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DEPARTMENT OF ARTIFICIAL INTELLIGENCE AND DATA SCIENCE

19AD504 – DATA VISUALIZATION

UNIT –I

DISPLAYING RELATIVE PERFORMANCE

Displaying relative performance effectively in data visualization is essential for comparing how different entities (like products, departments, or individuals) perform relative to each other. Here's a detailed guide on how to approach this, including the types of visualizations, key considerations, and practical tips.

1. Visualization Techniques for Displaying Relative Performance

1. Bar Charts

- **Purpose:** Compare performance metrics across different categories.
- **Features:** Horizontal or vertical bars. Each bar represents a category, with the length indicating the performance level.
- **Use Case:** Comparing sales figures across different sales representatives or departments.

2. Column Charts

- **Purpose:** Show performance metrics over time or across categories.
- **Features:** Vertical bars. Useful for visualizing performance changes or comparing different groups side-by-side.
- **Use Case:** Displaying quarterly revenue performance of different product lines.

3. Line Charts

- **Purpose:** Track performance trends over time.
- **Features:** Data points connected by lines. Ideal for showing how performance metrics change across periods.
- **Use Case:** Comparing the monthly growth rates of different marketing campaigns.



4. Scatter Plots

- **Purpose:** Show relationships between two variables and compare performance.
- **Features:** Data points plotted on a Cartesian plane. Different colors or shapes can represent different entities.
- **Use Case:** Comparing the relationship between hours worked and output for different employees.

5. Stacked Bar/Column Charts

- **Purpose:** Compare parts of a whole across different categories.
- **Features:** Bars or columns segmented into segments representing different sub-groups.
- **Use Case:** Visualizing total sales along with contributions from different product categories.

6. Bubble Charts

- **Purpose:** Compare performance across three dimensions.
- **Features:** Bubbles of varying sizes and colors represent different data points on two axes, with bubble size indicating a third dimension.
- **Use Case:** Comparing market share, growth rate, and revenue of various companies.

7. Heat Maps

- **Purpose:** Visualize data density or intensity through color gradients.
- **Features:** A matrix where color intensity represents performance levels.
- **Use Case:** Displaying employee performance ratings across different projects and time periods.

8. Radar Charts

- **Purpose:** Compare performance across multiple metrics.
- **Features:** A circular grid with multiple axes, each representing a different performance metric.
- **Use Case:** Comparing various features or attributes of different products.

9. Dot Plots

- **Purpose:** Show relative performance in a simplified format.
- **Features:** Dots represent individual data points. Effective for comparing values across categories.
- **Use Case:** Comparing customer satisfaction scores across different service providers.

10. Treemaps

- **Purpose:** Visualize hierarchical data and compare relative performance within a hierarchy.

- **Features:** Nested rectangles where size represents performance metrics.
- **Use Case:** Comparing budget allocations and performance across different departments or projects.

2. Key Considerations for Effective Visualization

1. Choose the Right Chart Type

- Select the chart that best represents the type of performance data you have and the comparisons you want to make. For instance, use bar charts for categorical comparisons and line charts for trend analysis.

2. Ensure Clarity

- **Labels and Legends:** Clearly label axes, categories, and data points. Use legends to explain color codes or symbols.
- **Annotations:** Highlight significant data points or trends with annotations or call-outs.

3. Use Consistent Scales

- Ensure that scales are consistent across charts to avoid misleading interpretations. For example, if comparing performance across categories, ensure that the axes use the same scale for accurate comparison.

4. Incorporate Color Wisely

- Use color to differentiate entities or highlight key data points, but avoid overwhelming the viewer with too many colors. Ensure that color choices are accessible to color-blind viewers (e.g., using colorblind-friendly palettes).

5. Focus on Key Insights

- Highlight key insights or trends to draw attention to the most important aspects of the data. Use visual emphasis like bold lines, contrasting colors, or larger markers.

3. Practical Tips for Implementation

1. Use Interactive Tools

- **Tableau:** Provides interactive features for creating and exploring visualizations.
- **Power BI:** Offers robust tools for comparing performance and generating reports.
- **Google Data Studio:** Allows for the creation of interactive dashboards with real-time data.

2. Validate Your Data

- Ensure that data is accurate and up-to-date before creating visualizations. Double-check for errors or inconsistencies.

3. Seek Feedback

- Share your visualizations with peers or stakeholders to get feedback and make improvements. Ensure that the visualizations effectively communicate the intended performance comparisons.

4. Stay Updated

- Keep up with best practices and new developments in data visualization. Explore resources such as blogs, webinars, and industry reports.