



THE POWER BI EBOOK

created by: Akshay Kamble

Table Of Contents

• Power BI	5
• Power BI Vs Tableau	7
• About Power BI	9
• Install and run Power BI Desktop	10
• What is Power BI Desktop?	12
• Power Query	14
• Connecting to Data Sources in Power BI and Power Query	15
• Step 2: Extracting Data	16
• Import Connection	17
• Direct Query Connection	20
• Live Connection	23
• Step 3: Data Transformation	25
• Merge Columns Function	29
• Step 4: Loading Data from Power Query to Power BI	31
• Step 5: Data Modeling in Power BI Desktop	32
• A Comprehensive Guide to 30 Default Charts in Power BI	33
• Column Charts	33
• Bar Charts	39
• Line Chart	45
• Area Charts	50
• Pie Chart:	54
• Donut Chart	56
• Stacked Donut Chart	57
• Scatter Chart:	58
• Bubble Chart:	59
• Waterfall Chart:	60
• Funnel Chart:	61
• Gauge Chart:	62
• Map Chart:	63
• Filled Map Chart:	64
• Treemap Chart:	65
• Step 6: DAX	66



Table Of Contents

• Data Analysis Expressions (DAX)	66
• Calculated Table	67
• Calendar Table	68
• CALENDARAUTO Function	68
• DAY, MONTH, YEAR, QUARTER, TODAY, WEEKDAY	69
• Basic Dax Functions	70
• Aggregation Functions:	70
• Iterative Function:	72
• Logical Function:	74
• Calculate	76
• Other Important DAX Functions	77
• All Function	77
• ALL EXCEPT	78
• ALLSELECTED	79
• Time Intelligence with DAX	80
• What are Time Intelligence Functions?	80
• USERRELATIONSHIP Function	82
• Step 7: REPORT	83
• Building Report (Working on Project)	83
• Inserting Text Boxes, Shapes, and Images	86
• Formatting Visuals (Basic Formatting)	87
• Drill Through	88
• Set up the drillthrough	89
• SMART VISUALS	91
• Custom Visuals	91
• Using Images as Chart	92
• DESIGNING REPORT	93
• TOOLTIPS	94



Table Of Contents

• Bookmark	96
• Power BI Interface tour	98
• Power BI Licences	100
• My Workspace Vs. Workspaces Vs. Apps	102
• ADVANCE POWER BI SERVICE	103
• Gateway	104
• Scheduled Refresh	105
• SHARING & COLLABARATION	106
• How to Share	106
• Share to Web	106



Power BI

Power BI is a powerful and widely-used business intelligence (BI) and data visualization tool developed by Microsoft. It enables users to connect to various data sources, transform and model data, create interactive reports and dashboards, and share insights across organizations. Here's a detailed overview of Power BI and its benefits:

Benefits of Power BI:

1. User-Friendly Interface:

Power BI features a user-friendly, drag-and-drop interface, making it accessible to both technical and non-technical users.

Users can create reports and dashboards without extensive training.

2. Data Integration and Transformation:

Power BI can connect to a wide range of data sources, including databases, cloud services, web sources, and more.

It offers robust data transformation capabilities to clean, reshape, and model data for analysis.

3. Advanced Data Modeling:

Users can create sophisticated data models using DAX (Data Analysis Expressions), enabling complex calculations, aggregations, and relationships.

The data model supports the creation of hierarchies, measures, and calculated columns.

4. Interactive Visualizations:

Power BI provides a vast library of customizable visualizations, including bar charts, line charts, maps, and more.

Visualizations can be filtered, cross-highlighted, and drilled down to explore data interactively.



5. Natural Language Queries:

Users can ask questions using natural language queries, and Power BI's AI capabilities generate visualizations and insights based on the questions.

6. Real-Time Data:

Power BI supports real-time data streaming, allowing organizations to monitor and react to data changes in real-time.

7. Data Sharing and Collaboration:

Reports and dashboards created in Power BI can be shared securely with others inside and outside the organization.

Collaboration features include commenting, annotation, and the ability to create and share dashboards with stakeholders.

8. Security and Compliance:

Power BI offers robust security and access control features, including integration with Azure Active Directory for identity management.

It complies with various industry standards and regulations, making it suitable for organizations with strict data governance requirements.

9. Scalability:

Power BI is highly scalable, capable of handling large datasets and serving the needs of small to large organizations.

10. Cost-Efficiency:

Power BI offers both free and paid licensing options, making it accessible to organizations of all sizes.

Power BI Pro and Premium licenses provide additional features for advanced use cases.



Power BI Vs Tableau

Power BI and Tableau are two popular data visualization and business intelligence tools, and they have several differences in terms of data sources, user interface, pricing, customization, collaboration, and machine learning capabilities.

Data Sources:

Power BI:

Offers a wide range of data connectors, including popular databases, cloud services, and file formats.

Integrates well with Microsoft products like Excel, SharePoint, and Azure services.

Tableau:

Provides a vast array of data connectors, covering various data sources, from spreadsheets to cloud databases.

Has a strong focus on data connectivity and has partnerships with many data providers.

User Interface:

Power BI:

Known for its user-friendly and intuitive interface, making it accessible to users with varying levels of technical expertise.

Offers a familiar Microsoft-style interface for those already using Microsoft products.

Tableau:

Offers a highly interactive and flexible interface with a steep learning curve for beginners.

Provides advanced customization options and is often favored by users who want more control over their visualizations.



Pricing:

Power BI:

Offers a free version (Power BI Desktop) and subscription-based plans like Power BI Pro and Power BI Premium.

Generally considered more cost-effective for smaller to medium-sized businesses.

Tableau:

Typically has a higher upfront cost, making it more suitable for larger enterprises.

Offers both subscription-based and perpetual licensing options, with Tableau Server and Tableau Online as hosting solutions.

Customization:

Power BI:

Provides extensive customization options, allowing users to create custom visuals using the Power BI Developer SDK.

Supports custom themes, templates, and JavaScript-based customizations.

Tableau:

Offers advanced customization through calculated fields, parameters, and scripting with Tableau Prep and Tableau Desktop.

Allows users to create custom calculations and integrate with R and Python for advanced analytics.



Power BI Desktop:

- Power BI Desktop is the authoring tool used to create interactive reports and dashboards.
- It is a Windows application that provides a rich environment for data modeling, transformation, and visualization.
- Key features of Power BI Desktop include the ability to import data from various sources, create data models, design visuals, write DAX calculations, and customize report layouts.
- Power BI Desktop is primarily used by data analysts and report developers to build and design reports before publishing them to the Power BI Service.

Power BI Service (Power BI Cloud):

- Power BI Service, also known as Power BI Cloud or Power BI Online, is a cloud-based platform where reports and dashboards created in Power BI Desktop can be published, shared, and accessed by others.
- With Power BI Service, users can view and interact with reports and dashboards through a web browser or the Power BI mobile app.
- It offers collaboration features, including the ability to share reports, create dashboards, set up data alerts, and collaborate with colleagues in real time.
- Power BI Service also provides data refresh capabilities to ensure that reports stay up to date with the latest data.

Power BI Mobile:

- Power BI Mobile is a mobile application available for iOS and Android devices. It allows users to access and interact with Power BI reports and dashboards on the go.
- Users can view, filter, and drill down into data, making it convenient for decision-makers who need access to business insights while away from their computers.
- The app also supports offline access, so users can access reports even without an internet connection.

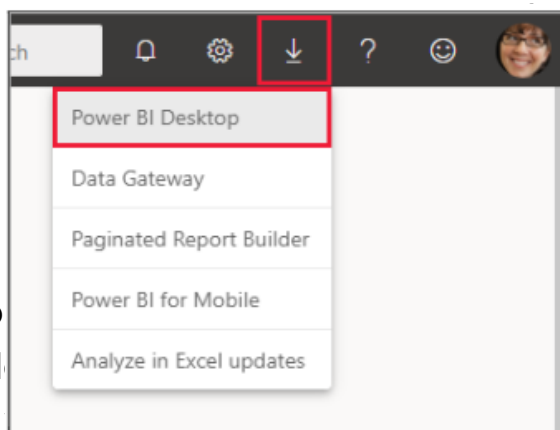


Install and run Power BI Desktop

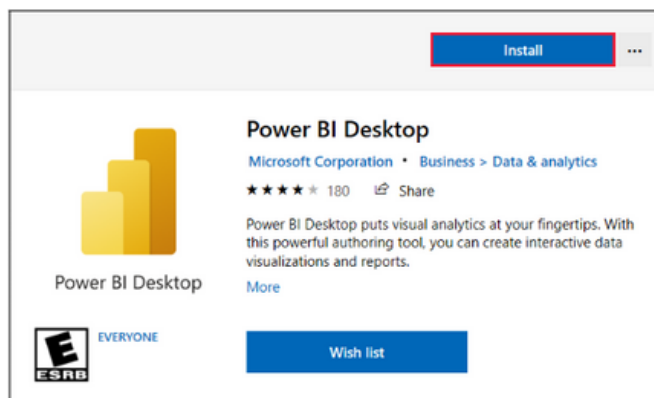
There are a few ways to access the most recent version of Power BI Desktop from the Microsoft Store.

1. Use one of the following options to open the Power BI Desktop page of the Microsoft Store:

- Open a browser and go directly to the [Power BI Desktop page](#) of the Microsoft Store.
- From the [Power BI service](#), in the upper right corner, select the Download icon and then choose Power BI Desktop

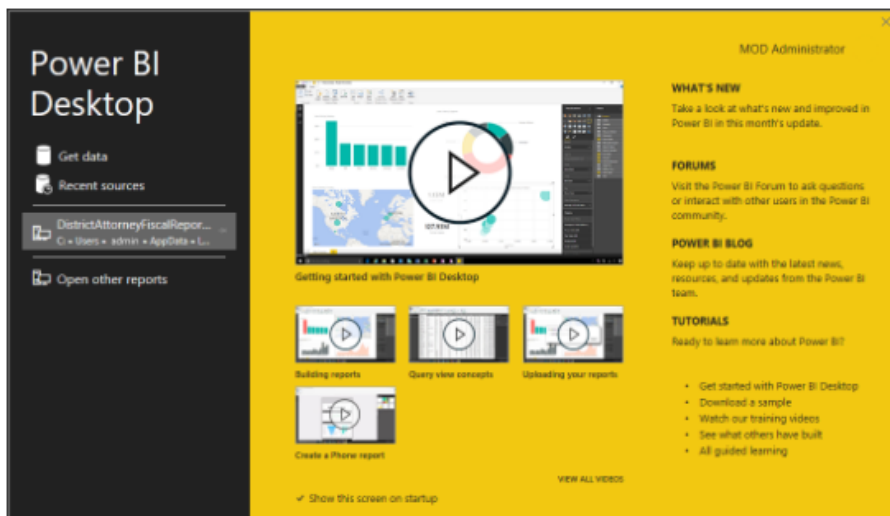


- Go to the [Power BI Desktop page](#), and then select Download.
- After the Power BI Desktop page of the Microsoft Store, select Install.



Use Power BI Desktop

When you launch Power BI Desktop, a welcome screen appears.



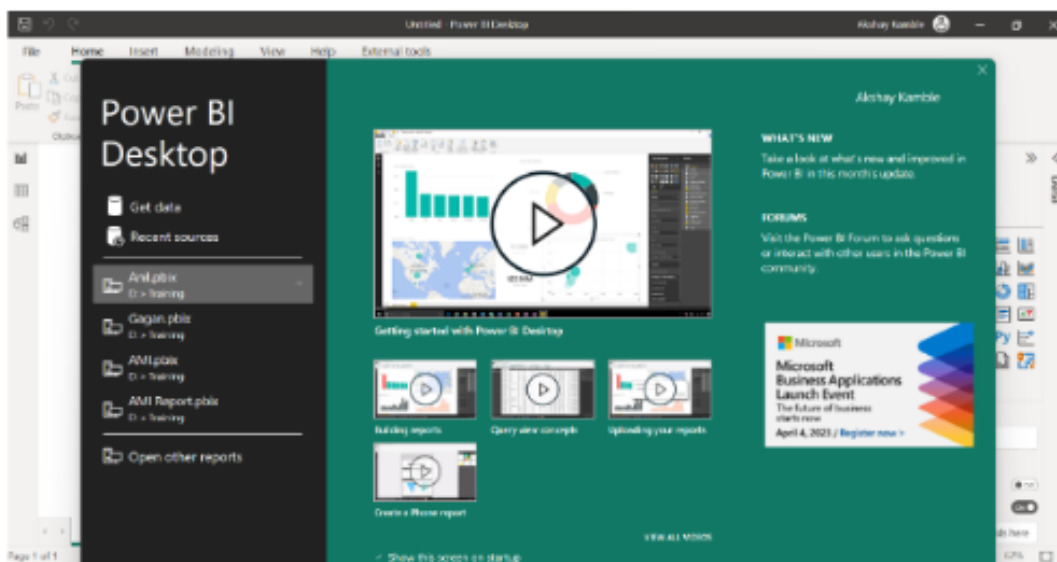
When you launch Power BI Desktop for the first time, if the installation isn't an upgrade, you're prompted to fill out a form or sign in to the Power BI service before you can continue.

After that, you can begin creating data models or reports, and share them with others on the Power BI service.



What is Power BI Desktop?

Power BI Desktop is a Windows application developed by Microsoft that is part of the Power BI suite of business intelligence tools. It is a powerful and versatile tool used for creating interactive reports and data visualizations. Power BI Desktop enables users to connect to various data sources, transform and model data, and design visually appealing reports and dashboards. It's a popular choice for data analysts, business intelligence professionals, and report developers to create, refine, and publish data-driven insights.



Power BI Desktop consists of three primary views:

Report View:

- Report View is where you design and create the actual reports and dashboards.
- In this view, you can drag and drop visuals (charts, tables, maps, etc.) onto a canvas to build your report.
- You can customize visuals, add titles, text boxes, images, and shapes to create a compelling and informative report.
- Interactivity features like filtering, drill-through, and bookmarks can be defined in this view to enhance user experience.

Table View:

- Data View provides a detailed look at the data tables that you've imported into your Power BI project. Earlier table view was named as Data View
- It displays the raw data in a tabular format, allowing you to see and edit individual data records.
- You can perform basic data transformations and data cleansing tasks in this view, such as sorting, filtering, and editing data values.
- Data View is useful for understanding your data structure and ensuring data quality before creating visualizations.

Model View:

- Model view is where you define the data model that underlies your report. The data model includes tables, relationships, calculated columns, and measures.
- You can create relationships between tables to establish how they are connected and joined.
- Calculated columns and measures are defined using the Data Analysis Expressions (DAX) language to perform calculations and aggregations on the data.
- Model View allows you to create a logical structure for your data, making it easier to create meaningful visuals and calculations.

Model View.

