

# Power BI Assignment 2

## 1. Explain the advantages of Natural Queries in PowerBi with an example?

**Solution:** Natural Queries in Power BI allow users to ask questions in a natural language format and receive answers in the form of visualizations and data insights. This feature has several advantages:

- 1) **Easy to use:** Users can ask questions in their own words, which eliminates the need to learn complex query languages or write complex queries. This makes it easier for non-technical users to access and analyze data.
- 2) **Faster insights:** Natural Queries allow users to quickly receive insights without the need to create complex data models or reports. The results are presented in easy-to-understand visualizations, which makes it easier to identify patterns and trends.
- 3) **Interactivity:** Natural Queries allow users to interact with data by asking follow-up questions, refining results, and changing parameters. This makes it easier to explore data and gain deeper insights.

Example:

Let's say you have a sales dataset that includes information about products, regions, and sales numbers. With Natural Queries, you can simply ask questions in natural language to gain insights. For example, you could ask:

- a) What are the top-selling products in the East region?
- b) How much revenue did we generate in the first quarter?
- c) What was the average sales price for product X in the South region?

Power BI would generate visualizations that answer these questions and allow you to explore the data further. You can refine your questions, change parameters, and explore the data in different ways until you gain the insights you need.

## 2. Explain Web Front End(WFE) cluster from Power BI Service Architecture?

**Solution:** The Web Front End (WFE) cluster is a component of the Power BI Service Architecture that handles incoming user requests and serves web pages to end-users. It is responsible for providing the user interface for Power BI and for handling all the interactions between users and the Power BI Service.

The WFE cluster consists of multiple servers that work together to provide high availability, scalability, and performance. Each server in the WFE cluster runs an instance of the Power BI web application, which handles user requests and generates web pages dynamically. The servers are load-balanced to distribute user requests across the cluster and ensure that no single server is overloaded.

The WFE cluster communicates with other components of the Power BI Service Architecture, such as the Data Model and Data Access layer, to retrieve and manipulate data. The cluster also manages user authentication and authorization to ensure that users only have access to the data and features they are authorized to use.

The WFE cluster also provides a variety of user-facing features, including dashboards, reports, and data exploration tools. These features are delivered through the web interface and allow users to view, analyze, and interact with data in real-time.

Overall, the WFE cluster plays a critical role in the Power BI Service Architecture by providing a scalable, performant, and user-friendly interface for end-users.

### 3. Explain Back End cluster from Power BI Service Architecture?

**Solution:** The Back End cluster is a component of the Power BI Service Architecture that handles data processing, storage, and management. It is responsible for managing the complex data workflows that power the Power BI Service.

The Back End cluster consists of multiple servers that work together to provide high availability, scalability, and performance. Each server in the Back End cluster runs an instance of the Power BI application, which handles data processing and storage. The servers are load-balanced to distribute data processing tasks across the cluster and ensure that no single server is overloaded.

The Back End cluster is responsible for managing several key functions, including:

- 1) **Data modeling:** The Back End cluster is responsible for creating and managing data models that represent the data stored in various data sources. This includes creating relationships between different data sources, defining measures and calculations, and managing data refresh schedules.
- 2) **Data processing:** The Back End cluster is responsible for processing data from various data sources, transforming it into a format that can be used by Power BI. This includes data cleansing, aggregation, and other transformations.
- 3) **Data storage:** The Back End cluster is responsible for storing data in a format that can be easily accessed by the WFE cluster. This includes storing data in memory, on disk, or in a cloud-based storage service.
- 4) **Data security:** The Back End cluster is responsible for managing data security, including authentication, authorization, and encryption. This ensures that data is protected from unauthorized access or tampering.

Overall, the Back End cluster plays a critical role in the Power BI Service Architecture by providing a scalable, performant, and secure platform for data processing and storage. By managing the complex data workflows that power the Power BI Service, the Back End cluster enables end-users to easily access and analyze data in real-time.

#### 4. What ASP.NET component does in Power BI Service Architecture?

**Solution:** ASP.NET is a web application framework developed by Microsoft and used in the Power BI Service Architecture to build the Web Front End (WFE) cluster.

ASP.NET provides a set of tools and libraries that enable developers to build web applications that can be deployed on Windows servers. The Power BI WFE cluster is built using ASP.NET and provides the user interface for Power BI.

