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**POWER BI**

## Power BI Introduction

- ✓ Introduction to Power BI
- ✓ A Brief History of Power BI
- ✓ Power BI Vs Tableau
- ✓ Power BI Characteristics (Names)
- ✓ Self-Serviced Software, Cloud Based Software
- ✓ Data Visualization Software, Reporting Software
- ✓ Data Analytics Software, Business Intelligence (BI) Software
- ✓ Cloud Based BI Vs On premise BI
- ✓ Power BI Products
- ✓ Power BI Desktop (Power Query, Power Pivot, Power View)
- ✓ Flow of Work in Power BI Desktop
- ✓ Power BI Service, Power BI Report Server, Power BI Mobile
- ✓ Flow of Work in Power BI / Power BI Architecture

## PBI Desktop Installation Power BI Desktop & Power BI Service Overview

- Power BI Desktop Software Installation
- Download & Installation of Power BI Desktop Software
- What are the Prerequisites to Install Power BI Desktop Software?

## Power BI Desktop User Interface

- ✓ Understanding Power BI Desktop User Interface
- ✓ Fields Pane, Visualizations Pane, Filters Pane
- ✓ Ribbon, Multiple Views (Report View, Data View & Model View)
- ✓ Report Canvas, Pages Section

### -----: I. Power Query: -----

- Introduction to Power Query & Power Query Editor User Interface
- Overview of Power Query / Query Editor
- How to Open Power Query / Query Editor
- Extracting the Data from Data Sources
- Transforming the Data using GUI Options
- Loading the Data in Power Pivot
- Query Editor UI (Queries Pane, Data Pane / Results Pane, Power Query Ribbon)
- Query Settings, Pane Applied Steps, Formula Bar
- Advanced Editor, Query Dependencies
- Understanding Power Query Conceptually
- Data Processing, Data types and Filters in Power Query
- How Data Processed in Power Query



- Data types, Changing the Data type of a Column, Detect Data Type
- Filters in Power Query and their Purpose
- Types of Filters in Power Query (Basic Filtering, Advanced Filtering)
- Auto Filter / Basic Filtering
- Filter a Column using Advanced Text Filters, Number Filters, Date Filters
- Filter Multiple Columns

### **Inbuilt Column Transformations**

- ✓ Remove Columns / Remove Other Columns, Choose Columns, Go to Column
- ✓ Name or Rename a Column
- ✓ Reorder Columns or Sort Columns (Move Left, Right, To Beginning, To End)
- ✓ Column from Examples (From All Columns, From Selection)
- ✓ Add Column / Custom Column
- ✓ Duplicate Column, Split Column, Merge Columns
- ✓ PIVOT, UNPIVOT Columns, Transpose Columns
- ✓ Replace Values, Remove Empty

### **In built Row Transformations**

- Header Row or Use First Row as Headers, Use Headers as First Row
- Keep Top Rows, Keep Bottom Rows, Keep Range of Rows
- Keep Duplicates, Keep Errors
- Remove Top Rows, Remove Bottom Rows, Remove Alternative Rows
- Remove Duplicates, Remove Blank Rows, Remove Errors
- Group Rows / Group By
- Combine Queries (Merge Queries & Append Queries)
- Merge Queries / Join Tables
- Merge Queries, Merge Queries as New
- Need of Merge Queries, Minimum requirements to Perform Merge Queries

### **Types of Joins / Join Kinds / Merge Type**

- ✓ Left Outer (all from first, matching from second)
- ✓ Right Outer (all from second, matching from first)
- ✓ Full Outer (all rows from both)
- ✓ Inner (only matching rows)
- ✓ Left Anti (rows only in first), Right Anti (rows only in second)
- ✓ Cartesian Join or Cross Join, Self-Join
- ✓ Merging the Tables using Multiple Join Conditions
- ✓ How to Merge 3 Tables
- ✓ Use Fuzzy Matching Option

## Append Queries / Union ALL Tables

- Append Queries, Append Queries as New
- Minimum requirements to perform Append Queries
- Append Two Tables, Append Three or More Tables
- Folder as Source
- Appending Multiple Files of same type from a folder using Single Query
- Appending Multiple Excel Files and Multiple Sheets using Single Query
- Union All, how to get Union Result

## Query Options

- ✓ Copy Query, Paste Query, Delete Query, Rename Query
- ✓ Enable Load, Include in report Refresh
- ✓ Duplicate Query, Reference Query
- ✓ Move to Group, Move Up, Move Down
- ✓ Advanced Editor, Properties