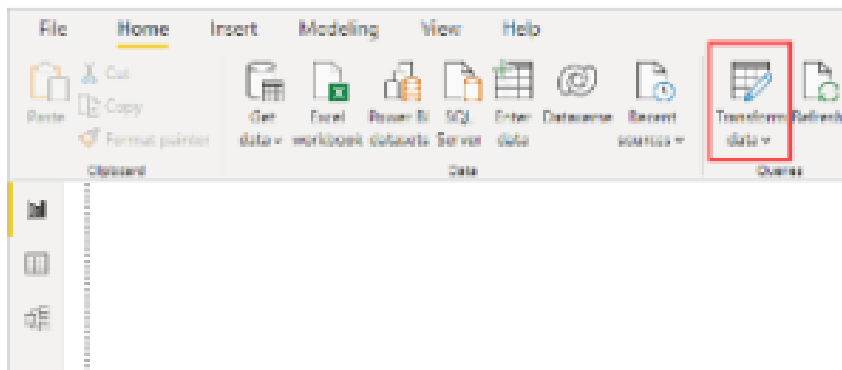


Power Query

Power Query is a data transformation and preparation tool that is part of the Microsoft Power BI and Excel ecosystem. It allows users to connect to various data sources, extract data, perform data transformations, and load the data into a usable format for analysis and reporting. Power Query is designed to simplify and automate the often complex and repetitive process of data preparation.

To open Power Query in Power BI Desktop, follow these steps:

- Open Power BI Desktop on your computer.
- Select the Home tab in the ribbon at the top of the screen.
- Click the "Transform data" button in the External Data section of the Home tab.



Step 1: Connecting to Data Sources in Power BI and Power Query

In Power BI

Connecting to data sources in Power BI is a crucial step in creating reports and dashboards. Power BI offers various options for connecting to data sources, allowing you to import, transform, and visualize your data. Here's a general overview of how to connect to data sources in Power BI:

Launch Power BI Desktop: Start by opening Power BI Desktop, which is the desktop application for creating Power BI reports and dashboards.

Get Data: To connect to a data source, click on the "Get Data" button in the Home tab of the Power BI Desktop ribbon.

Select a Data Source: Power BI supports a wide range of data sources.

You can choose from options like:

Database: Connect to databases like SQL Server, MySQL, Oracle, or cloud-based databases like Azure SQL Database.

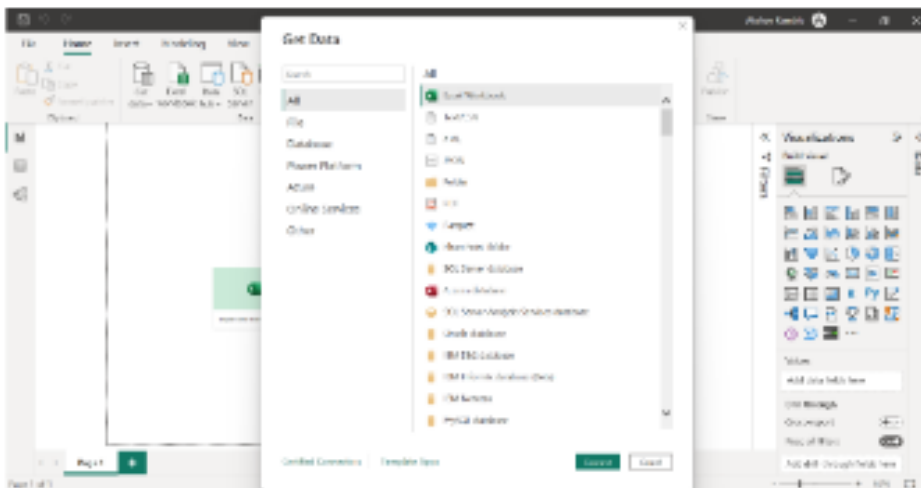
Files: Import data from Excel spreadsheets, CSV files, JSON files, or other text-based formats.

Online Services: Connect to online services like SharePoint, Dynamics 365, Google Analytics, or Salesforce.



Step 2: Extracting Data

Connecting to data sources is a fundamental step in creating reports and dashboards in Power BI. Power BI Desktop supports many types of data sources, including files, databases, cloud services, and web services. To connect to a data source, you can select the Get Data option from the Home tab, or you can right-click the Fields pane on the right side of the report canvas and select New Source.



Once you select the data source, In some Data sources you'll be prompted to enter the necessary credentials, such as a username and password, or an API key. After providing the required information, Power BI Desktop will connect to the data source and load the available data into the Query Editor.

As we are looking at data extraction, let's take a closer look at how Power BI connects to data sources. Power BI provides several different ways to connect to data sources, each with its own advantages and disadvantages. Understanding these connection types can help you decide which one to use for your specific needs.



Import Connection

An "import connection" refers to a method of data connectivity in the context of Power Query and data analytics tools like Microsoft Power BI or Excel. When you use an import connection, you are essentially importing a snapshot of your data from the source into your data analytics tool for further analysis and reporting. This is in contrast to other connection methods like direct query or live connection, where data is not imported but remains connected to the source in real-time.

Here are the key points regarding import connections:

Why We Use Import Connection:

Data Snapshot: Import connections are used to import data from the source system into your data analytics tool. This allows you to work with a static snapshot of the data, ensuring that the data is consistent and available for analysis even if the source changes or becomes unavailable.

Performance: Importing data can significantly improve query and report performance, especially when dealing with large datasets or complex calculations. Since the data is stored locally, queries and calculations can be executed more quickly.

Data Shaping: Import connections provide the flexibility to shape and transform the data as needed within your data analytics tool. You can create calculated columns, measures, and custom tables to meet specific reporting requirements.

Offline Work: You can work with imported data even when you're offline or disconnected from the source system. This is particularly useful for creating and editing reports without a live internet connection.



When to Use Import Connection:

You should consider using an import connection in the following scenarios:

Data Size: When working with relatively small to moderately sized datasets that can fit comfortably within the memory of your analytics tool.

Data Complexity: When your data requires extensive transformations, calculations, or joins with other data sources, as import connections provide better performance for these tasks.

Data Consistency: When you want to ensure data consistency for reporting purposes, even if the source data frequently changes.

Advantages of Import Connection:

Performance: Import connections typically offer faster query and report performance because the data is stored locally.

Data Shaping: You have full control over data transformations and can create custom calculations, aggregations, and hierarchies.

Offline Access: You can work with the data even when you're offline or disconnected from the source system.

Data Consistency: The imported data remains consistent, regardless of changes in the source, which is crucial for accurate reporting.



Disadvantages of Import Connection:

Data Staleness: Since the data is a snapshot, it may become stale or outdated if the source data changes frequently. You'll need to schedule periodic data refreshes to keep it up-to-date.

Storage Requirements: Importing large datasets can consume significant storage space in your analytics tool, which may be a consideration for very large datasets.

Maintenance: Managing data refresh schedules and ensuring data consistency can be additional overhead.

Not Real-Time: Import connections do not provide real-time access to data; you're working with a static snapshot.



Direct Query Connection

A "Direct Query" connection is a method of data connectivity used in data analytics tools like Microsoft Power BI, Tableau, or other similar tools. When you use a Direct Query connection, your analytics tool sends queries directly to the source database or system in real-time, without importing the data into the tool. This means that your analytics tool interacts with the source system on an as-needed basis, retrieving data on the fly and displaying it in your reports and dashboards.

Here are the key points regarding Direct Query connections:

Why We Use Direct Query Connection:

Real-Time Data Access: Direct Query connections provide real-time access to data. This means that you are always working with the most current data from the source system without the need for manual data refreshes.

Data Volume: Direct Query is useful when working with large datasets that cannot be efficiently imported into your analytics tool due to size constraints.

Data Freshness: When you need to ensure that your reports and dashboards reflect the most up-to-date information from the source system, Direct Query is an ideal choice.



When to Use Direct Query Connection:

You should consider using a Direct Query connection in the following scenarios:

Real-Time Reporting: When you require real-time or near-real-time access to your data, such as in financial reporting or operational dashboards.

Large Data: When working with very large datasets that would be impractical to import and store locally.

Frequently Changing Data: When the source data changes frequently and it's essential to have the latest data at all times.

Advantages of Direct Query Connection:

Real-Time Data: Direct Query provides access to the most current data from the source system, ensuring data freshness.

No Data Storage Overhead: You don't need to store data locally, which can be beneficial when dealing with large datasets.

Data Security: Sensitive data remains in the source system, reducing data exposure risks.



Disadvantages of Direct Query Connection:

Performance: Depending on the complexity of your queries and the performance of your source system, Direct Query can be slower than working with imported data, as it involves real-time data retrieval.

Limited Data Transformation: Direct Query may limit your ability to perform complex data transformations, as these are often easier to perform on data that has been imported into your analytics tool.

Source Load: Frequent and complex queries can put a load on your source system, potentially impacting its performance.

Offline Access: Direct Query does not support offline access. You need a live connection to the source system.



Live Connection

A "Live Connection" is a method of data connectivity used in data analytics tools like Microsoft Power BI, Tableau, or similar tools. When you use a Live Connection, your analytics tool establishes a real-time connection to a data source, typically a database, and interacts with it on-the-fly to retrieve and display data in your reports and dashboards. The data is not imported or cached in the analytics tool but is queried directly from the source.

Why We Use Live Connection:

Real-Time Data: Live Connection provides real-time access to data. It ensures that the data in your reports and dashboards is always up-to-date, as it directly reflects changes in the source system.

Data Freshness: When you need your reports and dashboards to reflect the most current data from the source, a Live Connection is an ideal choice.

When to Use Live Connection:

You should consider using a Live Connection in the following scenarios:

Real-Time Reporting: When your reporting requirements demand real-time or near-real-time access to data, such as in financial reporting or operational dashboards.

Data Size: When dealing with large datasets that cannot be efficiently imported or cached locally due to size constraints.

Data Freshness: When your data source is frequently updated, and you want to ensure that your reports always reflect the latest changes.



Advantages of Live Connection:

Real-Time Data: Live Connection ensures that you are always working with the most current data from the source system, providing data freshness.

No Local Data Storage: You don't need to store data locally, which can be beneficial when dealing with large datasets and reduces the need for data storage maintenance.

Data Security: Sensitive data remains in the source system, reducing data exposure risks.

Disadvantages of Live Connection:

Performance: The performance of reports and dashboards using a Live Connection can be influenced by the speed and capacity of the source system, as data is queried in real-time. Complex and frequent queries may slow down report rendering.

Limited Data Transformation: Live Connection may limit your ability to perform complex data transformations within the analytics tool since the data is not imported and cached locally.

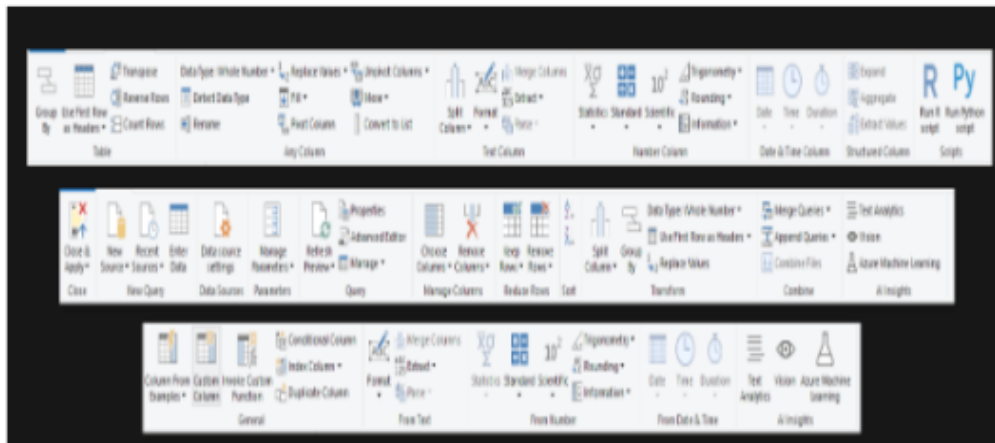
Source Load: Frequent and complex queries can put a load on your source system, potentially impacting its performance.

Offline Access: Live Connection does not support offline access. You need a live connection to the source system.



Step 3: Data Transformation

Once you've connected to your data source in Power BI, the next step is to transform the data into a format that can be easily analyzed and visualized. This process is often referred to as ETL (extract, transform, load).



Power Query is a data transformation and data preparation tool in Power BI that allows users to extract, transform, and load data from different sources into Power BI. The Power Query Editor provides a user-friendly interface that allows users to perform a series of data transformations through a set of tabs. Here are the different tabs available in Power Query:



Home Tab:

The Home tab is where you'll find essential tools for working with your data. It includes functions for connecting to data sources, creating and managing queries, and basic data transformation operations.

Get Data: Allows you to connect to different data sources and import data into your Power Query environment.

Edit Queries: Opens the Query Editor, where you can shape and transform your data.

Combine: Offers options for merging or appending multiple queries.

Manage Queries: Allows you to create, duplicate, and delete queries.

Close & Load: Loads the transformed data into your destination, such as Power BI or Excel.

Transform Tab:

The Transform tab is where you perform most of your data shaping and cleaning tasks. It provides a wide range of data transformation operations.

Data Type: Allows you to change the data type of columns.

Transform: Offers functions like filtering, sorting, and aggregating data.

Combine: Provides options for merging or appending data tables.

Text Column: Contains functions for working with text data.

Date: Provides date-related transformations.

Number: Offers numeric operations.

Column: Contains functions to add, remove, or transform columns.

Advanced: Includes more advanced transformations and custom expressions.



Add Column Tab:

The Add Column tab focuses on creating new columns based on your existing data.

Custom Column: Allows you to create calculated columns using the Power Query Formula Language (M).

Index Column: Adds an index or sequential number to your data.

Conditional Column: Lets you create new columns with values based on specified conditions.

Date: Offers functions for adding date-related columns.

Text: Provides options for creating new text columns based on existing data.

View Tab:

The View tab allows you to customize the appearance and layout of the Power Query Editor.

Zoom: Adjusts the zoom level for viewing your data.

Workbook Queries: Provides a list of all queries in your workbook.

Query Dependencies: Shows a visual representation of how queries depend on each other.

Formula Bar: Toggles the display of the formula bar, where you can see and edit query formulas.

Advanced Editor: Opens the Advanced Editor, where you can edit queries using M language directly.



Let's see some of the most important Power Query transformations that you can use to shape your data:

Remove Columns:

The "Remove Columns" transformation allows you to remove one or more columns from your dataset. You can select columns that you don't need for your analysis or visualization and exclude them from your data.

Use this transformation to clean up your dataset by removing unnecessary or redundant columns, which can improve query and report performance.

Filter Rows:

"Filter Rows" enables you to include or exclude rows from your dataset based on specific criteria or conditions. You can define conditions like filtering for rows where a column's value meets a certain threshold or falls within a particular range.

This transformation helps you narrow down your data to include only the rows that are relevant to your analysis, removing noise from your dataset.

Remove Duplicates:

The "Remove Duplicates" transformation allows you to eliminate duplicate rows from your dataset based on the values in one or more columns. It helps you maintain data integrity by keeping only unique records.

Use this transformation when you have duplicate data entries that could skew your analysis or visualization.



