Team B-4
Instructor Name: Micheal Guggemos
Class Section: 11:15 AM

Name	Slack Handle	ASU Email
Nate Huffman	nmhuffma	nmhuffma@asu.edu
Maanas Lalwani	mlalwan1	mlalwan1@asu.edu
Dayton McCann	djmccann	djmccann@asu.edu
Ramiro Morales	rmoral44	rmoral44@asu.edu
Samrat Serrikaliyev	sserikka	sserikka@asu.edu
Andrew Vinci	acvinci	acvinci@asu.edu

Data Subset 1: Data by Customer Country

Order Price Total by Customer Country
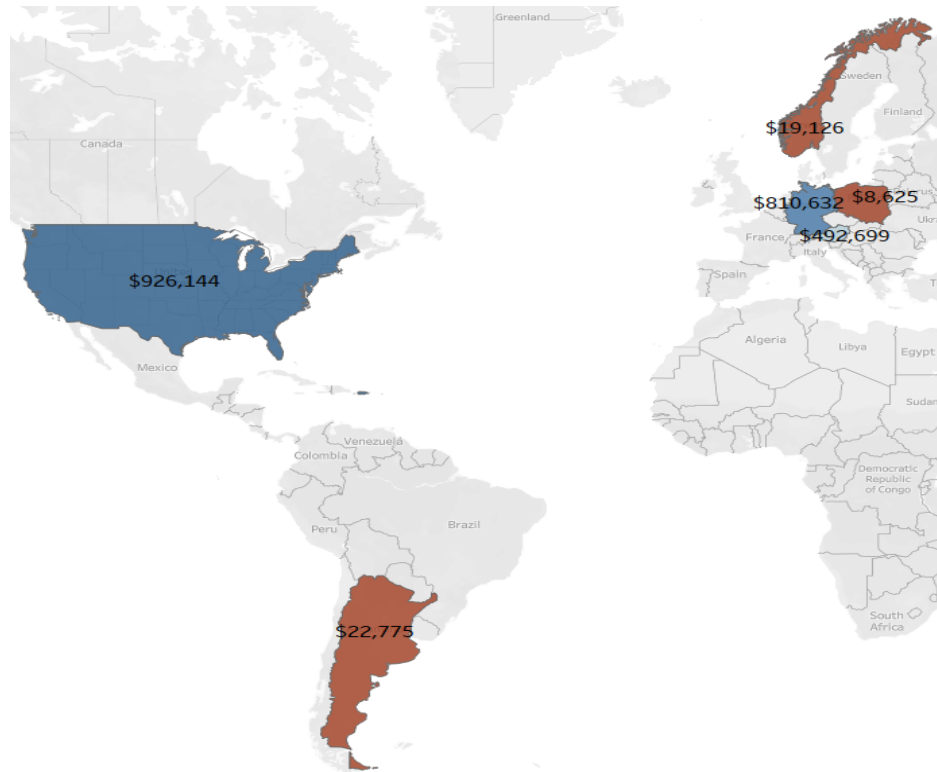
Why Customer Country?

- Understanding the price, quantity, and frequency of orders made by each country is essential to increasing sales and decreasing costs

What's the story?

- Graph displays countries with three highest and lowest order price totals between November 2020 and September 2022
- Customer country shows profitability of each country

What subsets can we link to this?

- Linking customer's country to product type shows where certain products are most popular
- Linking country to product name shows which brand names to prioritize in certain locations
- Linking country to product unit price shows the average price that different countries will pay per product
- Linking country to product order quantity shows which countries purchase the greatest amount of products

What don't we know that we should know?

- Shipping expenses and fees required to export products to each country

Data Subset 2: Data by Month

	January	February	March	April	May	June	July	August	September	October	November	December
■ Total	278575.14	362841	306424.6	340448.06	562478.91	424529.08	444658.39	616242.44	330486.97	145308.95	206547.64	261398.27

Why Month?
- It is the best period of time to choose from to give us a good idea of what to expect for future year patterns.
- Choosing data by days would show too much information to determine a proper pattern.
- Choosing data by year would not give us enough information.

What's the story?
- Time of year most and least spending occurs across all customers.
- May - August has the highest order price totals.
- October - January has the least amount of order price totals.

What subsets can we link to this?
- Data by year, that way we could have each month's order price totals for the years counted in this data set to give an even more descriptive analysis.
- Provides a further in depth look on how the order price totals change as the years progress.

