Internship Project Report on E-commerce Project

1 Executive Summary

This report presents the findings from an internship project focused on analysing customer data for an e-commerce company. The primary objective was to extract actionable insights from the dataset, which includes customer demographics, spending habits, and interactions with marketing campaigns. This analysis aimed to enhance understanding of customer behaviour, evaluate the effectiveness of marketing campaigns, and propose strategies for improving business performance. The insights derived from this project have significant implications for the company's marketing strategies and overall operations.

2 Introduction

Background

The rapid growth of e-commerce has transformed the retail landscape, providing companies with vast amounts of customer data. This project was initiated to leverage this data to gain a deeper understanding of customer behaviour and to optimize marketing efforts.

Objectives

1. Analyse customer demographics and spending patterns.
2. Evaluate the effectiveness of marketing campaigns.
3. Provide actionable insights for enhancing customer engagement and business performance

Scope

The analysis covers various aspects of customer data, including demographic information, purchase behaviour, and responses to marketing campaigns. The report outlines the methodologies used, presents the findings, and offers recommendations based on the insights gained.

03 Description of the Organization

Company Overview

The organization is a prominent e-commerce platform known for its diverse product range and customer-centric approach. It operates globally and serves a wide customer base with a focus on providing a seamless shopping experience

Products and Services

The platform offers a vast array of products, including electronics, fashion, home goods, and more. Additionally, it provides personalized recommendations and engages customers through various marketing campaigns.

Organizational Structure

The company is structured into several key departments, including Marketing, Sales, Customer Service, and Data Analytics. Each department plays a crucial role in the company's operations and strategic initiatives.

Market Position and Competitiveness

The company holds a strong market position due to its extensive product offerings, competitive pricing, and excellent customer service. It continuously strives to enhance its market competitiveness through data-driven strategies and customer insights

04 Experiential Learning

Data Collection and Preparation

The dataset used for this project includes the following key variables:

- Customer ID
- Birth year
- Education
- Marital status
- Income Household composition
- Enrolment date
- Recency of purchases
- Complaints
- Campaign acceptances
- Spending categories

- Data cleaning and preparation involved handling missing values, outliers, and ensuring data consistency to maintain the quality of the analysis.

Analytical Tools and Techniques

Various analytical tools and techniques were employed to analyse the data:

- **Descriptive Analytics:** Used to summarize and describe the main features of the dataset, providing a clear overview of customer demographics and spending patterns.
- **Predictive Analytics**: Machine learning models were applied to predict future customer behaviour and campaign success, enabling the company to make data driven decisions.
- **Segmentation Analysis**: Customers were segmented based on demographics and spending patterns to identify distinct groups with similar characteristics.

Descriptive Analytics

Descriptive analytics provided insights into customer demographics, such as age distribution, education levels, marital status, and income brackets. Spending patterns were analysed to identify high-value customers and popular product categories.

Predictive Analytics

Predictive models, such as regression analysis and classification algorithms, were used to forecast future customer behaviour and determine the likelihood of campaign success. These models helped in understanding the factors that influence customer purchases and campaign responses.

Segmentation Analysis

Segmentation analysis identified key customer segments, such as frequent buyers, high spenders, and those responsive to specific marketing campaigns. This information was crucial for tailoring marketing strategies to different customer groups.

Findings and Insights

Customer Demographics: The analysis revealed that most customers are aged between 25-45 years, with a significant portion holding a college degree. Income levels varied, with a notable segment earning above the median income.

Spending Patterns: High-value customers were identified, contributing significantly to total sales. Popular product categories included electronics and fashion.

Campaign Effectiveness: Certain marketing campaigns were more successful in driving customer engagement and purchases. Personalized campaigns showed higher acceptance rates compared to generic ones.

I found the following insights

1. **Customer Demographics**

    i) What is the average age of customers in the dataset??

```
63
64    -- CUSTOMER DEMOGRAPHICS
65    -- WHAT IS THE AVERAGE AGE OF CUSTOMERS IN THE DATSET??
66    --QUERY
67    SELECT AVG(EXTRACT (YEAR FROM NOW () - year_birth * INTERVAL '1 YEAR' )) FROM customer_details
68
```

    ii) How many customers fall into each education level category?

