VISUAL & DESIGN PRINCIPLES

for designing a visually enhanced and a more inclusive web site.

Day 2:

- Tables
- Charts & diagrams

VISUAL & DESIGN PRINCIPLES presented by Hothead Studio for LLS (Frank Hofmann)

LLS
Linux, Layout & Satz

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Class objective:

Living in an era where the visual part of what you display has become more important than ever before, the topics covered are to visually enhance & add quality to the web-based work you create.

Data tables, charts & diagrams + more on colour use:

Data tables all vary in size, content & purpose. The function of a well-designed data table is to provide clarity on the information presented to help users with insights and making decisions. One can apply various techniques to make the different data tables' content easier for the viewer to follow and understand.

Charts & diagrams form an important part in visually communicating & illustrating data to the viewer. This data visualization communicates & portrays complex information in graphical form. The visuals are designed to make comparing data easy and tell a story. This is mostly used to display data to help users in decision making. Data visualization can express data of varying types and sizes: from a small amount of data to large multivariate data-sets.

Furthermore, colour use & contrast aids in making the presentation clear & user-friendly.

With the correct use of colour & contrast it makes it easier for the viewer to follow & understand the data presented. This class serves to give the creator a better understanding of how to apply design principles to achieve a better end product when using data tables, charts & diagrams.

Following is a collection of best practices for data table UX/UI...

DATA TABLES: Table Styles

1. Choose The Best Row Style: The style of the row helps users to scan & read the data. Different styles allow you to choose a style that best suits the type & data for the table.

Grid:

Both the horizontal & vertical lines provide the separation between data points, but the amount of visual noise can be distracting. This is a spreadsheet-style & recommended for tables containing a lot of data.

Name	Location	Email	Phone Number
Esther Lungi	New York, NY	estherl@company.com	934-568-1177
John Smith	San Francisco, CA	johns@company.com	872-523-7905
Ling Ling Pak	Chicago, IL	lingp@company.com	938-552-8974
Eduardo Ramirez	Denver, CO	edura@company.com	192-374-6892
Lucy Manoban	Chicago, IL	lucy@company.com	938-420-4791
Armandt Du Toit	Boston, MA	armandt@company.net	928-938-5523

Horizontal Lines:

By only using horizontal lines it reduces the visual noise of a full grid. This style has a lot of white space while still helping the user keep their place while reading.
This style is most common and is recommended for all data set sizes.

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Esther Lungi	New York, NY	estherl@company.com	934-568-1177
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Ling Ling Pak	Chicago, IL	lingp@company.com	938-552-8974
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Zebra Stripes:

By using an alternating color background for every second row help users to keep their place while reading the lines.
This style is recommended for large data sets so the alternating background lines will be clear & the reader keeps their place.

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Free Form:

By removing all dividers (horizontal & vertical lines), it creates a minimalist look & reduces visual noise as much as possible. This style is recommended for small data sets where the users dont need help keeping their place while reading.

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Esther Lungi	New York, NY	estherl@company.com	934-568-1177
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Eduardo Ramirez	Denver, CO	edura@company.com	192-374-6892
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DATA TABLES: Table Styles

(Data composition by: Molly Hellmuth & tables from UI Prep)

2. Use Clear Contrast: Establish hierarchy by adding contrast to your table. This can be done with different text styles and backgrounds.

Header Contrast:

Differentiate header text from column text by changing the weight and color. Applying a different color background to the header can provide additional contrast if desired.

Product name	Product no.	Category	Price	Status
Women's Drift-in Parka	XYZ - 2394	Women's Outerwear	$150.00	In Stock
Women's Grace Insulated Flannel	XYZ - 9203	Women's Outerwear	$95.00	In Stock
Women's Minxy Fleece	XYZ - 7344	Women's Outerwear	$100.00	In Stock
Women's Heyland Jacket	XYZ - 9183	Women's Outerwear	$80.00	Backorder
Women's Kiley Jacket	XYZ - 5677	Women's Outerwear	$75.00	In Stock
Women's Hearth Fleece Pullover	XYZ - 1232	Women's Outerwear	$110.00	Backorder

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Column data:

Column data can also use different weights and colors to emphasize certain data like the row identifier (first column) or a primary data point in a single cell (ie. cell data: 1,234 34%).