## Home Tab Options

- Close & Apply, Apply, Close
- New Source, Recent Sources, Enter Data, Data Source Settings
- Manage Parameters (Manage Parameters, Edit Parameters, New Parameter)
- Suggested Values (Any Value, List of Values, Query), Convert to List
- Query Parameters and Power BI Templates
- Refresh Preview, Refresh All, Cancel Refresh
- Sorting Data

## Transform Tab Options

- ✓ Reverse Rows, Count Rows, Replace Values, Replace Errors, Fill Down, Fill Up
- ✓ Text Column, Number Column, Date & Time Column Options
- ✓ Structured Column (Expand, Aggregate, Extract Values)
- ✓ Run R Script, Run Python Script
- ✓ Add Column Tab Options
- ✓ Create Custom Function, Invoke Custom Function
- ✓ Conditional Column, Index Column, Duplicate Column
- ✓ From Text, From Number, From Date & Time Column Options

## View Tab, Tools Tab & Help Tab Options



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**: II. Power Pivot:**

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- Power Pivot Software Overview
- Understanding about Power Pivot – A In Memory Columnar Database
- Advantage of In Memory Columnar Database
- Power Pivot - Xvelocity In-memory Analytics Engine (Previously called Vertipaq)
- Overview of Data Modeling – Model View (Previously Relationship View)
- Enhancing the Data Model – DAX (Data Analysis eXpressions) Language – Data View
- Power BI Data Modeling – Model View (Previously Relationship View)
- Data Modeling Introduction
- Relationships, Need of Relationship Between Tables
- Dimension Column, Fact Column, Dimension Table, Fact Table
- Star Schema, Snowflake Schema
- Galaxy Schema or Hybrid Schema or Fact Constellation Schema
- Relationship Types / Cardinality in General
- One-to-One, One-to-Many (or Many-to-One), Many-to-Many
- AutoDetect the relationship, Create a new relationship
- Edit existing relationships, Delete a relationship
- Make Relationship Active or Inactive
- Cross filter direction (Single, Both), Apply Security Filter in Both Directions
- Assume Referential Integrity
- Enhancing the Data Model - DAX
- What is DAX (Data Analysis eXpressions) Language – Functional Language
- New Column, New Measure / Quick Measure, New Table
- DAX Table and Column Name Syntax
- Creating New Column, Creating New Measure
- Implicit Measures, Explicit Measures
- Difference Between New Columns & New Measures

**DAX Operators, Types of Operators**

- ✓ Arithmetic Operators, Comparison Operators
- ✓ Text Concatenation Operator, Logical Operators

**DAX Functions - Categories**

- Text Functions
- Logical Functions
- Date and Time Functions
- Filter Functions
- Math & Statistical Functions
- Time Intelligence Functions

## DAX Text Functions

- ✓ LEN, CONCATENATE (&)
- ✓ LEFT, RIGHT, MID
- ✓ UPPER, LOWER
- ✓ TRIM, SUBSTITUTE, REPLACE, BLANK
- ✓ DAX Logical Functions
- ✓ IF, Nested IF
- ✓ TRUE, FALSE, NOT, OR, IN, AND
- ✓ IFERROR
- ✓ SWITCH

## DAX Date & Time Functions

- YEAR, QUARTER, MONTH, DAY
- WEEKDAY, WEEKNUM
- FORMAT (Text Function) Month Name, Weekday Name
- DATE, TODAY, NOW
- HOUR, MINUTE, SECOND, TIME
- DATEDIFF, YEARFRAC, CALENDAR, CALENDARAUTO
- EDATE, EOMONTH, DATEVALUE
- Week Number of Month, Fiscal Year, Fiscal Quarter

## DAX Filter Functions

- ✓ CALCULATE, CALCULATETABLE
- ✓ ALL, ALLSELECTED, ALLEXCEPT
- ✓ RELATED, RELATEDTABLE
- ✓ LOOKUPVALUE (Information function)
- ✓ USERRELATIONSHIP
- ✓ FILTER, DISTINCT(Column), DISTINCT(Table), VALUES, SELECTEDVALUE

## DAX Math and Statistical Functions

- INT, ROUND, ROUNDUP, ROUNDDOWN
- DIVIDE, EVEN, ODD, POWER, SIGN, SQRT, FACT
- SUM, SUMX, MIN, MINX, MAX, MAXX, COUNT, COUNTX
- AVERAGE, AVERAGEX
- COUNTROWS, COUNTBLANK
- RANKX, SUMMARIZE