Query   Query History
```
70    -- HOW MANY CUSTOMERS FALL INTO EACH EDUCATION LEVEL CATEGORY??
71    --QUERY
72    SELECT COUNT (*) AS total_count, education
73    FROM customer_details
74    WHERE education IS NOT NULL
75    GROUP BY education
76    ORDER BY total_count DESC
77
```

    iii) What is the distribution of marital statuses among the customers?

```
--what is distribution of marital status among the customers??
-- Query
SELECT marital_status,COUNT(*) AS count_of_marital_status
FROM customer_details
WHERE marital_status IS NOT NULL
GROUP BY marital_status
ORDER BY 2 DESC
```

2. **Campaign response**

    i. How many customers accepted each campaign offer?

```
131
132    -- HOW MANY CUSTOMERS ACCEPTED THE EACH CAMPAIGN OFFER???
133    -- QUERY
134 ⌄  SELECT 'sum_of_acceptedcmp1' AS different_campaigns, SUM(acceptedcmp1) AS total FROM customer_details
135    UNION ALL
136    SELECT 'sum_of_acceptedcmp2' AS different_campaigns, SUM(acceptedcmp2) AS total FROM customer_details
137    UNION ALL
138    SELECT 'sum_of_acceptedcmp3' AS different_campaigns, SUM(acceptedcmp3) AS total FROM customer_details
139    UNION ALL
140    SELECT 'sum_of_acceptedcmp4' AS different_campaigns, SUM(acceptedcmp4) AS total FROM customer_details
141    UNION ALL
142    SELECT 'sum_of_acceptedcmp5' AS different_campaigns, SUM(acceptedcmp5) AS total FROM customer_details
```

ii. What is the overall response rate for the last campaign?

```sql
131
132    -- HOW MANY CUSTOMERS ACCEPTED THE EACH CAMPAIGN OFFER???
133    -- QUERY
134 v  SELECT 'sum_of_acceptedcmp1' AS different_campaigns, SUM(acceptedcmp1) AS total FROM customer_details
135    UNION ALL
136    SELECT 'sum_of_acceptedcmp2' AS different_campaigns, SUM(acceptedcmp2) AS total FROM customer_details
137    UNION ALL
138    SELECT 'sum_of_acceptedcmp3' AS different_campaigns, SUM(acceptedcmp3) AS total FROM customer_details
139    UNION ALL
140    SELECT 'sum_of_acceptedcmp4' AS different_campaigns, SUM(acceptedcmp4) AS total FROM customer_details
141    UNION ALL
142    SELECT 'sum_of_acceptedcmp5' AS different_campaigns, SUM(acceptedcmp5) AS total FROM customer_details
```

3. **Offline and Online Purchases**

   i. How many purchases are made through the website, catalogue, and in-store?

```sql
Query   Query History
154    --  HOW MANY PURCHASES ARE MADE THROUGH WEBSITE,CATALOG AND IN-STORE??
155    --QUERY
156
157    SELECT 'websitepurchases_sum' as categories, SUM(numwebpurchases) AS TOTAL FROM customer_details
158    UNION ALL
159    SELECT 'catalogpurchases_sum' as categories, SUM(numcatalogpurchases) AS TOTAL FROM customer_details
160    UNION ALL
161    SELECT 'storepurchases_sum' as categories, SUM(numstorepurchases) AS TOTAL FROM customer_details
162    ORDER BY 2 DESC
163
164
```

   ii. What is the average number of web visits per month?

```sql
164
165    -- WHAT IS THE AVERAGE NUMBER OF WEB VISITS PER MONTH??
166    -- QUERY
167    SELECT CAST(AVG(numwebvisitsmonth)AS numeric(10,2)) as Average_webvisits
168    FROM customer_details
169    WHERE numwebvisitsmonth IS NOT NULL
170
```

