SUPERMARKET ANALYSIS REPORT

GROUP 5

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OVERVIEW

- A supermarket is self-service shop offering a wide variety of food, beverages and household products, organized into sections. It is larger and has a wider selection than earlier grocery stores, but is smaller and more limited in the range of merchandise than a departmental store, hypermarket or big-box market.
- The growth of supermarkets in most populated cities are increasing and market competitions are also high. This dataset is one of the historical sales of supermarket company which has recorded in 3 different branches for 3 months data.

The Supermarket Outlet exist across three cities(Mandalay, Naypyitaw and Yangon) with three branches(A,B,& C) in all three cities.
It has a product line that comprises health and beauty, fashion accessories, home and lifestyle, sport and travel, food and beverages and lastly electronic accessories.
It operates everyday of the week from Monday to Sunday. As we know that supermarket is a place to be able to get all essentials and non-essentials because of it relatively low price of goods. Nevertheless, the objective of most supermarket is to sell products and earn the highest profit possible and also, to use best marketing strategy to fulfil customer retention.

PROJECT OBJECTIVES AND SUMMARY

- As Data Analysts, we were asked to use our knowledge of Python and Power BI to support the analysis for the supermarket outlet and help drive strategic actions.
- The use of python to perform exploratory data analysis on the Supermarket_Sales dataset
- The use of PowerBI to design a dashboard that visualizes the strategic insights generated from the dataset.
- The purpose of the project are:
  - To find high performing product from the supermarket product line portfolio.
  - To maximize profit.
  - To provide customer satisfaction.

DATASET AND TOOLS DESCRIPTION

- This dataset was provided as part of the Bootcamp Group Project by **Tech1m**. The dataset provides details about a supermarket outlet across 3 different branches for 3 months. It consists of the following columns and their respective descriptions; you can find that **here**.
- Dataset: Supermarket_Sales view **here**

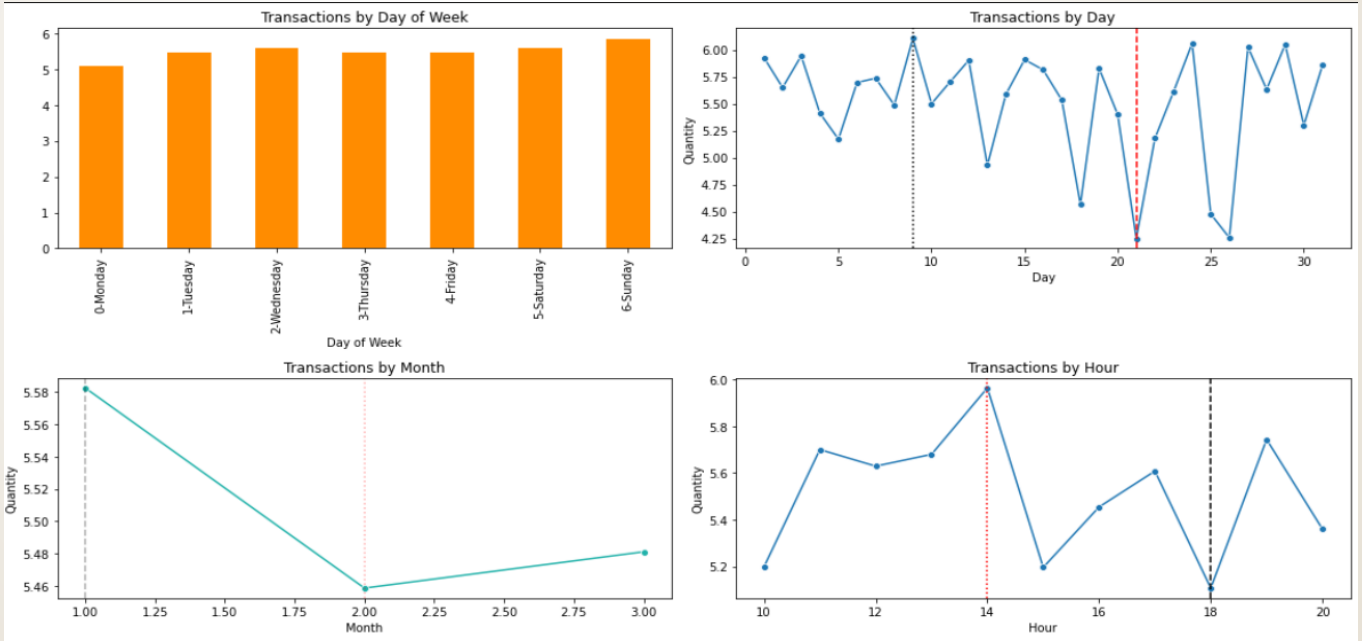
- EDA Tools: Excel, Python and PowerBI
  - **Excel** was used for visually inspecting the dataset(Data inspection/snooping).
  - **Python** was used as a programming language to perform exploratory data analysis on the dataset.
  - **PowerBI** was used as a Business Intelligence tool to visualize the data(Data Visualization).

