About Company

Kimia Farma is a leading pharmaceutical company in Indonesia with a rich history dating back to its establishment in 1817. As a pioneer in the pharmaceutical industry, Kimia Farma offers a wide range of health products and services, including medications, medical devices, pharmacy services, and clinics. The company boasts an extensive distribution network with branches spread across Indonesia, ensuring accessibility to its products even in remote areas.

kimia farma

Project **Portfolio**

Rakamin Academy

Background Problem

Kimia Farma, as a company in the pharmaceutical sector, requires an in-depth evaluation of its business performance. A comprehensive analysis of the company's performance during the 2020 to 2023 period is needed through a few data such as transactions, inventory, products, and branches data.

Objectives

- Evaluate the business performance of Kimia Farma from 2020 to 2023 through data analysis
- Process and clean datasets to create an analysis table
- Explore key trends and patterns within the data to gain insights into business operations
- Develop an interactive dashboard
- Provide actionable insights and recommendations based on the data analysis to support business decision-making

Importing Dataset to BigQuery

The process begins by importing four datasets in CSV format such as transactions data, inventory data, branch offices data, and products data into BigQuery as a data warehouse. After the data are successfully imported, they are combined into a single comprehensive table using SQL queries. The integration leverages common keys such as product_id and branch_id to join the data accurately and ensure consistency. This unified table consolidates all relevant information, enabling seamless analysis and reporting within BigQuery.

Data → imported to → **BigQuery** → combine 4 table → **Analysis table**
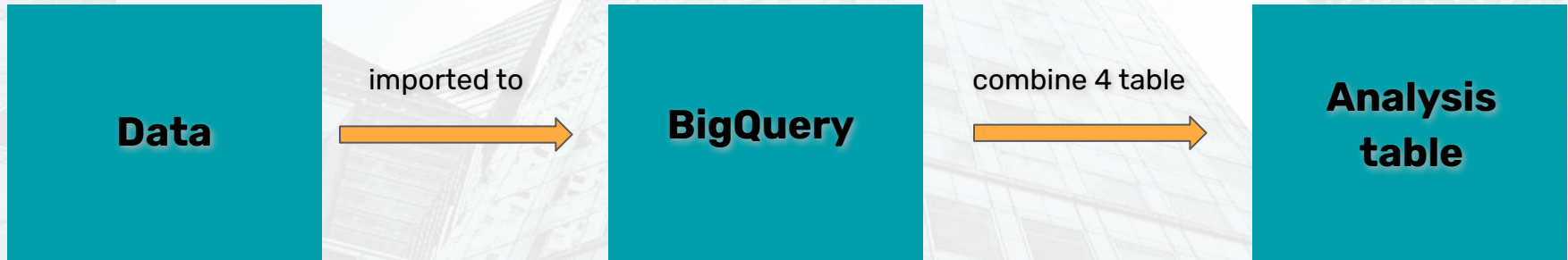
BigQuery Syntax for Creating Table

```sql
CREATE TABLE kimia_farma.kf_analysis AS
SELECT
  Ft.transaction_id,ft.date,ft.branch_id,kc.branch_name,kc.kota,kc.provinsi,
  kc.rating AS rating_cabang,ft.customer_name,ft.product_id,p.product_name,
  ft.price AS actual_price,ft.discount_percentage,
  CASE
    WHEN ft.price <= 50000 THEN 0.10
    WHEN ft.price > 50000 AND ft.price <= 100000 THEN 0.15
    WHEN ft.price > 100000 AND ft.price <= 300000 THEN 0.20
    WHEN ft.price > 300000 AND ft.price <= 500000 THEN 0.25
    ELSE 0.30
  END AS persentase_gross_laba,(ft.price * (1 - ft.discount_percentage)) AS nett_sales,
  ((ft.price * (1 - ft.discount_percentage)) *
    CASE
      WHEN ft.price <= 50000 THEN 0.10
      WHEN ft.price > 50000 AND ft.price <= 100000 THEN 0.15
      WHEN ft.price > 100000 AND ft.price <= 300000 THEN 0.20
      WHEN ft.price > 300000 AND ft.price <= 500000 THEN 0.25
      ELSE 0.30
    END) AS nett_profit,
  ft.rating AS rating_transaksi
FROM
  kimia_farma.kf_final_transaction AS ft
JOIN
  kimia_farma.kf_product AS p ON ft.product_id = p.product_id
JOIN
  kimia_farma.kf_kantor_cabang AS kc ON ft.branch_id = kc.branch_id;
```

