Communication and Visualization for Data Analytics

Final Project Report

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Abstract

This analysis reports on CBA Co., Retail Company performance indicators, encompassing customer preferences, customer demographic categorization, membership status, store locations and performance, and product sales performance. Via analysis, this report aims to gain a comprehensive understanding of customers and store performance through data and provide actionable recommendations to enhance customer experiences, derive marketing plans and optimize operations. To achieve these objectives, visualization and storytelling techniques will be utilized to support the business departments in achieving the company's strategic goals and improving overall business performance.

Introduction

In the highly competitive retail industry, customer insights have become essential for success. By analyzing customer data, retailers can gain valuable information about preferences, behaviors, and needs. This enables them to create personalized experiences, develop targeted marketing campaigns, optimize product offerings, and enhance customer satisfaction. Customer insights empower retailers to understand and cater to their customers' specific preferences, leading to stronger relationships, increased loyalty, and a competitive edge in the market.

The dataset analyzed in this report is permitted by CBA Company, a giant Retailer operating in Canada, Mexico and across regions of the United States. It includes variables

describing customer demographic and shopping preferences (Age, Zip Code, Type of Customers, Type of Membership, buying categories, last shopping period, …) and variables about the company network of warehouse stores (Region, Number of Warehouse, Distance, …)

By analyzing this dataset, this report aims to acquire valuable insights to drive operational efficiency in this specific context. Via understanding buying patterns and demand, CBA company can streamline inventory management, supply chain operations, and store layouts. This ensures the right products are available at the right time and reduces costs. Additionally, customer insights help CBA Co., differentiate themselves by offering unique experiences, tailored offerings, and superior customer service. In a customer-centric retail landscape, leveraging customer insights is crucial for long-term success and staying ahead of the competition.

Key findings

This report applied structural analysis of the comprehensive dataset on CBA Retail Company customers. From the insights uncovered, this repor will discuss the below proposal for leveraging the operational advangtages and trends in customers preferences for optimize business efficiency and enhance customers experiences:

- Due to our customers Age demographic and the relevancy between shopping prefences and proximity to physical stores, E-commerce portal has a significant potential in leveraging our ability to serve customers in distant areas and adaption to digital age trends.
- Executive Membership program is proving to be beneficial to our performance in term of revenue and customer engagement. Hence, further efforts and analysis should be focused to retain and expand our Executive Members base with initiates discussed in later parts.

Objectives

- Conduct data cleaning using Python to ensure data consistency and reliability.

- Create visualizations using Tableau to visually represent the insights derived from the cleaned data.

- Tailor the dashboards for the Marketing team, Account Membership team, and Store Development team to address their specific needs and support data-driven decision-making.

- Discuss insights and propose actionable initiates to elverage our advantages.

Methodology

The dataset provides in-depth information on retail store customers' demographics, account details, and shopping patterns in 20 variables and 120,450 rows. It encompasses a broad range of attributes such as membership accounts, membership types, demographics, shopping behaviors, and location data. This comprehensive dataset is a valuable resource for analyzing and gaining insights into the preferences and behaviors of retail store customers.

In order to ensure data consistency and facilitate analysis, the dataset underwent a thorough data cleaning process using Python. Python provides a range of powerful tools and libraries for tasks such as handling missing values, removing duplicates, and standardizing data formats. By leveraging Python's data cleaning capabilities, the dataset was prepared for further analysis, ensuring accurate and reliable insights.

Once the data cleaning process was completed, visualizations were generated using Tableau. By utilizing Tableau's features, the cleaned data was transformed into informative visual

representations, making it easier to identify patterns, trends, and relationships within the data. These visualizations enable stakeholders to gain actionable insights and make data-driven decisions to optimize operations, improve customer experiences, and drive business growth.

To cater to the specific needs of different teams within the retail store, three separate dashboards are created using Tableau which focus on:

- Marketing team dashboard focuses on customer segmentation, preferences, and targeted marketing strategies.
- Membership team dashboard provides insights into membership types, account details, and customer retention strategies.
- Store Development team dashboard highlights visit frequency, revenue patterns, and regional performance to optimize store locations and resource allocation.

By tailoring the dashboards to the specific requirements of each team, the retail store can effectively address the concerns and questions of the Marketing team, Membership team, and Store Development teams enabling them to make informed decisions and enhance their respective areas of responsibility. The insights derived from this dataset will support data-driven decision-making, leading to improved operational efficiency, customer satisfaction, and overall business success for the retail store.

Data Cleaning

To ensure consistency and facilitate analysis, data cleaning process was carried out using Python. The following steps were followed:

- **Removal of Duplicate Values:** A total of 14,022 duplicate rows were identified and removed. These duplicates had identical account numbers, account types, membership types, home regions, warehouses, and ages.

- **Replacing Values with Category Names:** In the "B/C Member" column, numeric values 1 and 2 were replaced with the corresponding categories "Consumer" and "Business" to avoid confusion. Similarly, the "EXCFLG" column's values, E and N, representing Executive and Non-Executive, were replaced with their respective category names.

- **Addition of New Columns:** Two new columns, "Age Group" and "Distance Range," were created. The "Age Group" column grouped age values for easier analysis, while the "Distance Range" column grouped distance values to facilitate analysis based on proximity.

- **Verification of Missing Values:** It was determined that no missing values were present in any of the attributes of the dataset.

After completing the data cleaning process, the dataset consisted of 106,428 rows and 22 columns, ensuring uniformity, and removing inconsistencies for smooth analysis.

