Analysis Project Features List Template

Analysis Features	Category	Possible Points	Points	Comments
Documentation (15 total points)				
Executive Summary (up to 1 page)	Core	2		
Feature List	Core	2		
List of Web and AI sources used	Core	3		At bottom of document
Summary Report (up to 15 pages)	Core	8		
Analysis: Customers by Region (10 total points)				
Overview of approach with assumptions	Done	3		
Predicted sales for 2023+2024 for each province and at least two charts or visualizations	Done	4		
Recommendation/summary paragraph for management	Done	3		
Analysis: Best and Worst Products (10 points)				
Overview of approach with assumptions	Done	3		
Predicted sales for 2023+2024 for top 5 and bottom 5 products with at least two charts or visualizations	Done	4		
Recommendation/summary paragraph for management	Done	3		
Analysis: Payment Methods (up to 5 total points)				
Overview of approach with assumptions	Done	1		
Visualization of payment methods used in 2022	Done	2		
Visualization/prediction of payment methods for 2024	Done	2		
Analysis: Inventory Management (up to 10 total points)				
Overview of approach with assumptions	Done	3		
Perform analysis with at least two charts or visualizations	Done	4		
Recommendation paragraph to management	Done	3		
Analysis: Your Choice (up to 10 total points)				
Overview of approach with assumptions	Done	3		
Perform analysis with at least two charts or visualizations	Done	4		
Recommendation paragraph to management	Done	3		
Analysis: Your Choice (up to 10 total points)				
Overview of approach with assumptions	Done	3		
Perform analysis with at least two charts or visualizations	Done	4		
Recommendation paragraph to management	Done	3		
General and Open Category (up to 20 total points)				
Suggest database improvements	Done	3		
Other (your suggestions including using tools besides Excel)	Done	Up to 20		
Total: (out of 50 with max of 10 bonus. i.e. 60 is max.)				

Group Members: Will Kwan, Mehdi Touijar

Predictions and Analysis: Report to ACME Company CEO

Executive Summary

This report summarizes the operational review for the ACME Company regarding regional trends in sales, product performance, payment methods, inventory management, and order fulfillment from 2019 to 2024. Major insights can enhance the business in areas such as Manitoba, while those in provinces such as Alberta and British Columbia are stalemated.

Product performance shows a need to optimize top products and reassess underperforming ones. Payment tracking and improving inventories will improve customer satisfaction. Further, streamlining the fulfillment processes using advanced data visualization tools will drive efficiency and profitability.

By adopting these strategies, ACME Company can enhance customer retention, stimulate growth, and sustain a competitive advantage in the market.

Feature List

Summary Report

Introduction

This report provides an in-depth analysis of ACME Company's operational performance from 2019 to 2024, focusing on critical areas such as regional sales trends, product performance, payment methods, inventory management, and fulfillment efficiency. The objective is to identify strengths, weaknesses, and opportunities to enhance ACME's overall market position, improve customer satisfaction, and drive profitability. The company can develop targeted strategies to respond to challenges and capitalize on growth opportunities by understanding these operational insights.

Main Findings

The regional sales trend analysis indicates that Manitoba, Newfoundland, Nova Scotia, and Quebec will experience high sales. In contrast, other regions that are expected to experience stagnation or decline in sales include Alberta, British Columbia, New Brunswick, Ontario, Prince Edward Island, and Saskatchewan. Such

regional variations call for an effective strategy for customer retention and market development, especially in regions where performance is expected to lag behind.

Product performance analysis shows that the top five products, such as the Aerodynamic Copper Bag and Ergonomic Iron Lamp, generate a substantial portion of ACME's revenue, contributing over 5.45% of total sales. Meanwhile, the bottom five products, including the Sleek Bronze Keyboard and Synergistic Iron Car, account for only 0.75% of total revenue, highlighting inefficiencies in resource allocation. These findings suggest the need for strategic reassessment of underperforming products, potentially phasing out or repositioning them.

The assessment of payment methods highlighted limitations in the current tracking capabilities, as payment data is not fully linked to individual orders. This deficiency leads to imprecise insights into customer payment preferences, making it challenging to optimize the checkout process. Improved data collection and tracking will enable ACME to better understand and cater to customer preferences, reducing friction during transactions.

Regarding inventory management, the Kelowna warehouse leads in stored units and revenue, reflecting its importance in meeting West Coast demand. However, the present inventory distribution strategy creates inefficiencies, especially for customers served by the Toronto and Winnipeg warehouses. Optimizing inventory allocation across all warehouses will reduce shipment times and costs, thus improving customer satisfaction.

Fulfillment efficiency: the range of fulfillment times is extensive; it ranges from zero to nineteen days. In contrast, most orders go out within one week, but a considerable fraction takes so long that it may provoke customer dissatisfaction. It follows from here that smooth warehouse operations and easy access to inventories will be critical to minimal fulfillment delays and enhanced overall efficiency.

