

# PowerBI. Balaji

## 1. What exactly is BI (Business Intelligence)?

- It refers to taking of raw data from different data sources.
- Then transforming raw data into useful information.
- Finally utilizing transformed data to make reports for data analysis to drive profitable business actions.

## 2. What is power bi?

- PowerBI is a cloud-based business intelligence tool provided by Microsoft.
- It is a collection of business intelligence and data visualization tools such as software services, apps and data connectors.
- Using PowerBI by making sharable reports and dashboards.

## 3. Components of power bi?

PowerBI is a collection of different kinds of services by Microsoft.

There are seven components in PowerBI:

### Power Query:

Using this service, we can access and transform data from different data sources.

### Power Pivot:

- Power Pivot enables users to build a data model and create relationships between different tables.
- Creating columns and measures on a variety of data resources
- Power Pivot uses DAX (Data analysis Expression) for calculations.

### Power View:

- Using this view, we can visually represent the data.
- With the help of Power View, filter the data for each visualization or for entire report.

### **Power Map:**

- Power Map is used to visualize the data in 3D mode.
- In Power Map, one attribute as length of the column in 3D and other attribute as heat map.
- Based on geographical location, data should be highlighted.

### **PowerBI Desktop:**

- PowerBI Desktop is a new component in PowerBI suite.
- It is an integrated development tool for Power Query, Power Pivot and Power View.
- Here we can import data from different data resources, transform it.
- Finally transformed data used in insights to create reports.

### **PowerBI Website:**

- It is a web platform to view and share PowerBI solutions.
- Using PowerBI website, we can create dashboards for reports and share the dashboards with other PowerBI Users.

### **Power Service:**

PowerBI Services is a web platform and it enables users sharing of reports with other users.

## **4. Building blocks of power bi**

They are five building blocks of power bi

1. Visual
2. Report
3. Dataset
4. Dashboard
5. Tile

### **Visual:**

Here represent the data set graphically with charts, tables, and maps.

### **Report:**

A report is a visual presentation of datasets having multiple pages.

### **Dataset:**

A dataset is a collection of data sets from different data resources. Using this data, we have to create the visuals.

### **Dashboard:**

A Power BI dashboard is a single page having collection of visuals that tells a story through visualizations.

### **Tiles:**

A tile is a block containing insights in a Power BI dashboard or report. These tiles can be adjusted it means size can be changed.

## **5. What exactly the Power bi desktop is?**

- PowerBI Desktop is a new component in PowerBI suite.
- It is free of cost
- It is an integrated development tool for Power Query, Power Pivot and Power View.
- Here we can import data from different data resources, transform it.
- Finally transformed data used in insights to create reports.
- By using desktop, we can publish reports to power bi service

## **6. What exactly the power BI services are?**

All admin activities of PowerBI come under PowerBI Services. It is a web platform

- Schedule refresh, it means updating data at a particular interval of time using Gateways
- Creating dashboard
- Share the reports
- Restrict data access for particular users.

## 7. Difference b/w power bi desktop and power bi service

Power bi desktop	Power bi service
<ol style="list-style-type: none"><li>1. PowerBI Desktop is a Windows Platform.</li><li>2. Desktop is used to create dashboards for reports, which is not sharable.</li><li>3. It is free of cost</li><li>4. We cannot do schedule refresh.</li><li>5. We are able to create DAX formulas.</li></ol>	<ol style="list-style-type: none"><li>1. Web Platform. Service is used to share the reports.</li><li>2. Services is used to create dashboards for reports, which is sharable.</li><li>3. It is costly</li><li>4. We can do schedule refresh using gateways</li><li>5. Unable to create DAX formulas.</li></ol>

## 8. What is Power query editor?

- With the help of query editor, we can do transformation the data
- Changing the datatypes
- Replace and splitting the values
- Renaming column names and table names. Etc.

## 9. What is Merge and Append in PowerBI?

### Append

- Append is used to combine two or more tables into a single table.
- Number of columns should be same in both tables.
- Note: Here size of the row increases.

### Merge:

- Merge is nothing but join, it merges two tables.
- Unlike append merge will not increase the number of rows.

