Mega Mart Strategic Data Insights

Company Overview:

Mega Mart is a global retail giant known for its wide product range and customer-focused approach. Operating in multiple countries, it offers physical stores and an e-commerce platform, serving millions of shoppers.The company's commitment to high-quality products at competitive prices ensures a seamless shopping experience, whether in-store or online.

Data analytics drive its operations, optimizing inventory, personalizing customer experiences, and maintaining efficient supply chains. This data-driven approach positions Mega Mart as a leader in the retail industry, ready to meet the changing needs of its diverse customer base.

Products and Services:

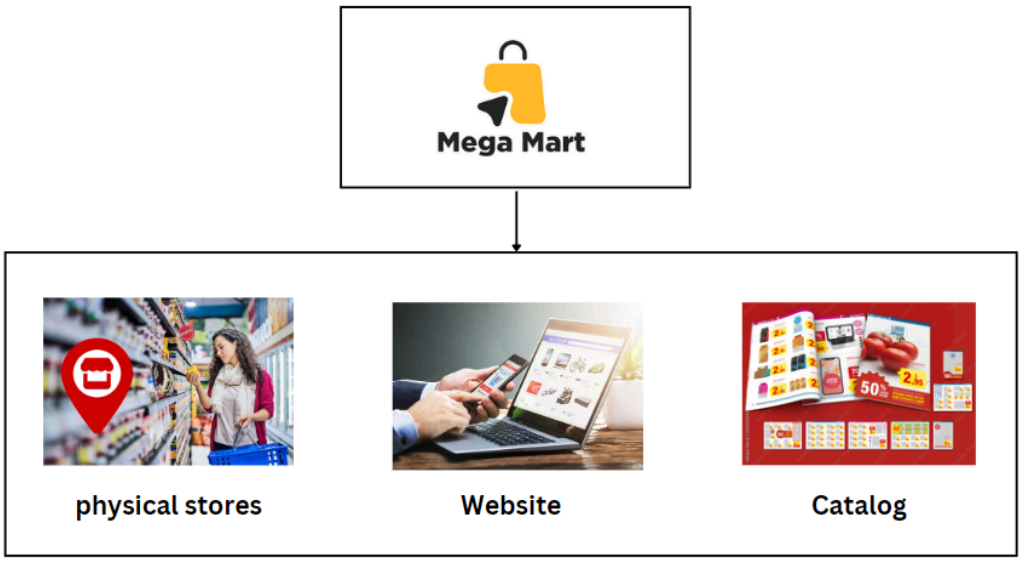
Mega Mart offers a wide array of products across various categories, catering to the everyday needs of its customers:

- Groceries and Everyday Essentials
- Electronics and Home Appliances
- Apparel and Fashion
- Health and Beauty
- Home and Furniture
- Sports and Outdoor Gear

Comparative Analysis of Mega Mart and Leading Retail Giants

Aspect	Mega Mart	Reliance Retail	Big Bazaar	DMart
Founded	1995	2006	2001	2002
Headquarters	Bangalore	Mumbai	Mumbai	Mumbai
Business Model	Multi-channel retail (stores, online, catalog)	Multi-format retail with physical stores and online	Hypermarket and online retail, value-focused	Hypermarket chain with strong regional focus
Product Range	Groceries, electronics, clothing, household items	Groceries, electronics, fashion, household items	Groceries, apparel, electronics, home goods	Groceries, FMCG, apparel, household items
Revenue (2023)	$10 billion	$22 billion	$5 billion	$4 billion

How Mega Mart sells its products:



1. In-Store Sales:

Mega Mart operates a vast network of physical stores across different regions, catering to customers who prefer traditional shopping experiences.

- **Sales Process:**
  - ☐ Customers visit a Mega Mart store, browse through various product categories (groceries, apparel, electronics, etc.), and make purchases.
  - ☐ Each transaction is recorded in the store_sales table, which captures details such as the item purchased (item), the store location (store), the date and time of the sale (date_dim, time_dim), and customer information (customer).
- **Returns:**
  - ☐ If a customer needs to return a product, the transaction is recorded in the store_returns table. This helps Mega Mart track return rates, reasons for returns (reason), and customer satisfaction.
- **Inventory Management:**
  - ☐ The inventory table tracks stock levels in each store. Mega Mart uses this data to ensure that popular products are always in stock and to trigger replenishments from warehouses (warehouse).

2. Catalog Sales:

Mega Mart also offers products through a catalog, which can be ordered via mail or phone. This channel appeals to customers who prefer browsing through physical catalogs and placing orders from the comfort of their homes.

- **Sales Process:**
  - ☐ Customers place orders based on the catalog pages (catalog_page) they receive. These transactions are captured in the catalog_sales table.
  - ☐ The catalog_sales table records the details of the order, including the items purchased, the catalog page they were featured on, and customer information.
- **Returns:**
  - ☐ Catalog returns are managed through the catalog_returns table. This table helps track which items are returned, the reasons for returns, and the impact on overall sales.

