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The Complete Guide to Data Visualization ●

A practical checklist for transforming your dashboards and data based apps into powerhouses



Intro

In digital products, data is everywhere: metrics, progress indicators, performance results, trends, and comparisons. However, raw numbers on their own rarely tell a meaningful story. This is where charts and data visualization come into play.

As UX/UI designers, our role goes beyond placing charts on a screen. We are responsible for helping users understand information quickly, accurately, and with confidence. A well-chosen chart can reduce cognitive load, support better decision-making, and build trust in a product. A poorly chosen one can create confusion and friction.

This guide breaks down the most common chart types used in web and app interfaces, explaining when to use them, when to avoid them, and the key UI and accessibility considerations designers should keep in mind.

Data visualization is the practice of translating data into visual formats such as charts, graphs, or diagrams to make information easier to interpret and understand.

In product design, charts help users to:

- Identify patterns and trends
- Compare values
- Track changes over time
- Make informed decisions more efficiently

The key principle is clarity over decoration. Charts are functional UI components, not visual fillers. Their purpose is to communicate information clearly and effectively.



Bar Charts

Bar charts use horizontal or vertical bars to compare values across categories.

WHEN TO USE THEM

- Comparing quantities between categories
- Showing rankings or distributions
- Displaying discrete data (e.g. sales by product, users by country)

WHEN NOT TO USE THEM

- When showing trends over time (line charts work better)
- When there are too many categories, which creates visual clutter



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MOBILE VS DESKTOP CONSIDERATION

- On mobile, limit the number of bars or use horizontal scrolling
- Prefer horizontal bars when labels are long

● UI TIP

Always start the axis at zero. Non-zero baselines can visually exaggerate differences and mislead users.

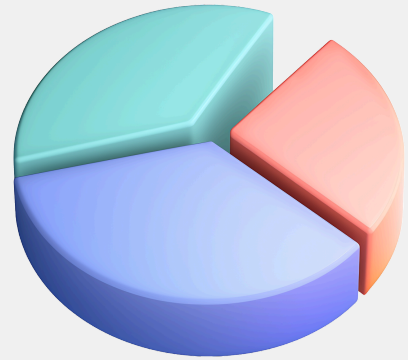


Pie Charts

Pie charts show how parts contribute to a whole using slices of a circle.

WHEN TO USE THEM

- Showing simple proportions
- When there are few categories (ideally 2–4)
- When the total equals 100%



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WHEN NOT TO USE THEM

- When values are very similar in size
- When there are many segments
- When users need precise comparisons

MOBILE VS DESKTOP CONSIDERATION

- Small slices become unreadable on mobile
- Labels often require legends, which adds cognitive load

● UI TIP

Order slices from largest to smallest and avoid rotating the chart. Consistent orientation improves scannability.



Donut Charts

Donut charts are a variation of pie charts with a hollow center, often used to highlight a key metric.

WHEN TO USE THEM

- Showing proportions with a primary value in focus
- Displaying progress or completion rates
- When a central number adds context



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WHEN NOT TO USE THEM

- When exact comparison between segments is critical
- When there are too many categories

MOBILE VS DESKTOP CONSIDERATION

- The center value must remain readable on small screens
- Avoid thin rings that reduce legibility

● UI TIP

Use the center space intentionally. A clear label or percentage adds meaning and avoids decorative emptiness.



Line Charts

Line charts connect data points to show changes over time.

WHEN TO USE THEM

- Displaying trends and patterns
- Tracking performance over time (growth, decline, seasonality)
- Comparing multiple data sets across the same timeline

WHEN NOT TO USE THEM

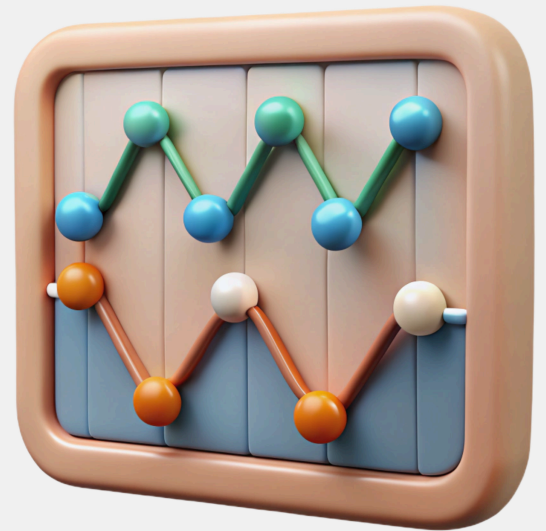
- When data has no chronological meaning
- When showing only one static value

MOBILE VS DESKTOP CONSIDERATION

- Avoid too many lines on mobile
- Use tooltips instead of permanent labels

● UI TIP

Highlight the most important line using color or thickness. Visual hierarchy helps users focus on what matters.



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Accessibility Rules Designers Should Not Ignore

Accessible data visualization is not optional. Some key rules to follow:

- Do not rely on color alone to convey meaning
- Ensure sufficient color contrast (especially for axes and labels)
- Use clear labels and legends
- Provide tooltips or text alternatives where possible
- Maintain readable font sizes on all devices

Accessibility improves usability for everyone, not just users with disabilities. Create universal design.

Closing Thoughts

Charts are more than UI components. When used correctly, they:

- Reduce cognitive effort
- Speed up decision-making
- Improve user confidence
- Turn complex data into actionable insights

The real value comes from choosing the right chart for the right context, not from visual complexity. A simple, well-designed chart will always outperform a visually impressive but confusing one.

As designers, our role is to make data understandable, honest, and useful. When charts do that, they stop being just visuals and start becoming product intelligence.



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