🎯 Retail Sales Analysis Project - Planning & Workflow

📁 Data Source

- CSV File Format
- 1,055 Trading Days
- Dec 2013 - Nov 2016
- Single Product Data

📥 Data Ingestion

- Upload to Snowflake
- Create Database
- Create Schema
- Define Table Structure

⚙️ Data Processing

- SQL Queries in Snowflake
- Calculate Metrics
- Date Functions
- Aggregations

🔍 Analysis Categories

- Pricing Analysis
- Volume Patterns
- Profitability
- Seasonality
- Promotional Impact

DATA STRUCTURE:

→ **Date:** Transaction date (DD/MM/YYYY format)
→ **Sales:** Total Rand value of daily sales
→ **Cost of Sales:** Total Rand value of daily costs
→ **Quantity Sold:** Total number of units sold per day

File: Sales_Case_Study__2_.csv (1055 records)

SNOWFLAKE SETUP:

→ Database: **SALES_ANALYTICS**
→ Schema: **CASE_STUDY**
→ Table: **sales_case_study**
→ Columns: date (VARCHAR), sales (DECIMAL), cost_of_sales (DECIMAL), quantity_sold (INTEGER)

Platform: Snowflake Data Warehouse
Method: Snowflake UI File Upload / COPY INTO command

KEY CALCULATIONS & METRICS:

Q1: Daily Price Per Unit
`Sales ÷ Quantity Sold`

Q2: Average Unit Price
`AVG(Sales ÷ Quantity)`

Q3: Daily Gross Profit %
`((Sales - Cost) ÷ Sales) × 100`

Q4: Profit Per Unit %
`Same as Q3 (mathematically equivalent)`

Q5: Price Elasticity (PED)
`(% Δ Quantity) ÷ (% Δ Price)`

Promotional Analysis
`Identify periods: Price < R32`

DATE & TIME ANALYSIS:

→ Date parsing: `TO_DATE(date, 'DD/MM/YYYY')`
→ Extract: `DAYNAME(), MONTH(), YEAR(), QUARTER()`
→ Grouping by: Day of week, Month, Quarter, Year

ANALYTICAL QUERIES PERFORMED:

→ **Monthly Sales Pattern:** GROUP BY MONTH() - Identify peak months (March: R20M)
→ **Day of Week Analysis:** GROUP BY DAYNAME() - Weekend spike (Fri-Sat: R1.1-1.2M)
→ **Yearly Trends:** Compare 2013-2016 performance (33% revenue decline)
→ **Quarterly Performance:** Q2 strongest, Q4 weakest (75% drop 2014-2016)
→ **Price Range Segmentation:** CASE statements for price brackets
→ **Cost vs Sales:** Daily comparison showing loss patterns (83% of months unprofitable)
→ **Promotional Period Identification:** WHERE price < R32 threshold
→ **Gross Profit Margin Trends:** Monthly profitability tracking (2.1% avg, 247 loss days)

SQL Features Used: SELECT, FROM, WHERE, GROUP BY, ORDER BY, AVG(), SUM(), COUNT(), ROUND(), CASE WHEN

Data Visualization

- Export to Excel/CSV
- Create Charts
- Pivot Tables
- Dashboard Design

VISUALIZATIONS CREATED:

1. Pie Chart
Quantity Sold: Normal (98%) vs Promotion (2%)

2. Line Chart
Price Trend Analysis (Monthly stability)

3. Area Chart
Sum of Sales per Month (Seasonality)

4. Dual Line Chart
Sales vs Cost per Day of Week

5. Bar Chart
Day of Week Analysis (Weekend peaks)

6. Grouped Bar Chart
Monthly Price by Year (2013-2016)

7. Bar Chart
Sales vs Cost per Year (Loss pattern)

8. Bar Chart
Gross Profit Margin Over Time (Monthly)

9. Stacked Bar Chart
Quarterly Sales by Year (Q2 dominance)

10. Line Chart
Price Elasticity of Demand (Quarterly)

11. Stacked Bar
Profit Per Unit by Quarter (Negative trend)

12. Donut Chart
Total Sales Distribution (R186.9M)

Tools: Excel for charting, Pivot tables for aggregation

Presentation

- Create Slides
- Key Insights
- Recommendations
- Visual Storytelling

PRESENTATION STRUCTURE (10 SLIDES):

→ **Slide 1:** Title - Sales Analytics
→ **Slide 2:** Key Metrics Summary + Total Sales Donut Chart
→ **Slide 3:** Sold Quantity vs Price Status (Pie Chart) + Insights
→ **Slide 4:** Price Trend + Sum of Sales per Month (Seasonal patterns)
→ **Slide 5:** Sales vs Cost per Day of Week + Day Analysis (Weekend dependency)
→ **Slide 6:** Monthly Price + Yearly Sales vs Cost (Multi-year losses)
→ **Slide 7:** Gross Profit Margin + Profit Per Unit by Quarter
→ **Slide 8:** Sales vs Cost per Year (Line + Bar charts)
→ **Slide 9:** Quarterly Sales + Price Elasticity (Q4 collapse)
→ **Slide 10:** Thank You

Platform: PowerPoint/Canva - "Borcelle" branded template

DELIVERABLES CREATED:

→ **SIMPLE_Query_Beginner_Friendly.sql** - No joins, basic queries for each question
→ **BEGINNER_Step_by_Step_Guide.md** - Complete walkthrough with examples
→ **QUICK_CHEAT_SHEET.md** - Copy-paste queries for all 6 questions
→ **Formula_Quick_Reference.md** - All formulas with examples and interpretations

📄 Documentation

- SQL Query Files
- Analysis Guide
- Insights Document
- GitHub Repository

→ **Sales_Presentation_Insights_and_Recommendations.md** - 40+ page comprehensive analysis
→ **Concise_2Line_Insights_Per_Graph.md** - Brief insights for each visualization
→ **Sample_Output_Examples.md** - What query results look like
→ **snowflake_setup.sql** - Database and table creation scripts

KEY FINDINGS DOCUMENTED:

→ ✗ Business unprofitable: 2.1% margin, 247 loss days (23.4%)
→ ✗ Cost > Sales every year (2013-2016) - never profitable
→ ✗ Revenue declining 33% from 2014 peak (R75M → R50M)
→ ✗ Negative unit economics: Lose R0.70 per sale
→ ✗ Weekend dependency: Only Fri-Sat profitable
→ ✗ Q4 collapse: 75% drop (2014: R12M → 2016: R3M)
→ ✓ Strong loyalty: 98% sold at normal price (not price-sensitive)
→ ✓ Predictable seasonality: Q2 peak, Q4 weak

🎯 PROJECT OUTCOME

- Complete SQL analysis answering all 6 case study questions
- 12 professional visualizations showing pricing, volume, profitability trends
- 10-slide presentation with data-driven insights and 2-line summaries
- Comprehensive documentation: 8 files with queries, guides, insights
- Critical business recommendation: 15-20% price increase OR exit within 60-90 days
- Beginner-friendly approach: No joins, simple SELECT/GROUP BY queries