ACME Business & Operations Analysis Report

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Table of Contents

Executive Summary

This report presents a comprehensive analysis of sales, product performance, payment methods, inventory management, product ratings, and revenue trends from 2020 to 2024.

Leveraging SQL for data extraction and Excel for forecasting, the findings offer actionable insights to optimize business strategies and drive growth. Key highlights and recommendations include:

1. **Regional Sales Performance**
   Saskatchewan (SK) and Alberta (AB) exhibit strong sales growth, reflecting effective management strategies. However, British Columbia (BC) faces declining sales, requiring targeted interventions to regain competitive advantage.
   - Recommendations:
     - Allocate resources to high-growth regions like SK and AB.
     - Investigate customer needs in BC and adapt offerings accordingly.
2. **Product Analysis**
   Top-performing products like the "Incredible Marble Coat" drive revenue, while underperformers, such as the "Heavy Duty Marble Table," signal market misalignment.
   - Recommendations:
     - Expand marketing for successful products.
     - Redesign or phase out persistently low-performing items.
3. **Payment Trends**
   VISA remains the most popular payment method, but alternative methods like PayPal and Apple Pay show potential for growth.
4. **Inventory Optimization**
   Efficient logistics minimize delays, yet surplus inventory poses cost risks for 2024.
   - Recommendations:
     - Refine demand forecasting using advanced analytics.
     - Adjust stock levels to reduce carrying costs.
5. **Customer Reviews and Ratings**
   Products with high ratings, such as the "Heavy Duty Silk Plate," reveal opportunities for marketing, while poor ratings highlight quality issues.
   - Recommendations:
     - Use positive reviews to boost visibility of high-rated products.
     - Address feedback for low-rated items to enhance quality and appeal.
6. **Revenue Trends**
   Seasonal peaks in July and May highlight revenue opportunities, while underperformance in March and October suggests the need for strategic adjustments.
   - Recommendations:
     - Maximize marketing efforts during peak months.
     - Align offerings with seasonal demand patterns during slower periods.

This report underscores the importance of data-driven decision-making to sustain growth and adapt to dynamic market conditions. The outlined strategies aim to enhance customer satisfaction, streamline operations, and improve profitability.

Summary Report

Analysis: Customers by Region

Overview

This analysis evaluates sales performance by province from 2020 to 2024, providing insights into high-performing regions and identifying areas requiring improvement. Using SQL, sales data from 2020 to 2022 was extracted and segmented by province. Subsequently, Excel was utilized to apply linear forecasting models for predicting sales trends in 2023 and 2024. This forecast assumes consistent market conditions and a continuation of the current strategic approach.
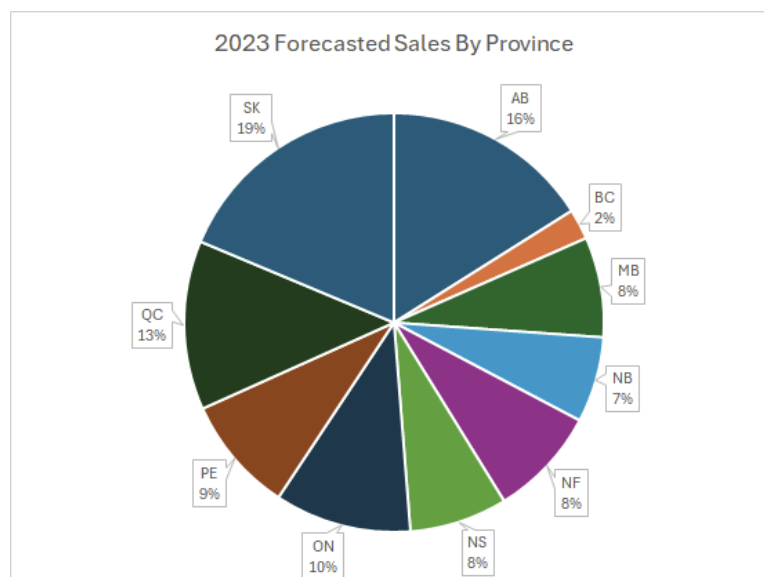
Analysis

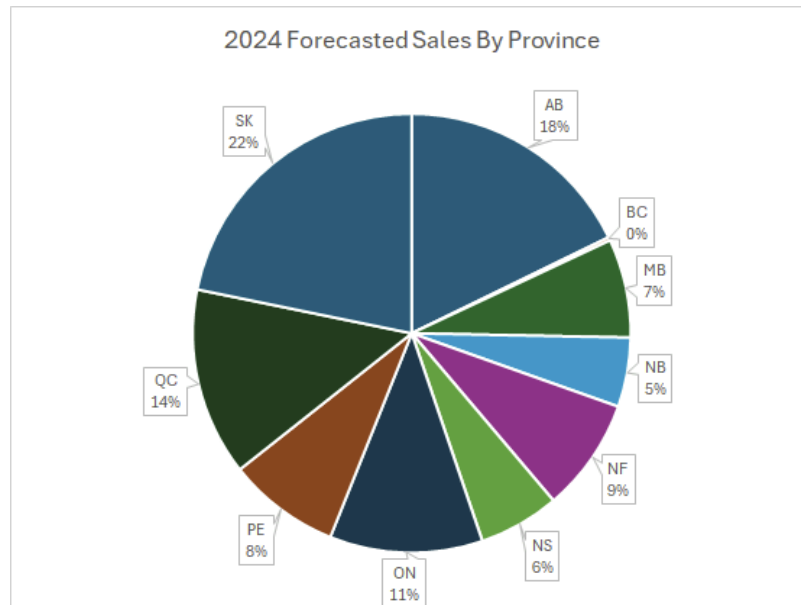*Fig 1. Pie chart of 2023 Forecasted Sales By Province*

