M-powering with Power BI - A Beginner's Guide

Introduction:

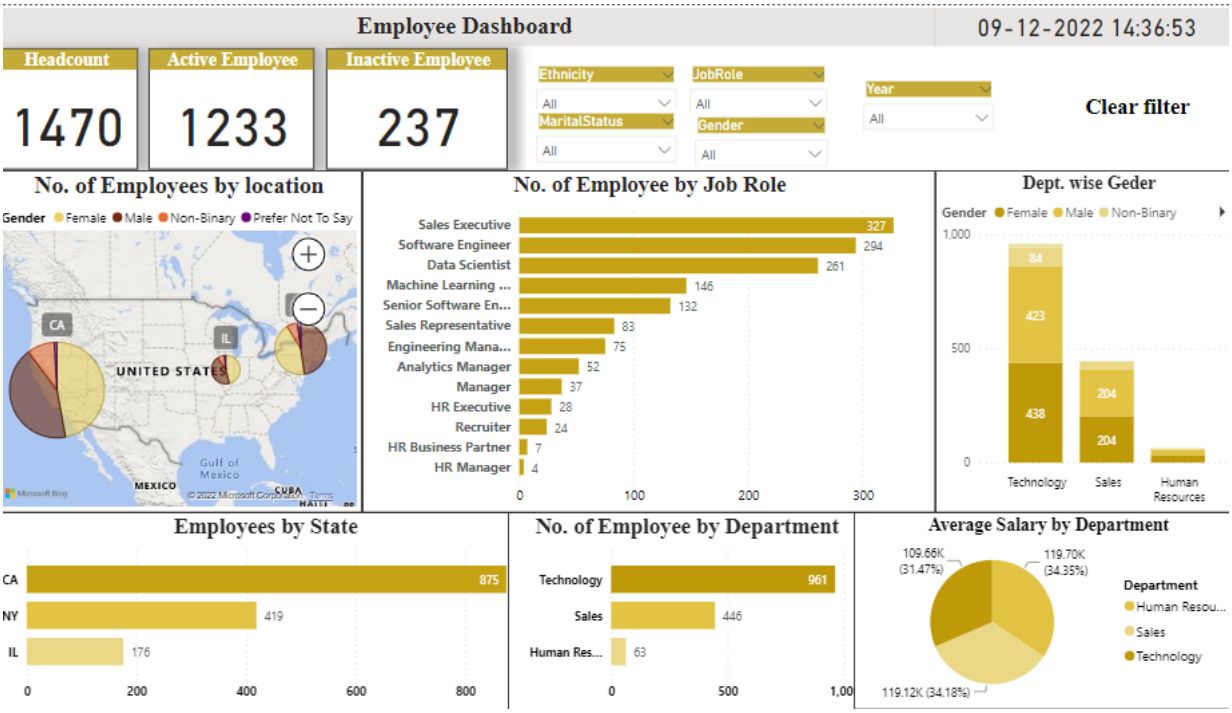
Hello there! Welcome to our newest e-book on Power BI. In this e-book you will learn about what Power BI is, its core components and its uses. We will also see how it fares against existing tools already available in the market while discussing its user friendliness.

The objective of this e-book is to introduce the readers to the top-rated business intelligence tool called Power BI from Microsoft. Before learning about Power BI, you might want to ask what is business intelligence?