- Notebook: VScode. To view the code click **here**.

EXPLORATORY DATA ANALYSIS

Data Exploration involves analyzing the Supermarket_Sales dataset to discover trends and patterns, generate insights while trying to understand the data in depth. We made use of python to explore the dataset. The link to the code is **here**.

1. Date Analysis



From The Date/Time Series Analysis in the images above:

i. The data was collated over the span of 3 months in 2019.

ii. The Supermarket operate all through the days of the week and open daily between the hours of 10:00am to 8:00pm

iii. Averagely, Sales perform better on '**SUNDAYS**' in the Supermarket Outlet

iv. More Quantity are sold at the '**second**' and '**fourth**' week of the month

v. Its peak sales occur around 'mid-day (2pm)' due to more traffic of customers and its lowest sales occur around '6pm' in the evening.

2. Product Sales Per City

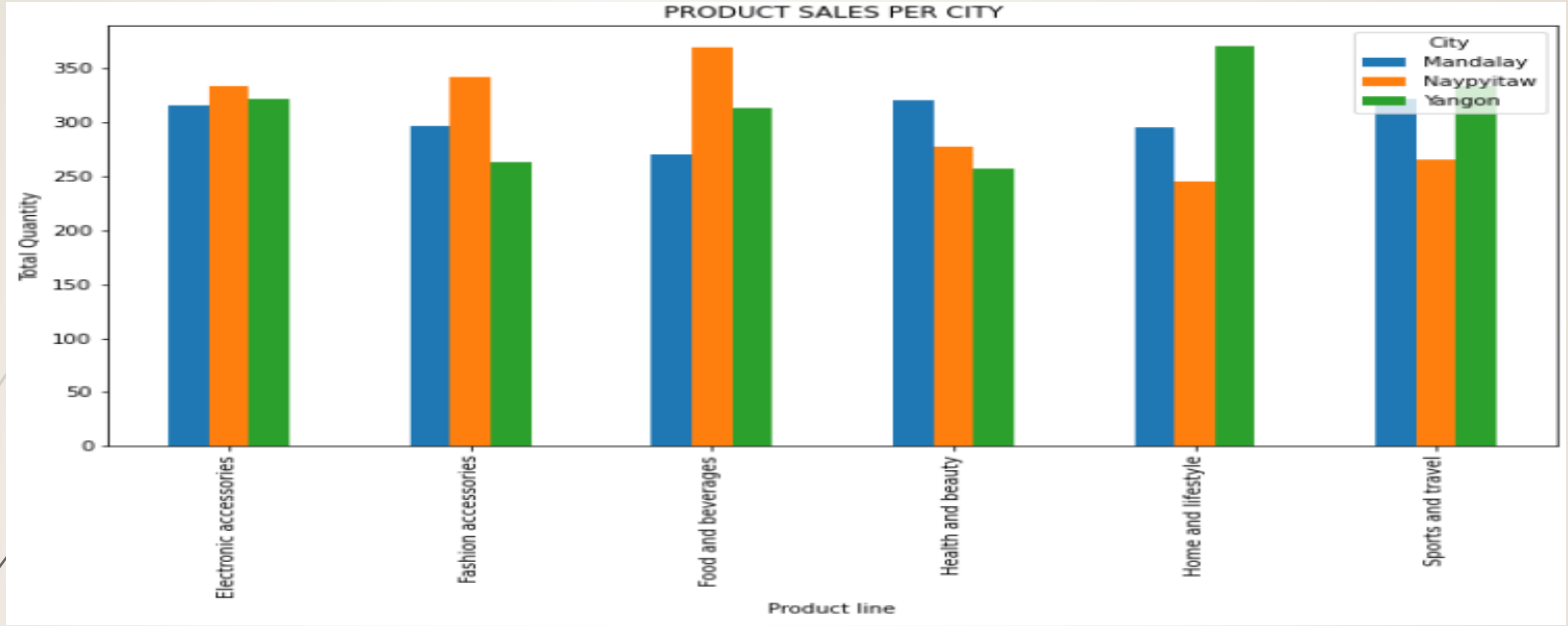
The Product Sales per City graph in the shows details of product lines that sold most across the three cities shows. This reports:

i. 'Sports' and 'Travel' Items as MANDALAY's **best selling product**

ii. NAYPYITAW had Food and beverages as its **top selling product**,

iii. While, **Home and Lifestyle** product sold more in YANGON,

iv. Averagely, Electronic accessories perform well across the city

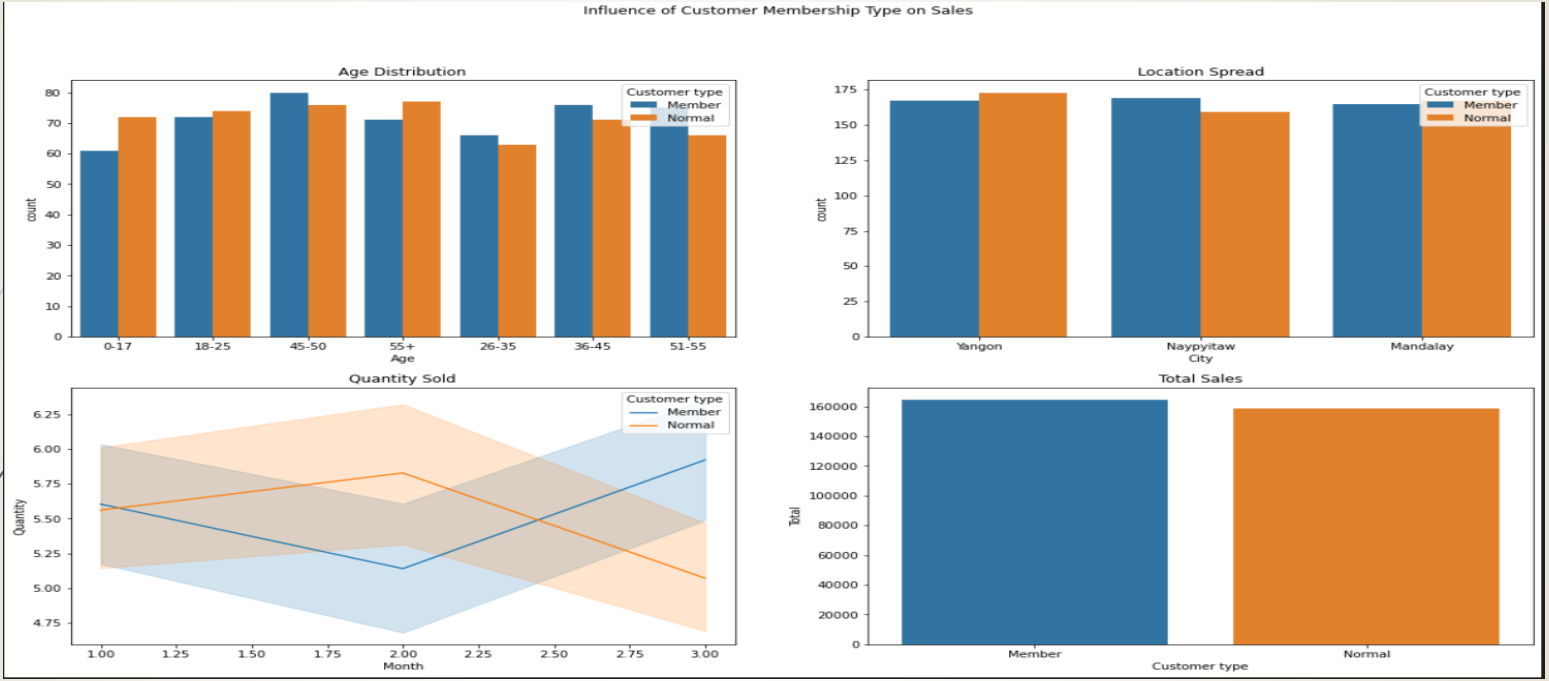


3. Total Sales(Price x Quantity) by Customer Type

