Bhakti Ramesh Chotalia **NU Id: 002822459**

E-Commerce Analytics (HBR#:521078-PDF-ENG,521079PDF-ENG, 521080-PDF-ENG)

Executive Summary: This series of cases presents a comprehensive examination of a Consumer-Packaged Goods (CPG) company using advanced data analytics to navigate challenges in the e-commerce sector. The company is tasked with refining its sales forecasts, optimizing product selection for new retail partnerships, and managing a Free Delivery program effectively. These cases underscore the critical importance of leveraging analytics for strategic planning and adaptability in the rapidly evolving retail landscape.

The case **outlines five sales projection methods** for projecting sales, each with its advantages and limitations:

- **Historic Month Trends:**
  - **Approach:** This method extrapolates future sales based on historical monthly data. It's straightforward, relying on past performance to predict future outcomes.
  - **Strengths:** Simple and easy to implement, particularly effective when market conditions are stable.
  - **Weaknesses:** It may fail to account for sudden market shifts, seasonal variations, or external factors that could disrupt historical patterns.

- **SKU-Level Trends:**
  - **Approach:** Analyzes sales trends at the SKU (Stock Keeping Unit) level, providing a granular view of each product's performance over time.
  - **Strengths:** Offers detailed insights, making it possible to identify top-performing SKUs and those with declining trends.
  - **Weaknesses:** Requires more extensive data and can be time-consuming. May also be less effective if SKU-level data is inconsistent or sparse.

- **Shares of the Top 10 SKUs:**
  - **Approach:** Focuses on the sales performance of the top 10 SKUs to estimate overall sales.
  - **Strengths:** Efficient and highlights key revenue drivers.
  - **Weaknesses:** Risks looking at the long-tail products that, collectively, might contribute significantly to sales.

- **Extrapolating Sales Using Every 10th SKU:**
  - **Approach:** Estimates total sales by analyzing the performance of every 10th SKU in the product lineup.
  - **Strengths:** Less data-intensive and offers a snapshot of the product range.
  - **Weaknesses:** The method could miss important trends in un-sampled SKUs, leading to inaccurate forecasts.

- **Average Online Shares:**
  - **Approach:** Averages the sales share across all SKUs to project total sales.
  - **Strengths:** Simple and quick, useful for getting a broad estimate.
  - **Weaknesses:** This method may not capture SKU-specific variations, leading to an over-simplified sales forecast.

Alternative Methods Proposed:

1. **Time Series Forecasting:**
    - **Approach:** Utilizes models like ARIMA (AutoRegressive Integrated Moving Average) to predict future sales based on past trends and seasonal patterns.
    - **Advantages:** Accounts for seasonality and trends, making it more adaptive to changing market conditions.
    - **Disadvantages:** Requires sophisticated modeling and historical data. Can be computationally intensive.
2. **Machine Learning Models:**
    - **Approach:** Applies algorithms like regression models and neural networks to forecast sales by incorporating a wide range of variables, including market trends, consumer behavior, and external factors.
    - **Advantages:** Can process large datasets and identify complex patterns. Offers high accuracy when trained with quality data.
    - **Disadvantages:** Requires significant computational resources and expertise. The models can be black boxes, making their predictions harder to interpret.
3. **Combination Models:**
    - **Approach:** Integrates traditional forecasting methods with advanced statistical or machine learning techniques to provide a comprehensive and nuanced sales forecast.
    - **Advantages:** Balances simplicity and accuracy, leveraging the strengths of multiple approaches.
    - **Disadvantages:** Complexity increases with the integration of different models. It requires careful management to avoid overfitting.

