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Customer Behavior Analysis

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Abstract: *Consumer behavior in the groups or organizations used to select products and the developments for meeting their needs and their influences on the society. Knowledge of consumers' conditions, factors, and behavioral reasons ensure competitiveness in entrepreneurship. New products, new beliefs, and psychology for society require a thorough analysis of segments of the market and consumer requirements. In this analysis, companies will implement a reliable marketing strategy that guarantees profits and sales. It has attained strategic planning and the objective market segment objective based on the computational model. The study results are presented by segmenting respondents by the sustainability factor, determining the impact of sustainability values upon consumers' conduct, and identifying barriers to the transformation of values in action*

Key Word: *consumer; market; products; strategic planning*

I. INTRODUCTION

The central idea of this research is to examine the overall consumer buying behavior and consumers' attitude on sustainable production and consumption in the food and beverage sector, while promoting public awareness about sustainable product. The food and beverage industry has an extensive reach. It is considered to be one of the most fast moving and growing industries in the world. This business sector plays a key role in a human's everyday life, as people purchase food and beverage products on a daily basis. There are many factors that affect consumers while selecting a specific brand of a product. Moreover, consumers are going through what if process while making their purchases. Therefore, we would like to research whether customers are thinking about buying food from good brands, which integrate sustainability as a main aspect into their strategy and ethos and concentrate on sustainable consumption and production in general. This study seeks to evaluate consumer behavior and purchase decision-making process towards green products from companies that act differently by managing sustainability.

II. PROBLEM DEFINITION

.As there is growing market, the manufactures need clear description about their products with basic research on it. Thispaper describe briefly on various products along with the customer's perspectives. Better understanding on customer'sbehavior will make the manufactures to understand how much they should work on increasing the production ofproducts. Data visualization is an intuitive way for users to easily read and understand data, especially in big dataanalyses. Tableau visualize users with a variety of data sources and enables them to create data visualizations bymaking an effective dashboards interface.

III. DESCRIPTION

Developing relationship between 7 tables in SQL and build a basic schema for related tables based on status and different products. After that arranging the data into schema which helps in easy extraction of data. There might be anomalies that must be pre-processed. To pre-process data we use python, for building up a schema we use SQL data diagrams, and Tableau for visualization and creating an interactive dashboard. We have data on customer purchasing dataset which was collected for marketing campaign purpose.

IV. OBJECTIVE

The function of a dashboard is to provide effective results by extracting value from all the data source. Theprimary objective of building this dashboard is to categorize the customers based on their income levels and theirpurchasing power which helps in future on launching of new product in the market in process of finding targetaudience,planning marketing strategies.

V. DATASET

The variables of the dataset is categorized is listed below:

Attributes:

People:

1. ID: Customer's unique identifier
2. Year_Birth: Customer's birth year

3. Education: Customer's education level
4. Marital_Status: Customer's marital status
5. Income: Customer's yearly household income
6. Kidhome: Number of children in customer's household
7. Teenhome: Number of teenagers in customer's household
8. Dt_Customer: Date of customer's enrollment with the company
9. Recency: Number of days since customer's last purchase
10. Complain: 1 if the customer complained in the last 2 years, 0 otherwise Products
11. MntWines: Amount spent on wine in last 2 years
12. MntFruits: Amount spent on fruits in last 2 years
13. MntMeatProducts: Amount spent on meat in last 2 years
14. MntFishProducts: Amount spent on fish in last 2 years
15. MntSweetProducts: Amount spent on sweets in last 2 years
16. MntGoldProds: Amount spent on gold in last 2 years

Promotion:

1. NumDealsPurchases: Number of purchases made with a discount
2. AcceptedCmp1: 1 if customer accepted the offer in the 1st campaign, 0 otherwise
3. AcceptedCmp2: 1 if customer accepted the offer in the 2nd campaign, 0 otherwise
4. AcceptedCmp3: 1 if customer accepted the offer in the 3rd campaign, 0 otherwise
5. AcceptedCmp4: 1 if customer accepted the offer in the 4th campaign, 0 otherwise
6. AcceptedCmp5: 1 if customer accepted the offer in the 5th campaign, 0 otherwise
7. Response: 1 if customer accepted the offer in the last campaign, 0 otherwise

