John's Company Sales Analysis Associate Discussion

<u>Overview</u>

Business Data Analysis

Use John's company data to analyse sales and Human Resource data.

- Use Excel Data to analyse John's company.
- Prepare and setup data correctly for analysis.
- Use Excel Pivot Table.

Key Metrics

- **Comparison Analysis:** Which figures are higher & lower, and which figures are much bigger than one another.
- **Trend Analysis:** See how your data changes over time.
- **Contribution Analysis:** See how much percentage are of the whole for that one figure and be able to display that information.
- **Variance Analysis:** How much something varies from something else.
- **Frequency Analysis:** How often did different events occur with grouping of data.
- **Correlation Analysis:** How figures correlate between two different variables.
- **Pareto Analysis:** 80/20 Principle. Pareto principle states that for many outcomes, roughly 80% of consequences come from 20% of causes.

Rules for Preparing Your Data for Analysis

Data Structure:

- **Each column** represents a field of data.
- **Each row** represents a record of data.
- **Name the columns** in a meaningful way.
- **Do not include** totals or subtotals in the data.
- **Correct data type:** Text / Numeric / Data

Data Formatting:

- **Text fields** should be aligned to the left side of the cell.
- **Numeric fields** should be aligned to the right side of the cell.
- **Date fields** should be aligned to the right side of the cell.

Key Metrics Analysis

Key Metric Analysis:-

Important method to understand the overall health of the business.

Key Metric Analysis Questions:

- **John's Company**

  1) What is total profit?
  2) What are total sales?
  3) What is profit ratio?
  4) How many transactions were processed?
  5) What was the average sales value?
  6) What was the highest sales value?
  7) What was the lowest sales value?

Select: Country, Product Category, Year

Key Metrics:

- **Total Sales:** Sum of all sales in the 'Sales' column (Entire Rows).
- **Total Profit:** Sum of all profits in the 'Profit' column (Entire Rows).
- **Profit Ratio:** Total Profit / Total Sales.
- **How Many Transactions Were Processed?** Count the number of Order IDs.
- **Average Sales Value:** Total Sales / Number of Sales Transactions.
- **Highest Sales Value:** MAX(Sales Value).
- **Lowest Sales Value:** MIN(Sales Value).

Pivot Table Analysis: Field, Items, Calculated Set

CEO's Interest:-

- The CEO might be interested to know what he's got different ways of looking at the data.

Questions from Boss:-

- **What are my sales for a particular country?** As we got different brands, names, regions, and country, city, and channel.
- **What are my sales for a particular country per timeline from 2018 to 2021?** Sales at 2021, Sales at 2018, Sales at Specific Months, Sales at Specific Region.

Activity: John has asked you to do further key metric analysis using Employee Master file.

Questions from John

For Entire Datasets:

1. How many employees are in John's company?
2. What is the average age of the employees?
3. What is the highest age of the employees?
4. What is the lowest age of the employees?
5. What is the average length of service?
6. What is the longest length of service?

New Questions Raised from Boss John's Company and from Departmental Associates:

- **Employee Details:**

  1) Employee's details per gender and department.
  2) We do have a department or gender, or any other way of looking at it.
  3) We worked out for the company, but what if he wanted to know what is happening in a specific department or what is happening by a specific gender.
  4) Analyse the things differently

Comparison Analysis

Comparison Analysis:-

- Compare the value of one item against the other.
- Understand which value is highest, which value is lowest, and how much larger one value is than another.
- Visualize data makes it easy.

Questions from John's Company Associate:-

Analysis Requests:

1. **Compare Sales and Profit by Year:** Analyse sales and profit trends over time.
2. **Compare Sales by Manufacturer:** Identify top-performing manufacturers.
3. **Compare Profit by Product Category:** Determine the most profitable product categories.
4. **Compare Sales by Product Sub-Category and Channel:** Analyse sales performance at different levels.
5. **Compare Profit by Product Sub-Category - Review by Country:** Evaluate profitability by product sub-category across different regions.
6. **Compare Sales and Profit by Country - Review by Product Sub-Category:** Analyse sales and profit performance by country and product sub-category.

Starting Point:

- We will begin by analysing some of the questions that John's company's associates have posed.
- We will use a Pivot Table for this analysis.