Optimal Assortment Criteria:

When selecting SKUs for a new retailer, the following criteria should guide the optimal assortment:

1. **Revenue Potential:** Focus on SKUs with a strong track record of sales, using historical and projected data to gauge potential revenue.
2. **Profit Margins:** Prioritize SKUs with higher profit margins to maximize profitability. This requires detailed margin analysis at the SKU level.
3. **Loyalty & Repeat Purchase Probability:** Utilize the loyalty variable to identify SKUs that drive repeat purchases, ensuring a steady revenue stream from loyal customers.
4. **Market Differentiation:** Select unique or niche SKUs that differentiate the brand on the retailer's platform, enhancing visibility and appeal.
5. **Inventory & Supply Chain Viability:** Ensure that the selected assortment is supportable by current logistics, considering inventory levels, lead times, and supply chain constraints.

Additional Data Requests:

To refine the SKU selection process further, the following data should be requested:

1. **Customer Demographics and Preferences:** Align SKU selection with the target market's preferences, ensuring that the assortment resonates with the retailer's customer base.
2. **Competitor Assortment and Pricing:** Analyze competitors' assortments and pricing strategies to position the brand competitively.
3. **Historical Performance on Similar Platforms:** Use performance data from similar platforms to benchmark and forecast expected SKU performance.
4. **Market Trends and Seasonality:** Incorporate market trends and seasonal factors into the assortment strategy to capitalize on demand peaks and avoid slow-moving stock.

Confidence in Recommendations:

The recommendations presented are underpinned by a robust analytical approach, balancing immediate revenue potential with strategic considerations such as customer loyalty and market differentiation. The confidence in these recommendations is enhanced by integrating additional requested data, which improves the precision and adaptability of the assortment strategy.

Learning from Cohort Comparisons:

Comparing consumer behavior across three cohorts offers valuable insights:

1. **Average Spend:** Analyzing the average spend per cohort helps in setting appropriate minimum spending thresholds for promotions.
2. **Product Mix Preferences:** Understanding cohort preferences allows for targeted marketing and bundling strategies that align with consumer behavior.
3. **Eligibility for Free Delivery:** Insights into the likelihood of consumers adding items to meet free delivery thresholds inform the setting of minimum spend levels and the design of promotions.

Recommendations for Free Delivery Terms:

To optimize the Free Delivery program, the following recommendations are made:

1. **Optimal Minimum Spend Threshold:** Set the minimum spend based on the cohort analysis, ensuring it covers the $5.50 delivery subsidy and yields at least $1 profit per transaction.
2. **Tiered Incentives:** Implement tiered incentives that reward higher spending, boost customer satisfaction and loyalty while increasing average order value.
3. **Promote Bundling:** Design product bundles that slightly exceed the minimum spend threshold, encouraging customers to buy more and enhancing profitability.

Request for Additional Data:

To further fine-tune the Free Delivery program, the following data is needed:

1. **Detailed Profit Margins by SKU:** Essential for determining which products should be featured prominently in the Free Delivery promotion.
2. **Competitor Delivery Offers:** Understanding competitor delivery strategies helps in ensuring the brand's offers are competitive yet profitable.
3. **Customer Segmentation and Preferences:** Enables the tailoring of promotions to different customer segments, maximizing the effectiveness of the Free Delivery program.
4. **Historical Data on Promotional Uplifts:** Analyzing past promotions helps in predicting the potential success of the Free Delivery program, allowing for more accurate planning.

Conclusion:

The case studies vividly illustrate the critical role of advanced e-commerce analytics in strategic decision-making for CPG firms. By adopting a holistic, data-driven approach, CPG companies can effectively address the challenges of the digital market, enhancing sales forecasts, optimizing product selection, and designing promotions that foster growth and profitability in an increasingly competitive landscape.