This shows the **Member** customer type contribute more to total sales of products in the supermarket than **Normal,** that is **Member** show better patronage in terms of the total sales than **Normal**.

	Customer type	Total
0	Member	164223.444
1	Normal	158743.305

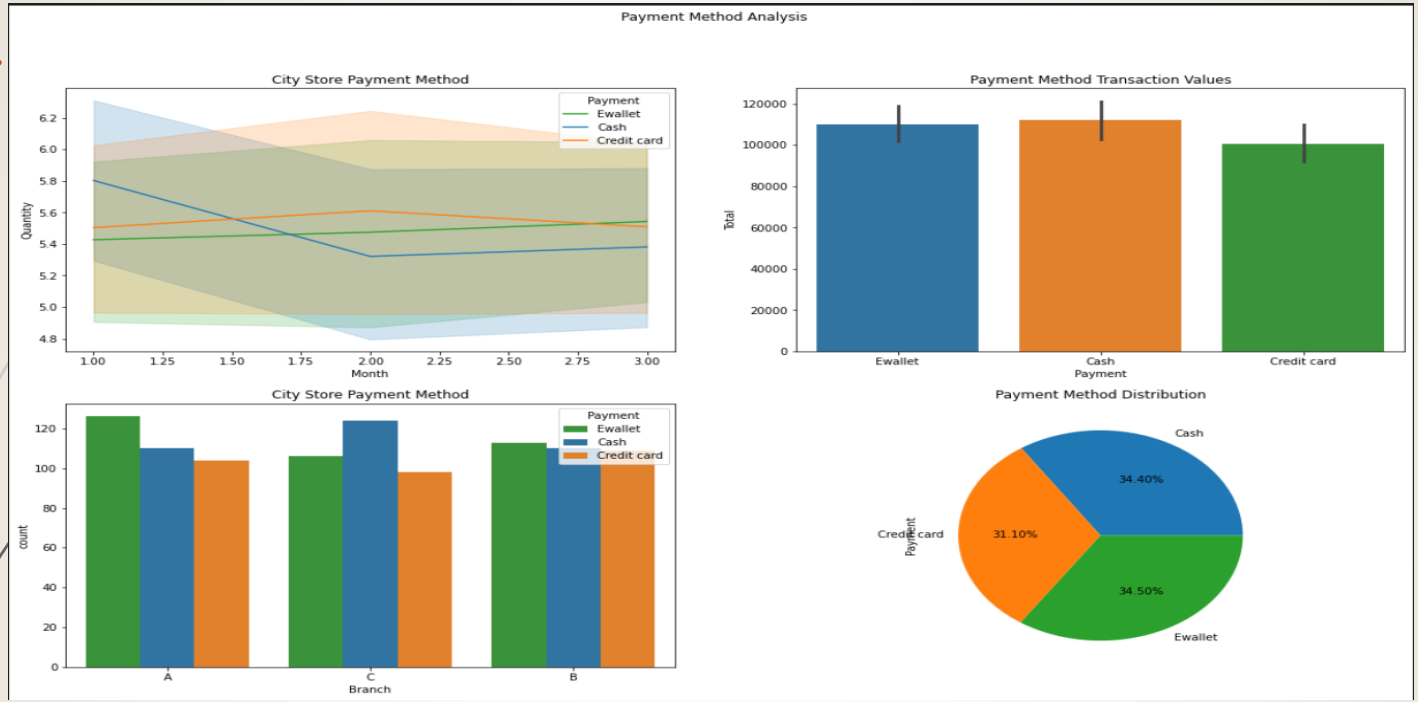
4. Influence of Membership Cards on Sale