Place:

1. NumWebPurchases: Number of purchases made through the company’s website
2. NumCatalogPurchases: Number of purchases made using a catalog
3. NumStorePurchases: Number of purchases made directly in stores
4. NumWebVisitsMonth: Number of visits to company’s website in the last month

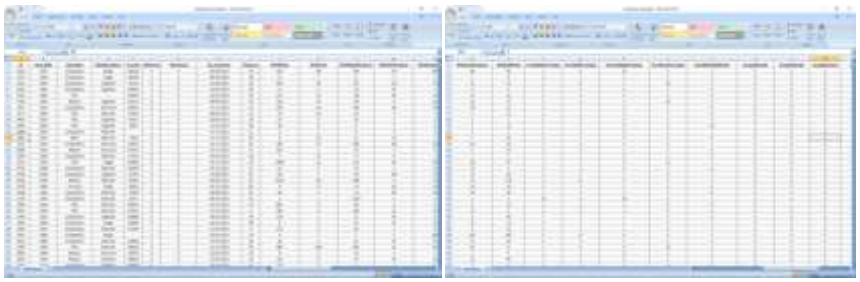

fig 5.1 Dataset

VI .METHODOLOGY

Tools Used:

1. Tableau
2. SQL
3. Python
4. Kibana and elastic search

Functionalities:

1. Preprocessing data with python
2. Building Schema using SQL
3. Building data Cube using Visual Studio
4. Dashboard design

5. ElasticSearch using Kibana

Tableau is used for building interactive dashboards on the raw data obtained from various sources. For building an interactive dashboard the datasets must be cleaned and compressed by removing unwanted details and by joining the related tables based on common attributes. Basic transformation of data is implemented through python or SQL. For splitting data lean and peak month data into required format we use python to split them into two rows and store in separate headers that will help in better visualizations. Using SQL removal of duplicates and extracting data fromstage into a mart organised file is done. Using data diagrams in SQL we establish schemas between tables. Not all the tables require pre-processing it might require only to extract, load and visualise. Performing transformation on raw data will improve the performance of the system as well helps in visualizing the major part of the data without manipulations.

Interpretation of data through visuals is much easier and simple when compared to raw sources. Also, since the data is obtained from various sources combining them into a single dashboard will be more efficient and insightful. To perform elastic search text dataset shows good excellence.

VII. DASHBOARD DESIGN

Summary dashboard which will have details about the customer according to their purchase, promotions, place, from the summary page we will drill through into promotion dashboard, purchase dashboard, products dashboard and customer detailed dashboard.

fig 6.1 slicer

fig 6.1 represents the slicer visualization in dashboard which works on based on customer status. The slicer helps in the selection of customers to infer with their respective status.It helps in short listing customers based on their ‘people’ category in the dataset.

fig 6.2 metrics

fig 6.2 represents the total web visits by the customer through internet. It describes the overall marketing results done in online. The metrics table describes the successful marketing campaign done through online where up to 2,025 purchase of products are done through online which is above average when compared to total purchase made in offline market.

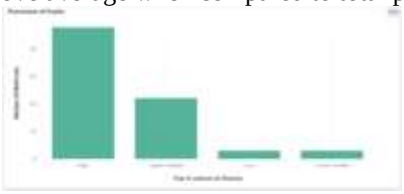

fig 6.3 purchase of fruits

fig 6.3 represents total purchase on fruit items by customers. It describes the data with customer income. The customers are categorized based on their income range where fruits are the common product, it has been widely purchased by all economic class of people.

