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Data Techcon Analytics Project

SQL DEVELOPMENT & DATABASE MANAGEMENT PROJECT

Background:

- The sales department faced challenges extracting and analyzing critical data from the company's Ecommerce database. This created gaps in understanding customer behavior, product performance, and sales trends, which hindered data-driven decision-making.
- As an independent contributor Data Analyst, I was responsible for extracting and analyzing data from the company's e-commerce database. The sales department relied on accurate data extraction to answer critical business questions and optimize sales strategies. Full access was granted to the company's PostgreSQL database to retrieve relevant sales information.

Goal:

- This project aimed to extract and analyze key sales data using SQL, ensuring that business questions regarding customer behavior, product performance, and sales trends were answered efficiently. The focus was on utilizing SQL queries to pull accurate data from the data warehouse and develop reports that enabled the sales team to make informed, data-driven decisions.

Methodology:

Data Extraction: Complex SQL queries were written using PostgreSQL, a relational database management system, to extract relevant data from multiple tables in the e-commerce database. This included:

- Retrieving customer demographics and purchase history.
- Pulling product performance metrics and sales history.
- Extracting order fulfillment data to analyze trends in delivery times and order volume.

Data Manipulation: Manipulated extracted data by joining tables, filtering records, and applying conditions to focus on specific periods and sales segments (e.g., extracting only orders from 2015-2017).

Data Analysis: Conducted exploratory data analysis (EDA) using SQL to uncover trends, patterns, and outliers in the sales data. Analytical focus areas included:

- Customer segmentation by demographics and purchasing behavior.
- Product ranking based on sales volume and profitability.
- Analysis of order fulfillment times and their impact on customer satisfaction.

Data Reporting: Developed comprehensive reports based on the extracted data, ensuring that actionable insights were provided to the sales department.

Skills & Tools:

- Tools: PostgreSQL (SQL coding), Data Warehouse (E-commerce Database), Visual Code.
- Skills: SQL coding, Data manipulation, Data extraction, Data analysis, Database querying, Joining tables, and Performance optimization.

Project Outcomes:

- Designed data model for data ingestion automation & used complex SQL syntaxes/ commands to conduct ETL. Ingested data from third-party applications, transformed, and loaded data into multiple tables in a relational database in PostgreSQL database management system.
- Modeled an ER diagram that showcased the relationship of entity sets stored in the database.
- Led & implemented a new SQL database that stored data tables for advanced E-commerce data analysis.

Performance Measures/Conclusion:

The project's success was measured by the efficiency of SQL code in terms of query performance and the accuracy of the data extraction. Additionally, the project was evaluated based on the actionable insights provided to the sales department, which led to improved decision-making regarding customer targeting and product focus.

By successfully applying SQL techniques to manipulate and extract data, the project achieved its objectives, delivering real-time data insights to the sales department and proving the ability to handle large, complex datasets.

CODE REVIEW

The queries (question and code answers) were transferred from PostgreSQL and stored in the Visual Studio Code for review and can be accessed via the GitHub link provided.