Conclusion

ACME Company is well-placed to leverage these emerging opportunities by addressing the salient points of operational improvements. Addressing regional gaps in sales, optimizing product performance, fine-tuning payment tracking, and improving inventory management will better equip ACME to meet customer needs and stay ahead of the competition. Smoothening the fulfillment processes will enhance ACME’s customer satisfaction and operational efficiencies.

Overview of Recommendations

Focused regional plans will also involve regionally driven customer retention and acquisition campaigns. These may include loyalty programs, region-specific campaigns, or reaching out to new customers.
Product optimization: Marketing and inventory will focus on best-in-class products. Poorly performing products will be reevaluated for a change in pricing to improve their quality or for elimination.

Improved payment tracking: Introduce an improved method for tracking payment methods, which will be fixed on different orders. This will provide even better insight into consumer preferences for checking out and enhance the general shoppers' experience.

Diversify your inventory: Diversify your inventory so that each warehouse has a stock of the most ordered products. This will reduce shipment time and increase customer satisfaction, especially in the area that has been bearing the brunt of shipments across the country.

Fulfillment Process Improvement: Smooth fulfillment operation by optimizing the packaging and shipment workflow, automating what is possible, and improving the warehouse layout to ensure easy picking of fast-moving products.

Advanced Data Visualization Tools: Use advanced data visualization tools like Tableau to gain deep insight into operational trends and customer behaviour. Management can make more enlightened, factual decisions based on interactive dashboards that showcase long-term growth and profitability.

General Recommendations

Database Enhancements

The database ensures effective, secure, centralized management of crucial business information, which is helpful in this analysis. However, ACME Company should gather and store customer data generated through interactions. This will drive decision-making based on facts, create insights, and help in predictive market development analysis.

The database should store customer demographics. Age, gender, location, and interests are all critical consumer demographics that should be stored in the database for future analysis. By analyzing how such demographics influence sales patterns, targeted advertisements can be created, and products can be made to appeal to specific demands.

The database should have a field to track the payment method used to complete an order. Currently, payment methods are only associated with customers; each customer can have multiple payment methods. This makes it very difficult to get a clear picture of the trend of the payment methods.

Shipment delivery dates should be stored in the database to better understand delivery time trends. Delivery times and associated delivery costs are huge factors in customer satisfaction. By understanding shipping trends, conclusions can be drawn about the optimal positions of future warehouses to decrease shipping costs and times for as many customers as possible.

The database must capture the date stocks arrive at warehouses so that items not sold within an unreasonable period can be queried. This information would determine which products are slow-moving, allowing for better inventory management and promotional strategies.

Tracking the abandonment status of any cart is essential for identifying trends in customer shopping. With analytics indicating how customers do or may choose to leave merchandise within a cart, focused plans may be implemented to raise the conversion rate of visitors to customers.

Other

Data Visualization with Tableau: Tableau can be integrated with a database and provides powerful data visualization and business intelligence through interactive dashboards. It enables the presentation of data trends, comparisons, and insights in an easily understandable format.

Other Tools Besides Excel, ACME Company has further opportunities for data capture and analysis outside of SQL and Excel, such as software such as Tableau. Additionally, stock management software like Cin7 will help streamline inventory management. Options like Cin7 allow centralized inventory management, real-time stock viewing and tracking across multiple warehouses, and consolidating and automating orders to improve shipping workflows.

Analysis: Customers by Region

Overview of Approach and Assumptions

The number of distinct customers per region was compared to total sales within each region to analyze customer trends by region. Additionally, historical data for each province was analyzed to predict values for 2023 and 2024. SQL was used to query and import data from the database into Excel. Sales data were extracted from historical order data, with each order assumed to represent a single sale. An exponential smoothing model was applied to the 2020 to 2022 sales data to forecast sales for 2023 and 2024. The exponential smoothing method was chosen due to its sensitivity to recent trends and its ability to adjust to

rapid changes in the data. Sales data from 2019 were excluded from the forecast, as they represented a period of dramatic sales growth and were assumed to be anomalous. The predictive results of the forecast sales assume consistent customer demand trends.

Analysis, Predicted Sales for 2023 and 2024 for Each Province

Table 1. Distinct customers, total sales from 2019 to 2022, and average sales per customer by province. Manitoba has the highest average sales per customer, while British Columbia has the lowest.

Province	# Distinct Customers	Total Sales (2019-2022)	Average Sales per Customer
AB	16	131	8.19
BC	5	28	5.60
MB	10	93	9.30
NB	6	48	8.00
NF	10	80	8.00
NS	13	116	8.92
ON	5	38	7.60
PE	12	83	6.92
QC	11	64	5.82
SK	12	95	7.92

Table 2. Number of annual sales and forecasted yearly sales for 2023 and 2024 by province.

