**Power BI Assignment 2**

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

Natural language querying is designed to simplify the user interface in [business intelligence](https://www.techtarget.com/searchbusinessanalytics/definition/business-intelligence-BI) applications. It enables both BI professionals and business users to generate queries and explore analytics data in natural language, using voice or text. Early implementations are focused mainly on enabling a larger number of employees to get information on common business metrics.

As natural language query technology matures, the process could be enhanced with AI guidance for improved insight, as well as [natural language processing (NLP)](https://www.techtarget.com/searchbusinessanalytics/definition/natural-language-processing-NLP) techniques applied to back-end data analysis like conversational analytics and sentiment analysis. Conversational analytics evaluates customer service or employee-to-employee interactions, while sentiment analysis can help summarize consumer opinion from social media, emails and surveys.

Some advantages of using natural language querying tools include the following capabilities.

**Simplifying employee access to BI data**

Marge Breya, chief marketing officer at MicroStrategy, said the BI vendor's experience with customers shows there are "large swaths of corporate employees that need immediate insights" from BI systems. But many business users lack the comfort level or skills to interpret complex [graphs and other data visualizations](https://www.techtarget.com/searchbusinessanalytics/tip/12-data-visualization-techniques-for-effective-BI-applications) themselves, she added.

Voice interfaces like Alexa will make it easier for these users to [take advantage of voice-enabled technology](https://www.techtarget.com/searchcio/opinion/What-technical-challenges-face-voice-AI-technology-There-are-many) to ask questions and get understandable answers in a natural manner, Breya said. For example, MicroStrategy has created NLP capabilities that can formulate a data visualization from a sentence of text entered by a user; it also has added Alexa connectivity and chatbot support.

### Driving deeper business insights

Some experts believe that natural language querying could help drive deeper insights by lowering the expertise required to interact with [BI and analytics tools](https://www.techtarget.com/searchbusinessanalytics/feature/How-to-evaluate-and-select-the-right-BI-analytics-tool). Instead of being limited to [BI analysts](https://www.techtarget.com/searchbusinessanalytics/feature/What-does-a-business-intelligence-analyst-do), data scientists and other skilled analytics professionals, the tools become directly accessible to business users. He added that the ability to [use NLP for querying](https://www.techtarget.com/searchbusinessanalytics/ehandbook/NLP-uses-in-BI-and-analytics-speak-softly-but-carry-a-big-stick) could vastly simplify such iterations and enable faster progress as data specialists and non-technical business experts collaborate more effectively, which ultimately should lead to [better analytics insights](https://www.techtarget.com/searchbusinessanalytics/feature/Enterprise-analytics-benefits-of-natural-language-processing).

### Reducing confusion about analytics results

To aid in the querying process, NLG technology enables BI tools to create narratives from data so that trends, variances, and exceptions can be both visualized and described. The adage "A picture is worth a thousand words" is often true, but in many cases, there are different ways to interpret that picture -- or data visualization.

"Narration describes a visualization so there is no ambiguity [about] what it means," said John Hagerty, vice president of product management for business analytics at Oracle. Additionally, for many [BI team members](https://www.techtarget.com/searchbusinessanalytics/answer/Key-roles-and-responsibilities-of-a-business-intelligence-team) or business analysts, creating a narration of analytics results takes up huge amounts of time. NLG accelerates that activity in a profound way, Hagerty said.

### Applying structure to unstructured data

The flip side of natural language querying on the front end lies in applying NLP techniques to help analyse [unstructured data](https://www.techtarget.com/searchbusinessanalytics/definition/unstructured-data). "NLP makes sense of that unstructured data, making it organized, query able and searchable," said Stephen Blum, founder and CTO of Pub Nub, a data management API provider.

A common example of unstructured data is social media data on a company's brand. Business executives want to know what people are saying and how they feel about the brand. NLP can both categorize social media mentions by topic and analyse the sentiments in posts. Those kinds of capabilities give business users a new way to query and analyse all the unstructured data in corporate systems, which an often-cited statistic says could be [up to 80%](https://www.capgemini.com/2018/08/reorganizing-unstructured-data/) of enterprise data overall.

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

Clients and the back end are connected by the front end, commonly known as the web front-end cluster. The front-end services handle the initial connection and Azure Active Directory client authentication. User IDs are kept in the Azure Active Directory. After authentication, user requests are routed through Azure Traffic Manager to the closest data center. The Azure Content Delivery Network makes static Power BI content and files available to users when a client or user has been authorized.