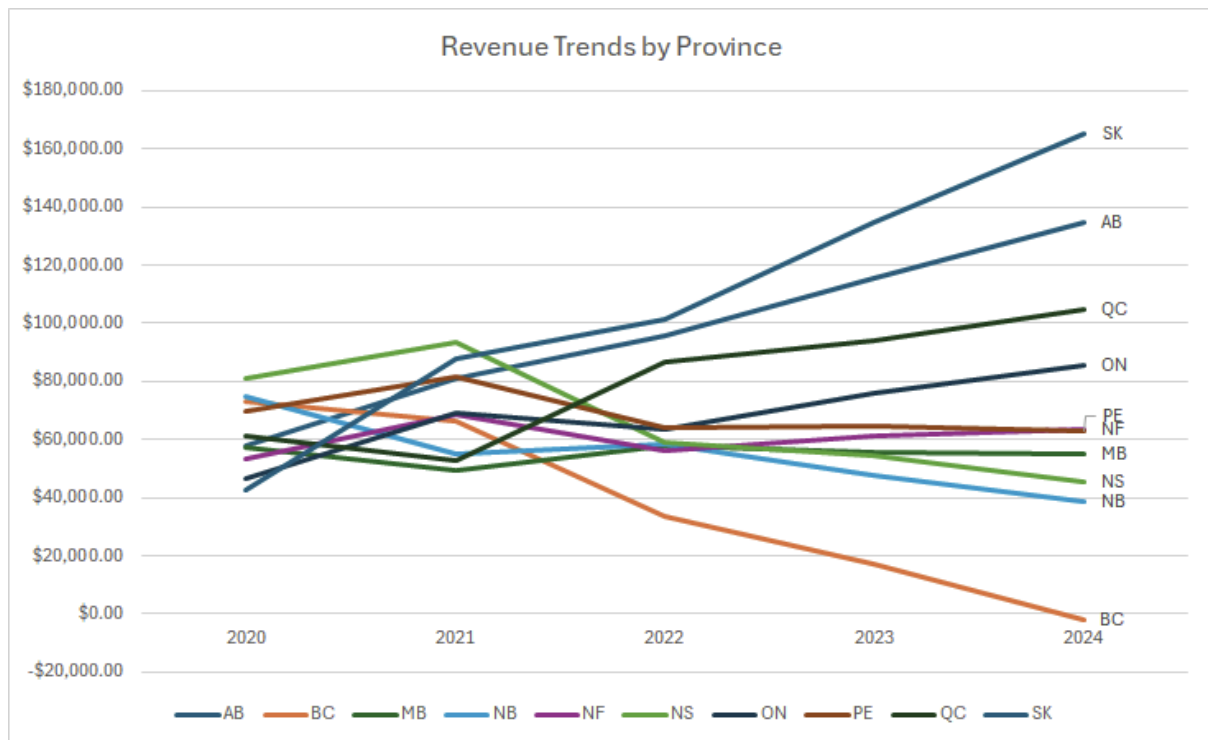*Fig 2. Pie chart of 2024 Forecasted Sales By Province*

Fig 3. Line Chart of 2024 Forecasted Sales By Province

- **Strong Performance in Saskatchewan (SK) and Alberta (AB):**
  Significant revenue growth in SK and AB suggests that the current management strategy is highly effective in these regions. Both provinces demonstrate upward trends in sales, with forecasts indicating further increases through 2024.
- **Sales Decline in British Columbia (BC):**
  British Columbia exhibits a notable decline in sales, contrasting sharply with the

success observed in SK and AB. This trend indicates potential challenges in meeting customer needs or maintaining competitive advantage in BC.

<u>Recommendations</u>

- **Capitalize on Growth in SK and AB:**
  - **Resource Allocation:** Redirect additional marketing and operational resources to SK and AB to amplify the current growth momentum.
  - **Customer Retention:** Focus on customer retention strategies in these regions, such as loyalty programs, to solidify market share.
  - **Market Expansion:** Investigate opportunities to expand offerings or open new outlets where demand is highest.
- **Address Sales Decline in BC:**
  - **Data Collection:** Conduct surveys, focus groups, and analyze marketing performance metrics to understand customer preferences and identify weak points in BC.
  - **Product Adaptation:** Based on insights, adapt products, pricing, or promotions to better align with BC's market demands.
  - **Localized Marketing:** Tailor campaigns to address regional preferences, leveraging messaging that resonates with BC's unique demographic and cultural factors.
- **Analyze competition**
  - Analyze key competitors in all regions. Take note of their products, pricing strategies, and marketing efforts. Implementing competitive pricing and marketing can improve sales in our poorly performing regions such as BC.

Analysis: Best and Worst Products

<u>Overview</u>

This section examines product sales data from 2020 to 2023 to identify the top and bottom five products by revenue. SQL queries were used to extract sales data for all products from the database, which was then analyzed and forecasted using Excel. An exponential trend model was applied to predict revenue trends for 2024. This analysis assumes consistent market conditions and customer purchasing behavior in the forecast period. As there are missing values for certain years for some products, we assume that the quantity sold is 0. Furthermore, as a linear predictive model leads to negative sales data for some products, we use a logarithmic transformation on our data.

Analysis

2023 Top 5	
Fantastic Concrete Bottle	$30,472.84
Fantastic Marble Watch	$28,405.50
Small Silk Keyboard	$25,998.48
Incredible Marble Coat	$24,464.44
Practical Wooden Coat	$23,091.12

2023 Bottom 5	
Fantastic Wooden Keyboard	$22.05
Heavy Duty Marble Table	$49.41
Lightweight Aluminum Pants	$57.39
Aerodynamic Leather Watch	$93.94
Enormous Wool Wallet	$123.18

2024 Top 5	
Aerodynamic Linen Gloves	$61,779.39
Awesome Aluminum Bag	$52,693.80
Incredible Marble Coat	$39,079.78
Intelligent Concrete Bag	$36,639.45
Heavy Duty Bronze Car	$28,949.02

2024 Bottom 5	
Aerodynamic Leather Watch	$64.55
Lightweight Aluminum Pants	$64.87
Lightweight Wooden Table	$69.96
Intelligent Leather Pants	$71.61
Heavy Duty Marble Table	$71.69

Fig 4. Charts of top and bottom 5 selling products in 2023 and 2024
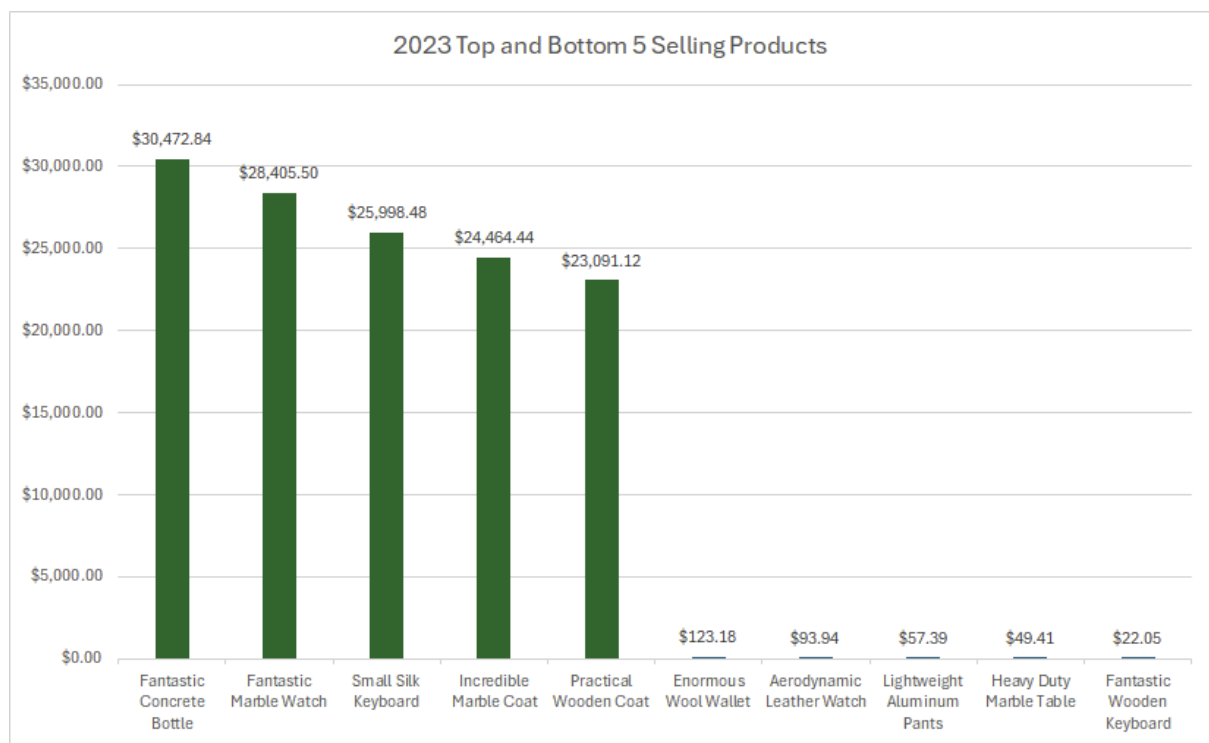

