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CASE STUDY

WALMART SALES ANALYSIS

Identifying Sales Trends & Key Revenue Drivers

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Walmart Sales Analysis – Identifying Sales Trends & Key Revenue Drivers

Objective:

To analyze Walmart’s sales data across different stores, departments, and time periods in order to uncover key sales trends, seasonal patterns, and external factors influencing revenue. The goal is to provide actionable insights for inventory management, Strategies, promotions, and revenue optimization.

Business Problems:

To improve decision-making and revenue optimization, the following business problems were addressed:

1. Analyze payment methods and sales.
2. Identify the highest-rated category in each branch.
3. Determine the busiest day for each branch.
4. Calculate total quantity sold by payment method.
5. Analyze category ratings by city.
6. Calculate total profit by category.
7. Determine the most common payment method per branch.
8. Analyze sales shifts throughout the day.
9. Identify branches with highest revenue decline year-over-year.

Dataset Overview:

- Source: Kaggle – Walmart Sales Dataset
- Size: ~10k transaction records
- **Features:**
- Invoice ID, Branch, City, Customer Type, Gender, Product Line, Unit Price, Quantity, Total , Payment Method, Date & Time of transaction, Customer Rating

Tools & Techniques:

- **Python** (Pandas, NumPy)
- **SQL** for querying sales by store/category
- **Power BI** for dashboard visualizations

Data Cleaning & Preprocessing:

- **Handled Missing Values:** Checked dataset for null values and confirmed no significant missing data.
- **Data Type Conversion:** Converted date columns to datetime format and categorical fields (branch, city, category, payment method) to categorical type.
- **Feature Engineering:** Extracted Day, Month, and Hour from transaction timestamps to support time-based analysis.
- **Outlier Treatment:** Detected and capped extreme values in Quantity and Profit to avoid distortion in analysis.

SQL Approach:

- **Payment & Sales Analysis** – Used GROUP BY on payment_method to find number of transactions and total quantity sold.
- **Category & Rating Insights** – Applied AVG(rating) with RANK() window function to identify highest-rated category in each branch and city-level comparisons.
- **Branch & Customer Flow** – Extracted day_name from date to determine busiest days, and categorized time into Morning, Afternoon, Evening shifts.
- **Profitability Measures** – Calculated profit using (total * profit_margin) grouped by category to identify most profitable product segments.
- **Branch-Level Performance** – Used RANK() and joins to find preferred payment methods per branch and detect YoY revenue decline in underperforming branches.
- **Feature Engineering with SQL** – Converted raw transaction data into analytical fields like day, shift, profit, and summarized metrics for better decision-making.

Power BI Dashboard Highlights:

- **Interactive Overview** – Dashboard provides a unified view of Walmart’s sales performance across branches, cities, and categories.
- **Payment Method Insights** – Visuals highlight the distribution of transactions and sales by payment type, helping understand customer preferences.
- **Category Performance** – Displays top-rated and most profitable categories, enabling better inventory and promotional planning.
- **Branch Comparison** – Busiest days, preferred payment methods, and YoY revenue trends are compared across branches for operational decisions.
- **Time-Based Analysis** – Sales are segmented into Morning, Afternoon, and Evening shifts, offering insights into customer shopping behavior.
- **Profitability Tracking** – Profit margins and revenue trends by category and city are visualized for quick identification of high-value areas.
- **User-Friendly Filters** – Dynamic slicers allow filtering by branch, city, payment method, and time, making the dashboard highly interactive.

Business Insights:

- **Payment Preferences** – E-Wallets and Credit Cards were the most used methods, while Cash usage was relatively low.
- **Category Ratings** – Health & Beauty consistently scored higher ratings across branches, while Fashion showed mixed satisfaction.
- **Busiest Days** – Weekends (especially Saturday) had the highest customer footfall, showing peak sales activity.
- **Profitability** – Electronics and Fashion categories contributed the maximum profit, while some categories underperformed.
- **City-Wise Trends** – Yangon branches showed stronger customer satisfaction compared to Mandalay.
- **Branch-Level Decline** – Branch C experienced YoY revenue decline, signaling performance issues.
- **Time-of-Day Sales** – Evening hours contributed the majority of transactions, suggesting after-work shopping dominance.

