Displaying State Court Data:

A Guide to Data Dashboard Design

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Introduction

As the use of data as a strategic asset within state courts has become more commonplace, the opportunity to use and communicate insights from data has continued to grow. Data dashboards are one tool that courts can use to meet the increasing expectations from both internal and external users for timely, accurate, and insightful data. However, not all dashboards are created equally; it's imperative that dashboards are designed with a clear purpose and the audience in mind. Court dashboards are consumed by a range of audiences, from court staff, administrators, and judges, to the public, media, legislative bodies and other court partners. In addition to designing for the correct audience, using the following fundamental principles will allow the users to efficiently access important information in a meaningful way.

Importance of Data Dashboard Design for Courts

While the design of data dashboards is the main focus of this guide, what is shown within the dashboard is of equal importance for creating an effective tool for data consumers. For more information on what measures courts should consider using, please see **CourTools** and the supplemental resources provided.

Understanding Data Dashboards

Data Dashboard Terminology

Data Visualization

A single graphical representation, data table, or number presented on a dashboard that makes it easier to quickly extract information from the data.

Data Dashboard

A versatile, interactive tool containing multiple data visualizations that displays key data and helps users better understand the information.

Data Storytelling

A way to present data in a way that simplifies complex information and highlights key insights in an easy-to-digest manner, leading the end user to a conclusion. Data visualization enhances data storytelling.

Data Source

The location where information is stored and the foundation of visualizations.

Quantitative Data

Numerical or measurable information that can be calculated.

Qualitative data

Descriptive, non-numerical information such as words and survey findings.

Key Performance Indicators (KPIs)

The quantifiable metrics used to track progress towards a specific objective.

Data Variable

Any characteristic, number, or quantity that can be measured or counted. Data collected about a numeric variable will always be quantitative, and data collected about a categorical variable will always be qualitative.

Measures

Numerical values that can be calculated or aggregated. Measures are quantitative; you can perform calculations on them, such as sums and averages.

Dimensions

Referential pieces of information that characterize measurable data (the who, what, when, where, and why of data). Dimensions are qualitative, such as name, case type, date, or court location.

Drill Down

Vertical movement through data that allows the user to select a data visualization and see the underlying data within that graphic. This allows the user to navigate the hierarchical relationship of the data.

Drill Through

Horizontal movement through data that allows the user to move from one visualization to another while continuing to analyze the same data set.

Filter

The end user's ability to include or exclude data represented in a data visualization based on a set of available variables. For example, a visualization showing the age of pending cases statewide may be filtered to limit the data visualization to one or more specific counties or case type(s).

Tooltip

A message that appears when a user hovers the cursor over part of a visualization. Tooltips are used to provide additional context for the chart or graph.

Data Dashboard Design Principles

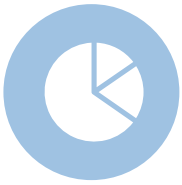
Chart Types

A chart shows data in the form of a graph, diagram, map, or table. Choosing the right way to visualize data is essential for effective data communication. The data, audience and dashboard purpose should all be kept in mind when choosing visualizations. Common types of visualizations are bar and column charts, pie charts, line charts, and maps.

Bar/Column Charts

- Used to represent categorical data.
- Though the names “bar chart” and “column chart” are often used interchangeably, bar charts have horizontal bars, and column charts have vertical bars.
- Most data can be represented in a bar or column chart.
- Bar charts are helpful if the labels are long because there is more room for text.

Pie Charts



- Pie charts represent percentages of a whole, in other words, all slices of the pie combined need to equal 100.
- Best for 2-5 categories and if one category is much larger than the other(s). Make sure “slices” of the pie are not too small.
- Label the slices directly rather than using a legend.
- Choose distinct colors for the segments.

Line Charts & Area Charts

- Line charts work well for displaying trends or continuous data over time.
- Area charts also indicate trends and data over time, but the space between each line and the X-axis is filled in.
- Make sure the line is easy to see and that the data points are marked.