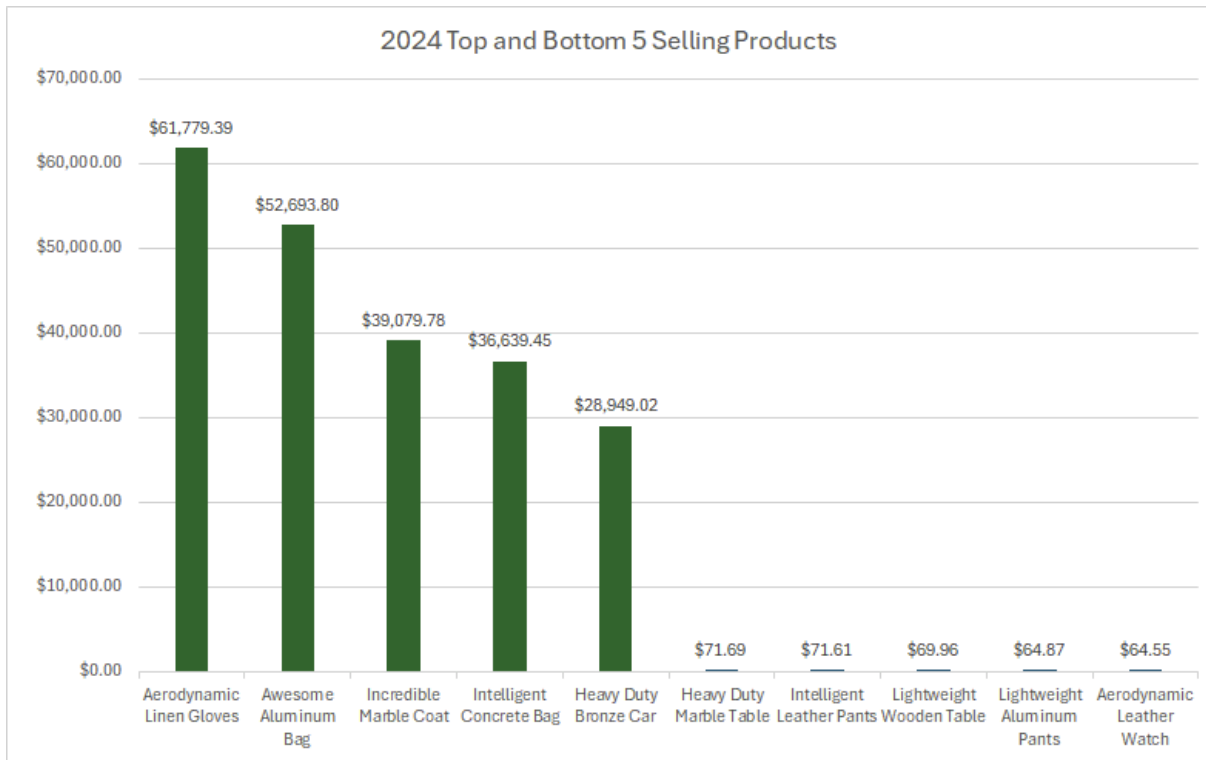*Fig 5. Column chart of top and bottom 5 selling products in 2023*

Fig 6. Column chart of top and bottom 5 selling products in 2024

- **Top-Performing Products**
  - The top five products by revenue in 2023 include:
    - Fantastic Concrete Bottle
    - Fantastic Marble Watch
    - Small Silk Keyboard
    - Incredible Marble Coat
    - Practical Wooden Coat

These products demonstrated strong and consistent sales growth throughout the year. However, projections for 2024 suggest a shift in customer preferences. Only the **Incredible Marble Coat** is predicted to remain in the top five. New entrants such as the **Aerodynamic Linen Gloves**, **Awesome Aluminum Bag**, **Intelligent Concrete Bag**, and **Heavy Duty Bronze Car** are forecasted to dominate the top-performing products list. This highlights the dynamic nature of customer demand and market trends.

- **Bottom-Performing Products**
  - The bottom five products in 2023 were:
    - Fantastic Wooden Keyboard
    - Heavy Duty Marble Table
    - Lightweight Aluminum Pants
    - Aerodynamic Leather Watch
    - Enormous Wool Wallet

These products exhibited declining sales and lower market demand. For 2024, the **Heavy Duty Marble Table** and **Aerodynamic Leather Watch** are expected to remain among the bottom five, while others may see slight improvement or be replaced by different underperformers. Factors such as misalignment with customer preferences, inadequate marketing, or competition from better alternatives contribute to their underperformance.

Recommendations

Analyze Persistent Underperformers

- Conduct customer feedback surveys and focus groups to understand why products like the **Heavy Duty Marble Table** and **Aerodynamic Leather Watch** remain in the bottom tier.
- Evaluate market trends and competitor offerings to identify gaps or areas of improvement.
- Consider redesigning, repositioning, or discontinuing consistently underperforming items to free up resources for higher-demand products.

Focus on Top Performers

- **Increase Inventory:** Ensure sufficient stock of high-demand products like the **Aerodynamic Linen Gloves** and **Awesome Aluminum Bag** to avoid stockouts.
- **Expand Marketing Efforts:** Promote these products further to capitalize on their growing popularity. Highlight features that resonate with customers in targeted campaigns.
- **Explore Complementary Products:** Use the success of top products to introduce complementary items (e.g., accessories for **Intelligent Concrete Bag**).

