Mobile Sales Analysis Report

Onyx Data DNA Challenge (May 2025)

14.05.2025

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Introduction

This report presents the findings from a mobile sales analysis project undertaken as part of the Onyx Data DNA Challenge for May 2025. The dataset contains detailed records of mobile phone transactions across multiple countries, capturing various dimensions including customer demographics, sales channels, product specifications, and payment methods.

The goal of this analysis is to uncover sales trends, customer behaviors, and product performance, enabling the business to make informed decisions on inventory planning, marketing strategies, and customer engagement.

Objective

The primary objectives of this analysis are to:
- Identify the best-performing mobile brands and models by sales volume and revenue.
- Understand how product features such as storage size, color, and operating system influence customer preferences.
- Profile customers based on age, gender, and brand affinity.
- Analyze the performance of different sales channels and payment types.
- Highlight regional patterns in mobile phone sales and revenue generation.
- Reveal month-over-month sales trends to identify peak periods and seasonality.

Dataset Overview

The dataset provided for this challenge consists of three primary tables: 'Fact Sales', 'Dim Products', and 'Dim Locations', along with a comprehensive Data Dictionary. The dataset captures mobile phone sales transactions across various countries in 2024 and includes rich data to enable a multidimensional analysis.

1. **Fact Sales:** This is the central fact table containing daily sales transaction data. Each row represents a transaction and includes:
   - Product attributes (Mobile Model, Brand, Storage Size, Color, Operating System)
   - Sales metrics (Price, Units Sold, Total Revenue)
   - Customer demographics (Age, Age Group, Gender)
   - Sales channel and payment info (Sales Channel, Payment Type)
   - Geographic data (City, Country, Latitude, Longitude)
   - Temporal fields (Transaction Date, End of Month)

2. **Dim Products:** This dimension table provides data about each mobile phone model, including:
   - Mobile brand
   - Operating system
   - Storage capacity
   - Available colors

3. **Dim Locations:** This table offers a geographic reference for each city included in the dataset. It includes:

- City and corresponding country
- Geographic coordinates (latitude and Longitude)

Together, these tables offer a complete and structured dataset ideal for deriving insights about sales trends, customer behavior, and regional performance across various dimensions.

Data Preprocessing & Cleaning

The data cleaning process was performed within Power BI, primarily using the Power Query editor. The following steps were taken:
- Checked for missing or inconsistent values in categorical columns such as Brand and Color, and ensured consistency.
- Verified numerical fields for outliers or extreme values (e.g., Revenue, Price).
- Ensured data types were correctly set (e.g., Date for Month field).
- Ensured categorical labels were standardized to maintain consistency (e.g., color spelling variations).
- Checked for duplicate values.

Exploratory Data Analysis (EDA) & Data Visualization

The exploratory data analysis was conducted using Power BI, with visuals grouped into three main pages:

I. **Sales & Revenue Overview:** Includes total revenue, unit sales, top brands/models, monthly trend, and revenue by country.
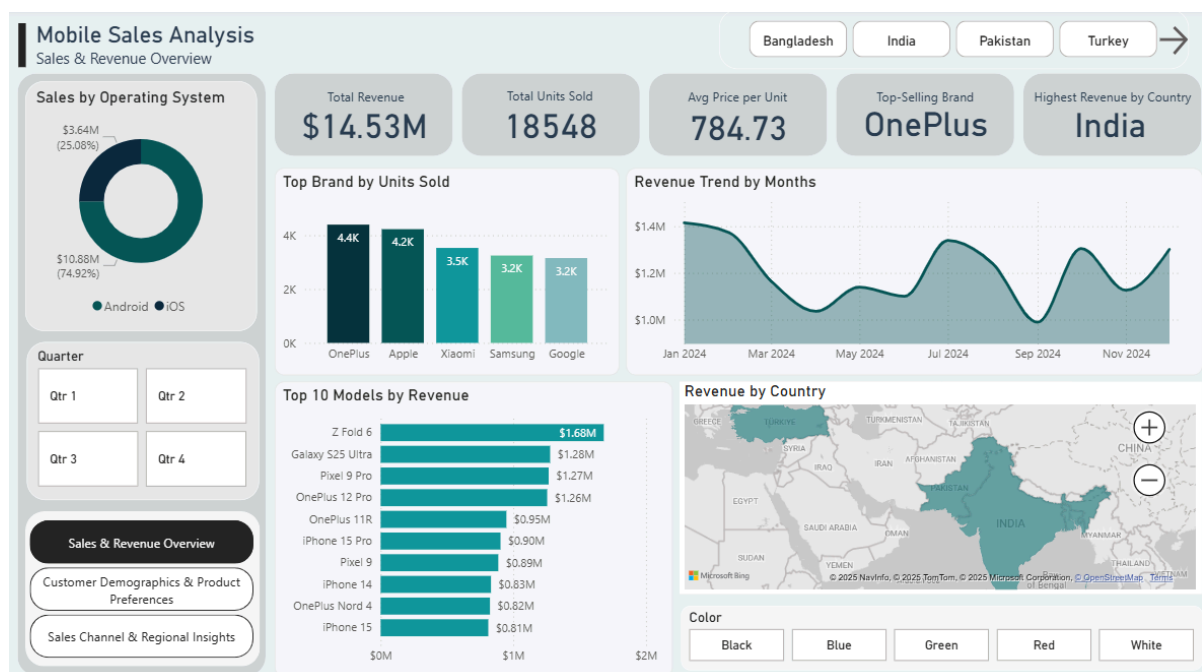
II. **Customer Demographics & Product Preferences:** Explores customer behavior by age, gender, brand, storage, and color.