Product name	Product no.	Category	Price	Status
Women's Drift-in Parka	XYZ - 2394	Women's Outerwear	$150.00	In Stock
Women's Grace Insulated Flannel	XYZ - 9203	Women's Outerwear	$95.00	In Stock
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Women's Heyland Jacket	XYZ - 9183	Women's Outerwear	$80.00	Backorder
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Women's Hearth Fleece Pullover	XYZ - 1232	Women's Outerwear	$110.00	Backorder

Channel	Sessions	Quality % New Sessions	New Users	Bounce Rate
Direct	39,443 (44.20%)	84.36%	33,276 (46.06%)	38.47%
Organic Search	18,199 (20.39%)	74.93%	13,585 (18.80%)	37.06%
Social	13,268 (14.87)	90.30%	11,962 (16.56%)	55.54%
Generic Paid Search	10,946 (12.27%)	84.29%	9,515 (13.17%)	88.03%
Brand Paid Search	6,640 (7.44%)	71.39%	3,397 (4.70%)	28.77%
Referral	620 (0.69%)	91.45%	513 (0.71%)	61.45%
Display	119 (0.13%)	2.67%	2 (0.00%)	30.25%

3. Add Visual Cues:

Use different colored backgrounds to add organizational context and meaning to your table. These visual cues help present the data in a way that is easier to scan and understand.

Row Background:

Change the color of an entire row to highlight a difference in the domain of data (ie. switching between single values and sums or averages).

Day	Fat	Carbs	Protein
Monday	70g	94g	81g
Tuesday	65g	85g	95g
Wednesday	88g	71g	105g
Thursday	57g	102g	78g
Friday	73g	96g	84g
Average	74g	85g	88g

Cell Background:

Change the color of a cell to highlight the status of a data point (ie. trending up, trending down).

Name (Symbol)	Div	Vol	Yld	P/E	Day Last	% Change
SkyHighCorp (SHC)	--	3143	--	76	21.25	+.25
LowDownInc (LDI)	2.35	2735	5.7	18	41.00	-.50
ValueNowInc (VNI)	1.00	1894	4.5	12	22.00	+.10
DoinBadlyCorp (DBC)	--	7601	--	--	33.50	-.75

4. Align Columns Properly:

By default, most column data is left aligned. This makes the data easy to scan, readable and comparable. The one exception is numeric data related to size. These numbers should be right aligned to help users identify number size.

Rules to follow:

- **Align textual data to the left (ie. Name)**
- **Align numeric data not related to size (ie. date, zip code, phone number)**
- **Align numeric data related to size (ie. count, percent)**
- **Align headers according to their column data**

Country	Population	Zip code
Austria	8,169,929	92735-8273
Belgium	11,007,000	18273-7263
Denmark	5,564,219	71726-1324
France	66,104,000	75649-9876

> **“Don’t rely on color to signal information. Design with enough contrast and rely on words and shapes to convey meaning.”**

5.1 Use Tabular Numerals:

Use a tabular (or monospaced) font when displaying numbers. This means, rather than having proportional spacing (ie. “W” is wider than “I”), each figure is the same width. This makes columns of numerical data easier to scan.

For your table, you can use an inherently monospaced font (ie. Courier, Courier New, Lucida Console, Monaco, ect.) or the monospaced numeric set sometimes included with proportional fonts.