Implement Dynamic Pricing Strategies

- Adjust pricing for underperforming products to incentivize sales or clear inventory.
- For top-performing products, evaluate opportunities to maximize margins without alienating customers.

Analysis: Payment Methods

Overview

This section evaluates customer payment methods used from 2020 to 2023 to identify trends in payment preferences and their impact on revenue. Data was extracted using SQL queries to separate transactions by payment method, followed by analysis in Excel to observe patterns and forecast usage for 2024. A linear trend model was applied to predict future usage based

on historical data, assuming a steady market environment and consistent payment infrastructure.
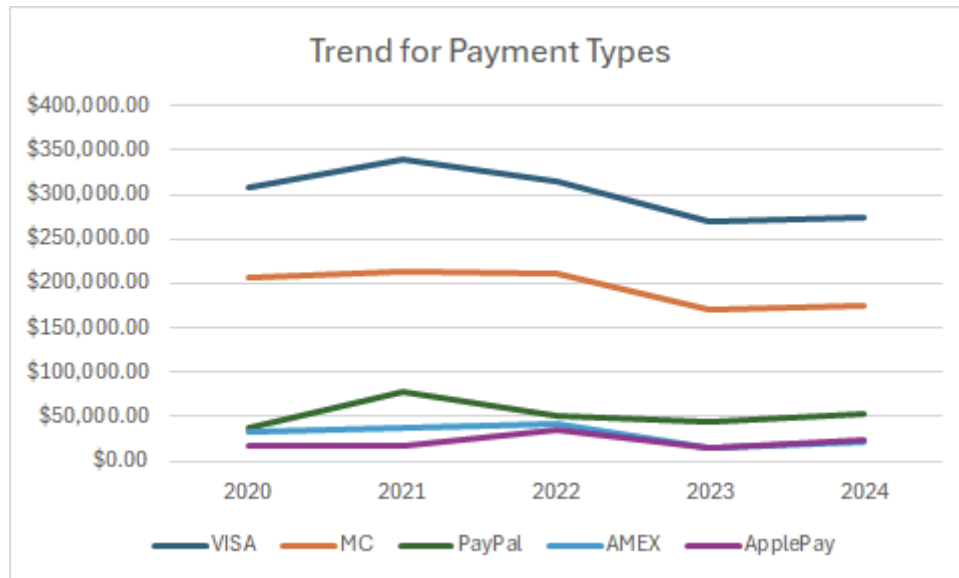
Analysis

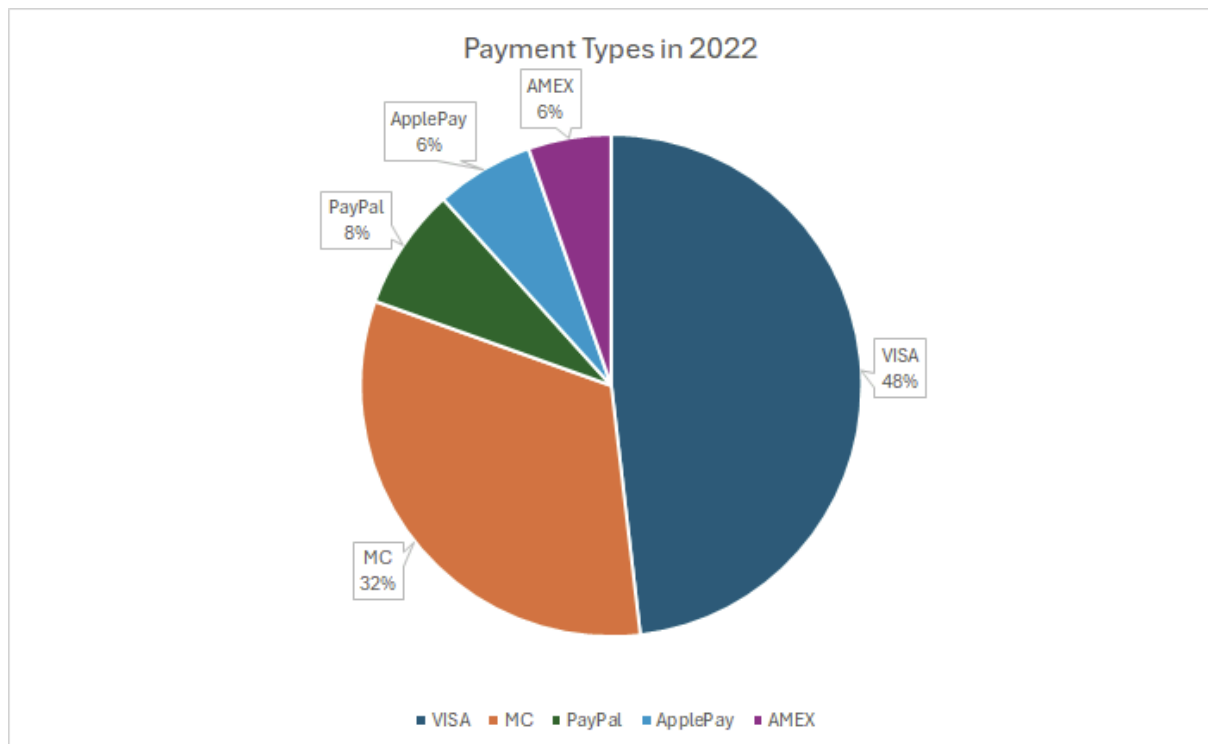*Fig 7. Column chart of top and bottom 5 selling products in 2023*

