

1) What is Power BI, and what are its three main components?

**Power BI** (Business Intelligence) is a **data analytics and visualization tool** developed by Microsoft.

Power BI turns raw data into meaningful insights through beautiful charts, graphs, and dashboards.

**Main Components of Power BI:**

-Power BI Desktop

-Power BI Service (Power BI Online)

-Power BI Mobile

2) Name two business use cases for Power BI dashboards.

**Sales Performance Analysis Dashboard**

**Purpose:**

To help a company track sales across regions, products, and time periods.

**Example use case:**

A retail company uses Power BI to monitor daily and monthly sales performance.

The dashboard shows:

- Total sales and profit by region or product
- Top-performing sales representatives
- Monthly sales trends compared to targets

**Benefit:**

Managers can instantly see which regions or products are doing well and take action to improve weaker areas.

--- Financial Management Dashboard

**Purpose:**

To analyze a company's financial health in real time.

**Example use case:**

A finance team uses Power BI to visualize:

- Revenue, expenses, and profit margins
- Budget vs. actual spending
- Cash flow trends

**Benefit:**

Decision-makers can identify overspending, forecast future performance, and make data-driven financial decisions quickly.

### 3) How do you download and install Power BI Desktop?

#### Step 1: Open Microsoft Store

- Click the **Start (Windows)** button at the bottom-left corner of your screen.
- Type **Microsoft Store** and click it to open.

#### Step 2: Search for Power BI Desktop

- In the Store's search box (top-right), type **Power BI Desktop**.
- Click on the **Power BI Desktop** app from the results.

#### Step 3: Download the App

- Click the **Get** or **Install** button.
- Wait a few minutes while it downloads and installs automatically.


#### Step 4: Open Power BI Desktop

- When it finishes installing, click **Open**.
- You can also open it later from the Start menu — just type **Power BI Desktop**.

#### Step 5: Allow Permission (if asked)

- If Windows asks, click **Yes** to allow the app to make changes.


### 4) Power BI Desktop

-  **It's an application you install** on your computer (Windows).
- You use it to **create reports** — that means importing data, cleaning it, and building visuals (charts, graphs, etc.).
- It's the main “**report building**” tool.
- File type: .pbix

#### Example:

You open Power BI Desktop, load sales data from Excel, and design a sales performance report.

### Power BI Service (Online)

-  It's a **cloud platform (website)** — you access it at <https://app.powerbi.com>.
- You use it to **publish, share, and view** reports and dashboards created in Power BI Desktop.
- It's mainly for **collaboration** and **online access**.
- You can view reports on any device — computer, tablet, or phone.

#### Example:

After creating your report in Power BI Desktop, you publish it to Power BI Service so your manager or team can view it online.

5) **What file extension does a Power BI project use?**

File type: .pbix

6) **Explain the role of Power Query in Power BI.**

**Power Query** is the **data connection and transformation tool** inside Power BI.

It helps you **import, clean, and shape** data **before** you create visuals or reports.

Role of Power Query

- Connects to Data Sources
- Transforms Data (Cleaning & Shaping)
- Applies Steps Automatically

Loads Clean Data into Power BI

7) **Why would a business prefer Power BI over Excel for reporting?**

- Better Data Visualization
- Easy Sharing and Collaboration
- Automatic Data Refresh
- Handles Large Data Easily
- Better Security and Control

8) **Describe one limitation of the free version of Power BI.**

You cannot share reports or dashboards with others using the Power BI Service.

9) **What is a "published report" in Power BI Service?**

A **published report** is a **Power BI report (.pbix file)** that you've **uploaded or sent from Power BI Desktop** to the **Power BI Service (online platform)** so it can be **viewed, shared, and interacted with** in a web browser.

10) **How does Power BI Mobile enhance accessibility?**

**Power BI Mobile** is a mobile app (available for **Android and iOS**) that allows users to **access, view, and interact** with their Power BI dashboards and reports **anytime, anywhere** — right from their phone or tablet.