Create a table named "kf_analysis"

Select essential columns

Calculates gross profit percentage

Calculates net sales

Calculates net profit

Joining the data

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Analysis Table

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Columns

transaction_id: Unique transaction ID

date: Date when the transaction occurred

branch_id: Unique ID for Kimia Farma branch

branch_name: Name of the Kimia Farma branch

kota: City where the Kimia Farma branch is located

provinsi: Province where the Kimia Farma branch is located

rating_cabang: Customer rating for the Kimia Farma branch

customer_name: Name of the customer who made the transaction

product_id: Unique ID for the product

product_name: Name of the product

actual_price: Price of the product

discount_percentage: Percentage discount applied to the product

persentase_gross_laba: Percentage of profit that should be earned from the product

nett_sales: Price after discount

nett_profit: Profit earned by Kimia Farma

rating_transaksi: Customer rating for the transaction

Table Preview

Row	transaction_id	date	branch_id	branch_name	kota	provinsi	rating_cabang	customer_name	product_id	product_name	actual_price	discount_percentage	persentase_gross_laba	nett_sales	nett_profit	rating_transaksi
1	TRX3823931	2022-09-11	80176	Kimia Farma - Apotek	Dumai	Riau	4.7	Sergio Garcia	KF601	Psycholeptics drugs, Anxiolyti...	512000	0.04	0.3	491520.0	147456.0	4.3
2	TRX1383347	2020-04-03	73158	Kimia Farma - Apotek	Tomohon	Sulawesi Utara	4.7	Melissa Gross	KF601	Psycholeptics drugs, Anxiolyti...	512000	0.04	0.3	491520.0	147456.0	4.8
3	TRX3866485	2020-09-13	69761	Kimia Farma - Apotek	Subang	Jawa Barat	4.9	Christopher Griffith	KF601	Psycholeptics drugs, Anxiolyti...	512000	0.04	0.3	491520.0	147456.0	3.8
4	TRX7698521	2023-12-16	58928	Kimia Farma - Apotek	Solok	Sumatera Barat	4.0	Marissa Oneal	KF601	Psycholeptics drugs, Anxiolyti...	512000	0.04	0.3	491520.0	147456.0	3.2
5	TRX1937686	2021-06-08	27840	Kimia Farma - Apotek	Denpasar	Bali	4.3	Allison Allen	KF601	Psycholeptics drugs, Anxiolyti...	512000	0.04	0.3	491520.0	147456.0	4.4
6	TRX3670814	2021-06-07	40222	Kimia Farma - Apotek	Purwokerto	Jawa Tengah	4.1	Christopher Wood	KF601	Psycholeptics drugs, Anxiolyti...	512000	0.04	0.3	491520.0	147456.0	3.6

Exploratory Data Analysis

Dataset Overview

The dataset contains 672,458 transactions involving 150 unique products sold across 1,725 branches in 31 provinces and 70 cities, reflecting a wide geographic and operational coverage.

Timeframe Analysis

Transactions span a four-year period from January 1, 2020, to December 30, 2023, indicating consistent business activity over time.

Rating Summary

On a scale of 0 to 5, branch ratings show high customer satisfaction with values ranging from 3.9 to 5.0, averaging 4.44, while transaction ratings range from 3.0 to 5.0, with an average of 4.00, suggesting positive customer experiences overall.

Exploratory Data Analysis

Net Sales and Profit Analysis

The significant variation in nett sales (IDR 1,785 to IDR 997,500) and profits (IDR 178.5 to IDR 299,250) suggests the presence of both low-cost, low-margin products and high-value, high-margin items in the product portfolio. This diversity likely caters to different customer segments or product categories.

Discount Analysis

Discounts averaging 7.5%, with a maximum of 15%, indicate a relatively restrained pricing strategy. This approach balances maintaining profit margins while offering incentives to attract or retain customers.

Profitability

The profit-to-sales ratio (average profit IDR 135,644 vs. average sales IDR 477,608) suggests an average profit margin of approximately 28.4%. This reflects a healthy profitability level, particularly in retail or pharmaceutical sectors.