What don't we know that we should know?
- November and December are the only months that include order price totals from the year 2020.
- October only presents order price totals from 2021.
- January - September include order price totals only from 2021 and 2022.

Data Subset 3: Data by Price
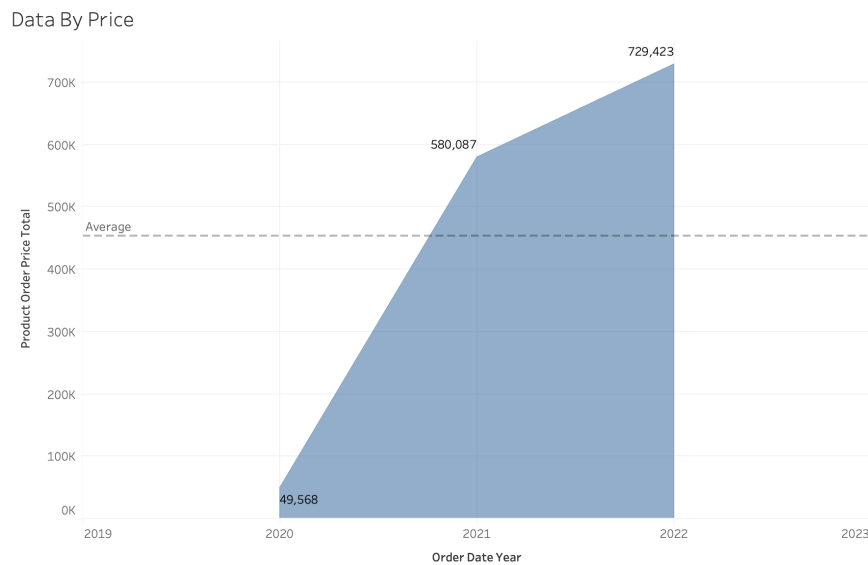
Data By Price

Why Price?
- Analyzing the data by price enables us to understand market trends and demand patterns across given price ranges
- The pricing chart helps to compare to its rivals or industry standards for the same time range. This comparison offers insight into market positioning and relative performance, and competitiveness in terms of pricing strategies

What's the story?
- In 2022, customers spent the most money ($729,423)
- In 2020, customers spent the least money ($49,568)

What subsets can we link to this?
- In addition to the subgroups shown on the chart, we can use customer country as a filter to determine pricing ranges in various countries
- Price fluctuations relate to financial performance through linked order quantity and product categories in the company's accounts

What don't we know that we should know?
- Hidden data like maximum, minimum, range and median aren't given in this data
- The 2020 price range totals are lower due to inclusion limited to November and December, accounting for the reduced overall price

Data Subset 4: Data by Product Category
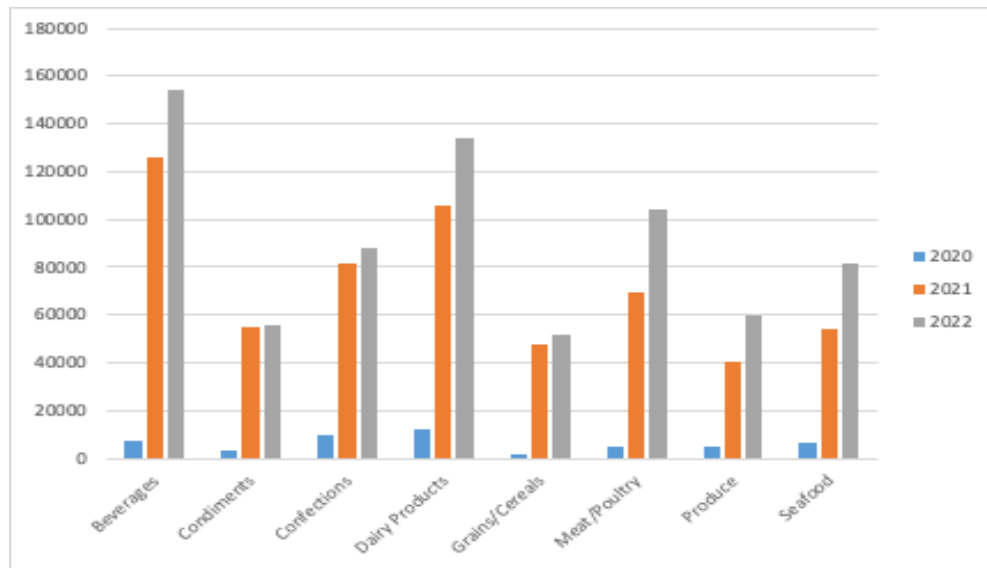
Why Product Category?
- Analyzing Product Category by year will help our business understand what product categories have made the most sales and the least sales
- It will also help us understand which year had the most sales and which year had the least sales