	# of Sales					
Province	2019	2020	2021	2022	2023 (Predicted)	2024 (Predicted)
AB	4	40	52	35	36	35
BC	0	10	11	7	6	5
MB	7	17	30	39	51	62
NB	6	20	10	12	6	2
NF	6	21	28	25	28	31
NS	3	34	40	39	42	45
ON	2	13	12	11	10	9
PE	5	23	35	20	22	22
QC	1	18	19	26	29	33
SK	3	34	27	31	28	26

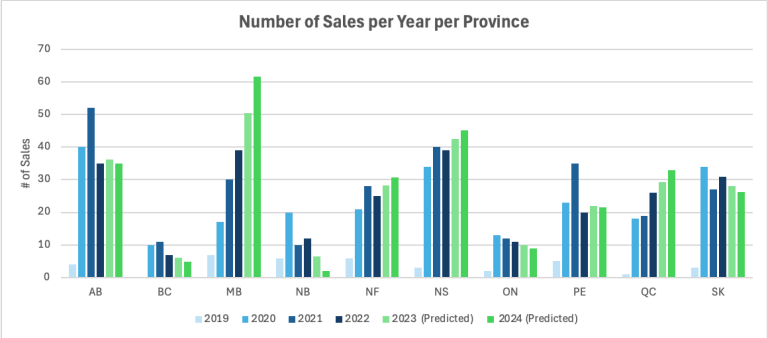

Figure 1. Annual sales and predicted annual sales by province.

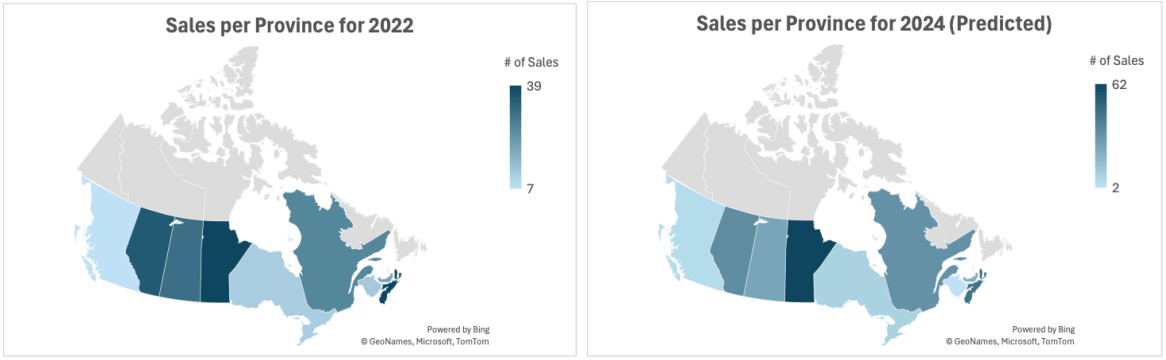

Figure 2. Geographic representation of sales patterns: 2022 actual sales data plotted by province (left) and 2024 predicted sales values by province (right).

Summary and Recommendations

Manitoba, Newfoundland, Nova Scotia, and Quebec are projected to experience sales growth in 2023 and 2024. Conversely, Alberta, British Columbia, New Brunswick, Ontario, Prince Edward Island, and Saskatchewan are expected to see stagnating or declining sales.

To address these trends:

1. **Increase customer retention:** Focus on converting repeat customers in provinces with low average sales per customer, such as British Columbia and Quebec (*Table 1*).
2. **Expand customer base:** Implement strategies to attract new customers in stagnating or declining sales regions (*Table 2*, *Figure 1*).
3. **Strengthen infrastructure:** Enhance infrastructure and customer support in regions with increasing sales to sustain growth and customer satisfaction (*Table 2*, *Figure 1*).

Analysis: Best and Worst Product

Overview of Approach and Assumptions

To determine the best and worst products, products were ranked by their total revenue. SQL was used to query and import data from the database into Excel. Revenue data were derived from order data, where total revenue for each item was calculated as the sum of the quantity ordered multiplied by the price across all orders. Order cost was assumed to be an appropriate measure of revenue. Note that product prices varied across orders. Annual sales data were extracted from historical order data, with the quantity of products in each order assumed to represent the quantity sold. An exponential smoothing model was applied to sales data from 2019 to 2022 to forecast sales for 2023 and 2024. This method was selected for its sensitivity to recent trends and ability to quickly adapt to changes in the data. Predicted sales assume product demand trends stay consistent.

Predicted Sales for 2023 and 2024: Top 5 and Bottom 5 Products

Table 3. Total revenue and sales from 2019 to 2022 of top 5 products by revenue.

Product ID	productName	Total Sales	Total Revenue
81	Product Name	240	$32,684.89
70	Heavy Duty Plastic Knife	236	$29,536.23
72	Ergonomic Iron Lamp	238	$25,879.65
160	Practical Cotton Wallet	241	$25,731.17
150	Incredible Wool Plate	221	$23,343.69

Table 4. Total revenue and sales from 2019 to 2022 of bottom five products by revenue.