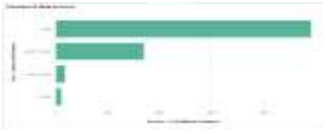

fig 6.4 purchase on meat products

fig 6.4 represents total purchase on meat items by customers.It describes the data with customer income and their purchase power. Among categorized customers, it can be observed that the people who earn moderate have low purchase power compare to other two categories. The graph represents the purchase frequency gaps between the lower class and middle class on meat products.

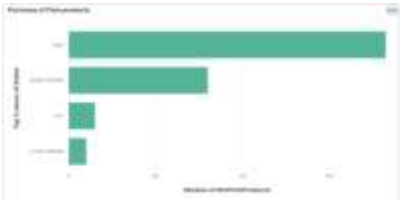

fig 6.5 purchase of fish products

fig 6.5 represents the total purchase on fish items by customers.It describes the data with the median of the total sales in fish items. The fish product is also same as the meat product classification with the slight difference in the order of purchase as people can buy both meat and fish products simultaneously or they may buy either one of them. Fish and meat products could be inferred as common relationship in purchase history.

fig 6.6 customer's income

fig 6.6 represents total income of customers on yearly basis.

The pie chart describes the income of the customer with three attributes as follows: year, income, top five income. This chart gives the overall analysis of income of the customers over the years and how it has affected their purchase power and needs. Each year there is change in demand and supply chain on products so as the market has been flexed based on the income of the customers. In each year the purchase power of customer would change respective to their earning capacity so customer's income and sales in products would be directly proportional to each other.

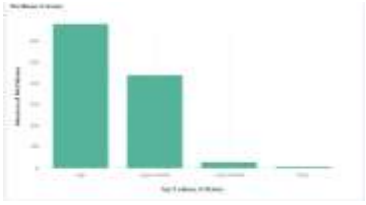

fig 6.7 purchase of wine

fig 6.7 represents total purchase on wine items by customers.It describes the data with customer income. Since wine is not family targeted product, The supply will be moderate or slow but the price plays the huge role in categorizing the customers. The graph depicts the purchase of wine products in all categories where every class of people buy it but the price range may differ based on the wine type the customers will to buy.

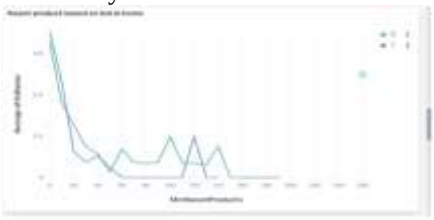

fig 6.8 sweet product based on kid in home

fig 6.8 represents total sweet products available in stock for kids.It describes the data with presence of kids classification model(yes-1,no-0). Simply the target audience for sweet products will always be kids which plays major role in subdivided sweet products such as chocolates, products related to baking cakese.t.c hence the purchase history will be more in families with kids.

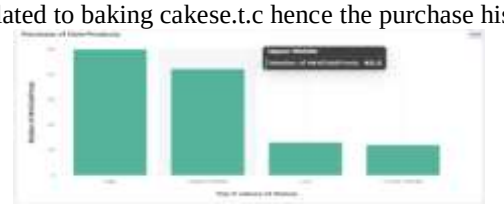

fig 6.9 purchase of gold products

Gold is not easily purchasable product for every customer unlike sweet and meat products. The majority customers who

buys gold belongs to upper class in income table though there is change in price for gold in day to day basis over the years. Comparatively other class of customers may be not efficient or low efficient to purchase gold products which may increase in future based on market of gold and various gold purchase schemes.

fig 6.10 customers' info

fig 6.10 represents customer's personal information. The details will be formulated according to the module selected in respective fields on the other chart's attributes. The slicer tab works on the details extracted from the customers information tab. It distributes data to all the graphs plotted in the dashboard which helps for various insights.