3. Online (Web) Sales:

Mega Mart has a strong online presence, enabling customers to shop via their website. This channel is particularly important in today's digital age, providing convenience and a wider reach.

- **Sales Process:**

- ☐ Customers can browse Mega Mart's online store (web_site), add items to their cart, and complete purchases. These transactions are recorded in the web_sales table.
- ☐ The web_sales table contains detailed information about each online transaction, including the customer's ID, the item purchased, the web page (web_page) where the item was viewed, and the shipping mode (ship_mode) selected by the customer.

❖ **Returns:**

- ☐ Online returns are managed through the web_returns table. This table captures data on the items returned, reasons for returns, and the effectiveness of online sales.

4. Omni-Channel Integration:

Mega Mart's omni-channel strategy seamlessly integrates in-store, catalog, and online sales to provide a consistent shopping experience.

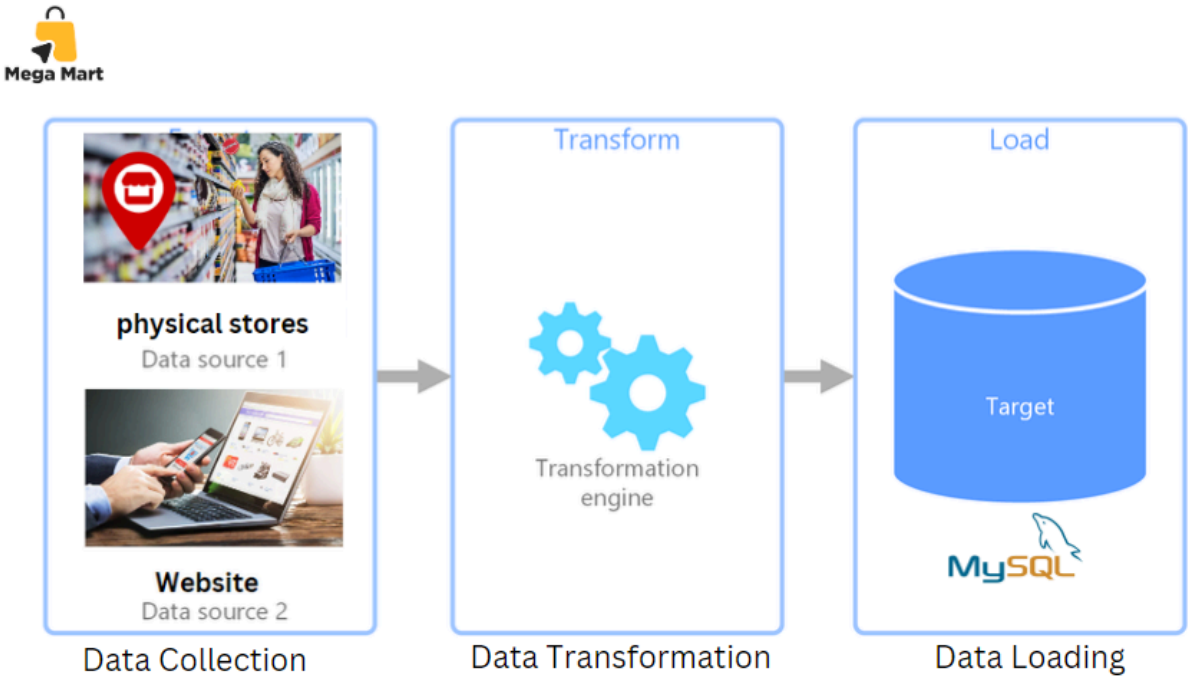
❖ **Click-and-Collect:**

- ☐ Customers can order products online and pick them up in-store. This process involves the web_sales, store (for pickup location), and inventory tables to ensure the product is available and ready for collection.

❖ **Cross-Channel Returns:**

- ☐ Products purchased online or via catalog can be returned in-store. This flexibility is managed by integrating data from the web_returns, catalog_returns, and store_returns tables.

Data Journey for Mega Mart:



1. Data Collection: Mega Mart operates across multiple sales channels—physical stores, online platforms, and catalog orders—each generating vast amounts of data daily. This data includes sales transactions, customer information, inventory levels, and promotional activities. Here's how data is collected across these channels:

- **In-Store Data:** Point-of-Sale (POS) systems in physical stores capture transactional data, including items purchased, payment methods, customer information (if available), and timestamps.
- **Online (Web) Data:** Mega Mart's e-commerce platform collects data from online transactions, including product views, clicks, cart additions, purchases, and customer profiles.
- **Catalog Orders:** Orders placed via catalog are recorded, capturing customer information, products ordered, and shipping details.
- **Customer Engagement:** Data is also collected from customer interactions, such as responses to promotions, loyalty program activities, and feedback.

2. Data Ingestion: Once collected, the data from various sources is pre-processed and formatted to ensure consistency. This step might involve:

- **Data Cleansing:** Removing duplicates, correcting errors, and ensuring data consistency across different sources.
- **Data Transformation:** Formatting data to match the schema requirements, such as converting date formats, normalizing text entries, and standardizing product codes.