Proportional	Tabular
390,209,000	390,209,000
112,371,000	112,371,000

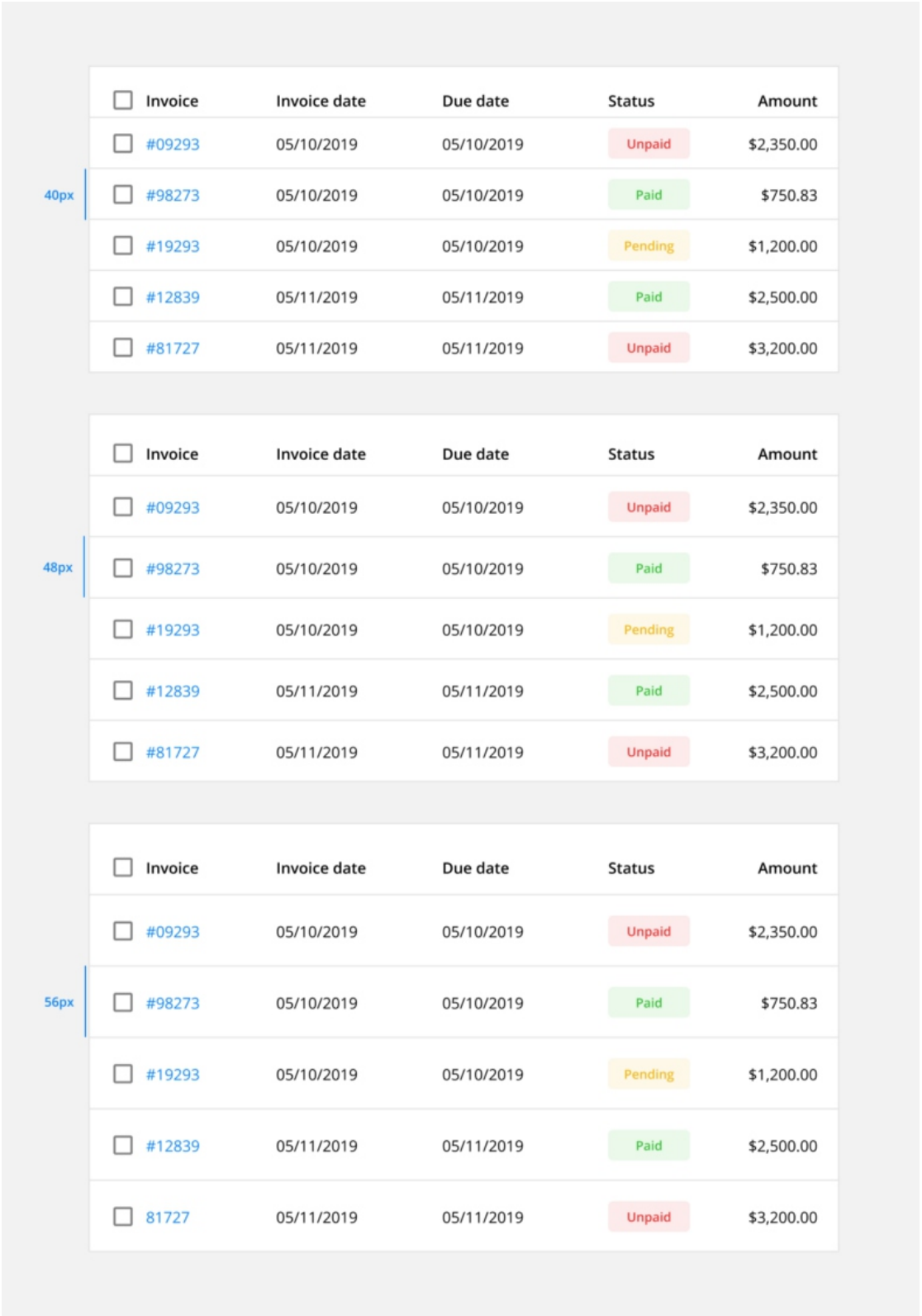
5.2 5. Choose an Appropriate Line Height:

Choose a line height most appropriate for the type and amount of data in your table.
Regular and relaxed row heights offer more white space, and are more comfortable for reading large data sets.

Using a condensed row height will allow the user to view more data at once without having to scroll, but will reduce the table's readability and potentially cause parsing errors.