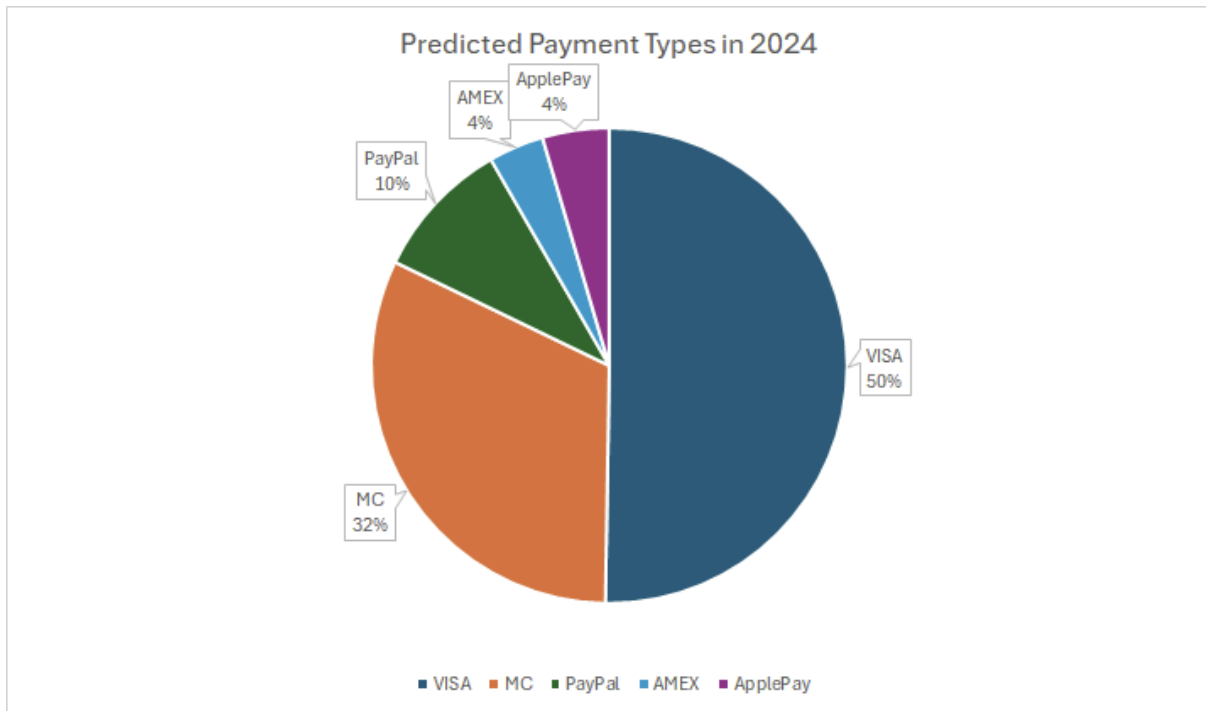*Fig 8. Pie chart of shares payment types used in 2022*

Fig 9. Pie chart of predicted shares payment types used in 2024

VISA payments have consistently dominated the market, accounting for 50% of all transactions and forecasted to maintain this share in 2024. Mastercard (MC) is the second most used payment method, while PayPal, AMEX, and Apple Pay collectively account for less than 25% of payments. Despite the dominance of VISA and MC, the total revenue generated by all payment types has declined between 2020 and 2023. However, forecasts indicate a potential rebound in 2024, with revenue expected to increase across all payment methods.

Analysis: Inventory Management

Overview

This analysis evaluates the efficiency of inventory management across warehouses from 2020 to 2024. Data was extracted using SQL queries to analyze inventory by product and warehouse, followed by Excel-based calculations to identify trends and forecast inventory needs 2024. This forecast assumes consistent demand patterns and no major supply chain disruptions.
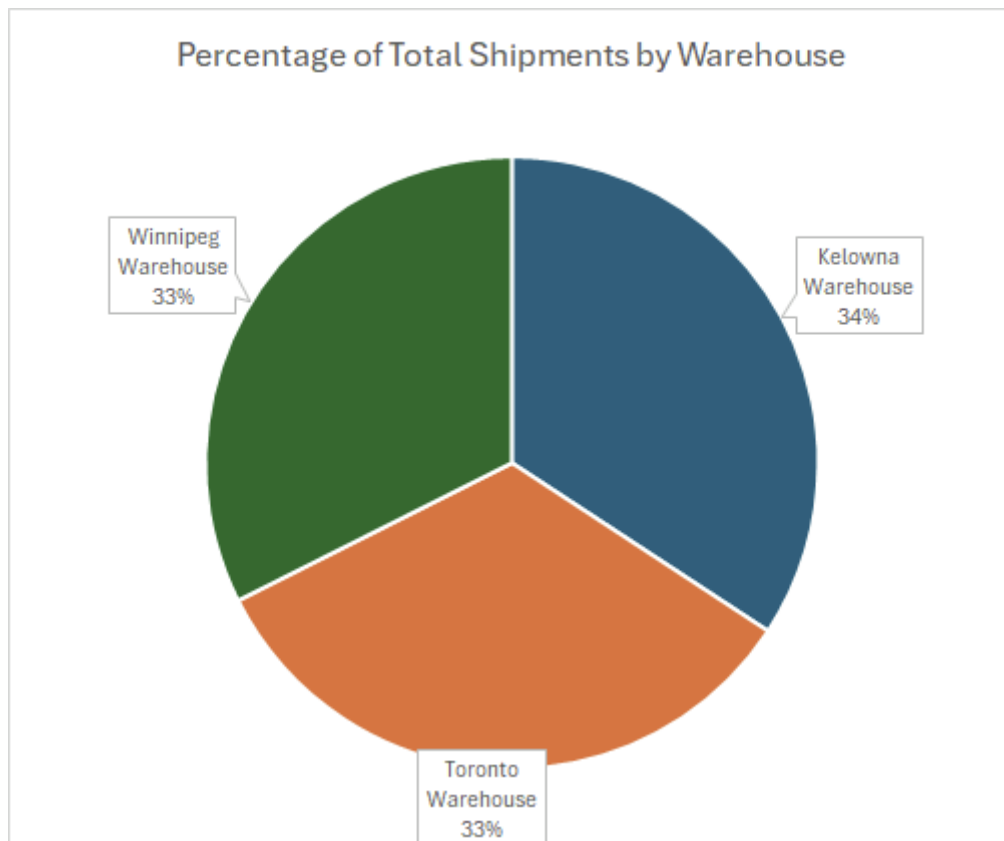
<u>Analysis</u>

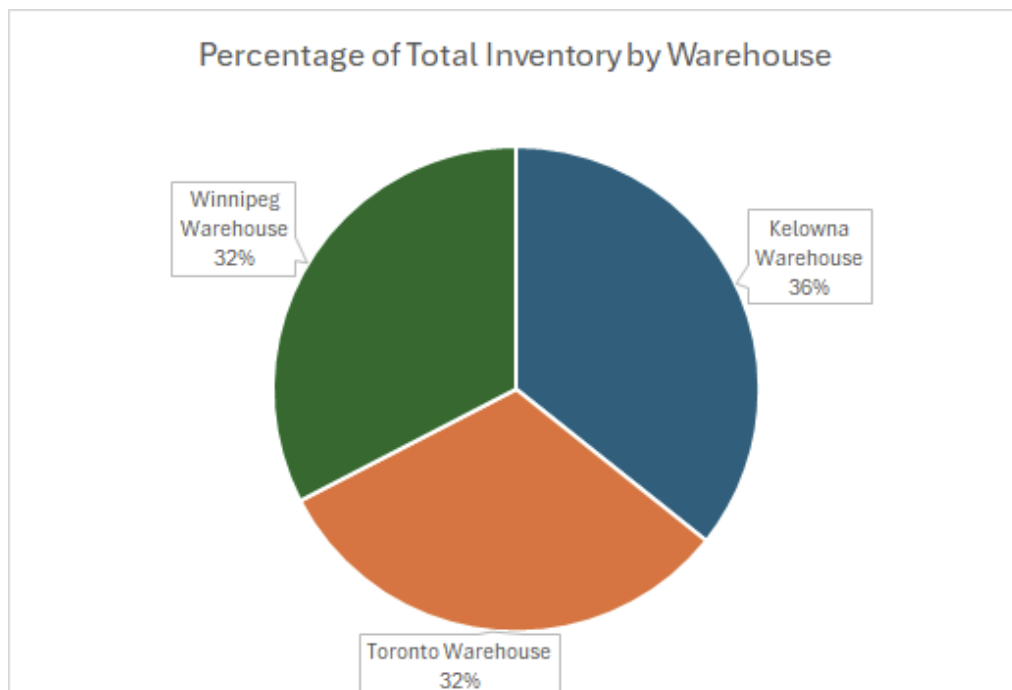*Fig 10. Pie chart of the percentage of total shipments by warehouse*