3. Data Loading into MySQL Database: After preprocessing, the cleaned and transformed data is loaded into the MySQL database. The database used for storing and managing all this data at Mega Mart is named **tpcds**.

- **Batch Loading:** Data might be loaded in batches, especially for large datasets like daily sales or inventory updates.
- **Real-Time Loading:** For critical data, such as online transactions, real-time loading might be implemented to ensure up-to-date information is available for analysis.

4. Database and Schema Overview:

The **tpcds** database in MySQL is structured to handle a comprehensive range of retail operations data, organized into 24 tables. These tables are categorized as follows:

Database: tpcds

Schema Overview:

1. **Fact Tables:** These tables record detailed transactional data, such as sales, returns, and inventory changes. They are the largest tables in the database, capturing high-volume data.
    - ➢ **store_sales**: Records all sales transactions made in physical stores.
    - ➢ **store_returns**: Tracks product returns in stores.
    - ➢ **catalog_sales**: Captures sales from catalog orders.
    - ➢ **catalog_returns**: Records returns of catalog orders.
    - ➢ **web_sales**: Logs online sales transactions.
    - ➢ **web_returns**: Manages data on returns of online purchases.
    - ➢ **inventory**: Maintains records of inventory levels across different locations.

2. **Dimension Tables:** These tables contain descriptive attributes related to the facts, providing context to the transactional data, such as product details, customer information, and store locations.
    - ➢ **customer**: Contains personal details of customers.
    - ➢ **customer_address**: Stores customer addresses.
    - ➢ **customer_demographics**: Holds demographic data about customers.
    - ➢ **date_dim**: Provides detailed date information for transaction timestamps.
    - ➢ **time_dim**: Contains information on the time of transactions.
    - ➢ **household_demographics**: Offers demographic data at the household level.
    - ➢ **item**: Describes the products sold, including name, category, and price.
    - ➢ **promotion**: Stores data on promotional campaigns.
    - ➢ **store**: Contains information about physical store locations.
    - ➢ **call_center**: Manages data related to call center operations.

- **catalog_page**: Provides details about catalog pages where products are featured.
- **web_site**: Contains information on the Mega Mart website.
- **web_page**: Describes individual web pages on the site.
- **ship_mode**: Details various shipping methods offered.
- **warehouse**: Stores information about warehouse locations.
- **income_band**: Categorizes customers based on income levels.
- **reason**: Captures reasons for product returns.

Business Problem for Mega Mart

Problem Statement: Mega Mart, a leading global retailer, is facing challenges in optimizing its operations due to the vast amount of data generated across multiple channels. The company struggles with efficiently managing inventory, understanding customer behavior, and maximizing sales across different platforms (in-store, online, and catalog). Additionally, Mega Mart aims to improve its promotional strategies to increase customer engagement and retention.

To address these challenges, Mega Mart requires a comprehensive data analytics solution that can provide actionable insights into its operations, customer base, and sales performance. The goal is to enhance decision-making, improve operational efficiency, and ultimately drive higher profitability.

How to download the dataset

The datasets are publicly available

1. Open your favorite MariaDB client (MySQL Workbench)
2. Use following credentials:
   - hostname: db.relational-data.org
   - port: 3306
   - username: guest
   - password: relational
3. Choose database tpcds (SQL Query: use tpcds)

Project Components

➔ Component 1: SQL Analysis

Objective: Perform in-depth analysis on Mega Mart's data using SQL to uncover insights that drive business decisions. This involves querying the TPC-DS database to analyze sales performance, inventory management, customer behavior, promotional effectiveness, channel performance, and supply chain logistics. The SQL analysis will provide the foundational data and insights needed for further reporting and visualization in Power BI.

➔ Component 2: Power BI Report

Objective: Develop interactive and visually engaging dashboards in Power BI that represent the insights derived from SQL analysis. These dashboards will track key performance indicators (KPIs) across various aspects of Mega Mart's operations, including sales, inventory, customer engagement, and promotions. The Power BI report will enable stakeholders to monitor business performance in real-time and make informed decisions based on data-driven insights.

➔ Component 3: Report and PPT Presentation

Objective: Compile the findings from the SQL analysis and Power BI reports into a comprehensive written report and a PowerPoint presentation. The report will document the analysis, insights, and strategic recommendations, while the presentation will be used to communicate these findings to Mega Mart's management team. The goal is to provide a clear, concise, and actionable overview that can guide strategic planning and operational improvements.

Component 1: SQL Analysis

Start Analysis:

SQL analysis is the cornerstone of data-driven decision-making at Mega Mart. By querying the TPC-DS database, we can extract valuable insights from raw data that inform business strategies. The purpose of starting with SQL analysis is to:

Identify Business Opportunities: Understand sales trends, customer behavior, and inventory dynamics to uncover opportunities for growth and optimization.

Support Strategic Decision-Making: Provide data-backed insights that guide decisions on resource allocation, marketing strategies, and operational improvements.