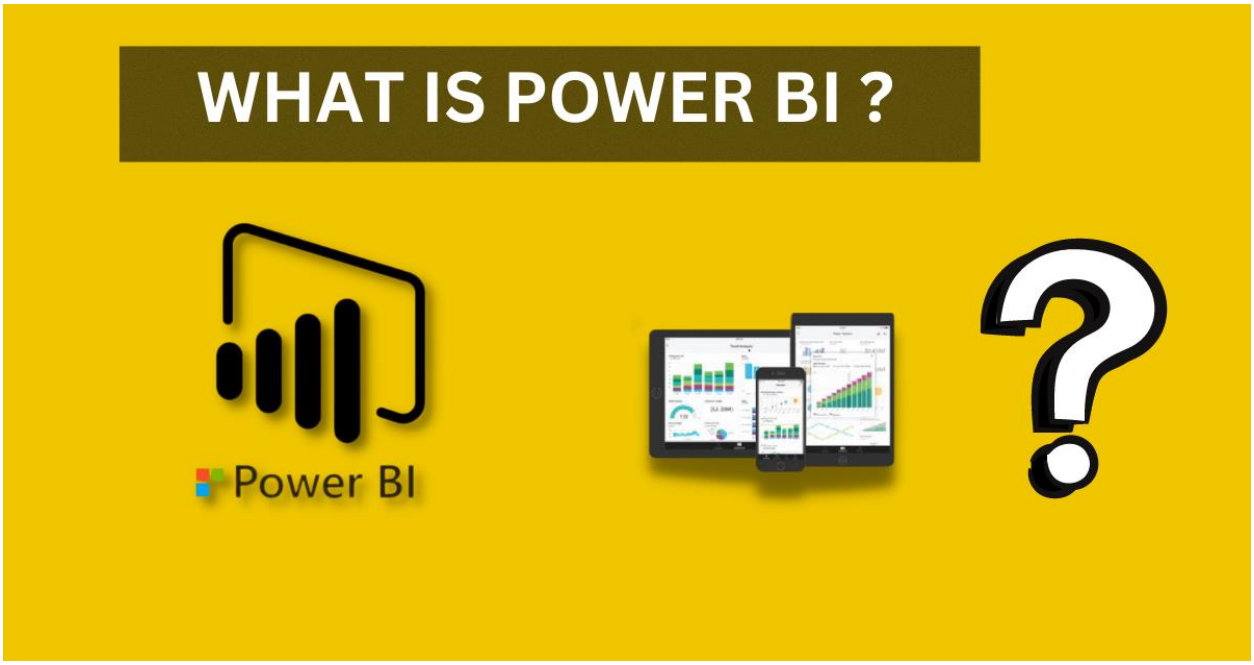
BI (Business Intelligence) is a set of processes, architectures, and technologies that convert raw data into meaningful information through graphical and interactive visuals that drive profitable business actions.

It is a suite of software and services to dig deep into data to provide actionable intelligence and useful insights.BI has a direct impact on an organization's strategic, tactical and operational business decisions. BI supports fact-based decision making using historical and real time data, providing prescriptive actions, rather than assumptions and gut feeling.

Below is an example of a dashboard overview used in Power BI to give you some context about the general information of a topic in a snapshot:



What is Power BI?



Power BI is a business analytics service provided by Microsoft that helps you visualize your data and share insights about the data to your organization. It collects data from different sources and transforms it to build interactive dashboards and Business Intelligence reports. Power BI is part of the Power BI service(SaaS-Software as a Service).

It allows you to collect data, create reports and dashboards and ask important business-driven questions about the data. With Power BI it's also possible to receive continuous data for reporting and analytics with Power BI gateway which can be connected to on-premise/cloud based data sources.

Components of Power BI:

In this section you will be introduced to the core components of Power BI such as Power BI desktop, Power Pivot, Power Query etc. as well as some universal components that are a crucial part of BI in general such as Datasets, reports, visualizations to name a few.

Datasets

A dataset is a collection of information regarding a specific entity that Power BI uses to make its representations. You can have a basic dataset in the form of a table from an Excel workbook.

Datasets can likewise be obtained from a wide range of sources, like CSV, XML, JSON, PDF, Parquet, server, Oracle, MS Access to name a few, which you can channel and consolidate to create an exceptional accumulation of information for use in Power BI.

Separating information before bringing it into Power BI gives you a chance to draw insights around the information that concerns you. After isolating the information, you could make visuals in view of that subset (that separated information). Separating helps you to center your information around your endeavors.

When you have imported a dataset, you can start making a visualization that shows important parts of that dataset in various ways, and with what you see you can pick up valuable insights. You can create a report combining multiple visuals.

Power BI Desktop

Power BI Desktop is a crucial component of the Power BI suite. It is an integrated development environment for Power Query, Power Pivot, Power Q &A etc. It lets you build advanced queries, data models and reports. With Power BI Desktop, you can easily advance your skills in BI and your experience in data analytics.

Power Query

Power Query is a crucial component of Power BI. This can be found in Excel or can be used as a component of Power BI Desktop. Using Power Query, you can transform data from numerous data sources and extract data from a wide range of different databases like Oracle, SQL Server, MySQL, Postgre and other sources.

Power BI gives you a strong GUI that you can use to transform and use the data as you need, such as date and time changes, adding columns and many different options. It uses a simple language called Power Query M Formula Language, as a supporting code which is more vigorous than a GUI. Power Query M Formula Language in Power BI is case sensitive and is optimized for building highly functional data queries which are available in Power BI Desktop and Power Query.

Power Pivot

Power Pivot is a data modeling and calculation component of Power BI. It is used to model simple as well as complex data. In Power Pivot, you can define relationships between different tables and make complex calculations that can be viewed in Pivot tables.

The language used by Power Pivot is Data Analysis Expression (DAX) and all your calculations are done here.

Visualization

A visual is a graphical portrayal of information. For example, a chart, shaded coded outline, maps and other intriguing visuals you can make to speak to your information directly. Power BI has a wide range of various perceptive visuals with new ones included in updates constantly. Perceptions can vary – like a solitary number in a card that speaks to something noteworthy – or they can show a trend of sales across a time period to show a trend. The objective of a visual is to introduce information in a way that gives context and experiences, both of which would almost certainly be hard to perceive from a basic table of numbers.