Merge Column:

"Merge Column" lets you combine the values from multiple columns into a single new column. You can choose the delimiter or separator to use between merged values.

This transformation is useful when you need to concatenate information from different columns into a single column for reporting or analysis purposes.

Conditional Column:

The "Conditional Column" transformation allows you to create new columns based on conditional logic. You specify conditions, and if those conditions are met, a new value or calculation is applied to create the column.

It's useful for adding calculated columns based on various conditions in your data.

Split Column:

The "Split Column" transformation allows you to divide a single column into multiple columns based on a specified delimiter or pattern. This is helpful when your data is in a combined format, and you want to break it down into separate parts.

Use this transformation to split data into more granular components, such as splitting a full name into first and last names.

Transpose:

"Transpose" is used to pivot your data by switching rows and columns. It's particularly useful when your data is in a format where rows represent attributes or fields, and you want to transform it into a format where columns represent attributes.

This transformation is commonly used for reshaping data to make it suitable for various reporting and visualization scenarios.



Pivot Columns:

The "Pivot Columns" transformation allows you to convert column values into new columns, essentially rotating your data. You select one or more columns that contain values you want to pivot, and Power Query creates new columns based on unique values in those columns.

Use this transformation when you have data in a "stacked" format, where different categories or attributes are represented as rows, and you want to transform it into a "cross-tab" or "matrix" format.

Unpivot Data:

The "Unpivot Data" transformation does the opposite of pivoting. It takes columns that represent different attributes or categories and reshapes them into rows, creating a "stacked" format.

This is useful when you have data in a cross-tab format, and you want to convert it into a format that is easier to work with in Power BI.

Group By:

The "Group By" transformation allows you to group rows in your dataset based on one or more columns. You can then perform aggregations (e.g., sum, count, average) on the grouped data.

Use this transformation when you want to summarize or aggregate data based on specific criteria, such as calculating totals or averages for different categories.

Column From Example:

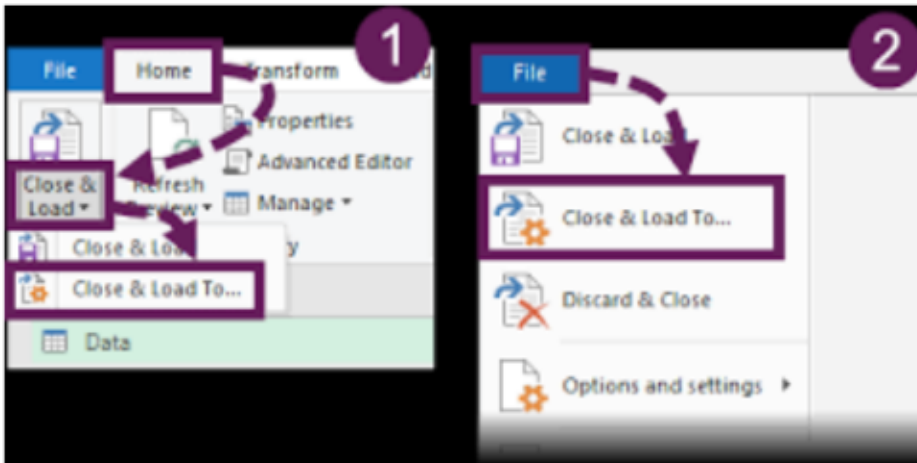
The "Column From Example" transformation enables you to create new columns by providing examples of the data you want to generate. You specify a few examples in the desired format, and Power Query generates the transformation logic for you.

This is a helpful feature for creating calculated columns or performing complex data transformations without writing custom code.



Step 4: Loading Data from Power Query to Power BI Desktop

Once you have extracted and transformed your data in Power Query, you can load it into Power BI Desktop to create your reports and visualizations.



Here's how to do it:

- With your query open in Power Query, click on the "Close & Load" button in the "Home" tab of the ribbon. This will load your data into Power BI Desktop.
- Your loaded data will now appear in the "Fields" pane on the right side of the Power BI Desktop window. You can use these fields to create visualizations and reports.



Step 5: Data Modeling in Power BI Desktop

Data modeling in Power BI is the process of structuring and organizing your data to create a logical and efficient foundation for reporting, analysis, and visualization. It involves defining tables, relationships, calculations, and hierarchies to ensure data accuracy, consistency, and relevance in your Power BI reports. Here's why data modeling in Power BI is needed, in short:

Why Data Modeling in Power BI is Needed:

Data Organization: Data modeling organizes raw data into structured tables, making it easier to work with and understand.

Relationships: It establishes relationships between tables, allowing you to combine data from different sources or tables for analysis.

Context: Data modeling adds context to your data by creating dimension tables with descriptive attributes and fact tables with measures.

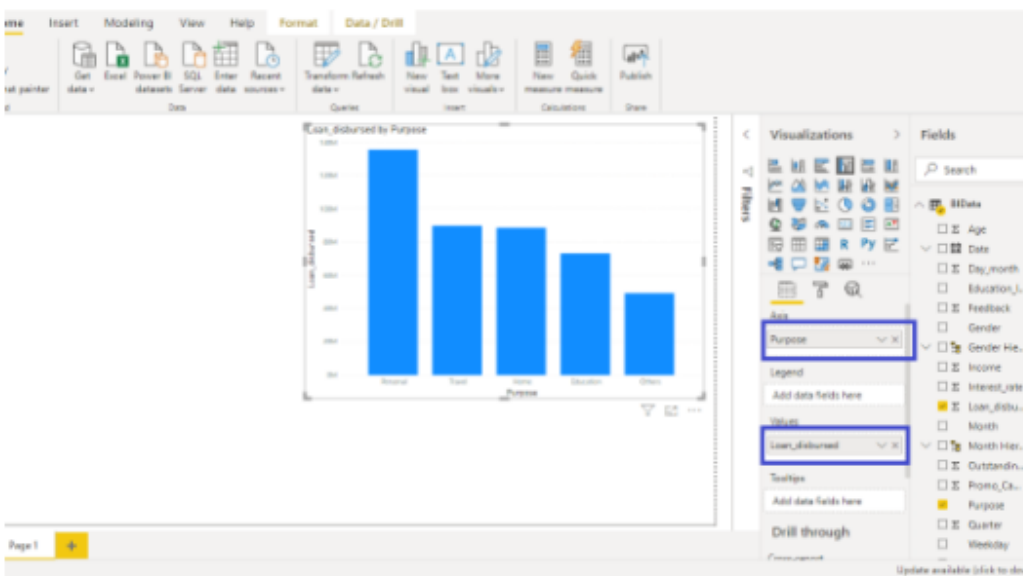
Performance: A well-designed data model enhances query performance, ensuring that reports and dashboards load quickly.



A Comprehensive Guide to 30 Default Charts in Power BI

In Power BI, charts are an essential part of creating impactful reports that help businesses make data-driven decisions. Power BI offers a variety of default charts that can be used to visualize different types of data. In this section, we'll go through all 30 default charts in Power BI and when to use them.

Column Charts



Column charts are one of the most commonly used chart types in data visualization, and they are ideal for showing changes in data over time. Power BI Desktop provides several column chart types, including:



Clustered Column Chart:

Explanation:

A clustered column chart displays data using vertical bars for different categories or series, with each category having its set of columns side by side. It's suitable for comparing values within the same category across multiple series.

Why to Use It:

- Use clustered column charts when you want to compare values for different categories (e.g., months, products, regions) within the same series.
- Ideal for showing the distribution and variation of data points across categories.
- Helps identify trends, disparities, or patterns among categories.

When to Use It:

Use clustered column charts when comparing sales figures for different months or evaluating the performance of products in various regions.

How to Use It:

Drag the categorical field (e.g., months, products) to the Axis area and the numerical field (e.g., sales) to the Values area in Power BI visuals. Power BI will automatically create a clustered column chart.



Stacked Column Chart:

Explanation:

A stacked column chart represents data with vertical bars, but each bar is divided into segments to show the contribution of different categories to the whole. It's useful for illustrating the composition of a total value.

Why to Use It:

Use stacked column charts to visualize the composition of a total, showing how individual components contribute to the whole.

Effective for showing part-to-whole relationships and percentage breakdowns.

When to Use It:

Use stacked column charts to display the composition of sales by product categories for different months.

How to Use It:

Similar to the clustered column chart, place the categorical field on the Axis and the numerical field on the Values area. Power BI will create a stacked column chart.



Stacked Column Chart with 100% Scale:

Explanation:

This chart is a variation of the stacked column chart where the segments are scaled to represent 100% of the total for each category. It's helpful for comparing the relative proportions of categories across different series.

Why to Use It:

Use a stacked column chart with 100% scale when you want to emphasize the relative proportions of categories across series.

Ideal for displaying the percentage distribution of data within categories.

When to Use It:

Use it when you need to compare the percentage breakdown of sales across different product categories for various months.

How to Use It:

Create a stacked column chart first, and then in the Format options, choose the "100% Stacked" option to scale the segments to 100% for each category.



100% Stacked Column Chart:

Explanation:

A 100% stacked column chart displays each category as a vertical bar where the segments represent percentages. It's useful for comparing the distribution of categories across multiple series while keeping the total constant (100%).

Why to Use It:

Use a 100% stacked column chart when you want to emphasize the relative distribution of categories across different series while maintaining a consistent total (100%).

Effective for showing the proportional makeup of data.

When to Use It:

Use it to compare the percentage distribution of different types of expenses (e.g., rent, utilities, salaries) across multiple departments.

How to Use It:

Create a clustered column chart with the categorical field on the Axis and the numerical field on the Values area. Then, select the "100% Stacked" option in the Format options.



Column and Line Chart:

Explanation:

A column and line chart combines vertical bars (columns) with a line graph on the same chart. It's used when you want to compare two different types of data series that have different scales or units of measurement.

Why to Use It:

Use a column and line chart when you want to visualize two different sets of data with distinct scales or units.

Effective for showing relationships or trends between two related variables.

When to Use It:

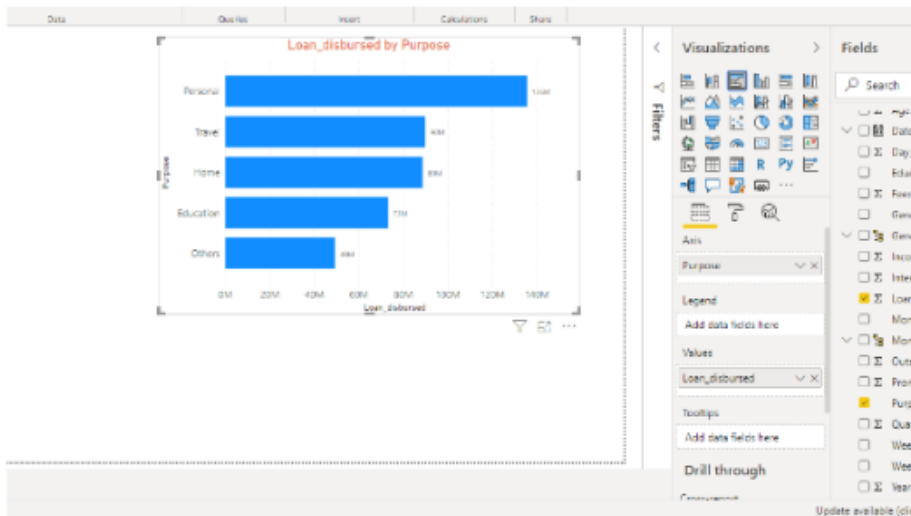
Use it to compare monthly sales (column) with monthly expenses (line) to understand the profit trend.

How to Use It:

Create a clustered column chart with the categorical field on the Axis and both numerical fields (e.g., sales and expenses) on the Values area. Then, change the chart type for one of the measures to a line chart.



Bar Charts



Bar charts are a popular chart type in Power BI and are used to visualize categorical data. They represent data in rectangular bars where the length of each bar represents the value of the data point. Bar charts can be used to compare data across different categories, identify trends, and highlight differences in data.



Clustered Bar Chart:

Explanation:

A Clustered Bar Chart is used to display data in vertical bars, where each bar represents a category or group, and the height of the bar corresponds to the value of a specific variable. Multiple bars are clustered together for side-by-side comparisons.

Why to Use:

Use Clustered Bar Charts when you want to compare values across different categories or groups, especially when there are multiple data series to be compared within each category.

When to Use:

Use it when you have categorical data and want to show how multiple measures or variables vary across categories. It's great for comparing data across different groups.



Stacked Bar Chart:

Explanation:

A Stacked Bar Chart is similar to the Clustered Bar Chart, but in this case, the bars are stacked on top of each other. Each bar is divided into segments, and each segment represents a portion of the total value, showcasing the composition within each category.

Why to Use:

Use Stacked Bar Charts when you want to visualize both the individual values within categories and the total values across categories.

When to Use:

It's effective when you want to emphasize the part-to-whole relationship within each category and across categories. It's suitable for displaying categorical data with multiple variables.



Stacked Bar Chart with 100%:

Explanation:

A Stacked Bar Chart with 100% scales the height of the bars to 100%, making it useful for displaying the relative proportions of data within each category. Each bar represents 100%, and segments within the bar show the distribution of values as percentages.

Why to Use:

Use this chart to highlight the relative composition of data within each category while normalizing them to 100% for easy comparison.

When to Use:

It's ideal for scenarios where you want to emphasize the relative contribution of each segment within categories, especially when comparing compositions.



100% Stacked Bar Chart:

Explanation:

A 100% Stacked Bar Chart is similar to the Stacked Bar Chart, but here, the bars are scaled to 100%. Each bar represents 100%, and segments show the relative distribution of values within categories.

Why to Use:

Use this chart to focus on the relative distribution and proportions of data across categories while maintaining a consistent scale.

When to Use:

It's suitable when you need to compare the distribution of data across categories and emphasize the relative composition, especially when you want to maintain consistent scaling.



Bar and Line Chart:

Explanation:

A Bar and Line Chart combines both bars and lines in a single visualization. You can represent one data series using bars and another using lines, allowing you to show the relationship between two different measures over the same categories.

Why to Use:

Use this chart when you want to visualize the correlation or trend between two different variables, where one variable is represented by bars and the other by lines.