From the visualizations, the insights shows that:

1. 45-50 Age group had more loyal customers than other age group.
2. Only **Naypyitaw** had more loyal customers to ordinary customers ratios than others.
3. There seems to be increasing sales from Loyal customers than Ordinary customers.
4. As a result of 3 more revenue are generated from the Loyal customers.

5. Analyzing Progress of the Payment Methods

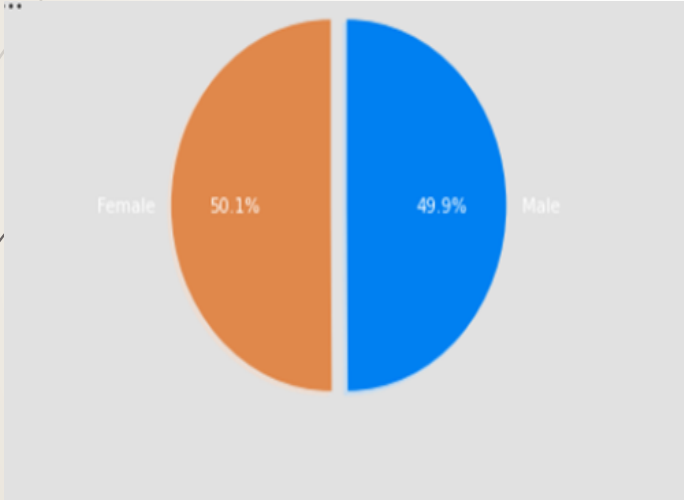


Insights from the above visuals in the previous slide:

1. The rate of supermarket e-wallet adoption is steadily increasing as against other methods.
2. Cash transactions still maintain the **heaviest transaction value** as compare to others but in terms of cash handling (merging credit and e-wallet as one), Cashless transactions maintain **better transaction value** and **quantity** than cash transaction.
3. Branch A has better e-wallet adoption progress than other branches.

6. Percentage Gender Distribution

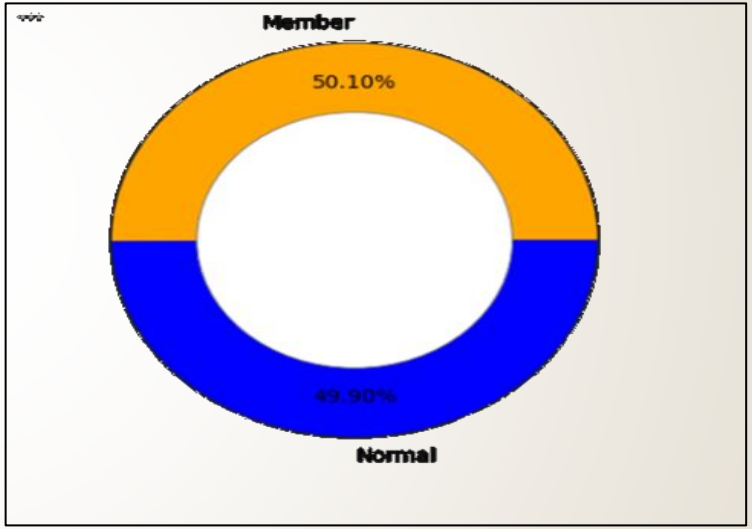
	Gender	Total	Percentage
0	Female	501	50.1
1	Male	499	49.9



The result in the above visuals showed a slightly better patronage from the female customers (50.1%) than the male customers.