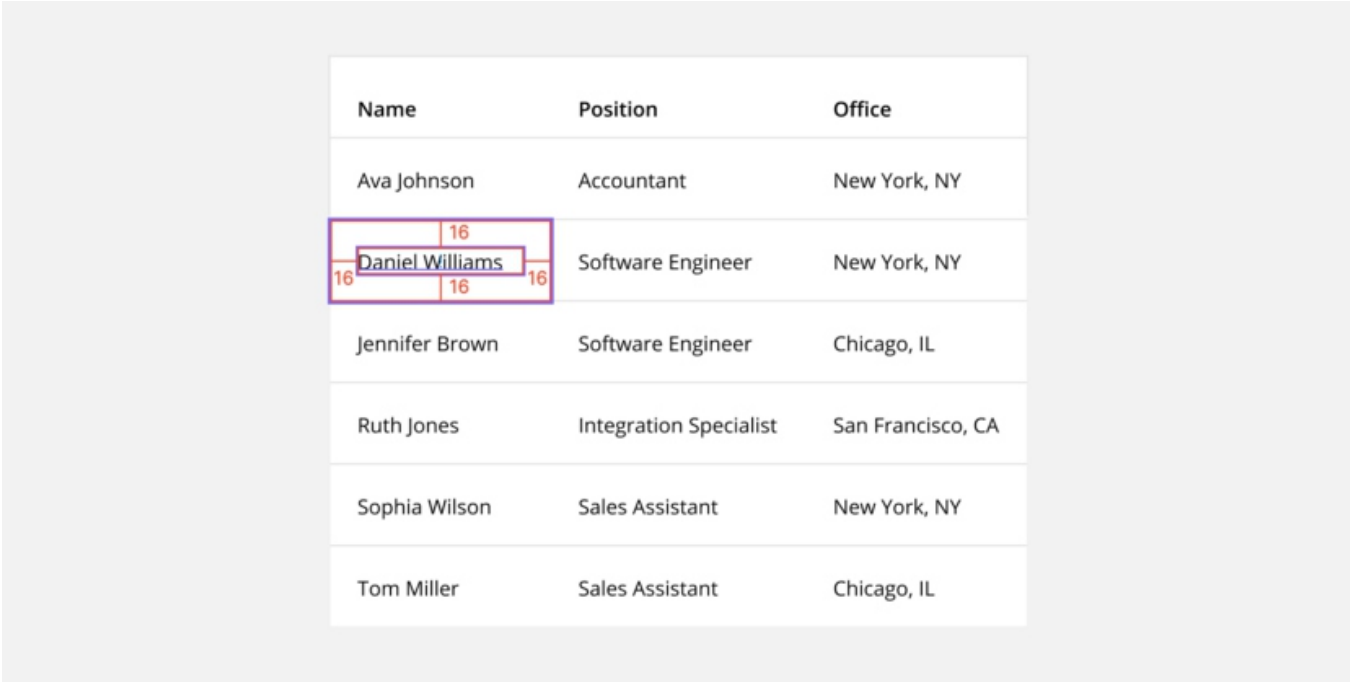
Row heights:

Condensed: 40px
Regular: 48px
Relaxed: 56px



6. Include enough padding:

Maintain a minimum of 16px padding on both the right and left of each column. This means the space between each column should total at least 32px.



7. Use Subtext:

Subtext can provide timely context and helpful details without taking up space or cluttering the table. It can also be used to combine columns.

For example, instead of having separate columns for user and email, the email can be added as subtext below the user's name.

