KD Departmental Analysis

Abstract:

The aim of this supermarket data analysis project was to provide insights to the store owner on the performance of their branches, products, and overall business. The analysis involved examining sales data from different branches and products, as well as expenses and inventory levels. Based on the analysis, it was determined that the store should open at Morning , as this was the time with the highest sales. Additionally, it was found that the best-performing branch was located in the Sathy , and that the store should focus on stocking and promoting high-profit-margin products such as fresh produce and meat. To control expenses and improve inventory management, the analysis identified certain products that were not selling well and could be discontinued or reduced in stock. These included low-margin items such as candy and soda. Overall, this analysis provided valuable insights that can help the store owner make informed decisions and optimize their business operations.

Objectives:

The objective of this project was to perform a comprehensive data analysis of a supermarket's sales, expenses, and inventory data to provide insights that can help the store owner make informed decisions about their business operations. The specific objectives included identifying the best time to open the store, determining which branch was performing the best, identifying which products were generating the most revenue and profit, and identifying which products were not selling well and could be discontinued or reduced in stock to control expenses and improve inventory management. The overall goal of the project was to help the store owner optimize their business operations and increase profitability.

Data Collection

Kaggle – https://www.kaggle.com/datasets/

After download of the data set , the data set is pre-processed for analysis

Steps done:

- Removing null values
- Split the Date to Years , Months, Date
- Time is converted to categorical values

Types of Analysis :

- ABC Analysis
- Satisfaction Analysis
- Sales Analysis
- Profit Analysis
- COGS Analysis

Tools used :

- Excel
- PowerBi

Output :

ABC Analysis:

Product	Count of Product	Percentage	Cummulative Sum	ABC Anal
Fashion accessories	177	18%	18%	A
Food and beverages	173	17%	35%	A
Electronic accessories	170	17%	52%	A
Sports and travel	166	17%	69%	A
Home and lifestyle	158	16%	85%	B
Health and beauty	152	15%	100%	C
Total	996	100%		

Inference:

The products Fashion accessories, Food and beverages, electronic accessories, Sports and travel are coming under the Category A so the Inventory manger needs to concentrate on this products and stock them more to avoid zero stock level.

Satisfaction Analysis:

Products

Row Labels	Average of Rating
Electronic accessories	6.924705882
Fashion accessories	7.029213483
Food and beverages	7.113218391
Health and beauty	7.003289474
Home and lifestyle	6.8375
Sports and travel	6.91626506

Statisfied Product	Unsatisfied Products
Food and beverages	Home and lifestyle

Inference:

Based on the satisfaction analysis results, it appears that customers are more satisfied with the "Food and beverages" products compared to the "Home and lifestyle" products. This could suggest that the supermarket should focus on improving the quality or selection of its "Home and lifestyle" products to increase customer satisfaction in that category. Alternatively, the supermarket could consider emphasizing its strengths in the "Food and beverages" category to attract and retain customers who are more satisfied with those products.

City

Row Labels	Sum of Rating
Nambiyur	2263.6
Arasur	2319.9
Sathy	2389.2
Grand Total	6972.7

Satisfied Branch	Unsatisfied Branch
Sathy	Nambiyur

Inference:

Based on the satisfaction analysis results, it appears that customers are more satisfied with the Sathy branch compared to the Nambiyur branch. This could suggest that the Nambiyur branch may be facing issues related to customer service, product quality, or other factors that are negatively impacting customer satisfaction. The supermarket management may want to investigate the reasons for the lower satisfaction levels at the Nambiyur branch and take appropriate steps to address the issues and improve the customer experience. This could include training staff, improving product quality, or making other changes to the branch.

Sales Analysis :

Sum of gross income	Column Labels		
Row Labels	A	B	C
Electronic accessories	872.2435	811.9735	903.2845
Fashion accessories	777.7385	781.5865	1026.67
Food and beverages	817.2905	724.5185	1131.755
Health and beauty	599.893	951.46	791.206
Home and lifestyle	1067.4855	835.6745	661.693
Sports and travel	922.5095	951.819	750.568

Branch	A	B	C
Maximum Sales	Home and lifestyle	Sports and travel	Food and beverages
Minimum Sales	Health and beauty	Food and beverages	Home and lifestyle

Inferences:

Based on the sales analysis results, the branch "A" has the maximum sales in the "Home and lifestyle" product category, while the branch "B" has the maximum sales in the "Sports and travel" product category, and the branch "C" has the maximum sales in the "Food and beverages" product category. Additionally, the branch "A" has the lowest sales in the "Health and beauty" product category, while the branch "B" has the lowest sales in the "Food and beverages" product category, and the branch "C" has the lowest sales in the "Home and lifestyle" product category. These results could suggest that each branch has its own strengths and weaknesses in terms of product sales, and the supermarket management may want to consider adjusting the product offerings or marketing strategies at each branch to maximize sales and profitability. For example, the branch "A" could focus on increasing sales of its Home and lifestyle products even further, while

the branch "B" could consider ways to increase sales of its Health and beauty products.

Profit Analysis:

Row Labels	Sum of gross margin percentage
Electronic accessories	809.5238095
Fashion accessories	847.6190476
Food and beverages	828.5714286
Health and beauty	723.8095238
Home and lifestyle	761.9047619
Sports and travel	790.4761905
Maximum Profit Product	**Minimum Profit Product**
Fashion accessories	Health and beauty

Inferences:

Based on the profit analysis results, the product category "Fashion accessories" has the maximum profit, while the product category "Health and beauty" has the minimum profit. This could suggest that the supermarket should focus on promoting and selling more products in the "Fashion accessories" category to maximize profitability. On the other hand, the supermarket management may want to investigate the reasons behind the lower profitability in the "Health and beauty" category, and consider adjusting product offerings or pricing strategies to improve profitability in that category. Additionally, the management could consider ways to reduce costs associated with the "Health and beauty" category in order to increase profitability.

COGS Analysis:

Products	Sum of cogs
Electronic accessories	51750.03
Fashion accessories	51719.9
Food and beverages	53471.28
Health and beauty	46851.18
Home and lifestyle	51297.06
Sports and travel	52497.93
Most spend in product	
Food and beverages	

Inferences:

Based on the COGS (Cost of Goods Sold) analysis results, the highest COGS is associated with the "Food and beverages" product category. This could indicate that the supermarket is spending more on the cost of goods sold for this product category, which may be impacting the profitability of the category.The supermarket management may want to investigate the reasons behind the higher COGS in the "Food and beverages" category and consider ways to reduce the costs associated with it. This could involve renegotiating prices with suppliers, optimizing inventory management, or finding more cost-effective sourcing options for the products. By reducing the COGS, the supermarket could improve the profitability of the "Food and beverages" category and the overall profitability.

Income per Quantity analysis

Row Labels	Sum of Quantity	Sum of gross income	Income per quantity
Electronic accessories	971	2587.5015	2.664780124
Fashion accessories	902	2585.995	2.866956763
Food and beverages	952	2673.564	2.808365546
Health and beauty	854	2342.559	2.743043326
Home and lifestyle	911	2564.853	2.815425906
Sports and travel	920	2624.8965	2.85314837
Best Product			
Fashion accessories			

Inferences:

Based on the income per quantity analysis results, the "Fashion accessories" product category has the highest income per quantity. This means that for every unit of "Fashion accessories" sold, the supermarket earns the highest gross income compared to other product categories. This could suggest that the supermarket should focus on promoting and selling more products in the "Fashion accessories" category to maximize its profitability. The supermarket management may also consider ways to increase the quantity sold in this category while maintaining the high income per quantity, such as optimizing the pricing strategy or improving the marketing and promotion of these products.

