

# Power BI Assignment 1

## 1 What are the Products available in the market for Power BI?

Power BI offers several tools and services, each serving a specific purpose within the BI ecosystem.

The **main Power BI products** are:

Product	Description
<b>Power BI Desktop</b>	A free Windows application for creating, transforming, and visualizing data. It's mainly used for report and dashboard creation.
<b>Power BI Service (Power BI Online)</b>	A cloud-based SaaS platform used for publishing, sharing, and collaborating on reports and dashboards.
<b>Power BI Mobile</b>	Mobile applications (Android/iOS/Windows) for viewing and interacting with reports and dashboards on the go.
<b>Power BI Report Server</b>	An on-premises report server where organizations can host Power BI reports securely within their own infrastructure.
<b>Power BI Data Gateway</b>	A bridge that connects on-premises data sources to Power BI cloud services for scheduled data refreshes.
<b>Power BI Embedded</b>	A PaaS (Platform as a Service) that allows developers to embed Power BI reports and dashboards into custom applications.
<b>Power BI Premium</b>	Provides dedicated cloud resources, larger dataset sizes, advanced AI, and paginated reports for enterprise-level deployment.

## 2 What are the different steps involved in Power BI workflow Architecture.

The Power BI architecture follows a **step-by-step workflow** from data acquisition to visualization and sharing:

Stage	Process Description
<b>1. Data Source Connection</b>	Connects to various data sources such as Excel, SQL Server, APIs, or cloud platforms (Azure, Salesforce, etc.).
<b>2. Data Extraction</b>	Imports or connects to live data using built-in connectors.
<b>3. Data Transformation (ETL)</b>	Performed using <b>Power Query Editor</b> — cleaning, filtering, merging, and reshaping raw data into an analysis-ready format.
<b>4. Data Modeling</b>	Building relationships between tables, creating calculated columns, measures, and hierarchies using <b>DAX (Data Analysis Expressions)</b> .
<b>5. Data Visualization</b>	Creating charts, graphs, KPIs, and dashboards using drag-and-drop visuals.
<b>6. Report Publishing</b>	Reports are published from <b>Power BI Desktop</b> to <b>Power BI Service</b> for online access.
<b>7. Collaboration and Sharing</b>	Reports and dashboards are shared with users through Power BI Service, Power BI Apps, or embedded analytics.

Stage	Process Description
<b>8. Data Refresh and Governance</b>	Scheduled data refreshes, row-level security (RLS), and monitoring via Power BI Gateway and Admin Portal.

### 3 Why Visualisation is major building block of Power BI?

Visualization is the **core strength** of Power BI because it transforms raw data into **insightful, interactive, and easy-to-understand visuals**.

Reasons why it's a major building block:

- **Simplifies complex data:** Converts millions of rows of data into charts, KPIs, and dashboards that are easy to interpret.
- **Drives decision-making:** Helps stakeholders quickly identify trends, anomalies, and business patterns for strategic decisions.
- **Interactive exploration:** Allows users to filter, drill down, and slice data dynamically to find specific insights.
- **Storytelling with data:** Enables creation of visually compelling narratives that communicate insights clearly to both technical and non-technical users.

### 4 Explain any 3 key benefits of Power BI in data analytics domain.

Benefit	Explanation
<b>1. Integration and Connectivity</b>	Power BI connects with over 100+ data sources including SQL, Azure, Excel, SAP, Salesforce, and even web APIs, allowing seamless data consolidation.
<b>2. Real-Time Data Analysis</b>	Dashboards can display live data through streaming datasets or real-time connections, enabling instant insights and quick business actions.
<b>3. Advanced Analytics and AI Features</b>	Built-in AI visuals, natural language querying (Q&A), and integration with Azure ML and Python/R scripts enhance predictive and advanced analytics capabilities.

### 5 What are the different responsibilities of Power BI developer in the market.

A **Power BI Developer** plays a crucial role in transforming raw data into valuable business insights.

**Core Responsibilities:**

1. **Data Preparation & Integration**
  - Connect to multiple data sources (databases, APIs, cloud).
  - Perform data cleaning, transformation, and modeling using Power Query.
2. **Data Modeling & DAX Implementation**
  - Create relationships, calculated columns, and measures.
  - Optimize data models for performance and scalability.
3. **Report & Dashboard Development**

- Design interactive and visually appealing dashboards and reports.
- Ensure visual consistency and user-friendly interfaces.

#### **4. Performance Optimization**

- Optimize queries and data models for faster refresh and report loading times.

#### **5. Collaboration & Deployment**

- Publish reports to Power BI Service and manage user access and permissions.
- Set up scheduled refreshes and gateways for live data connections.

#### **6. Governance & Security**

- Implement Row-Level Security (RLS) and compliance policies.
- Maintain data accuracy and reliability.

#### **7. Continuous Improvement**

- Stay updated with Power BI updates, DAX optimizations, and visualization best practices.
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