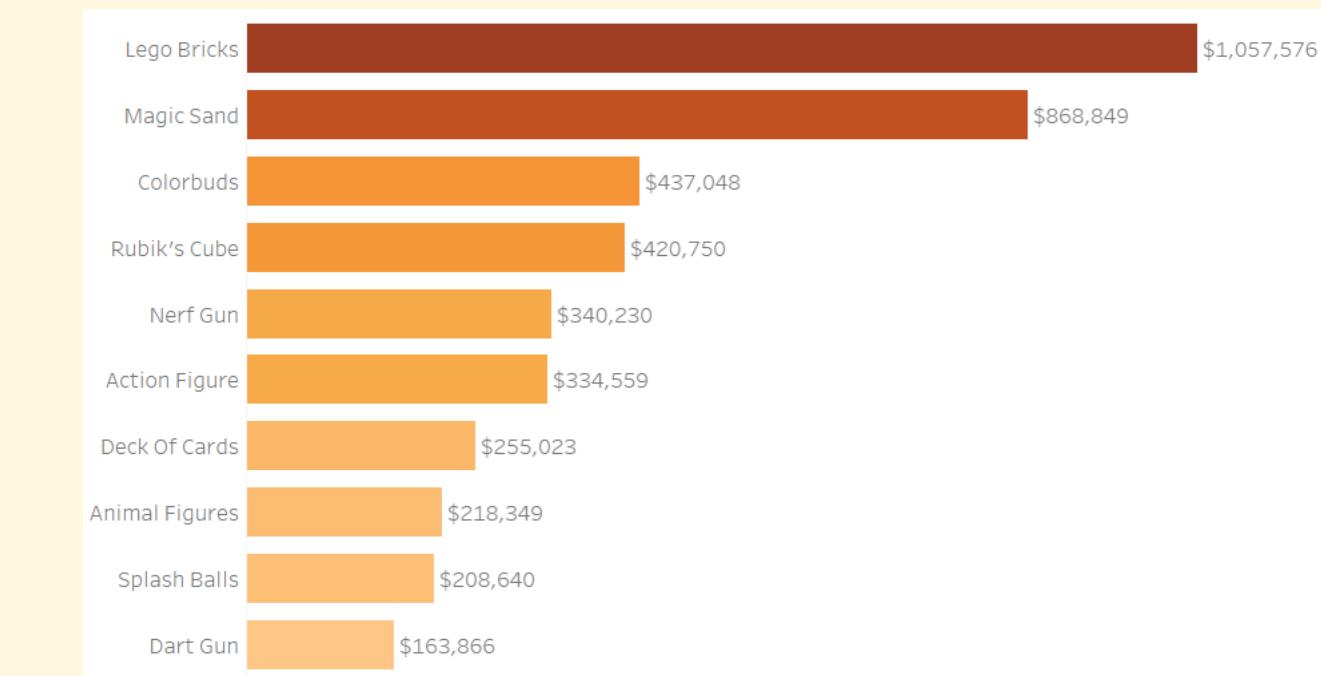
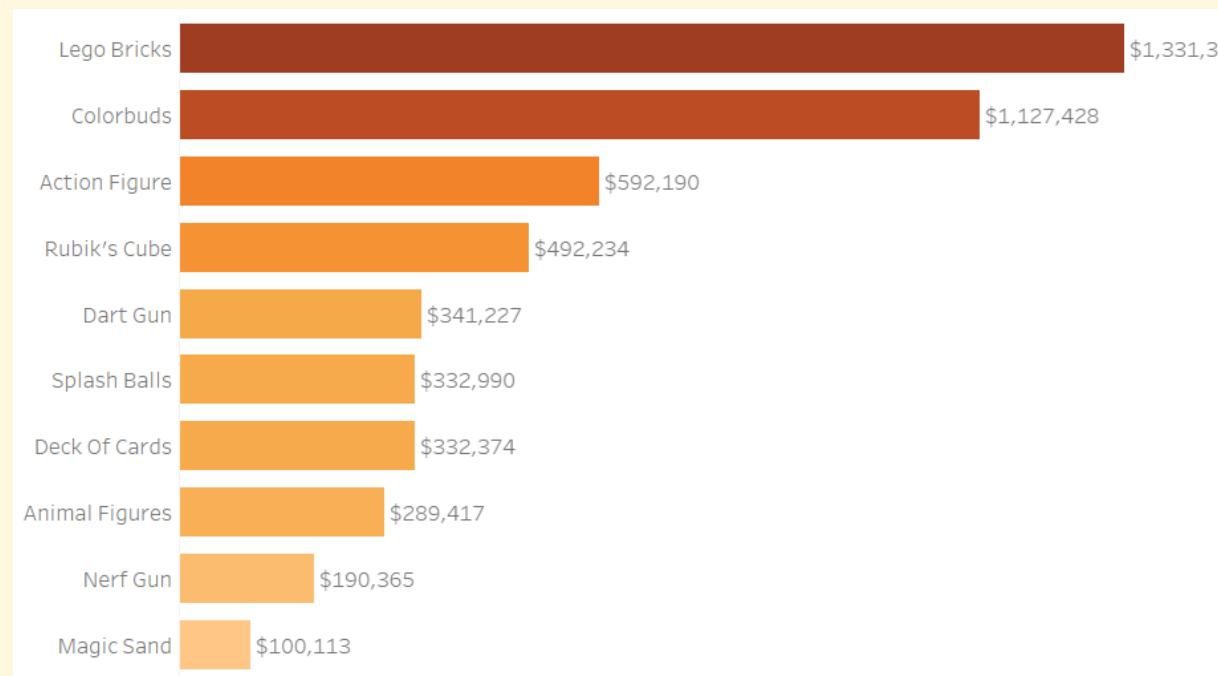