Optimize Operations: Enhance efficiency in key areas such as inventory management, supply chain logistics, and promotional effectiveness.

Improve Customer Experience: Analyze customer data to better understand their preferences and behavior, enabling more personalized and effective engagement strategies.

Sales Performance Analysis:

Understand how different product categories, regions, and channels contribute to overall sales and identify growth opportunities.

Key Metrics: Total sales, sales by product category, sales by region, sales by channel.

Objective :

To understand the key drivers of sales revenue across product categories, regions, and sales channels, enabling Mega Mart to identify growth opportunities and optimize sales strategies.

Sql Queries for analysis:

1. **Total Sales by Product Category:**

   Question: Calculate the total sales revenue for each product category across all channels.

2. **Sales Trend Over Time:**

   Question: Analyze monthly sales trends for the past two years.

3. **Top 10 Best-Selling Products:**

   Question: Identify the top 10 best-selling products by total revenue.

4. **Sales by Region:**

   Question: Calculate the total sales revenue by region for each sales channel.

5. **Year-over-Year Sales Growth:**

   Question: Compare the year-over-year sales growth for the current and previous year.

6. **Sales Contribution by Channel:**

   Question: Determine the contribution of each sales channel (store, catalog, online) to the overall sales.

7. **Sales Performance of New Products:**

   Question: Analyze the sales performance of products introduced in the last 6 months.

8. **Average Order Value:**

Question: Calculate the average order value for each sales channel.

9. **Seasonal Sales Analysis:**

   Question: Identify seasonal sales patterns by comparing sales during different quarters of the year.

10. **Product Category Sales Distribution:**

    Question: Determine the sales distribution across different product categories.

Strategic Recommendations for Mega Mart's Sales Optimization

write a comprehensive summary of the decisions Mega Mart should consider based on these findings. Here's how to structure your decision-making process:

1. **Top Performing Products and Categories:**
   - Based on the sales data, identify which products and categories are performing the best. Consider how MegaMart should adjust its marketing, inventory, and product strategy to capitalize on these top performers. What actions should the company take to ensure these products remain well-stocked and continue driving revenue?
2. **Sales Trends Over Time:**
   - Analyze the sales trends identified over different time periods (e.g., months, seasons). What decisions should Mega Mart make regarding promotional timing, inventory planning, and staffing? How can the company better prepare for peak sales periods and mitigate the impact of low-demand times?
3. **Regional Sales Insights:**
   - Consider the regional sales data. Which regions are excelling, and which are underperforming? What strategic moves should Mega Mart make to enhance sales in weaker regions? How should resources be allocated differently based on regional performance?
4. **Channel Contribution:**
   - Reflect on the contribution of each sales channel (store, online, catalog). How should Mega Mart invest in or improve its sales channels? What channel-specific strategies should be implemented to maximize profitability and customer engagement?
5. **New Product Performance:**
   - Evaluate the performance of newly introduced products. What should Mega Mart do with products that are either succeeding or underperforming? Should the company expand, continue, or discontinue these products? Provide recommendations based on the data.
6. **Average Order Value (AOV):**

- ❖ Analyze the AOV across different channels. What strategies could Mega Mart implement to increase the AOV? Consider the use of cross-selling, upselling, and bundle deals, and how these strategies might differ across channels.

7. **Seasonal Sales Analysis:**
   - ❖ Based on seasonal patterns, what decisions should Mega Mart make regarding inventory levels, marketing efforts, and promotional activities? How can the company leverage these seasonal trends to maximize sales?
8. **Product Category Sales Distribution:**
   - ❖ Consider the distribution of sales across product categories. What adjustments should Mega Mart make to its product offerings? Should certain categories be promoted more, or should the inventory for low-performing categories be reduced?

Inventory Management Analysis

Optimize inventory levels to reduce costs while ensuring product availability.

Objective: To optimize inventory levels by analyzing turnover, stockout rates, and overstock situations, ensuring that products are available when needed while minimizing holding costs.

Sql Queries for analysis:

11. Inventory Turnover Ratio:

Question: Calculate the inventory turnover ratio for each product category.

12. Stockout Rate by Product:

Question: Identify the products with the highest stockout rates in the past month.

13. Days of Inventory on Hand:

Question: Calculate the average days of inventory on hand for each product category.

14. Top 10 Overstocked Products:

Question: List the top 10 products with the highest overstock levels.

15. Replenishment Frequency:

Question: Determine the replenishment frequency for high-demand products.

16. Inventory Aging Analysis:

Question: Analyze the aging of inventory to identify slow-moving products.

17. Warehouse Inventory Levels:

Question: Monitor the current inventory levels across all warehouses.

Data-Driven Decisions for Optimizing Inventory Management at Mega Mart

write a comprehensive summary of the decisions Mega Mart should consider based on these findings.