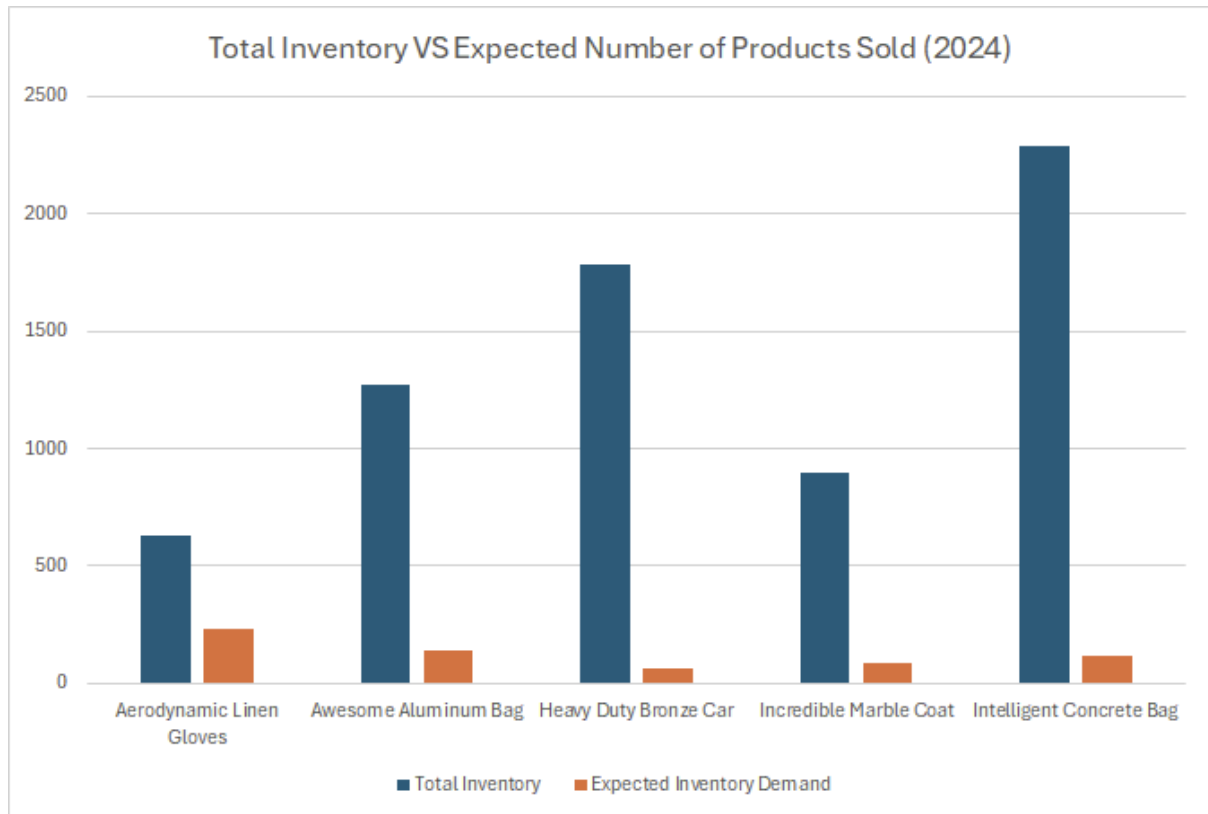*Fig 11. Pie chart of the percentage of total inventory by warehouse*

Fig 12. Column chart of current total inventory vs expected number of products sold for 2024

- **Efficient Logistics Network**:
  Shipments and inventory levels are closely aligned, indicating that the logistics network operates effectively to fulfill orders across all warehouses with minimal delays.
- **Excess Inventory Levels for 2024**:
  Our projections for 2024 reveal that current inventory levels significantly exceed the forecasted demand for the coming year. This surplus could result in increased holding costs, inefficiencies, and potential waste if products become obsolete or expire.

Recommendations

Optimize Inventory Levels:

- **Adjust Stock Levels**: Reduce inventory for products that are projected to have lower demand in 2024. This will minimize carrying costs and free up storage space.

Forecast Accuracy Improvements:

- **Incorporate Seasonal Trends**: Refine demand forecasting models to account for seasonal fluctuations and historical trends.
- **Utilize Predictive Analytics**: Adopt advanced tools such as machine learning models for more precise predictions of inventory needs.