7. Customer Loyalty Distribution

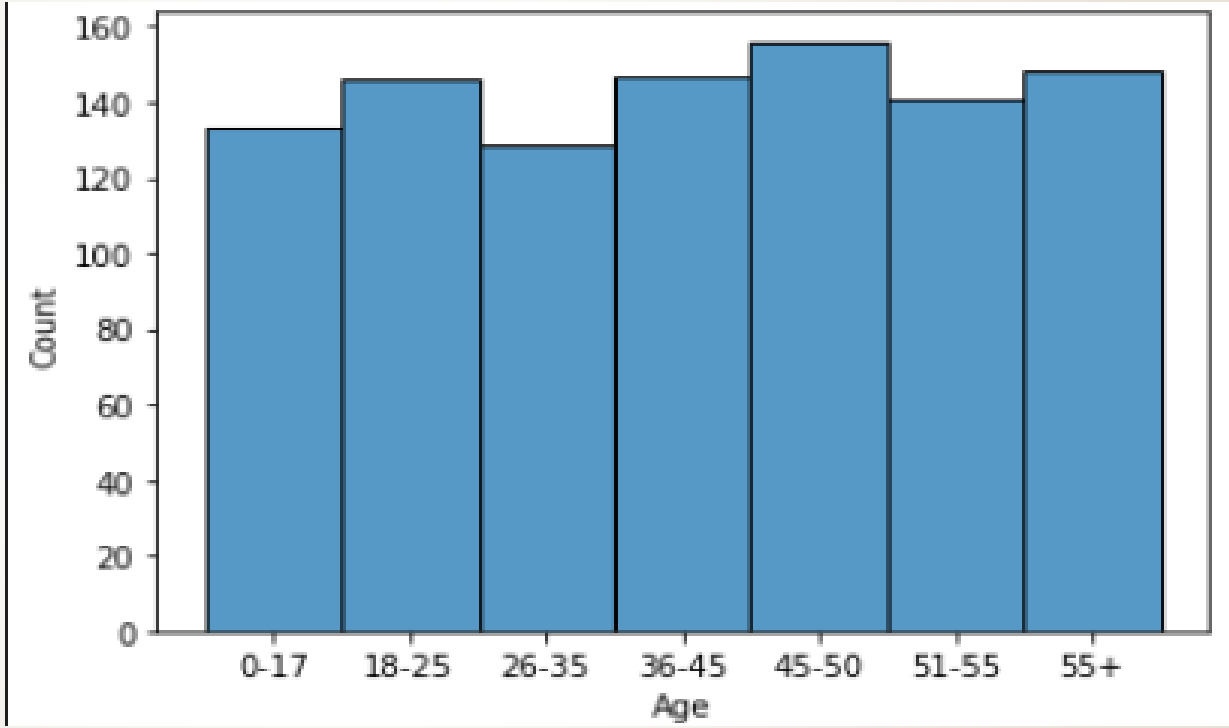
	Customer type	Total
0	Member	501
1	Normal	499



The Distribution Percentage of the Loyal Customers to Ordinary Customers Imitate that of the gender distribution with loyal customers taking a slight advantage over the normal customers.

8. Age Distribution

	Age	Total
0	0-17	133
1	18-25	146
2	26-35	129
3	36-45	147
4	45-50	156
5	51-55	141
6	55+	148



Even though patronage is somewhat similar among all age groups, The Business experienced more patronage from customers within the 45-50 years age bracket.