1. **Inventory Turnover Ratio**:
    - ❖ Based on the inventory turnover data, identify which products are selling quickly and which are slow-moving. Consider how MegaMart should adjust reorder quantities, promotional efforts, or discontinuation strategies for these products. What actions should the company take to ensure efficient inventory management and reduce holding costs?
2. **Stockout Rate by Product:**
    - ❖ Analyze the products with high stockout rates. What decisions should Mega Mart make to improve demand forecasting and inventory replenishment processes? How can the company prevent missed sales opportunities by maintaining adequate stock levels for high-demand products?
3. **Days of Inventory on Hand:**
    - ❖ Consider the average days of inventory on hand across different product categories. What strategies should Mega Mart implement to balance inventory levels, avoiding both overstocking and stockouts? How should reorder points and safety stock levels be adjusted?
4. **Top 10 Overstocked Products:**
    - ❖ Evaluate the most overstocked products. What actions should Mega Mart take to reduce excess inventory, such as running clearance sales or adjusting future purchasing decisions? How can the company optimize inventory to free up space and reduce costs?
5. **Replenishment Frequency:**
    - ❖ Reflect on the replenishment frequency for high-demand products. Should Mega Mart automate reordering for these products or adjust stock levels to reduce the frequency of reorders? How can the company ensure continuous product availability while managing inventory efficiently?
6. **Inventory Aging Analysis:**
    - ❖ Analyze the aging inventory data. What decisions should Mega Mart make regarding the promotion or markdown of slow-moving products? Should certain items be discontinued or re-evaluated for their relevance in the product lineup?
7. **Warehouse Inventory Levels:**
    - ❖ Consider the current inventory levels across all warehouses. How should Mega Mart optimize inventory distribution to ensure that each warehouse is adequately

stocked? What steps can be taken to balance stock levels and reduce logistics costs?

Customer Behavior Analysis

Gain insights into customer preferences and behavior to enhance engagement and retention strategies.

Objective: To gain insights into customer preferences, behavior, and value, allowing Mega Mart to improve customer engagement, retention, and maximize lifetime value through targeted strategies.

Sql Queries for analysis:

18. **Customer Segmentation by Demographics:**

    Question: Segment customers based on age, income, and region.

19. **Customer Lifetime Value (CLTV):**

    Question: Calculate the customer lifetime value based on past purchase behavior.

20. **Repeat Purchase Rate:**

    Question: Determine the repeat purchase rate for each customer segment

21. **Average Purchase Frequency:**

    Question: Calculate the average purchase frequency per customer.

22. **Customer Churn Analysis:**

    Question: Identify customers who have not made a purchase in the last year.

23. **Top 10 Most Valuable Customers:**

    Question: List the top 10 customers by total spend.

24. **Customer Acquisition by Channel:**

    Question: Analyze how customers are acquired through different sales channels.

25. **Customer Satisfaction Analysis:**

Question: Correlate customer satisfaction scores with purchase behavior (requires hypothetical satisfaction data).

Strategic Decisions for Enhancing Customer Engagement and Retention at Mega Mart

write a comprehensive summary of the decisions Mega Mart should consider based on these findings.

Customer Segmentation by Demographics:

- Based on the customer segmentation data, identify the key demographic groups that are most valuable to Mega Mart. What strategies should the company implement to target these segments more effectively? Consider how marketing campaigns, product offerings, and pricing strategies can be tailored to different demographic groups.

Customer Lifetime Value (CLTV):

- Analyze the customer lifetime value data to determine which customer segments generate the most revenue over time. What actions should Mega Mart take to retain high-value customers and increase their spending? Consider implementing loyalty programs, personalized offers, or exclusive deals for these customers.

Repeat Purchase Rate:

- Reflect on the repeat purchase rate across different customer segments. What strategies can Mega Mart employ to encourage repeat purchases? Should the company introduce incentives such as loyalty rewards, subscription services, or targeted promotions to increase customer retention?

Average Purchase Frequency:

- Consider the average purchase frequency for each customer segment. How can MegaMart increase the frequency of purchases? Explore options such as personalized email marketing, reminders, or discounts on recurring purchases to drive more frequent shopping behavior.

Customer Churn Analysis:

- Analyze the churn data to identify customers who have not made a purchase in the last year. What strategies should Mega Mart implement to re-engage these lapsed

customers? Consider offering reactivation campaigns, special discounts, or targeted communication to win back these customers.

Top 10 Most Valuable Customers:

- Identify the top 10 customers by total spend. How can Mega Mart further strengthen relationships with these high-value customers? Consider providing personalized services, exclusive offers, or premium experiences to maintain their loyalty and encourage continued spending.

Customer Acquisition by Channel:

- Reflect on the customer acquisition data across different sales channels. Which channels are most effective at acquiring new customers? How should Mega Mart allocate marketing resources to maximize customer acquisition? Consider optimizing or expanding the most successful channels and improving underperforming ones.

Promotional Effectiveness Analysis

Evaluate the impact of promotional campaigns on sales and customer behavior to optimize marketing efforts.

Objective: To assess the impact of promotional campaigns on sales and customer engagement, guiding Mega Mart in optimizing its promotional strategies to maximize ROI and customer response.