Overview

This analysis examines the relationship between product ratings, customer reviews, and total revenue for 2023. Products were categorized into **Perfect Score** (average rating of 5) and **Worst Rated** (average rating of 1). The goal is to evaluate the impact of ratings on revenue and identify strategies to improve performance. Data was collected for individual products, including their average ratings, number of reviews, and total revenue.
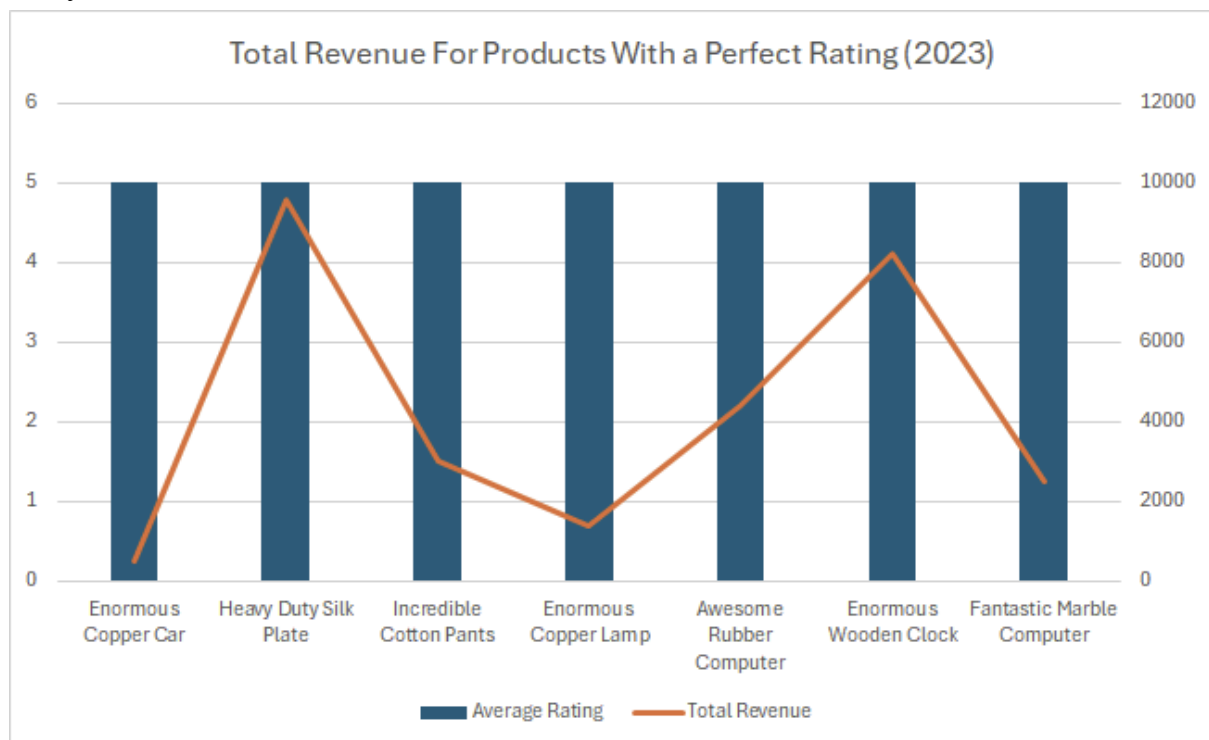
Analysis

Fig 13. Column chart total revenue for products who have a perfect rating in 2023
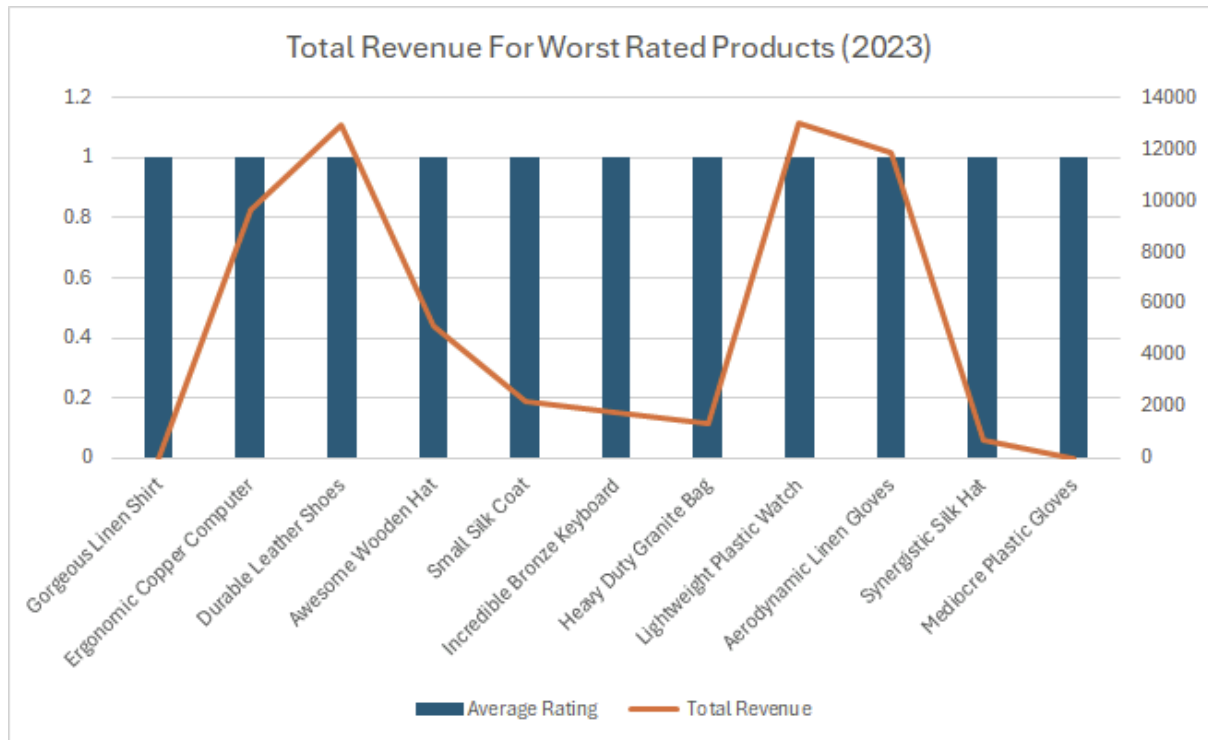
Fig 14. Column and line chart combo of total revenue for the worst rated products in 2023

Perfect Score Products:

- Seven products achieved an average rating of **5**, indicating strong customer satisfaction and alignment with market demands.
- Revenue performance varies widely, with some products generating high revenue, such as the **Heavy Duty Silk Plate** ($9,540.08) and **Enormous Wooden Clock** ($8,193.38), while others, like the **Enormous Copper Car** ($496.54), have lower revenue despite the perfect rating.
- This suggests that while high ratings positively impact sales, additional factors such as product visibility, marketing, and customer demand influence revenue generation.

Worst Rated Products:

- Eleven products received an average rating of **1**, with varying review counts.
- High-revenue products, such as the **Ergonomic Copper Computer** ($9,651.12) and **Durable Leather Shoes** ($12,940.20), demonstrate that strong sales are not solely dependent on ratings but could be driven by brand loyalty or lack of alternatives.
- Several products with poor ratings, such as the **Gorgeous Linen Shirt** ($0 revenue) and **Mediocre Plastic Gloves** ($0 revenue), highlight potential issues with product quality, unmet customer expectations, or inadequate marketing efforts.

Recommendations

Capitalize on Perfect Score Products:

- **Marketing Push**: Increase marketing efforts for top-rated products with lower revenue, such as the **Enormous Copper Car** and **Enormous Copper Lamp**, to improve their visibility and sales.
- **Leverage Reviews**: Use positive customer reviews and testimonials in advertising campaigns to highlight customer satisfaction.

Address Issues with Worst Rated Products:

- **Customer Feedback Analysis**: Collect and analyze customer feedback to identify specific complaints and areas for improvement.
- **Reevaluate Underperforming Products**: Consider discontinuing products with low ratings and minimal revenue, such as the **Gorgeous Linen Shirt** and **Mediocre Plastic Gloves**, to focus on more profitable lines.