When to Use:

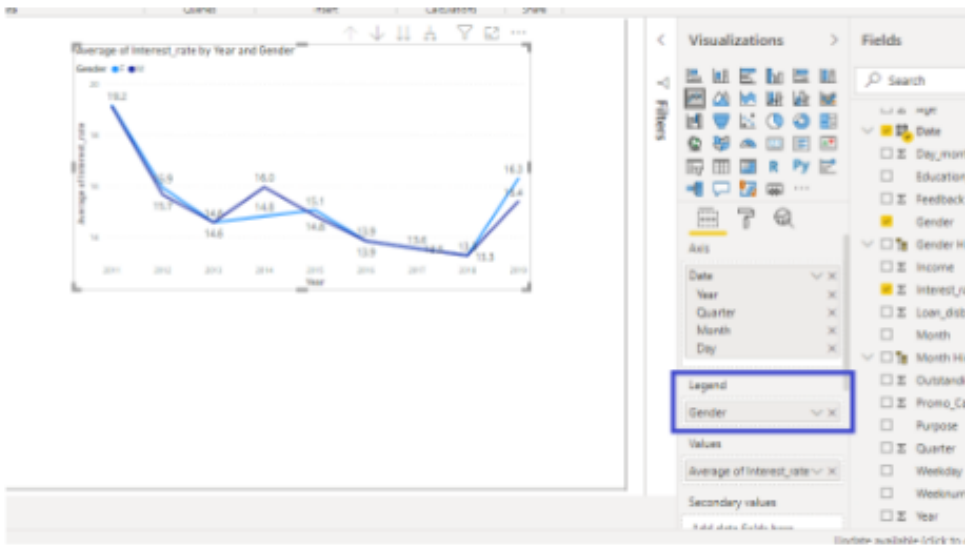
It's effective for displaying data with different units or scales, helping you understand how two variables interact or change in relation to each other.

To use these charts in Power BI, you typically follow these steps:

1. Open Power BI Desktop and load your data.
2. Drag and drop the fields you want to use for categories and values into the appropriate areas in the visualizations pane.
3. Choose the chart type you want to create from the visualization options.
4. Customize the chart by adding labels, titles, legends, and formatting options to make it more informative and visually appealing.
5. Use the "Fields" pane to add additional data series, customize colors, and apply filters to your chart as needed.



Line Chart



Line charts are useful for showing trends over time or continuous data. They are commonly used in financial, sales, and marketing reports to track data over time. Power BI offers several variations of line charts that can be used to display data in different ways.



Line Chart:

Description:

A Line Chart displays data points as markers connected by lines. It is used to visualize trends and changes in data over a continuous axis, typically time.

Why to Use It:

Use a Line Chart when you want to show how a single data series changes over time or across a continuous scale.

It is effective for displaying trends, comparisons, and identifying patterns in time-series data.

When to Use It:

Show stock price fluctuations over months.

Display temperature changes throughout the day.

Analyze website traffic by hour.

How to Use It:

Drag a date or numeric field to the Axis area.

Add a numeric field to the Values area to represent the data series.



Line and Stacked Column Chart:

Description:

This chart combines a Line Chart with a Stacked Column Chart in a single visualization. It's useful for comparing the total values of multiple data series over time, with one series represented by a line and the rest stacked as columns.

Why to Use It:

Use this chart when you need to show both individual data series (as stacked columns) and their overall trend (as a line) simultaneously. It's helpful for understanding the composition of a total value.

When to Use It:

Analyze monthly sales figures by product category, where each category contributes to the total sales.

How to Use It:

Drag a date field to the Axis area.

Add numeric fields to the Values area, including one field for the line series and others for stacked columns.



Line and Clustered Column Chart:

Description:

This chart combines a Line Chart with a Clustered Column Chart. It's suitable for comparing multiple data series over time side by side, with one series represented by a line and the rest as separate columns.

Why to Use It:

Use this chart when you want to compare different data series (e.g., products, regions) in the same visual while emphasizing the trend of one series.

When to Use It:

Compare sales performance across different product categories, with one category shown as a line and others as separate columns.

How to Use It:

Place a date field on the Axis area.

Add multiple numeric fields to the Values area, designating one as the line series and others as clustered columns.



Stacked Line Chart:

Description:

A Stacked Line Chart displays multiple data series as lines stacked on top of each other. It shows how each series contributes to the overall total.

Why to Use It:

Use this chart to compare the composition of a total value over time or across categories.

When to Use It:

Visualize the distribution of expenses over different expense categories over months.

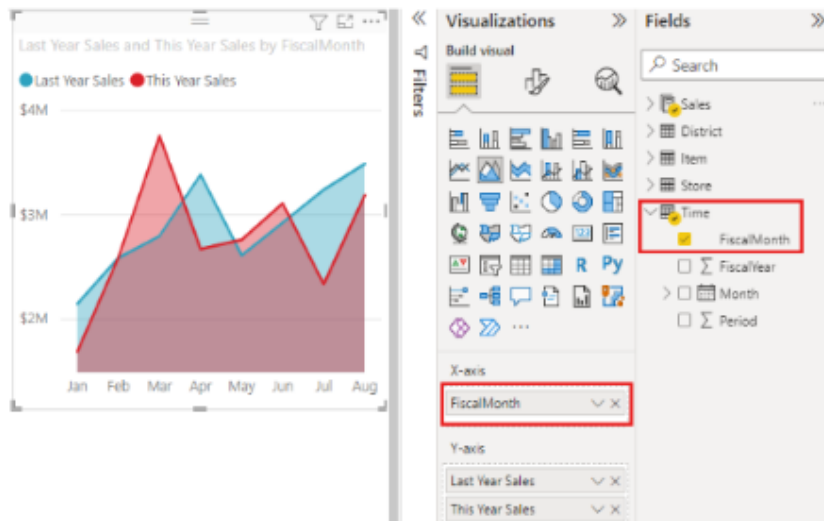
How to Use It:

Place a date field on the Axis area.

Add multiple numeric fields to the Values area, and they will be represented as stacked lines.



Area Charts



Area charts are a type of chart that displays quantitative data in a graphical manner by plotting data points and joining them with line segments to form an enclosed area. The enclosed area represents the cumulative value of the data points, making it easier to visualize the overall trend of the data. In Power BI, there are three types of area charts: area chart, stacked area chart, and 100% stacked area chart.



Area Chart:

Explanation:

An Area Chart in Power BI is a graphical representation of data that displays quantitative values as shaded areas below lines connecting data points. The area between the line and the x-axis is filled with color, helping to visualize the cumulative data. This chart type is particularly useful for showing trends over time or comparing the contribution of multiple series to a whole.

Why to Use It:

Trend Analysis: Area charts are effective for displaying trends in data over time, making them useful for time-series data.

Comparative Analysis: They allow you to compare multiple categories or series on a single chart, emphasizing the total values.

Highlighting Data: The filled area beneath the line draws attention to the magnitude of data and can help users quickly identify patterns.

When to Use It:

Use an Area Chart when you want to show how individual data series contribute to a whole over time.

Use it for visualizing cumulative data or stacked values.

How to Use It:

In Power BI, you can create an Area Chart by selecting your data fields, placing the time/date field on the x-axis, and placing the numeric values on the y-axis. Choose the "Area Chart" visualization type, and customize it by adding legends, data labels, or color schemes as needed.



Stacked Area Chart:

Explanation:

A Stacked Area Chart in Power BI is an extension of the Area Chart where multiple data series are stacked on top of each other. Each series represents a segment of the whole, and the areas between the lines represent the cumulative contribution of each series. Stacked Area Charts are useful for displaying how multiple categories or groups evolve over time while emphasizing the overall trend.

Why to Use It:

Part-to-Whole Relationships: Stacked Area Charts effectively show the composition of a whole by breaking it down into its constituent parts.

Tracking Trends: They help track changes in the distribution of data categories over time.

Comparative Analysis: Useful when comparing the contribution of different categories or groups to the whole.

When to Use It:

Use a Stacked Area Chart when you want to represent multiple categories or groups over time and show their relative proportions.

Useful for visualizing the cumulative trend of parts that make up a whole.

How to Use It:

Create a Stacked Area Chart in Power BI by selecting the appropriate data fields and placing the time/date field on the x-axis. Place the numeric values in the values area, and categorize them using the "Legend" field. Choose the "Stacked Area Chart" visualization type, and customize it as needed.



100% Stacked Area Chart:

Explanation:

A 100% Stacked Area Chart in Power BI is a variation of the Stacked Area Chart where data series are stacked, but the areas always add up to 100%. This chart type is valuable for displaying the relative proportion of each data series within the whole over time.

Why to Use It:

Relative Proportions: 100% Stacked Area Charts emphasize how each data series contributes to the whole, showing the percentage distribution.

Part-to-Whole Comparison: Useful for comparing the relative contributions of multiple categories or groups.

When to Use It:

Use a 100% Stacked Area Chart when you want to represent multiple categories or groups over time while highlighting their percentage distribution within the whole.

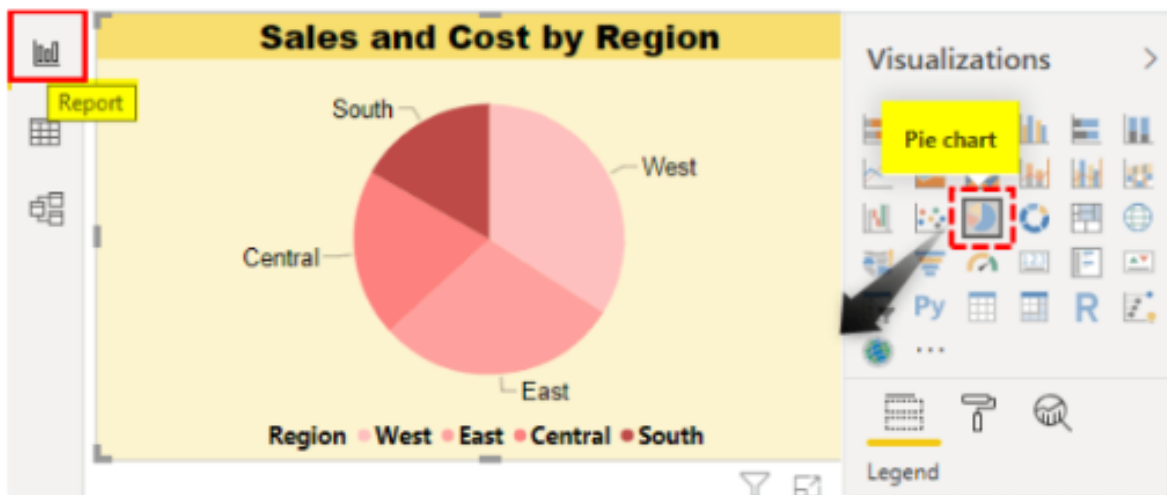
Effective for showing how the composition of data changes over time.

How to Use It:

Create a 100% Stacked Area Chart in Power BI by selecting the relevant data fields and following a similar process as the Stacked Area Chart. The key difference is that you specify the chart type as "100% Stacked Area Chart" to ensure that all areas add up to 100% of the whole.



Pie Chart:



A Pie Chart is a circular visualization that represents data as slices of a pie, where each slice (or sector) corresponds to a category or data point. The size of each slice is proportional to the value it represents relative to the whole dataset.

Key characteristics of Pie Charts in Power BI include:

Categories: Each category or data point is represented by a slice, and the chart's legend typically labels these categories.

Proportional: The area of each slice is directly proportional to the value it represents. Larger values occupy a larger portion of the pie.

Total View: Pie Charts provide an immediate visual representation of how each category contributes to the total dataset.



Pie Chart in Power BI:

Why to Use a Pie Chart in Power BI:

Comparative Analysis: Pie Charts are useful when you want to compare the relative sizes or proportions of different categories within a dataset.

Part-to-Whole Relationship: They are effective for showing the contribution of each category to the total. For example, market share, budget allocation, or sales distribution by product category.

Simplicity: Pie Charts are easy to understand and require minimal cognitive effort from viewers due to their simple and intuitive design.

When to Use a Pie Chart in Power BI:

- Use Pie Charts when you have a small number of categories (typically less than five or six) to avoid clutter and maintain clarity.
- Use them to emphasize the part-to-whole relationship and showcase the relative proportions of categories.
- Consider Pie Charts for situations where a quick visual summary of data distribution is needed, especially when you want to highlight the largest or smallest categories.

How to Use a Pie Chart in Power BI:

Prepare Data: Ensure your dataset includes categorical data and associated values or counts that you want to visualize.

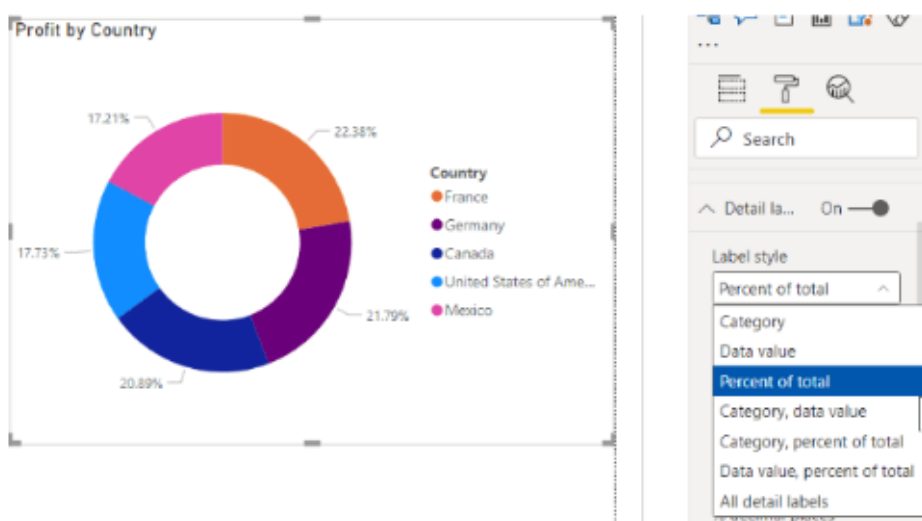
Insert a Pie Chart: In Power BI Desktop, select the Pie Chart visualization from the Visualizations pane and place it on the report canvas.

Drag Fields: Drag and drop the categorical field into the "Legend" well of the Pie Chart visual, and drag the corresponding numeric field into the "Values" well.

Customize: Customize your Pie Chart by adding labels, changing colors, adjusting the legend position, and configuring other formatting options using the Format options in the Visualizations pane.



Donut Chart:



A Donut Chart in Power BI is a circular chart that is similar to a Pie Chart but with a hole (or "donut hole") in the center.

It displays data in a segmented, circular format, with each segment representing a category or data series.

Why to Use It:

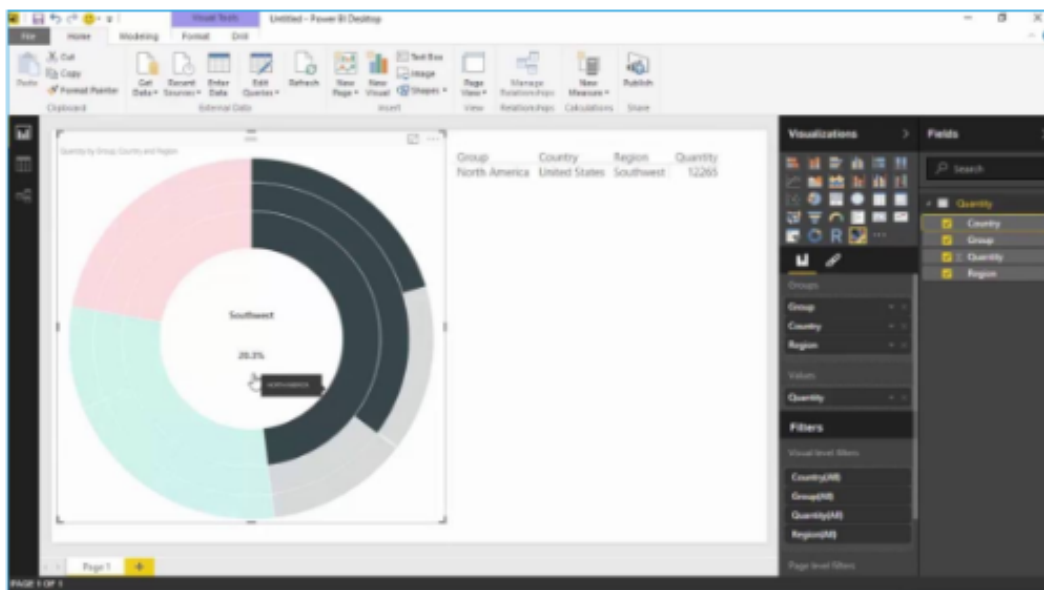
Comparison of Parts to the Whole: Donut Charts are useful for displaying the relationship between parts and the whole, making it easy to compare the contributions of different categories to a total.

