# Power BI Charts

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# Contents

- Charts cheat sheet
- Chart Types
- When to use which chart?
- Use cases and business examples

# Charts cheat sheet

| Chart Name | When to use it |
|---|---|
| Line Chart | To show trend over time, and identify patterns or seasonality in data |
| Column Chart | To compare the performance of different data series, and identify opportunities for growth or improvement |
| Bar Chart | To compare the performance of different data series, and identify opportunities for growth or improvement |
| Pie Chart | To show the proportion of different categories in a whole, and identify the main contributors |
| Scatter Plot | To identify correlation between two variables, and identify outliers or anomalies |
| Bubble Chart | To show the relationship between three variables, and identify patterns or clusters in the data |
| Treemap | To display hierarchical data, and show the proportion of different subcategories in a whole |
| Map Chart | To display geographic data, and identify patterns or trends by region or location |

| Chart Name | When to use it |
|---|---|
| Waterfall Chart | To show the breakdown of a whole into its parts, and identify the contributions of each part to the total |
| Area Chart | To show the trend of data over time, and compare the relative magnitude of different data series |
| Card | To display a single key metric, and provide a quick and easy way to compare it to a target or previous value |
| Gauge | To monitor a key performance indicator, and identify opportunities for improvement |
| Donut Chart | To show the proportion of different categories in a whole, and identify the main contributors |
| Pivot Table | To summarize and analyse large amounts of data, and identify patterns or trends |
| Slicer | To filter and interact with data, and identify patterns or trends |
| Matrix | To analyse and compare data in a multi-dimensional way, and identify patterns or trends |

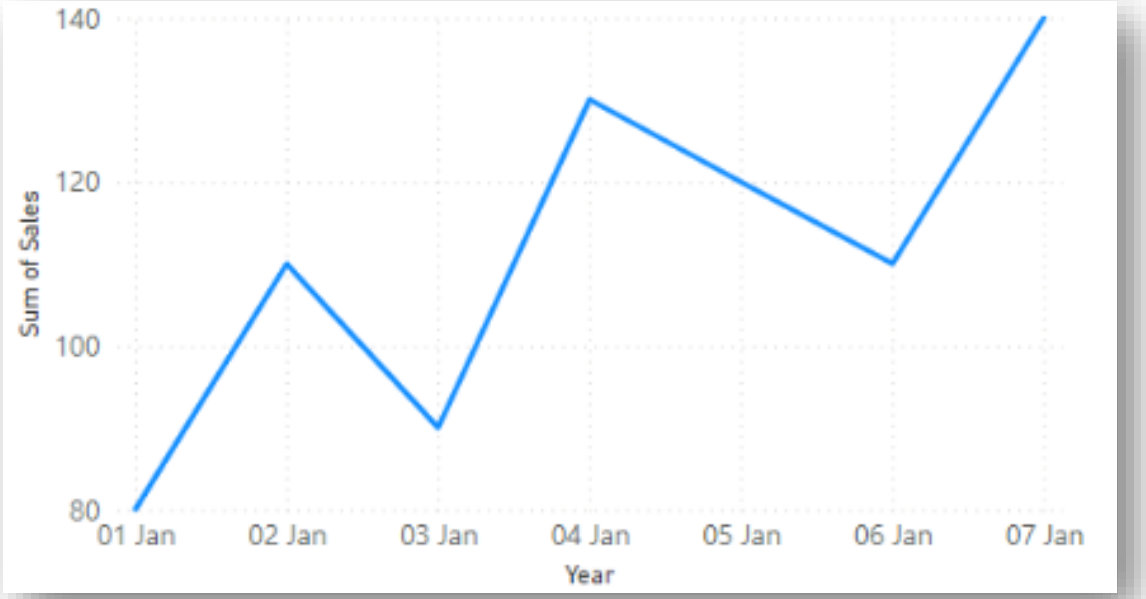
# Frequently used Charts in general

- Line chart
- Column chart
- Bar chart
- Pie chart
- Scatter plot
- Bubble chart
- Treemap
- Map Chart

# Line chart

- Use a line chart to visualize trends over time or to compare multiple series.
- For example, you might use a line chart to show the sales of a company over the past year, or to compare the sales of two different products.
- Line charts are used in Power BI to display trends over time. They are often used to visualize time series data, such as sales figures or stock prices, as well as other data that changes over time.