What's the story?
- The top selling category was beverages with over $250,000 revenue generated in three years.
- The least selling categories were Grains/Cereals and Produce with over $100,000 revenue generated each in three years
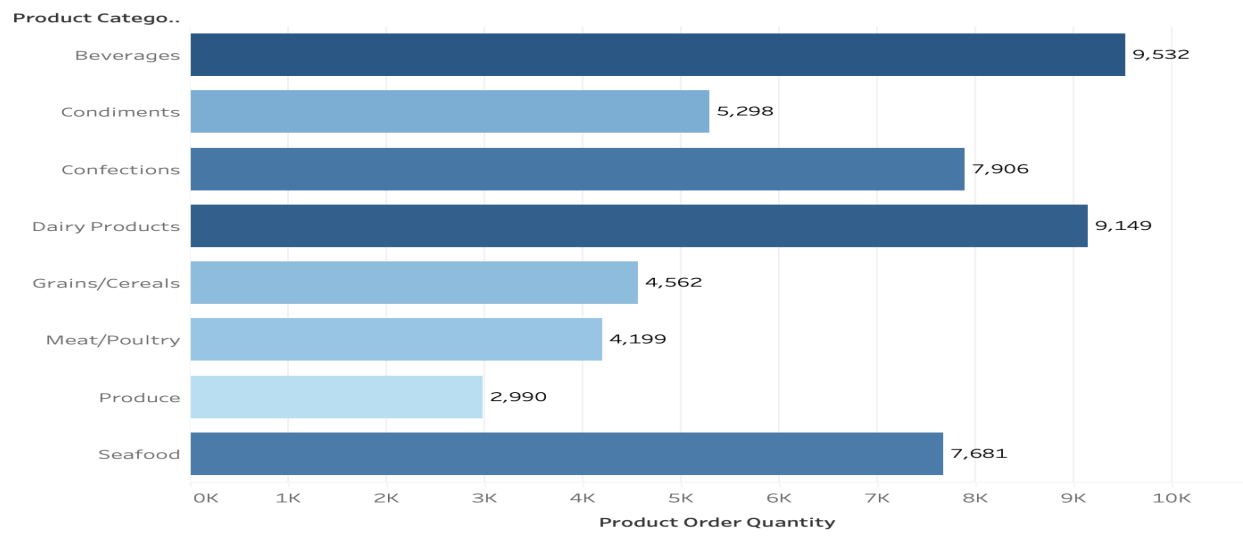- 2022 was more profitable as compared to 2021

What subsets can we link to this?
- We can include country as a filter to see what product categories are popular in each country
- Analyzing by month can help us understand what month of year had most sales and what month had least sales
- Using the above information, we can offer discounts and offers on specific product categories to increase profit

What don't we know that we should know?
- Data for only November and December are included in 2020, that's why visualization shows 2020 has least amount of sales
- Hidden costs such as shipping costs aren't given in the data set

Data Subset 5: Product Order Quantity by Product Category

Product Catego..

Category	Product Order Quantity
Beverages	9,532
Condiments	5,298
Confections	7,906
Dairy Products	9,149
Grains/Cereals	4,562
Meat/Poultry	4,199
Produce	2,990
Seafood	7,681

Product Order Quantity

Why Product Order Quantity?

● It directly impacts inventory management, revenue, and customer satisfaction
● Identifies categories with consistently high or low order quantities, aiding in strategic inventory planning.

What's the story?

● The graph shows the distribution of order quantities across different product categories, highlighting top-performing categories and potential areas for growth or optimization.
● Guides decision-making by focusing on categories contributing significantly to revenue and those requiring optimization.

What subsets can we link to this?

● Linking product quantity to product name would help give a deeper insight into which products in each category are failing or succeeding and how they can be optimized
● Linking product quantity to country would help target specific countries where the most quantity is being bought and what countries they need to focus on improving their marketing with

What don't we know that we should know?