III. **Sales Channel & Regional Insights:** Analyzes sales volume and revenue across sales channels, payment types, and top-performing cities.

Key Findings

Following an in-depth analysis of the 2024 mobile phone sales dataset, this section presents critical insights into brand performance, product preferences, customer behavior, sales channels, regional trends, and temporal patterns in the mobile retail market.

1. **Best-Selling Brands and Revenue Generating Models**
OnePlus emerged as the top-selling brand in terms of unit sales, recording a total of 4,395 units sold, closely followed by Apple (4,226 units) and Xiaomi (3,529 units).
Despite not having the highest unit sales, **Apple generated the highest revenue** at $3.64M, followed by Samsung with $3.48M, highlighting Apple's premium pricing and brand strength.
The **Samsung Z Fold 6 was the single most profitable model,** generating $1.68M in revenue. It was followed by the Samsung Galaxy S25 Ultra ($1.28M), Google Pixel 9 Pro ($1.27M), and OnePlus 12 Pro ($1.26M), demonstrating strong market traction for high-end devices across multiple brands.

2. **Product Features and Sales Distribution**
The market is clearly dominated by Android devices, which accounted for 74.9% of total sales, compared to iOS.
64GB storage devices were the most popular, with 6,340 units sold, especially among the 18–25 age group, indicating cost-conscious preferences. In contrast, customers aged 42–49 showed a higher preference for 128GB devices, suggesting a greater demand for storage among older users.
In terms of design preference, **Black phones were the top sellers**, followed by White, Blue, and Red, showcasing a consumer tendency toward neutral and classic color tones.

3. **Customer demographics and Brand Preferences**
From a revenue standpoint, **female customers contributed slightly more (50%) than male customers (42%)**, with the remaining percentage attributed to unspecified or other categories.
The age group 26–33 led in total units purchased, followed by the 42–49 group, indicating strong engagement from both younger and middle-aged consumers.
Brand preferences were notably segmented by age:
- Apple and OnePlus dominated sales among 18–33-year-olds.
- Xiaomi was more popular with the 34–41 age group.
- OnePlus and Google devices were favored by the 58–65 group.

- Apple, Google, and Samsung attracted more customers in the 50–57 range.
- Samsung and Apple were popular with the 42–49 age group.

This variation reflects how pricing, features, and brand perception influence purchase decisions across age groups.

4. **Sales Channels and Payment Methods**

The **online sales channel was the most dominant**, with over 11.2K units sold, emphasizing the importance of a digital-first retail strategy.

When examining payment preferences, **EMI and credit card transactions generated the most revenue**, signaling customer preference for flexible and credit-based purchasing options.

5. **Geographic Performance Across Countries and CIties**

At the country level, **India led in total revenue**, highlighting its massive mobile consumer base.

At the city level, **Bursa (Turkey) emerged as the top revenue-generating city**, followed by Chennai, Antalya, Ankara, Istanbul, and Jaipur, all of which showed strong sales performance. These regions offer high potential for future market expansion and targeted campaigns.

6. **Monthly Sales Trends and Channel Stability**

Sales performance across the year exhibited **noticeable spikes during Q1 and Q3**, which may correspond with promotional periods, product launches, or seasonal demand surges.