| Date | Sales |
|---|---|
| 01/01/2020 | 80 |
| 02/01/2020 | 110 |
| 03/01/2020 | 90 |
| 04/01/2020 | 130 |
| 05/01/2020 | 120 |
| 06/01/2020 | 110 |
| 07/01/2020 | 140 |



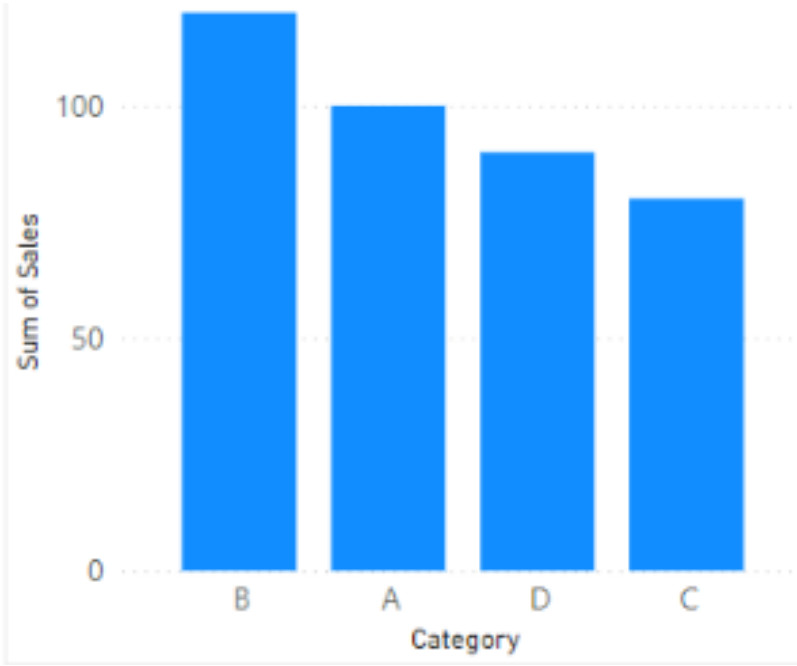
# Line chart Cases

- Sales trend analysis:
  - A line chart can be used to show the trend of sales over time, and to identify patterns or seasonality in sales data.
- Financial analysis:
  - A line chart can be used to show the trend of financial metrics such as revenue, profit, or stock price over time, and to identify patterns or opportunities for growth.
- Time-series forecasting:
  - A line chart can be used to show the trend of data such as weather, traffic, or social media activity over time, and to predict future trends.
- Project management:
  - A line chart can be used to show the progress of a project over time, and to identify opportunities for optimization.
- Inventory management:
  - A line chart can be used to show the trend of inventory levels over time, and to identify opportunities for optimization.
- Website analytics:
  - A line chart can be used to show the trend of website traffic, engagement, or conversion rates over time, and to identify opportunities for optimization.

# Column chart

- Use a column chart to compare values across categories or to show changes over time.
- For example, you might use a column chart to compare the market share of different brands in a particular industry, or to show the sales of a company by product line over the past year.
- Column charts are used in Power BI to display data as vertical bars. They are commonly used to compare data across different categories or to display changes over time.

| Category | Sales |
|---|---|
| A | 100 |
| B | 120 |
| C | 80 |
| D | 90 |



# Column chart Cases

- Sales comparison:
  - A column chart can be used to compare the sales of different product lines, regions, or channels, and to identify opportunities for growth or improvement.
- Market share analysis:
  - A column chart can be used to compare the market share of different companies, products, or brands, and to identify opportunities for expansion or market penetration.
- Financial analysis:
  - A column chart can be used to compare the performance of different financial metrics, such as revenue, profit, or return on investment, and to identify opportunities for improvement.
- Employee performance:
  - A column chart can be used to compare the performance of different employees, departments, or teams, and to identify opportunities for improvement.
- Supply Chain:
  - A column chart can be used to compare the performance of different suppliers, vendors or logistics service providers and to identify opportunities for optimization.

