A graph and diagram on a piece of paper

Description automatically generated

**1. Three main reasons for using interactive visualization**

* Data Exploration: Interactive visualization allows users to explore large and complex datasets. It provides a means to interact with the data, enabling users to uncover patterns, trends, and insights that may not be apparent through static representations. By interacting with the visualization, users can selectively focus on specific aspects of the data, filter information, and drill down into details as needed.

Example: Interactive visualization allows you to analyze a large sales dataset. By filtering and highlighting specific segments of the data, such as age groups or regions, you can uncover patterns and trends that provide deeper insights.

* Amplifies Cognition: Interaction with visualizations enhances the understanding of information. When users can manipulate and engage with visual elements directly, they can better grasp the relationships, correlations, and cause-and-effect relationships within the data. By observing the effects of their actions, users can gain deeper insights and improve their cognitive understanding of the underlying concepts.

Example: Using an interactive line chart, you can analyze energy consumption trends over time in different cities. By zooming in on specific time periods or data points, you can observe the cause-and-effect relationships between events and energy usage.

* Supports Different Tasks and Perspectives: Interactive visualization provides a variety of interaction methods and techniques to support different tasks and perspectives. Whether it's navigating through different views, filtering and querying data, or zooming in and out for focus and context, interactive visualizations offer flexibility in exploring and analyzing information. Users can customize their interactions based on their specific needs and goals, enabling them to gain a comprehensive understanding of the data from different angles.

Example: With interactive linking and brushing, you can analyze customer preferences for products. By selecting a product in one visualization, you can see the corresponding data highlighted in another visualization, allowing you to compare customer satisfaction across different price ranges or identify patterns between ratings and product attributes.

**2. Why chart not good**

a) Line chart

**Some aspects could improved:**

- Resolution and Clarity: The chart is quite pixelated and blurry, making it difficult to read the text and distinguish between the data lines clearly.

- Color and Line Style: The lines appear to be in grayscale, which can be difficult to distinguish. There is also an overlap of the lines, which may cause confusion.

- Lack of Context: The y-axis is labeled, but there's no indication of what the numbers represent – are they stock prices, performance indices, or something else? Additionally, there is no label for the x-axis, although it seems to represent years.

- Data Labels: The legend that indicates which line corresponds to which company is not directly next to the lines themselves, which requires the reader to shift attention back and forth to match the company with the data.

- Title and Labeling: The word "bad" in the top right corner is ambiguous. It's unclear whether it refers to the quality of the chart or the performance of the companies. The chart lacks a descriptive title that explains what the figure is depicting.

**Redesign it:**

**-** Use high-quality, clear graphics so that all text and lines are legible.

- Apply color to differentiate between the companies more clearly.

- Label both axes with appropriate units of measurement and time intervals.

- Position the legend closer to the corresponding lines or use interactive elements that allow hovering over a line to see the company name.

- Add a descriptive title that clearly states what the chart is displaying.

- Incorporate grid lines for easier reading of values from the chart.

- Provide annotations or a brief description if any significant events or points of interest correspond to changes in the data.

b) Bar chart

**Some aspects could improved:**

**-** Proportional Representation: The visual representation of the tax rates does not seem to be proportionate to the actual percentages. For instance, the increase from 25% to 39.6% looks significantly larger than it should be when compared to the scale on the right.

- Scale and Axes: The y-axis is not clearly labeled, and it's not clear what the numbers on the right side represent. The chart also lacks a clear x-axis.

- Design and Clarity: The use of a shaded box to represent the future tax rate is unconventional and may be confusing. The percentage inside the box is difficult to read due to the shading.

- Misleading Visuals: The size of the shaded area could be misinterpreted as a much more substantial increase than what the percentage indicates.

- Contextual Information: There is no context provided about what the current rate applies to or how the new rate would compare in a broader economic context.

**Redesign it:**

- Use a simple bar chart with two bars to clearly represent the 'now' and 'January 1, 2013' tax rates, ensuring that the height of each bar is proportional to the tax rate it represents.

- Clearly label the y-axis to indicate that it represents the percentage of the tax rate and ensure that the axis is scaled appropriately.

- Provide a legend or note to explain what the tax rates represent and any relevant information about the Bush tax cuts for context.

- Use clearer typography to ensure that all text is legible and that percentage values are easily readable.

- Avoid using shading that can obscure text and use solid fill colors instead.

c) Network diagram

**Some aspects could improved:**

- Clarity: The lines and connections between the nodes are quite cluttered, which can make it difficult to follow the paths and understand the connections.

- Resolution: The image is blurry, which further complicates the interpretation of the diagram.

- Labels: There are no labels or identifiers for the nodes (circles) or the lines connecting them. Without these, it is hard to determine what each node represents or the nature of their connections.

- Key or Legend: There is no legend or key to explain the meaning of different shapes or line types, if they have specific meanings.

- Purpose and Context: There is no context provided for what this diagram represents. Without knowing the purpose of the diagram, it is hard to determine if it is conveying the necessary information effectively.

**Redesign it:**

- Ensure a higher resolution so that all elements are crisp and clear.

- Introduce labels for the different nodes and connections.

- Simplify the layout to reduce clutter and improve readability.

- Provide a legend or key if different elements have specific meanings.

- Include a title or caption that explains the context and purpose of the diagram.