Dashboard Performance Analytics

Dashboard Performance Analytics

The dashboard provides a comprehensive overview of Kimia Farma performance metrics, featuring interactive filters for year, province, and branch, enabling users to customize the view based on their preferences. It begins with a summary section presenting total counts for products, branches, provinces, and cities. There is a series of cards that highlights key performance indicators such as average ratings, total transactions, sales growth, and total profit. The dashboard also includes a variety of visualizations like a year-over-year revenue comparison in a line chart, bar charts showcasing the top 10 branches by total transactions and net sales, and grouped bar chart of the top 5 branches with the highest branch ratings but lowest transaction ratings. Additionally, a geo map visualizes total profit by province across Indonesia. Lastly, a product profitability table provides detailed insights into top-performing products, analyzing sales, discounts, and profit margins.

Dashboard Performance Analytics

The sales growth shows a fluctuating trend, with a decline of -0.50% in 2021, a slight recovery of 0.68% in 2022, and another drop to -0.57% in 2023, resulting in an average growth of -0.13% which is quite concerning. This suggests inconsistent performance, with the 2022 recovery likely driven by post-pandemic economic improvements, while the declines in 2021 and 2023 highlight challenges such as market saturation, regional imbalances, and ineffective strategies to sustain growth.

Year: 2021, 2020   (2) ▼

Average Sales Growth
-0.50%

Year: 2022, 2021   (2) ▼

Average Sales Growth
0.68%

Year: 2023, 2022   (2) ▼
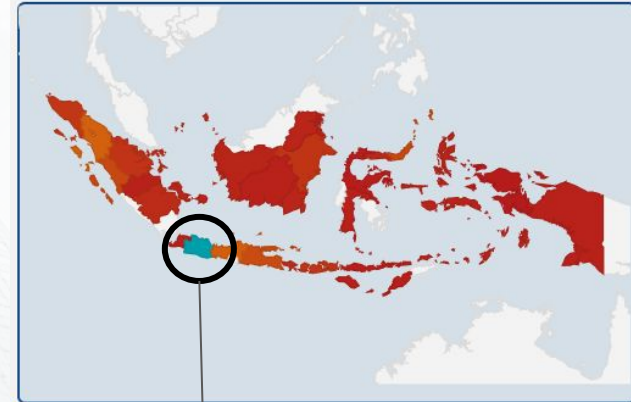
Average Sales Growth
-0.57%

Dashboard Performance Analytics

- Products with high margins achieve profitability without depending on large-scale sales or heavy discounts, highlighting operational efficiency or strong pricing strategies.
- Products with lower unit sales can still achieve significant profitability through strategic pricing and discount management
- Uniform discounts may limit the opportunity to apply targeted strategies. For high-margin products, the same discount might be unnecessary, while low-margin, high-sales products could benefit from tailored discount schemes to optimize sales volumes and net profits further.

Products Profitability

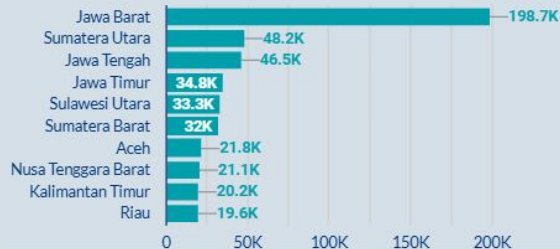| Top 5 - Products	Units Sold	Discount	Net Sales	Net Profit	Profit Margin
Other analgesics and antipyretics, Pyrazolones and Anilides	58.03K	7.55%	33.57B	9.89B	29.46
Anti-inflammatory and antirheumatic products, non-steroids, Propionic acid derivatives	58.23K	7.51%	27.92B	8.15B	29.18
Anti-inflammatory and antirheumatic products, non-steroids, Acetic acid derivatives and related substances	67.37K	7.52%	25.89B	6.94B	26.82
Antihistamines for systemic use	71.79K	7.48%	40.41B	11.58B	28.67
Other analgesics and antipyretics, Salicylic acid and derivatives	85.07K	7.50%	43.23B	12.35B	28.56

Dashboard Performance Analytics

Jawa Barat stands out as the dominant contributor, achieving the highest total branch transactions at 198.7K and nett sales of 94.9B, far exceeding other provinces. While Sumatera Utara and Jawa Tengah rank second and third, but with significantly lower figures compared to Jawa Barat. This substantial gap indicates that Jawa Barat plays a highly dominant role in overall business performance, both in terms of transaction volume and revenue. This dominance may be attributed to factors such as a higher number of branches, greater product demand, or more effective marketing strategies in the region compared to other provinces.