Product ID	productName	Total Sales	Total Revenue
174	Sleek Bronze Keyboard	39	$2,404.30
48	Lightweight Aluminum Gloves	76	$3,502.07
162	Enormous Wool Wallet	70	$4,156.69
61	Synergistic Iron Car	58	$4,290.21
40	Fantastic Silk Knife	73	$4,515.65

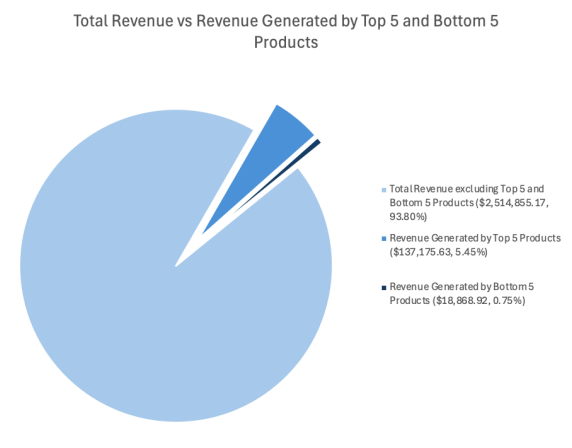

Figure 3. Comparison of total revenue with revenue from the top five and bottom five products, including associated amounts and percentages of total revenue.

Table 5. Number of annual sales and predicted annual sales by product for the top 5 products.

		# of Sales					
Product Id	Product Name	2019	2020	2021	2022	2023 (Predicted)	2024 (Predicted)
81	Aerodynamic Copper Bag	27	9	74	95	118	141
70	Heavy Duty Plastic Knife	48	42	92	22	30	25
72	Ergonomic Iron Lamp	0	49	68	70	98	120
160	Practical Cotton Wallet	19	102	15	50	50	58
150	Incredible Wool Plate	10	19	41	86	106	132

Table 6. Number of annual sales and predicted annual sales by product for the bottom five products.

		# of Sales					
Product Id	Product Name	2019	2020	2021	2022	2023 (Predicted)	2024 (Predicted)
174	Sleek Bronze Keyboard	0	0	16	23	31	39
48	Lightweight Aluminum Gloves	0	32	34	0	8	7
162	Enormous Wool Wallet	7	8	36	16	26	31
61	Synergistic Iron Car	0	20	0	10	11	13
40	Fantastic Silk Knife	4	2	34	20	34	41

Figure 4. Annual and annual predicted sales for the top (left) and bottom (right) five products.

Summary and Recommendations

The top five products (Aerodynamic Copper Bag, Heavy Duty Plastic Knife, Ergonomic Iron Lamp, Practical Cotton Wallet, and Incredible Wool Plate) account for 5.45% of total revenue (Figure 3). The bottom five products (Sleek Bronze Keyboard, Lightweight Aluminum Gloves, Enormous Wool Wallet, Synergistic Iron Car, and Fantastic Silk Knife) contribute only 0.75% of total revenue. In terms of annual and projected annual sales, the top 5 products significantly outperform the bottom 5 (Figure 4). Among the top 5, the Aerodynamic Copper Bag, Ergonomic Iron Lamp, and Incredible Wool Plate are expected to experience substantial sales growth. In contrast, the Heavy Duty Plastic Knife and Practical Cotton Wallet are projected to see only slight increases or remain stagnant.

To address these trends:

1. **Focus on the top 5 products:** Prioritize marketing efforts and optimize inventory for the top 5 products, especially those projected to increase sales in 2023 and 2024.
2. **Reevaluate the bottom five products:** Review marketing, pricing strategies, product quality, and customer satisfaction of the bottom five products. Consider adjustments or phasing out underperforming products.

Analysis: Payment Methods

Overview of Approach and Assumptions

SQL was used to query and import data from the database into Excel. Payment methods are associated with a customer, who can have multiple payment types. However, the database does not track the payment method used for an order. As a result, for the sake of simplicity of analysis, it was assumed that any order that could have used multiple payment methods should count both. Therefore, though not ideal, the analysis reflects the *maximum possible* number of orders each payment method is associated with, not the exact transaction frequency. Payment methods that expired before an order was placed were discounted. 2024 predicted values were derived from a linear forecast fit to historical 2020-2022 data. Data from 2019 were omitted as they are assumed to represent an abnormal period of dramatic growth across all payment methods. The predicted values for 2024 assume that current trends in payment method usage will continue, with no significant changes in the public perception or availability of these payment methods.

Visualization of Payment Methods Used in 2022

Table 7. Maximum possible orders associated with each payment method and their percentage of maximum total orders.

Payment Method	# of Orders	% of Total Orders
VISA	331	46.75%
MC	175	24.72%
ApplePay	72	10.17%
AMEX	70	9.89%
PayPal	60	8.47%

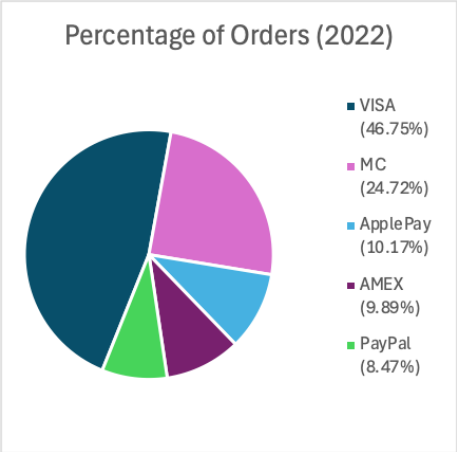

Figure 5. Payment methods as a percentage of the maximum possible orders associated with all payment methods.