Overview of Dataset

The table below presents details regarding the type of information available in the dataset, along with the data type and definition for each variable:

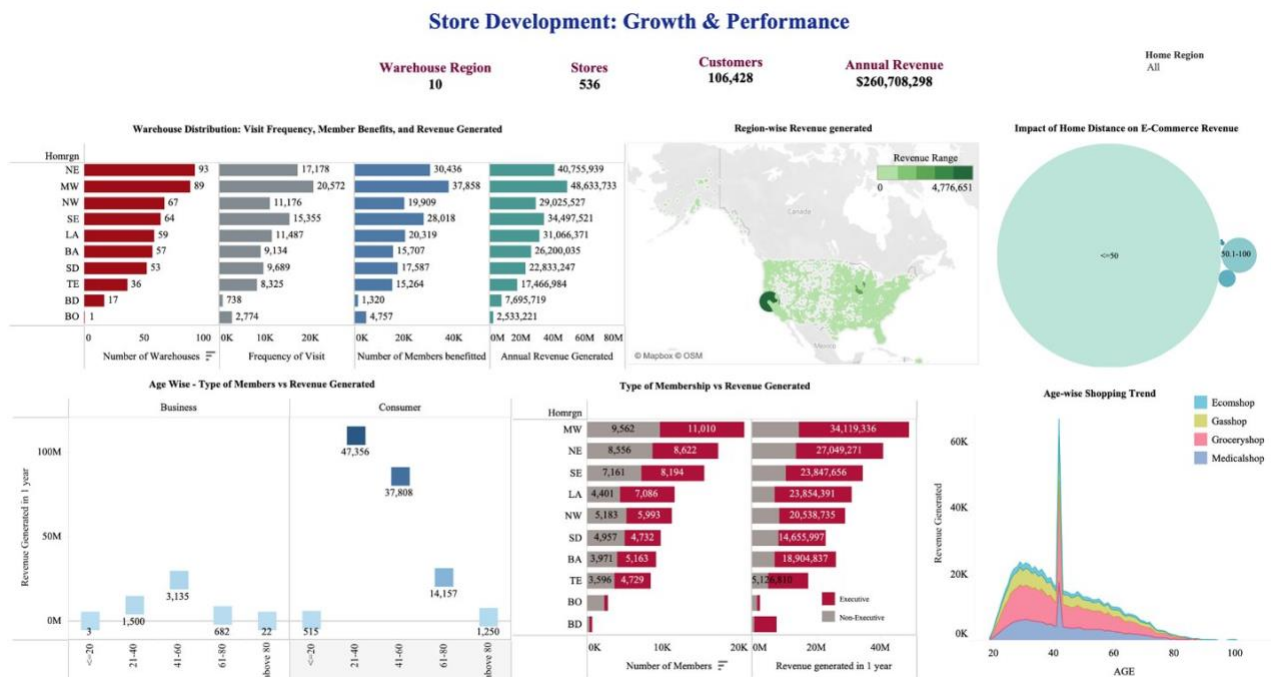| Variable Classification and Definition		
Type of Details	**Variables**	**Definition**
Account Identification	AC-Num	Unique Account Number of Member - It is a unique identifier assigned to each member's account.
	B/C Member	Account Type - It indicates whether the member is classified as a Business or Consumer member.
	EXCFLG	Executive membership - It indicates whether the member has an Executive membership
	AGE	Age of Primary member - It represents the age of the primary member associated with the account.
	AGE GROUP	Age Group - The age values are grouped under categories
	TENURE	Tenure of the entire membership - It indicates the length of time the membership has been active.
Geography Identification	HOMRGN	Home Region - It represents the region where the member's home address is located.
	HOMWHS	Home Warehouse - It denotes the specific warehouse that is considered the member's home location.
	ZIPCODE	Zip code of the home address - It represents the zip code of the member's home address.
	MBRCOUNT	How many members in the account - It denotes the number of members associated with the account.
	DISTANCE	Distance to the nearest warehouse - It represents the distance from the member's home address to the nearest warehouse.
	DISTANCE RANGE	Distance Range - The distance to the nearest warehouse values are grouped under categories
	HOMEFCTYCHANGE	Is there current home facility different from enrolled warehouse? - It indicates whether the member's current home facility (warehouse) is different from the initially enrolled warehouse.
	RECENT MOVING	Did they change the home address in our system during the recent 6 months? - It indicates whether the member has changed their home address in the system within the last 6 months.
Shopping Habits	Last Shopping	Number of days elapsed since last shopping - It indicates the number of days that have passed since the member's last shopping trip.
	SHOP1YR	Shop amount for the year - It represents the amount spent on shopping by the member within the past year.
	SHOP6M	Shop amount for 6 months - It represents the amount spent on shopping by the member within the past 6 months.
	SHOP3M	Shop amount for 3 months - It represents the amount spent on shopping by the member within the past 3 months.
	ECOMSHOP	E-commerce amount over total shopping - It represents the amount spent on shopping specifically at e-commerce compared to the total shopping amount.
	GASSHOP	Gas Shop amount over total shopping - It represents the amount spent on gas purchases at the warehouse compared to the total shopping amount.
	MEDICALSHOP	Medical item Shop amount over total shopping - It represents the amount spent on medical item purchases at the warehouse compared to the total shopping amount.
	GROCERYSHOP	Grocery Shop amount over total shopping - It represents the amount spent on grocery purchases at the warehouse compared to the total shopping amount.

The 22 variables are divided into three categories:

- **Account Identification:** including Account number, Account type, Executive membership, Tenure and Age. This identification helps to identify essential information and categorize customer accounts into groups. During later steps, identification will also allow for filtering target groups with efficiency.