9. Popular Payment Methods

Payment	Total Transaction	Transaction Values
Cash	344	112206.570
Credit card	311	100767.072
Ewallet	345	109993.107

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Payment
Cash          344
Credit card   311
Ewallet       345
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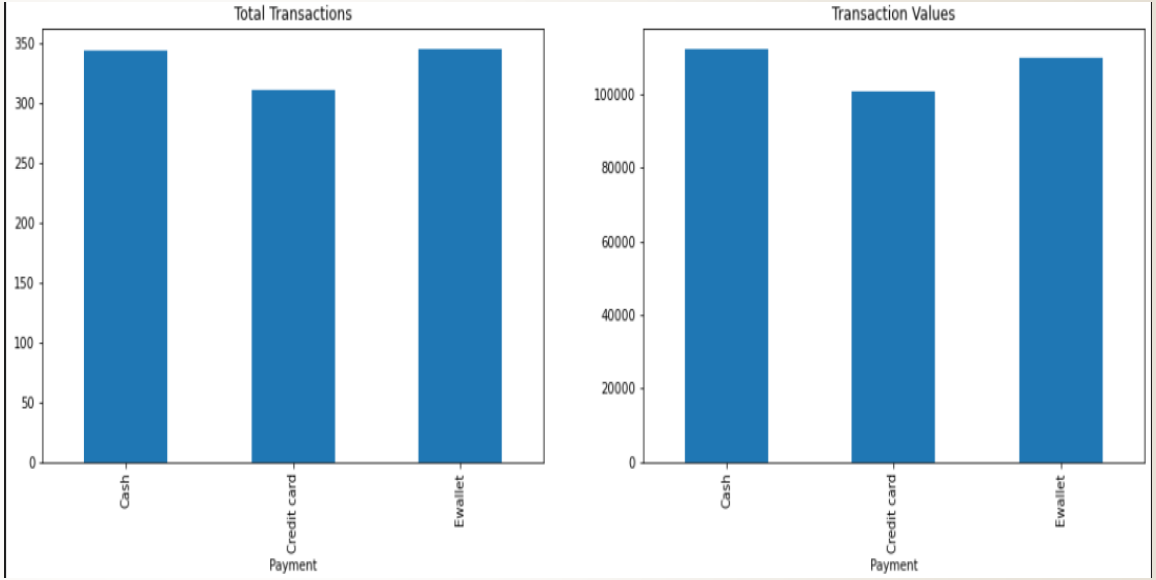


Note: From the visuals above, it is observed that the business effort to reduce access to cash is successful so far with major payment methods being the usage of credit card and e-wallet. Even though cash transactions brought in more revenue in transactions as compared to the other two, we believe it might be due to the provision of incentives to encourage cashless payment (special discount)

10.Top Products

Product line	Total Quantity	Transaction Values
Health and beauty	854	49193.7390
Fashion accessories	902	54305.8950
Home and lifestyle	911	53861.9130
Sports and travel	920	55122.8265
Food and beverages	952	56144.8440
Electronic accessories	971	54337.5315

Even though **Electronic** Accessories experienced more quantity sales among all the product offered on the shelf, food and beverages generated more revenue in compare to other products.

11. Top Branch Sales

	sum	
	Quantity	Total
Branch		
A	1859	106200.3705
B	1820	106197.6720
C	1831	110568.7065