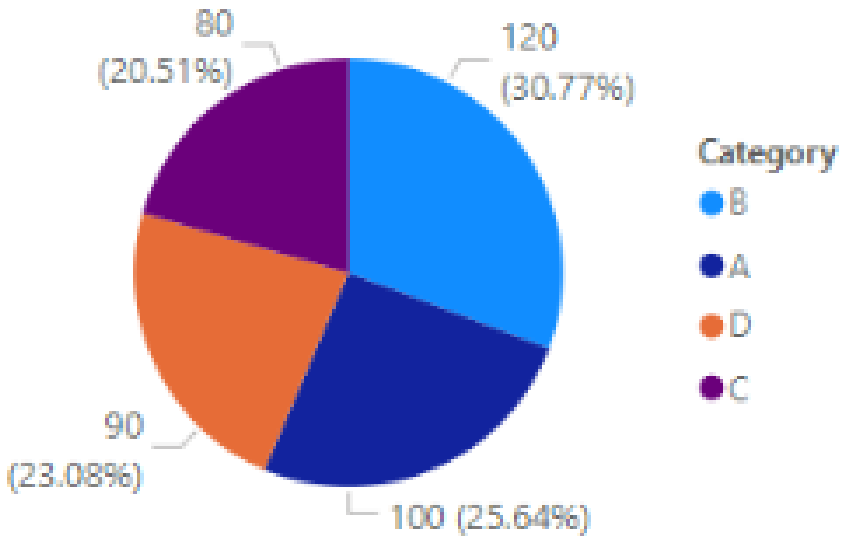
# Bar chart

- Bar charts are similar to column charts, in that they are used in Power BI to display data as bars. However, while column charts display the bars vertically, bar charts display them horizontally.
- They are also commonly used to compare data across different categories or to display changes over time. Like column charts, bar charts are particularly useful when you have a large number of data points and you want to emphasize the differences between them.

# Pie chart

- Pie charts are used in Power BI to display data as a proportion of a whole.
- They are commonly used to show the distribution of data across different categories or to compare the size of different parts of a whole
- Pie charts are particularly useful when you want to compare the relative size of different data points, but not their actual values.

| Category | Sales |
|---|---|
| A | 100 |
| B | 120 |
| C | 80 |
| D | 90 |



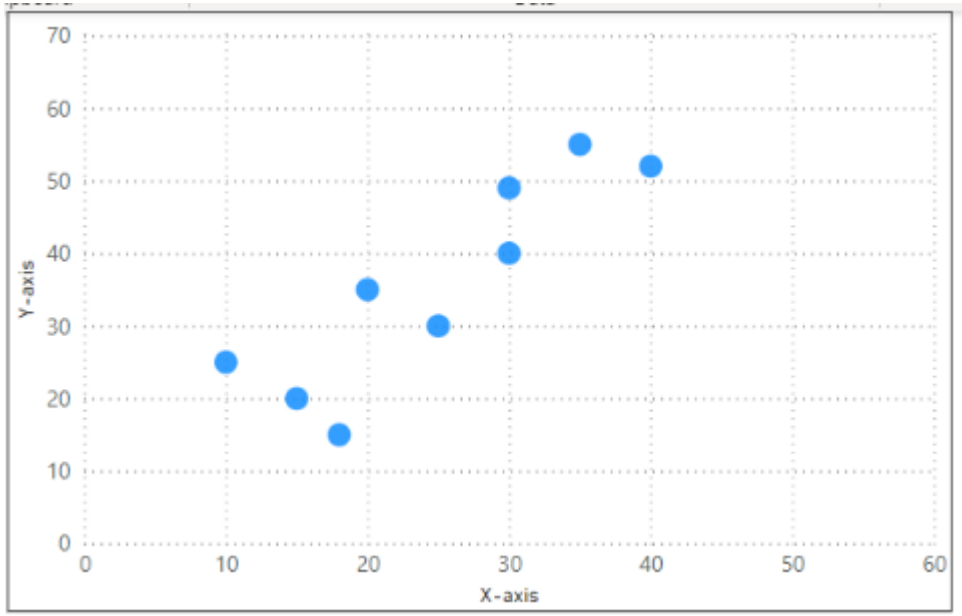
# Pie chart Cases

- Market share analysis:
  - A pie chart can be used to represent the market share of different companies in a particular industry.
- Sales analysis:
  - A pie chart can be used to show the proportion of sales generated by different products or product categories.
- Employee demographics:
  - A pie chart can be used to visualize the breakdown of employees by gender, age, or other demographic characteristics.