- **Geography Identification:** including Home Region, Home Warehouse, Zip code, Distance and home change. In retail industry, distance to the nearest accessible store is critical in retaining customer loyalty which is why this identification plays a crucial role in strategic development.
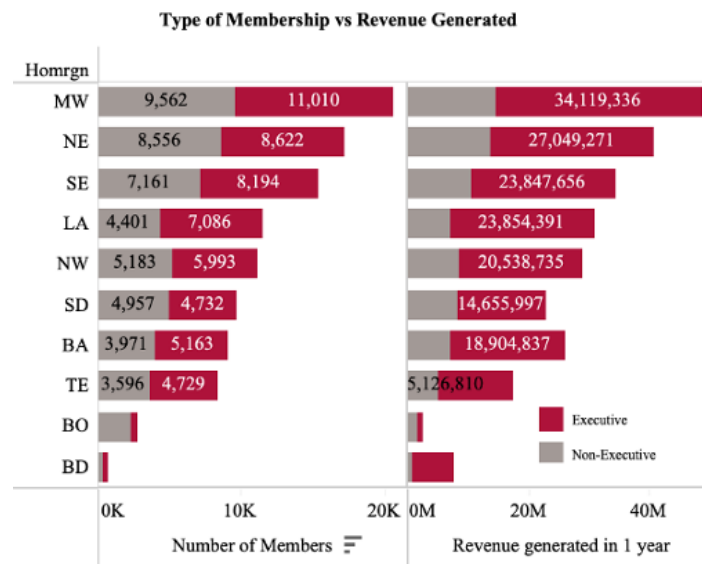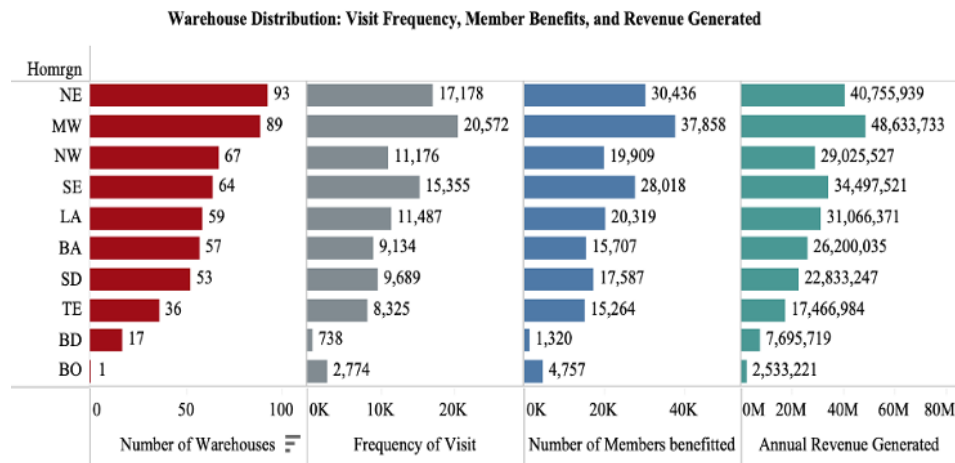
- **Shopping Habits:** including shopping amount in different intervals, e-shopping amount, and product categories. This characterizes the consuming tendency and habits and by matching this with identifications, we can locate key findings affecting customer experiences.

Store Development Team

The Store Development dashboard provides crucial insights for retail stores' operations, enabling informed decision-making, enhanced store development strategies, and improved operational efficiency and customer satisfaction. This dashboard summarizes the key insights gained from the visualizations, highlighting their relevance to optimizing logistics, improving member experience, and strengthening warehouse planning and stock management.

Store Development: Growth & Performance

1. Warehouse Distribution and Member Benefits:

Warehouse Distribution: Visit Frequency, Member Benefits, and Revenue Generated

Homrgn	Number of Warehouses	Frequency of Visit	Number of Members benefitted	Annual Revenue Generated
NE	93	17,178	30,436	40,755,939
MW	89	20,572	37,858	48,633,733
NW	67	11,176	19,909	29,025,527
SE	64	15,355	28,018	34,497,521
LA	59	11,487	20,319	31,066,371
BA	57	9,134	15,707	26,200,035
SD	53	9,689	17,587	22,833,247
TE	36	8,325	15,264	17,466,984
BD	17	738	1,320	7,695,719
BO	1	2,774	4,757	2,533,221

Type of Membership vs Revenue Generated

| Homrgn	Number of Members (Non-Executive / Executive)		Revenue generated in 1 year
MW	9,562	11,010	34,119,336
NE	8,556	8,622	27,049,271
SE	7,161	8,194	23,847,656
LA	4,401	7,086	23,854,391
NW	5,183	5,993	20,538,735
SD	4,957	4,732	14,655,997
BA	3,971	5,163	18,904,837
TE	3,596	4,729	5,126,810
BO			
BD			

Legend: Executive, Non-Executive

The two bar graphs analysis revealed the following insights:

- The Midwest (MW) region stands out with a higher visit frequency of 20,572, resulting in significant member benefits for 37,858 individuals.

- The BO region attracts a notable number of visitors despite having only one warehouse, indicating strong member engagement.

- Except for the BO region, all other regions show higher annual revenue from executive members.

- In the BO region, revenue is nearly equal between the two membership types, presenting a unique pattern.

These insights help optimize revenue generation, member benefits, and logistics, allowing retail stores to strategically allocate resources and enhance the overall member experience.

2. Geographic Presence and Warehouse Planning
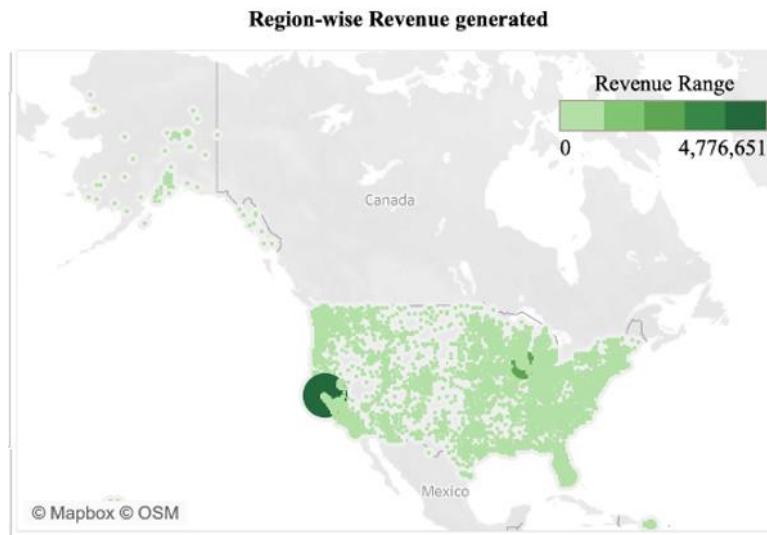
The map visualization provided the following key insights:

- There is a higher concentration of retail stores in the USA compared to Canada.

