High Level
Design (HLD)

CPA(Customer Personality Analysis)

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Abstract

Customer Personality Analysis is a valuable tool for businesses aiming to understand their ideal customers more deeply. By examining the specific needs, behaviors, and concerns of different customer segments, companies can effectively tailor their products to meet the preferences of their target audience. This analysis allows businesses to optimize their marketing efforts by identifying the customer segments most likely to engage with their products and focusing their resources on those specific segments. By exploring customer attitudes and actions towards the product, businesses gain valuable insights that enable them to make informed decisions and enhance their overall customer experience.

1. Introduction

1.1 Why this High-Level Design Document?

This High-Level Design (HLD) Document aims to add the necessary detail to the current project description to represent a suitable model for coding. This document is also intended to help detect contradictions before coding and can be used as a reference manual for how the modules interact at a high level.

The HLD will:

- Present all of the design aspects and define them in detail
- Describe the user interface being implemented
- Describe the hardware and software interfaces
- Describe the performance requirements
- Include design features and the architecture of the project
- List and describe the non-functional attributes like
    - Security
    - Reliability
    - Maintainability
    - Portability
    - Reusability
    - Application compatibility
    - Resource utilization
    - Serviceability

1.2 Scope

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

1.3 Definitions

Term CPA	Description
Database	Collection of all the information monitored by this system
IDE VS Code	Visual Studio Code

2. General Description

2.1 ProductPerspective

CPA is a customer personality analysis which is a clustering problem It helps a business to better understand its customers and makes it easier for them to modify products according to the specific needs, behaviors, and concerns of different types of customers.

2.2 Problem statement

To develop a data-driven customer personality analysis solution that helps businesses understand their ideal customers, enabling them to tailor their products based on specific customer needs, behaviors, and concerns. The solution should effectively analyze customer attitudes and actions, allowing businesses to optimize their marketing strategies and allocate resources to target the most receptive customer segments, ultimately enhancing customer satisfaction and product success.

2.2 Proposed Solution

The solution proposed here is an CPA (Customer Performance Analysis) In this project, I will be performing an unsupervised clustering of data on the customer's records from a website database. Customer segmentation is the practice of separating customers into groups that reflect similarities among customers in each cluster. I will divide customers into segments to optimize the significance of each customer to the business. To modify products according to distinct needs and behaviors of the customers. It also helps the business to cater to the concerns of different types of customers.

2.3 Data Requirements

- Data requirement completely depend on our problem statement.
- We require a data sample consisting of a minimum of 20 to 30 observations from a smaller subgroup.
- The sample should include customer information.
- It should contain details about sales and promotions.
- All personal information such as age, total family size, income, etc., should be included.

2.4 Tools used

Python programing language and frameworks such as

- NumPy
- Pandas
- Sklearn
- Matplotlib
- Seaborn
- Flask
- OS
- AWS (or any other cloud platform)
- GitHub
- IDE VS Code

2.5 Constraints

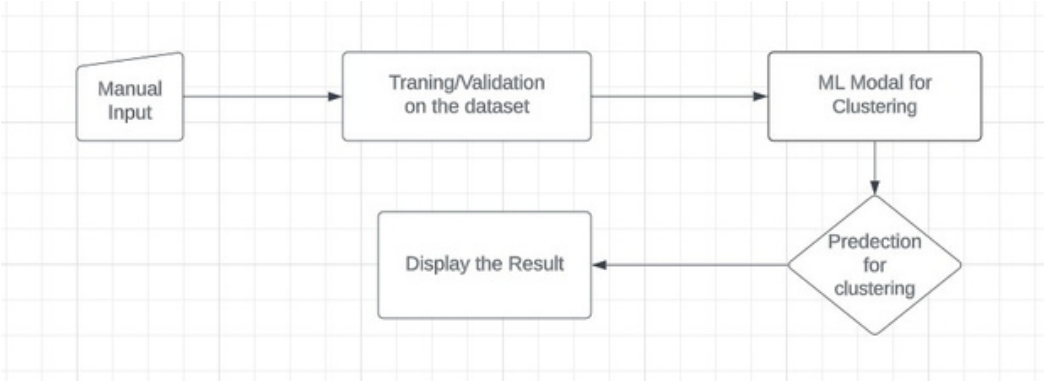
The CSA (Customer Sales Analysis) should be presented in a manner that is easily comprehensible and accessible to all, even those without any prior knowledge of analysis. The information should be presented in a clear and straightforward manner, ensuring that anyone can understand it without difficulty.