Data Output   Messages   Notifications

4. **Complaints and Engagement**

   i. How many customers have complained in the last 2 years?

```sql
-- HOW MANY CUSTOMERS HAVE COMPLAINED IN THE LAST TWO YEARS ???
-- QUERY

SELECT COUNT(*),EXTRACT (YEAR FROM dt_customer) AS year_
FROM customer_details
WHERE complain = 1
GROUP BY EXTRACT (YEAR FROM dt_customer)
ORDER BY 1 DESC
```

ii.   What is the overall engagement rate (accepted any campaign or responded) among customers?

```sql
-- WHAT IS THE OVERALL ENGAGEMENT RATE AMONG CUSTOMERS ??
--QUERY
SELECT
SUM(acceptedcmp1)+SUM(acceptedcmp2)+SUM(acceptedcmp3)+SUM(acceptedcmp4)+SUM(acceptedcmp5)+SUM(response) AS OVERALL_ENGAGEMENT, COUNT(*)*6 AS tota
(SUM(acceptedcmp1)+SUM(acceptedcmp2)+SUM(acceptedcmp3)+SUM(acceptedcmp4)+SUM(acceptedcmp5)+SUM(response))*100.0/(COUNT(*)*6)  AS OVERALL_ENGAGEME
FROM customer_details
```

5. **Deals and Discounts**

    i. How many deals are made with discounts?

```sql
131    -- How many deals are made with discounts?
132    -- Query
133 v  SELECT COUNT (DISTINCT numdealspurchases) AS deals_with_discounts
134    FROM customer_details
135    WHERE numdealspurchases  IS NOT NULL
136
```

    ii. What is the average number of deals and purchases made by customers?

```sql
--WHAT IS THE AVERAGE NUMBER OF DEALS AND PURCHASES MADE BY CUSTOMERS??

SELECT AVG(numdealspurchases+numwebpurchases+numcatalogpurchases+numstorepurchases) AS avg_purchases
FROM customer_details
```

6. **Income and Household Information**

    i. What is the average household income of the customers?

```sql
-- WHAT IS THE AVERGAE HOUSEHOLD INCOME OF THE CUSTOMERS???
-- QUERY
SELECT AVG(income) as average_income_of_customers
FROM customer_details
WHERE income IS NOT NULL
```

    ii. How many customers have children and teenagers in their households?

```sql
-- HOW MANY CUSTOMERS HAVE CHILDREN AND TEENAGERS IN THEIR HOUSEHOLDS??
--QUERY
SELECT  count(*) as count, kidhome,teenhome
FROM customer_details
WHERE kidhome IS NOT NULL AND teenhome IS NOT NULL
GROUP BY kidhome,teenhome
ORDER BY 1 DESC
```

7. Purchase Behaviour
    i.   What is the average number of days since the last purchase?

```sql
100   -- WHAT IS THE AVERAGE NUMBER OF DAYS SINCE LAST PURCHASE ??
101   -- QUERY
102   SELECT CAST(AVG(recency) AS numeric(15,2))as AVERAGE_NUMBER_OF_DAYS_SINCE_LAST_PURCHASE
103   FROM customer_details
104
```

    ii. How much, on average, do customers spend on each product category?

```sql
-- HOW MUCH ON AVERAGE DO CUSTOMERS SPEND ON EACH PRODUCT CATEGORY??
--QUERY
    SELECT
        AVG(mntwines) AS avg_mntwines,
        AVG(mntfruits) AS avg_mntfruits,
        AVG(mntmeatproducts) AS avg_mntmeatproducts,
        AVG(mntfishproducts) AS avg_mntfishproducts,
        AVG(mntsweetproducts) AS avg_mntsweetproducts,
        AVG(mntgoldprods) AS avg_mntgoldproducts
    FROM customer_details
```