# Scatter plot

- A scatter plot, also known as a scatter diagram or scatter graph, is a type of plot or mathematical diagram using Cartesian coordinates to display values for typically two variables for a set of data.
- In a business scenario, scatter plots can be used to visually represent the relationship between two variables, such as the relationship between price and demand for a product, or the relationship between advertising spending and sales.

| X-axis | Y-axis |
|---|---|
| 10 | 25 |
| 20 | 35 |
| 30 | 40 |
| 40 | 52 |
| 15 | 20 |
| 30 | 49 |
| 25 | 30 |
| 18 | 15 |
| 35 | 55 |

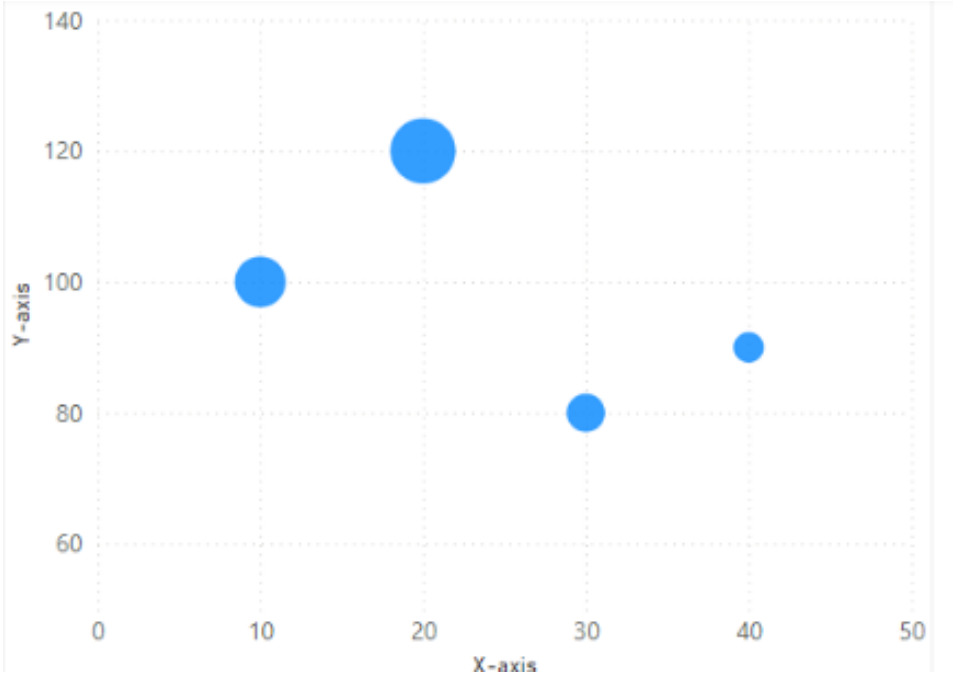


# Scatter plot - cases

- They are commonly used to visualize the distribution of data points, as well as to identify patterns, trends, and outliers in the data. Scatter charts are particularly useful when you want to explore the relationship between different variables, or to identify patterns and trends that are not immediately obvious in other types of visualizations.
- Cost-benefit analysis:
  - A scatter plot can be used to show the relationship between costs and benefits for different projects or initiatives, and to identify the most cost-effective options.
- Risk assessment:
  - A scatter plot can be used to identify the relationship between different risk factors, such as market fluctuations, changes in regulations, and technological advancements, and to evaluate their impact on an organization.
- Customer analysis:
  - A scatter plot can be used to identify patterns in customer data, such as the relationship between customer demographics(Like Age, Income) and purchase history, and to target marketing efforts more effectively.

# Bubble chart

- Bubble charts are similar to scatter charts, in that they are used in Power BI to display the relationship between two or more numeric variables.
- However, while scatter charts use dots to represent data points, bubble charts use bubbles, with the size of the bubbles representing a third variable.
- This third variable can be used to add an additional layer of information to the chart and make it easier to identify patterns and trends in the data.




| X-axis | Y-axis | Size |
|---|---|---|
| 10 | 100 | 20 |
| 20 | 120 | 35 |
| 30 | 80 | 10 |
| 40 | 90 | 5 |