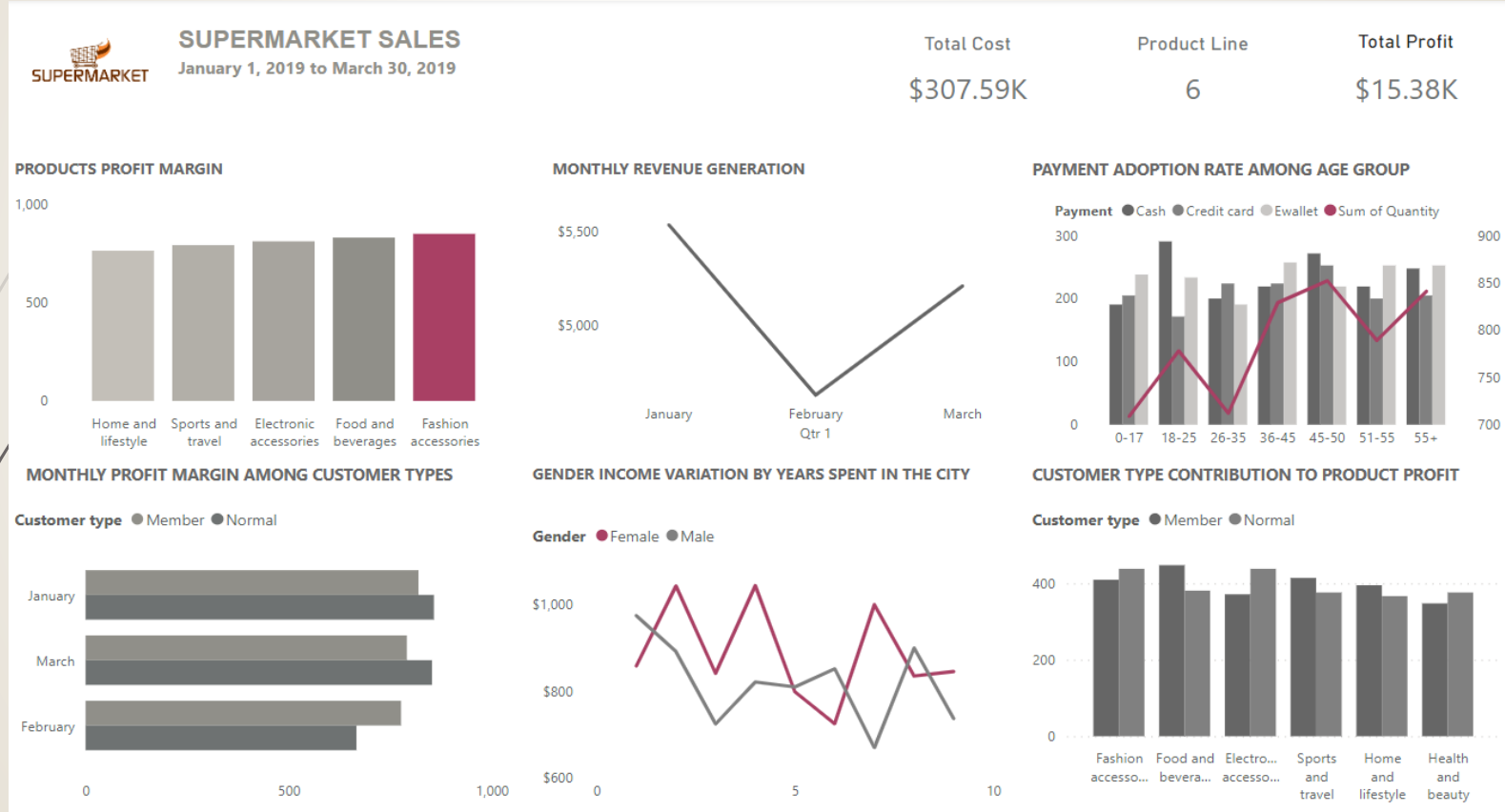
Even Though **Branch A** experience more **quantity sales** as compared to other branches, Branch C and Even B averaged more sales per product than it.

12. City Sales

	Quantity	
Customer type	Member	Normal
City		
Mandalay	924	896
Naypyitaw	897	934
Yangon	964	895

The City Sales also follow the branch sales as Branch A, B and C are located in Mandalay, Naypyitaw and Yangon respectively. Deriving insights from other perspectives, it is observed that, in compare to other city branches, only Naypyitaw had more product sales to ordinary customers than loyal customers.

DATA VISUALIZATION



CONCLUSION

- Marketing Strategy

Based on the analyzed data, The following recommendations are suggested:

1. The Loyalty Program should further continue across the branches and special focus should be placed on branch C through slightly higher discount offers to ensure meeting up with other branches in terms of customer conversions and growth.
2. More products line should be introduced across the store branches.
3. Introduction of events like weekly or monthly sales and promotions to drive traffic; additionally, the supermarket could offer in-store events and workshops.

- Effect of Loyalty Card Issuance on Sales

Even though not every branch experience relatively more sales from its loyal customers as compared to the ordinary customers but overall sales (both in quantity and relative transaction values) peaked from the Loyal customers in compare to the Ordinary customers.

Thank You