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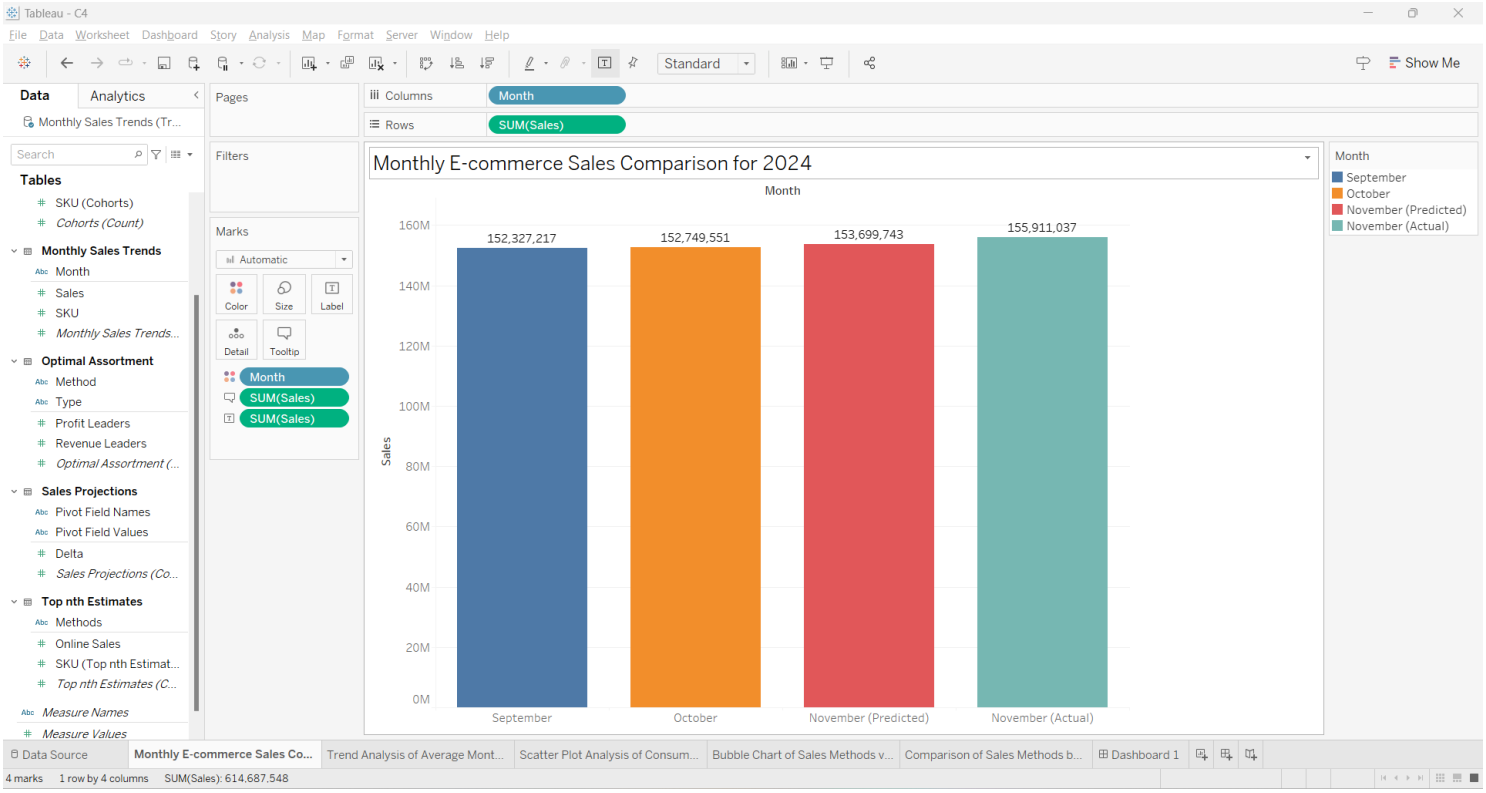