Key Findings

Top Products

By Sales:

- 2022: Lego Bricks (\$1,331.3K), Colorbuds (\$1,127.4K), Action Figures (\$592.2K)
- 2023: Lego Bricks (\$1,057.6K), Magic Sand (\$868.8K), Colorbuds (\$437.0K)

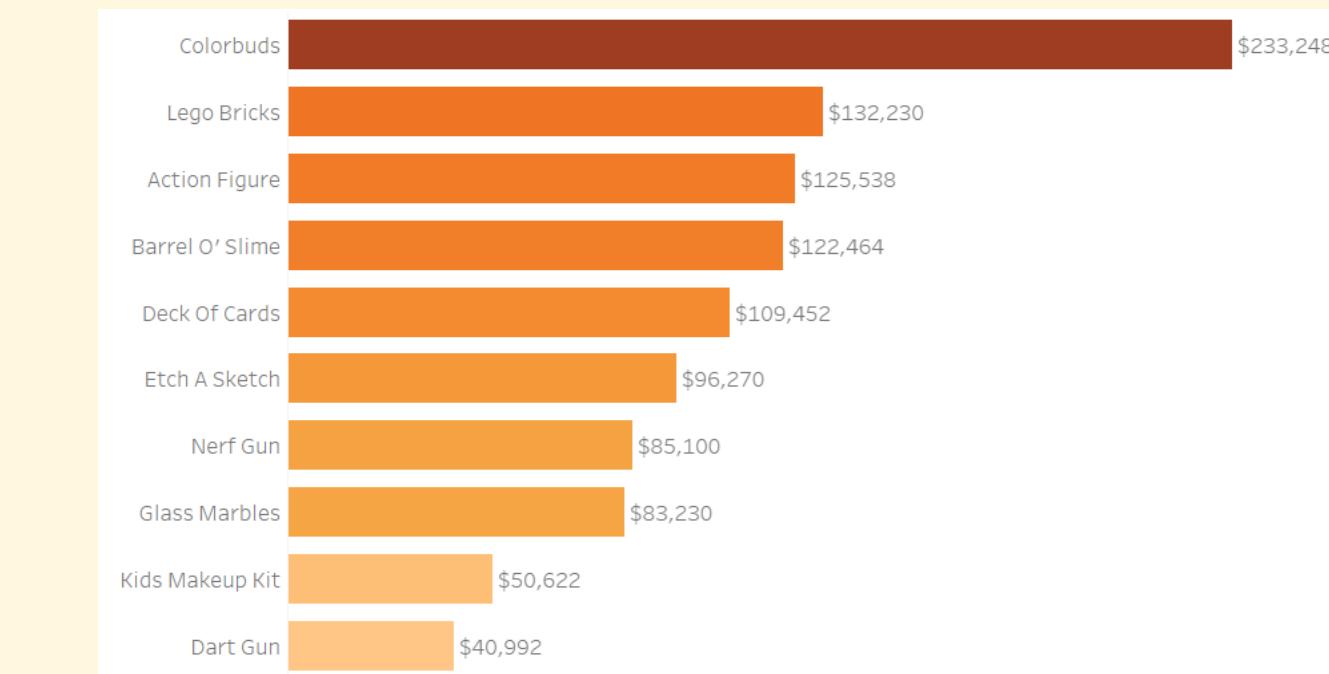
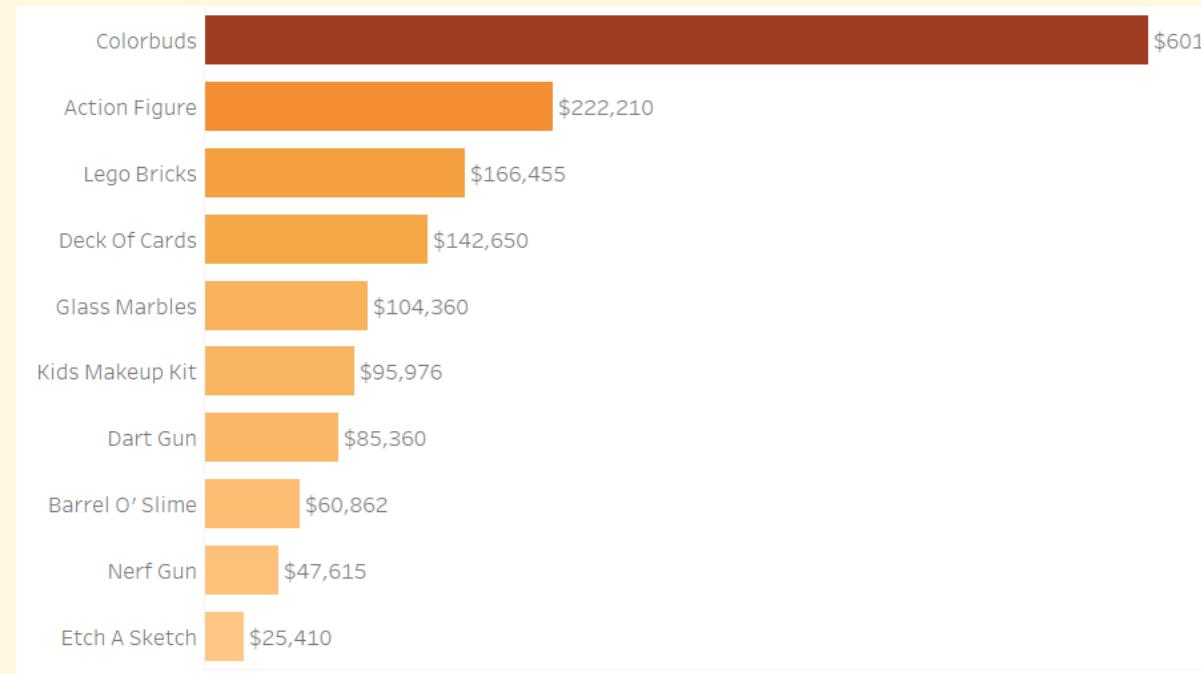


Key Findings

Top Products

By Profit:

- 2022: Colorbuds (\$601.7K), Action Figures (\$222.2K), Lego Bricks (\$166.5K)
- 2023: Colorbuds (\$233.2K), Lego Bricks (\$132.2K), Action Figures (\$125.5K)



Key Findings

Sales | By Store Location



Profit | By Store Location



Store Location Performance

2022:

- Downtown: \$4.2M sales (56%) | \$1,217.9K profit (55%)
- Airport: \$0.7M sales (9%) | \$205.0K profit (9%)

2023:

- Downtown: \$4.0M sales (57%) | \$1,030.8K profit (57%)
- Airport: \$0.6M sales (9%) | \$173.0K profit (10%)

Insight: Downtown stores consistently dominated both years, accounting for over half of total sales and profit, though all locations saw slight declines.