Power BI Architecture -The **WFE** cluster uses Azure AD to authenticate clients and provide tokens for subsequent client connections to the Power BI service. Power BI uses the **Azure Traffic Manager** (Traffic Manager) to direct user traffic to the nearest data centre. Traffic Manager directs requests using the DNS record of the client attempting to connect, authenticate, and to download static content and files. Power BI uses the **Azure Content Delivery Network** (CDN) to efficiently distribute the necessary static content and files to users based on geographical locale.

1. Explain Back End cluster from Power BI Service Architecture?

The Back-End cluster. Once authenticated, the Back end handles all subsequent user interactions. Power BI uses Azure Active Directory to store and manage user identities. Azure AD also manages data storage and metadata using Azure BLOB and Azure SQL Database, respectively.

Visualizations, datasets, storage, reports, data connections, data updating, and other Power BI interactions are handled by the Power BI services on the back end. A web client can only directly interface with Azure API Management and Gateway Role on the backend. These two parts are in charge of routing, load balancing, authentication, and authorization.

Power BI Architecture -The **Back-End** cluster determines how authenticated clients interact with the Power BI service. The **Back-End** cluster manages visualizations, user dashboards, datasets, reports, data storage, data connections, data refresh, and other aspects of interacting with the Power BI service. The **Gateway Role** acts as a gateway between user requests and the Power BI service. Users don't interact directly with any roles other than the **Gateway Role. Azure API Management** eventually handles the **Gateway Role**.

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

A WFE cluster consists of an ASP.NET website running in the [Azure App Service Environment](https://learn.microsoft.com/en-us/azure/app-service/environment/intro). When users attempt to connect to the Power BI service, the client's DNS service may communicate with the Azure Traffic Manager to find the most appropriate (usually nearest) data centre with a Power BI deployment.

Static resources such as \*.js, \*.css, and image files are mostly stored on an Azure Content Delivery Network (CDN) and retrieved directly by the browser. Note that Sovereign Government cluster deployments are an exception to this rule, and for compliance reasons will omit the CDN and instead use a WFE cluster from a compliant region for hosting static content.

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

Data import - To import a file into Excel, click the **Data**tab on the ribbon and use the **Get data**drop-down menu to select one of the available choices. Power BI has an easy-to-use interface for data integration and analysis. You can import data into Power BI from a variety of online and offline sources including cloud services, databases such as SQL and Azure, as well as simple text files.

Data transformation – In Excel for data transformation, we use Split or merge cells, remove duplicates, and perform tasks like concatenation. In power bi Query editor with a visual interface, Filtering, merging, sorting, pivoting, splitting, for transforming data. Built-in functions for data manipulation. Cleaning tasks (correction, duplicate deletion, etc.). Shaping and structuring data.

Modelling - Excel is all about the simplicity of organizing and analysing data sets, whereas Power BI is fine-tuned to handle data from different sources while allowing the creation of complex models.

Excel provides a wide range of data preparation methods—sorting data, removing duplicate entries from a list of values, merging multiple tables, and much more. You can also use Excel's advanced filters and validation methods to select a specific subset of your raw data based on the criteria that you specify. Power BI, on the other hand, offers more features, based on its broad focus on data ingestion and analysis, and storage capabilities. It can be used with any type of data source, including structured and unstructured formats.

Reporting - While Excel does have a robust set of tools for analysing data, including pivot tables, Power BI offers more advanced charting and reporting options.

In Excel, you can choose from different types of charts, such as line graphs, pie charts, bar charts, stacked column charts, and PivotTable reports. Power BI reports can be used to generate meaningful insights from your data, help you understand your business or organizational metrics, and make data-driven decisions. You can share those insights with your team and collaborate with them in making decisions.

Server Deployment – In Excel there is no need of server deployment, you can save it and share it to anyone. For power BI you have to deploy the report on server (in Power BI App) then it will be saved and share to others.

Convert Models – Excel is focused on structured and simple[data models](https://www.educba.com/data-models-in-dbms/) with a wide range of features. Power BI focuses on data ingesting and easily building potentially complex data models.

Cost- Since we already have Excel, we need to spend additional money to procure this and build dashboards. Power BI Desktop is free to download and use for personal use, but it takes $10 per month per user to share reports with others.

1. List 20 data sources supported by Power Bi desktop.

An important component of Power BI is its vast range of data sources. You can import data from files in your system, cloud-based online data sources or connect directly to live connections. If you import from data on-premises or online services, there is a limit of 1 GB. Some commonly used data sources in Power BI are:

* Excel
* Text/CSV
* XML
* JSON
* Oracle Database
* IBM DB2 Database
* MySQL Database
* PostgreSQL Database
* Sybase Database
* Teradata Database
* SAP HANA Database
* SAP Business Warehouse server
* Amazon Redshift
* Impala
* Google Big Query (Beta)
* Azure SQL Database
* Salesforce Reports
* Google Analytics
* Facebook
* GitHub