Visualization and Prediction of Payment Methods for 2024

Table 8. Maximum possible orders per payment method by year and predicted maximum orders for each payment method in 2024.

	# of Orders				
Payment Method	2019	2020	2021	2022	2024 (Predicted)
AMEX	6	69	74	70	73
ApplePay	7	58	65	72	86
MC	30	192	180	175	157
PayPal	3	56	76	60	70
VISA	46	326	356	331	345

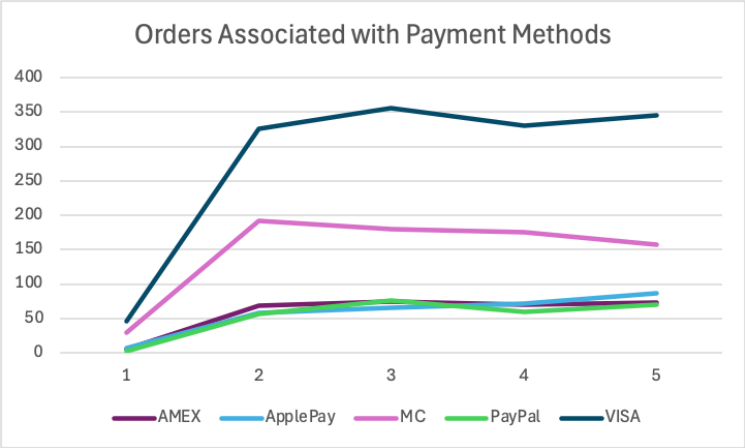

Figure 6. Maximum possible orders by payment method for each year, with year 1 representing 2019, year 2 representing 2020, year 3 representing 2021, year 4 representing 2022, and year 5 representing the predicted values for 2024.

Analysis: Inventory Management

Overview of Approach and Assumptions

To assess inventory management, warehouses were analyzed by units stored and stored revenue. Further, to evaluate storage efficiency, warehouse stock for the top and bottom five products was compared to units sold. SQL was used to query and import data from the database into Excel. Units stored at each warehouse were calculated from product inventory quantities, where each unit represents a single product of various types. Stored revenue was computed as the sum of the quantity multiplied by the price for all products in a warehouse, representing the total potential revenue if all items were sold at their listed price. Units sold were derived from historical order data (2019–2022) as the total quantity of each product across all orders. It was assumed inventory quantity values were accurate and up-to-date.

Analysis and Visualizations

Table 9. Total units stored and stored revenue per warehouse.

Warehouse ID	Location	Total Units Stored	Stored Revenue
1	Kelowna	85570	$21,059,976.20
2	Winnipeg	78065	$17,353,783.98
3	Toronto	75847	$20,019,354.70

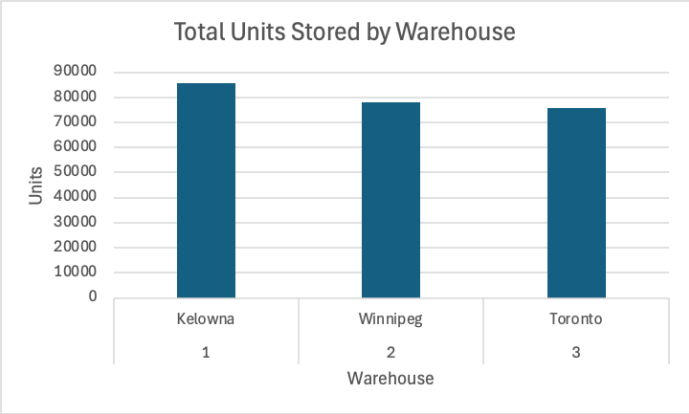

Figure 7. Total units of product stored by warehouse.

Table 10. Total units sold from 2019 to 2022 compared to units stored at each warehouse for the top 5 best-selling products by units sold.

			Units in Storage		
Product ID	Product Name	Units Sold	Warehouse 1	Warehouse 2	Warehouse 3
160	Practical Cotton Wallet	241	775	172	98
81	Aerodynamic Copper Bag	240	379	0	420
165	Mediocre Aluminum Plate	239	681	423	653
72	Ergonomic Iron Lamp	238	785	0	119
70	Heavy Duty Plastic Knife	236	992	555	481

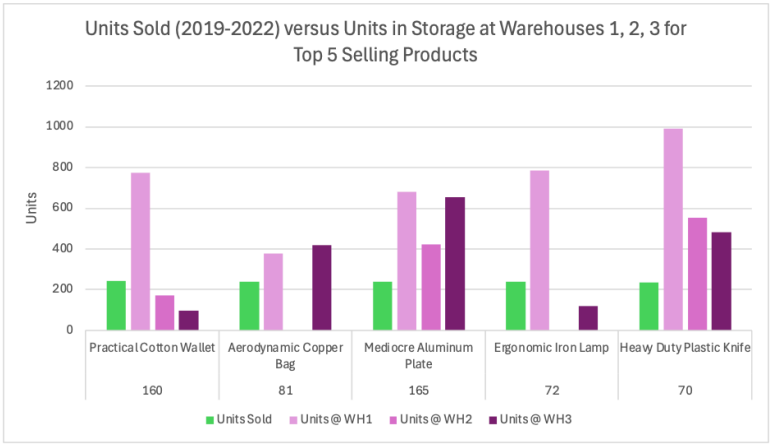

Figure 8. Units of products sold from 2019 to 2022 compared to units stored at each warehouse (WH) for the top 5 best-selling products by units sold.