Associate Discussion:-

John's Company's Request for Further Analysis:

1. **Total Order Quantity by Manufacturer:** Calculate the total quantity of orders for each manufacturer.
2. **Average Profit by Brand:** Determine the average profit generated by each brand.
3. **Create a Column Graph:**
   o Display Total Order Quantity by Brand.
   o Display Total Order Quantity by Category, reviewing by country.
4. **Create a Bar Graph:** Display Total Order Quantity by Product Category, reviewing by region.

Pivot Graph Setup:

- Create two pivot graphs as instructed below.
- Filter both graphs by Country and Year using a slicer.
- **Create a Column Graph:** Display Total Profit by Product Category.
- **Create a Bar Graph:** Display Total Profit by Manufacturer.

Trend Analysis

Trend Analysis

Understanding Data Changes Over Time:-

- Analyse if the data is moving up, down, stable, or volatile over years, months, days, quarters, and regions.
- Use line and area graphs.
- Different types of trendlines can be used.

Questions from John's Company Associate:-

Analysis Requests:

1. **Understand the Trend for Sales by Years and Months:** Analyse the sales trend over time.
2. **Understand the trend for Sales by Year and Month by Product Category:** Analyse sales trends for different product categories over time.
3. **Develop Seasonality Graph:** Create a graph to visualize seasonal sales patterns.

Associate Discussion:-

John's Company Associate Request for Further Analysis:-

1. **Create a Line Graph:** Display profit by year and quarter.
2. **Add a Polynomial Trend Line:** Include a trend line to visualize the profit trend.
3. **Add a Slicer for Product Category:** Enable filtering by product category.
4. **Create an Area Graph:** Display profit by year and quarter for a specific product category.
5. **Add a Slicer for Country:** Enable filtering by country.

Ranking Analysis

Ranking Analysis

Understanding the Ranking Order of Items:-

- **Simplest Form:** Use sorting.
- **Normal Ranking:** Items with the highest value are ranked 1, and items with the lowest value are ranked last.
- **Top 10/Bottom 10 Analysis:** Identify the top 10 or bottom 10 items based on a specific metric.
- **Percentage Ranking:** Calculate rankings based on percentages.

In Trend Analysis: Months are typically arranged in a specific chronological order.

Associate Discussion:-

John's Company's Request for Analysis:

1. **Display Top 15 Products by Sales:** Determine the highest-selling products.
2. **Display Top 5 Product Sub-Categories by Sales:** Determine the highest-selling sub-product.
3. **Display Total Sales and Profit:** Analyse the overall sales and profit performance.
4. **Add a Slicer for Country:** Enable filtering by country.
5. **Display the Products that contribute Top 20% of Profit:** Pareto Analysis.
6. **Display the rankings of the Profit by Year and Month:** Review by Product Category.
7. **Display the rankings for Sales and Profit:** Review by Country

Result Discussion:

In the fifth question out of 1600 total items, the top 20% of profit contribution leads to 45 of my top 201 items. This indicates that 45 out of 1600 items are responsible for the majority of profit contribution. This type of analysis is called Pareto Analysis.

Associate Discussion:-

John's Company's Request for Further Analysis:

1. **Identify Top 15 Products by Order Quantity Sold:** Determine the highest-selling products.
2. **Display Total Sales and Profit:** Analyse the overall sales and profit performance.
3. **Add a Slicer for Country:** Enable filtering by country.
4. **Create a Ranking Report for Product Name:** Rank products alphabetically.
5. **Display the Product Name in Alphabetical Order:** Present products in alphabetical order.
6. **Display Total Sales and Ranking:** Show the total sales and corresponding rankings.
7. **Display Total Profit and Ranking:** Show the total profit and corresponding rankings.

Variance Analysis

Variance Analysis:-

Variance analysis is a technique used to understand the difference between actual data and budgeted data, or between different data sets. It's a common practice in various fields, especially in finance and accounting.

Common Applications:-

- **Comparing actual and budgeted data:** Understanding the differences between planned and actual performance.
- **Benchmarking:** Comparing performance to industry standards or best practices.
- **Trend analysis:** Identifying changes in performance over time.

Example: John's Company

John's company has tasked you with analysing the following variances:-

1. **Variance between Actual Product Sub Category Sales for 2019 and the budgeted amount:** Compare the actual sales for each product subcategory to the planned sales.
2. **Variance between Desktops Product Sub Category and the other Product Sub Category:** Compare the sales performance of the desktop's subcategory to the other product subcategories.
3. **Variance between the Month Sales amount and Previous Month for 2019:** Analyse how sales have changed from month to month.
4. **Percentage variance from Previous Month as a line chart:** Visualize the percentage changes in sales from month to month.

