

## PowerBI Assignment 2

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

A) Natural Queries in Power BI refer to the ability to use natural language to ask questions and retrieve insights from data.

B) Some advantages of Natural Queries in Power BI are as follows:

1)Faster insights: With Natural Queries, users can quickly get the answers they need without going through the process of creating and executing traditional queries. This reduces the time and effort required to explore data and derive insights, allowing for faster decision-making.

2)Accessibility: Natural Queries make data analysis more accessible to a wider range of users. Non-technical users who may not have expertise in SQL or data analysis can easily ask questions in plain language and get meaningful insights from the data.

3)Ease of use: By allowing users to ask questions in a conversational manner, Natural Queries eliminate the need to learn complex query languages or syntax. Users can simply type or speak their questions in a way they would ask a colleague or search engine.

4)Enhanced data exploration: Natural Queries enable users to have a more interactive and iterative exploration of data. Users can ask follow-up questions, refine their queries, and drill down into specific details, helping them gain a deeper understanding of the underlying data.

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

1)A Web Front End (WFE) cluster is a key component that handles user interactions and serves as the entry point for accessing and interacting with Power BI content through a web browser. Its features are as follows.

2)User Interaction: The WFE cluster receives requests from users who access Power BI content through their web browsers. These requests can include actions such as viewing reports, dashboards, or datasets, interacting with visualizations, creating and sharing content, and managing user access and permissions.

3)Load Balancing: The WFE cluster utilizes load balancing techniques to distribute incoming requests across multiple servers within the cluster. This ensures efficient utilization of resources and helps maintain high availability and performance, especially during periods of increased user activity.

4)Authentication and Authorization: The WFE cluster handles user authentication and authorization. When a user accesses Power BI content, the WFE cluster verifies their credentials, validates their permissions, and determines the level of access they have to the requested resources. This ensures that users can only view and interact with content they are authorized to access.

5)Rendering and Visualization: Once the user is authenticated and authorized, the WFE cluster retrieves the necessary data and renders it into visualizations, reports, and dashboards. It leverages the underlying data models, queries, and visualizations created in the Power BI Desktop or Power BI Service to generate the interactive content that users can view and interact with.

6)Caching and Performance Optimization: To improve performance and reduce the load on backend resources, the WFE cluster implements caching mechanisms. It caches frequently accessed data, metadata, and visualizations, allowing for faster response times and a smoother user experience. Caching can be applied at various levels, including dataset, report, and visual element levels.

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

1)The Back End cluster is a fundamental component responsible for storing, processing, and managing the data and metadata associated with Power BI content. It features are as follows.

2)Data Refresh and Synchronization: The Back End cluster manages the scheduled or on-demand data refresh processes. It ensures that data from the connected data sources (such as databases, APIs, or files) is periodically updated to reflect the latest changes. This enables users to view up-to-date information in their reports and dashboards.

3)Metadata Management: The Back End cluster stores and manages metadata associated with Power BI content, such as dataset schemas, report definitions, security rules, user permissions, and relationships between data entities. This

metadata is crucial for maintaining the structure and integrity of the data and enabling user access and collaboration.

4)Data Storage: The Back End cluster stores various types of data required for Power BI, including datasets, reports, dashboards, data models, and user metadata. It leverages Azure services like Azure SQL Database, Azure Analysis Services, Azure Data Lake Storage, and Azure Blob Storage to store and manage the data.

5)Data Processing: The Back End cluster handles the processing of data and performs operations such as data transformation, modelling, aggregation, and indexing. It executes queries and calculations required to generate visualizations and insights from the underlying data.

6)Scalability and High Availability: The Back End cluster is designed to be highly scalable and resilient. It can handle large volumes of data and user requests by horizontally scaling out the infrastructure. It also incorporates redundancy and fault tolerance mechanisms to ensure high availability and reliability of the service.

7)Integration with other services: The Back End cluster integrates with various other services within the Power BI ecosystem, such as Power BI Desktop, Power Query, Power Automate, and the Power Platform. This integration enables seamless data connectivity, workflow automation, and application development capabilities.

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

1)ASP.NET components play a crucial role in handling web application development and serving web pages to users. ASP.NET is a web application framework developed by Microsoft and is widely used in building web applications, including the Power BI Service. The functions of ASP.NET are as follows.

2)Web Application Development: ASP.NET provides a development framework for building web applications, including the Power BI Service. Developers use ASP.NET to create the web pages, user interfaces, and functionality required for accessing and interacting with Power BI content.

3)Request Handling: ASP.NET handles incoming requests from users accessing the Power BI Service through their web browsers. It processes these requests,

executes the necessary code, and generates responses that are sent back to the users.