Table 11. Total units sold from 2019 to 2022 compared to units stored at each warehouse for the top 5 worst-selling products by units sold.

			Units in Storage		
Product ID	Product Name	Units Sold	Warehouse 1	Warehouse 2	Warehouse 3
174	Sleek Bronze Keyboard	39	7	515	0
171	Mediocre Rubber Bench	48	0	0	574
197	Fantastic Wooden Chair	53	438	285	914
61	Synergistic Iron Car	58	0	424	821
13	Incredible Leather Shoes	58	596	524	403

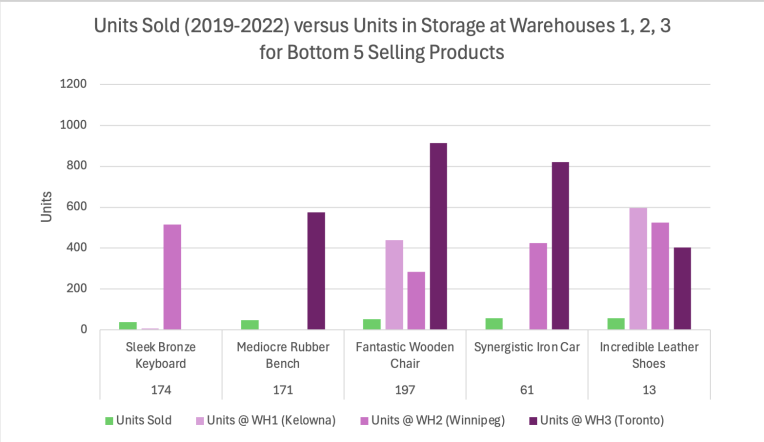

Figure 9. Total units sold from 2019 to 2022 compared to units stored at each warehouse for the top 5 worst-selling products by units sold.

Summary and Recommendations

The three warehouses (Kelowna, Winnipeg, and Toronto) were found to have comparable values for units stored and stored revenue, with Kelowna leading in both categories (*Table 9, Figure 7*). This insight aligns with Kelowna's being the only warehouse located on the West Coast, which means it should be better stocked to fulfill greater demand. On average, the Toronto warehouse stored more valuable products, resulting in lower total units but higher stored revenue than the Winnipeg warehouse *(Table 9*).

The top-selling products by units sold were Practical Cotton Wallet, Aerodynamic Wooden Bag, Mediocre Aluminum Plate, Ergonomic Iron Lamp, and Heavy Duty Plastic Knife (*Table 10*). Stock for these products varied across the three warehouses but was generally sufficient to meet demand. Conversely, the lowest-selling products were Sleek Bronze Keyboard, Mediocre Rubber Bench, Fantastic Wooden Chair, Synergistic Iron Car, and Incredible Leather Shoes (*Table 11*). Stock for these low-demand items varied but was generally abundant relative to their sales (*Figure 9*).

To address these trends:

1. **Diversify storage:** Stock should be distributed to ensure shipment availability from each warehouse to reduce transit times from warehouses to customers. Distribution is critical in cases where all stock is concentrated in the Kelowna warehouse or limited to the Toronto and Winnipeg warehouses, as cross-country transit times are longer and more expensive.
2. **Optimize inventory for low-demand stock:** The amount of storage invested in low-demand items is high, especially for products like Fantastic Wooden Hair and Incredible Leather Shoes. Consideration should be given to reducing stock levels and increasing demand for low-demand stock.

Analysis: Product Ratings and Sales

Overview of Approach and Assumptions

Statistics were calculated to determine the correlation between product ratings and sales. Data were extracted from the database using SQL and input into Excel. The average review rating for a product was defined as the sum of all individual review ratings divided by the number of reviews. Only products with reviews were included in the analysis. Sales data were extracted from historical (2019-2022) order data, where the quantity sold was used to measure sales. This analysis assumes that sales volume is the primary indicator of sales, omitting other factors such as revenue, pricing variations, or discounts.

Analysis and Visualizations

Table 12. The top five products as ranked by average review score, and their total sales and the number of reviews considered in the average.

Product ID	Product Name	Average Review	Total Sales	# of Reviews
46	Mediocre Plastic Table	5.00	118	4
112	Awesome Rubber Computer	5.00	163	1
67	Enormous Wooden Clock	5.00	132	3
87	Fantastic Marble Computer	5.00	124	1
153	Incredible Cotton Pants	5.00	151	2

Table 13. The bottom five products as ranked by average review score, and their associated total sales and the number of reviews considered in the average.

