# Foundational concepts of design: Usability and accessibility

Building effective visualizations isn't just about presenting data. UI, UX, and cloud analytics work is centered on creating an experience where the audience can engage with the data comfortably. In this reading, you'll learn about the core tenets of usability and accessibility, and how they're intertwined in dashboard design.

## Create a simple design

As an analyst who has access to all data, it's your responsibility to present your findings in a simple and understandable way. Effective visualizations are simple to use and understand, and they're also functional. Simplicity allows you to prioritize information and key findings without distracting the audience from your main insights. Simplicity is about designing with clarity, intent, and intuitiveness. An intuitive design can be viewed with easy-to-follow logic. Alternative text, proper font size and text alignment, and captions contribute to intuitive design. Dashboards must make sense at first glance, guiding users effortlessly through data sets and key findings.

Simplicity can be implemented in various ways throughout the design process by:

- Giving users control
- Using familiar design elements
- Managing errors

### Give users control

Dashboards are usually designed to be interactive, allowing users to drill down, zoom in, add and change filters, and focus on specific parts of data. You can give users a sense of control by allowing them to tweak views, or adjust data representations. The ability to drill down on data, or switch the view of a bar chart to a line graph, are two examples of control. When designing your own dashboards, consider adding simple toggles, intuitive sliders, and clear labels to provide flexibility to your audience.

### Use familiar design elements

When considering design, include fonts, color schemes, and templates that your audience might be familiar with. Familiarity ensures that your audience can navigate information faster and easier. Effective design also involves consistency in design elements. This consistency

shows respect for a user's time because they can navigate with ease when they revisit the visualization.

If you're working on a visualization for an internal team, the organization will most likely have their own style guidelines or templates for presentations. Your audience, like a specific department or your leadership team, will be familiar with the layout, font choices, and graphics styles. You can use this to your advantage to reduce the learning curve of introducing new data findings.

### Manage errors

Data errors can arise at any stage of the analytic process, even when you've made it as far as the visualization phase. As a reminder, data errors include gaps, null values, and incorrect information. An effective visualization minimizes error chances by helping to validate if the data it's built on is correct. If an error is present in a visualization, it should be easy to correct. Providing the ability to drill down on the data, or adding a table of the data the visualization is built on, makes it easier to trace errors.

## Accessibility and equitable use

Accessibility, equity, and inclusion ensures everyone, irrespective of their abilities or backgrounds, can engage with your visualizations. As a cloud data analyst, it's your responsibility to communicate your findings to a variety of stakeholders. Avoid closing off parts of your audience because your visualization isn't accessible by considering:

- Dexterity adaptations
- Visual inclusivity
- Cultural nuances

### Dexterity adaptations

Whether a user's interaction with digital information is through touch, voice, or a keyboard, your visualizations should be prepared to accommodate. Consider the various ways the audience will view, interact, and share your data representations. Keyboard shortcuts, voice-activated commands, and touch-friendly toggles are a good starting point.

### Visual inclusivity

The chosen color palette for your visualization must follow appropriate professional and branding guidelines. This is where the Web Content Accessibility Guidelines (WCAG) is helpful for ensuring that users of various abilities can interact with your visualization.

WCAG aims to define how to make web content more accessible to people with physical limitations. They have a variety of tools that anyone creating content can use, like the color contrast checker to ensure visualizations are compliant. Users can also take advantage of free accessibility scans and manual website audits.

## Cultural nuances

Your design choices should be globally friendly, devoid of biases, and universally understandable. These considerations apply to all aspects of your visualization, including color palettes and image choices. Understanding how your target audience will interpret your color and image choices is important, but you should generally aim to reduce specific nuances to broaden understanding.

For example, the color red is often interpreted differently across cultures. While some might associate red with warnings, stop signs, or stop lights, others may associate red with prosperity and good fortune. Let's say you're creating a heatmap where warmer colors indicate higher values and cooler colors indicate lower values. It might seem intuitive to you that green would correspond with lower temperatures, while red would correspond with higher temperatures. This may not apply across other cultures.

Avoid cultural misunderstandings by:

- Keeping the cultural context of your target audience at the forefront of design decision-making
- Opting for universally neutral color palettes when possible
- Testing your visualization with a diverse audience and iterating on feedback

## Key takeaways

As a cloud data analyst, you'll create visualizations for a variety of audiences. It's important that you learn to design with empathy and clarity. When creating visualizations, implement simple and familiar design elements and accessibility features for dexterity, visual inclusivity, and cultural nuances.

## Resources for more information

Explore the following links to learn more about how to make your visualizations accessible and inclusive:
- A guide from University of Washington, Madison Information Technology on how to make complex data visualizations accessible: Accessible Data Visualizations
- An article from Harvard's Digital Accessibility department on how to make visualizations more accessible: Data Visualizations, Charts, and Graphs