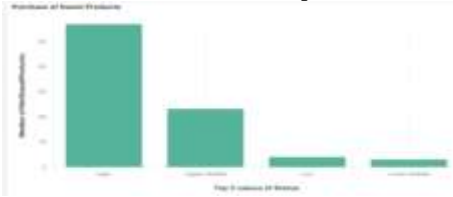

fig 6.11 purchase of sweet products

fig 6.11 represents total purchase on sweet items by customers.It describes the data with customer income. Simply the target audience for sweet products will always be kids which plays major role in subdivided sweet products such as chocolates, products related to baking cakes e.t.c hence the purchase history will be more in families with kids.

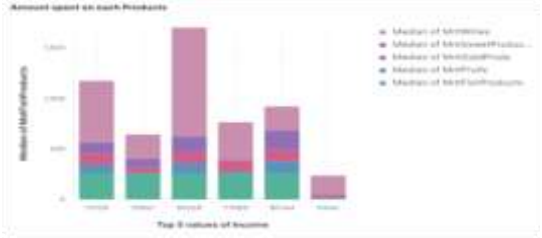

fig 6.12 amount spend on each products

fig 6.12 represents total amount spend on every items by customers. The graph shows the various splits of cost by the customers based on their previous purchase history. It plots the split of income of the customers used to purchase their required products with top five values of the income and the median of all the products. Each bar plot is formulated by combining the median values of wine, sweet, gold, fish products, e.t.c for the result.

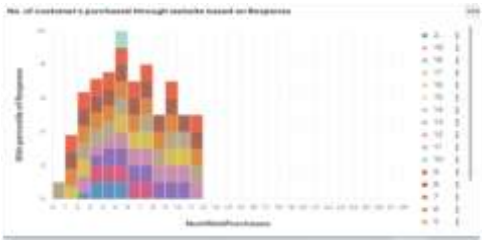

fig 6.13 no of customers purchased through website

fig 6.13 represents total purchase through online based on the response. It shows the insights of online marketing that caused the customers to visit website and made a purchase on various products like fish, wine and other items. This graph is the detailed overview of the metrics tab where 2,025 purchases made through online portal is briefly classified with number of web purchases and response for the online marketing which triggered the customers to purchase. Usually gold product is low in online purchase as it is based on design and price perspective.

VIII. OBJECTIVE

As the business world is rapidly growing, so do consumer needs and preferences change. Consumer behavior analysis

is the major factor in planning a marketing campaign. Customer demand for transparency in marketing products is increasing. Customers purchase through online purchases and courier services. We conclude that even the strongest organizations, with the most money and the most innovative products can fail, in a new market, if there is no thorough research. Consumers won't respond to a newly launched product if it doesn't fulfill their basic needs. So we will be implementing this analysis in the upcoming months to get a better and greater profit for an organization.

IX. CONCLUSION

The main focus of this study is to increase the profit of the organizations by evaluating and analyzing the behaviors of their customers. Implementation in this paper includes classifying consumers based on their location, their age, income and value of their purchases, etc. By exploring the delivery timing, it can be made sure that the product reaches the customer on time. The sentiment analysis which was analyzed on the consumer opinions may be used to recognize the mind of a consumer over a product and their assumptions at the same time as buying a comparable product. The recommendation engine not only helps the consumers in making choices but also helps the organization in gaining profit. Thus, this research simplifies the works of consumers and also benefits the organization.

X. LITERATURE SURVEY

1. consumer buying behavior has been conducted by Acebron et al (2000).The aim of the study was to analyze the impact of previous experience on buying behavior of fresh foods, particularly mussels.

2. A study conducted by Variawa (2010) analyzed the influence of packaging on the consumer decision making process for Fast Moving Consumer Goods. The aim of the research was to analyze the impact of packaging for decision making processes of low-income consumers in retail shopping.

3. Backhaus et al (2007) suggested that purchase decision is one of the important stages as this stage refers to the occurrence of a transaction. In other words, once the consumer recognized the need, searched for relevant information and considered the alternatives he/she made the decision whether or not to make the decision.

4. Consumer searches information related to desired product or service (Schiffman and Kanuk, 2007).

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