Tiles

In Power BI, a tile is a singular representation found in a report or on a dashboard. It’s a rectangular box that contains an individual visual.

When you’re making a report or a dashboard in Power BI, you can move or organize tiles in any way you need to show your data. You can change their dimensions and various other properties to present them as you want.

Power Map

Power Map is used to showcase geospatial data in 3D. As soon as the visualization is rendered in 3D mode, it provides another dimension to it. The data can be highlighted based on a geographical location. Geographical locations can vary from country, state, city and even a street address.

To get the best visualizations, Bing Maps is incorporated within Power maps based on the geographical latitude or longitude or a geospatial location.

Power Q & A

Power Q&A is a NLP (Natural Language Processing) engine for questioning your data in your own words and getting answers directly. After creating your data model and publishing it on the Power BI Website, you or your users can ask questions, if any, and get answers to those questions. For data visualizations, Power Q&A works with Power View so that users can ask questions, like the number of customers by Postal code, and the question will be answered in the form of a map view with numbers being represented as bubbles by Power Q&A.

Reports

In Power BI, a report is a gathering of visuals that are present together on at least a single page. Much the same as a report you may make for a business introduction, or a report you would make for a school assignment, in Power BI a report is an accumulation of visuals that identify with each other.

Reports let you make numerous insights on diverse pages and give you a chance to organize them in the best way to present your story. A report about product development in a specific portion, or a report about employee attrition. The reports give you a chance to accumulate and sort out your perceptions on at least one page.

Dashboards

When you prepare to share a single page from a report or an accumulation of pages, you make a dashboard. A Power BI dashboard is a gathering of visuals from a solitary page that you can share with others. Frequently, it's a chosen combination of visuals that give snappy understanding into the information or story you're attempting to exhibit.

A dashboard can consist of multiple reports consisting of multiple pages, frequently called a canvas. Consider it as a canvas that a craftsman or painter uses. You can share dashboards with different clients or gatherings, who would then be able to interact with your dashboard when they're in the Power BI website, or on their cell phone using Power BI mobile apps.

Power BI Website

The reports created in Power BI can be published on the Power BI Website using the Power BI gateway. You can create dashboards in Power BI for your reports and share them with others, or you can also create them directly on the Power BI Website. With Power BI Website, you can perform transformative operations on data online using a web browser, and it doesn't even require any additional tool.

Power BI Mobile Apps

Power BI Mobile Apps provides support for three mobile operating systems (OS): namely Android, iOS, and Windows. These applications provide you with an interactive view of reports and dashboards directly on the Power BI site. You can even share them from your mobile device. Furthermore, some portion of the reports can be featured where a note can be created and at the same time it can be shared with other users.

In this section, we learned about twelve components of Power BI which are: Datasets, Power BI desktop, Power Query, Power Pivot, Visualizations, Tiles, Power Map, Power Q & A, reports, dashboards, Power BI Website, and Power Mobile Apps.

Why we use Power BI:

1. **Access to large Volumes of Data from Multiple Sources**:In Power BI,you can access vast volumes of data from multiple data sources. It allows you to view, analyze,modify, and visualize vast quantities of data that cannot be opened efficiently in Excel.Power BI also allows you to model the data creating appropriate relations between entities with pre-built modeling as default. Some of the important data sources available for Power BI are Excel, CSV,SQL

server, XML, JSON, pdf, etc. Power BI uses powerful compression algorithms to import and cache the data within the. PBIX file extension.

2. **Best in class Excel Integration**

Power BI helps you to gather, analyze, publish, and share Excel business data. Anyone familiar with Excel can easily use Power queries, data models, and reports to Power BI Dashboards.

3. **Accelerate Big Data Preparation with Azure**

Using Power BI with Azure allows you to analyze and share massive volumes of data without any hiccups. Power BI can be connected to Azure data lake to retrieve data to reduce the time it takes to gain insights and increase collaboration between business analysts, data engineers, and data scientists.