## DAX Time Intelligence Functions

- ✓ Time Intelligence Introduction
- ✓ Date Dimension Table, Mark as Date Table
- ✓ TOTALMTD, TOTALQTD, TOTALYTD
- ✓ PREVIOUSDAY, PREVIOUSMONTH, PREVIOUSQUARTER, PREVIOUSYEAR
- ✓ NEXTDAY, NEXTMONTH, NEXTQUARTER, NEXTYEAR
- ✓ SAMEPERIODLASTYEAR
- ✓ YOY Growth, QOQ Growth, MOM Growth
- ✓ FIRSTDATE, LASTDATE
- ✓ Quick Measures
- ✓ Creating Measures without writing the DAX Formula using Quick Measures
- ✓ Sales YoY Growth %, Sales YTD, Sales MTD

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## : III. Power View:

- ❖ Report View User Interface / Power BI Desktop User Interface
- ❖ Fields Pane, Visualizations pane, Filters Pane
- ❖ Ribbon, Multiple Views, Report Canvas, Pages Section
- ❖ Fields, Filed Wells, Formatting, Analytics
- ❖ Visuals Interactions
- ❖ Interaction Type (Highlight, Filter, None)
- ❖ Visual Interactions Default Behavior
- ❖ Changing the Default Interaction Behavior, Edit Interactions

## Filters in Power View

- ✓ Filters, Filter Types in Power View
- ✓ Filters on this Visual, Filters on this Page, Filters on All Pages
- ✓ Drill Through Filters, Cross Report Drill Through, Keep All Filters
- ✓ Filter Sub Types - Basic Filtering, Advanced Filtering, Top N, Relative Date Filtering
- ✓ Numeric field filters, Text field filters, Date and Time field Filters

## Hierarchies and Drill-Down Reports

- ❖ Hierarchy Introduction, Default Date Hierarchy
- ❖ Creating Hierarchy, Creating Custom Date Hierarchy, Change Hierarchy Levels
- ❖ Drill Actions - Drill Down, Drill Up, Show Next Level, Expand Next Level
- ❖ Apply Drill Down filters to Selected Visual

## Power BI Visualizations

- ✓ Visualizing Data, Why Visualizations
- ✓ Visualization types, Build Visuals/ Field Wells
- ✓ Visuals for Filtering, Visualizing Categorical Data, Visualizing Trend Data
- ✓ Visualizing KPI Data, Visualizing Tabular Data, Visualizing Geographical Data
- ✓ Leveraging Power BI Custom Visuals
- ✓ Visuals for Filtering
- ✓ Slicer Visualization, when to use a Slicer
- ✓ Create and format Slicer Visualization
- ✓ Hierarchy Slicer (Custom Visualization)
- ✓ When to use a Hierarchy Slicer, Create and format Hierarchy Slicer
- ✓ Advantages of Hierarchy Slicer
- ✓ Play Axis (Dynamic Slicer) - Custom Visualization
- ✓ When to use a Play Axis Visual, Create and format Play Axis Visual

## Visualizing Categorical Data

- ❖ Purpose of Pie and Donut Charts, Create and Format Pie and Donut Charts
- ❖ Purpose of Tree map Visual, Create and Format the Tree Map Visual
- ❖ Purpose of Bar & Column Charts
- ❖ Create and Format Bar and Column Charts
- ❖ Create and Format Stacked Bar Chart, Stacked Column Chart
- ❖ Create and Format Clustered Bar Chart, Clustered Column Chart
- ❖ Create and Format 100% Stacked Bar Chart, 100% Stacked Column Chart
- ❖ Purpose of Scatter Chart, Create and Format Scatter Chart

## Visualizing Trend Data

- ✓ Purpose of Line and Area Charts
- ✓ Create and Format Line Chart, Area Chart, Stacked Area Chart
- ✓ Combo Charts
- ✓ Create and Format Line and Stacked Column Chart, Line and Clustered Column Chart
- ✓ Create and Format Ribbon Chart, Waterfall Chart

## Visualizing KPI Data

- Create and Format Gauge Visual, KPI Visual
- Create and Format Card Visualization, Multi Row Card
- Create and Format Funnel Chart
- Visualizing Tabular Data
- Create and Format Table Visual, Matrix Visualization
- Visualizing Geographical Data
- Create and Format Map Visual, Filled Map Visual



## Grouping, Binning & Sorting

- ❖ Grouping and Binning Introduction
- ❖ Using grouping, Creating Groups on Text Columns
- ❖ Using binning, Creating Bins on Number Column and Date Columns
- ❖ Sorting Data in Visuals, Changing the Sort Column, Changing the Sort Order
- ❖ Sort using column that is not used in the Visualization
- ❖ Sort using the Sort by Column button

## Tooltip Page

- ✓ Create a Report Tooltip Page, Configure your Tooltip Report Page
- ✓ Manually setting a Report Tooltip