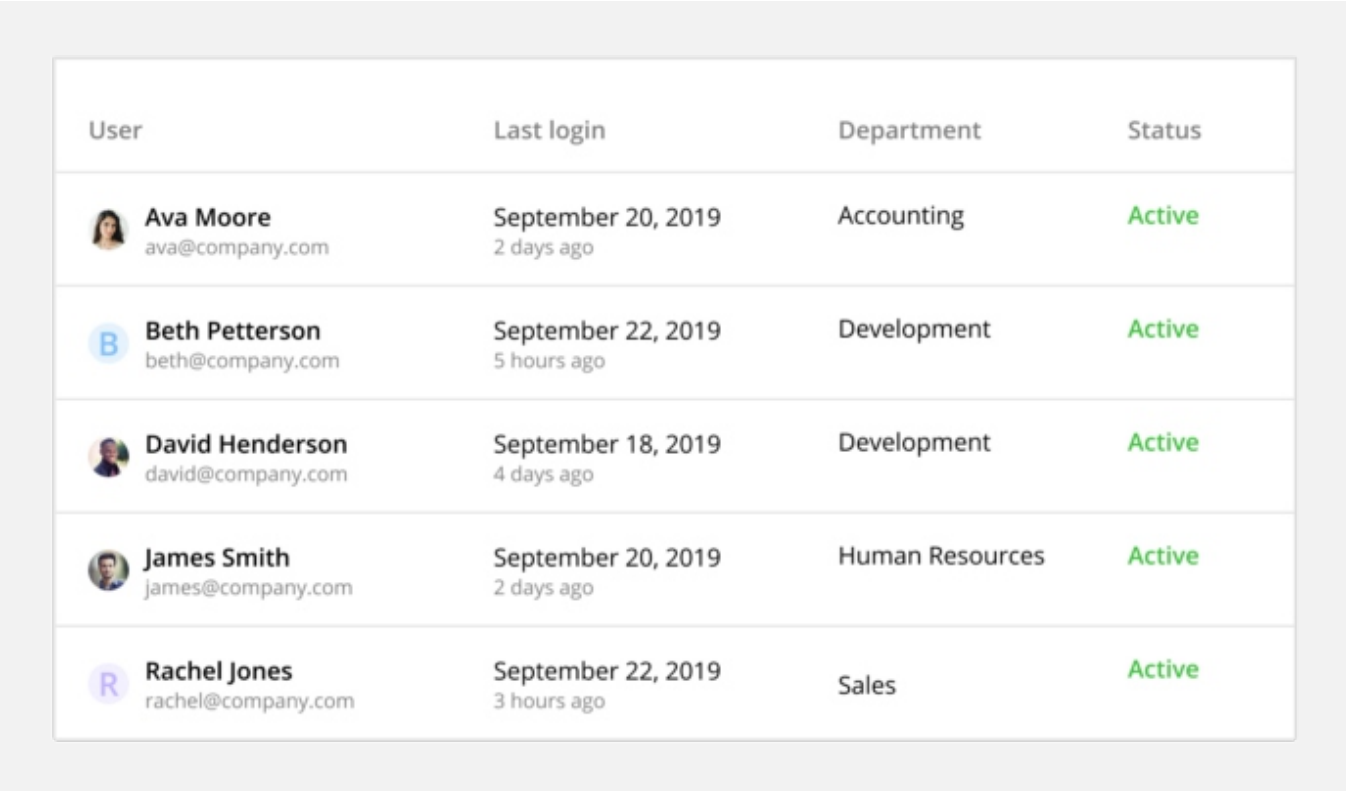


Table Functionality:

Data tables should enable users to scan, understand, analyze, compare, and act upon the information within them.

1. Maintain Context When Scrolling
Anchor contextual information to help users understand what data they're looking at while scrolling down or across a table. This functionally is important when designing tables with large data sets or on smaller screen sizes.

Fixed Header: Fix the header to the top of the table when a user starts to scroll vertically. This provides context by keeping the column labels in view at all times.

Fixed Column: Fix the first column (with identifying information) to the side of the table when a user starts to scroll horizontally. This provides context by keeping the row identifier in view at all times.

2. Use Subtext:
Subtext can provide timely context and helpful details without taking up space or cluttering the table. It can also be used to combine columns.

For example, instead of having separate columns for user and email, the email can be added as subtext below the user's name.

Prioritize Common Actions
Allow users to complete common actions quickly and without having to navigate to a new page. This will save users time and frustration from having to complete simple, repetitive tasks.

Hover Action: Present common actions when a user hovers over a row. This reduces visual clutter but may cause discoverability issues for new users.

Bulk Action: Allow users to select and update multiple items at a time. Once the rows are selected, common actions are made avalible at the top o the table. This feature can save users a lot of time by batching together repetitive tasks.

3. Manipulate Data With Filters
Enable users to manipulate data presented in the table. Filtering data helps users find what they're looking for, gain different insights, and make comparisons.

Basic Filters: Allow users to apply preset parameters to the data set. This feature is very versatile and appropriate for most data tables.

Complex Filters: Allow users to apply custom parameters to specific columns. This advanced functionality enables users to analyze and compare very specific results for complex numeric data tables. Additionally, this feature can include the ability to save a "filter set" to save users time and effort if repeated use is likely.

4. Include Pagination
Break long tables down into multiple pages with a set number of rows on each page. Users need to understand what page they're currently on and have the ability to navigate to other pages. Additionally, users can have the ability to customize how many rows are included on each page.

5. Make Column Data Customizable
Enable users to choose what data is included in their table. This functionality allows the user to add, remove, and reorder columns based on their use case. Additionally, this feature can include the ability to save column preferences if repeated use is likely.

6. Make Table Display Customizable
Enable users to customize the order and display of the avalible data. These customizations can serve different work flows, surface new insights, and aid users with impaired vision.

Sort Columns: Allow users to organize rows by a specific category. Any column can be ordered alphabetically or numerically by clicking the sort icon next to the column label.

Resizable Columns: Allow users to expand and contract the width of any column to expose eclipsed data in full.

Display Density: Allow users to toggle between row heights depending on their use case and visual accessibility.