● Customer satisfaction considering the quantity bought by each customer
● Seasonal trends for the quantity bought and how that influences the amount for each category

Executive Summary
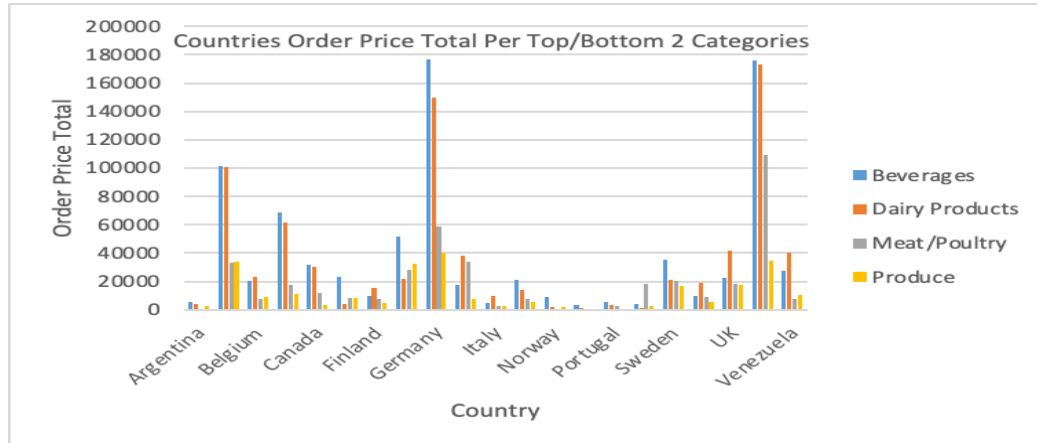
Data subset 1: Data by Customer Country shows the three highest order price totals which are the United States, Germany, and Austria; and the lowest three which are Argentina, Norway, and Poland. We need information on shipping expenses and country-specific export fees to gain broader insight into net profitability per country.

Data subset 2: Data by Month shows May - August produces the highest order price totals, with the least being October - January. Our data set only includes only months November and December for 2020, and October is only represented in 2021. This limitation will cause skewed insights, and the inability to accurately represent months' analytics for 2020 - 2022.

Data Subset 3: Data by Price shows customers spent the most money in 2022 ($729,423) with the least spent in 2020 ($49,568). Hidden data like maximum, minimum, range, and median would expand insight on data, allowing for metrics to further decipher each year's performance. 2020 and 2022 do not include all months of the year which skews data insight and would provide further analytics to distinguish the profitability of each year.

Data subset 4: Data by Product Category shows Beverages as the top-selling category with over $250,000 of revenue generated; and Grains/Cereals and Produce as the bottom-selling category with nearly $100,000 of revenue generated each in 2020 - 2022. We also see that 2022 is the most profitable of the three years. 2020 only includes November and December, which gives an inaccurate representation of the comparison of each year. Shipping costs would reload the profitability of each category with the possibility of new top and bottom sellers.

Data Subset 5: Data by Product Order Quantity by Product Category shows the 3 top-performing categories are Beverages, Dairy Products, and Seafood; and the 3 bottom-performing categories are. By continuing top-performing categories and improving bottom categories we can boost profitability. Customer satisfaction and seasonal trends would give insight into different influences on how each product is viewed by consumers which could influence marketing decisions.

Conclusion

Each data subset highlights the strengths and weaknesses of that specific subject and helps visualize room for improvement. We can make data-driven decisions that will produce boosted sales and areas for improvement to cut expenses. Nevertheless, we must focus on improving bottom-selling categories such as Produce, Meat/Poultry, and Grains/Cereals with bulk discounts and improving product quality; and continue excelling with top-selling categories such as Beverages, Dairy Products, and Seafood by encouraging discounts and sales. More information such as shipping costs, customer satisfaction, and an expanded data range for the years 2020 and 2022 are required to fully grasp the correct course of action. To obtain this information, surveys and more detailed order tracking is required.