Fig 1: Monthly E-commerce Sales Comparison for 2024

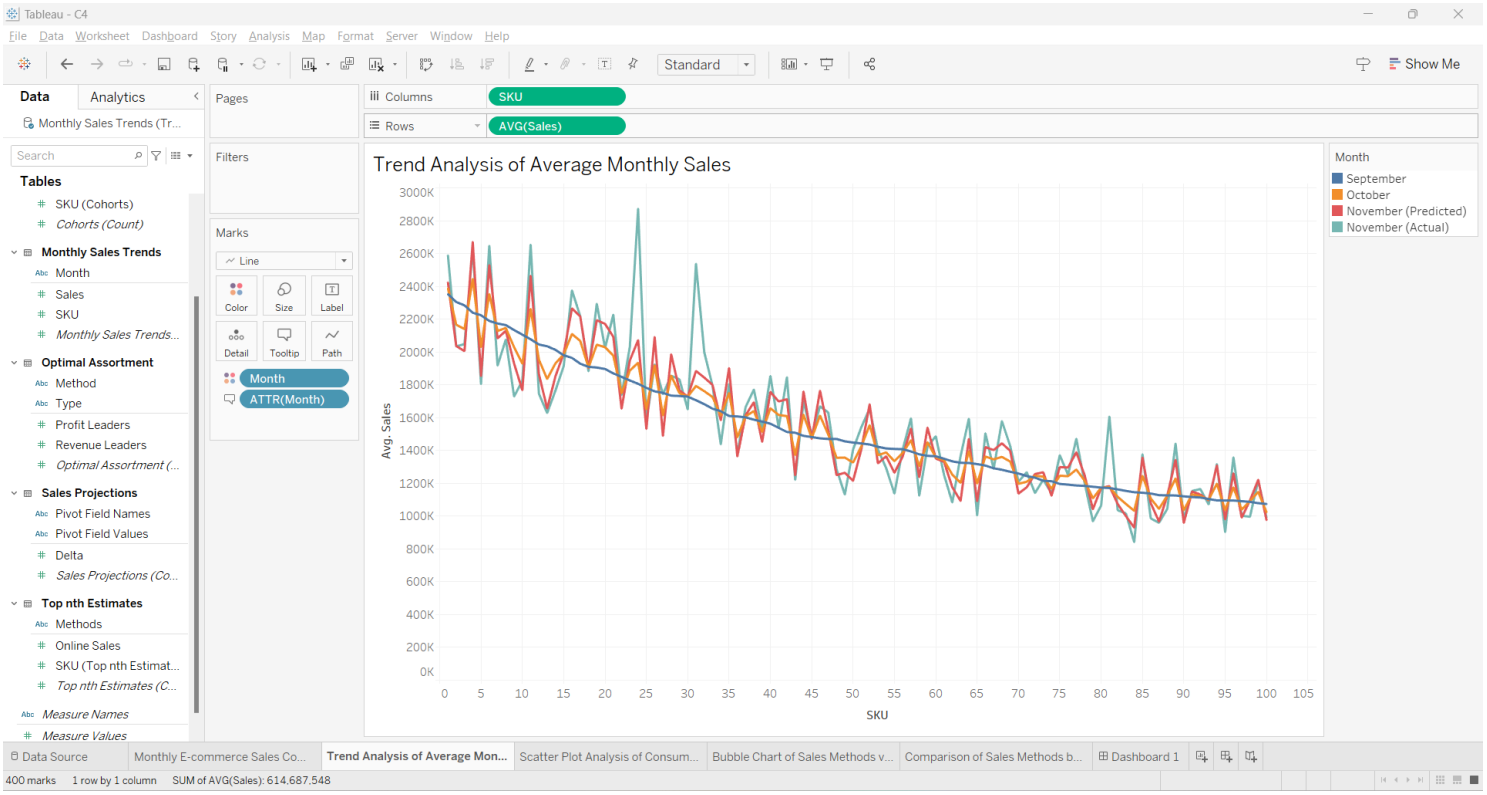

Fig 2: Trend Analysis of