## Bookmarks, Selection Pane & Buttons

- ❖ Changing the chart type dynamically
- ❖ Changing the Axis of Chart Dynamically

## ----- : IV. Power BI Service: -----

- ✓ Power BI Service Introduction
- ✓ Power BI Service Introduction, Power BI Cloud Architecture
- ✓ Cloud Vs. On Premise
- ✓ Creating Power BI Service Account, SIGN IN to Power BI Service Account
- ✓ Power BI Pro & Power BI Premium

## My Workspace & Project Workspace

- Adding Dataset to Power BI Service and Creating Multiple New Reports
- Publishing Reports to the Power BI service, Import / Getting the Report to PBI Service
- Creating Multiple Reports using Dataset
- Power BI Datasets Live Connection using Desktop to Create New Report
- Creating New Reports in Cloud using Published Datasets
- Shared and Certified Datasets, Sharing Dataset across Multiple Projects

## Dashboards Development

- ✓ Dashboard, Creating Dashboards using Multiple Reports
- ✓ Pin Visuals and Pin LIVE Report Pages to Dashboard
- ✓ Advantages of Dashboards
- ✓ Interacting with Dashboards
- ✓ Adding Tiles to Dashboards
- ✓ Web Content, Image, Text Box, Video

## Data Connectivity Modes in Power BI

- ✓ Import, Direct Query & Connect Live / Live

## Installing & Configuring the Data Gateways

- Introduction to Data Gateways, How Data Gateways work
- Connect to an on-premise Data Source by using a Data Gateway
- Download Data Gateway, Installing a Data Gateway
- Types of Gateways – Enterprise & Personal Gateway
- Difference Between Enterprise & Personal Gateway
- Manage Data Gateway
- Sharing the Gateway, Add and Remove Administrators
- Add Data Source, Add or Remove Users to a Data Source
- Refresh On Premise Data
- Configuring Automatic Refresh using Schedules
- Full Refresh / Truncate & Load, Incremental Refresh the Data in Dataset

## Understanding Sub folder in Workspace

- ✓ Datasets + Dataflows - Dataflows, Datasets
- ✓ Content - Workbooks, Reports & Dashboards
- ✓ All - Dataflows, Datasets, Workbooks, Reports & Dashboards

## Dataflows

- Dataflows, Purpose of Dataflows
- Creating and Working with Dataflows
- Using Dataflows to Create a Dataset in Power BI Desktop
- Power BI Architecture with Dataflows

## Dataset Actions

- ✓ Refresh, Schedule Refresh, analyze in Excel, Create Report
- ✓ Delete Dataset, Get Quick Insights, Security, Rename, Settings, Download .pbix
- ✓ Manage Permissions, View Lineage
- ✓ Excel Workbooks
- ✓ Import Excel Data into Power BI as Dataset
- ✓ Upload you Excel file to Power BI

## Report Actions

- Share, Mark as Favorite, analyze in Excel, Delete, Quick Insights, Save a Copy, Settings
- View usage Metrics Report, View Lineage



## Dashboard Actions

- ✓ Share, Mark as Favorite, Delete, Settings, View usage Metrics Report, View Lineage
- ✓ Team Collaboration in Power BI using Workspaces

## Introduction to Workspaces

- Classic Workspaces, Upgraded Workspaces
- Create a Workspace, Add Members to Workspace to Collaborate
- Workspace Access - Admin, Member, Contributor, Viewer Roles
- Sharing Power BI Content using Basic Sharing, Content Packs and Apps
- Sharing Reports & Dashboards using Direct Sharing / Basic Sharing

## Content Pack Introduction

- ✓ Create Content Pack, Sharing Content Packs
- ✓ Specific Groups, My Entire Organization
- ✓ Selecting the Content / Items to Publish or Share

## Introduction to App

- Publish an App, Update a Published App
- Manage Content in App, Include in App, Exclude in App
- Sharing App
- Entire Organization, Specific individuals or group
- Un publishing an App

## Row Level Security in Power BI

- ✓ Introduction to Row Level Security
- ✓ Row Level Security (RLS) with DAX
- ✓ Manage Roles, Creating Roles, Testing Roles
- ✓ Adding Members to Roles in Power BI Service
- ✓ Dynamic Row Level Security
- ✓ Creating Users Table and Adding to the Model
- ✓ Capturing users using Username () or UserPrincipalName () DAX Functions

## ADD ON

- ❖ Real-time Project Explanation
- ❖ Resume Preparation, Power BI Developer Roles & Responsibilities
- ❖ Interview Questions & Answers
- ❖ Mock Interviews
- ❖ **SQL Classes**





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