- The California region generates the highest revenue among all regions.

This information enables strategic decision-making regarding market expansion, store optimization, and resource allocation. Retail stores can leverage these geographic insights effectively to maximize revenue and ensure efficient warehouse planning.

3. Impact of Online Shopping based on Distance to Nearest Warehouse

The analysis of the packed bubble chart revealed the following findings:

- A considerable portion of online shopping revenue is generated by members living within a 50-mile radius of the store.

- Members residing within a 100-mile radius also contribute significantly to online sales.

Impact of Home Distance on E-Commerce Revenue

<=50   50.1-100
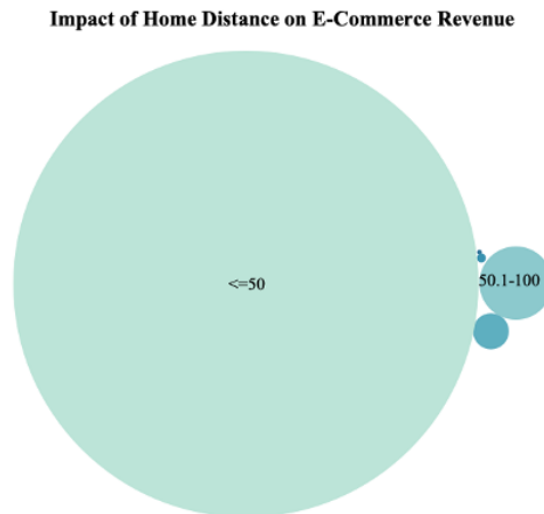
These findings suggest that proximity to the warehouse strongly influences members' participation in online shopping. However, there is a significant opportunity to increase online sales among members residing in distant regions. Retail stores can leverage targeted marketing strategies, optimize delivery services, and ensure efficient reach to these remote areas to tap into

this potential. This information also assists in making informed decisions about store locations, strategically placing them to cater to members within different distance ranges.

4. Age-Revenue Correlation for Store Development and Optimization


Age Wise - Type of Members vs Revenue Generated
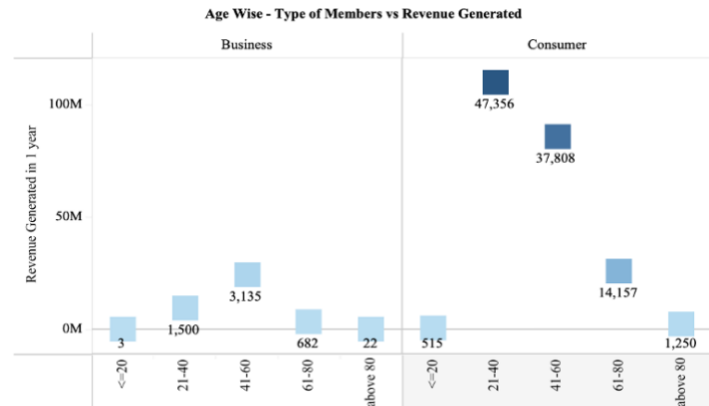
The scatter plot analysis provided the following insights:

- Consumers contribute higher revenue compared to businesses in store development and optimization.

- The age group of 21-40 significantly influences consumer revenue, while the 41-60 age group holds the most impact on business revenue.

These findings emphasize the importance of tailored marketing strategies and product customization to cater to these age groups, ultimately maximizing revenue in both consumer and business segments. Additionally, this analysis can facilitate store layout optimization, efficient warehouse planning, and stock management based on the preferences of various age demographics. Further analysis by filtering for each region can provide deeper insights into regional preferences.

5. Store Categories and Shopping Trend for Warehouse Planning/Stock Management
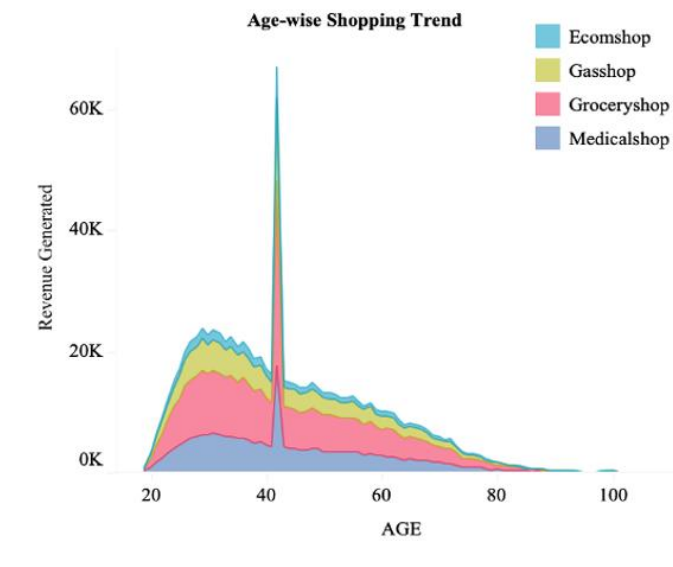
The analysis of store categories revealed the following trends:

- E-Commerce stores generate the highest revenue, followed by Gas, Grocery, and Medical shops.

- Members in the age group of 40-42 contribute the most to revenue, closely followed by members around 30 years old.

These findings provide valuable insights for warehouse planning, stock management, and product assortment decisions. Retail stores can develop tailored strategies for specific member segments, leveraging the preferences of different age groups to maximize revenue and optimize stock allocation.

Membership Team

In regard of Membership Dashboard, the focus turns to Membership Account (Exetutive and Non-Executive) perspective to uncover shoping patterns and preferences.

Executive members are customers who register annually paid membership and benefit from Rewards scheme based on the volumes they accumulate. Therefore, they tend to have a strong engagement with brand as well as higher shopping frequency than non-Executive customers.