Process Discussion:-
- The analysis will be conducted using **Power Query**. This tool is suitable for working with large datasets, such as the sales and budget data provided by John's company.
- The reason we need to use the product like Power Query here is that we've actually got two different tables of data.
- Here is the challenge that we face with the pivot tables is that we've actually got two different tables of data with that when we're working with standard Excel. In pivot table, is that we can only use one table of data to create a pivot table.
- In this sheet, we've got two tables. So, we need to combine them into one table, and then we need to then, we can use it as a pivot table, or we could create a pivot table from that table.
- **Power Query Editor:-**

    i.   Select Data from the Ribbon
    ii. Select Data from the Datasheet or Today Tab
    iii. Click on Get Data
    iv. Click on From Table/Range
    v.   You will visit Power Query

- In Power Query, here you got the preview of the data that we just saw in the Excel datasheet.

- And also, we're currently got is that we've got one query. So, we get different queries we're working with, we get a preview of data we're working with.
- And on the right-hand side, we get the ability to change the properties in this datasheet. We are going to call this variance, because ultimately, we want to know what is the variance between actual and budget sales.
- Here we got applied steps. It is like a macro, it's a set of steps that run one after the other. So, you're telling Power Query to do a set of steps here.
- There's no actually undo in Power Query, so what we can do is just we can delete any steps. If you're going to this delete icon, applied steps (x), then it will remove the steps.

Associate Discussion Solution:-

- **Sales figures for Year 2019**
    - **Fact:** Power Query works on a preview of your data. It doesn't always bring all of the data into work with. So, you can load more data if you needed.
- **Now, sum up all the sales**
    - **To specify the column to group by and the desired output:**
        - We use Group By:-
            - **Product Sub Category**
            - **Column Name:** Total Sales
            - **Operation:** Sum
            - **Column:** Sales
- From here, we need actual Product Sub-Category Sales for 2019.
- For 2019, for different Product Sub-Categories, we need sales data.
- For each Product Sub-Category, we need to sum sales.
- Hence, we got Total Sales for 2019.
- I need next is to actually need to get my budgeted figures because here we want to use my budgeted figures and then be able to work out variance between two.
- **Power Query:**

    - Actual Product Sub Category Sales for 2019.
    - 2019 Product Sub Category Sales.

Hence, table 'Variance' is created. By Get-Data, table 'Variance' in imported in Power Query. Now, we have to look up what is my budget in this variance table. We have to use merge function within Power Query. After merge, within Power Query, we will add a column to calculate the required value as Variance.

Associate Discussion:-

John has asked to do further analysis using Sales Data file:-

- Display Profit by Year and Month.
- Calculate the difference from the Previous Month.
- Use a data bar to display the difference visually.
- Calculate the percentage of difference from the Previous Month.
- Display the Ranking by Month.

Contribution Analysis

Contribution Analysis:-

- Easily calculate percentage contributions without using formulas.
- Percentages are easier to understand than large numbers.
- Review best practices for pie graph development to display percentages.
- Use 100% stacked column graphs to display percentage contributions.

Associate Discussion:-

- What is the percentage contribution of Sales by Product Category?
- What is the percentage contribution of Sales by Product Category and Channel?
- Create a Pie Graph displaying the percentage contribution of Sales by Product Category.
- Create a 100% Stacked Column Graph displaying Sales by Product Category - review by Region.

Note: To complete these tasks, you'll likely need to use Excel's formulas, formatting options, and visualization tools.

Fact: If we're doing a comparison analysis and we want to see which one is highest and which one is lowest, we will use column graphs or bar graphs.

But if we're looking to show the percentage contribution to the total, then the pie graph would be one to use.

Associate Discussion:-

John has asked you to do further analysis using the Sales Data file.

John would like you to answer the following questions:

1. Create a Table displaying the Profit value and Profit percentage by Country.
2. Create a 100% Stacked Column Graph displaying the percentage Profit by Product Category by Year.
3. Create a pie graph displaying the Profit by Region.
4. Create a Slicer for Product Category.

Frequency Analysis

Frequency Analysis:-

- Calculate the number of occurrences within a grouping of data.
- Analysing data within a specific group can be used for many types of questions, such as age groups (20-30, 30-40, 40-50, etc.).
- Examine the number of orders that created a Profit within a specific group.
- Easiest example is Human Resources.