By applying the design guidelines covered for creating tables, it will ad value on the user end. Should you want to know more about table design, follow the link below:

https://medium.com/design-with-figma/the-ultimate-guide-to-designing-data-tables-7db29713a85a

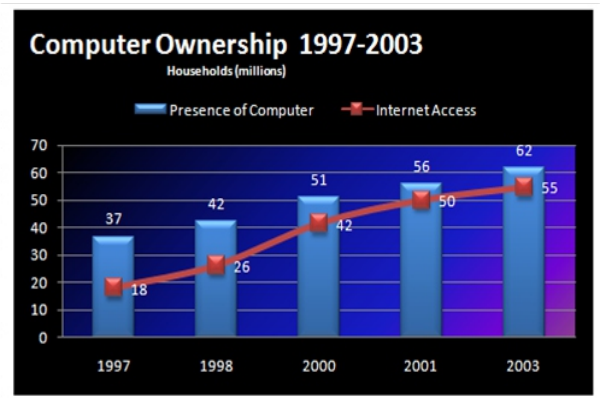
Charts & Diagrams

Since there are many different types of charts, think about whether a chart or simple data table will serve the purpose better. Often, because it is simpler, a table or even text alone will communicate the data more effectively. Since creating a well-designed chart requires time & effort, make sure it enhances your data story. Following are 10 principles for better chart design:

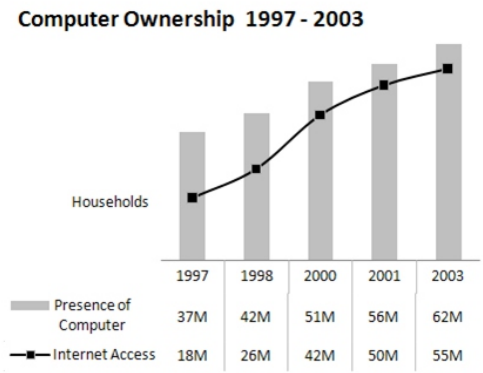
- Avoid Fancy Formatting
- Skip the Unnecessary Chart Junk
- Format Large numbers where possible
- Use Data Tables instead of Data Labels
- Make Effective Use of Chart Titles
- Sort your data before Charting
- Limit the use of Pie charts
- Don’t be afraid to parse data into separate charts
- Maintain Appropriate Aspect Ratios
- Don’t be afraid to not use a chart

1. Avoid Fancy Formatting

Don’t apply background colors to the Chart or Plot Area. Colors in general should be reserved for key data points in your chart. 3D & 3D effects such as gradients, pattern fills, shadows, glow, soft edges and other formatting are distracting and look unprofessional. The focus must be on the data.



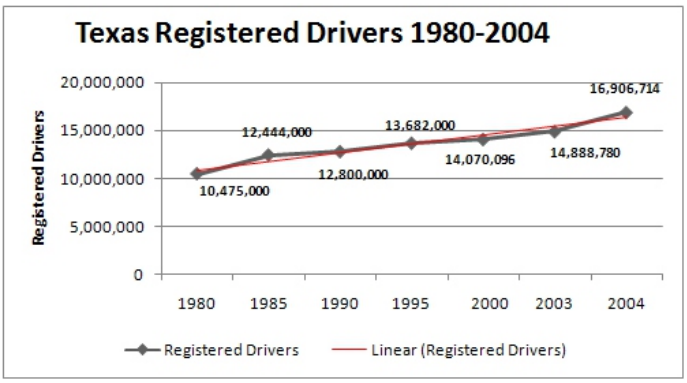
Wrong



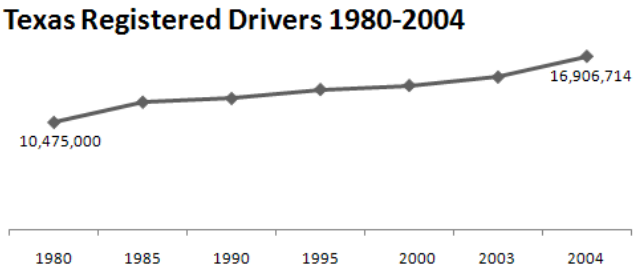
Right

2. Skip the Unnecessary Chart Junk

- Remove Gridlines
- Remove Borders
- Skip the Trend Lines
- Avoid Data Label Overload
- Don't Show a Legend if you don't have to
- Remove Axes that Don't Provide Value



