Power BI – Typed Notes

What is Power BI?

Power BI is a **Business Intelligence (BI) tool by Microsoft** that helps convert raw data into **meaningful insights** through interactive dashboards, visualizations, and reports.

Dashboard – Complete Process

1. **Data Loading**
2. **Data Transformation** (Power Query / Query Editor)
3. **Data Modeling** (Relationships)
4. **DAX Formulas** (Measures & Calculations)
5. **Visualization** (Reports & Dashboards)

Use of Dashboard: - Analysis of data - Data visualization - Report sharing

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What is Power BI Used For?

- Business Intelligence and analytics
- Transforming raw data into insights
- Creating interactive dashboards and reports

Components of Power BI

1. **Power BI Desktop** – Create reports and dashboards
2. **Power BI Service (Web)** – Cloud platform to publish, share, and collaborate
3. **Power BI Mobile App** – View dashboards on mobile devices
4. **Power BI Gateway** – Connect on-premise data with cloud services
5. **Power BI Report Server** – On-premise hosting of reports

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Who Needs to Learn Power BI?

- **Business Analysts** – Business data & KPIs visualization
- **MIS Executives** – Automated and dynamic reporting
- **Data Analysts** – Transform raw data into dashboards
- **Team Leaders / Managers** – Monitor performance
- **Entrepreneurs / Freelancers** – Business performance tracking
- **Students & Job Seekers** – Data-oriented career growth

Hierarchy in Data Field

- **MIS Executive** – Day-to-day reporting & dashboards
- **Data Analyst** – Data cleaning, visualization, basic forecasting
- **Business Analyst** – Business insights & strategy
- **Data Scientist** – Predictive models & machine learning

Power BI Workflow

1. Load Data
2. Transform & Clean Data
3. Create Data Model (Relationships)
4. Write DAX Measures
5. Build Visualizations (Dashboards)

Data Loading in Power BI

- Import Mode – Data is imported into Power BI
- Direct Query – Data remains at source and updates dynamically

Data Connections

Power BI supports multiple sources: - Excel - CSV / Text files - SQL Server - Databases - Cloud platforms

Power Query Overview

Power Query is used for **ETL (Extract, Transform, Load)**.

Types of Transformations

Column-Level Transformations

- Rename columns
- Remove unwanted columns
- Reorder columns
- Split / Merge columns
- Change data types
- Replace values

Row-Level Transformations

- Remove top/bottom rows

- Remove duplicates / blank rows
- Filter rows
- Sort rows
- Group By (sum, average, count)

Table-Level Transformations

- Transpose table
- Pivot / Unpivot columns
- Remove errors
- Detect data types

Add Column Transformations

- Custom column (M language)
- Index column
- Conditional column
- Duplicate column

Text Transformations

- Trim, Clean
- Uppercase / Lowercase / Capitalize
- Extract text
- Replace text

Number Transformations

- Round, Absolute
- Add / Subtract / Multiply / Divide
- Statistical functions (min, max, average)

Date & Time Transformations

- Extract year, month, day
- Add or subtract days
- Date difference

Visualization Overview

Common Charts

- Clustered Column Chart
- Clustered Bar Chart
- Stacked Column & Bar Chart
- 100% Stacked Chart
- Line & Area Chart

- Pie & Donut Chart
- Tree Map
- Table & Matrix
- Cards & Multi-row Cards
- KPI & Gauge
- Funnel Chart
- Waterfall Chart
- Scatter Chart
- Combo Chart
- Ribbon Chart

Filters & Slicers

- Used to make interactive dashboards
- Categorical and date-based filtering

Maps

- Map – Location-based visualization
- Filled Map – Region-based values

Q&A Feature

- Natural language questions
- Ad-hoc analysis

Dashboard Planning

- Title
- Layout & flow
- Data relevance
- Visual selection

Data Modeling Overview

Table Types

Fact Table

- Contains transactional/measurable data

- Used for analysis
- Example: Sales (SalesID, ProductID, CustomerID, Date, Quantity, Amount)

Dimension Table

- Descriptive information
- Example: Customer, Product, Date

Bridge Table

- Used for many-to-many relationships

Date Table

- Used for time intelligence

Lookup Table

- Extends dimensions

Helper / Utility Table

- Used for calculations and filtering

Schema Types

Star Schema

- One fact table with multiple dimension tables
- Best performance

Snowflake Schema

- Dimension tables further normalized
- More complexity

Flat Table

- Single table model
- Used for small reports

Keys in Power BI

- **Primary Key** – Unique identifier
- **Foreign Key** – Links tables

Relationship Types

- One-to-Many (1:*)
- Many-to-One (*:1)
- One-to-One (1:1)

Relationship Creation Steps

1. Load data
2. Understand table structure
3. Identify primary & foreign keys
4. Create relationships in model view
5. Set cardinality & direction
6. Validate relationships

Importance of Keys

- Accurate reporting
- Avoid duplication
- Correct relationships

End of Notes

(Converted from handwritten notes into a clean typed document)