Maps

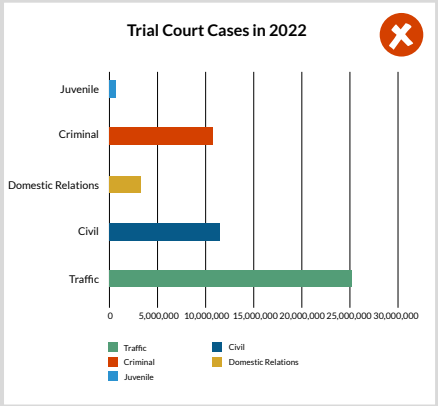
- Interactive physical maps are useful for displaying data linked to specific locations, such as a county, zip code, state or region.
- Hex/shape maps are useful to use as filters and when the geographic comparison is less important because hex/shape maps will have some inherent distortions from placing the shapes on a grid.
- Choose colors that are easy to read.
- Label directly on the map if possible.

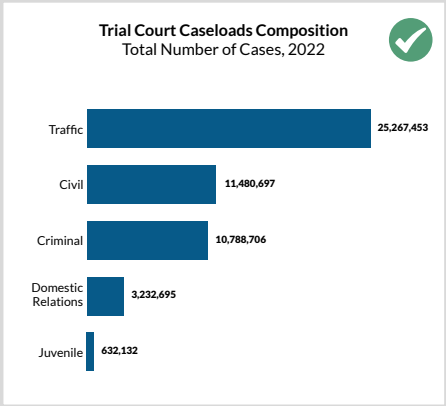
Additional types of graphs and charts found in data dashboards include scatter plots (for identifying trends or outliers within data), heat maps (for showing large amounts of data by representing values as colors), histograms (for identifying patterns like normal or skewed distributions), and box plots (for comparing distributions between different categories).

Best Practices for Designing Charts

- Avoid redundant labeling.
- Adding individual mark labels and removing axis labels helps make the visualization easier to understand. However, if there are a lot of data points or large numbers, labeling the axis may be the best option so the visualization doesn't look cluttered.
- Avoid conveying meaning with only color due to accessibility considerations. Using color is okay as long as the information in conveyed in another way.
- Use colors consistently when using categorical measures. For example, if the same category is shown in multiple places, try to maintain consistent color usage throughout the visualization.
- Round to whole numbers unless it's necessary to use the exact number.
- For comparative data, it's generally best to start the axis at 0 so it does not distort how the data is displayed.
- Use two-dimensional charts (avoid 3-D charts).
- Simplify the charts where possible by removing grid lines, axis lines and borders.
- Use titles strategically to convey information and be descriptive. If there is a specific question answered by the visualization, this can help the user quickly locate which visualization contains the information they need. If there is a certain date range used, include this in the title, too.

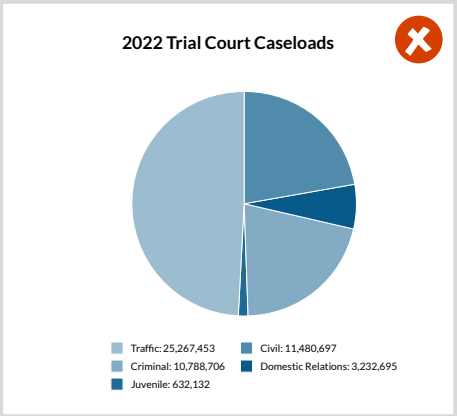
Chart Dos and Don'ts

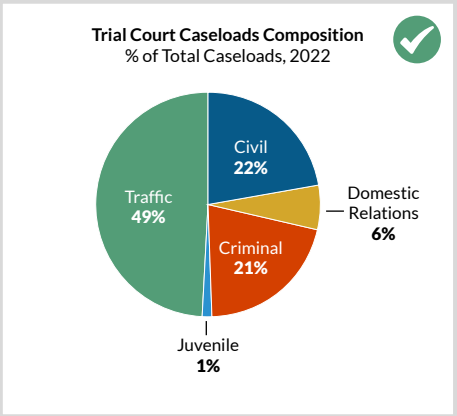




Do:

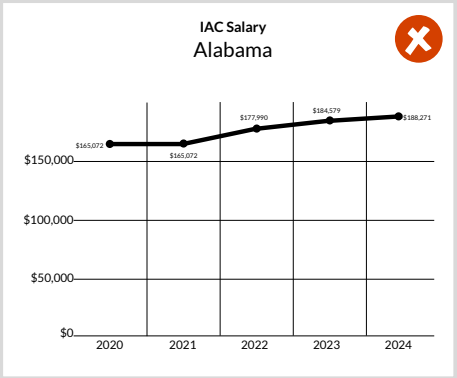
- Use a more descriptive title.
- Make all bars the same color since color does not add value here.
- Add mark labels.
- Remove gridlines.
- Sort the bars.

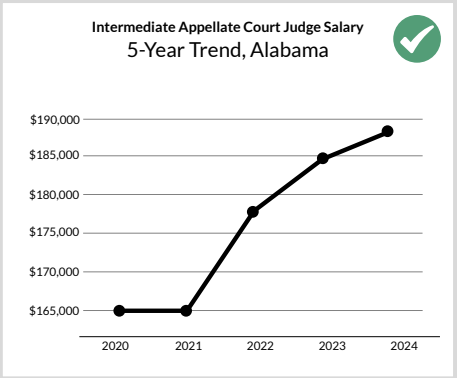




Do:

- Use a more descriptive title.
- Use a distinct color for each slice.
- Remove color key and label slices directly.
- Use percentages instead of exact numbers.
- Increase font sizes.

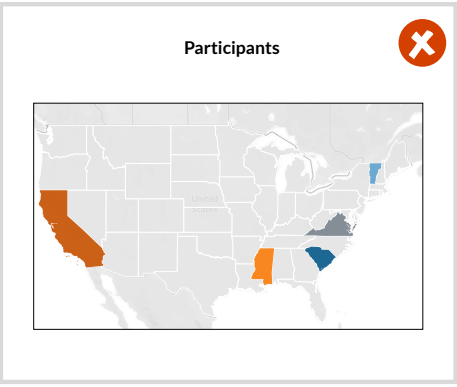


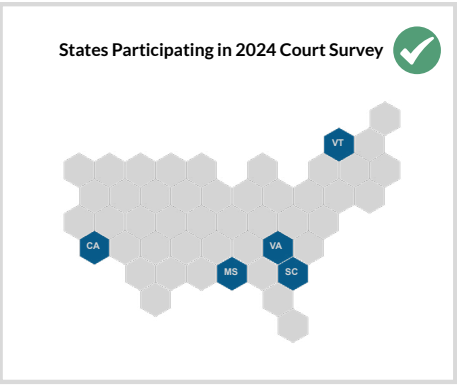


Do:

- Use a more descriptive title.
- Remove redundant labels and unnecessary gridlines.
- Start axis at the initial salary.

Note: *The axis should be started at 0 if the visualization is being compared to other data.*





Do:

- Use a more descriptive title.
- Convert to a hex map so states are the same size.
- Remove background layers.
- Add state abbreviations.
- Use one color for states because there is only one category.

Dashboard Layout

Before starting on layout, always determine how the dashboard will be used and where it will be accessed. This will inform the dashboard dimensions (the length and width of the dashboard). If the dashboard will be embedded on the court website, work with your web team to find out what the best dimensions would be. Sometimes, dashboards will not be embedded, but rather shared via a link. The dimensions may not matter as much for this; however, there may be additional branding needed (see "Branding" below). It's also possible the dashboard may only be used in a presentation, in which case, it should be laid out in a way that is easy to digest quickly with large, clear headings, and additional information should be kept to a minimum.

Information Hierarchy

Information hierarchy determines how data is grouped. All aspects of a dataset cannot be equally prioritized so before building the dashboard, determine what data is most important and what is least important. The most important information generally should be placed in the upper left portion of the dashboard because this is naturally where the user will start reading.

Titles and Headings

Use clear and descriptive titles and headings to help users understand the purpose of the dashboard. Where it makes sense, add additional descriptive information to help users navigate and better understand the context.