The Membership Dashboard goal is to capture the status of Customers overall and Executive Membership in particular. From these insights, we would propose recommendations to optimize customer-based revenue streams, enhance customer experiences as well as retain current Executive Members.
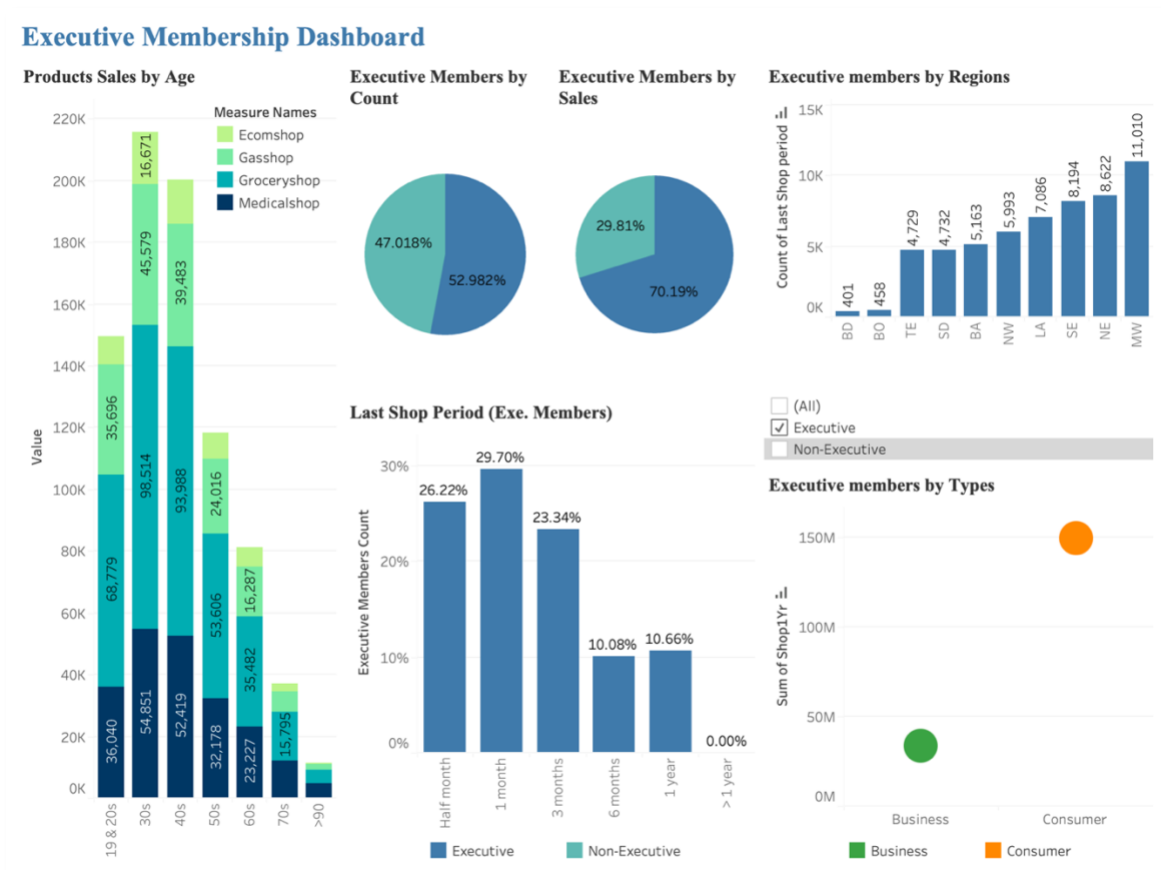
1.Customers spending shows particular trends in regard of Products and Age Group.

The first barchart, *Product Sales by Age groups*, takes an overall look at all customers spending accumulated during one year period, there are several trends to be noticed:

- Grocery category takes up the major part in customer spending for all Age Groups except above 80. In some case, the grocery volume even doubles the second highest selling product group. Our customers might find our grocery catergory the most attractive and convenient.

- On the other hand, E-commerce revenue is the lowest across all customer age groups. This might restrict our ability to reach our customers when direct shopping is hindered or even blocked during extreme cautions (such as extreme weather or pandemic).

	Age Group						
	19 & 20s	**30s**	**40s**	**50s**	**60s**	**70s**	**>80**
Ecomshop	5.97%	7.73%	7.20%	7.29%	7.71%	6.94%	3.72%
Gasshop	23.89%	21.14%	19.71%	20.28%	20.04%	18.55%	15.55%
Groceryshop	46.03%	45.69%	46.92%	45.26%	43.67%	42.35%	39.84%
Medicalshop	24.12%	25.44%	26.17%	27.17%	28.58%	32.17%	40.89%
Grand Total	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**100.00%**

- It is clearly shown that the 30s and 40s are the highest spending group in all of our customers, next is the 20s group. The distribution is heavily right skewed in regard of spending by Age Groups.

These significant trends can help us to derive strategy to enhance customers experience, such as increasing the products catering to the 30s, 40s and 20s Age Groups, especially in Groccery department.

2.Executive Customers contribute a significant part in our total revenue.

The two pie charts in the middle, *Count and Sales volume of Executive and Non Executive charts,* help us understand that even though Executive Members only take up around 53% of all total customer counts, but they contribute the majority 70% of revenue total.

Executive are paid membership and can benefit the more they spend on shopping. This strengthen their engagement with our brand and services. The piecharts confirm once again Executive Membership play a critical part in our revenue stream and Company should promote Membership registration to acquire more registered membership.

3.More than 20% of Executive members have not made purchase for the last 6 months or more.

In relation of the piecharts on Executive members ratios, we further track the last time our Executive Members made a purchase in the top right corner chart. An alarming 20% of Executive Members had not made any purchases in the last 6 months.

It is generally known that the cost of acquiring new customers can be five or seven times more than retaining current customers. Therefore it is of extreme importance that we find a way to maintain current Executive members by engaging them to re-visit and make purchase with us as soon as possible.

4.Executive Customers by Regions and Types.

The barchart of *Executive Members by Regions* tells us that our regions are performing equally well in terms of number of Executive Members with MW is leading in all areas, except for BO and BD areas.

