

High Level Design (HLD)

CPA (Customer Personal Analysis)



Document Version control

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Abstract

Customer Personality Analysis is a study that uses psychological profiling to understand how different personality traits influence consumer behavior. This research explores the impact on purchasing decisions, brand loyalty, and customer engagement. It also considers the ethical use of consumer data. By tailoring marketing strategies to align with personality types, businesses can enhance customer satisfaction and build stronger brand relationships, leading to increased profitability.



1. INTRODUCTION

Customer personality analysis aims to understand the traits, behaviors, and preferences of customers based on their interactions and responses to marketing campaigns. This high-level design document outlines the key steps and components involved in conducting customer personality analysis using the provided marketing_campaign.csv dataset.

1.1 Why this High-Level Design Document?

The purpose of this high-level Design document is to add the necessary detail to the current project description to represent a suitable model for coding. This document also intended to help detect contradictions prior to coding. And can be used as a reference manual for how the modules interact at a high level.

1.2 Scope

The HLD documentation presents the structure of the system, such as the database architecture, application architecture, application flow, and technology architecture. The HLD use non-technical to mildly-technical terms which should be understandable to the administrators of the system.

1.3 Definitions

| Terms | Description |
|-------|----------------------------|
| CPA | Customer Personal Analysis |
| EDA | Exploratory Data Analysis |

2. OBJECTIVES

The primary objectives of the customer personality analysis are as follows:

1. Identify customer segments based on their responses to marketing campaigns.
2. Analyze customer traits, behaviors, and preferences within each segment.
3. Develop insights to improve marketing strategies and enhance customer engagement.
4. Create a predictive model to forecast customer responses to future campaigns.



3. DATA SOURCE

The dataset for this analysis is located at the following URL:

“ <https://www.kaggle.com/datasets/imakash3011/customer-personality-analysis> ”

The dataset contains the following columns:

- ID: Unique identifier for each customer
- Year_Birth: Customer's birth year
- Education: Customer's education level
- Marital_Status: Customer's marital status
- Income: Customer's annual income
- Kidhome: Number of children living at home
- Teenhome: Number of teenagers living at home
- Dt_Customer: Date of customer enrollment
- Recency: Number of days since the last purchase
- MntWines: Amount spent on wines in the last 2 years
- MntFruits: Amount spent on fruits in the last 2 years
- MntMeatProducts: Amount spent on meat products in the last 2 years
- MntFishProducts: Amount spent on fish products in the last 2 years
- MntSweetProducts: Amount spent on sweet products in the last 2 years
- MntGoldProds: Amount spent on gold products in the last 2 years
- NumDealsPurchases: Number of purchases made with discount
- NumWebPurchases: Number of purchases made through the website
- NumCatalogPurchases: Number of purchases made using catalogs
- NumStorePurchases: Number of purchases made directly in stores
- NumWebVisitsMonth: Number of visits to the website in the last month
- AcceptedCmp1 to AcceptedCmp5: Whether the customer accepted the offer of the corresponding marketing campaign (1 = Yes, 0 = No)
- Response: Whether the customer accepted the offer of the last campaign (1 = Yes, 0 = No)

4. HIGH-LEVEL STEPS

The customer personality analysis involves the following high-level steps:

4.1. Data Preprocessing

- Load the dataset and perform initial data exploration to understand its structure and quality.
- Handle missing values, if any, using appropriate imputation techniques.
- Convert categorical variables into numerical representations through one-hot encoding or label encoding.
- Normalize or scale numerical features, if required.

4.2. Exploratory Data Analysis (EDA)

- Conduct exploratory data analysis to gain insights into customer demographics, spending patterns, and campaign response rates.
- Visualize key metrics to identify patterns and trends.
- Perform statistical analysis to understand the relationships between variables.

4.3. Customer Segmentation

- Utilize clustering algorithms (e.g., K-means, hierarchical clustering) to segment customers based on their behaviors and preferences.

4.4. Customer Personality Profiling

- Within each customer segment, analyze spending patterns, response rates, and other characteristics.
- Identify unique traits and preferences for each segment.

4.5. Insights and Recommendations

- Summarize the findings from the analysis, including customer segments, personality profiles, and predictive model performance.
- Provide actionable recommendations to improve marketing strategies and enhance customer engagement.



5. TOOLS AND TECHNOLOGIES

The following tools and technologies are recommended for conducting the customer personality analysis:

- Programming Language: Python
- Data Manipulation and Analysis: Pandas, NumPy
- Data Visualization: Matplotlib, Seaborn
- Machine Learning: Scikit-learn (sklearn)
- Integrated Development Environment (IDE): Jupyter Notebook



6. CONCLUSION

The customer personality analysis aims to gain valuable insights into customer behavior and preferences, which can significantly impact marketing strategies and customer engagement. By understanding customer segments and developing predictive models, businesses can tailor their campaigns more effectively, leading to increased customer satisfaction and higher conversion rates.