Average Monthly Sales

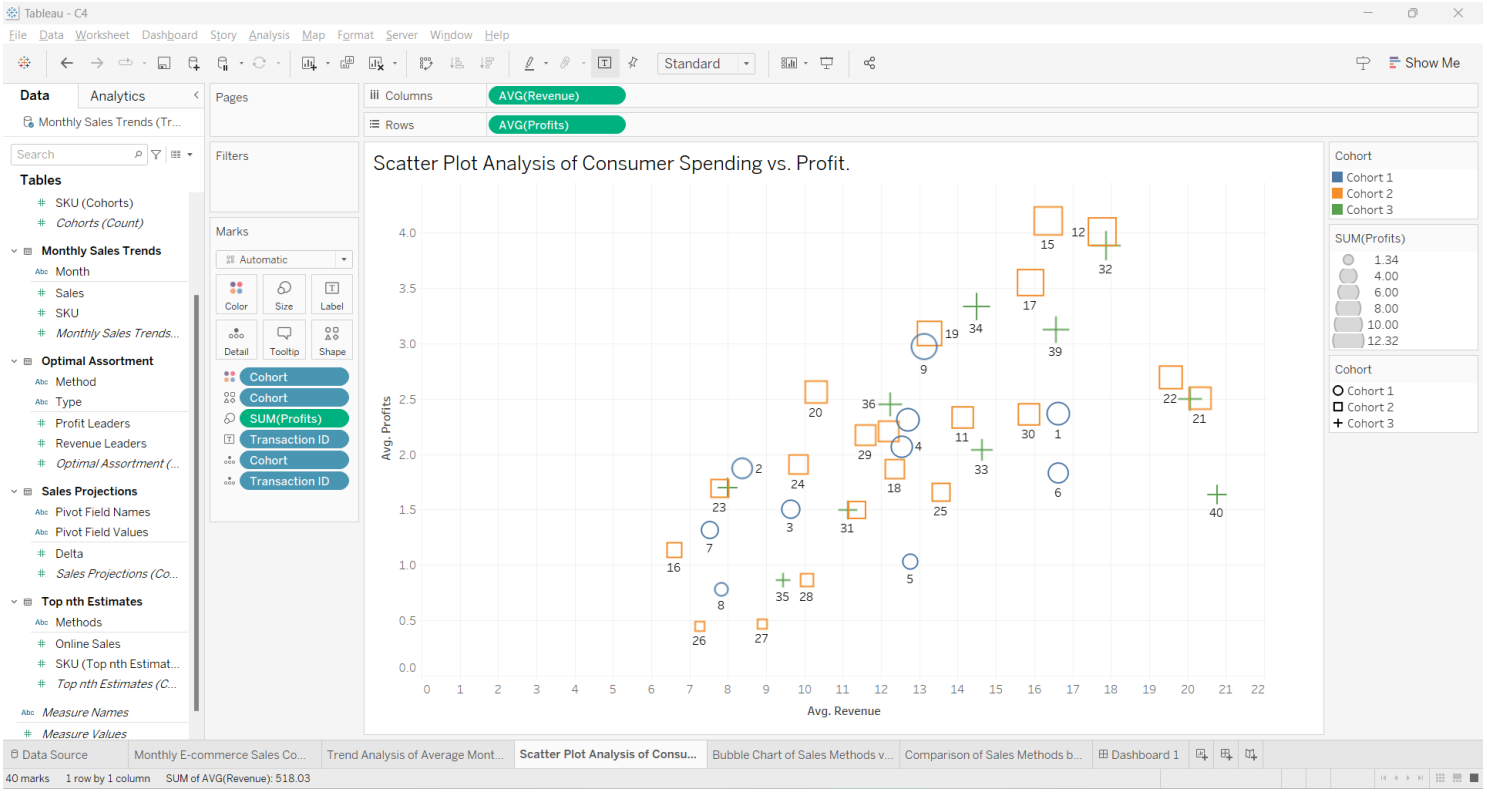

Fig 3: Scatter Plot Analysis of Consumer Spending vs. Profit.