It should be brought to attention that BD and BO are doing poorly in term of acquiring Executive Members, almost 10 times behind compare with TE, the closest ranking area. Moreover, when further compared with the *Total Executive and Non-Executive in Regions* chart below, we can see that in BO area, the number of Non-executive members are significantly higher than Executive Members, while for other areas, the ratio is almost equally divided.

These insights require for further investigation to uncover the root causes for low membership acquisition of these 2 areas.
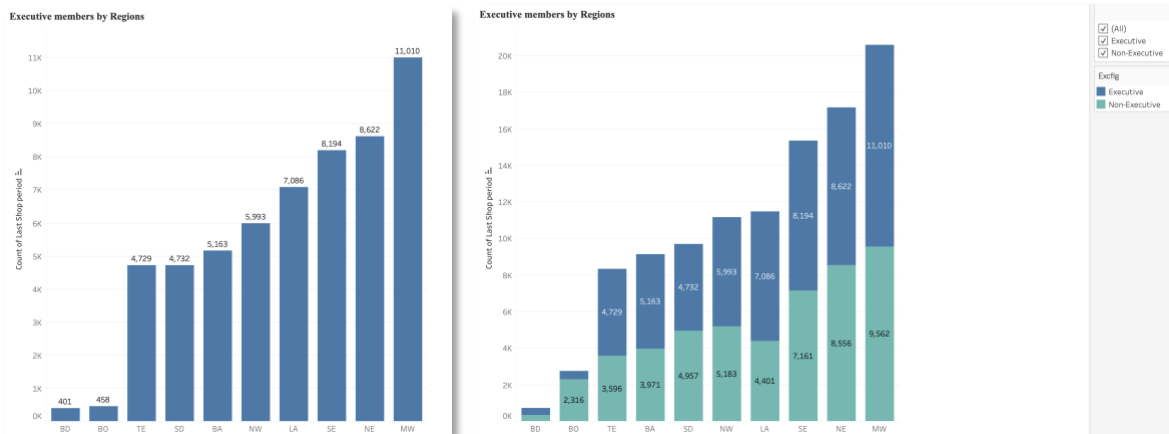
Finally, in the bottom right corner is the *Type of Customer* chart. This chart explains that, within the Executives members, the Consumer group spend almost triple the amount of the Business group. Therefore, the type of customers is not significantly affecting the purchase amount. Depend on the company strategy at each time, we can adapt with flexibility to the target customer types, between Consumer and Business group.

The audience who might be interested in this report is the management board across different functions. The most prominent would be the Marketing team, Store Development team and Membership/Account

team. Marketing Team: The marketing team might be interested in understanding consumer behavior and developing targeted strategies. They could ask questions such as:

o What are the spending patterns and preferences of Executive members versus nonExecutive members?

o Are there any regional variations in shopping habits that can be leveraged for targeted marketing campaigns? o Do members with longer tenure exhibit higher levels of loyalty and spending?

From an initial look at the dataset, some potential findings can be considered regarding customer preferences, customer demography and spending habits. Taking our key audience and their concerns into account, the report proposes to deep dive into some of the questions below: Marketing Team: o How does the distribution of member ages look like? Can we visualize the age demographics of our customer base? o Are there any noticeable seasonal trends in shopping behavior? o What is the relationship between customer age, shopping frequency, and revenue generated?

Considering the three segments of the audience as the Marketing team, Store Development team, and Membership/Account team, three separate dashboards would be ideal focusing on and answering their questions. Also, the dashboard will also be interactive by adding necessary filter options to easily analyze based on the category. For this initial report, the proposal considers the graphs and charts as below list. However, during later steps with further analyzing and feedbacks from stakeholders, some graphs and charts might be adjusted to better reflect stakeholders requirement.

Marketing Team: • Age Demographics: A bar chart/histogram showing the distribution of member ages, allowing the marketing team to understand the age composition of their customer base and their engagement with the marketing campaigns. • Age and Shopping Frequency: Line charts or scatter plots can help to track the shopping frequency based on the customer age group to assess the effectiveness of marketing efforts. • E-commerce Shopping: A stacked column chart can compare the proportion of online versus offline shopping to evaluate the success of digital marketing strategies. • Spending Patterns and

Preferences of Executive vs. Non-Executive Members: A bar chart will help to compare the spending amounts across different categories for Executive and non-Executive members. Each category can be represented as a stacked bar as well, with different segments representing the contribution of each membership type. • Regional Variations in Shopping Habits: A map or barchart can be used to visualize the regional differences in shopping habits by coloring different regions based on average spending amounts or shopping frequencies. Darker shades can indicate higher spending or more frequent shopping, allowing targeted marketing campaigns to focus on regions with higher engagement. • Tenure, Loyalty, and Spending: A scatter plot can be used to plot member tenure and spending amount on the y-axis. Each data point represents an individual member, and the marker color or size can represent loyalty (e.g., frequency of purchases). This graph can show if there is a positive correlation between tenure and spending and if loyal members with longer tenure tend to spend more.

Marketing Team

A marketing dashboard is a tool used to track and visualize key performance indicators (KPIs) and metrics related to marketing activities. It provides a centralized and real-time view of marketing data, allowing marketers and decision-makers to monitor the effectiveness of their marketing campaigns, identify trends, and make data-driven decisions.
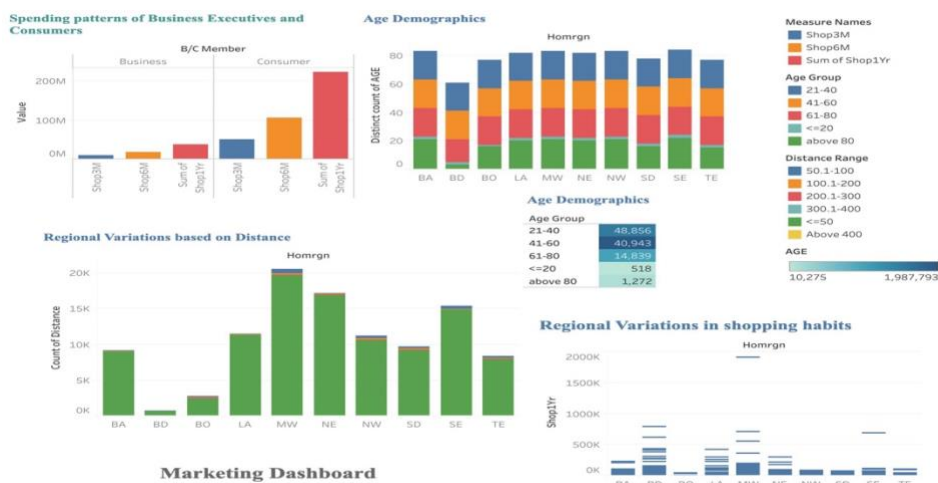
1) **Spending preferences of Business and Consumer Customers:**

- The data shows a significant difference in shopping expenditures between Businness and Consumer customers over the past year, six months, and three months. This consistent pattern suggests a trend rather than a one-time occurrence.