Alignment

When it comes to laying out items, it's usually a good idea to line things up. Not only does this help guide users through the dashboard in a logical manner, but it makes the dashboard look cleaner and less cluttered.

White Space Balance

White space, or negative space, is the empty area between text, visualizations and images. Ensuring a reasonable amount of white space on the dashboard will help it look less cluttered and can actually help users with navigation. White space can be used to help distinguish one section from the next. However, too much white space may make the dashboard seem incomplete.

Dashboard Instructions

Depending on your audience, adding instructions for use may be beneficial. Keep in mind creating a dashboard for frequent dashboard users will require less instructions than creating a dashboard for the general public who may interact less, or not at all, with data dashboards.

Version History

Adding a publish date or data last updated to the data dashboard helps increase transparency and trust. This also can help court staff with making sure that the correct version is updated.

Branding

Branding is a unique visual identity that encompasses an organization's name, logo, colors, mission, values, and voice. Data visualization is an extension of an organization's brand. Before creating a data dashboard for your court, make sure to find out if there are guidelines that need to be followed and if there are any brand elements that need to be included.

Where the final dashboard will be displayed (embedded in a website, shown in a presentation, etc.) will dictate which brand elements should be included. If the dashboard will be embedded on your court website which already includes your state/jurisdiction's logo or your court logo, it may not be necessary to include that on your dashboard.

Color

Using color in data dashboards is not just for aesthetics—it also conveys meaning. Applying color sparingly can help users understand the data better by highlighting important information and metrics.

Use of Color

When using color, less is more. Plan to choose 3-5 colors (ideally from your court's brand color palette), and stick with them. Adding too many colors can be distracting for users.

Applying colors consistently throughout your dashboard is important for understanding. For example, if blue is used in one visualization for civil court cases, make sure that same blue is used to represent civil court cases in other parts of your dashboard, too.

Accessibility Considerations

It is okay to use color in your dashboard, but keep in mind some users may have disabilities related to sight. Make sure that color is not the only indicator for interactive elements.

Accessibility will be explained in greater detail in ***Designing for User Experience***.

Typography

Plan how you want to use headings and fonts before starting on your dashboard. Knowing what typeface, font styles and font sizes to use will help make the design process more efficient and will lead to a more professional product.

Heading Hierarchy

Just like writing an outline for a research paper, your dashboard should have a top-level heading with subsequent levels of headings below. Use the levels consistently throughout, and make sure each level of heading has a unique font size or style. The top-level heading will be the largest font size and lower-level headings will be the smallest.

Choose Readable Fonts

Before choosing a typeface (a font family), refer to your court's brand standards for typography guidance. There may be a certain font you are required to use. Make sure to use fonts consistently and avoid decorative and script fonts on your dashboard.

Because data dashboards are accessed on screens, sans-serif fonts should be used

because they are easier to read at small sizes. Choose a typeface that comes in a variety of weights and styles (such as bold, italic, and condensed). Use fonts from the same typeface throughout, but if using a second typeface, consider using the alternate font for headings. A serif works well in this case. It's usually best to stick with one font throughout your dashboard, but you could use a different font from another typeface as headings. In this case, using a serif font helps add visual contrast.

Font Size

Font sizes should always be maximized for readability. As a rule of thumb, do not use less than a 9-pt. font. Try to stick with only three sizes of the same typeface. Using different fonts within the same typeface (such as a bold or italic version) will help emphasize and differentiate text. Headings should always be larger than body text.

BANs – Use Text to Emphasize Key Information

BANs, also known as "big aggregated numbers," are numbers in a large font size used on a dashboard. Using BANs is a data dashboard technique used to give end users a quick overview of top-level insights.

Designing for User Experience (UX)

User-Centered Design Approach

When creating a dashboard with user-centered design, the goal is to focus on the users' needs in order to create usable and accessible products. In dashboard design especially, it is imperative to create dashboards with audience in mind. Knowing the audience helps guide dashboard design in several ways, including choosing the best data visualization platform. It's important to ask questions about your audience prior to creating a dashboard, such as:

Who is the audience? Designing a dashboard for court leadership will look and function differently than one created for the general public. Rarely do one-size-fits-all dashboards work for all audiences.

