Assignment - 2

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1⇒ Explain the advantages of Natural Queries in Power BI with an example?

Sol^n- Natural Queries in Power BI, also known as Q & A (Question and answer), is a feature that allows users to interact with their data by asking questions in plain language, rather than creating complex queries or reports manually. Here are some advantages of using Natural Queries in Power BI,

(i) Accessibility ⇒

Natural Queries make data analysis accessible to users with varying levels of technical expertise. Business users who may not be proficient in SQL or other query langages can easily interact with the data by asking questions in their own words.

(ii) Example-

Let's say you have a sales dataset in Power BI, and you want to know the total sales for a specific product in a specific region.

(iii) Time-Saving ⇒

Natural queries save time by eliminating the need to manually create charts or reports.

Example- If you want to see a trend in your monthly sales, you can ~~speak~~ ask, "Show me a line chart of monthly sales," and power BI will generate the chart for you.

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(iii) Exploratory Analysis ⇒

Natural Queries are excellent for exploratory data analysis. Users can ask ad-hoc questions and iteratively refine their queries to gain insights from the data.

Example- You might start with a general question like, "Tell me something interesting about our sales data," and then gradually refine your queries based on the insights you receive.

(iv) Conversational interaction ⇒

Natural queries allow for a conversational interaction with your data.

Example- After asking about monthly sales, you can follow up with, "What were the highest and lowest sales months last year?" Power BI will understand the context and provide the relevant information.

(v) User friendly ⇒

This feature promotes user adoption because it's user-friendly and intuitive. New users can quickly start using power BI without extensive training.

Example-

A new employee can simply ask, "Give me an overview of our sales performance"

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I⇒ Explain Web Front End (WFE) cluster from power BI service Architecture?

Ans— An explanation of the Web Front End cluster in the power BI service architecture

Web Front End (WFE) Cluster:

(i) Purpose ⇒

The Web Front End (WFE) cluster is a critical component in the Power BI service architecture responsible for handling user interactions with Power BI reports, dashboards, and related services through web browsers and mobile apps.

(ii) Load Balancing ⇒

The WFE cluster is designed to distribute user requests and traffic evenly across multiple servers or nodes. Load balancing helps ensure high availability scalability and optimal performance by preventing any single server from becoming a bottleneck.

(iii) Authentication and Authorization ⇒

The WFE cluster is responsible for enforcing authentication and authorization for users. It ensures that only authorized users have access to specific Power BI content based on their permissions and roles.

(iv) Rendering and Visualization ⇒

When a user requests a Power BI report or dashboard the WFE cluster is responsible for

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rendering and displaying the visualization and data within the web browser or mobile app.

(v) Interactivity ⇒
Users can interact with the reports and dashboards by clicking on visuals, applying filters and drilling down into tables. The WFE cluster manages these interactions, sends appropriate requests to the backend services, and updates the visuals in real-time, providing a responsive user experience.

3 ⇒ Explain Back End cluster from Power BI Service Architecture?

Soln. An explanation of the Back End cluster in the Power BI service architecture.

Back end cluster

(i) Purpose -
The back end cluster is a core component of the Power BI service service architecture that handles data processing, data storage, and the execution of complex operations related to Power BI reports and datasets. It works behind the scenes to ensure data integrity, reliability and performance.

(ii) Data Processing -
The Back end cluster is responsible for processing and transforming data from various sources, including data

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connectors, on-premises data sources and cloud-based data sources. It can apply data transformations, aggregations and calculations as defined in Power BI queries and transformations.

(iii) Data Storage –

The Back end cluster stores Power BI data sets, which are the structured and optimized representations of data used in Power BI reports. These datasets are typically stored in a highly compressed and columnar format for efficient storage and retrieval.

(iv) Query Execution –

When users interact with Power BI reports or dashboards, their queries are executed by the Back End cluster. It retrieves data from the stored datasets and calculates aggregations or performs calculations are needed to respond to user queries in a performant manner.

(v) Data Refresh –

Power BI datasets often require regular updates to reflect changes in underlying data sources. The Back End cluster manages data refresh operations, ensuring that datasets are kept up-to-date according to the defined refresh schedules and policies.

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

Ans— (1)

(i) Web Application Hosting —

ASP.NET is used to host the web application that serves as the front end of the Power BI Service. This web application provides the user interface for interacting with Power BI reports, dashboards, and related content through web browsers and mobile devices.