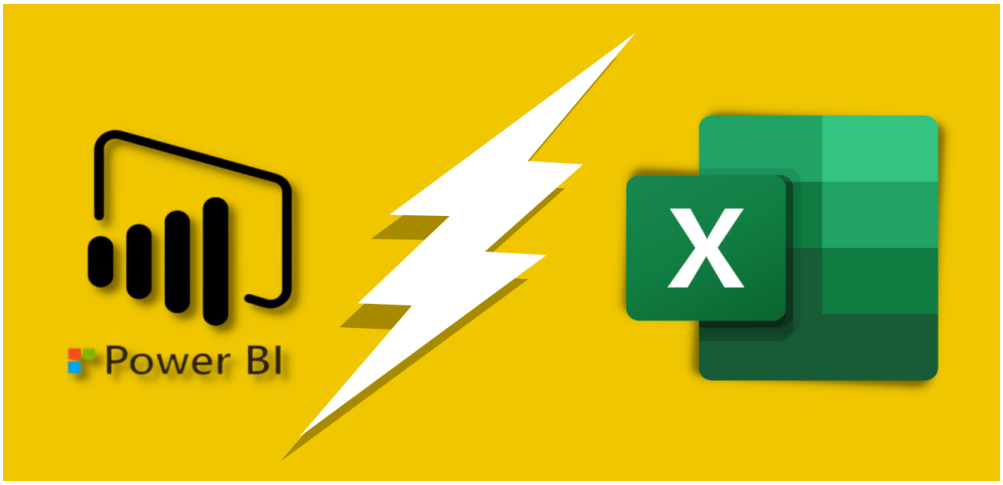
4. **Turn Insights into Action**

Power BI allows you to gain valuable insights from data through easy-to-understand visuals and turn those insights into actions to make data-driven business decisions. Reports created in Power BI can be shared with other business users with the Power BI service. Owners of the report have the option to select what level of access those users can have with the report.

5. **Real-time Stream Analytics**

Power BI will enable you to perform real-time stream analytics.You can fetch data from multiple sensors and social media sources to get access to real-time analytics.Power BI gateway can be used to refresh the data periodically at your choice to get insights whenever it's necessary.

Power BI vs EXCEL:



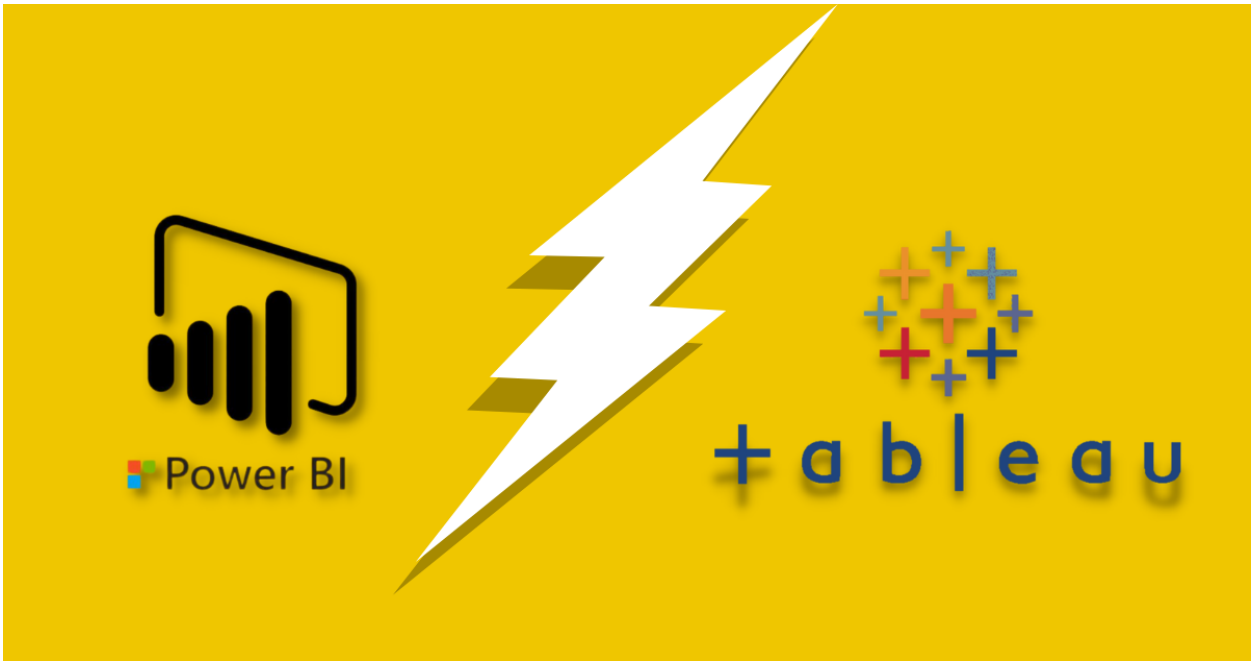
1. **Data Size:** One of the key differences is in handling the capacity of data quantity. With Power BI, we can handle millions of rows together with fast speed while maintaining data integrity, but with Excel, it takes a long time to load large amounts of data and the dataset may be incomplete. Also, with Excel you can only store the data in a limited number of rows while Power BI gives you nearly unlimited space to store data.