Key Ways It Enhances Accessibility:

- Access from Anywhere
- Interactive Reports
- Real-Time Alerts
- Sharing and Collaboration
- Offline Access

11) Compare Power BI with Tableau—pros and cons.

### **Power BI — Pros and Cons**

#### **Pros:**

- Easy to learn and use (especially for Excel users)
- Lower cost
- Strong integration with Microsoft products
- Regular updates (monthly from Microsoft)
- Great for self-service analytics and business reporting

#### **Cons:**

- Slightly slower with very large datasets
- Limited design flexibility compared to Tableau
- Best performance when used in Microsoft environment

### **Tableau — Pros and Cons**

#### **Pros:**

- Excellent for complex, detailed, and creative visualizations
- Handles large data sets very efficiently
- Flexible connections to many data sources
- Advanced analytics and visualization options

#### **Cons:**


- Expensive (higher license cost)
- Requires more training and experience
- Collaboration setup (Tableau Server/Online) can be complex

12) Explain how Power BI integrates with Azure services.

**Power BI** and **Azure** are both part of Microsoft's cloud ecosystem.

They work **together** to help organizations **store, process, and analyze** massive amounts of data efficiently.

## 1. Azure SQL Database → Power BI

- Power BI can directly **connect to Azure SQL Database**.
- This allows you to **import or live-connect** to cloud-stored data and create real-time dashboards.
-  *Example:* You can click \**“Get Data → Azure → Azure SQL Database” → Enter server name → Load data → Create visuals.*

*Why it matters:* Businesses can monitor live database updates without manual Excel exports.

## 2. Azure Data Lake Storage → Power BI

- Azure Data Lake stores huge volumes of **raw, unstructured data** (like logs, IoT data, etc.).
- Power BI can read and transform that data using **Power Query**.

*Benefit:* Enables **big data analytics** and advanced visualizations directly from large files.

## 3. Azure Synapse Analytics (formerly SQL Data Warehouse)

- Power BI can connect to **Azure Synapse** for **fast, large-scale analytics**.
- It lets you visualize processed data in seconds — perfect for enterprise-level reports.

*Benefit:* Handles millions of records efficiently, great for big companies.

## 4. Azure Machine Learning → Power BI

- Power BI can **integrate AI models** built in **Azure Machine Learning**.
- You can use predictions (like sales forecasting, churn analysis) inside Power BI visuals.

*Example:* A model in Azure ML predicts customer churn → Power BI visual shows “which customers might leave soon.”

## 5. Azure Active Directory (AAD) → Security Integration

- Power BI uses **Azure Active Directory** for **user authentication and role-based access**.
- *Example:* Only managers can see profit reports; others see limited data.

## 6. Azure Analysis Services

- Power BI connects to **Azure Analysis Services** to access complex data models.
- It helps with **faster calculations** and **centralized semantic models** for business users.

## 13) What are "gateways" in Power BI, and when are they needed?

A **gateway** in Power BI acts as a **bridge** between your **on-premises data** (like data stored on your computer or local company server) and the **Power BI cloud service**.

A **gateway** helps Power BI **safely connect** to data that is **not in the cloud**, so you can refresh and use it in your online dashboards

## Why Gateways Are Needed

Gateways are needed when:

- Your data source is **on-premises** (e.g., SQL Server, Excel, Oracle, SAP, etc.).
- You want to **schedule automatic data refreshes** in Power BI Service.
- You need a **secure way** to transfer data between your local network and the Power BI cloud.

### Example:

Imagine your company keeps its data in **SQL Server** on your office computer (not in Azure).

- You install a **Power BI Gateway** on that computer.
- The gateway connects your local data to **Power BI Service** in the cloud.
- Now, Power BI dashboards online can **refresh automatically** without you uploading the data every time

## 14)How would you convince a company to adopt Power BI? (ROI argument)

### 1. Cost Efficiency

- Power BI is **more affordable** than many BI tools like Tableau or Qlik.
- The **Power BI Desktop** app is free, and the **Pro license** costs only about **\$10–\$20 per user/month**, which is low compared to competitors.
- This means even small and medium businesses can access **enterprise-grade analytics** without high costs.