## 10. What is Dimension table and fact table?

Dimension table contains attributes, whereas fact table contains measurable values.

Dimension tables includes primary key, whereas fact table includes foreign key.

## 11. What are the Types of connections in PowerBI?

- Import (<2GB)
- Direct query(>2GB)
- Live connection (SSAS)

- Data is nothing but information ..
- Meta data is nothing but it contains only table name and column names.it won't contain any data



### Import

- Import is used to get data from different data sources. It contains both data and Meta data inside PowerBI
- If you have less data, we are using Import.
- Import is fast because data is stored, with in the PowerBI

### Direct query

- Direct query contains only Meta data.
- If you have large data, we go for a Direct query.
- With the help of direct query, loading data from Servers to desktop
- Direct query is slow compared to import because data is stored outside PowerBI

### Live connection

- Live connection is used to import data from SSAS cubes. Cube is nothing but predefined model in SSAS.

## 12. What is the calculated column in the PowerBI?

- A calculated column that can be added to existing table
- Calculated column will be physically created in a table and occupy space in the file

### 13. What is the Measure in the PowerBI?

- Measure are dynamic calculations where; result can change depends on context
- New measure will not create any column in the table, it just executes whenever it is call and it does not occupy space in the file.

### 14. Difference b/w column and measure

Column	measure
<ul style="list-style-type: none"><li>• Calculated column is created based on existing columns.</li><li>• It is static.</li><li>• It is unique at table level.</li><li>• It is faster because column will take data from table and give the values.</li><li>• It will occupy space.</li><li>• It will store only column data.</li></ul>	<ul style="list-style-type: none"><li>• It is an expression stored in a model.</li><li>• It is dynamic</li><li>• It is unique at model level</li><li>• It is slower because measure take time to calculate the values</li><li>• It won't occupy any space</li><li>• It will store any type of data</li></ul>

### 15. What are the types of charts available in PowerBI?

#### Card:

- It shows a single value

#### Clustered bar chart:

- Each and every measure represented in separate bars
- Representing data in groups

#### Clustered column Chart:

- Same as clustered bar chart but represents the data in vertical

#### Stacked bar chart:

- Multiple measures represented in single bar values.

### **Pie Chart:**

- It is used to perform proportionate analysis up to 12 slicers.

### **Donut Chart:**

- Same as pie chart but it contains hole in the middle

### **Line Chart:**

- It is used for time series analysis

### **Tree Map:**

- It displays data in multiple blocks, bigger measure in bigger size in left side and smaller measure in smaller size right side.
- It will show size from left to right

### **Area chart:**

- Area chart is optional chart to perform time series analysis.
- Area chart filled below portion of line to indicate its proportion

### **Funnel chart:**

- Funnel shows the values step by step.

### **Gauge chart:**

- Gauge indicates target how much we achieve the target.

### **Maps:**

- Maps will give Geographical representation of data

### **Multi row card:**

- It will show multiple measures in the single card

### **KPI:**

- Key performance indicator it will show up and down values

### **Table:**

- It will show the values in the form of text

### **Matrix:**

- It will show the values in text but it will contain drill up and drill down options to show below level and next level

## **16. What are the Custom Visuals in PowerBI?**

### **Word Cloud:**

- It shows bigger measures in bigger letters with darker colour and smaller measure in smaller letters with lighter colour

### **Heat map:**

- It indicates bigger values in bigger size and darker and smaller values in smaller size and lighter colours
- It displays larger amount of information in smaller area.

### **Dot plot:**

- Dot plot will show the data in dots instead of bar

### **Bubble chart:**

- It will show the data in bubbles based on measure

## **17. What is My workspace?**

### **My workspace:**

- My workspace is a personal workspace for any PowerBI customer to work with User's own content
- Only that particular User can access, User's my workspace
- User can share dashboard and reports from User's my workspace with another User's.



### **App workspace:**

- App workspace is used to share content with colleagues.
- Create an app workspace where user, bundle content into app and make it available to others in User's organization, so user can share and collaborate with other users.

### **Content pack:**

- It contains datasets, reports and dashboards.