2. **Cloud-Based Features:** Once the dashboard building is completed in Power BI, you can publish the report to the end-users with Microsoft's cloud-based services without having to worry about the file size. But, when it comes to Excel, we need to share the large data with the **dashboard via email or any online sharing tool thus compromising on flexibility.**

3. **Visualizations:** Power BI offers plenty of visualizations out of the box to design the dashboard with options to download custom visuals, but with excel, we have only limited visualizations,which when used in a large quantity can slow down the system.

4. **Measures:** Power BI offers you the option to create measures for creating calculated fields which do not hold physical space in the memory and are not included in the actual dataset. Excel does not offer that luxury as you have to create calculated columns in the actual dataset which consumes physical memory.

Power BI vs TABLEAU:



Well! To start with each of these tools has its own sets of advantages and it totally depends on the users and the scenario in which these tools are being leveraged.

Some of the key differences between Power BI and Tableau are listed below

Difference between Power BI and Tableau

- **Performance and Ease of Use**

  Power BI is relatively easier to use than its Tableau counterparts. So, if you are a newbie to the field of Data Visualization and Modelling Power BI should be your ultimate choice.

On the other hand, Tableau gives an extra advantage to the experienced individuals as it is capable of handling larger amounts of data as it can process it quickly.

- **Data Sources**

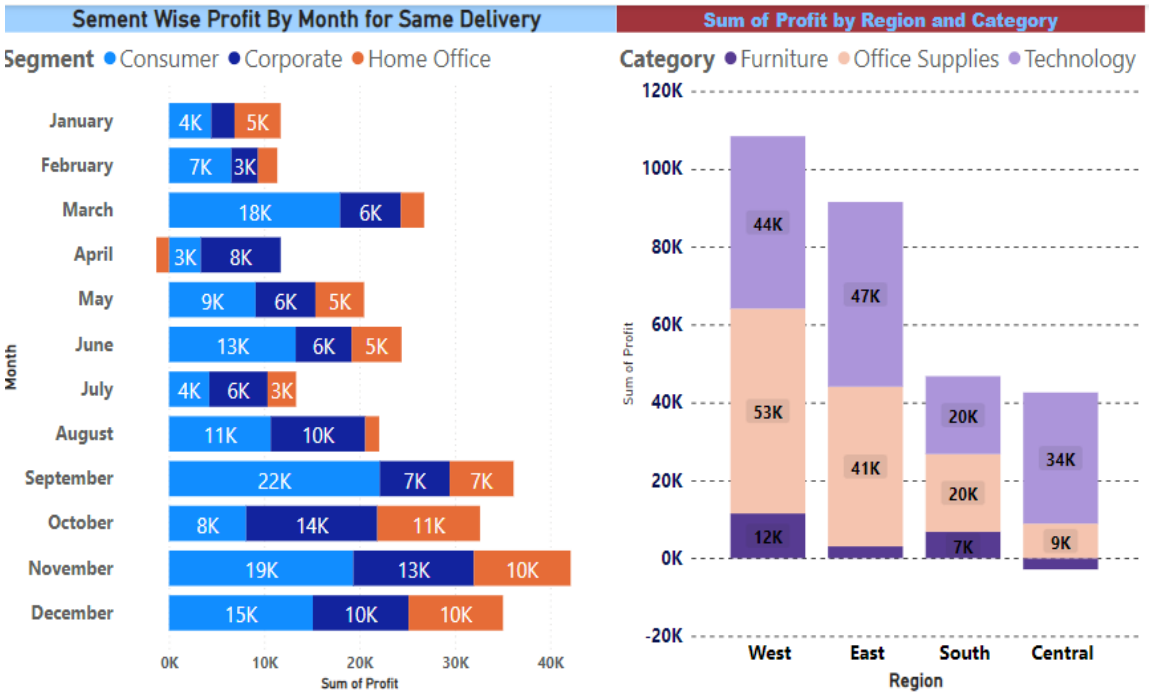
  Power BI offers support to various data sources but it has limited access in connecting with various databases and servers compared to Tableau.

  In contrast, Tableau has access to a wide range of data sources and Servers such as Excel, PDF, JSON, Hadoop, Google sheets, Google drive, Amazon Redshift and a lot others.

Do note this isn't the entire difference between Power BI & Tableau. This debate is a huge topic in itself. We'll surely be covering this discussion some other day. Do, follow our e-book page to get updated about the upcoming e-books.