Limited Categories: When you have a limited number of categories or data series (ideally less than 5-7), Donut Charts can effectively communicate the data without clutter.

Visual Appeal: Donut Charts are visually appealing and can be more engaging than traditional bar or column charts



Stacked Donut Chart:



A Stacked Donut Chart is a type of data visualization available in Power BI and other data visualization tools. It is a variation of the traditional donut chart where multiple data series are stacked on top of each other within the circular structure of the chart. Here's an explanation of the Stacked Donut Chart, why to use it, when to use it, and how to use it:

Why to Use It:

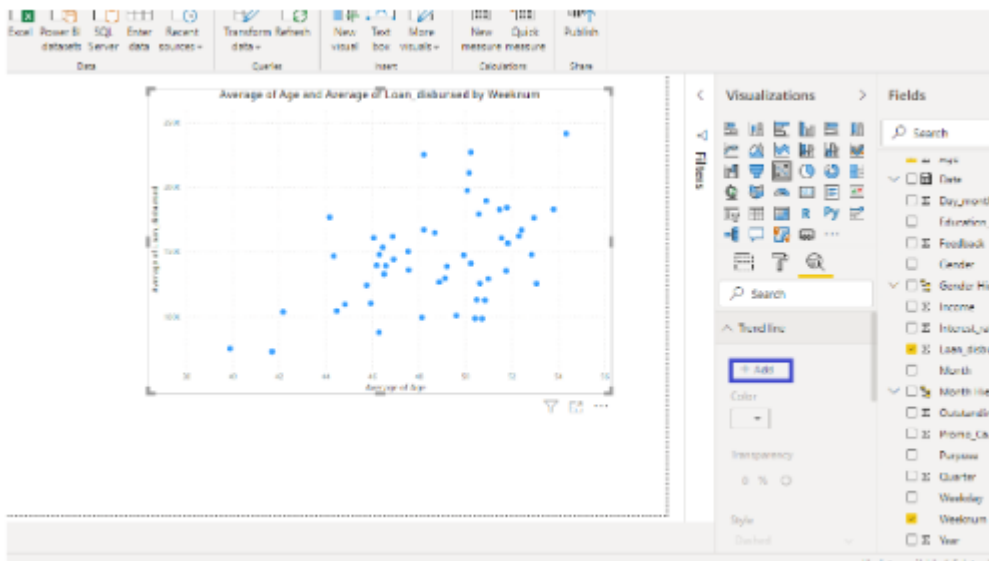
Comparison of Categories: Stacked Donut Charts are useful when you want to compare the composition of multiple categories across different data series. They provide a visual representation of how each category contributes to the total for each series.

Visualize Parts-to-Whole: These charts help illustrate the relationship between individual data points (categories) and the whole (total value). They are effective for showing the breakdown of a total into its components.

Relative Proportions: Stacked Donut Charts are suitable for showing the relative proportions of categories within each series and for making comparisons between different series.



Scatter Chart:



A Scatter Chart in Power BI is a type of visual representation that displays data points as individual markers on a two-dimensional plane. Each data point is plotted based on its values along two axes (X and Y), and the position of each marker represents the relationship between these two values. Scatter charts are effective for visualizing and analyzing relationships, correlations, patterns, and outliers in data.

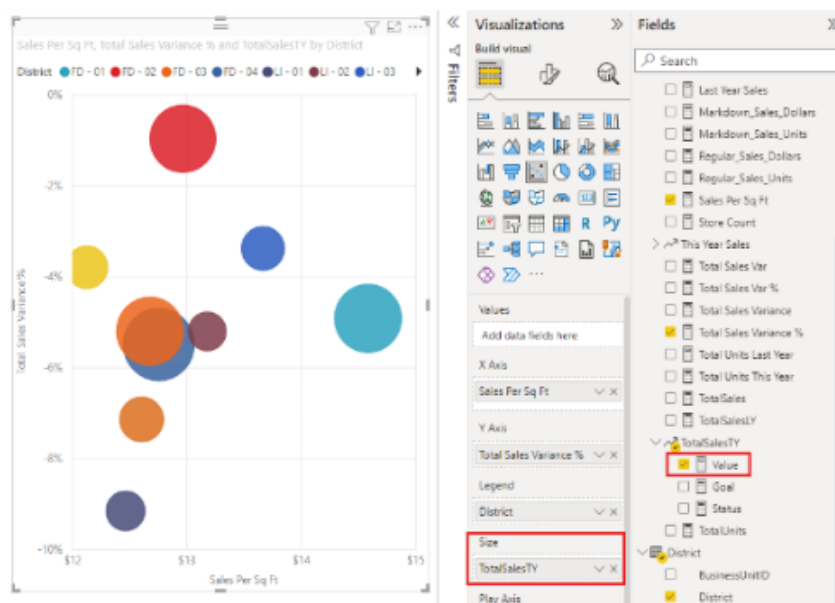
When to Use a Scatter Chart:

Use a Scatter Chart in Power BI when you want to:

- Explore and visualize the relationship between two numerical variables.
- Identify patterns, trends, or correlations in your data.
- Detect outliers or anomalies in your dataset.
- Compare data points and understand how variables interact.
- Perform multivariate analysis by encoding additional information through color, size, or shape.



Bubble Chart:



A Bubble Chart is a type of data visualization in Power BI that displays data points as bubbles on a two-dimensional XY (scatter) plot. Each bubble represents a data point with three distinct attributes:

X-Axis: The horizontal axis represents one data attribute or variable, typically a quantitative or numerical value.

Y-Axis: The vertical axis represents another data attribute or variable, also quantitative or numerical.

Bubble Size: The size of each bubble represents a third data attribute, typically a quantitative value. The larger the bubble, the higher the value.

The position of each bubble on the XY plane is determined by the values of the X and Y variables, while the bubble size represents a third dimension. Bubble Charts are particularly useful for visualizing relationships and patterns between three variables simultaneously.



Waterfall Chart:

Waterfall Chart in Power BI:

A Waterfall Chart in Power BI is a visual representation of sequential data that illustrates the incremental impact of various positive and negative factors on a starting value, ultimately arriving at a final value. It is called a "waterfall" because the chart looks like a series of cascading bars, with each bar representing a change in the value from one step to the next. Here's an explanation of the Waterfall Chart and its usage:

Why to Use a Waterfall Chart:

Change Analysis: Waterfall charts are excellent for analyzing and visualizing how a starting value evolves over time or through different factors, such as financial performance, project costs, or inventory levels.

Highlighting Contributions: They help highlight the contributions of various factors, whether positive (revenue growth, profit increase) or negative (costs, losses), to the final outcome.

Identifying Trends: Waterfall charts make it easy to identify trends, spot anomalies, and understand the flow of values from one step to another.

When to Use a Waterfall Chart:

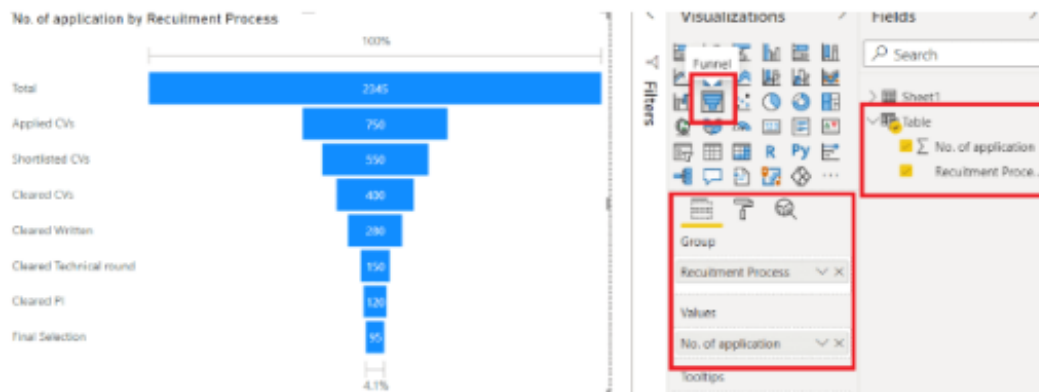
Financial Analysis: Waterfall charts are commonly used in financial reporting to show the impact of revenues, expenses, and other financial variables on net income.

Project Management: They can be used to track and visualize project budgets, expenses, and variances over time.

Sales Analysis: Waterfall charts help analyze sales performance by showing changes in revenue due to factors like new customers, churn, upsells, and discounts



Funnel Chart:



A Funnel Chart is a type of data visualization commonly used in Power BI to represent a sequence of stages in a process, with each stage showing a progressively decreasing quantity or value. Here's an explanation of the Funnel Chart, its use cases, and how to use it in Power BI

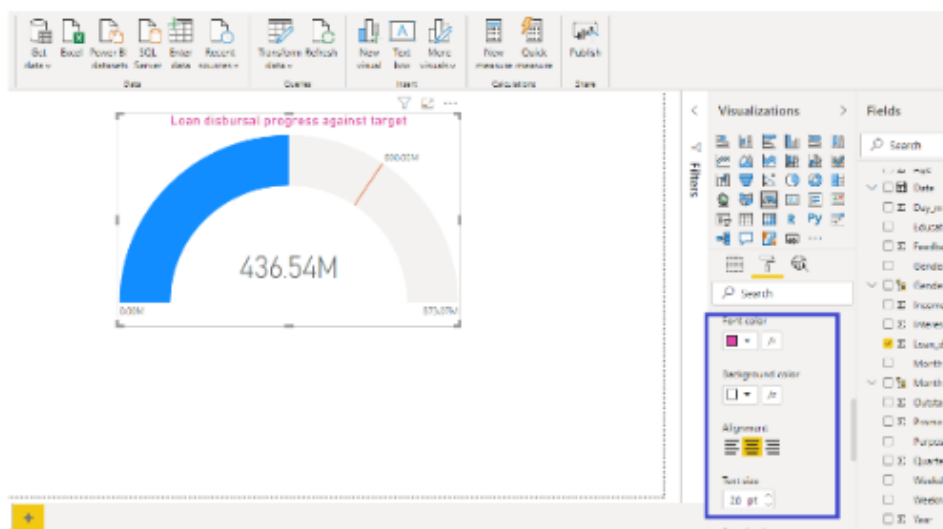
When to Use a Funnel Chart:

Use a Funnel Chart when you want to represent a sequential process with stages that involve a reduction in quantity or value from one stage to the next.

It's effective for visualizing conversion rates, sales pipelines, or any process with a series of steps



Gauge Chart:



A Gauge Chart is a type of data visualization used in Power BI that resembles a speedometer or gauge found on instruments like car dashboards. It typically consists of a circular or semi-circular dial with a needle or pointer indicating a value on a scale. The gauge chart is used to display a single value within a specific range and provides a visual representation of how that value compares to predefined thresholds or targets.

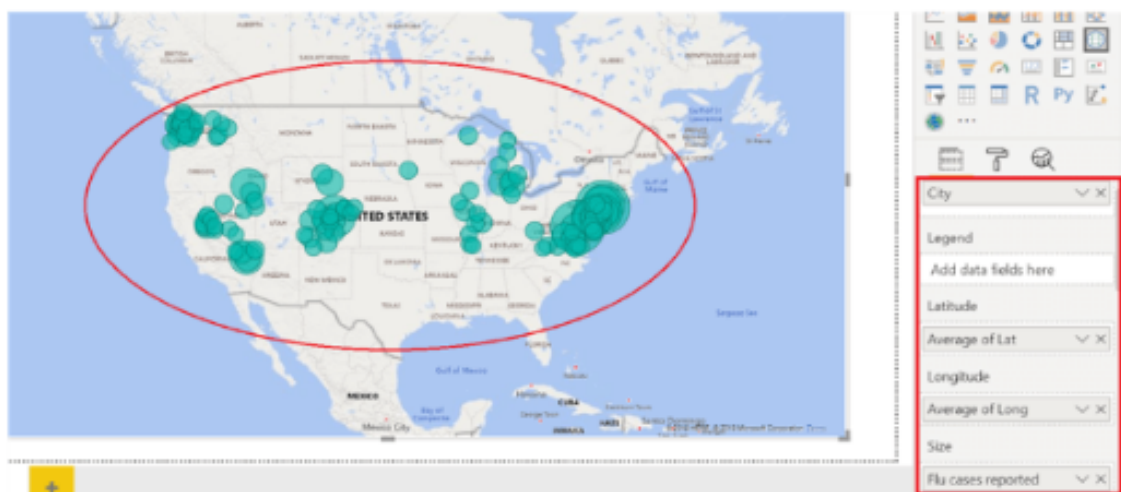
Why to Use Gauge Charts:

Single-Value Emphasis: Gauge charts are ideal for highlighting a single key performance indicator (KPI) or metric. They draw attention to a specific value, making it the focal point of the visualization.

Threshold Comparison: They allow you to compare the value against predefined thresholds or targets. Users can quickly assess whether the value is within an acceptable range, above a target, or below a threshold.



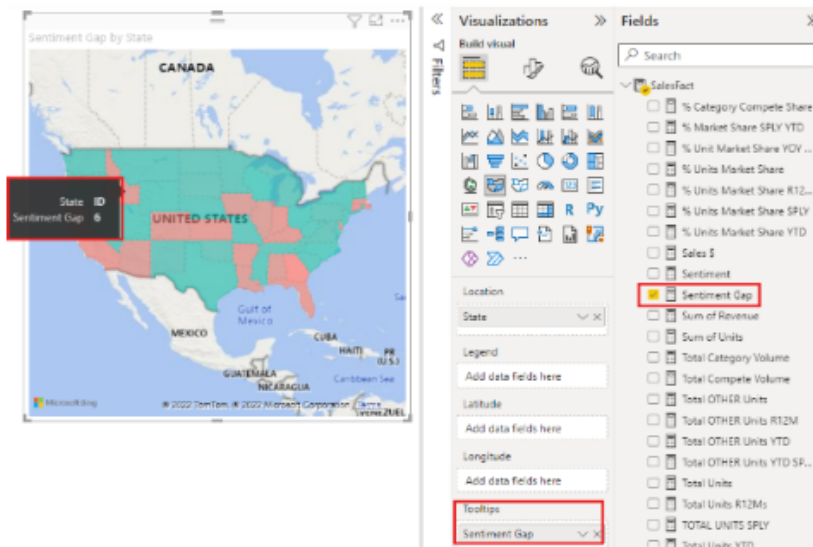
Map Chart:



A Map Chart in Power BI is a visualization that displays data points on a map, allowing you to visualize geographic patterns and relationships within your data. It uses geographic coordinates or location data to plot points, shapes, or areas on the map.