Recommendations

High Priority

1. Focus on Growing Categories:

Action: Increase inventory and marketing efforts for Art & Crafts products to maintain their strong growth.

Impact: Adds an estimated \$0.5M in annual sales, making Art & Crafts an even stronger contributor to the business's success.

2. Electronics:

Action: Review and adjust the prices, introduce new products, and create marketing campaigns to improve Electronics performance.

Impact: Recovering just 10% of the profit lost in 2023 could bring in an extra \$65K, helping to strengthen overall business profits.



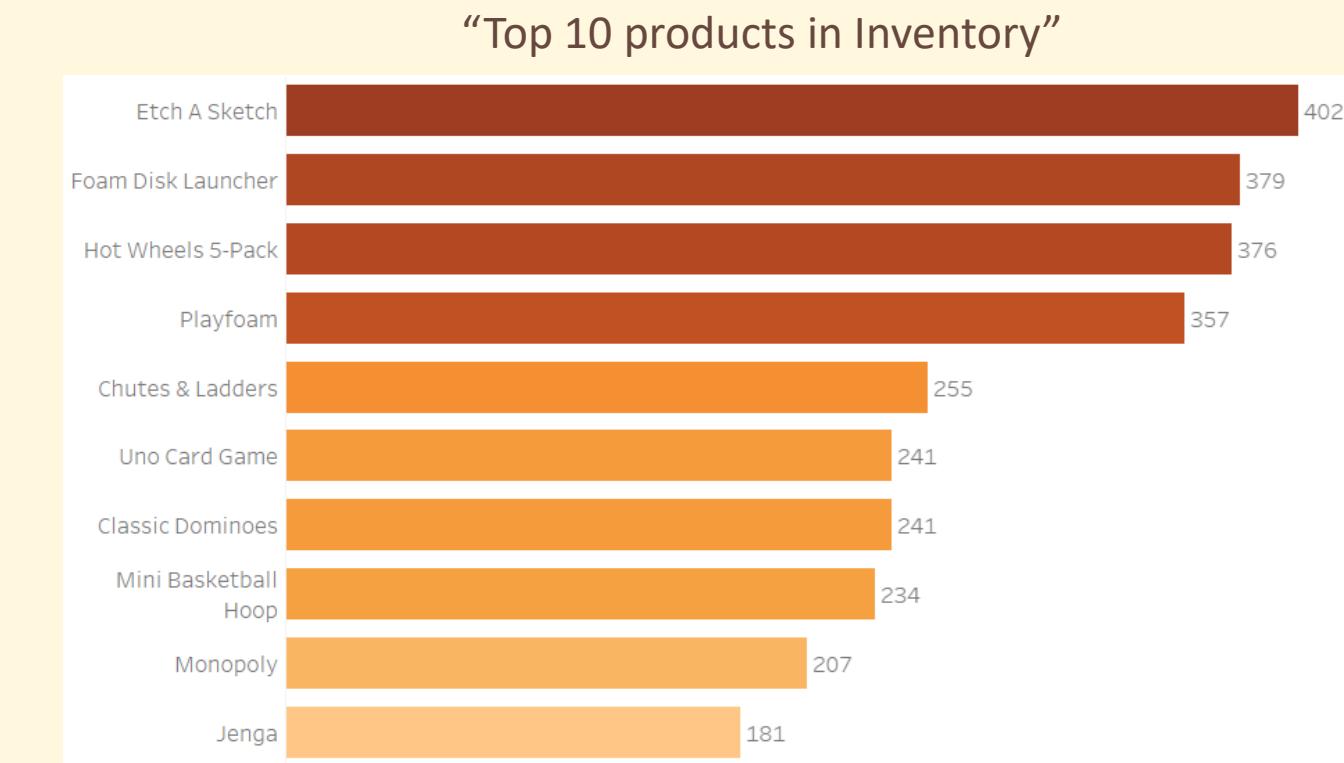
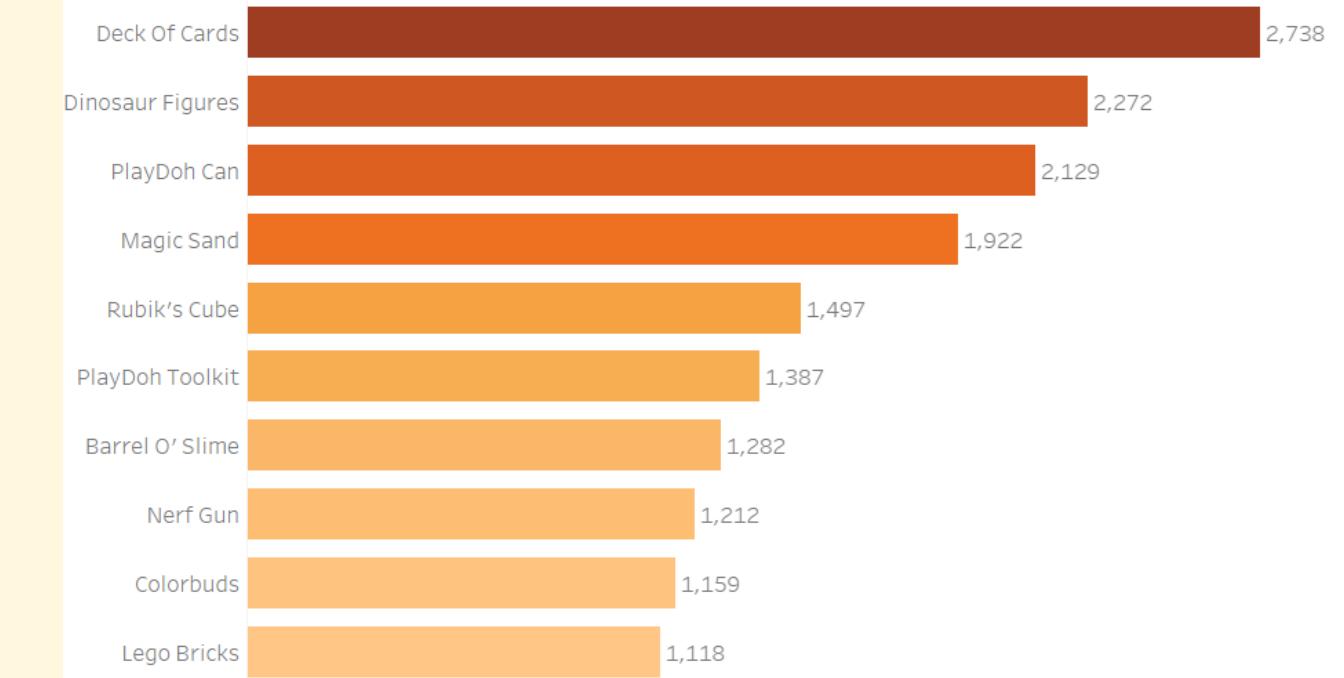
Recommendations