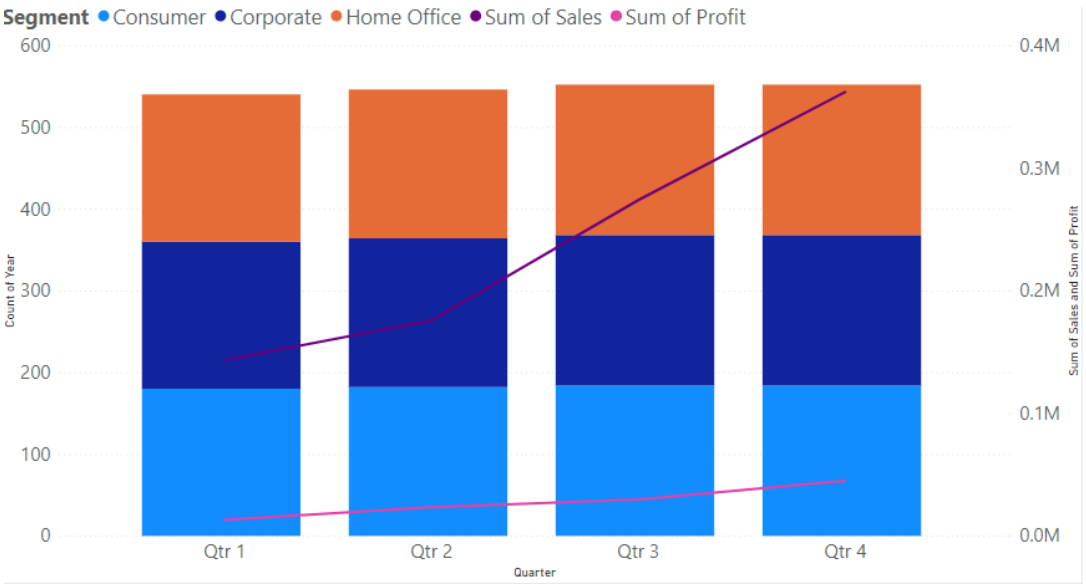
Commonly used visuals in Power BI:

- Bar and column charts

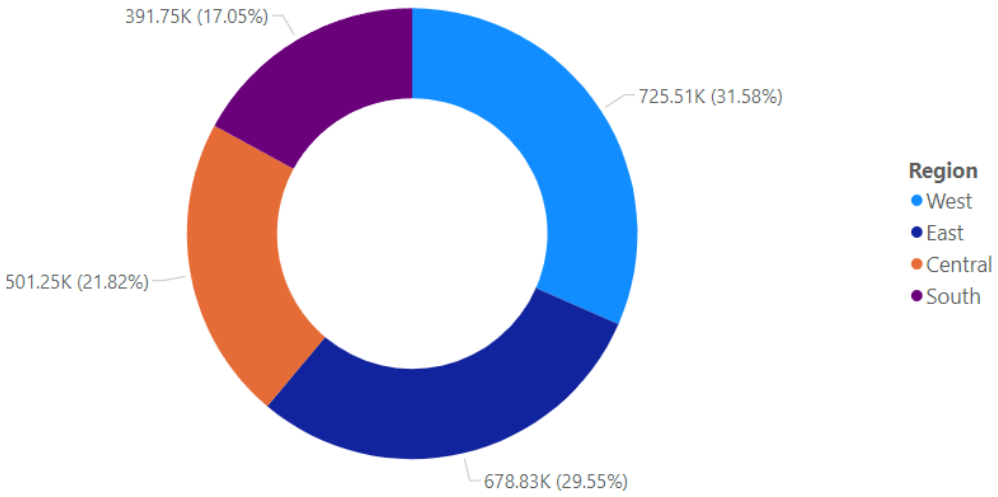


- Cards(Multi row,Single card)