- The total shopping expenditure of Consumer customers for the past year was 223,836,844 units of currency, while Business customers only spent 36,871,454 units. This substantial difference indicates that Consumer customers are more active shoppers within the given time frame.

- The data suggests that Consumer customers may have more leisure time or flexibility to engage in shopping activities compared to Businness customers. This could be attributed to the distinct needs and patterns within the organization.

- The trend of Consumer customers outspending Business continues in both the medium and short-term. Over the past six months, Consumer customers spent 106,801,764 units compared to the 18,722,577 units spent by Business. In the most recent three months, Consumer customers spent 50,828,654 units, while Business spent 9,052,126 units. This indicates a persistent difference in shopping behaviors between the two groups.

- The contrasting spending patterns between Business and Consumer customers may reflect differences in income levels, job responsibilities, and lifestyle choices. Consumer customers, potentially having a different needs for shopping compared to Businness, may prioritize personal items and experiences. On the other hand, Businness may allocate their financial resources towards operation expenses, investment opportunities, business-related expenses, or other financial commitments.

2) **Age Demographics:** The population can be divided into five age groups.

- The first group, less than 20 years old, consists of 518 individuals who are typically dependent on their parents but can still be targeted for products designed for children and teenagers.

- The second group, aged 21-40, comprises 48,856 individuals who have higher disposable income and may spend on technology, fashion, travel, and experiences.

- The third group, aged 41-60, includes 40,943 individuals who are in their prime career years and may prioritize quality and value in their purchases, such as home improvement, luxury goods, and healthcare.

- The fourth group, aged 61-80, consists of 14,839 individuals who are either retired or approaching retirement and may spend on leisure activities, health-related expenses, and retirement planning.

- The fifth and oldest group, above 80 years old, has 1,272 individuals who may prioritize essential needs like healthcare and assisted living services, but spending patterns can vary greatly based on individual circumstances and health conditions. Targeting each age group requires understanding their specific needs, interests, and financial capacities.

3) **Regional variations in shopping habits:**

- With the 'MW' region consistently showing the highest sales figures over the 3-month and 6-month periods.

- This indicates a strong consumer base and a higher inclination for shopping in that region. Retailers can capitalize on this information by concentrating their marketing efforts on the 'MW' region, allocating resources, and implementing targeted strategies

to meet the existing demand. This may involve personalized advertising, exclusive promotions, or improved customer service to retain and expand market share.

- On the other hand, the 'BO' region consistently exhibits the lowest sales figures.

- This presents an opportunity for retailers to analyze the reasons behind the underperformance. Factors such as limited awareness, unfavorable market conditions, or insufficient product availability may contribute to the low sales volume. Armed with this knowledge, retailers can tailor their marketing strategies to address these specific challenges. This may include conducting market research, increasing brand visibility, or adapting product offerings to better align with the preferences and needs of the 'BO' region.

What story do the visualizations tell? The dashboard's visuals provide the marketing team with insightful data and useful information by telling a fascinating tale. The narrative that the visuals tell is as follows: 1) Consumer Preferences and Behavior: The visualizations provided insight into consumer preferences and behavior. The marketing team can pinpoint important distinctions and adjust marketing efforts by comparing the spending habits and preferences of Executive members with non-Executive members. The team can create tailored strategies to engage and keep these various consumer categories by using visualizations, which show the disparities in spending behaviors. 2) Regional Variations for customized Marketing: The visualizations highlight regional differences in shopping preferences, allowing the marketing team to use this data for customized advertising efforts. The team can create region-specific plans to successfully reach and engage customers in those locations by identifying particular regions with distinctive buying trends. The team can more effectively manage resources and customize campaigns based on regional preferences thanks to the infographics that make these variances crystal evident. 3) Customer Loyalty and Tenure: The visualizations examine the connection between member tenure and

levels of expenditure and customer loyalty. The marketing team can determine if members with longer tenure show higher levels of loyalty and spending by studying the data. Using this data, retention strategies and programs may be created to increase customer loyalty and increase the lifetime value of long-term members. 4) Age Demographics and Shopping Behavior: The visualizations shed light on the consumer base's age demographics and shopping habits. The marketing team can determine the age breakdown of the customer base and target particular age groups with specialized marketing campaigns by looking at the distribution of member ages. The visualizations also demonstrate how client age, shopping frequency, and revenue are related, which enables the team to spot trends and patterns and improve marketing campaigns. 5) Seasonal Trends in Consumer Behavior: The marketing team is able to spot any obvious seasonal trends in consumer behavior thanks to the visuals. They can determine the busiest shopping times and modify their marketing strategies by examining the data. The team can better match marketing initiatives, sales events, and inventory management to client demand by having a better understanding of seasonal patterns

Conclusion

The insights gained from the **Store Development** dashboard play a crucial role in answering key business questions related to optimizing logistics, improving member experience, and strengthening warehouse planning and stock management. By leveraging the visualizations, retail stores have been able to make informed decisions, enhance store development strategies, and improve operational efficiency and customer satisfaction. The presence of retail store warehouses in the Midwest region has resulted in significant benefits for members, while the BO region has attracted a notable number of visitors despite having only one warehouse. The analysis of annual revenue from different membership types highlights the popularity and profitability of executive

membership. Additionally, the geographic insights obtained from the map visualization have enabled strategic decisions for warehouse planning, resource allocation, and market expansion. Furthermore, identifying the impact of online shopping based on distance to the nearest warehouse has revealed opportunities for targeted marketing strategies and optimized delivery services to increase online sales in distant regions. The correlation between age and revenue has emphasized the importance of tailored marketing strategies and product customization for different age groups, ultimately maximizing revenue in both consumer and business segments. Finally, the analysis of store categories and shopping trends has provided valuable insights for warehouse planning, stock management, and product assortment decisions, enabling retail stores to develop tailored strategies for specific member segments. Overall, these insights have empowered retail stores to make data-driven decisions, enhance store development strategies, and improve operational efficiency and customer satisfaction.