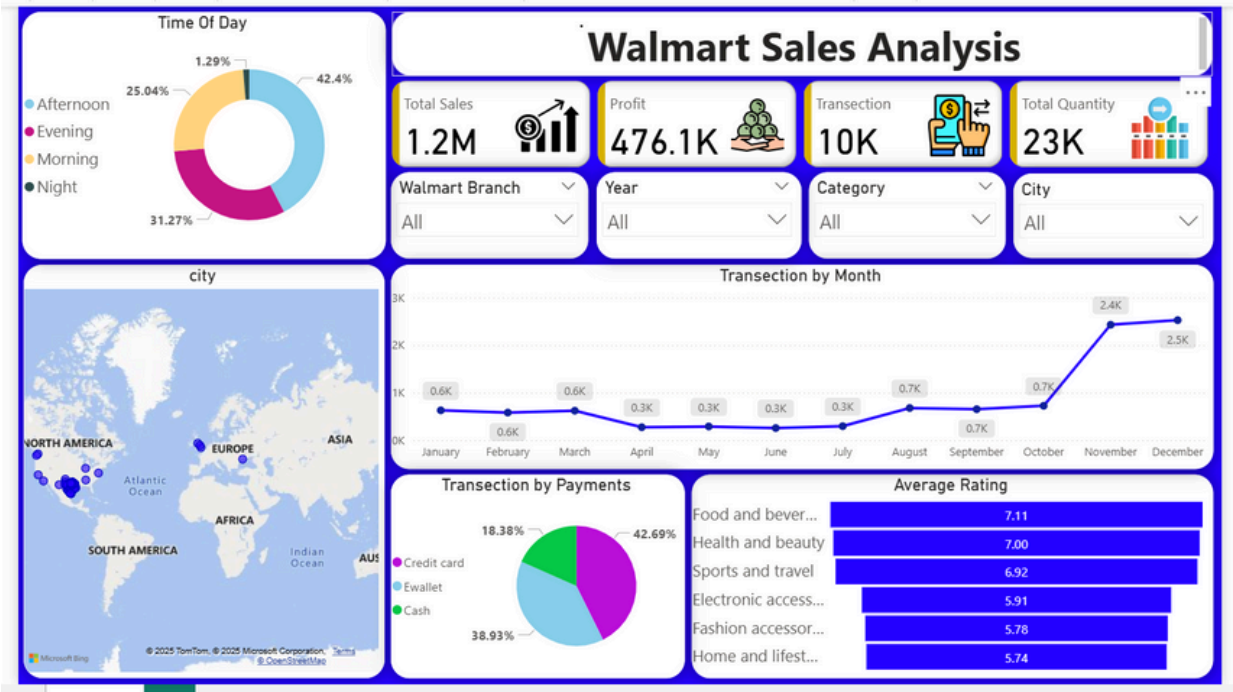
Recommendations:

- 1. Promote Digital Payments** – Offer cashback/loyalty rewards on E-Wallets & Credit Cards to strengthen already popular channels.
- 2. Category Investment** – Increase inventory and promotions for Health & Beauty and Electronics, while improving product quality/experience in weaker categories.
- 3. Optimize Staffing & Inventory** – Allocate more staff and stock during weekends and evenings, when customer flow is highest.
- 4. Branch C Recovery Plan** – Launch localized marketing campaigns and targeted discounts to counter revenue decline.
- 5. City-Level Strategy** – Focus on replicating Yangon’s strong satisfaction model in Mandalay by improving store experience.
- 6. Profit Margin Monitoring** – Regularly track underperforming categories and adjust pricing or supplier contracts to increase profitability.

Business Impact:

- 1. Increased customer convenience & higher repeat transactions.
- 2. Boosted category-wise sales and improved customer satisfaction.
- 3. Maximized seasonal revenue and avoided stockouts.
- 4. Higher customer lifetime value (CLV) and recurring revenue.
- 5. Improved overall branch profitability and reduced performance gap.

Visualization (Dashboard / Output):



Conclusion & Takeaways:

The analysis shows that aligning with customer payment preferences, optimizing inventory for top-rated categories, and leveraging seasonal sales patterns can directly boost revenue and customer loyalty. Branch-level insights help close performance gaps, ensuring sustainable growth.