High Priority

3. Inventory:

Action: Align inventory levels with demand by reducing overstock for slow-moving items (e.g., Deck of Cards) and ensuring sufficient stock for high-demand products like Colorbuds, Lego Bricks, and Action Figures.

Impact: Improves cash flow by freeing up funds tied in unsold stock and reduces storage costs by minimizing overstock of slow-moving items.



"Least 10 products in Inventory"



Recommendations

Sales | By Store Location



Profit | By Store Location



Medium Priority

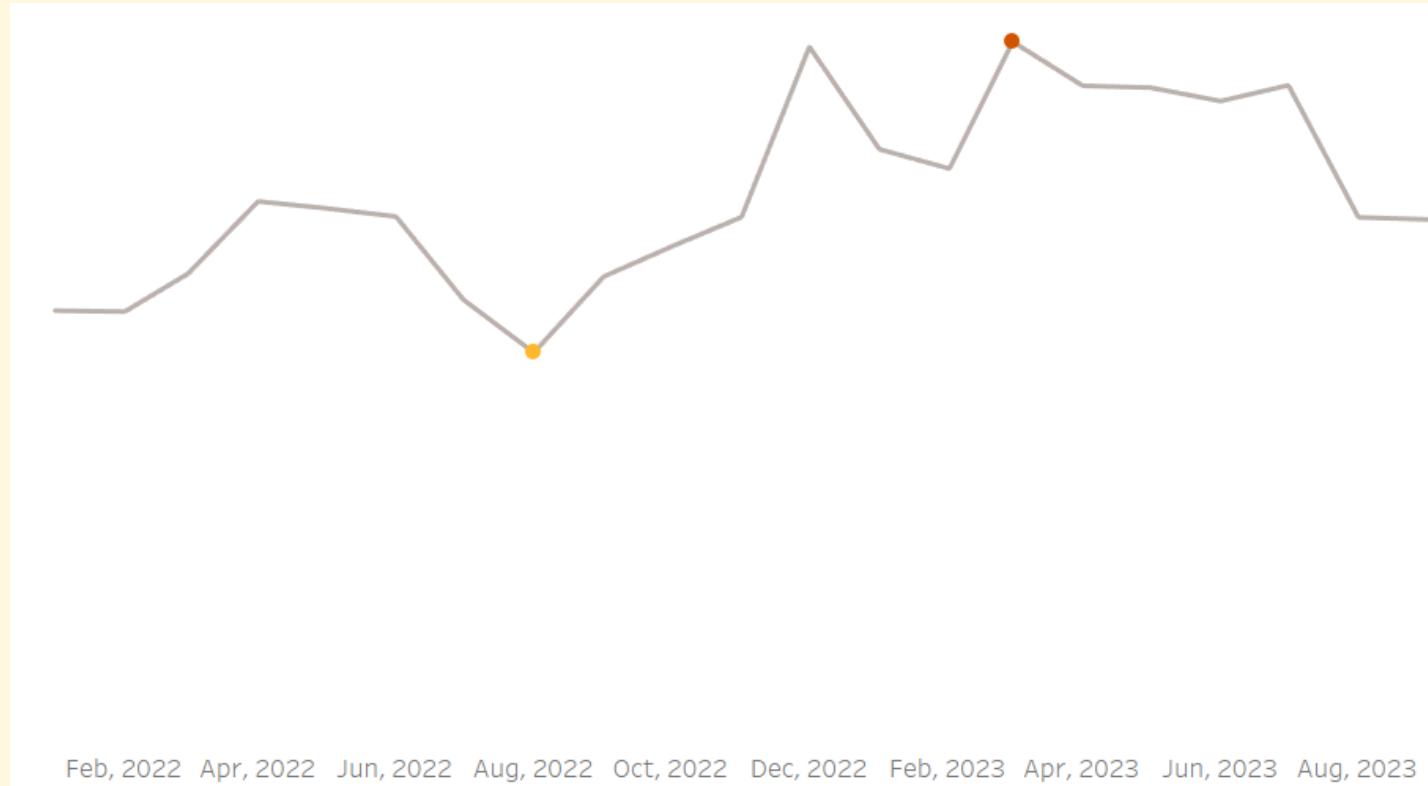
4. Expand Downtown Advantage:

Action: Introduce loyalty programs and targeted promotions at Downtown stores to further capitalize on their dominance.

Impact: Enhancing customer retention could add \$0.3M to annual revenue.

Recommendations

Medium Priority



5. Leverage Seasonal Trends:

Action: Use historical data to plan seasonal promotions, especially for Toys and Art & Crafts during holidays.

Impact: Targeted campaigns during these peak periods could drive a 5% increase in seasonal sales, translating to an additional \$0.35M in revenue.

Recommendations

Sales | By Store Location



Profit | By Store Location



Low Priority

6. Investigate Underperforming Locations:

Action: Analyze customer feedback and operational challenges at Airport and Residential locations.

Impact: Identifying and addressing issues could stabilize these regions and prevent further declines.

Conclusion

The data reveals both challenges and opportunities:

High Priority: Targeting Art & Crafts growth, revitalizing Electronics, and optimizing inventory directly addresses the largest opportunities and challenges.

Medium Priority: Expanding Downtown advantages and leveraging seasonal trends builds on strong performance and captures peak demand periods.

Low Priority: Investigating underperforming locations stabilizes weaker areas without diverting focus from high-impact opportunities.





Thank You