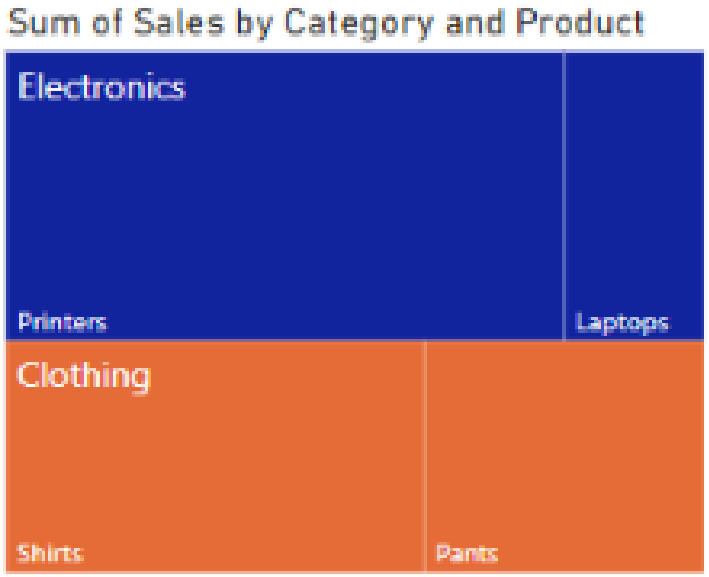
# Bubble chart - Cases

- Market segmentation:
  - A bubble chart can be used to represent the size and growth potential of different market segments, and to identify opportunities for expansion.
- Portfolio analysis:
  - A bubble chart can be used to represent the performance and risk of different investments in a portfolio, and to identify potential opportunities for diversification.
- Social media analysis:
  - A bubble chart can be used to represent the reach, engagement, or other characteristics of different social media accounts or posts, and to identify trends and best practices.
- Resource allocation:
  - A bubble chart can be used to represent the size and importance of different projects or initiatives, and to identify opportunities for optimization.

# Treemap

- Treemap charts are used in Power BI to display hierarchical data, where each data point is represented by a rectangle, the size of which corresponds to the value of the data point, and the color of which corresponds to a second variable.
- Treemaps are particularly useful when you have a large amount of hierarchical data that you want to display in a compact and easy-to-understand format.

| Category | Product | Sales |
|---|---|---|
| Clothing | Pants | 80 |
| Clothing | Shirts | 120 |
| Electronics | Laptops | 50 |
| Electronics | Printers | 200 |



# Treemap - Cases

- Inventory management:
  - A tree map chart can be used to represent the hierarchical structure of a company's inventory, and to identify opportunities for optimization.
- Budget allocation:
  - A tree map chart can be used to represent the hierarchical structure of a company's budget, and to identify opportunities for optimization.
- Market segmentation:
  - A tree map chart can be used to represent the hierarchical structure of a market, and to identify opportunities for expansion in different segments.

# Map chart

- Map charts (also known as geographical maps) are used in Power BI to display data that is associated with a location on a map.
- They are commonly used to visualize data that is associated with geographical locations, such as sales figures by region, population density, or weather patterns.
- Map charts are particularly useful when you want to explore the geographical distribution of data, or to identify patterns and trends that are not immediately obvious in other types of visualizations.

| City | Sales |
|---|---|
| New York | 100 |
| Los Angeles | 120 |
| Chicago | 80 |
| Houston | 90 |

# Map chart - Cases

- Sales analysis:
  - A map chart can be used to show the distribution of sales by location and identify areas with high or low sales performance.
- Market analysis:
  - A map chart can be used to show the distribution of customers, competitors, or other market characteristics by location and identify opportunities for growth or expansion.
- Geographic data visualization:
  - A map chart can be used to represent a wide range of data, such as population density, climate, natural resources, political boundaries, etc.
- Logistic and transportation:
  - A map chart can be used to plan and optimize routes for delivery, shipping, and transportation services, and to identify bottlenecks or potential delays.
- Real estate:
  - A map chart can be used to represent the distribution of properties by location, price, or other characteristics and identify opportunities for investment or development.
- Social network analysis:
  - A map chart can be used to show the distribution of social connections, such as friends or followers, by location and identify patterns or clusters in the network.