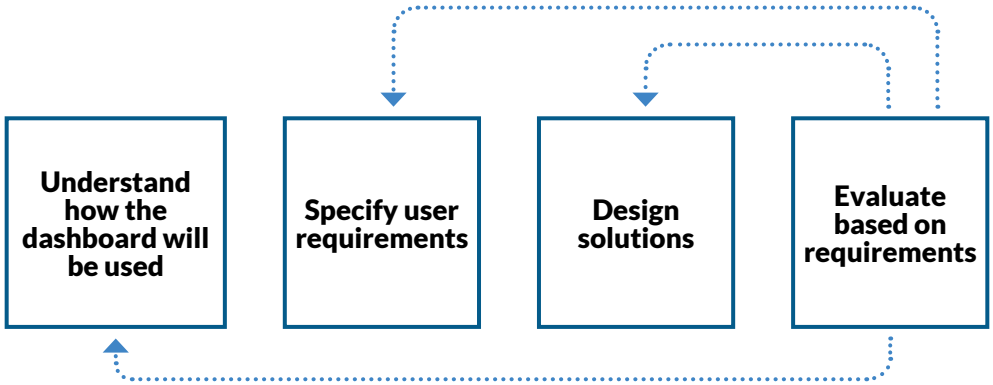
What information is the audience interested in? Your audience may be interested in court-specific caseloads, court performance measures, judicial workloads, or other specific information. While it may seem obvious, continually comparing the dashboard with the users' goals will help create a useful product.

Does the audience have experience using dashboards? If not, providing instructions for use and using plain language throughout the dashboard will help users navigate the views.

What functionality is needed, and will additional functionality be needed in the future? For example, does your audience need to be able to generate reports or be able to download the data? Knowing functionality needs will help choose the correct data visualization platform.

Where and how will your audience access the dashboard? Will your dashboard be embedded on a web page, shared electronically, or used in a presentation? User-centered design is an iterative process

meaning that the dashboard should be continuously reviewed and tested, keeping the users' needs in mind. With the nature of interactive dashboards and having the ability to make improvements, designers have an ongoing opportunity to continue to meet the needs of the user as they change or grow.



Intuitive Navigation and Layout

Using intuitive navigation helps users find what they are looking for quickly and easily in a logical way. When navigation is intuitive, it improves user satisfaction. However, difficult navigation can lead to frustration, causing users to stop using the dashboard and can even damage the court's reputation.

To avoid these issues, it is important to prioritize intuitive navigation while designing dashboards. This means focusing on user-centered design, and organizing content and navigation elements in a way that is logical and easy to understand.

Best Practices for Developing Intuitive Navigation

- Organize content in a manner that is logical and intuitive. Similar visualizations should be grouped together, important takeaways should be visually prioritized, and headings should be easy-to-understand so that users can find what they are looking for. Most languages are read from left to right, so keep that in mind when laying out content. Users generally look at the top left portion of the screen first, so that's a great spot for important information. As users continue to read, they'll continue down the page in a similar order.
- Use visual design elements to guide users through the dashboard. Elements like icons, arrows, white space, headings, and borders may provide visual cues to help users differentiate between sections. Keep accessibility (explained below) in mind when using visual design elements, especially for when it comes to use of color.
- Use straight-forward, consistent and clear labels for navigation items. Add clear and descriptive language anywhere it may help explain the content or communicate the functionality of the dashboard.
- Test your navigation with users to ensure that it is easy to use and understand. This can identify potential issues or confusion.

Utilizing Interactive Elements

Interactive elements help make data dashboards insightful and engaging. Adding filters and the ability to sort data allows users to dive deeper into the data and tailor the information to their needs, empowering them to find the information they need more efficiently. Because courts can direct the public, media and other interested parties to court dashboards for additional information, public access to court data helps lessen common information requests and relieves some staff burden.

Interactive elements on data dashboards include filters, buttons and tooltips. Filters add a lot of value to dashboards because users can customize their view. Keep layout and usability in mind by placing filters at the top or sides of the dashboard. This allows users to easily view and access the filters while making sure the visualizations have the main focus.