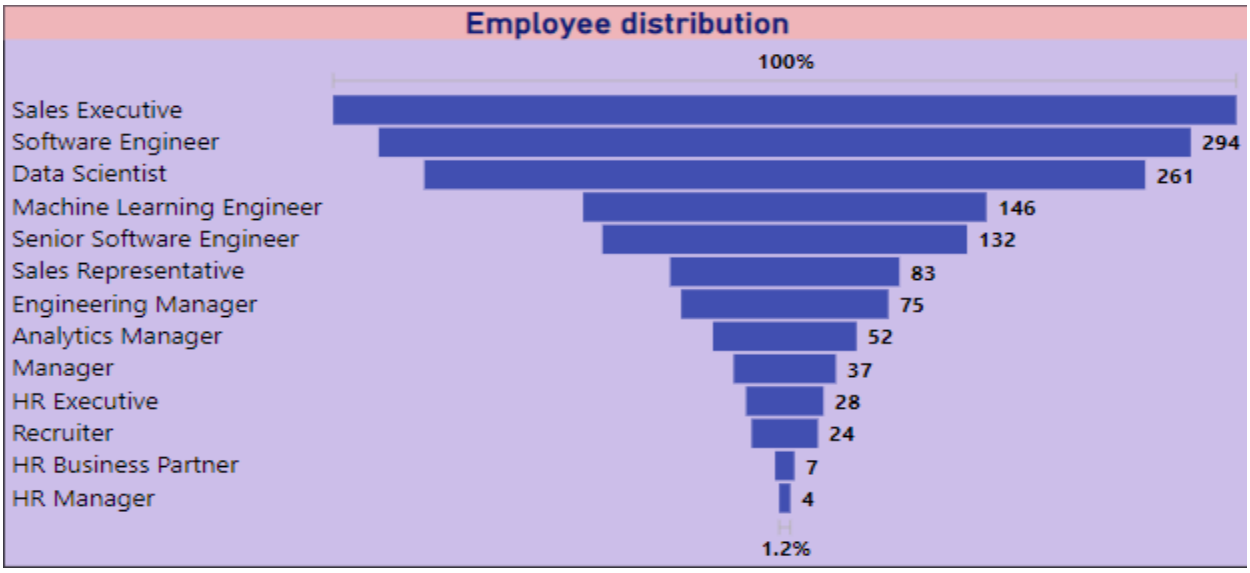
- Combo charts



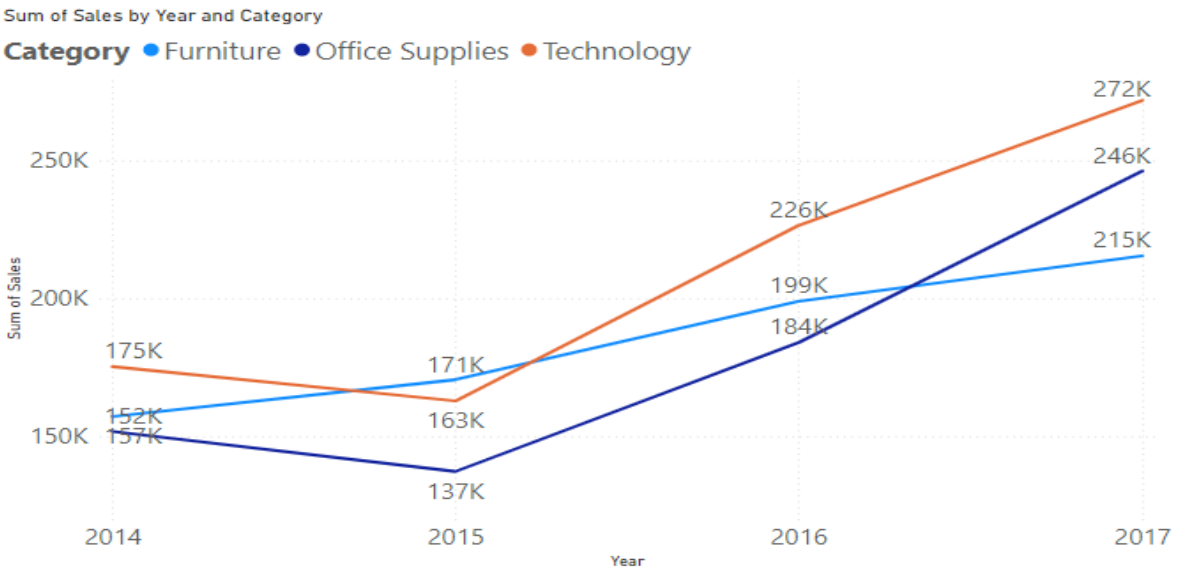
- Donut charts



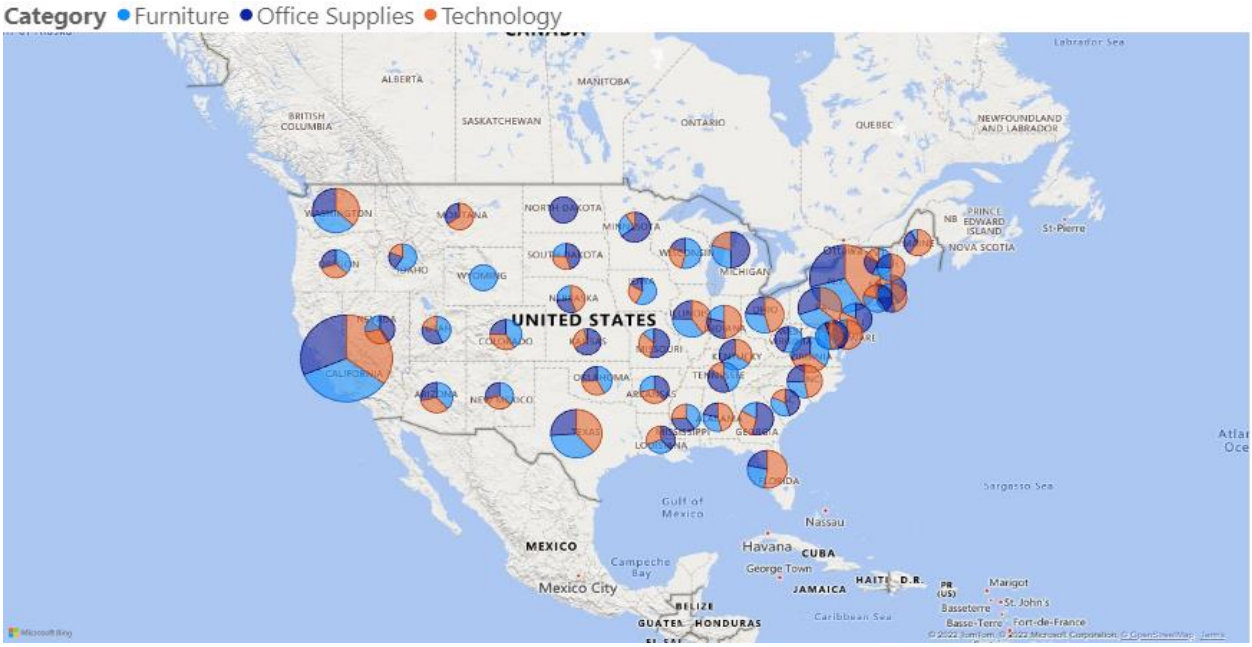
- Funnel charts



Line charts



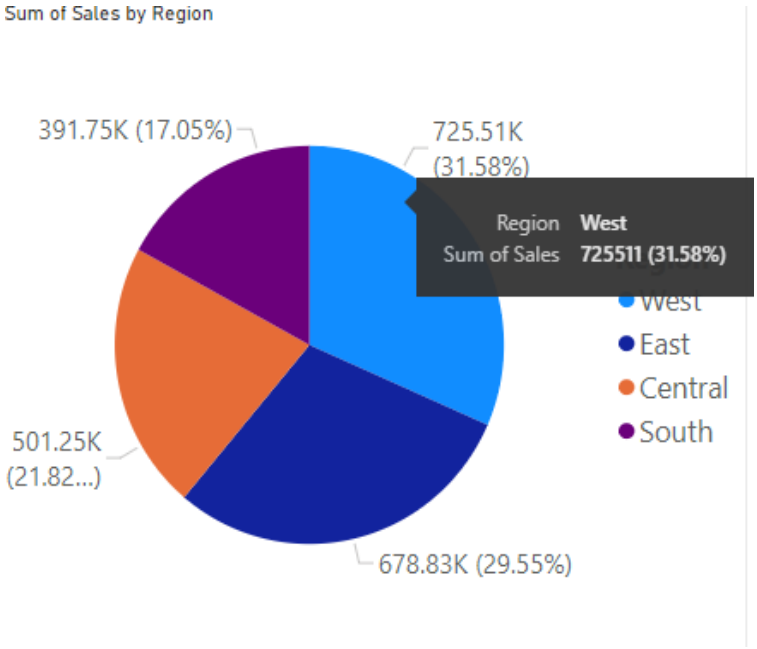
- Maps(Basic map,ArcGIS map,Azure map,Filled map (Choropleth),Shape map)



- Matrix

Sub-Category	Central	East	South	West	Total
Phones	72410	100628	58311	98698	**330047**
Chairs	85228	96262	45177	101786	**328453**
Storage	45933	71618	35770	70539	**223860**
Tables	39152	39141	43919	84755	**206967**
Binders	56926	53500	37032	55967	**203425**
Machines	26800	66107	53890	42445	**189242**
Accessories	33962	45038	27280	61120	**167400**
Copiers	37260	53220	9300	49750	**149530**
Bookcases	24153	43819	10900	36007	**114879**
Appliances	23581	34191	19525	30240	**107537**
Furnishings	15256	29067	17310	30071	**91704**
Paper	17491	20174	14146	26664	**78475**
Supplies	9470	10763	8320	18126	**46679**
Art	5763	7497	4662	9214	**27136**
Total	**501253**	**678828**	**391748**	**725511**	**2297340**

- Pie charts



To learn more in depth about visualizations in Power BI click here.

Is Power BI User-Friendly ?

Yes! It absolutely is. In fact, for using Power BI desktop, you do not need much report designing skills or query skills to build a report. Power BI's interactive UI/UX features makes things visually appealing. The Power Q&A feature in Power BI lets you ask questions about your data in your own words.

It is the fastest way to get an answer from your data using NLP (natural language processing). A real-life example could be what was the total profit for this year? Once you've built your data model and created the report, then you can ask questions and get relevant answers quickly.

Power BI is your one stop shop for all your BI needs with comprehensive documentation about every feature available in Microsoft's learn section. To install Power BI, head over to the microsoft store and get new features in updates almost every week.