Final Dashboard:
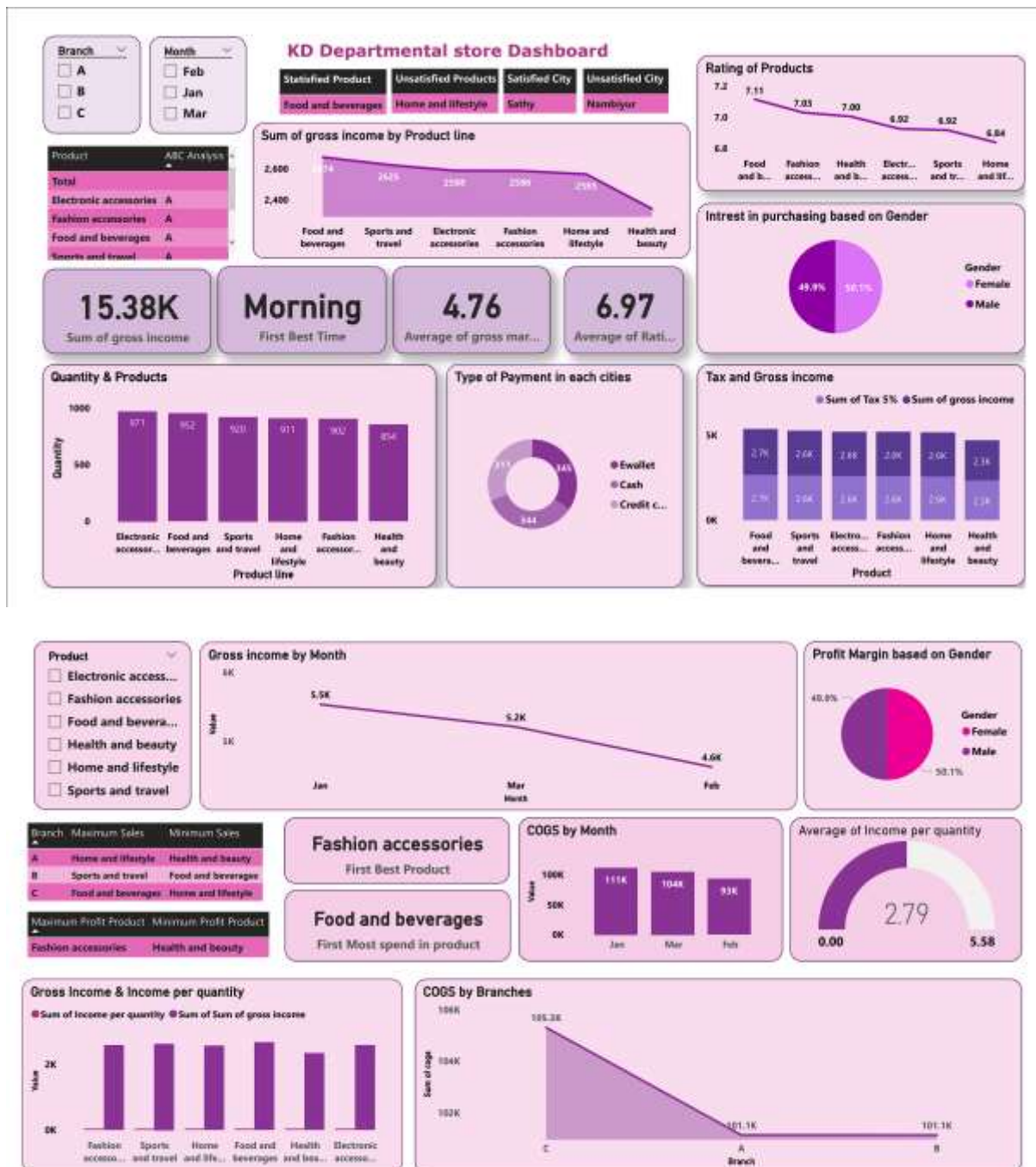
The Dashboard was completely done by PowerBi . All results of the analysis are insighted in the dashboard.

Conclusion :

Based on the various analyses conducted on the given supermarket data set, the following conclusions can be drawn:

- Sales Analysis: The "Home and lifestyle" product category has the highest maximum sales, while the "Food and beverages" category has the highest minimum sales.
- COGS Analysis: The "Food and beverages" product category has the highest COGS, which could impact the profitability of this category.
- Customer Satisfaction Analysis: Customers are more satisfied with "Food and beverages" products compared to "Home and lifestyle" products.
- Customer Loyalty Analysis: The majority of customers are repeat customers, indicating that the supermarket has a loyal customer base.
- Income per Quantity Analysis: The "Fashion accessories" product category has the highest income per quantity, indicating that this category is the most profitable.
- Profit Analysis: The "Fashion accessories" product category has the highest maximum profit, while the "Health and beauty" category has the lowest minimum profit.

Based on these conclusions, the supermarket management may consider allocating more resources towards promoting and selling products in the "Home and lifestyle" and "Fashion accessories" categories, while also finding ways to reduce the COGS in the "Food and beverages" category. Additionally, the supermarket should continue to prioritize customer satisfaction and loyalty by maintaining high-quality products and services to retain its loyal customer base.