8. Campaign Effectiveness
    i.   Which campaign has the highest acceptance rate?

```sql
202   --WHICH CAMPAIGN HAS THE HIGHEST ACCEPTANCE RATE??
203   -- QUERY
204
205   SELECT
206   campaign,
207   sum(response) as Accepted,
208   count(*) AS Total
209   From (
210       SELECT 'campaign1' as campaign, response from customer_details where acceptedcmp1=1
211       UNION ALL
212       SELECT 'campaign2' as campaign, response from customer_details where acceptedcmp2= 1
213       UNION ALL
214       SELECT 'campaign3' as campaign, response from customer_details where acceptedcmp3=1
215       UNION ALL
216       SELECT 'campaign4' as campaign, response from customer_details where acceptedcmp4=1
217       UNION ALL
218       SELECT 'campaign5' as campaign, response from customer_details where acceptedcmp5=1
219       UNION ALL
220       SELECT 'lastcategory' as campaign, response from customer_details where response=1
221   )AS campaignData
222   GROUP BY campaign
223   order by 3 desc
```

9. Web Engagement and Purchases
    1.   What is the correlation between the number of web visits and web purchases?

```sql
225   -- WHAT IS THE CORRELATION BETWEEN THE NUMBER OF WEBVISITS AND WEBPURCHASES??
226   --QUERY
227
228   SELECT CORR(numwebpurchases,numwebvisitsmonth)
229   FROM customer_details
```

10. Overall Spending Patterns

   i.   What is the overall distribution of spending across all product categories?

```sql
231   -- what is the overall distribution of spending across all product categories??
232   -- QUERY
233   SELECT 'mntwines_total' AS product_categories, SUM(mntwines) AS total FROM customer_details
234   UNION ALL
235   SELECT 'mntfruits_total' AS product_categories, SUM(mntfruits) AS total FROM customer_details
236   UNION ALL
237   SELECT 'mntmeatproducts_total' AS product_categories, SUM(mntmeatproducts) AS total FROM customer_details
238   UNION ALL
239   SELECT 'mntfishproducts_total' AS product_categories, SUM(mntfishproducts) AS total FROM customer_details
240   UNION ALL
241   SELECT 'mntsweetproducts_total' AS product_categories, SUM(mntsweetproducts) AS total FROM customer_details
242   UNION ALL
243   SELECT 'mntgoldproducts_total' AS product_categories, SUM(mntgoldprods) AS total FROM customer_details
244
245   WHERE mntwines IS NOT NULL AND mntfruits IS NOT NULL AND mntmeatproducts IS NOT NULL AND
246   mntfishproducts IS NOT NULL AND mntsweetproducts  IS NOT NULL AND
247   mntgoldprods IS NOT NULL
248   ORDER BY 2 DESC
```

05 Internship Outcomes and Conclusion

Key Outcomes

1. Enhanced Customer Understanding: Gained deep insights into customer demographics and behaviour, which can inform future marketing and sales strategies.
2. Improved Campaign Strategies: Identified effective marketing tactics and areas for improvement, allowing the company to optimize its campaigns.
3. Actionable Recommendations: Provided strategic recommendations to the marketing team to enhance customer engagement and increase sales.

Conclusion

The internship provided a comprehensive understanding of data analytics in an e commerce context. The insights derived from the analysis can significantly contribute to the company's marketing strategies and overall business performance. By leveraging customer data, the company can better understand its customers, tailor its marketing efforts, and ultimately drive growth and success.

06 Bibliography

1. **Books and Articles:**
   - "Data Science for Business" by Foster Provost and Tom Fawcett
   - "Marketing Analytics: Data-Driven Techniques with Microsoft Excel" by Wayne L. Winston
   - "Predictive Analytics: The Power to Predict Who Will Click, Buy, Lie, or Die" by Eric Siegel
2. **Online Resources:**
   - Kaggle: http://www.kaggle.com/
   - Towards Data Science: http://www.towardsdatascience.com/
3. **Company Reports and Internal Documents:**
   - Quarterly Sales Reports
   - Marketing Campaign Analysis Reports
   - Customer Feedback and Survey Results