Associate Discussion:-

John has asked you to review the Human Resource file and analyse the following:-

- How many employees are aged between 20 to 30, 30 to 40, 40 to 50 and over 50.
- What is breakdown of number of employees by gender.
- What is the percentage breakdown?
- What is the breakdown by Department?

Associate Discussion:-

John would like you to please analyse the Employee Master data and answer the following questions:-

- Calculate the number of employees who earn Salaries:-

    1. 0 to 1000
    2. 1000 to 2000
    3. 2000 to 3000
    4. 3000 to 4000
    5. Over 4000

- Understand the salary groupings By Gender: Add Gender to columns.
- Create a stacked column graph to display the results
- Create Department as a Slicer.

Correlation Analysis

Correlation Analysis:-

- **Common practice in business:** Correlate the relationship between two variables
- **For Ex:** Correlate the relationship between Sales and Profit. (If the sales go up, does our profit values also go up?)
- **Here, we want to see:** If we have higher sales value, we would like to see higher profit value.
- Now that we could expect to see is that there would be a correlation as one goes up, the other one could go as well.
- Also, to find businesses that may have negative correlation, so may have variable as it goes up and other variable as it goes down.
- Visualize the relation to understand correlation

Associate Discussion:-

John's Company would like you to complete the following:-

    i)   Correlate Sales and Profit by Product Category.
    ii)   Correlate Sales and Profit by Product Sub-Category.

Visual Discussion:-

- Now what we're interested to know is that we're looking at this sales value and this profit value, is it basically in line with the fact of these sales and these profit value.
- So as our sales value goes higher, we also expect our profit values to get higher.
- From the training dataset, the result that we see is that it is actually correlated.
- So, for this, we're going to use the scatter chart.
- In scatter chart, we want to use the ability to have our sales on one axis and our profit on the other axis.

Result Discussion:-

- In this chart, here we plotted, we use as the profit and sales are highly correlated.
- So here we use, as the one value goes up, the other value goes up as well.
- As the sales value goes up, the profit value goes up as well.

Pareto's Analysis

Pareto's Analysis:

- Pareto analysis is based on the work of Italian economist Vilfredo Pareto.
- Recognized that sometimes disproportion-al relationships exist between items.
- So, when we're doing analysis, it may find that a small amount of something contributes to quite a large result.
- For example, in a country, 80% of the property may be owned by 20% of the population.
- In the United States, 80% of the population lives in 20% of the land area of the country.
- This is also the 20/80 principle.
- **Apply the principle to business data analysis.**
- **Find that a small amount can contribute a good result.**
- **This means that we can then focus on 20% of customers and get a much better return.**
- Also, we can investigate 20% of customers could give 80% of profit.

Associate Discussion:-

John would like to use Pareto's analysis to understand the percentage of products that can contribute to 80% of profit.

Result Discussion:-

- Sort the profit values from the largest to the smallest.
- So, here we want to know what percentage of the total profit is actually contributing.
- We need to add more rows, use the values of each product, and summarize the values.
- But this will not show me how much of the total profit each of my product names
- actually contributes. Each product is showing profit percentage.
- We want to know how many items are contributing to total profit.
- We want to know how many items actually contribute to 80% of my total profit.
- So, we need to do a running total and calculate this profit percentage as a running total.
- So, each of these now need to add on to previous values, so that I can see when I get 80%.
- Then, count no. of items and then be able to know how many items are there.
- The total amount of items calculating their profit.
- Adding another Profit Column, to summarize the values from the largest to the smallest.
- So, in Product Name column, running total in value, each value in cumulative column, we can see how much it contributes in Product Name.
- In Cumulative column, on counting the column, we came to know that out of 1638 products, 552 products are contributing 80% of my profit.
- Now, we want to know in terms of Pareto, what is that as a percentage of your overall amount of items.
- 80% of total products = 552/1638 x 100%.
- So, 33.7% products are contributing 80% of total profit. So, we can focus on just one-third of items, 33.7% of total items contributing 80% of grand total profit by basically focusing on these items.
- Now, conversely, what it means is that 66% of my items are only contributing 20% of my total profit. So, 66% items, which is a vast majority, are only contributing a small amount of profit.

Conclusion

This is a useful method; we could use it with customer total or product total and basically what we're always going to find is that a small proportion of total items often contribute a much larger amount.

So, focusing on these smaller amounts, we could get much bigger or better return by focusing on them.