## Experiment No.: 10

**Title:** Demonstration of Data Visualization and Reporting using Microsoft Power BI

**Objectives**: 1. To Create visualization dashboards for sales analysis using PowerBI

**Key concepts:** Dashboard, SSRS

**About PowerBI:**

Power BI is a business analytics service by Microsoft that provides interactive visualizations and business intelligence capabilities with an interface simple enough for end users to create their own reports and dashboards. It is part of the Microsoft Power Platform, which also includes Power Apps, Power Automate, and Power Virtual Agents. Here are some key aspects of Power BI:

1. Data Connectivity:

Power BI allows you to connect to a wide variety of data sources, including databases, cloud-based and on-premises data sources, Excel spreadsheets, SharePoint lists, and more.

2. Data Transformation and Modeling:

Power BI provides tools for data transformation and modeling. You can shape and clean your data using Power Query, and create relationships between tables in the data model.

3. Data Visualization:

Users can create interactive and visually appealing reports and dashboards using a drag-and-drop interface. Power BI supports a variety of visualizations such as tables, charts, maps, and custom visuals.

4. DAX (Data Analysis Expressions):

Power BI uses a formula language called DAX for creating custom calculations and aggregations in your reports. DAX is a powerful and flexible language similar to Excel formulas.

5. Power Query:

Power Query is a data connection technology that enables you to discover, connect, and transform your data. It's used for data shaping and transformation before it is loaded into the Power BI data model.

6. Power BI Desktop:

Power BI Desktop is a free application that you install on your computer for creating Power BI reports. It provides a comprehensive set of tools for data preparation, modeling, and visualization.

**Steps to perform:**

Creating charts in Power BI for sales analysis using AdventureWorks data involves several steps. AdventureWorks is a sample database provided by Microsoft for SQL Server, and Power BI is a powerful tool for data visualization and analysis. Here's a step-by-step guide to help you create different charts for sales analysis:

Prerequisites:

Install Power BI Desktop:

Make sure you have Power BI Desktop installed on your machine. You can download it from the official Microsoft website.

AdventureWorks Database:

Ensure that you have access to the AdventureWorks data in your SQL Server database. You can download and install the AdventureWorks database from the Microsoft website.

Steps:

Connect to SQL Server:

Open Power BI Desktop.

Click on "Get Data" and choose "SQL Server" as the data source.

Enter the server name and database name where AdventureWorks is installed.

Load Data:

Select the tables you need for sales analysis (e.g., Sales, Product, and Date tables).

Load the necessary data into Power BI.

Create Relationships:

Identify and create relationships between the tables. Typically, you would link tables through common fields, such as OrderID or ProductID.

Data Modeling:

Create calculated columns or measures in the "Model" view to enhance your data model. For example, you might create a Total Sales measure using the SalesAmount column.

Create a Table or Matrix for Overview:

Drag and drop fields onto the canvas to create a table or matrix to provide an overview of sales. You might include columns like Date, Product, Quantity, and Sales Amount.

Create a Line Chart for Trends:

Use a line chart to visualize sales trends over time. Place the Date field on the axis and the Sales Amount on the values.

Build a Bar Chart for Product Sales:

Create a bar chart to analyze sales by product. Place the Product field on the axis and the Sales Amount on the values.

Generate a Pie Chart for Sales Distribution:

Use a pie chart to show the distribution of sales across different product categories. Place the Category field on the legend and the Sales Amount on the values.

Add Slicers for Interactivity:

Include slicers to allow users to filter data interactively. For example, add slicers for Date Range, Product Category, or Region.

Create a Map for Geographic Analysis:

If applicable, create a map visualization to analyze sales geographically. Use fields like City, State, or Country.

Enhance Visuals with Formatting:

Format your charts and visuals for better readability. Adjust colors, fonts, and other formatting options.

Create a Dashboard:

Bring all your visuals together on a dashboard for a comprehensive view of the sales analysis. Arrange visuals and add any additional insights.

Publish to Power BI Service:

Save your Power BI report and publish it to the Power BI service if you want to share it with others. This step requires a Power BI account.