ASP.NET provides several key components that are used in the Power BI Service Architecture, including:

- 1) **Web Forms:** This component provides an easy-to-use programming model for building web applications that are based on HTML pages. The Power BI WFE cluster uses Web Forms to create dynamic web pages that display Power BI content, such as dashboards, reports, and visualizations.
- 2) **MVC (Model-View-Controller):** This component provides a flexible and powerful programming model for building web applications that separate the data, user interface, and logic of the application. The Power BI WFE cluster uses MVC to build complex web applications that can be easily maintained and extended.
- 3) **Web API:** This component provides a framework for building RESTful web services that can be accessed by external applications. The Power BI WFE cluster uses Web API to expose Power BI data and functionality to external applications, such as mobile apps or custom web applications.

Overall, ASP.NET plays a critical role in the Power BI Service Architecture by providing a flexible and powerful framework for building the WFE cluster. By leveraging the tools and libraries provided by ASP.NET, developers can quickly build and deploy web applications that provide a rich user experience and enable users to easily access and analyze data in real-time.

#### 5. Compare Microsoft Excel and PowerBI Desktop on the following features:

**Data import**  
**Data transformation**  
**Modeling**  
**Reporting**  
**Server Deployment**  
**Convert Models**  
**Cost**

**Solution:** The comparison between Microsoft Excel and Power BI Desktop on various features:

- 1) **Data import:** Microsoft Excel and Power BI Desktop both allow users to import data from a wide variety of sources such as databases, flat files, cloud services, and other data sources. However, Power BI Desktop provides more advanced and sophisticated data connectors that enable users to import data from a larger number of sources, including big data sources such as Hadoop clusters and cloud-based data platforms like Azure.

- 2) **Data transformation:** Both Excel and Power BI Desktop offer basic data transformation capabilities such as filtering, sorting, and grouping. However, Power BI Desktop provides more advanced data transformation capabilities such as merging, appending, and pivoting data. It also offers a range of data transformation functions that can be used to perform complex data manipulations.
- 3) **Modeling:** Power BI Desktop provides a more advanced and robust data modeling capability than Excel. It offers features such as calculated columns, hierarchies, and measures, which allow users to create more sophisticated data models that can be used to analyze data in more depth. It also allows users to create relationships between tables and create more complex calculations using DAX, a powerful formula language.
- 4) **Reporting:** While Excel offers basic charting and reporting features, Power BI Desktop offers much more advanced reporting capabilities. Power BI Desktop allows users to create interactive dashboards, charts, and reports that can be used to drill down into data and explore trends and patterns. It also offers a wide range of visualizations, including custom visuals, that can be used to create engaging and insightful reports.
- 5) **Server Deployment:** Excel is primarily a desktop application that is designed for individual use, while Power BI Desktop is designed for collaborative use and server deployment. Power BI Desktop allows users to publish reports to the Power BI service, where they can be accessed and shared by others. This makes it easier for teams to collaborate on data analysis and report creation.
- 6) **Convert Models:** Power BI Desktop allows users to convert their data models to Analysis Services models, which can be used to create enterprise-level solutions. This feature is not available in Excel.
- 7) **Cost:** Excel is a part of the Microsoft Office Suite, which requires a license for each user. Power BI Desktop is a standalone application that can be downloaded and used for free. However, to access more advanced features and to share reports with others, a Power BI Pro or Power BI Premium license is required, which incurs a cost.

Overall, while Excel is a powerful tool for data analysis and reporting, Power BI Desktop provides more advanced features and capabilities for data modeling, transformation, and reporting, and is better suited for collaborative use and server deployment.

## 6. List 20 data sources supported by Power Bi desktop.

**Solution:** Power BI Desktop supports a wide range of data sources, including:

- 1) Excel Workbook (XLS, XLSX, XLSM, XLXB)
- 2) CSV
- 3) XML
- 4) JSON
- 5) Text/CSV

- 6) Access database (ACCDB, MDB)
- 7) SQL Server
- 8) Azure SQL Database
- 9) Oracle Database
- 10) IBM DB2
- 11) MySQL
- 12) PostgreSQL
- 13) Sybase
- 14) SharePoint List
- 15) SharePoint Online List
- 16) Salesforce Objects
- 17) Dynamics 365 Business Central
- 18) Dynamics 365 Customer Insights
- 19) Google Analytics
- 20) Adobe Analytics

These are just a few examples of the many data sources that can be used with Power BI Desktop. In addition, Power BI also supports cloud-based data sources such as Azure Data Lake Storage, Azure Data Factory, and others, as well as big data sources such as Hadoop, HDInsight, and Spark.