(ii) Authentication and Authorization —

ASP.NET components are responsible for handling user authentication and authorization. Users log in to the Power BI service through this web application, and ASP.NET helps validate user credentials and determine their permission to access Power BI content.

(iii) Session Management —

ASP.NET can be used to manage user sessions. It keeps track of user interactions, session timeouts, and maintains the context of user activities while they navigate and interact with Power BI content.

(iv) Web API Endpoints —

The Power BI service exposes a set of web APIs that allow developers to integrate Power BI functionality

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into custom applications. ASP.NET can be used to create and manage these API endpoints enabling developers to programmatically interact with Power BI features.

(v) Load Balancing –

In a scaled-out and load-balanced Power BI service architecture, ASP.NET components can play a role in distributing incoming web requests across multiple servers or nodes to ensure load balancing and optimal performance.

(vi) Customization and Extensions –

ASP.NET allows developers to create custom web pages and extensions that can be integrated into the Power BI service. This enables organizations to customize the look and feel of the power BI experience and add additional functionality as needed.

(vii) Security

ASP.NET provides robust security features, including protection against common web application vulnerabilities such as Cross-site Scripting (XSS) and Cross-site Request Forgery (CSRF). These security measures help protect the power BI service from web based attacks.

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5⇒ Compare Microsoft Excel and Power BI Desktop on the following features.

Ans-(i) Data import-

· Microsoft Excel-

Excel allows you to import data from various sources, including databases, text files, web services and more. It offers features like Power Query for data retrieval and transformation.

· Power BI -

Power BI desktop also supports importing data from diverse sources and provides robust data connectivity options, including Power Query, which is the same technology used in Excel for data import.

(ii) Data Transformation-

· Microsoft Excel-

Excel provides basic data transformation capabilities, including sorting, filtering and basic formulas. It also offers Power Query for more advanced data transformations.

· Power BI Desktop-

Power BI desktop excels in data transformation capabilities. It's designed for more advanced ETL (Extract, Transform, Load) operations.

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(iii) Modeling -

· Microsoft Excel -

Excel has limited data modeling capabilities. While you can create Pivot Tables and Pivot Charts, it lacks the robust modeling features of Power BI.

· Power BI desktop -

Power BI desktop is designed for advanced data modeling. It allows you to build relationships between tables, create calculated columns, and measures using DAX (Data Analysis Expressions), and design complex data models.

(iv) Reporting -

· Microsoft Excel -

Excel is primarily a spreadsheet tool, so reports are often created in tabular or chart format within worksheets. While you can build reports, it may not offer the same interactive and visual reporting capabilities as Power BI.

· Power BI desktop -

Power BI desktop is specialized for creating interactive and visually appealing reports and dashboards. It offers a wide range of data visualization options, including custom visuals and supports drill-through, bookmarks and interactive filtering.

(v) Server Deployment-

- Microsoft Excel-

Excel files can be shared via email or stored on network drives, but real-time collaboration and centralized management are limited.

- Power BI desktop-

Power BI reports and datasets can be published to the Power BI service (Power BI cloud) for centralized sharing and collaboration. This allows for version control, access control and automatic data refresh.

(vi) Convert Models-

- Microsoft Excel-

Excel models can be converted to Power BI models, but this typically requires some manual effort to redesign the data model and reports in power BI desktop.

- Power BI desktop-

~~Excel models can be converted to Power BI models, but this typically requires some manual effort to~~ Power BI desktop models can be directly published to the power BI service, making it easier to migrate models from the desktop environment to the cloud.

(vii) Cost -

· Microsoft Excel -

Excel is often included in Microsoft office 365 subscriptions, making it a part of the overall office suite. cost. However, there may be additional costs for Power Query add-ins and Power Pivot capabilities.

· Power BI Desktop -

Power BI Desktop is free to download and use. costs come into play when using the power BI service, which requires a subscription, and costs vary depending on the licensing plan.

6 ⇒ List 20 data sources supported Power BI desktop

Ans - 20 commonly used data sources supported by power BI desktop.

1 - Excel workbook
2 - SQL Server Database
3 - Azure SQL Database
4 - Azure Data Lake storage
5 - Azure Blob Storage
6 - Azure Synapse Analytics
7 - Microsoft Access Database.
8 - Oracle Database
9 - Mysql database
10 - PostgreSQL
11 - SharePoint list
12 - Web
13 - JSON
14 - XML
15 - Hadoop HDFS
16 - Salesforce
17 - Google Analytics
18 - Facebook
19 - Exchange Online
20 - Dynamics 365