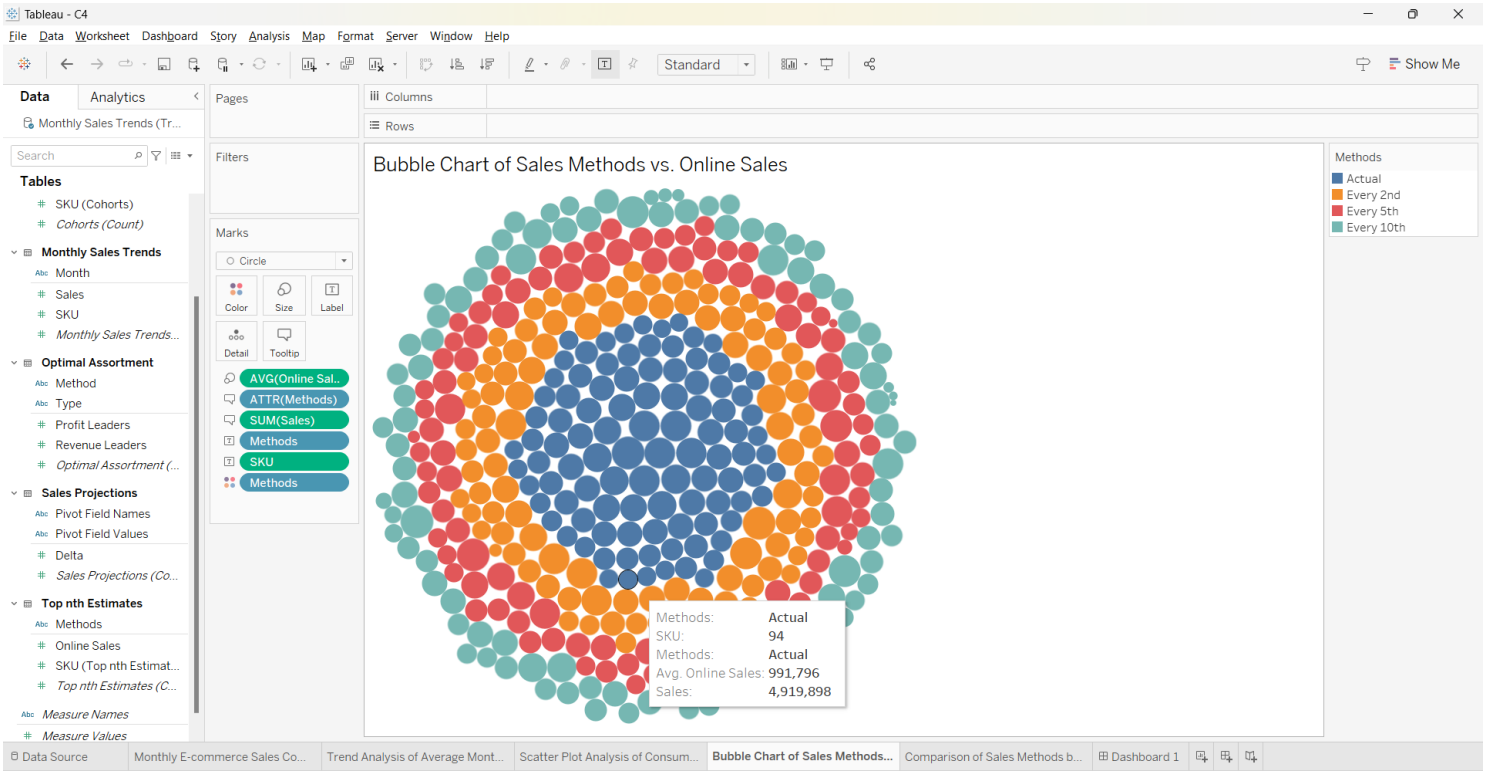

Fig 4: Bubble Chart of Sales Methods vs. Online Sales