4)Server-Side Processing: ASP.NET enables server-side processing of user requests. It executes code and performs various operations, such as data retrieval, data processing, calculations, and rendering of visualizations, to generate the content that users see in their web browsers.

5)User Authentication and Authorization: ASP.NET provides features and APIs for implementing user authentication and authorization in the Power BI Service. It handles the verification of user credentials, enforces security policies, and ensures that users have the appropriate permissions to access and interact with Power BI content.

6)Integration with Power BI APIs: ASP.NET integrates with Power BI APIs to enable programmatic access and interaction with Power BI content. Developers can use ASP.NET to build custom applications that leverage Power BI capabilities, such as embedding Power BI reports and dashboards, automating data refresh, and managing user access and permissions.

7)Error Handling and Logging: ASP.NET provides mechanisms for handling errors and logging important events in the Power BI Service. It captures and logs exceptions, tracks application performance, and enables developers and administrators to monitor and troubleshoot issues effectively.

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

Data import

Data transformation

Modelling

Reporting

Server Deployment

Convert Models

Cost

Here is a comparison of Microsoft Excel and Power BI Desktop based on the following features:

### 1)Data Import:

-Excel: Excel allows importing data from various sources, including databases, files, and online services. It offers features like Get Data, Power Query, and Data Connections to import data.

-Power BI Desktop: Power BI Desktop provides robust data import capabilities, including a wide range of data connectors to import data from databases, files, online services, and cloud platforms. Power Query is integrated into Power BI Desktop for data import and transformation.

### 2)Data Transformation:

-Excel: Excel offers basic data transformation capabilities through functions, formulas, and features like sorting, filtering, and pivot tables. Power Query in Excel provides more advanced data transformation options.

-Power BI Desktop: Power BI Desktop includes Power Query, a powerful data transformation tool. It allows users to perform advanced data cleansing, shaping, merging, and transformations using a user-friendly interface.

### 3)Modelling:

-Excel: Excel offers basic modelling capabilities through features like tables, relationships, and formulas. It supports creating simple data models for analysis and calculations.

-Power BI Desktop: Power BI Desktop provides advanced modelling capabilities. It allows users to build complex data models using relationships, hierarchies, calculated columns, and measures. Power BI Desktop also supports DirectQuery and Import modes for data storage and retrieval.

### 4)Reporting:

-Excel: Excel provides robust reporting capabilities with features like charts, tables, pivot tables, conditional formatting, and formulas. It offers flexibility in designing custom reports and dashboards.

-Power BI Desktop: Power BI Desktop is specifically designed for creating interactive and visually appealing reports and dashboards. It offers a wide range of visualization options, custom visuals, drill-through, filtering, and interactive features for data exploration.

### 5)Server Deployment:

-Excel: Excel workbooks can be shared via email, network drives, or cloud storage platforms like OneDrive or SharePoint. Collaborative editing and real-time data updates are limited.

-Power BI Desktop: Power BI Desktop reports can be published to the Power BI Service for server deployment. This allows for centralized management, sharing, collaboration, and real-time data updates. Power BI Service offers features like data refresh, sharing and access controls, scheduled data refresh, and embedding.

#### 6)Convert Models:

-Excel: Excel models can be converted to Power BI models using the Power BI Publisher for Excel. This allows migrating Excel-based models to Power BI Desktop for enhanced modelling and reporting capabilities.

-Power BI Desktop: Power BI Desktop models can be saved and published to the Power BI Service. They can also be exported as PBIX files for sharing and distribution to other Power BI Desktop users.

#### 7)Cost:

-Excel: Excel is part of the Microsoft Office suite and is available through various licensing options, including standalone purchases and subscriptions.

-Power BI Desktop: Power BI Desktop is a free standalone application available for download from the Microsoft website. However, additional costs may be associated with using the Power BI Service for server deployment, collaboration, and advanced features.

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

The following are 20 data sources that are supported by PowerBI:

1)Excel Workbook (.xlsx)

2)CSV (Comma-Separated Values) files

3)SQL Server Database

- 4)Azure SQL Database
- 5)Oracle Database
- 6)MySQL Database
- 7)PostgreSQL Database
- 8)SharePoint List
- 9)Salesforce
- 10)Dynamics 365
- 11)Google Analytics
- 12)SharePoint Online
- 13)JSON (JavaScript Object Notation) files
- 14)Web (HTML) pages
- 15)OData feeds
- 16)Hadoop Distributed File System (HDFS)
- 17)Microsoft Azure Blob Storage
- 18)XML (Extensible Markup Language) files
- 19)Web APIs (via custom connectors or Power Query)
- 20)SAP HANA Database

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  - Data transformation
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