# Additional Charts available in Power BI

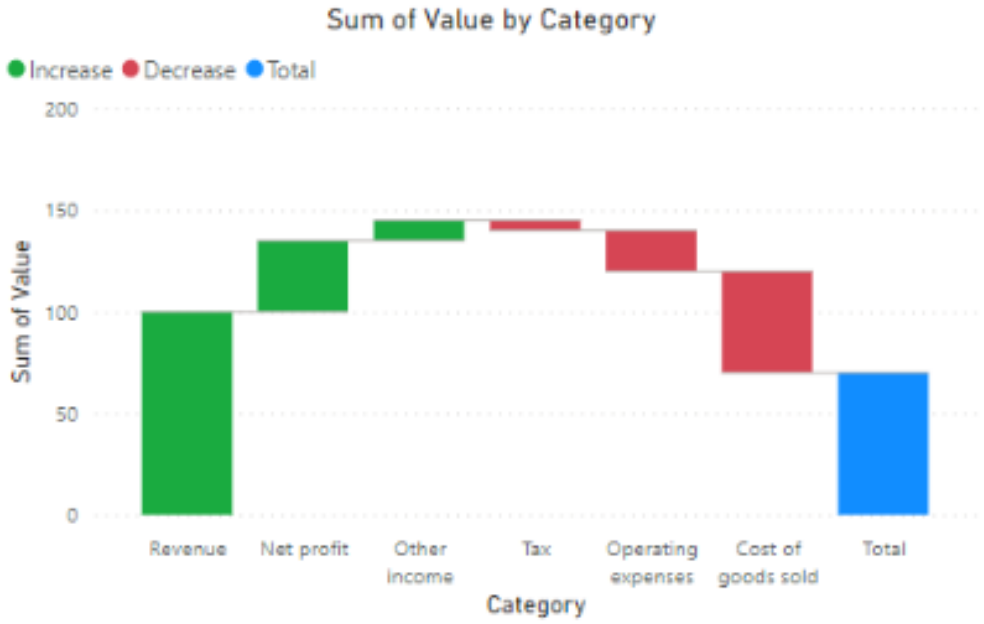
# Additional Charts available in Power BI

- Waterfall Chart
- Area Chart
- Card
- Gauge
- Donut chart
- Pivot table
- Slicer
- Matrix

# Waterfall Chart

- A Waterfall chart, also known as a bridge chart, is a type of chart that is used to show how different categories contribute to a total, and how each category changes the overall total.
- This type of chart is particularly useful for showing how changes in individual categories impact the overall total, and can be used in a wide range of business scenarios.

| Category | Value |
|---|---|
| Revenue | 100 |
| Cost of goods sold | -50 |
| Operating expenses | -20 |
| Other income | 10 |
| Tax | -5 |
| Net profit | 35 |



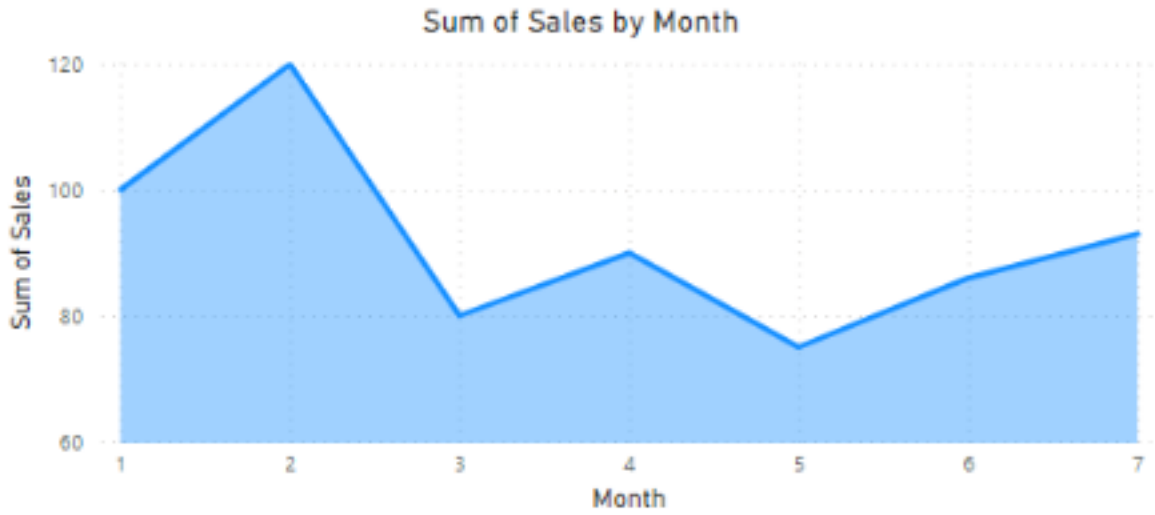
# Waterfall Chart - Cases

- Financial analysis:
  - A waterfall chart can be used to show the breakdown of revenue, expenses, or other financial metrics, and to identify the impact of different factors on the bottom line.
- Project management:
  - A waterfall chart can be used to show the breakdown of project costs, timelines, and deliverables, and to identify opportunities for optimization.
- Human Resources:
  - A waterfall chart can be used to show the breakdown of employee headcount, cost, and turnover by different factors such as location, department, or job function, and to identify opportunities for improvement.
- Supply Chain:
  - A waterfall chart can be used to show the breakdown of costs and revenues, and to identify opportunities for optimization in the supply chain.