Sql Queries for analysis:

26. **Promotion Uplift Analysis:**

    Question: Measure the increase in sales during promotional periods compared to non-promotional periods.

27. **ROI of Promotional Campaigns:**

    Question: Calculate the return on investment (ROI) for each promotional campaign.

28. **Customer Response Rate to Promotions:**

    Question: Determine the response rate of customers to different promotions.

29. **Effectiveness of Discounts vs. Coupons:**

Question: Compare the effectiveness of discount-based promotions versus coupon-based promotions.

30. **Sales by Promotion Type:**

    Question: Analyze sales generated by different types of promotions (e.g., discounts, buy-one-get-one).

31. **Seasonal Promotion Analysis:**

    Question: Evaluate the effectiveness of seasonal promotions (e.g., holiday sales).

32. **Promotion-Driven New Customer Acquisition:**

    Question: Identify how many new customers were acquired during promotional periods.

Channel Performance Analysis

Compare the effectiveness of different sales channels and optimize strategies for each.

Objective: To evaluate the effectiveness and profitability of different sales channels (store, online, catalog), enabling Mega Mart to optimize channel-specific strategies, improve customer satisfaction, and enhance overall sales performance.

Sql Queries for analysis:

33. **Sales Contribution by Channel:**

    Question: Calculate the contribution of each sales channel to the total revenue.

34. **Customer Satisfaction by Channel:**

    Question: Analyze customer satisfaction scores across different sales channels (requires hypothetical satisfaction data).

35. **Conversion Rate for Online Sales:**

    Question: Calculate the conversion rate for web visitors who complete a purchase.

36. **In-Store vs. Online Sales Growth:**

Question: Compare the sales growth rates between in-store and online channels over the past year.

37. **Product Performance by Channel:**

    Question: Analyze which products perform best in each sales channel.

38. **Channel Profitability Analysis:**

    Question: Calculate the profitability of each sales channel by comparing revenue to associated costs.

Optimizing Promotional Strategies for Maximizing Sales and ROI at Mega Mart

write a comprehensive summary of the decisions Mega Mart should consider based on these findings

Promotion Uplift Analysis:

- Based on the promotion uplift data, identify which promotional campaigns had the most significant impact on sales. What actions should Mega Mart take to replicate the success of these promotions? Consider increasing the frequency of effective promotions or extending them to more products or regions.

ROI of Promotional Campaigns:

- Analyze the return on investment (ROI) for each promotional campaign. Which promotions delivered the highest returns relative to their costs? What decisions should Mega Mart make regarding future promotional spending? Consider reallocating the budget to the most profitable campaigns and discontinuing less effective ones.

Customer Response Rate to Promotions:

- Reflect on the customer response rates for different promotions. Which types of promotions (e.g., discounts, coupons, buy-one-get-one) generated the most customer engagement? How can Mega Mart optimize its promotional strategies to increase response rates? Consider focusing on the promotion types that resonate most with customers.

Effectiveness of Discounts vs. Coupons:

- Compare the effectiveness of discount-based promotions versus coupon-based promotions. Which approach drove more sales and customer engagement? What strategies should Mega Mart implement to maximize the effectiveness of its

promotional efforts? Consider using the more effective promotion type for future campaigns.

Sales by Promotion Type:

- Evaluate the sales generated by different types of promotions (e.g., percentage discounts, free shipping, bundle offers). What insights can Mega Mart gain about customer preferences for certain promotions? How should the company tailor its promotional mix to better align with customer preferences and maximize sales?

Seasonal Promotion Analysis:

- Analyze the effectiveness of seasonal promotions, such as holiday sales. Which seasonal promotions were most successful, and why? What decisions should Mega Mart make regarding the timing and execution of future seasonal promotions? Consider repeating successful promotions during the same season and exploring new opportunities for other seasonal events.

Promotion-Driven New Customer Acquisition:

- Reflect on how many new customers were acquired during promotional periods. What strategies can Mega Mart implement to convert these new customers into repeat buyers? Consider offering follow-up promotions or loyalty incentives to encourage repeat purchases from newly acquired customers.

Supply Chain and Logistics Analysis

Streamline supply chain operations to ensure timely product delivery and efficient inventory management.

Objective: To streamline supply chain operations by analyzing warehouse efficiency, shipping times, and order fulfillment, ensuring timely product delivery and reducing logistics costs.

Sql Queries for analysis:

39. **Warehouse Turnover Rate:**

    Question: Calculate the inventory turnover rate for each warehouse.

40. **Average Shipping Time:**

    Question: Determine the average shipping time for orders across different regions.

41. **Delivery Success Rate:**

Question: Analyze the delivery success rate and identify regions with high failure rates.

42. **Warehouse Stock Levels:**

    Question: Monitor the stock levels of key products in each warehouse.

43. **Shipping Mode Efficiency:**

    Question: Compare the efficiency of different shipping modes in terms of cost and delivery time.

44. **Supply Chain Bottleneck Analysis:**

    Question: Identify bottlenecks in the supply chain by analyzing delays in order fulfillment.