Jawa Barat has the highest profit

Top 10 Provinces by Total Branch Transactions

Province	Transactions
Jawa Barat	198.7K
Sumatera Utara	48.2K
Jawa Tengah	46.5K
Jawa Timur	34.8K
Sulawesi Utara	33.3K
Sumatera Barat	32K
Aceh	21.8K
Nusa Tenggara Barat	21.1K
Kalimantan Timur	20.2K
Riau	19.6K

Top 10 Provinces by Branch Nett Sales

| Province	Nett Sales
Jawa Barat	94.9B
Sumatera Utara	23B
Jawa Tengah	22.2B
Jawa Timur	16.6B
Sulawesi Utara	15.9B
Sumatera Barat	15.3B
Aceh	10.5B
Nusa Tenggara Barat	10B
Kalimantan Timur	9.7B
Riau	9.4B

Dashboard Performance Analytics

The profit trend over the years appears to be relatively stable, with only slight variations from year to year. This consistency indicates steady business performance across different periods. However, a noticeable decline in profit occurs consistently in certain months, particularly in February.

Profit Trend Over the Years

Dashboard Performance Analytics

Branches with high branch ratings and relatively low transaction ratings can still be considered to have a fairly good transaction rating, approximately 4. This indicates varying transaction experiences among customers. The correlation suggests good service quality despite differing transaction scales. Additionally, these top 5 branches are located in various cities, indicating that service quality and positive experiences are not confined to a specific location.

Top 5 Branches:
High Branch Ratings vs. Low Transaction Ratings
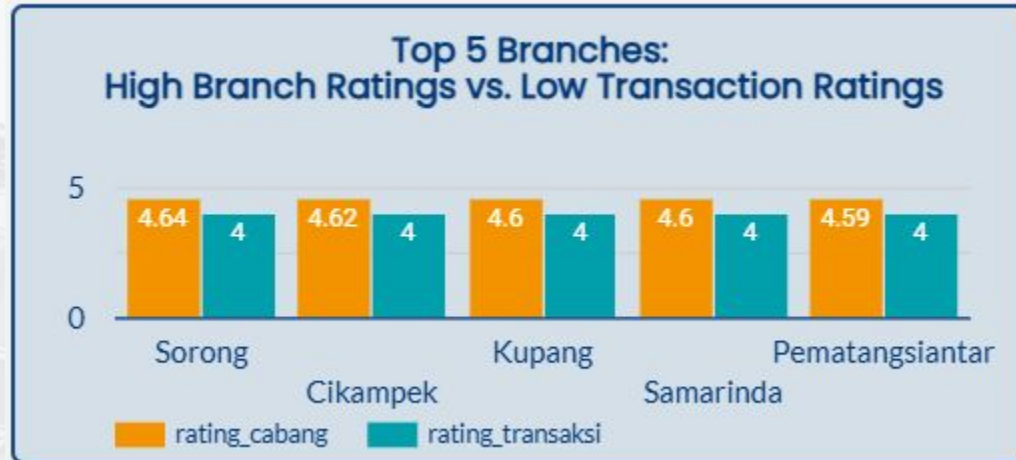
Conclusion

- Province Performance: Jawa Barat is the top-performing province but has significant gaps with the other provinces, contributing to regional imbalances
- Profit Trends: Profits remain relatively stable year-over-year, but no significant growth trends are evident, necessitating optimization efforts for consistent improvement.
- Cost Management: Consistent profit margins indicate well-managed costs despite offering discounts
- Sales and Margins: High profit margins are not solely dependent on the highest sales volume
- High average transactions and branch ratings shows good performance in terms of customer satisfaction

Recommendation

- Boosting operations in regions outside Jawa Barat may unlock additional growth. Conduct market research to understand local demand, competition, and preferences.
- Optimize the distribution of high-margin products, especially in regions with lower sales, and assess pricing strategies to achieve a balance between unit sales growth and maintaining strong profit margins.
- Reward top-performing branches for service quality to encourage continuous improvement

Thank You

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