Subsequently, the **Membership dashboard** further explore the performance of our Executive Membership in term of number of registered members and their annual spending. The dashboard uncovers that Grocery is our best performing category between all of our customers, with 30s and 40s are the highest spengding group. We also further confirm that Executive Members are our most engaged customers and we should maintain and expand the registered Executive Members. Especially more efforts should be spent to reach and maintain those members who had not made a purchase in the last 6 months or more. This group takes up more than 20% of our total members and we might risk membership cancellation without a good campaign to retain them.

Furthermore, the **Marketing Dashboard** data indicates that consumer have higher shopping expenditures compared to business customers, and the majority of the customer base falls within the 21-40 age range. This suggests that young adults and individuals in their thirties

are actively engaged in shopping activities, potentially driven by their higher disposable income and lifestyle preferences. The higher shopping expenditure by customers may be attributed to their diverse needs, preferences, and purchasing power compared to business executives who may prioritize other financial commitments and have less time for personal shopping. Understanding the age demographic of the customer base can help businesses tailor their marketing strategies and offerings to effectively cater to this active and influential age group.

Recommendations

- **Optimize the MW region:** Given that MW outperforms NE with fewer warehouses, it is important to focus on optimizing the MW (presumably the main warehouse) region to further enhance its performance. Analyze the existing supply chain and distribution processes in the MW region to identify areas for improvement. This may involve streamlining operations, improving inventory management, and implementing more efficient logistics strategies.

- **Increase online sales initiatives for customers within a >100-mile radius:** Since customers within close proximity to the BO (assumed to be a physical store) frequently shop online, it is crucial to target this customer segment by launching more online sales initiatives. This can include personalized marketing campaigns, exclusive online promotions, and an improved online shopping experience. Enhancing the e-commerce platform, optimizing product visibility, and offering convenient delivery options can help attract and retain customers within a >100-mile radius, further boosting online sales in this region.

- **Expand warehouses to distant regions, including BO:** To cater to the increasing demand and reach a wider customer base, consider expanding warehouses to distant regions. Identify areas where there is a significant customer population and a potential market for your products. In addition to expanding the MW region, it is also advisable to consider expanding the BO warehouse. This expansion will enable faster delivery and reduce shipping costs for customers in the vicinity of the BO, which can further strengthen engagement and visits to the physical store. By strategically expanding the warehouse network, you can ensure efficient order fulfillment and enhance customer satisfaction across different regions.

- **Further encompass E-commerce to leverage customers experiences and competitive strength.**

The Age demographic in regard of spending volume confirm the highest spending customers groups are those in their 20s, 30s and 40s. This demographic is known for being very receptive of digital trends and E-commerce shopping preferences. However our current E-commerce revenue is relatively lacking.

Another reason that E-commerce is critical to our business is that this channel can help us reach and increase sales among members residing in distant regions. As menionted in data analyzing above, the distant locations strongly hinders our customers inclination to make purchases.

Marketing and Promotion team should increase E-commerce initiates while at the same time, Operations team should ensure adequate resources are allocated to E-commerce operation. By ensuring and enhancing our customers experiences when making online purchases, we can catch up on the E-commerce business and especially eliminate risks when direct shopping is limited in extreme scenarios. Furthermore,

- **Executive Membership play a critical role in securing business success:** The ratio of member on revenue prove Executive Members are contributing sigificantly to revenue. They are all the more important due to their voluntarily to register for paid membership which shows potential to build strong engagement in this group. However, we need to increase efforts to motivate the inactive members for re-purchase as retaining current customers has a higher cost-efficiency and success change than acquiring new customers

- **Leverage regional variations in shopping habits:** Recognize the regional differences in shopping behaviors and adjust marketing strategies accordingly. Allocate resources to focus on regions with higher sales figures, such as the 'MW' region, by implementing personalized advertising, exclusive promotions, and enhanced customer service. Conduct market research and adapt product offerings to address the specific challenges and preferences of regions with lower sales figures, like the 'BO' region. By tailoring marketing efforts to regional variations, the marketing team can optimize sales and market penetration.

- **Segment marketing campaigns based on age groups:** Utilize the age group information to create targeted marketing campaigns. Develop strategies that align with the lifestyle choices, interests, and spending power of different age groups. For example, for the 21-40 age range, focus on technology, fashion, travel, and experiences. For the 41-60 age range, emphasize quality, value for money, and products related to home improvement, luxury goods, healthcare, and travel. Adapt marketing approaches for older age groups, such as retirement planning, senior discounts, and healthcare solutions. By tailoring campaigns to specific age groups, the marketing team can effectively reach and engage their target audience.

- **Customize strategies for different customer tenure stages:** Customize marketing strategies based on customer tenure to enhance customer acquisition, retention, and loyalty. For new customers (0-0.3 years tenure), develop targeted onboarding campaigns to provide a seamless and personalized experience, with the goal of increasing initial spending and fostering long-term loyalty. For customers in the 0.9-1.3 years tenure range, implement customer retention initiatives to counter any decrease in spending, such as personalized communication, loyalty programs, and tailored promotions. By recognizing and addressing the specific needs and behaviors of customers

at different tenure stages, the marketing team can drive customer satisfaction, repeat purchases, and customer lifetime value.

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