Product ID	Product Name	Average Review	Total Sales	# of Reviews
132	Lightweight Rubber Shirt	1.00	91	1
89	Small Bronze Watch	1.00	130	1
29	Heavy Duty Rubber Bottle	1.00	306	1
115	Heavy Duty Copper Computer	1.00	129	2
95	Incredible Paper Coat	1.00	100	1

Table 14. Output from linear regression on average review and total sales. The multiple R value (0.006) is close to zero, suggesting a very weak linear relationship between the variables. The very low R square value (3.67223E-05) indicates that the average review value explains little variation in total sales.

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.006022646
R Square	3.62723E-05
Adjusted R Square	-0.005226695
Standard Error	1.040146552
Observations	192

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	0.007456466	0.007456466	0.00689198	0.933924666
Residual	190	205.5619214	1.08190485		
Total	191	205.5693779			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	2.540523159	0.142616268	17.81369817	2.19636E-42	2.25920855	2.821837768	2.25920855	2.821837768
X Variable 1	-2.43251E-05	0.00029301	-0.083017947	0.933924666	-0.000602296	0.000553646	-0.000602296	0.000553646

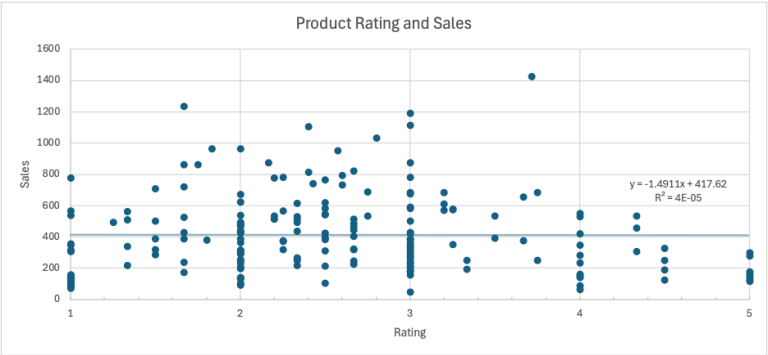

Figure 10. Product average rating plotted against total sales. Note the trend line with a very low R squared value, indicating the absence of a linear trend between rating and sales.

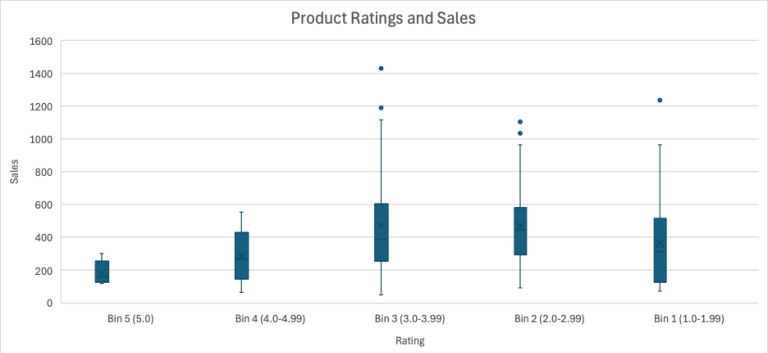

Figure 11. Products binned by review value and the corresponding variance in sales data. Note the high degree of variance in sales independent of rating.

Summary and Recommendations

Based on analysis, there is no significant linear relationship between product ratings and total sales. This insight suggests that other factors impact sales more than product ratings (*Table 14*, *Figure 10*, *Figure 11*). It is found that most products have very few reviews, and five-star products are generally rated based on a single review (*Table 12*). Five-star products do not sell better than low-rated products, with low-rated products often selling significantly more units than higher-rated ones (*Figure 11*).

To address these trends:

1. **Increase customer satisfaction surveying:** Listening to customer feedback is crucial for making informed improvements to products and services. To enhance customer satisfaction, efforts should be focused on understanding customer impressions of the product. Few customers leave reviews, so initiatives should be implemented to encourage more customer feedback.
2. **Increase Advertising Initiatives for Top-Rated Products:** Positive reviews and customer praise play a crucial role in building trust in a brand and its products. Currently, more top-rated products are not being sold than lower-rated ones. To address this, initiatives should be implemented to raise customer awareness of these high-quality products and promote them more effectively.

Analysis: Fulfillment Time

Overview of Approach and Assumptions

Order fulfillment times were analyzed to measure the duration between order placement and shipment. Fulfillment time is defined as the difference in days between the order date and the shipment date, representing the time it took for the warehouse to process and ship the order. Data was queried from the database with SQL and input to Excel. Order date data was extracted from historical order data, and shipment date data was extracted from historical shipment data. This analysis assumes that accurate order and shipment dates are recorded and that order placement is immediately recorded in the system.