For all interactive features, make sure they are labeled properly, provide context where helpful, and include instructions for use. For example, if there is a drop-down menu containing case types, the title of the menu can be “Court Types” and written below it, “Click the drop-down menu to filter the chart below by court type.”

Responsive Design

Responsive design refers to how the dashboard is displayed on different devices (computer, cell phone, tablet, etc.). Make sure your dashboard adapts to different devices without compromising usability or readability. Most popular data visualization platforms contain a way to preview how your dashboard would be displayed on different devices. If available, use this feature, but also preform your own tests.

Accessibility

Accessibility is the practice of making information understandable, meaningful and usable for those with or without disabilities. Types of disabilities include visual, auditory, physical, speech, cognitive, language, learning and neurological.

Laws Related to Accessibility

Section 508 of the Rehabilitation Act of 1973 states anytime the federal government develops, procures, maintains, or uses information communications technology (ICT), solutions must provide the same or comparable access for all users.

Title II of ADA states that state and local governments must ensure that people with disabilities can fully participate in all programs, activities, and services.

Accessibility Guidelines

While the laws above say that government entities need to be compliant, they don’t say how, which is where the **Web Content Accessibility Guidelines (WCAG)** come in. These standards help users ensure that tools, products (such as data dashboards) and websites are accessible to all users.

Best Practices for Accessibility

Simplify

- Use easy-to-understand chart types.
- Avoid adding redundant or unnecessary visuals or text.
- For embedded visualizations, include as much information as possible on the web page rather than within the embed.
- Aggregate data where possible.

Explain with Text

- Add instructions for how to navigate.
- Use titles, captions and mark labels wherever possible.

Ensure Keyboard Accessibility

- Ensure that all interactive elements can be accessed and operated using only a keyboard. Depending on the data visualization platform, there may be specific combinations of keystrokes required to utilize the dashboard.

Use Alt Text

- Alt, or alternative, text is read aloud to users by screen reader software. It is descriptive text that conveys the meaning and context of a visual item. Any images or graphics added to the dashboard need to have alt text.

Check Color Contrast

- Ensure appropriate text-background contrast ratios: 4.5:1 for standard text and 3:1 for large text (14pt bold/18pt regular). Color alone should not be used to convey information.

Use Descriptive Hyperlinks

- Use descriptive link text instead of generic phrases. For example, if linking to a document, use the document name as the link text rather than “click here.” Always underline hyperlinks.

Provide Access to Underlying Data

- If the visualization cannot be accessible, allow users to download the data if possible.

Working with Data

Underlying Data

What data do you have? Do you know how to access it? What format is it in?

Data quality should always be considered. See the Data Governance Policy Guide for more information on data quality.

If there are common data files or data sources used across dashboards, make them available in a centralized location, where staff can access them to develop dashboards. For example, if hex maps are commonly used in your dashboards, create a file of coordinates that staff can use to construct the visualization. This will help keep the formatting consistent across all dashboards and will ensure updates are only needed in one location.

Selecting the Right Tools

There are many different tools available to courts to display data. Courts may use commercial dashboard platforms, open-source solutions, or custom development. Familiarize yourself with the capabilities and requirements for the platform you choose. You may need to transform the format of your underlying data to be compatible with the visualization tool you choose.

Conclusion

Data dashboards are useful tools, if designed properly. Externally, not only do data dashboards increase transparency, but they allow court users to access information that even just a few years ago was out of reach. Internally, courts can harness data to make policy and program decisions. Not all dashboards are created equal, however. Both quality data and the dashboard audience must be kept at the forefront of the design process in order to create a product that is functional, intuitive, and accessible. Design principles like layout, color, and typography tie the visualizations together, especially when incorporating an organization's branding. Whether creating a dashboard to be used by court staff, justice partners and stakeholders, or the general public, following the best practices suggested in this guide will help create useful and professional data dashboards.

Recommendations for Further Reading

NCSC's Data-Driven Decision Making

NCSC's Data Governance Policy Guide

Tableau's Visual Best Practices

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