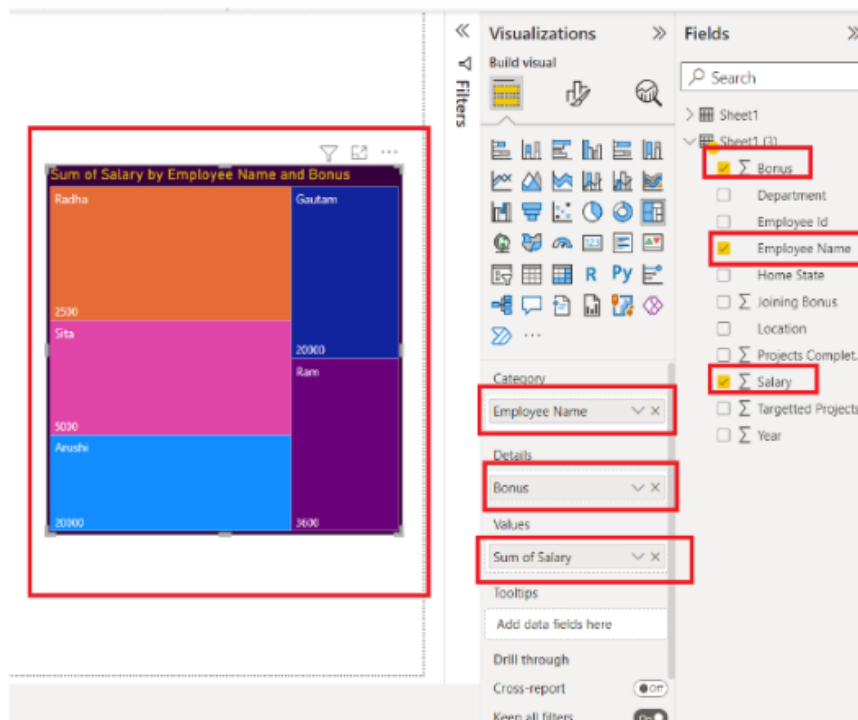
Filled Map Chart:



A Filled Map chart in Power BI is a type of data visualization that displays geographical data using filled regions or shapes on a map. Each region or shape is color-coded based on a numeric value, allowing you to visualize data patterns and variations across different geographic areas.



Treemap Chart:



A Treemap Chart is a data visualization in Power BI that displays hierarchical data as nested rectangles, where each rectangle represents a category or subcategory of data. These rectangles are sized and colored based on a chosen measure, providing an intuitive way to visualize and compare data hierarchies.



Step 6: DAX

DAX (Data Analysis Expressions) in Power BI:

DAX, which stands for Data Analysis Expressions, is a powerful and formula language used in Power BI and other Microsoft products like Excel and Analysis Services. DAX is specifically designed for working with tabular data models, allowing users to create custom calculations, aggregations, and expressions to derive insights from their data. DAX functions and formulas are used to manipulate and transform data within Power BI, making it a fundamental component for data modeling, analysis, and creating dynamic reports and dashboards.

Why and When to Use DAX in Power BI:

Custom Calculations: DAX enables users to create custom calculations and measures that are not available in the source data. This is invaluable for businesses with unique metrics and KPIs that require tailored calculations.

Aggregations: DAX is essential for aggregating data to summarize information. You can calculate sums, averages, counts, percentages, and more using DAX functions, making it crucial for creating meaningful reports and dashboards.



Calculated Table

A Calculated Table in Power BI is a user-defined table that you create within your data model using DAX (Data Analysis Expressions) formulas. Unlike regular tables, which store data imported from a data source, a calculated table is generated on the fly based on a DAX expression. It allows you to define custom tables by specifying criteria, conditions, or calculations, and it refreshes dynamically as data changes in the source tables.

Calculated Column

A Calculated Column in Power BI is a user-defined column that you create within a table in your data model. Unlike regular columns in a table, which are populated with data from the data source, a calculated column is derived from a calculation or expression that you define. It contains values computed based on a formula you specify using the DAX (Data Analysis Expressions) language.

Measure

A Calculated Measure in Power BI is a user-defined computation or calculation that is performed on the data within a data model. Unlike regular measures, which are typically based on straightforward aggregations like sums or averages, calculated measures allow you to create custom calculations using the DAX (Data Analysis Expressions) language. Calculated measures are particularly useful when you need to perform complex calculations, create custom Key Performance Indicators (KPIs), or derive insights that are not available directly from the data source.



Calendar Table

Calendar Table:

A Calendar Table, also known as a Date Dimension or Time Table, is a specialized table in a data model that contains a continuous and comprehensive list of dates. Typically, it covers a range of dates, starting from the earliest date in your dataset to the latest date. Calendar tables are essential for time-based analysis, reporting, and data modeling. They provide a consistent framework for organizing and analyzing data related to dates, such as sales, events, and trends.

CalendarAuto Function:

The CALENDARAUTO function is a DAX function in Power BI and other tools that automatically generates a calendar table. It creates a date table with a predefined range of dates, eliminating the need to manually input date values or import them from an external source. The CALENDARAUTO function simplifies the process of creating a basic calendar table when you have a date column in your data source.

To create a calendar table using the CALENDARAUTO function, follow these steps:

- Click on the "New Table" button in the "Modeling" tab.
- Enter the following formula:
- `Calendar = CALENDARAUTO()`
- Click "Enter" to create the calendar table..

The function will generate a calendar table with dates ranging from the specified start date ("2023-01-01" in this example) to the specified end date ("2023-12-31" in this example). The table will include columns like Date, Year, Month, Quarter, and more.



DAY, MONTH, YEAR, QUARTER, TODAY, WEEKDAY

DAX provides several functions that can be used to extract different parts of a date, such as the day, month, year, quarter, and weekday. These functions are often used in conjunction with a calendar table to perform time-based calculations and analysis. These functions can be used in calculated columns, measures, and other DAX formulas to perform time-based calculations and analysis.

Here are some examples of DAX functions that can be used to extract date-related information:

DAY Function:

The DAY function is used to extract the day of the month from a date value.

Syntax: DAY(date)

Example: DAY('DateColumn') returns the day component of the date in the 'DateColumn'.

MONTH Function:

The MONTH function is used to extract the month from a date value. It returns a number representing the month (1 for January, 2 for February, and so on).

Syntax: MONTH(date)

Example: MONTH('DateColumn') returns the month component of the date in the 'DateColumn'.

YEAR Function:

The YEAR function is used to extract the year from a date value.

Syntax: YEAR(date)

Example: YEAR('DateColumn') returns the year component of the date in the 'DateColumn'.

QUARTER Function:

The QUARTER function is used to extract the quarter of the year from a date value. It returns a number (1, 2, 3, or 4) representing the quarter.

Syntax: QUARTER(date)

Example: QUARTER('DateColumn') returns the quarter of the year for the date in the 'DateColumn'.



Basic Dax Functions

Basic DAX (Data Analysis Expressions) functions in Power BI and other DAX-supported tools are fundamental building blocks for creating calculations, aggregations, and expressions to manipulate data in your data models. These functions cover a wide range of operations, from simple arithmetic calculations to date and time manipulation.

Aggregation Functions: [SUM, AVERAGE, MAX, MIN, COUNT, DISTINCT COUNT]

Aggregation functions in DAX are used to calculate the sum, average, maximum, minimum, count, and distinct count of a column or expression. These functions are often used in calculated columns, measures, and other DAX formulas to perform calculations on data.

Here are some examples of DAX aggregation functions:

SUM Function:

The SUM function calculates the total sum of numeric values in a column or a table.

Syntax: SUM(table[column])

Example: SUM(Sales[Revenue]) calculates the total revenue from the Sales table, summing up all revenue values.

AVERAGE Function:

The AVERAGE function calculates the mean (average) of numeric values in a column or a table.

Syntax: AVERAGE(table[column])

Example: AVERAGE(Orders[Quantity]) computes the average quantity ordered in the Orders table.



MAX Function:

The MAX function returns the maximum (largest) value from a column or a table.

Syntax: MAX(table[column])

Example: MAX(Products[Price]) provides the highest product price from the Products table.

MIN Function:

The MIN function returns the minimum (smallest) value from a column or a table.

Syntax: MIN(table[column])

Example: MIN(Sales[OrderDate]) returns the earliest order date from the Sales table.

COUNT Function:

The COUNT function counts the number of rows in a table or the number of non-blank values in a column.

Syntax: COUNT(table[column])

Example: COUNT(Customer[CustomerID]) counts the unique customer IDs in the Customer table.

DISTINCT COUNT Function:

The DISTINCT COUNT function counts the number of distinct (unique) values in a column or a table.

Syntax: COUNTROWS(VALUES(table[column]))

Example: COUNTROWS(VALUES(Product[Category])) counts the number of distinct product categories.



Iterative Function: - [SUMX, AVERAGEX, MAXX, MINX, COUNTX]

Iterative functions in DAX are used to perform calculations on a table or a column row by row. These functions are often used in calculated columns, measures, and other DAX formulas to perform complex calculations on data.

Here are some examples of DAX iterative functions:

SUMX Function:

The SUMX function iterates through a table and calculates the sum of a specified expression for each row. It then returns the sum of these individual row-level results.

Syntax: SUMX(table, expression)

Example: SUMX(Sales, Sales[Quantity] * Sales[UnitPrice]) calculates the total sales revenue by multiplying quantity and unit price for each row in the Sales table and summing up these individual results.

AVERAGEX Function:

The AVERAGEX function iterates through a table and calculates the average of a specified expression for each row. It then returns the average of these individual row-level results.

Syntax: AVERAGEX(table, expression)

Example: AVERAGEX(Orders, Orders[TotalAmount]) calculates the average total order amount for each order in the Orders table.



MAXX Function:

The MAXX function iterates through a table and calculates the maximum value of a specified expression for each row. It then returns the maximum value among these individual row-level results.

Syntax: MAXX(table, expression)

Example: MAXX(Products, Products[UnitsInStock]) finds the maximum units in stock among all products in the Products table.

MINX Function:

The MINX function iterates through a table and calculates the minimum value of a specified expression for each row. It then returns the minimum value among these individual row-level results.

Syntax: MINX(table, expression)

Example: MINX(Sales, Sales[Profit]) determines the minimum profit among all sales transactions in the Sales table.

COUNTX Function:

The COUNTX function iterates through a table and counts the number of rows for which a specified expression evaluates to a non-blank value. It returns the count of such rows.

Syntax: COUNTX(table, expression)

Example: COUNTX(Customer, Customer[LastPurchaseDate]) counts the number of customers who have a recorded last purchase date in the Customer table.



Logical Function: – [IF, Switch, AND, OR, NOT, TRUE, FALSE]

Logical functions in DAX are used to evaluate logical expressions and return true or false values. These functions are often used in calculated columns, measures, and other DAX formulas to perform conditional calculations and analysis on data.

Here are some examples of DAX logical functions:

IF Function:

The IF function evaluates a specified condition and returns one value if the condition is true and another value if it's false.

Syntax: IF(logical_test, value_if_true, value_if_false)

Example: IF(Sales[Revenue] > 1000, "High", "Low") categorizes revenue as "High" or "Low" based on a condition.

SWITCH Function:

The SWITCH function evaluates an expression and returns a value based on multiple conditions. It works similar to a series of nested IF statements but provides a more concise and readable way to handle multiple conditions.

Syntax: SWITCH(expression, value1, result1, value2, result2, ...)

Example: SWITCH(Products[Category], "Electronics", "High-Tech", "Clothing", "Apparel", "Books", "Literature", "Other") categorizes product categories into broader categories.



AND Function:

The AND function checks whether all specified conditions are true. It returns TRUE if all conditions are true; otherwise, it returns FALSE.

Syntax: AND(condition1, condition2, ...)

Example: AND(Sales[Quantity] > 0, Sales[Profit] > 0) checks if both quantity and profit are positive.

OR Function:

The OR function checks whether at least one of the specified conditions is true. It returns TRUE if at least one condition is true; otherwise, it returns FALSE.

Syntax: OR(condition1, condition2, ...)

Example: OR(Customer[Status] = "Active", Customer[Status] = "Pending") checks if the customer status is either "Active" or "Pending."

NOT Function:

The NOT function negates a logical condition. It returns TRUE if the condition is false and FALSE if the condition is true.

Syntax: NOT(logical_condition)

Example: NOT(Sales[Cancelled]) checks if a sale is not canceled.

TRUE Function:

The TRUE function returns the logical value TRUE.

Syntax: TRUE()

Example: TRUE() simply returns TRUE.

FALSE Function:

The FALSE function returns the logical value FALSE.

Syntax: FALSE()

Example: FALSE() simply returns FALSE.



Calculate

The CALCULATE function is one of the most important functions in DAX, as it allows you to modify the context in which a formula is evaluated. The context is the set of filters and relationships that determine which rows and columns are included in a calculation. The CALCULATE function allows you to temporarily modify this context to perform more complex calculations and analysis. The syntax of the CALCULATE function is as follows: CALCULATE(, , ...) The argument is the calculation or measure that you want to modify, and the , , etc. arguments are the filters that you want to apply to the expression. The filters can be column filters, row filters, or other types of filters that are applied to the data model.

The CALCULATE function can be used to perform a variety of calculations and analysis, such as:

The syntax of the CALCULATE function is as follows:

CALCULATE(<expression>, <filter1>, <filter2>, ...)

The <expression> argument is the calculation or measure that you want to modify, and the <filter1>, <filter2>, etc. arguments are the filters that you want to apply to the expression. The filters can be column filters, row filters, or other types of filters that are applied to the data model.



Other Important DAX Functions

All Function

The ALL function in DAX (Data Analysis Expressions) is a powerful and versatile function used in Power BI, Power Pivot (Excel), and Analysis Services Tabular models. Its primary purpose is to alter or remove filters applied to a table or a column, allowing you to perform calculations or aggregations on the entire table or a specific column, regardless of any applied filters or context.

The basic syntax of the ALL function is as follows:

ALL([TableNameOrColumnName], [ColumnName1], [ColumnName2], ...)

[TableNameOrColumnName] (optional): Specifies the table or column from which you want to remove filters. If omitted, it defaults to the current table or column in the context of the calculation.

[ColumnName1], [ColumnName2], ... (optional): You can specify one or more columns to remove filters from. This is useful when you want to maintain some filters but remove others.