Analysis and Visualizations

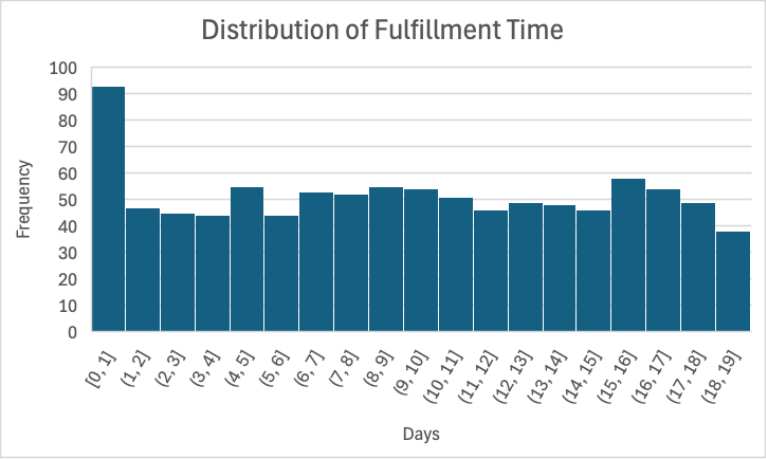

Figure 12. Frequency of fulfillment times in days.

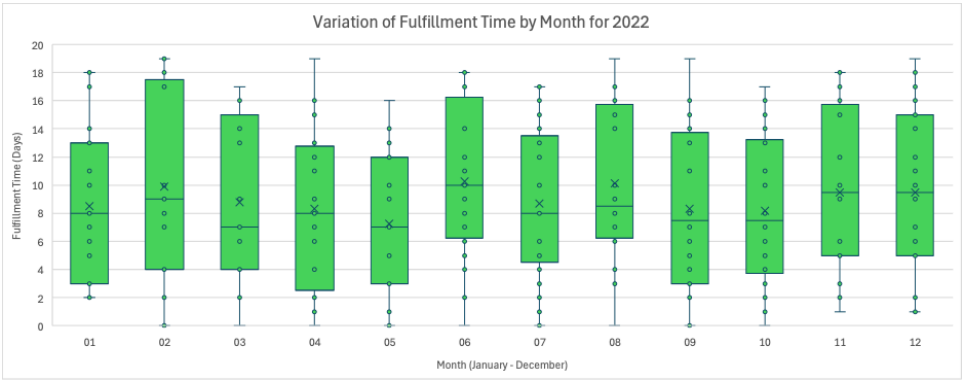

Figure 13. Variation of fulfillment time in days by month for 2022.

Summary and Recommendations

Fulfillment times for orders vary from zero to nineteen days (*Figure 12*). Though most orders are shipped within one week of placement, a substantial number are only shipped a week to more than two weeks after placement. Fulfillment times vary by month, though they remain relatively consistent, with no months showing abnormally high or low fulfillment times (*Figure 13*).

To address these trends:

1. **Improve operation efficiency:** Shipment efficiency plays a crucial role in customer satisfaction. To increase customer satisfaction and stimulate growth, effort should be made to decrease maximum fulfilment times. Packing and shipping processes should be streamlined wherever possible.
2. **Optimize inventory management:** Inventory management should be improved so products are readily available for shipment. Attention should be paid to enhancing warehouse layouts and stock access.

General Recommendations

Database Improvements

The database ensures efficient, secure, and centralized management of vital business information, which proves invaluable in this analysis. However, ACME Company should collect and store customer data generated through interactions. Doing so enables data-driven decision-making, generates insights, and supports predictive analysis, promoting market growth.

Some specific suggestions:

1. **Store consumer demographics:** To better understand sales trends, demographics such as age, gender, location, and interests should be stored in the database for future analysis. Targeted advertisements can be created by analyzing how these demographics influence sales patterns, and products can be made to meet specific demands.
2. **Store payment method information:** To better understand payment method trends, the database should implement a field to track the payment method utilized to complete an order. Currently, payment methods are only linked to customers, who can have multiple payment methods, making trend analysis cumbersome.
3. **Store shipping dates:** Shipment delivery dates should be stored in the database to better understand delivery time trends. Delivery times and associated delivery costs are a significant factor in customer satisfaction. By understanding shipping trends, conclusions can be drawn about the optimal positions of future warehouses to decrease shipping costs and times for as many customers as possible.
4. **Store more in-cart information**: Tracking in-cart details, such as the abandonment status, is essential to understanding customer shopping trends. By analyzing whether or not customers leave products in the cart and why they might decide to, targeted strategies can be employed to increase the conversion rate.

Other

ACME Company has further opportunities for data capture and analysis through tools other than SQL and Excel, such as software such as Tableau. Tableau allows integration with a database and provides powerful data visualization and business intelligence through interactive dashboards, allowing the presentation of data trends, comparisons, and insights in an easily understandable format.

ACME Company should consider stock management software like Cin7 to streamline its inventory management. Cin7 is a cloud-based software that allows centralized inventory management, real-time stock viewing, and tracking across multiple warehouses. It also consolidates, tracks, and automates orders, streamlining shipping workflows.

References

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