# Area Chart

- Area charts are used in Power BI to display data as a series of points connected by a line with the area below the line filled with a color or pattern.
- They are commonly used to visualize trends over time or to compare the relative size of different data points.
- Area charts are particularly useful when you want to show the progression of a value over time or when you want to compare the relative size of different data points.

| Month | Sales |
|---|---|
| 1 | 100 |
| 2 | 120 |
| 3 | 80 |
| 4 | 90 |
| 5 | 75 |
| 6 | 86 |
| 7 | 93 |



# Area Chart - cases

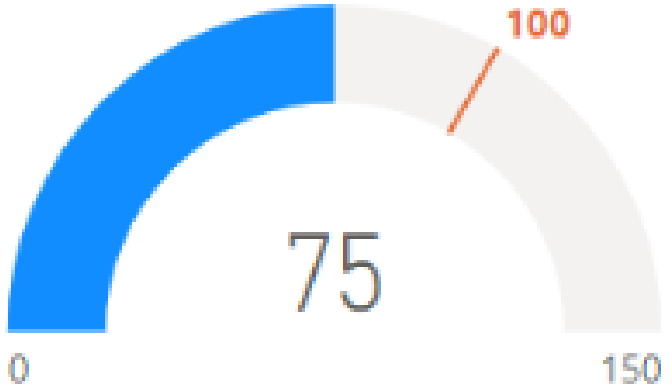
- Sales trend analysis:
  - An area chart can be used to show the trend of sales over time, and to identify patterns or seasonality in sales data. It is useful when you want to show the relative magnitude of different data series and compare them over time.
- Financial analysis:
  - An area chart can be used to show the trend of financial metrics such as revenue, profit, or stock price over time, and to identify patterns or opportunities for growth.
- Time-series forecasting:
  - An area chart can be used to show the trend of data such as weather, traffic, or social media activity over time, and to predict future trends.

# Card

- Card visuals in Power BI are used to display a single value or a small set of values in a compact and easy-to-read format.
- They are commonly used to display key performance indicators (KPIs), such as total sales or customer count, as well as to show the current status of a metric, such as the percentage of a target that has been achieved.
- It's also worth noting that Card visual can be used in combination with other visuals in a report. For example, you can place a card visual next to a bar chart to show a specific data point in context of the overall trend, or next to a map visual to show the data point by geographic location.
- Overall, It's an efficient way to convey key information at a glance and can be used in combination with other visuals to provide a comprehensive view of data.

# Gauge Chart

- A gauge visual in Power BI is used to display a single value within a predefined range, similar to a speedometer or a fuel gauge.
- They are commonly used to display key performance indicators (KPIs), such as the percentage of completion for a project or the percentage of a target that has been achieved.
- They are also useful for showing how a value compares to a predefined target or range.

