**📘 Power BI Visuals – Detailed Documentation**

Power BI provides a wide range of visuals to **analyze, interpret, and present data**. Visuals transform raw numbers into insights that help decision-making.

**🔹 1. What are Visuals in Power BI?**

* Visuals are graphical representations of data in a Power BI report/dashboard.
* They help identify **patterns, trends, comparisons, distributions, and relationships**.
* Users can interact with visuals through **filters, slicers, drill-throughs, and cross-highlighting**.

**🔹 2. Common Power BI Visuals and Their Uses**

**2.1 Bar Chart / Column Chart**

* **Use:** Compare values across categories.
* **Where to use:** Sales by region, revenue by product, customer counts by category.
* **Example:** Compare sales of "Product A, B, C" across different states.

**2.2 Line Chart**

* **Use:** Show trends over time.
* **Where to use:** Monthly revenue growth, website traffic over days, stock price history.
* **Example:** Sales trend from January to December.

**2.3 Area Chart**

* **Use:** Similar to line chart but emphasizes total value with filled area.
* **Where to use:** Show cumulative trends, growth contribution.
* **Example:** Revenue contribution by product category over time.

**2.4 Pie / Donut Chart**

* **Use:** Show proportion or percentage of a whole.
* **Where to use:** Market share by company, expenses breakdown.
* **Example:** Market share of brands (Brand A – 40%, Brand B – 30%, Brand C – 30%).

**2.5 TreeMap**

* **Use:** Hierarchical data representation using nested rectangles.
* **Where to use:** Large datasets where categories and subcategories need comparison.
* **Example:** Sales distribution by department and product line.

**2.6 Scatter Plot**

* **Use:** Show relationships between two numeric values.
* **Where to use:** Correlation analysis like sales vs. advertising spend.
* **Example:** Relationship between profit margin and sales volume.

**2.7 Bubble Chart**

* **Use:** Enhanced scatter plot with bubble size representing a third measure.
* **Where to use:** Market analysis, risk analysis.
* **Example:** Show "Profit vs. Sales" where bubble size = "Customer Count".

**2.8 Table**

* **Use:** Display raw data in rows and columns.
* **Where to use:** Detailed data lookup, financial reporting.
* **Example:** List of all customers with sales, discount, profit.

**2.9 Matrix (Pivot Table)**

* **Use:** Summarize data with rows and columns (similar to Excel Pivot).
* **Where to use:** Multi-dimensional comparisons (Product vs. Region).
* **Example:** Sales by product across multiple regions.

**2.10 Card**

* **Use:** Display a single numeric KPI.
* **Where to use:** Show key figures like "Total Sales", "Profit Margin", "Number of Customers".
* **Example:** A card showing "Total Sales = ₹5.2M".

**2.11 Multi-Row Card**

* **Use:** Display multiple KPIs together.
* **Where to use:** Show small sets of important business metrics.
* **Example:** Display "Sales, Profit, Customers" in one view.

**2.12 Gauge**

* **Use:** Show progress toward a target.
* **Where to use:** Performance tracking (Sales vs. Target).
* **Example:** Gauge showing "Achieved 75% of sales target".

**2.13 KPI Visual**

* **Use:** Compare actual performance with target (trend included).
* **Where to use:** Strategic performance dashboards.
* **Example:** Show current sales value with trend line and target.

**2.14 Map Visuals**

* **Types:** Map, Filled Map, Shape Map, ArcGIS Map.
* **Use:** Show geographical data.
* **Where to use:** Sales by country/state/city, customer distribution.
* **Example:** Map showing revenue by state in India.

**2.15 Waterfall Chart**

* **Use:** Show incremental positive/negative changes leading to a final value.
* **Where to use:** Financial analysis (Profit analysis).
* **Example:** Start with revenue → subtract costs → add discounts → final profit.

**2.16 Funnel Chart**

* **Use:** Show process stages and drop-offs.
* **Where to use:** Sales pipelines, recruitment process.
* **Example:** Leads → Qualified Leads → Opportunities → Deals Closed.

**2.17 Histogram**

* **Use:** Show frequency distribution of values.
* **Where to use:** Customer age groups, income levels, product ratings.
* **Example:** Distribution of customer ages in 10-year intervals.

**2.18 R/Python Visuals**

* **Use:** Advanced statistical and custom visuals.
* **Where to use:** Predictive analytics, machine learning insights.
* **Example:** Regression analysis for sales prediction.

**2.19 Custom Visuals (Marketplace)**

* **Use:** Extend Power BI with visuals from AppSource.
* **Examples:** Bullet chart, Heatmaps, Gantt chart, Tachometer.
* **Where to use:** Industry-specific dashboards (project management, HR analytics).

**🔹 3. Where and How to Use Power BI Visuals**

**Where to Use**

* **Dashboards:** To track KPIs and provide a quick business overview.
* **Reports:** To explore detailed insights, drill-down into trends.
* **Self-service analytics:** To allow users to filter, slice, and analyze data themselves.

**How to Use**

1. Import your dataset into Power BI (Excel, SQL, etc.).
2. Drag a field to the report canvas → Power BI auto-selects a visual.
3. Change visual type from **Visualizations Pane**.
4. Configure fields:
   * **Axis/Legend** → Categories (e.g., Product, Region).
   * **Values** → Measures (e.g., Sales, Profit).
   * **Filters** → Narrow down data.
5. Use **Formatting Options** (colors, labels, legends) for better storytelling.
6. Add **interactivity** with slicers, drill-through, bookmarks.

**🔹 4. Best Practices for Building Visuals**

* Keep visuals **simple and focused** (avoid clutter).
* Use **consistent colors** (e.g., green for profit, red for loss).
* Use **hierarchies and drill-downs** for detailed exploration.
* Use **tooltips** for additional info without crowding visuals.