**Project Documentation: E-commerce Sales Analysis**

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**Introduction**

The purpose of this project is to analyze e-commerce sales data to uncover insights that can drive strategic decisions, optimize inventory management, and inform marketing strategies. This document outlines the steps taken, from data cleaning and SQL queries to visualization and insights.

**Data Cleaning and Preparation**

* Identified missing values and handled them appropriately.
* Removed duplicates from the dataset.
* Created a new table named "Products" with columns ProductID, ProductName, Category, and Brand.
* Linked "Products" and "SalesTransactions" tables via the ProductID column for normalization.

**SQL Queries for Insights**

**Sales Analysis by Month**

SELECT DATE\_FORMAT(OrderDate, '%Y-%m') AS Month,

COUNT(DISTINCT TransactionID) AS TotalTransactions,

SUM(Quantity) AS TotalItemsSold,

SUM(Price \* Quantity) AS TotalRevenue

FROM SalesTransactions

GROUP BY Month

ORDER BY Month;

**Top Selling Products**

SELECT p.ProductName,

p.Category,

SUM(st.Quantity) AS TotalItemsSold,

SUM(st.Price \* st.Quantity) AS TotalRevenue

FROM Products p

JOIN SalesTransactions st ON p.ProductID = st.ProductID

GROUP BY p.ProductName, p.Category

ORDER BY TotalRevenue DESC

LIMIT 10

**Customer Analysis**

SELECT **c.CustomerID,**

**c.FirstName,**

**c.LastName,**

**COUNT(st.TransactionID) AS TotalTransactions,**

**SUM(st.Quantity) AS TotalItemsPurchased,**

**SUM(st.Price \* st.Quantity) AS TotalSpending**

**FROM Customers c**

**JOIN SalesTransactions st ON c.CustomerID = st.CustomerID**

**GROUP BY c.CustomerID**

**ORDER BY TotalSpending DESC**

**LIMIT 10;**

**Data Visualization**

**Visualizations were designed to showcase insights:**

* Sales trends were visualized using line charts and bar graphs.
* Product performance was depicted using bar charts.
* Customer behavior was illustrated using bar charts and tables.

**Key Findings and Recommendations**

**Key findings include:**

* Seasonal sales trends indicating peak and off-peak periods.
* Top selling products by revenue and quantity.
* High-spending customers and their purchase patterns.

**Recommendations:**

* Optimize inventory based on seasonal trends.
* Create targeted marketing campaigns for top products and customer segments.

**Conclusion**

This project demonstrates the power of SQL analysis in uncovering insights from e-commerce sales data. The insights gained contribute to informed decision-making, inventory management, and strategic marketing efforts.

**Impact**

The project's findings empower businesses to make data-driven decisions, enhance customer experiences, and drive revenue growth.