Analysis: Monthly Revenue

Overview

This analysis evaluates monthly revenue trends from November 2019 to October 2023, identifying seasonal patterns, high-performing months, and areas for improvement. Revenue data was also aggregated by month to assess long-term performance. Data was extracted using SQL to ensure accurate segmentation by month and year, and Excel was used for trend analysis, forecasting, and visualization.
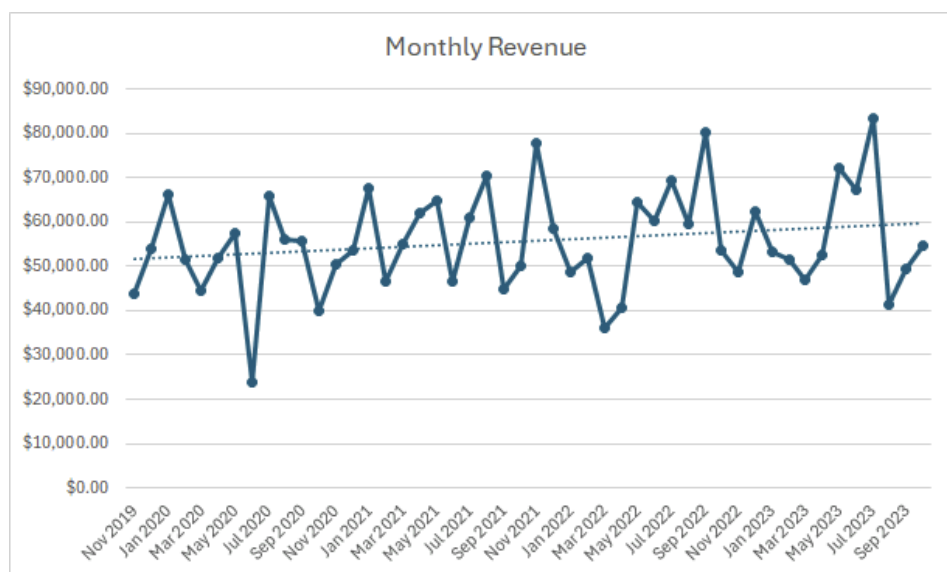
Analysis

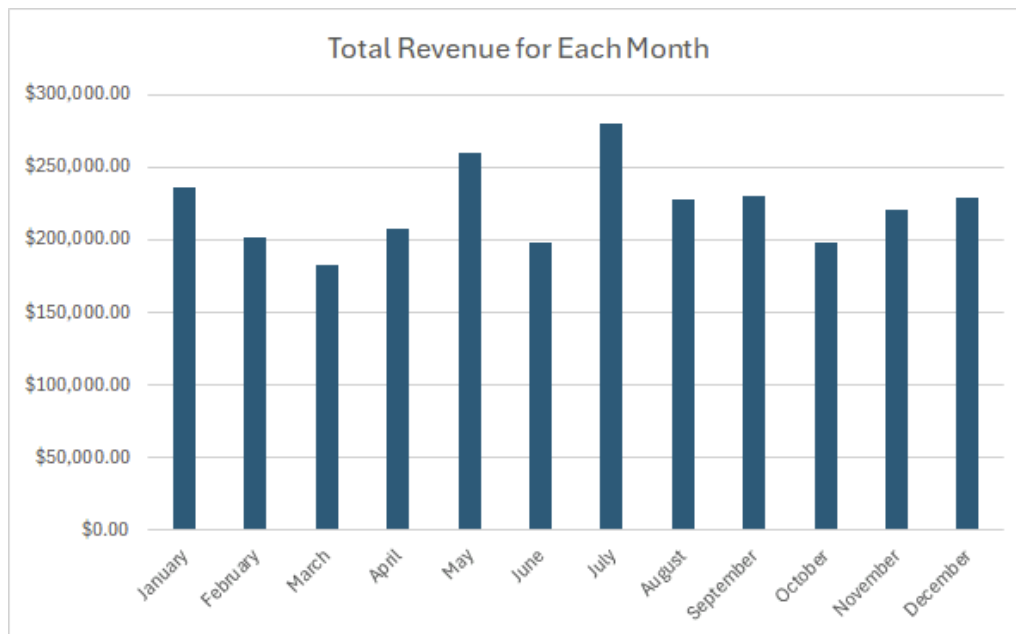*Fig 15. Line chart of monthly revenue from 2019 to 2023*

Fig 16. Column chart total revenue for by month for all years

Consistent Growth in High-Performing Months:

- Certain months, such as **July** ($280,071.38 total) and **May** ($259,201.82 total), consistently outperform others. These months likely correspond to seasonal trends, marketing campaigns, or high customer activity.

Underperforming Months:

- **March** ($182,888.41) and **October** ($198,482.47) rank as the lowest-revenue months overall, suggesting potential gaps in seasonal strategies or market demand.

Variability:
- Revenue trends show variability, with notable dips in months like **June 2020** ($23,918.90), likely due to external factors such as market conditions or could just be due to seasonal trends. However, there are signs of recovery and growth in later years, exemplified by months like **July 2023** ($83,281.62). Thus, these dips do not indicate our products are not performing well. However, understanding the reason for these dips will prove useful.

Recommendations
Leverage High-Performing Months:
- **Maximize Marketing During Peak Months**: Focus marketing and promotional activities during **July** and **May** to capitalize on high customer engagement and spending.
- **Optimize Inventory Management**: Ensure sufficient stock of high-demand products during these months to avoid missed revenue opportunities.

Address Underperforming Months:
- **Seasonal Alignment**: Investigate market trends during these months to identify potential misalignments between customer needs and offerings.

Suggestions to Management

Database Improvements

- **Normalize Data**
  - Remove redundancy in ordersummary:
    - Columns like shiptoCity, shiptoState, etc., could reference a locations table to avoid repeating the same data for multiple orders.
  - Separate user credentials from customer table:
    - Move userid and password to a separate auth table for better security.
- **Handling Missing Values**
  - Deciding on a clear, uniform method to handle missing values will make data easier to read and analyze. For example, using a default depending on the data type or removing data with gaps.

Other Suggestions

- **Integrate with Tableau for Interactive Dashboards**
  - Connect Tableau directly to the ACME SQL database for real-time reporting.
  - Use Tableau's Data Extracts feature to periodically pull data for analysis or to improve performance when working with large datasets.
  - Allows management to explore data across different dimensions (e.g., by region, time period, product, etc.).
  - Use filters and parameter controls to give users the ability to drill down into specific segments of data or view different metrics interactively.
- **API Integrations for External Data Sources**
  - Connect the ACME database with payment gateways like Stripe or PayPal to track payment methods and transaction details for a deeper understanding of customer purchasing behavior.
  - Integrate your database with a Customer Relationship Management (CRM) system like Salesforce or HubSpot to track customer interactions and integrate sales data.