### **Creating app workspaces**

- Go to workspace ->
- Right click on workspace ->
- Create app workspace

### **App workspaces access**

- Go to created app workspace ->
- Workspace access->
- Select admin, member, contributor, or view

### **18. How to Publishing reports to the app workspace?**

- Create reports in power desktop ->
- Then, Create app workspace in power bi service ->
- After that, publish the created reports into created app workspace

### **19. How to Share and subscribing to reports**

Reports we can share in 5 ways

1. Gmail
2. Apps
3. Content packs
4. App workspace
5. My workspace

### **20. Creating Dashboards, Pinning tiles**

- Go to report in power bi service->
- Select the tile->
- Add that tile to the new dashboard or existing dashboard
- Creating apps
- Publishing apps
- Get apps
- Giving access to apps for users

## **21. What is Bookmark in PowerBI?**

Bookmarks are used to save current state or current position in a report for separate pages.

Bookmarks can do in two ways

- When data is in multiple pages. If I want to see all data by clicking on buttons, then user need to create bookmark and need to give actions.
- To see all the data in single page by using selection pane and bookmarks pane to create bookmarks

For example, I have 3 pages in a report, then choosing page3 as first page at that time user need to add page3 as first page in the bookmarks.

### **New Group:**

- New group is used to combine different set of information into a single information.
- Example: If user have A, B, C and D cities in a chart, if I need to combine A&B cities in a vsingle bar by using New group option.
- GO TO FIELD—>RIGHT CLICK ON TABLE -> ☰ Select column->New Group

### **Buttons:**

- Buttons are used to give actions to that page

### **Selection pane**

- With the help of selection pane, we can show or hide visuals.

## **Actions through buttons and edit interactions**

By using edit interactions, we can turn on and turn off visual interaction control

We have three options:

- Report author can modify the visual interaction behaviour
- Selections on certain visuals do not impact on other visuals
- Only impact on certain visuals and highlight interaction by default,

**Example:** If I have three visuals in a page, then I want to filter only one visual at that time, by using edit interaction.

Go to Format

☰ edit interactions

☰ it will show the filter icon on visual.

We need to make it as none for which visual is not required.

1. Filter 2. Highlight 3. None

## **22. Types of Filters in PowerBI**

Filters are used to filter the data at developer level, and share limited data access to other users.

There are three types of filters in PowerBI.

- 1) Report level filter
- 2) Page level filter
- 3) Visual level filter.

### **Visual-level Filters:**

- These filters can work only on individual visualization.

### **Page-level Filters:**

- These filters can work at page level. Different pages in the same report can have different page-level filters.

### **Report-level Filters:**

- These filters can work at entire report, filtering all pages included in the report.

### **23. What is Bi-Directional Cross filters/ what is Cross Filter?**

Cross filtering is nothing but relationship between two tables. Cross Filtering, filters the data in two ways

1. Single
2. Both

#### **Single:**

- If we have, both parent and child table, then applying single direction filter on parent table, then if user filter the data in parent table automatically filter the data in child table.
- If user filter the data in child table it will not filter the parent table.



#### **Both:**

If user apply both then data get changes in both the tables

Edit Relationship->Cross Filter Direction ->Select both and Apply security filter in both directions.



### **24. What is Drill through in PowerBI?**

- Drill through is nothing but navigation from one page to another page is called drill through if report having parent and child pages.
- When user add child page column into drill through filter of Parent page when pressing CTRL + Enter directly navigate to child page

## **25. What is Mobile layout in PowerBI?**

It means Mobile compatible reports

First, we need to create visualizations as per the requirement.

Once reports creation is done, then go to view menu option

-> Select Page layout

-> Adjust the visual as per the page layout size.

### **Example:**

When User create report and publish. It will show as per the power bi service. If user want to see the reports in mobile at that time, it will not show properly for this purpose, go for mobile compatible.

## **26. What is Row Level Security in PowerBI?**

Row level security is used to filter the content based on user's role.