Here's an example of how to use the ALL function:

You can use ALL to remove filters from a single column. For example, suppose you have a table named "Sales" and you want to calculate the total sales for a specific product, regardless of any filters applied to other columns:

```
Total Sales (All Products) =  
CALCULATE(  
    SUM(Sales[SalesAmount]),  
    ALL(Sales[Product])  
)
```



ALL EXCEPT

The ALL EXCEPT function in DAX (Data Analysis Expressions) is used to remove specific filters from a table or column while retaining other filters. It's particularly helpful when you want to perform calculations or aggregations on a table or column while excluding certain values or criteria. You specify the columns from which you want to remove filters using the ALL EXCEPT function, and any filters on those columns will be removed while filters on other columns remain in effect.

Here's the basic syntax of the ALL EXCEPT function:

**ALL EXCEPT([TableNameOrColumnName], [ColumnName1],
[ColumnName2], ...)**

[TableNameOrColumnName]: Specifies the table or column from which you want to remove filters.

[ColumnName1], [ColumnName2], ...: You can list one or more columns that you want to exclude from the removal of filters.

Here's an example of how to use the ALL Except function:

You can use ALL EXCEPT to remove filters from a single column while retaining filters on specific values within that column. For example, suppose you have a table named "Sales" and you want to calculate the total sales for a specific product but exclude a particular product category:

**Total Sales (Product, Except Category) =
CALCULATE(
 SUM(Sales[SalesAmount]),
 ALL EXCEPT(Sales[Product], Sales[Category]),
 Sales[Category] = "ExcludeCategory"
)**



ALLSELECTED

The ALLSELECTED function in DAX (Data Analysis Expressions) is used to remove filters from a table or column while preserving the context created by user selections or slicers in a Power BI report or Excel PivotTable. It allows you to perform calculations or aggregations on a table or column while considering the filters applied by users, providing a way to override certain filters while keeping others intact.

Here's the basic syntax of the ALLSELECTED function:

ALLSELECTED([TableNameOrColumnName])

[TableNameOrColumnName]: Specifies the table or column from which you want to remove filters. If you omit this argument, the function uses the current table or column in the context of the calculation.

Here's an example of how to use the ALLSELECTED function:

One of the primary use cases for ALLSELECTED is to calculate aggregations or measures while considering user selections or slicers. For example, suppose you have a table named "Sales" and users can select specific products and regions using slicers.

You want to calculate the total sales for the selected products while ignoring any filters on the "Region" column:

```
Total Sales (Selected Products) =  
CALCULATE(  
    SUM(Sales[SalesAmount]),  
    ALLSELECTED(Sales[Region])  
)
```



Time Intelligence with DAX

What are Time Intelligence Functions?

Time Intelligence Functions in DAX (Data Analysis Expressions) are a set of functions used to perform calculations and aggregations on date and time-based data. These functions are particularly useful for analyzing data that has a temporal dimension, such as sales data, financial data, or any dataset with date-related information. Time Intelligence Functions enable you to extract valuable insights from your data by making it easier to create time-based calculations and comparisons.

Time Intelligence Functions are used in data analysis to perform various calculations and analyses on data that has a temporal dimension, such as date or time-related data. These functions are particularly valuable because they enable you to gain insights and make data-driven decisions based on time-based patterns and trends.



Some commonly used Time Intelligence Functions include:

- **CLOSINGBALANCEMONTH:** Evaluates the expression at the last date of the month in the current context.
Syntax: CLOSINGBALANCEMONTH(<expression>,<dates>[,<filter>])
- **CLOSINGBALANCEQUARTER:** Evaluates the expression at the last date of the quarter in the current context.
Syntax: CLOSINGBALANCEQUARTER(<expression>,<dates>[,<filter>])
- **CLOSINGBALANCEYEAR:** Evaluates the expression at the last date of the year in the current context.
Syntax: CLOSINGBALANCEYEAR(<expression>,<dates>[,<filter>][, <year_end_date>])
- **DATEADD:** Returns a table that contains a column of dates, shifted either forward or backward in time by the specified number of intervals from the dates in the current context.
Syntax: DATEADD(<dates>,<number_of_intervals>,<interval>)
- **DATESBETWEEN:** Returns a table that contains a column of dates that begins with a specified start date and continues until a specified end date. This function is suited to pass as a filter to the CALCULATE function. Use it to filter an expression by a custom date range.
Syntax: DATESBETWEEN(<Dates>, <StartDate>, <EndDate>)



USERELATIONSHIP Function

The USERELATIONSHIP function in DAX (Data Analysis Expressions) is used to temporarily override the active relationships between tables in a data model when performing calculations. It allows you to specify a different relationship to be used for a particular calculation or expression, thereby giving you more flexibility in your data analysis.

Here's the basic syntax of the USERELATIONSHIP function:

USERELATIONSHIP(fromTable[fromColumn], toTable[toColumn])

fromTable: The name of the table from which you want to start the relationship.

fromColumn: The name of the column in the fromTable to be used as the starting point of the relationship.

toTable: The name of the table to which you want to establish the relationship.

toColumn: The name of the column in the toTable to be used as the end point of the relationship.



Step 7: REPORT

Building Report (Working on Project)

To build a report in Power BI, you can follow these general steps:

Step 1: Connect to Your Data Source and Import Data

- In Power BI, you begin by connecting to your data source, which could be a database, Excel file, online service, or other data repositories.
- You import the data into Power BI's data model, where you can transform, shape, and clean the data as needed.
- You can create relationships between tables if your data comes from multiple sources.

Step 2: Create Visuals

- Once your data is imported, you start creating visuals to represent your data.
- Power BI offers a wide range of visualization types, including bar charts, line charts, pie charts, tables, maps, and more.
- You choose the visual type that best conveys the information you want to communicate.



Step 3: Arrange Visuals on the Report Canvas

- You arrange the visuals on the report canvas, which is like a blank canvas where you design your report.
- You can use gridlines, rulers, and snapping to align and position visuals precisely.
- Think about the logical flow of the report and how visuals should be organized for clarity.

Step 4: Add Filters and Interactive Elements

- To make your report interactive, you can add filters, slicers, and other elements that allow users to explore and drill down into the data.
- Filters let users select specific data points or time periods, and slicers provide interactive filtering options.
- You can create cross-filtering relationships between visuals to maintain data consistency.

Step 5: Customize the Report Appearance

- To enhance the report's visual appeal and consistency, you can customize its appearance.
- You can apply themes to change the overall look and feel, change fonts, colors, and backgrounds, and add logos or branding elements.
- Customization helps create a report that aligns with your organization's style and branding.



Preview and Adjust

- Throughout the report-building process, you can continuously preview the report to see how it looks and functions.
- Make adjustments, fine-tune visuals, and refine interactivity as needed to improve the user experience.

Publish or Share the Report

- Once your report is complete and you're satisfied with how it looks and functions, you have several options to share it:
- You can publish it to the Power BI service, where others can access it online.
- You can create a dashboard in the Power BI service to combine multiple reports and visuals.
- You can share the report with specific individuals or groups, controlling their level of access and permissions.



Inserting Text Boxes, Shapes, and Images

Power BI allows you to add text boxes, shapes, and images to your report to provide additional context or visual interest.

Step 1: Choose the Text Box, Shape, or Image Tool

To get started, go to the "Insert" tab on the Power BI ribbon.

From the "Insert" tab, select the tool you want to add: Text Box, Shape, or Image.

Each tool serves a specific purpose:

Text Box: Used to insert text, labels, or explanations within your report.

Shape: Used to add geometric shapes like rectangles, circles, or arrows for emphasis or separation.

Image: Used to insert images, logos, icons, or pictures relevant to your report.

Step 2: Drag and Drop onto the Report Canvas

- After selecting the tool, simply click and drag it onto the report canvas. The canvas is where you design your report layout.
- Position the element where you want it to appear in your report. You can resize it as needed.



Step 3: Customize the Element

Once the element is on the canvas, you can customize it to meet your needs:

- For a Text Box, you can click within it to enter and format text, adjust the font size and style, set text color, and choose alignment options.
- For a Shape, you can select the shape to change its fill color, border color, line style, and other formatting options.
- For an Image, you can browse for an image file on your computer or provide a web URL. You can also adjust the size and position of the image.

Formatting Options in the Visualizations Pane

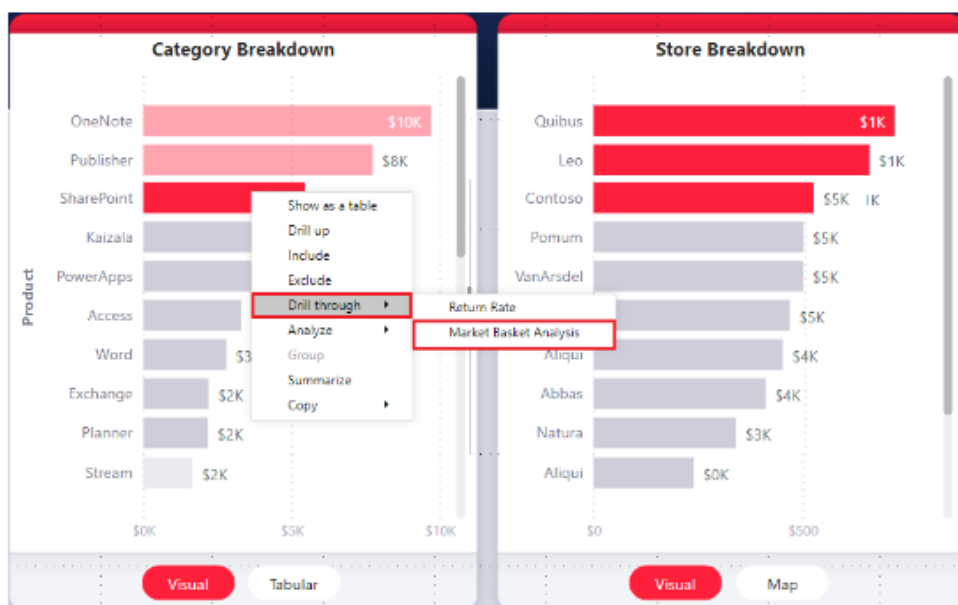
- In addition to direct customization, you can use the Visualizations pane to fine-tune the appearance of these elements further:
- For text boxes, you can change font settings, alignment, and padding.
- For shapes, you can modify the color, border style, and shadow effects.
- For images, you can control aspect ratio, alignment, and cropping.



Drill Through

Drill Through is a powerful feature in Power BI that allows users to explore detailed information or sublevels of data from a visual by clicking on a data point. It enables users to navigate from a high-level summary to a more detailed view of the data.

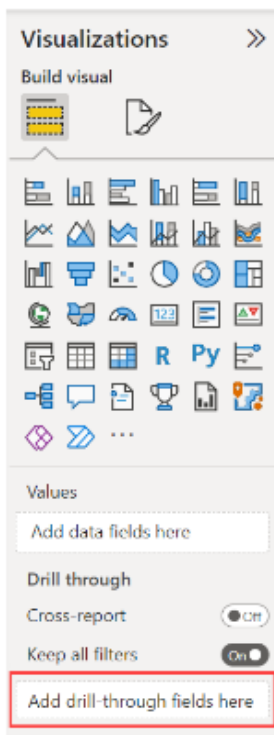
Here's how to set up drill through, pass all filters, and add a measure to the drill through in Power BI:



Setting Up Drill Through:

1.Enable Drill Through in Power BI Desktop:

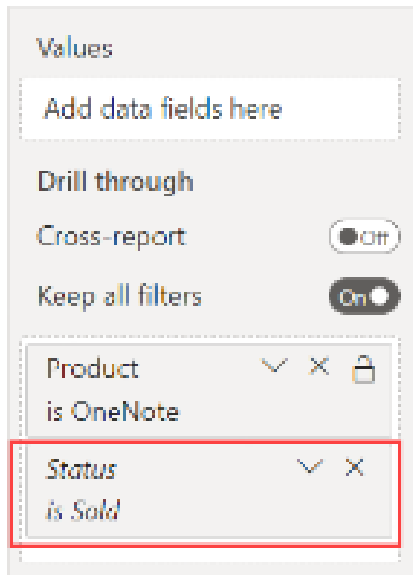
- Open your Power BI report in Power BI Desktop.
- Select the visual or element (e.g., a data point on a chart) for which you want to enable drill through.
- In the "Visualizations" pane on the right, find the "Drillthrough" icon (represented by a magnifying glass) and turn it on.



2. Define Drill Through Fields:

- In the "Fields" pane on the right, create or select a field that you want to use as a drill-through field.
- This field should contain the data you want to drill into, such as categories, subcategories, or dates.





3. Add Drill Through Page:

- Create a new report page dedicated to the drill-through experience. This page will display detailed information related to the selected data point.
- You can create this page by right-clicking on the page tabs at the bottom of Power BI Desktop and selecting "New Page."

Passing All Filters in Drill Through:

Configure Drill Through Filters:

- On the new drill-through page, you can add visuals and elements that represent the detailed information you want to display.
- Ensure that these visuals are associated with the same dataset and data model as the original report.
- Set up filters on the drill-through page to receive and respond to the drill-through field passed from the original page.
- To do this, select a visual on the drill-through page, go to the "Visualizations" pane, and use the "Filters" section to filter data based on the drill-through field.



SMART VISUALS

Custom Visuals

Custom visuals in Power BI refer to custom-designed or third-party-developed visualizations that extend the capabilities of Power BI beyond the built-in chart types and visuals. Power BI allows you to import and use custom visuals to create unique, tailored data visualizations that suit your specific reporting needs. Here's an overview of custom visuals in Power BI:

Importing Custom Visuals:

- To use custom visuals, you need to import them into your Power BI report.
- In Power BI Desktop, go to the "Visualizations" pane.
- Click on the "Import a custom visual" icon, which looks like a three-dot menu (ellipsis).
- Choose the custom visual file (in .pbviz format) that you want to add to your report.

Examples of Custom Visuals:

Word Clouds

Sankey Diagrams

Chord Diagrams

Heat Maps

Custom Gauges and KPIs

Custom Maps and Geographic Visualizations



Using Images as Chart

In Power BI, you can use images as a visual element within your report to enhance data storytelling, provide context, or simply make your report more visually appealing. While images themselves are not dynamic charts or visualizations, they can be used effectively alongside other charts and visuals. Here's how to use images as a chart or visual element in Power BI:

Adding Images to Power BI:

You can add images to your Power BI report in several ways:

- **Insert Image:** Go to the "Insert" tab in Power BI Desktop, click on "Image," and then browse and select the image file you want to use.
- **Image URL:** If the image is hosted online, you can use the "Web content" visual and specify the URL of the image.
- **Import Image Data:** If your image data is part of your dataset (e.g., as URLs or binary data), you can use custom visuals or DAX measures to display images dynamically.

Placing Images in Your Report:

- After adding an image to your report, you can place it on the report canvas like any other visual.
- Images can be resized, moved, and positioned as needed to complement your data visuals.
- You can layer images over other visuals or place them in the background to create a specific visual hierarchy.