2.6 Assumptions

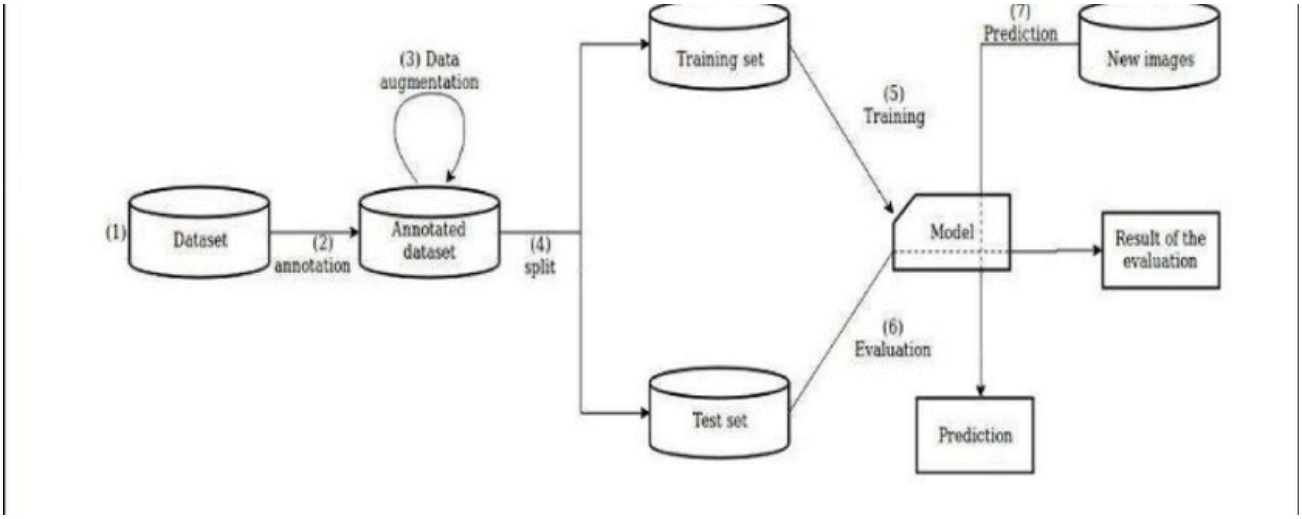
The primary goal of this project is to implement the use cases mentioned earlier (as stated in section 2.2 Problem Statement) for a new dataset obtained from a website. The aim is to apply the mentioned use cases to the input data. It is also assumed that all components of this project are designed to work harmoniously and meet the expectations of the designer.

3 Design Details

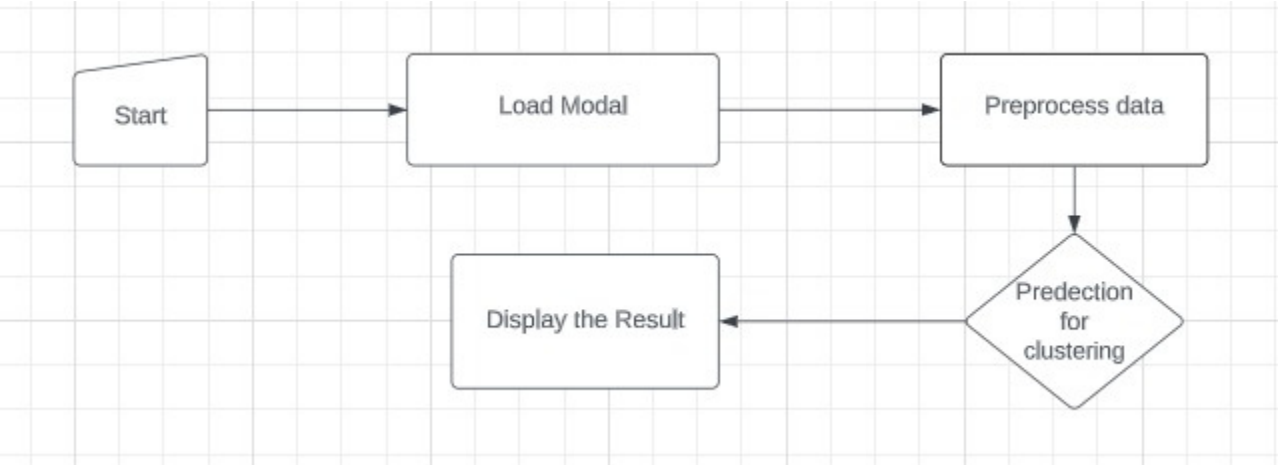
3.1 Process Flow



3.1.1 Modal Training and evaluation



3.1.2 Deployment Process



3.2 Event Log

The system should log every event so that the user will know what process is running internally.
Initial Step-By-Step Description:

1. The System identifies at what step logging required
2. The System should be able to log each and every system flow.
3. Developer can choose logging method. You can choose database logging/ File logging as well.
4. System should not hang even after using so many loggings. Logging just because we can easily debug issues so logging is mandatory to do.

3.3 Error Handling

Should errors be encountered, an explanation will be displayed as to what went wrong? An error will be defined as anything that falls outside the normal and intended usage.

4 Performance

CPA (Customer Profiling Analysis) is employed to segment customers and analyze their behavior in order to optimize product and marketing strategies accordingly. The accuracy of this analysis is crucial as it directly influences the decisions made by the company. It is essential that the CPA provides reliable insights and does not misguide the company's decision-making process.

4.1 Reusability

The code written and the components used should have the ability to be reused with no problems.

4.2 Application Compatibility

The different components for this project will be using Python as an interface between them. Each component will have its own task to perform, and it is the job of the Python to ensure proper transfer of information.

4.3 Resource Utilization

When any task is performed, it will likely use all the processing power available until that function is finished.

4.4 Development

5 Dashboard

Dashboards will be implemented to display and indicate certain KPIs and relevant indicators for the unveiled problems that if not addressed in time could cause catastrophes of unimaginable impact.

6 Conclusion

In conclusion, the implementation of CSA (Customer Sales Analysis) and CPA (Customer Profiling Analysis) in this project aims to provide valuable insights and understanding of customer behavior. By analyzing customer data, such as sales, promotions, demographics, and personal details, these analyses enable the company to optimize its product offerings, marketing strategies, and target specific audiences accurately. It is crucial to present the analysis in an easily understandable manner, ensuring that it supports informed decision-making and avoids misleading the company's actions.