They are two types of RLS

1. Static
2. Dynamic

### **Creating Static RLS:**

Security model does not change dynamically for each logged in user

Create Roles in Power BI Desktop---> Test Roles in Desktop

Publish to Power BI Service -----> Add Users to Power BI Service

## **Creating Dynamic RLS:**

Static RLS is about creating roles manually.

If we have too many Roles to create, Static RLS is not an option. Then, we have to use Dynamic RLS.

### **Example:**

If you want to restrict the user based on state then we need to create Role for each state.

## **27. What are types of gateways in PowerBI?**

- Gateway acts as bridge between On-premise data source and power bi service.
- It is used to connect and access On-Premise data.
- Gateways used in organization where data is kept in security.
- Mainly gateways are used to refresh the data.

There are two Types:

### **1. On-premise (personal Mode) data Gateway:**

- It can allow only one user to connect. We cannot share with others.

### **2.On \_premise data gateway:**

It allows multiple users to connect and we can share with others

- Installing and configure the gateways
- Schedule the refresh in power bi service

## **Creating content packs**

- 1) Content Packs will be shared to specified users.
- 2) User cannot edit the Content Packs, but user can make a copy of content pack, which is shared, and edit the copied Content pack.
- 3) Using the datasets in the content pack, other users can create reports.

In content packs, sharing reports with dataset. However, we can share only the dataset if we want to.

### Sharing content pack

Go to settings-> create content pack\_>share

- Power bi datasets
- Power bi dataset is nothing but pre-defined model

## **28. PowerBI Architecture:**

The architecture can be divided into three parts or phases

- Data Integration
- Data Processing
- Data Presentation

### **Data Integration:**

Import data from different data sources in different formats. PowerBI brings all data together and converts into a standard format. Stored in a common storage area known as staging area.

### **Data Processing:**

Here we have to do several pre-processing or cleansing operations, it means transform the raw data into useful information, to our business needs.

### **Data presentation:**

In this phase, the processed data moves from warehouse to PowerBI Desktop to create dashboards we can also import custom visualizations from marketplace.

## **29. What are the pricing plans available in PowerBI?**

There are three pricing plans available in PowerBI.

### **PowerBI Desktop:**

It is free of cost and includes tools like data visualization, data preparation, data modeling, and finally publishing reports to PowerBI Services.

### **PowerBI Pro:**

It is available for subscription price \$9.99 per user per month. We can try it for 60 days free trial before purchasing subscription. Here we can do viewing dashboards and to publishing reports anywhere

### **PowerBI Premium:**

It is available at a price of \$4995 per month and it provides dedicated storage resource (cloud) for current user organization

### **30. What are the features of PowerBI?**

- Attractive visualization
- Connect to different range of data sources
- Custom Dashboards
- Flexible titles
- Navigation pane
- Q & A question box
- DAX (data analysis expression is used to perform specific functionalities on data)

### **31. How many ways we can publish the reports?**

We can publish the reports created in PowerBI Desktop in two ways.

- PowerBI Service
- PowerBI Report Server

PowerBI Service is a cloud based public platform where as PowerBI Report Server is an On-Premise platform protected by firewall security.

### **PowerBI Service:**

- PowerBI Service is a web-based platform where user can share reports made on PowerBI Desktop
- It is also known as PowerBI.com, PowerBI Workspace, PowerBI Suite, PowerBI web portal.



### **PowerBI Report Server:**

- It is similar to PowerBI Service. The only difference is PowerBI Report Server is an On-premise platform.
- It is used by organizations who do not want to publish their reports on cloud and are concerned about security for their data.

### **32. What is Data Modelling in PowerBI?**

Data modelling is used to connect multiple data sources using a relationship. A relationship defines how data sources are connected with each other.

In PowerBI on the left-hand side of the screen we have following tabs

- Report
- Data
- Relationship

#### **Report View:**

In report tab, we are able to see a dashboard and charts in visual pane. It is used to create number of pages with visualizations.

#### **Data View:**

It helps to understand how data behaves in PowerBI desktop model.

It is different from viewing tables in power query editor

#### **Model View or Relationship View:**

Model View shows all tables, columns and relationships in the model. This view can be helpful when model has complex relationships between many tables.