*ROI impact:* Lower software costs = higher profit margin.

### 2. Time Savings and Productivity

- With Power BI, employees can **automate reports and dashboards**, reducing hours spent on manual Excel reporting.
- **Data refreshes automatically**, so managers always see up-to-date results.
- Built-in tools like **Power Query** simplify cleaning and transforming data — no coding needed.

*ROI impact:* Employees save time and focus on decision-making instead of manual reporting.

### 3. Data-Driven Decision Making

- Power BI gives **real-time insights** through interactive dashboards.
- Decision-makers can identify trends, problems, or opportunities immediately — leading to **faster and smarter business actions**.

*ROI impact:* Better decisions = increased revenue and reduced risk.

### 4. Integration with Existing Tools

- Since Power BI integrates seamlessly with **Excel, Teams, SQL Server, and Azure**, companies don't need to replace existing systems.
- This makes adoption easier and saves money on retraining staff or changing software.

*ROI impact:* No extra costs for integration or new systems.

## 5. Scalable and Secure

- Power BI works for both small teams and large enterprises.
- Data is stored and secured through **Microsoft Azure**, ensuring reliability and compliance with enterprise standards.

*ROI impact:* Scalability means the tool grows with the company — no future replacement costs.

15) What security features does Power BI offer for sensitive data?

Power BI provides **multiple layers of security** — from how data is stored to how it's accessed and shared.

These layers ensure that **only authorized users** can see or use confidential information.

### 1. Row-Level Security (RLS)

- RLS controls **which rows of data each user can see**.
- For example, a sales manager in Tashkent only sees sales data for **Tashkent**, while another manager in Samarkand sees **Samarkand** data.
- You can define rules in Power BI Desktop or Service.

*Benefit:* Users see **only their own data**, keeping other regions' or departments' data private.

### 2. Role-Based Access Control (RBAC)

- Power BI uses **Azure Active Directory (AAD)** to manage user roles.
- Admins can assign roles like **Admin, Member, Contributor, or Viewer** for each workspace.

*Benefit:* Access is given **only as needed**, reducing risk of data misuse.

### 3. Data Encryption (in Transit & at Rest)

- All data in Power BI is **encrypted using Microsoft's encryption standards**:
  - **In transit:** Protected with HTTPS/TLS while data is sent between Power BI and other systems.
  - **At rest:** Encrypted when stored in the Power BI service (on Microsoft Azure).

*Benefit:* Prevents unauthorized access even if data is intercepted or stolen.

### 4. Microsoft Cloud Security (Azure)

- Power BI is hosted on **Microsoft Azure**, which follows strict global standards like **ISO 27001, GDPR, HIPAA, and SOC**.
- Azure provides **network security, threat detection, and compliance monitoring**.

*Benefit:* Enterprise-level protection that meets international regulations.

## 5. Data Loss Prevention (DLP) Policies

- Power BI integrates with **Microsoft Purview / Microsoft 365 compliance center** to detect and prevent sensitive data (like credit card numbers) from being shared.

*Benefit:* Prevents accidental or unauthorized sharing of confidential data.

## 6. Sensitivity Labels

- You can apply **labels** such as “Confidential,” “Private,” or “Public” to datasets and reports.
- These labels travel with the data — even if exported to Excel or PDF.

*Benefit:* Helps enforce data governance automatically.

## 7. Multi-Factor Authentication (MFA)

- Power BI uses **Azure Active Directory** to enable **MFA** — users must verify identity (e.g., password + phone code).

*Benefit:* Strong protection against unauthorized logins.

Year	Quarter	Month	Day	Count of OrderID	Sum of Price	Product	Sum of Quantity
2023	Qtr 1	January	5	1	1200	Laptop	2
2023	Qtr 1	February	5	1	80	Keyboard	1
2023	Qtr 1	February	5	1	25	Mouse	5
2023	Qtr 1	March	5	1	1200	Laptop	1
2023	Qtr 1	March	5	1	300	Monitor	1
Total				5	2805		10