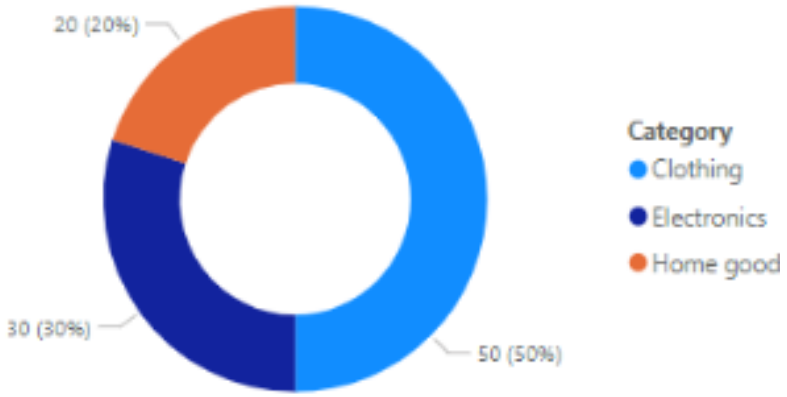


# Gauge Chart - Cases

- Key Performance Indicator (KPI) monitoring:
  - A gauge chart can be used to monitor key performance indicators such as sales, revenue, customer satisfaction, or website traffic, and to identify opportunities for improvement.
- Equipment or machine monitoring:
  - A gauge chart can be used to monitor the performance of equipment or machines, such as temperature, pressure, or speed, and to identify opportunities for optimization.
- Process monitoring:
  - A gauge chart can be used to monitor the performance of a process, such as production efficiency, quality control, or inventory turnover, and to identify opportunities for optimization.
- Environmental monitoring:
  - A gauge chart can be used to monitor environmental data such as weather, air quality, or water quality, and to identify opportunities for improvement.
- Network monitoring:
  - A gauge chart can be used to monitor network performance, such as server load, bandwidth usage, or response time, and to identify opportunities for optimization.

# Donut chart

- Donut chart is a variation of a pie chart where a hole is cut out of the center.
- They are used in Power BI to display data as a proportion of the whole, with each section of the chart representing a different category.
- They are commonly used to display data that can be divided into a small number of categories, such as product sales by category or customer demographics by age group.



# Pivot table

- A pivot table in Power BI is a tool for summarizing and analyzing large sets of data by grouping and aggregating the data based on one or more columns.
- They are commonly used to summarize data, such as calculating the total sales for each product category, or to analyze data, such as determining the average sales per customer by region.

# Pivot table

| Order Date | Region | Product | Quantity | Sales |
|---|---|---|---|---|
| 01/01/2021 | East | A | 10 | 100 |
| 01/01/2021 | East | B | 5 | 75 |
| 01/02/2021 | West | A | 12 | 120 |
| 01/03/2021 | West | B | 8 | 80 |

| Region | A | B | Total |
|---|---|---|---|
| East | 100 | 75 | **175** |
| West | 120 | 80 | **200** |
| **Total** | **220** | **155** | **375** |

| Region | A | B | Total |
|---|---|---|---|
| East | 26.67% | 20.00% | **46.67%** |
| West | 32.00% | 21.33% | **53.33%** |
| **Total** | **58.67%** | **41.33%** | **100.00%** |

# Slicer

- A slicer visual in Power BI is used to filter data in other visuals on the report.
- They allow users to select one or more values from a specific field to filter the data in other visuals.
- Slicers are commonly used to filter data by date, category, region, or any other field that is present in the data.

# Slicer

| Order Date | Region | Product | Quantity | Sales |
|---|---|---|---|---|
| 01/01/2021 | East | A | 10 | 100 |
| 01/01/2021 | East | B | 5 | 75 |
| 01/02/2021 | West | A | 12 | 120 |
| 01/03/2021 | West | B | 8 | 80 |

| Region | A | B | **Total** |
|---|---|---|---|
| East | 100 | 75 | **175** |
| West | 120 | 80 | **200** |
| **Total** | **220** | **155** | **375** |

# Matrix

- A matrix visual in Power BI is used to display data in a grid format, with rows and columns that can be grouped and summarized.
- They are commonly used to summarize data by multiple dimensions and to display data in a compact format.
- They are similar to pivot tables, but can include multiple levels of grouping and aggregation, and can be used to create more complex and detailed reports.

# Matrix

- You can further customize the matrix visual by using the "Format" tab in the "Visualizations" pane. You can change the aggregation for the values, add filters, and sort the data. You can also add more columns to the Rows and Columns fields to create a more complex and detailed matrix visual.
- Additionally, you can also group and summarize data by multiple levels. For example, you can group the data by region, then by product category, then by product sub-category, and so on. You can also use the "Format" tab to customize the appearance of the matrix visual, such as changing the font size, color, and alignment.
- Matrix visual is a powerful tool for summarizing and analyzing large sets of data and it allows you to create complex and detailed reports by grouping and summarizing data by multiple dimensions.

# Concussion

- In conclusion, charts and graphs are powerful tools for visualizing and analysing data in a variety of business contexts.
- From line charts for trend analysis and column charts for comparison, to scatter plots for correlation analysis and bubble charts for multivariate data, the variety of chart types available can help to effectively communicate key insights and inform decision-making.
- Waterfall charts can be used to show breakdown of costs and revenues, map charts for geographic data visualization, gauge charts for monitoring key performance indicators and tree maps for displaying hierarchical data.
- By choosing the appropriate chart type for the data and message at hand, businesses can effectively communicate key insights and inform decision-making.