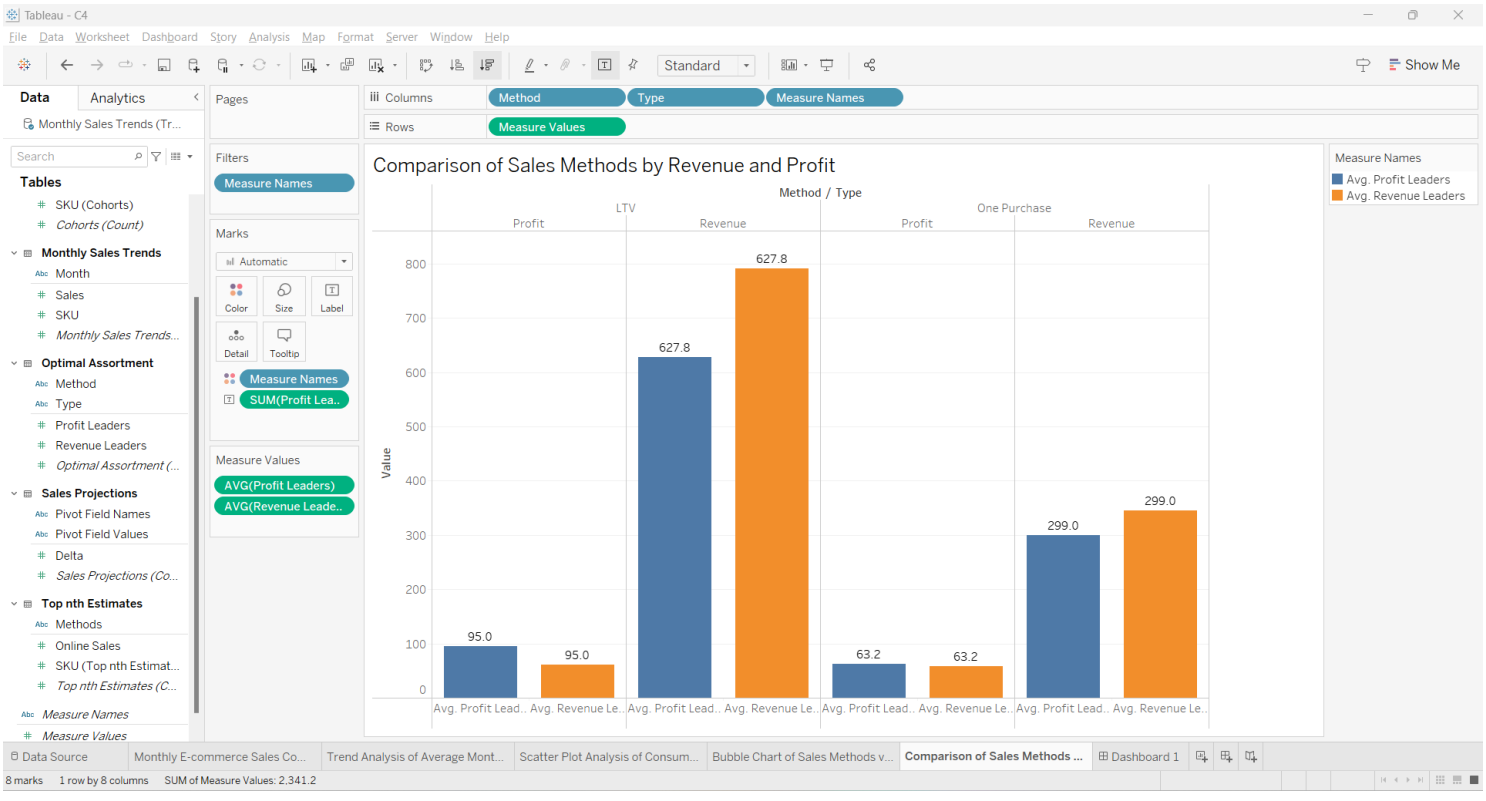

Fig 5: Comparison of Sales Methods