45. **Order Fulfillment Rate:**

    Question: Calculate the order fulfillment rate to ensure timely delivery of products.

Enhancing Supply Chain Efficiency and Delivery Reliability at Mega Mart

write a comprehensive summary of the decisions Mega Mart should consider based on these findings

Warehouse Turnover Rate:

- Based on the warehouse turnover rate data, identify which warehouses are operating efficiently and which are underperforming. What actions should Mega Mart take to improve inventory movement in underperforming warehouses? Consider optimizing inventory levels, improving demand forecasting, or adjusting stock distribution among warehouses.

Average Shipping Time:

- Analyze the average shipping time for orders across different regions. How can Mega Mart reduce shipping times and improve delivery efficiency? Consider optimizing shipping routes, selecting faster shipping methods, or strategically placing warehouses closer to high-demand regions.

Delivery Success Rate:

- Reflect on the delivery success rates in various regions. Identify regions with high failure rates and consider what changes Mega Mart should make to improve delivery reliability. Potential actions include collaborating with more reliable carriers, improving address accuracy, or enhancing communication with customers during delivery.

Warehouse Stock Levels:

- Evaluate the current stock levels across all warehouses. Are there any significant imbalances in stock distribution? What steps should Mega Mart take to ensure that stock levels are optimized based on regional demand? Consider redistributing inventory, increasing safety stock in high-demand areas, or reducing excess stock in overstocked warehouses.

Shipping Mode Efficiency:

- Compare the efficiency of different shipping modes in terms of cost and delivery time. Which shipping modes offer the best balance of cost-effectiveness and speed? What decisions should Mega Mart make regarding the choice of shipping methods? Consider standardizing on the most efficient shipping modes to reduce costs and improve customer satisfaction.

Supply Chain Bottleneck Analysis:

- Identify any bottlenecks in the supply chain that are causing delays in order fulfillment. What actions should Mega Mart take to address these bottlenecks? Consider process improvements, increased automation, or additional resources to ensure a smoother flow of goods through the supply chain.

Order Fulfillment Rate:

- Reflect on the order fulfillment rates across different regions or warehouses. What strategies can Mega Mart implement to ensure that orders are fulfilled on time? Consider improving inventory accuracy, enhancing warehouse operations, or increasing staffing during peak times to boost fulfillment rates.

Component 2: Power BI Report

Power BI KPI Requirements for Mega Mart

1. Sales Performance KPIs

- Total Sales Revenue: Display total sales across all channels (in-store, online, catalog) over time.
- Sales Growth Rate: Track year-over-year and month-over-month sales growth.
- Top-Selling Products: Highlight the top 10 products by revenue, helping the company focus on high-performing items.
- Sales by Product Category: Break down sales by category to identify which product lines are driving revenue.
- Sales by Region: Show sales performance across different geographic regions to identify high and low-performing areas.
- Average Order Value (AOV): Measure the average revenue per order, providing insights into customer purchasing behavior.

2. Inventory Management KPIs

- Inventory Turnover Ratio: Measure how quickly inventory is sold and replaced over a specific period.
- Days of Inventory on Hand: Track how long inventory is expected to last based on current sales rates.
- Stockout Rate: Monitor the percentage of products that are out of stock, helping prevent lost sales.
- Overstock Levels: Identify products with excess inventory to avoid unnecessary holding costs.
- Warehouse Stock Levels: Display inventory levels by warehouse to optimize stock distribution.

3. Customer Behavior KPIs

- Customer Lifetime Value (CLTV): Estimate the total value a customer brings to the company over their lifetime.
- Repeat Purchase Rate: Track the percentage of customers who make multiple purchases, indicating loyalty.
- Customer Segmentation: Visualize customer segments based on demographics and purchasing behavior to tailor marketing efforts.

- Customer Churn Rate: Monitor the percentage of customers who have not made a purchase in a defined period, signaling potential churn.
- Top Customer Segments by Revenue: Identify which customer segments are generating the most revenue.

4. Promotional Effectiveness KPIs

- Promotion Uplift: Measure the increase in sales during promotional periods versus non-promotional periods.
- ROI of Promotions: Evaluate the return on investment for each promotional campaign.
- Customer Response Rate to Promotions: Track how many customers engage with promotional offers.
- Sales by Promotion Type: Compare the effectiveness of different types of promotions (e.g., discounts vs. coupons).
- Promotion-Driven New Customer Acquisition: Identify how many new customers were acquired through promotions.

5. Channel Performance KPIs

- Sales Contribution by Channel: Measure the percentage of total sales contributed by each channel (in-store, online, catalog).
- Conversion Rate (Online Sales): Track the percentage of website visitors who make a purchase, providing insights into e-commerce effectiveness.
- Channel Profitability: Compare profitability across different sales channels to focus on the most profitable ones.
- Customer Satisfaction by Channel: Monitor customer satisfaction scores across channels (if available), helping to improve service quality.
- Sales Growth by Channel: Analyze sales growth rates across different channels to identify the most dynamic areas.

