Retail Analysis: Using Artificial Intelligence to find customer patterns and predict future trends…

Our project aims to leverage the capabilities of Artificial Intelligence to analyze customer patterns and predict future trends in the retail industry. By integrating an ecommerce API with a SQL database, we enable seamless data retrieval and analysis. The centerpiece of our project is a Business Analytics Dashboard, which provides comprehensive insights into user activity and behavior, empowering businesses to enhance customer service and optimize operations.

Client-side Interface:

The client-side interface serves as the gateway for users to interact with the Business Analytics Dashboard. It offers a user-friendly experience, allowing stakeholders to access key metrics and insights generated from the data analysis.

Ecommerce API:

The ecommerce API acts as a bridge between the client-side interface and the SQL database, facilitating the retrieval of real-time data such as user transactions, product information, and customer feedback.

SQL Database:

The SQL database serves as the central repository for storing vast amounts of ecommerce data, including customer profiles, purchase history, product inventory, and more. It provides the necessary foundation for conducting in-depth analysis and generating meaningful insights.

Business Analytics Dashboard:

The Business Analytics Dashboard presents a visual representation of key performance indicators and trends derived from the data. It offers dynamic charts, graphs, and tables to convey information such as sales trends, customer behavior, and product performance.

Analysis Engine:

The Analysis Engine powers the predictive analytics and machine learning algorithms used to uncover hidden patterns and trends within the data. It employs advanced techniques such as item-based clustering, sentiment analysis, and predictive modeling to generate actionable insights for business decision-making.

Item-based Clustering:

Item-based clustering categorizes products based on their attributes and customer preferences, enabling businesses to identify product affinities and recommend related items to customers.

Item to Location Analysis:

Item to Location Analysis explores the geographical distribution of product sales, allowing businesses to optimize inventory management and marketing strategies based on regional demand patterns.

Customer Satisfaction by Rating:

Customer Satisfaction by Rating analyzes customer feedback and ratings to gauge overall satisfaction levels and identify areas for improvement in product quality and service delivery.

Client Location to Spending Ratio:

Client Location to Spending Ratio correlates customer spending behavior with their geographical location, providing insights into regional market dynamics and customer preferences.

Sales by Category over Time:

Sales by Category over Time tracks the performance of different product categories over time, enabling businesses to identify emerging trends and adjust inventory and marketing strategies accordingly.

Preferred Payment Methods:

Preferred Payment Methods analyzes the distribution of payment methods used by customers, helping businesses optimize payment processing systems and tailor promotional offers to incentivize preferred payment methods.

Checkout Quit Rate:

Checkout Quit Rate measures the rate at which users abandon the checkout process without completing a purchase, allowing businesses to identify friction points and optimize the checkout experience to reduce cart abandonment.

Average Order Value over Time (AOV):

Average Order Value over Time (AOV) tracks the average value of orders placed by customers over time, providing insights into purchasing trends and customer spending behavior.

By combining these components, our project aims to provide businesses with a holistic view of their operations, enabling data-driven decision-making and strategic planning to drive growth and success in the competitive retail landscape.

Catalog	
Item_ID	UUID(32)
Item_Name	String
Price	Float
Manufacturer_ID	UUID(32)
Category_ID	UUID(32)
Quantity	Int
Added_date	Date
Updated_Date	Date
Deleted_date	Date
Discount	Float
Description	String
Weight	Float
Dimension_ID	UUID(32)
Image_Url	String
Rating	[Float]
Reviews	[String]
Tags	[String]

Login_Access	
Login_ID	UUID(32)
User_ID	UUID(32)
Login_time	TimeStamp
Logout_time	TimeStamp
IP_Address	String
Device_Type	String

Cart	
Cart_ID	UUID(32)
Item_ID	UUID(32)
User_ID	UUID(32)
Added_time	TimeStamp
Deleted_time	TimeStamp
Quantity	Float
Active	Boolean
Subtotal	Float

Checkout	
Checkout_ID	UUID(32)
User_ID	UUID(32)
Cart_ID	UUID(32)
Payment_ID	UUID(32)
Added_date	Date
Shipping_ID	UUID(32)
Shipping_Cost	Float
Total_Paid	Float
Complete?	Boolean

Payment	
Payment_ID	UUID(32)
User_ID	UUID(32)
Amount	Float
Method_Payment	String
Date_of_txn	Date
Transaction_Status	String
Payment_Status	String
Confirmation_Number	String

Shipping	
Shipping_ID	UUID(32)
User_ID	UUID(32)
Checkout_ID	UUID(32)
Payment_ID	UUID(32)
Address_ID	UUID(32)
Date_estimated	Date
Date_delivered	Date
Date_added	Date
Shipping_Status	String
Carrier	String
Tracking_Number	String

Customer	
User_ID	UUID(32)
Name	String
Age	Int
Phone_Number	String
Email	String
Gender	String
Date_of_Birth	Date
Account_Creation_Date	
Address_ID	UUID(32)
Total_purchase_cost	Float

Address	
Address_ID	UUID(32)
Line 1	String
Line 2	String
City	String
State	String
Country	String
PinCode	String

Manufacturer	
Manufacturer_ID	UUID(32)
Manufacturer_Name	String
Location	String
GSTIN	String

Category	
Category_ID	UUID(32)
Name	String

Dimension	
Dimension_ID	UUID(32)
Length	Float
Breadth	Float
Height	Float