DESIGNING REPORT

Using Power Point for Background Designing

Using PowerPoint for Background Designing:

1. **Open PowerPoint:** Launch PowerPoint and create a new blank presentation.
2. **Slide Master View:** Go to the "View" tab and click on "Slide Master" to access the Slide Master View.
3. **Design Background:** Customize the background of your slides by changing colors, applying gradients, or adding images. You can modify the background of the entire presentation or individual slide layouts.
4. **Add Graphics:** Insert graphics, logos, or shapes to enhance the background design. Position and format them as desired.
5. **Apply to Slides:** Once you're satisfied with the background design, click "Close Master View" to return to normal slide view.
6. **Apply Background:** Right-click on a slide thumbnail in the left pane, select "Format Background," and choose "Slide Master" or "Slide Layout" to apply your background design to specific slides or the entire presentation.
7. **Save and Export:** Save your presentation and export it as needed, such as a PowerPoint file, PDF, or image.



TOOLTIPS

TOOLTIPS in Power BI:

What Are Tooltips?

Tooltips in Power BI are a feature that allows you to display additional information or context when you hover over a data point or visual element in a report.

Tooltips can be used to provide detailed insights, explanations, or data values related to the content being hovered over, enhancing the interactivity and informativeness of your reports.

Why Use Tooltips?

- Tooltips enhance the user experience by providing on-demand information without cluttering the report canvas.
- They allow you to convey additional data and insights without the need for extra visuals or space, making your reports more concise.
- Tooltips are particularly useful for conveying details, such as data point values, trends, or explanations, in a user-friendly and interactive way.



How to Set Up Tooltips:

To set up tooltips in Power BI, follow these steps:

a. Select a Visual:

Open your report in Power BI Desktop and select the visual element (e.g., a chart or table) for which you want to create a tooltip.

b. Go to "Format" Pane:

In the "Visualizations" pane, navigate to the "Format" section.

c. Enable Tooltips:

In the "Format" section, find the "Tooltip" toggle switch and turn it on.

d. Define Tooltip Fields:

Below the toggle switch, you'll find the "Tooltip" options.

Choose how you want to define the tooltip content:

Field Value: Select a data field from your dataset to display its value as the tooltip.

Tooltips Page: Create a custom tooltip page (explained below).

e. Customize Tooltip Formatting:

Adjust the formatting of the tooltip, such as font size, color, and background, to match your report's style.

f. Save and Test:

Save your report and test the tooltips by hovering over the visual elements in your report.



Bookmark

What Are Bookmarks?

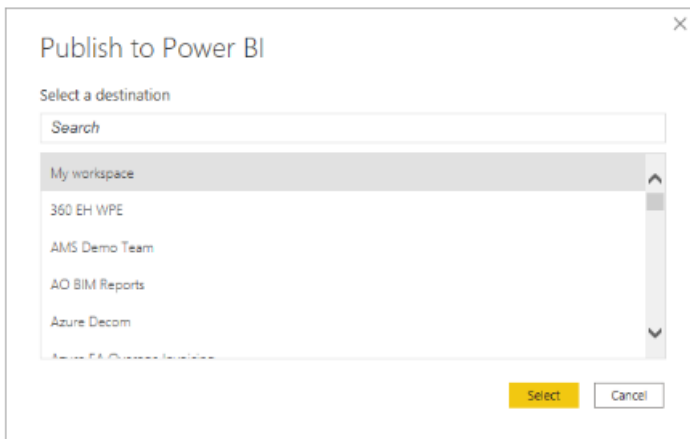
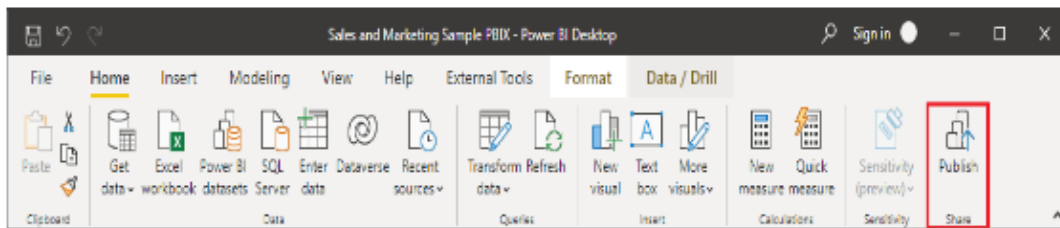
- Bookmarks in Power BI are a feature that allows you to capture and save the current state of your report, including the selection, visibility, and filters applied to visuals.
- Bookmarks act like snapshots or bookmarks in a book, enabling you to return to a specific view or state of your report with a single click.

Why Use Bookmarks?

- Bookmarks are useful for creating interactive and guided reports, presentations, or dashboards.
- They allow you to create custom navigation paths, storytelling experiences, or drill-through actions within your report.
- Bookmarks can simplify complex reports by offering users predefined views and insights without requiring them to manually adjust filters and selections.



Publish the Report to Cloud



To publish a Power BI report to the cloud and share it with others, you need to use the Power BI service (also known as Power BI Online).



Power BI Interface tour

When you log in to Power BI Service, you'll find a user-friendly interface with several key sections:

a. Navigation Pane:

- Located on the left side, the navigation pane allows you to switch between workspaces, access content, and navigate to the Power BI home page.

b. Home Page:

- The home page displays your recent dashboards and reports, making it easy to access your content.

c. Workspaces:

- Workspaces are areas where you organize and collaborate on reports, dashboards, and datasets. You can create and manage workspaces based on your needs.

d. Content List:

- In each workspace, you'll find a list of reports, dashboards, and datasets. Clicking on an item opens it for viewing and interaction.

e. Editing and Viewing Tools:

- Power BI Service provides tools for editing reports and dashboards, including the ability to make changes and add comments. You can also view and interact with reports in a reading mode.

f. Navigation Bar:

- The top navigation bar includes options for uploading content, creating reports, sharing, exporting, and more.



g. Power BI App Launcher:

- The app launcher (nine-dot grid icon) provides access to various Microsoft and Power BI-related apps and services.

h. Settings and Account Management:

- You can access settings, preferences, and account management options by clicking on your user profile picture in the upper-right corner.

i. Power BI Service Features:

- Explore and utilize features such as data refresh, sharing with collaborators, creating and editing dashboards, creating datasets, and more.

j. Mobile Access:

- You can access your Power BI content on mobile devices through the Power BI mobile app or a mobile web browser.

k. Help and Support:

- Power BI Service provides access to resources, tutorials, and support options to help you get the most out of the platform.

l. Workspaces, Datasets, Reports, and Dashboards:

- Each of these components has its dedicated sections where you can create, organize, and manage your content.



Power BI Licences

Power BI offers various licensing options to cater to the needs of different users and organizations. Each type of license comes with its own features, capabilities, and pricing. Here's an overview of the main types of Power BI licenses:

1. Power BI Free:

Use Case: This license is intended for individuals and small businesses looking to explore Power BI's basic capabilities.

Features:

- Allows creating and publishing reports and dashboards.
- Access to Power BI Desktop for report creation.
- Limited data storage and data refresh options.

When to Use: Use Power BI Free if you are an individual user or a small team that wants to get started with Power BI without incurring additional costs.

2. Power BI Pro:

Use Case: This license is designed for individual business users and small teams that require advanced sharing and collaboration features.

Features:

- All features of Power BI Free.
- Sharing and collaboration with other Power BI Pro users.
- Scheduled data refresh.
- Access to on-premises data sources.

When to Use: Choose Power BI Pro if you need to share reports and dashboards with other users, collaborate on content, or have more robust data connectivity and refresh options.



3. Power BI Premium Per User (PPU):

Use Case: Power BI Premium Per User is for users who need premium features but don't require an organization-wide Premium capacity.

Features:

- All features of Power BI Pro.
- Access to premium capabilities like paginated reports, AI, and advanced analytics.
- Higher data capacity and better performance.

When to Use: Opt for Power BI PPU if you need premium features and performance but do not require or want to share a dedicated Premium capacity with the entire organization.

4. Power BI Premium:

Use Case: Power BI Premium is suitable for large organizations or enterprises with extensive data needs and numerous users.

Features:

- All features of Power BI Pro.
- Dedicated cloud-based Premium capacity for better performance and scalability.
- Support for Power BI Report Server for on-premises report hosting.

When to Use: Consider Power BI Premium if your organization has a high volume of users, complex reports, or extensive data requirements, and you require dedicated capacity for performance and scalability.



My Workspace Vs. Workspaces Vs. Apps

Features	My Workspace	Workspaces	Power BI Apps
Definition	A personal space for an individual user in Power BI	A shared space for a group of users in Power BI	A way to share Power BI content(dashboards, reports, etc.) with users outside of your organization
Purpose	Used for personal organization and development of Power BI content	Used for collaboration and development of Power BI content among a group of users	Used for sharing Power BI content with users outside of your organization, either publicly or with specific individuals or groups
Access	Only accessible by the individual user	Accessible by a group of users who are granted access	Accessible by any user who is granted access by the app owner
Customization	Highly customizable to individual user's preferences and needs	Customizable to fit the needs of the group of users	Customizable to some extent, with options for branding and customization of the landing page
Collaboration	Not designed for collaboration among multiple users, as it's intended for personal use only	Customizable to fit the needs of the group of users	Customizable to some extent, with options for branding and customization of the landing page
Examples	Personal Power BI reports, dashboards, and datasets	Team collaboration on Power BI reports, dashboards, and datasets	Sharing Power BI content with customers, partners, or other external users.



ADVANCE POWER BI SERVICE

Gateway

In Power BI, a gateway is a crucial component that enables secure and efficient communication between Power BI and on-premises data sources or services. It allows you to connect Power BI to data that resides within your organization's network, including databases, file servers, and other data sources that are not directly accessible from the Power BI cloud service. Gateways are essential for ensuring data freshness, enabling scheduled refreshes, and maintaining security and privacy.

There are two main types of gateways in Power BI:

1. On-Premises Data Gateway:

The On-Premises Data Gateway is designed for connecting Power BI to on-premises data sources within your organization's network.

Key features include:

- **Data Source Support:** It supports a wide range of data sources, including SQL Server, Oracle, SharePoint, File Shares, and more.
- **Scheduled Refresh:** You can schedule data refreshes to keep your Power BI reports and dashboards up-to-date with the latest on-premises data.
- **Data Privacy:** It ensures data privacy and security by allowing you to configure which data sources and credentials are accessible.
- **High Availability:** You can install multiple gateways for high availability and load balancing.

Use Cases: The On-Premises Data Gateway is used when you need to connect Power BI to on-premises data sources securely, ensuring that your reports and dashboards are always based on fresh data.



2. Power BI Gateway – Personal:

The Power BI Gateway – Personal (formerly known as the Power BI Personal Gateway) is a lightweight gateway designed for individual use.

Key features include:

- **Single-User:** It is intended for individual users and is not suitable for sharing or collaboration scenarios.
- **DirectQuery:** It supports DirectQuery mode, which enables you to connect to on-premises data sources directly from Power BI Desktop.
- **Limited Data Sources:** It supports a limited set of data sources compared to the On-Premises Data Gateway.
- **No Scheduled Refresh:** It does not support scheduled refreshes or automatic data updates.

Use Cases: Power BI Gateway – Personal is primarily used by individual users who want to connect Power BI Desktop to on-premises data sources while working on their own reports. It's not suitable for sharing or collaborative scenarios.

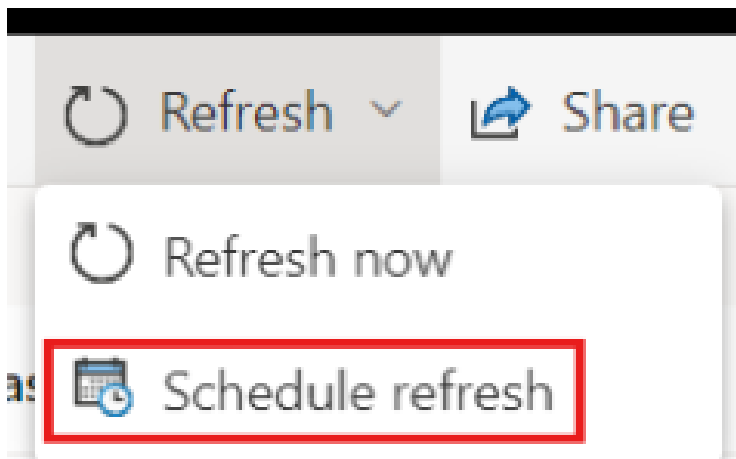
When to Use Each Gateway Type:

On-Premises Data Gateway: Use this gateway type when you need to connect Power BI to on-premises data sources in a shared or collaborative environment, or when you require scheduled data refreshes.

Power BI Gateway – Personal: Use this gateway type if you are an individual user and want to connect Power BI Desktop to on-premises data sources for your personal reports. It's not intended for collaboration or sharing with others.



Scheduled Refresh

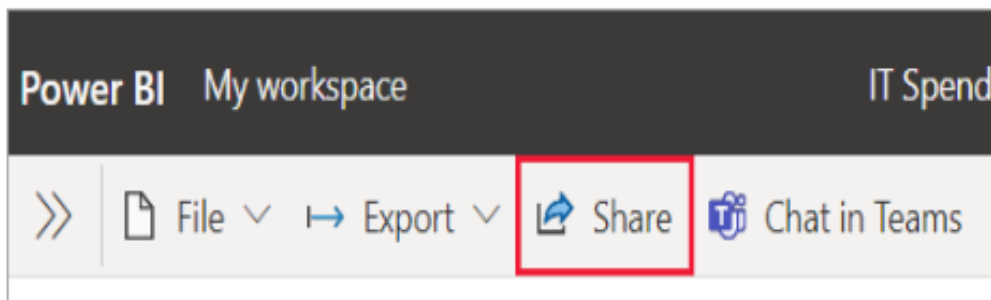


Scheduled refresh in Power BI is a critical feature that enables you to keep your Power BI reports, dashboards, and datasets up-to-date with the latest data from your data sources. It automates the process of data retrieval and refresh, ensuring that your business intelligence content reflects real-time or near-real-time data changes. Scheduled refresh is especially important when your reports rely on data from on-premises or cloud-based data sources.



SHARING & COLLABORATION

How to Share



Sharing is a critical aspect of collaboration in Power BI. With sharing, you can grant access to your reports and dashboards to other users, either within your organization or outside of it.

To share a report or dashboard, you will need to go to the "Share" button in the top-right corner of the screen. From there, you can enter the email address or name of the person or group you want to share the content with, along with a message explaining the purpose of the share. You can also set the level of access that the user has, such as view-only or edit.

Share to Web

Share to Web is a feature that allows you to embed a report or dashboard in a website or blog. This feature generates an HTML code that you can copy and paste into your website, and the report will appear as a live, interactive element on your site.

To share a report or dashboard to the web, you will need to go to the "Share" button in the top-right corner of the screen and select the "Create Embed Code" option. You can then customize the settings for the embedded report, such as the size and level of interactivity, and copy the generated code to your website.



THANK YOU



Akshay Kamble