Analytics and Reporting System

Overview

This document contains the Analytics and Reporting database schema, including customer behavior analysis, spending patterns, and business metrics.

Table: Customer_Spending_Analysis

Purpose: Stores aggregated spending analysis and patterns for each customer.

Column Name	Data Type	Description	Constraints
Analysis_ID	INTEGER	Unique identifier for analysis record	PRIMARY KEY, AUTO_INCREMENT
Customer_ID	INTEGER	Reference to Customer_Info table	FOREIGN KEY, NOT NULL
Analysis_Month	DATE	Month for which analysis is done	NOT NULL
Total_Spending	DECIMAL(12,2)	Total spending in the month	DEFAULT 0.00
Average_Transaction_Amount	DECIMAL(10,2)	Average transaction amount	DEFAULT 0.00
Transaction_Count	INTEGER	Number of transactions	DEFAULT 0
Top_Merchant_Category	VARCHAR(100)	Top merchant category by spending	
Top_Merchant	VARCHAR(255)	Top merchant by spending	
Spending_Trend	VARCHAR(20)	Trend (Increasing/Decreasing/Stable)	DEFAULT 'Stable'
Month_on_Month_Growth	DECIMAL(5,2)	Month-on-month growth percentage	DEFAULT 0.00
Analysis_Date	TIMESTAMP	Date when analysis was performed	DEFAULT CURRENT_TIMESTAMP

Relationships

- **Foreign Key**: `Customer_ID` references `Customer_Info.Customer_ID`

Table: Category_Spending_Breakdown

Purpose: Stores spending breakdown by merchant category for each customer.

Column Name	Data Type	Description	Constraints
Breakdown_ID	INTEGER	Unique identifier for breakdown	PRIMARY KEY, AUTO_INCREMENT
Customer_ID	INTEGER	Reference to Customer_Info table	FOREIGN KEY, NOT NULL
Merchant_Category	VARCHAR(100)	Merchant category	NOT NULL
Period	VARCHAR(20)	Period (Monthly/Quarterly/Yearly)	DEFAULT 'Monthly'
Period_Date	DATE	Start date of the period	NOT NULL
Total_Amount	DECIMAL(12,2)	Total spending in category	DEFAULT 0.00
Transaction_Count	INTEGER	Number of transactions in category	DEFAULT 0
Percentage_of_Total	DECIMAL(5,2)	Percentage of total spending	DEFAULT 0.00
Average_Transaction_Size	DECIMAL(10,2)	Average transaction size in category	DEFAULT 0.00

Relationships

- **Foreign Key**: `Customer_ID` references `Customer_Info.Customer_ID`

Table: Customer_Behavior_Metrics

Purpose: Stores behavioral metrics and engagement indicators for customers.

Column Name	Data Type	Description	Constraints
Metric_ID	INTEGER	Unique identifier for metric	PRIMARY KEY, AUTO_INCREMENT
Customer_ID	INTEGER	Reference to Customer_Info table	FOREIGN KEY, NOT NULL
Metric_Date	DATE	Date of metric calculation	NOT NULL
Login_Frequency	INTEGER	Number of logins in the period	DEFAULT 0

Transaction_Frequency	INTEGER	Number of transactions in the period	DEFAULT 0
Days_Since_Last_Transaction	INTEGER	Days since last transaction	
Days_Since_Last_Login	INTEGER	Days since last login	
App_Usage_Minutes	INTEGER	Total app usage in minutes	DEFAULT 0
Feature_Usage_Count	INTEGER	Number of features used	DEFAULT 0
Support_Tickets_Raised	INTEGER	Number of support tickets	DEFAULT 0
Satisfaction_Score	DECIMAL(3, 1)	Customer satisfaction score (0-10)	
Churn_Probability	DECIMAL(5, 2)	Probability of customer churn (0-100)	DEFAULT 0.00

Relationships

- **Foreign Key**: `Customer_ID` references `Customer_Info.Customer_ID`

Table: Business_Metrics

Purpose: Stores overall business metrics and KPIs.

Column Name	Data Type	Description	Constraints
Metric_ID	INTEGER	Unique identifier for metric	PRIMARY KEY, AUTO_INCREMENT
Metric_Date	DATE	Date of metric	NOT NULL
Total_Customers	INTEGER	Total number of customers	DEFAULT 0
Active_Customers	INTEGER	Number of active customers	DEFAULT 0
New_Customers	INTEGER	Number of new customers in period	DEFAULT 0
Churned_Customers	INTEGER	Number of churned customers	DEFAULT 0
Total_Transactions	INTEGER	Total number of transactions	DEFAULT 0
Total_Transaction_Amount	DECIMAL(15,2)	Total transaction amount	DEFAULT 0.00

Average_Transactio n_Value	DECIMAL(1 0,2)	Average transaction value	DEFAULT 0.00
Total_Merchants	INTEGER	Total number of merchants	DEFAULT 0
Active_Merchants	INTEGER	Number of active merchants	DEFAULT 0
Customer_Retention _Rate	DECIMAL(5, 2)	Customer retention rate (%)	DEFAULT 0.00
Customer_Acquisitio n_Cost	DECIMAL(1 0,2)	Average customer acquisition cost	DEFAULT 0.00
Customer_Lifetime_ Value	DECIMAL(1 2,2)	Average customer lifetime value	DEFAULT 0.00

Relationships Summary

- One customer can have multiple spending analysis records (one per month)
- One customer can have multiple category breakdowns
- One customer can have multiple behavior metric records
- Business metrics are aggregated across all customers
- All relationships are maintained through foreign keys

Cross-Table Relationships

Customer_Info is the central hub:
- Connects to **Customer_Preferences** for communication settings
- Connects to **Customer_Segments** for segmentation
- Connects to **Transaction_History** for transactions
- Connects to **Payment_Methods** for payment details
- Connects to **Customer_Spending_Analysis** for spending patterns
- Connects to **Category_Spending_Breakdown** for category analysis
- Connects to **Customer_Behavior_Metrics** for behavior tracking

Transaction_History connects to:
- **Customer_Info** for customer details
- **Merchant_Master** for merchant information

This creates a comprehensive data model for customer analytics and business intelligence.