Working Data Set: Northwind Trader Global Sales Data 20.21.23.xlsx

Company References

1. **PwC (PricewaterhouseCoopers)**
   a. Internal Contact: Audit
   b. External Contact: Phoenix, AZ
      I. Website: https://www.pwc.com/us/en.html
      II. Contact Info: (602) 364-8000
2. **McKinsey & Company**
   a. Internal Contact: Business Consulting
   b. External Contact: Tempe, AZ
      I. Website: https://www.mckinsey.com/
3. **Deloitte**
   a. Internal Contact: Audit
   b. External Contact: Tempe, AZ
      I. Website: https://www2.deloitte.com/us/en.html
      II. Contact Info: (602) 234-5100

Name: Northwind Trader	Proposal Due Date: 11/19/23

Project Overview:
Northwind Trader, an international reseller and distributor is looking to increase sales while decreasing costs and provide valuable insights using their sales data. Northwind Trader is looking to analyze information to locate any significant trends or changes to create cost-efficient and profitable operations that will increase sales and decrease costs. Bidding occurs between PwC, McKinsey & Company, and Deloitte.

Project Goals:
- Increase sales of products and decrease costs of producing them
- Analyze total product price and average produce price by country
- Evaluate yearly sales of each product category
- Compare the top-selling countries to the low-selling countries
- Adjust amount of products manufactured based on country
- Locate the most profitable months of selling a product
- Understand the quantity sold for each product category

Scope of Work:
- Must submit the RFP to the contact listed on page 1 to begin the project within 3 business days after acceptance (Phase 0).
- Acquire sales data for overall performance and trends into Excel workbooks within 10 days of project acceptance (Phase 1).
- Must look over and normalize the data within the 10 days of Phase 1 before entering Phase 2.
- Analyze and assemble data on Northwind Trader's sales by interpreting product order price total, sales by category, order price total by country, product order quantity by country, and order price total by month over an approximately 2-year period–11/9/2020 to 9/10/2022–utilizing Tableau. This is Phase 2 which is due 15 days after Phase 1 completion of data collection.
- Identify trends, patterns, or shifts in purchasing behavior during the time period. This is also part of Phase 2 but it is due 30 days after collecting the data.

- Determine opportunities for refinement for profitability and overall performance within 10 days of Phase 2 completion as a part of Phase 3.
- Provide a PDF report and a presentation that includes a valuable recommendation for Northwind Trader to optimize its operations, increase sales, and decrease costs in the most efficient way possible. This is Phase 4 which is due 10 days after the completion of Phase 3.

Current Roadblocks and Barrier to Success:
- Audit and research costs at or below budget stated
- Skewed or absent data points
- Large amounts of data collected between approximately 2 years may cause consistency and reliability issues
- Project to be completed within 67 days of acceptance with grace period

Evaluation Metrics and Criteria:
- Project must begin December 3, 2023
- Project team will have access to all of Northwind Trader's sales data from November 9, 2020 to September 10, 2022
- Team must be made up of data analysis specialists that each have a minimum of 3 years of industry experience, and have a project based data analytics background.
- Accredited auditor with at least 3 successful government audits completed.
- Must use Business Intelligence(BI) softwares to collect and analyze data
- Data attributes to be included in data collection for each order:
  - Order ID number
  - Order Year, Month, and Day
  - Name of Customer
  - Country Customer is from
  - Name of Product ordered
  - Product Category
  - Product Unit Price
  - Quantity of Product ordered
  - Total Price for Product ordered
  - Total Price of entire order
- Must include 6 charts visualizing data analysis

Desired Services:
- ABC - Activity Based Costing:
  - Demonstrated ability to implement Activity Based Costing methodologies.
  - Capability to evaluate the time and financial resources allocated to specific products and assess the return on investment.
- Market Research and Analysis:
  - Comprehensive understanding of market trends, competitor landscapes, and emerging opportunities.
  - Ability to analyze and provide insights into our competitors' strategies, specifically in terms of cost structures and market penetration.
- Technology and Systems Capacity:
  - Proficiency in technology related to our business processes
  - Expertise in ensuring systems capacity aligns with seasonality spikes by region and supports overall process efficiency.

○ Understanding of order placement methods (fax, email, mobile device, desktop, auto-fulfillment) and the impact on operational efficiency.	

Submission Requirements:
- One zipped file with all Excel workbooks
- PDF formatted report summarizing all findings.
- The submission deadline is 60 days from the project's acceptance date, which includes a 7-day grace period that accounts for exceptional circumstances, such as data or file corruption and acts of nature.
- Ensure that all files are sent to each Team B-4 member based on their contact information listed on <u>Page 1</u> by the specified due date following project acceptance.
- The latest deadline based on the project start date is February 8, 2024.

Contact: Maanas Lalwani | mlalwan1@asu.edu	**Budget:** 950,000

Link to presentation: 📄 T5 Dataset Evaluation Final