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Sales Insights : Data Analysis and Visualization Using SQL and Power BI

Introduction

This project focuses on using SQL and Power BI to perform data analysis, data cleaning, and dashboard creation.. The initial phase involves analyzing a MySQL database containing sales insights, including customer, transaction, product, and market data. The project progresses to the integration of Power BI for advanced data transformation and visualization, highlighting the importance of data preparation and modeling.

Key Highlights

- **Data Cleaning Challenges:** Issues such as negative sales amounts and inconsistent currency formats highlight the importance of data integrity.
- **Yearly Sales Analysis:** SQL queries are used to analyze historical sales trends by year.
- **Data Integrity:** Cleaning data, such as resolving negative sales and currency inconsistencies, is critical for accurate analysis.
- **Historical Data Analysis:** Analyzing sales data by year provides valuable insights into business trends.

Power BI Integration and Data Transformation

Overview

The project transitions to connecting Power BI with the MySQL database to perform Extract, Transform, Load (ETL) processes. Participants learn to clean and transform data in Power BI, focusing on preparing it for visualization and analysis.

Key Highlights

- **Data Transformation:** Demonstrates the ETL process, converting messy data into a usable format.
- **Data Modeling:** Introduces creating data models and establishing relationships between tables using a star schema.
- **Data Cleaning:** Includes filtering out negative sales and irrelevant entries.
- **Currency Conversion:** Converts sales amounts from USD to INR for consistency.
- **ETL Importance:** Streamlines the data analysis pipeline, ensuring only relevant data is used.
- **Power Query Utility:** A powerful tool within Power BI for filtering, cleaning, and reshaping data.
- **Data Relationships:** Establishing relationships using a star schema enhances analytical efficiency.
- **Data Quality:** Removing erroneous entries ensures reliable analysis.
- **Currency Standardization:** Avoids calculation errors and maintains consistency.

Advanced Data Cleaning and Dashboard Creation

Overview

Building upon previous lessons, this phase emphasizes handling real-world data issues such as duplicate transactions and currency inconsistencies. The project culminates in the creation of an interactive Power BI dashboard.

Key Highlights

- **Data Cleaning:** Focuses on resolving duplicates and filtering out anomalies.
- **Dashboard Construction:** Now creating a detailed dashboard with visualizations.
- **Interactive Visualizations:** Enables dynamic filtering by customer, region, or date.
- **Revenue Analysis:** Tracks performance by customers and regions, illustrating trends over time.
- **Measures in Power BI:** Defines metrics for revenue and sales quantity to drive decision-making.
- **KPI's:** Revenue, Product sales, Revenue By Customer, Revenue By Product Types, Revenue by Year
- **Visualizations:** Crads, clustered bar chart, Line chart, Slicers.
- **Customizing Visuals:** Enhances dashboard aesthetics for better user engagement.

Conclusion

This project provides a comprehensive approach to data analysis and visualization, starting with SQL-based querying and progressing to advanced Power BI features. By focusing on data preparation, transformation, and modeling, participants gain hands-on experience with tools and techniques essential for data analysts. The resulting dashboards enable actionable insights, laying a solid foundation for future projects.

Appendix

- **Tools Used:** MySQL, MySQL Workbench, Power BI
- **Data Sources:** Sales insights database from Kaggle
- **Key Visualizations:** Revenue by customer, sales trends, interactive filters