BIS

Experiment no: 4

* Aim: To study Data Modelling in BI

* Theory:

→ Data Modelling in BI

- Data modelling is a process of creating a conceptual representation of data objects and their relationships to one another. The process of data modelling typically involves several steps, including requirements gathering, conceptual design, logical design, physical design, and implementation.
- Data modellers collaborate with stakeholders to understand what data is needed, define the entities and their traits, set up connections between data objects, and build a model that helps developers, database managers, and others work effectively with the data.

→ Data modelling types:

1) Conceptual data modelling

It is a visual representation of database concepts and the relationships between them identifying the high-level user views of data. Rather than the details of the database itself, it focuses on establishing entities, characteristics of an entity, and relationships between them.

2) Logical Model
This model further defines the structure of the data entities and their relationships. Usually, a logical data model is used for a specific project since the purpose is to develop a technical map of rules and data structures.

3) Physical Model
This is a schema or framework defining how data is physically stored in a database. It is used for database-specific modeling where the columns include exact types and attributes. A physical model designs the internal schema.

→ Steps to create Data model in BI

1) To create data model in Power BI, you need to add all data sources in Power BI new report option.
2) Once you add a data source, it is presented on the right side bar.
3) In Power BI on the left side of the screen, you have the following three tabs :- Report, Data, Relationships.
4) When you navigate to the Report tab, you can see a dashboard and a chart selected for data visualization.
5) When you go to the Data tab, you can see all the data as per the defined Relationship.
6) In the Relationship tab, you can see the relationship between data sources.

→ Creating Calculated Columns

You can create calculated columns in Power BI by combining two or more elements of the existing data.

1) To create a new calculated column, navigate to Data View tab on the left side of the screen and then click Modelling
2) When you navigate to the modelling tab, you can see a New Column option at the top of the screen.
3) This also opens the formula bar, where you can enter DAX formula to perform calculation. DAX - Data Analysis Expression is a powerful language also used in Excel to perform calculations

→ Creating Calculated Tables

We can also create a new calculated table in data modelling in Power BI.

1) DAX expression is used to create the new table. You have to enter the name of a new table on the left side of the equal sign and DAX formula to perform the calculation to form that table on the right.
2) When the calculation is complete, the new table appears in the Fields pane in your model.

→ Managing Time-Based data:

Power BI allows to drill through time-based data by default. When you add a date field in your analysis and enable drill

on your data visualization, it takes you to the next level of time-based data.

We can enable the drill feature in visualizations using the option at the top. Once we enable the drill feature and click the bars or lines in the chart, it drills down to the next level of time hierarchy.
Example:- Years → Quarters → Months.