Channel-specific trends showed that **online sales remained consistently strong throughout all months**, further reinforcing the reliability and scalability of the digital channel over traditional or partner-based methods.

Recommendations

Drawing from the insights uncovered in the analysis, the following recommendations are proposed to enhance strategic decision-making and improve business performance:

1. **Strengthen Online Sales Infrastructure:** With online channels accounting for the majority of unit sales throughout the year, it is crucial to continue investing in a robust and user-friendly e-commerce platform. Enhancements in digital marketing, mobile optimization, and customer support could further drive conversions and customer retention.

2. **Expand Product Offerings Based on Regional Preferences:** Given the strong performance of cities like Bursa, Chennai, and Jaipur, regional marketing campaigns and tailored product bundles should be explored

to deepen market penetration. For example, introducing localized promotions or exclusive model variants can help maintain momentum in these high-performing areas.

3. **Optimize Inventory by Age and Storage Preference:** Stock management should reflect demographic demand—such as maintaining a healthy inventory of 64GB devices for younger buyers (18–25) and offering higher storage models (128GB and above) for older, more storage-conscious users (42–49). This will reduce overstock risk and improve customer satisfaction.

4. **Promote High-Margin Brands and Devices:** With premium models like the Samsung Z Fold 6 and Google Pixel 9 Pro driving significant revenue, marketing efforts should emphasize these high-margin products. Bundling accessories, offering financing options, or loyalty rewards can help increase their adoption without discouraging price-sensitive buyers.

5. **Enhance Payment Flexibility:** Given the strong revenue share from EMI and credit card payments, partnering with more financial institutions to expand installment and credit offerings may attract additional customers. This strategy can also improve conversion rates for premium purchases.

6. **Segment Marketing by Age Group Behavior:** Customer purchase behavior varied noticeably by age group. Marketing communications should be segmented accordingly—for example, promoting Apple and OnePlus to younger audiences via digital campaigns, and emphasizing Xiaomi's affordability and reliability to mid-aged users.

Limitations

While this analysis provided valuable insights into sales trends, customer behavior, and product performance, it is important to acknowledge certain limitations that may have impacted the depth and scope of the findings.

Firstly, the dataset lacked detailed cost or profit margin information. Although revenue figures were available and useful for identifying top-performing brands, models, and channels, the absence of cost data limited the ability to assess actual profitability. This means that conclusions drawn about financial performance are based solely on gross revenue, without a clear understanding of operating costs, margins, or the relative efficiency of various sales strategies. A deeper financial analysis would require cost-of-goods-sold (COGS) data to determine which products or customer segments truly drive business value.

Secondly, the dataset did not include customer satisfaction metrics or product return information. These are critical indicators of long-term customer loyalty and product performance. Without this data, the analysis could not capture potential post-purchase issues that may affect future sales or brand perception. For example, a product generating high sales may also have a high return rate or low satisfaction levels, which would not be reflected in this report. As such, the insights are limited to transactional behavior and may not fully represent customer sentiment or retention patterns.

Incorporating cost and satisfaction data in future analyses would enable a more comprehensive understanding of the business's financial health and customer experience, leading to even more actionable and strategic recommendations.

Conclusion

This analysis offered a comprehensive exploration of mobile phone sales performance across various dimensions including product specifications, customer demographics, sales channels, and regional activity. Leveraging Power BI, key insights were uncovered that highlight prevailing consumer preferences, regional market strengths, and top-performing brands and models.

OnePlus, Apple, and Xiaomi emerged as top-selling brands, with Samsung models generating the highest revenue overall. Android devices maintained dominance in the market, while 64GB storage and black-colored phones proved most popular among buyers. The online channel stood out as the primary driver of sales, and flexible payment options like EMI and credit cards led revenue contributions, underscoring the importance of convenience in customer purchasing decisions.

Furthermore, the demographic analysis revealed distinct brand preferences across different age groups and emphasized the strong revenue contribution of female customers. High-performing regions and cities such as India and Bursa (Turkey) also signal opportunities for strategic expansion and localized marketing efforts.

While the dataset's limitations—particularly the absence of cost and customer feedback data—restricted the scope of financial and satisfaction-based assessments, the analysis nonetheless provides a solid foundation for data-driven decision-making. Going forward, integrating more

granular financial metrics and customer experience data would enrich the insights and support more holistic strategic planning.

This project underscores the value of business intelligence tools in transforming raw data into actionable insights, offering decision-makers a clearer understanding of their market dynamics and opportunities for growth.