6. Supply Chain and Logistics KPIs

- Warehouse Turnover Rate: Measure how efficiently inventory moves through the warehouse.
- Average Shipping Time: Track the average time it takes for orders to be shipped, providing insights into logistical efficiency.
- Delivery Success Rate: Monitor the percentage of successful deliveries, helping identify areas needing improvement.

- Shipping Mode Efficiency: Compare the cost-effectiveness and speed of different shipping methods.
- Order Fulfillment Rate: Track the percentage of orders fulfilled on time, indicating the reliability of the supply chain.

Component 3: Report and PPT Presentation

The PowerPoint presentation should be 10-15 slides long, focusing on your key findings and recommendations. Be prepared to present your analysis and defend your decisions in a 5-minute presentation.

Task: After completing your SQL analysis and Power BI dashboard, compile a detailed report summarizing your findings. The report should be structured to provide the stakeholder with clear, actionable recommendations based on your data analysis. Additionally, prepare a PowerPoint presentation to effectively communicate your insights to the executive team.

Instructions:

1. Carefully review the provided schema and understand the relationships between the tables before starting your analysis.
2. Use MySQL Workbench to write and execute SQL queries to answer the provided questions.
3. Export the relevant data and build your Power BI dashboard with the required KPIs.
4. Compile your findings into a report and prepare a PowerPoint presentation.
5. Remember, the quality of your analysis, the relevance of your KPIs, and the clarity of your communication are key to providing value to the client.

Submission Guidelines

Please name your files as follows: `LastName_FirstName_ProjectComponent.pdf`. Ensure that your Power BI file does not exceed 50 MB.

1. SQL Analysis: Submit a document containing all SQL queries and their corresponding outputs.
2. Power BI Dashboard: Submit the Power BI file (.pbix) with all the required KPIs.
3. Report and Presentation: Submit a written report in PDF format and a PowerPoint presentation.

Important Dates:

Project start date	26th Aug 2024
Project Submission Date	9th Sep 2024
Interview and PPT Presentations	From 9th Sep 2024

Detailed Instructions for Building the Report

These guidelines are essential to ensure that your report is comprehensive, well-structured, and easy to follow. Please review each section carefully and consider following a provided template if available.

The report you create is a crucial component of your project. It should be structured to provide the client with clear, actionable insights based on your SQL analysis and Power BI visualizations. Here are some key pointers to guide you in building a comprehensive and effective report:

1. Executive Summary:

Start with a concise executive summary that provides an overview of the key findings from your analysis. This section should briefly summarize the most important insights and recommendations.

2. Introduction:

Provide context about the project, including the objectives, the dataset used, and the methodology you followed. Explain why this analysis is important for the client's business strategy.

3. Data Analysis:

Break down your SQL analysis into sections based on the themes of the questions (e.g., Population & Demographics, Economic Analysis, Geographical Analysis). For each section, present the SQL queries used, the rationale behind them, and the insights derived.

4. Key Findings:

Highlight the most significant findings from your analysis. Use data visualizations, tables, and charts where appropriate to support your points. Discuss any patterns, trends, or anomalies you discovered.

5. Power BI Insights:

Provide a detailed explanation of the KPIs you included in your Power BI dashboard. Explain why each KPI was chosen, how it was calculated, and what insights it offers. Include screenshots of the dashboard where relevant.

6. Recommendations:

Based on your analysis, provide actionable recommendations for the client. These should be specific, data-driven, and aligned with the client's business goals. For example, if you identified emerging markets with high growth potential, recommend a strategy for market entry.

7. Conclusion:

Summarize the overall findings of the project and reiterate the key takeaways. This section should reinforce the value of your analysis and how it can help the client achieve their objectives.

8. Appendix:

Include any additional information, such as detailed SQL query results, raw data extracts, or any supplementary analysis that supports your findings but was not included in the main report.

Submission Details

As part of your final submission, you need to provide the following files via the Google Form:

Form Link: click here

1. Report: A comprehensive document in PDF format that includes your analysis, findings, and recommendations.

2. Power BI Dashboard: The Power BI (.pbix) file containing the KPIs and visualizations you created.

3. SQL Analysis Report: A document containing all your SQL queries, their results, and a brief explanation of each query.

4. PPT Presentation: A PowerPoint (.pptx) presentation summarizing your key insights and recommendations, which you will present in class.

Academic Integrity and Plagiarism Policy

You may discuss general approaches with your classmates, but you must write your own SQL queries, create your own Power BI visualizations, and compile your report independently.

It is imperative that all work submitted as part of this project is your own. Copying or closely imitating the analysis, report, or Power BI dashboard of another student or any external source will result in a score of 0 marks for this project.

You are encouraged to discuss concepts and ideas with your peers, but the actual execution of the analysis, report writing, and dashboard creation must be done individually. Any form of plagiarism, including but not limited to copying SQL queries, report content, or Power BI designs, will be treated as a serious violation of academic integrity.

All submissions will be subject to a thorough review to ensure originality. Any evidence of plagiarism will lead to disciplinary actions as per the institution’s academic policies.