by Revenue and Profit

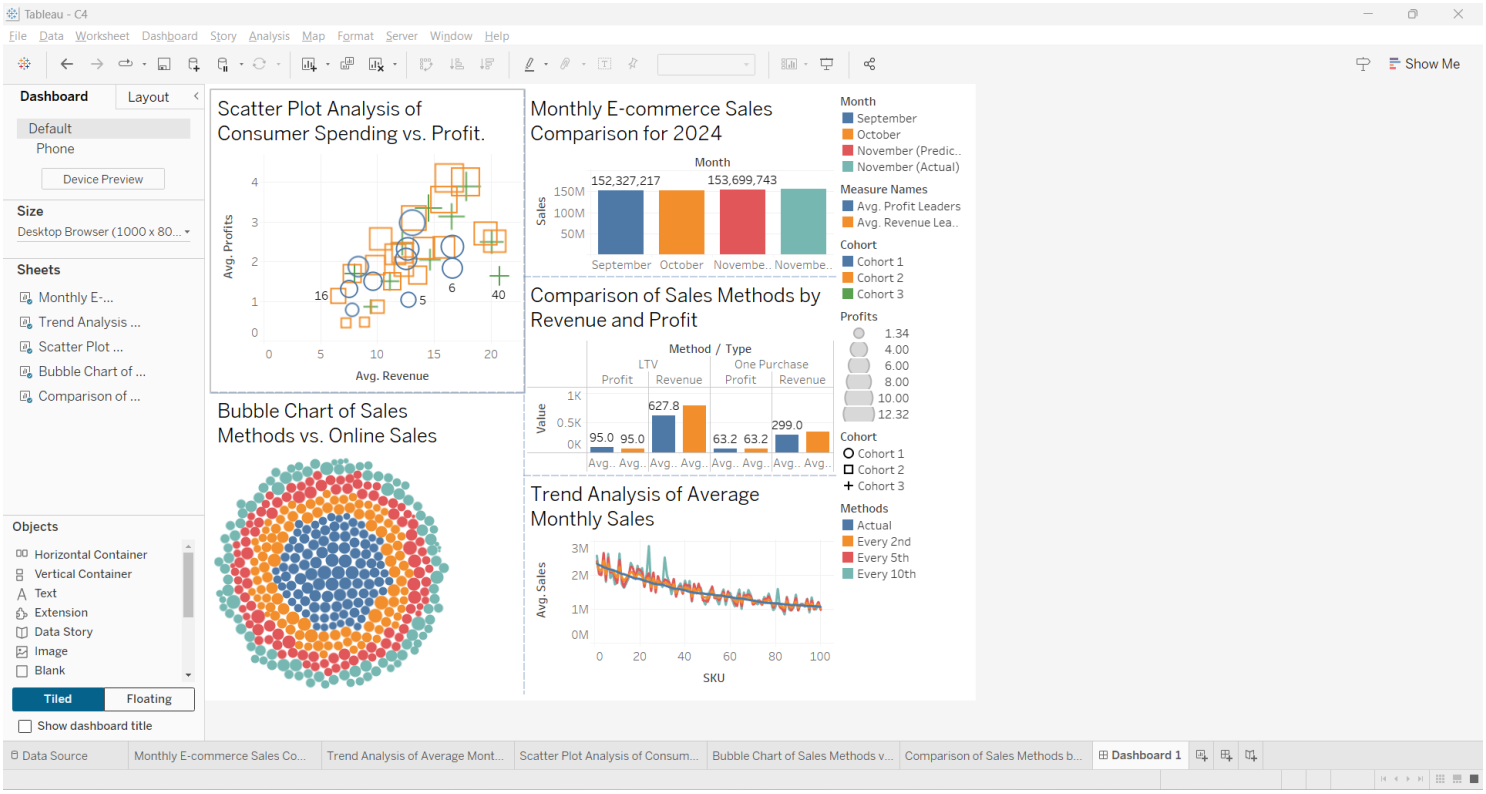

Fig 6: Final Dashboard