Wrong

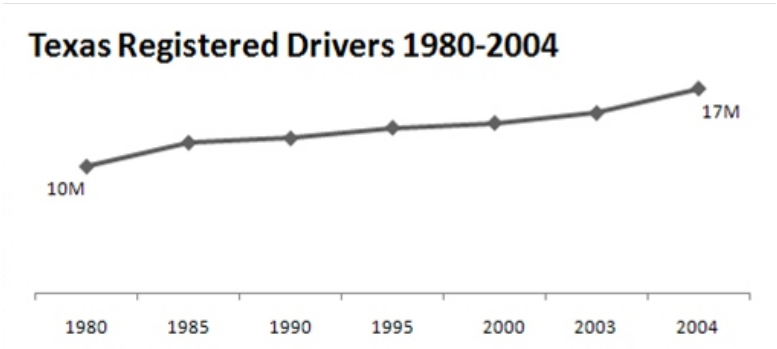


Right

3. Format Large numbers where possible

When plotting very large numbers on a chart, you should consider formatting the values so that they are truncated for easy reading.

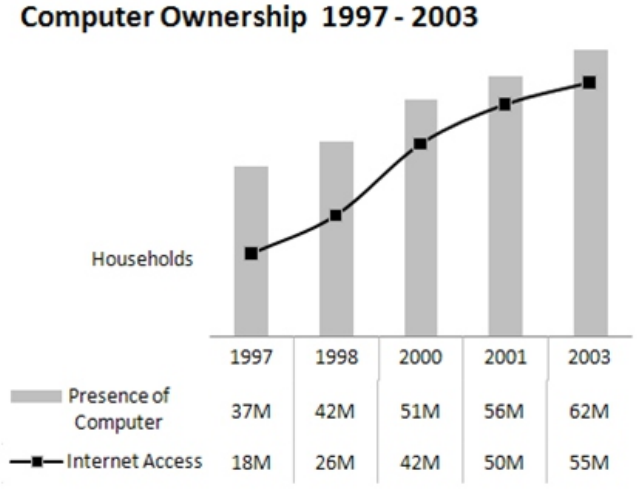
For instance, in this chart, the values are formatted to be displayed as 10M and 17M instead of the hard-to-read 10,475,000 and 16,906,714



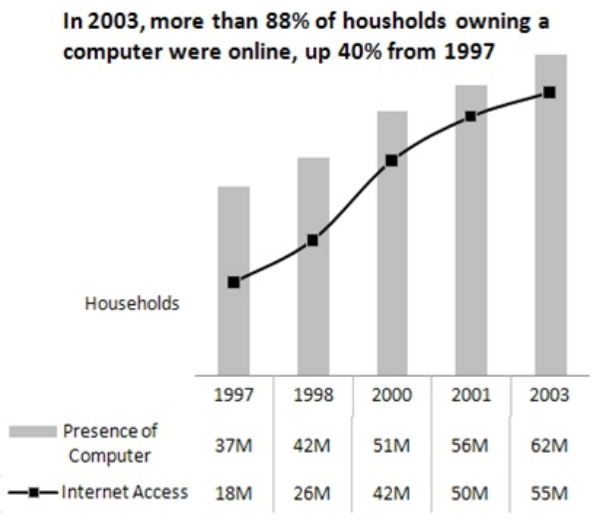
4. Use Data Tables instead of Data Labels

A data table allows you to see the data values for each plotted data point, without overcrowding the chart itself.

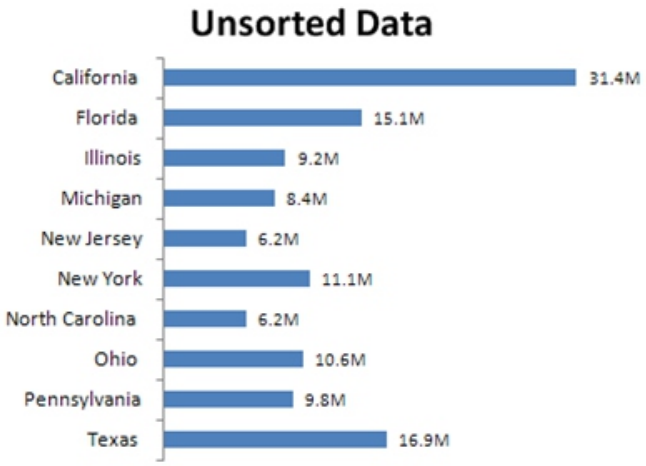
Although data tables increase the space your charts take up on your dashboard, they respond well to formatting and can be made to meld nicely into your charts. Data tables come in particularly handy if your clients are constantly asking to see the detailed information behind your charts.

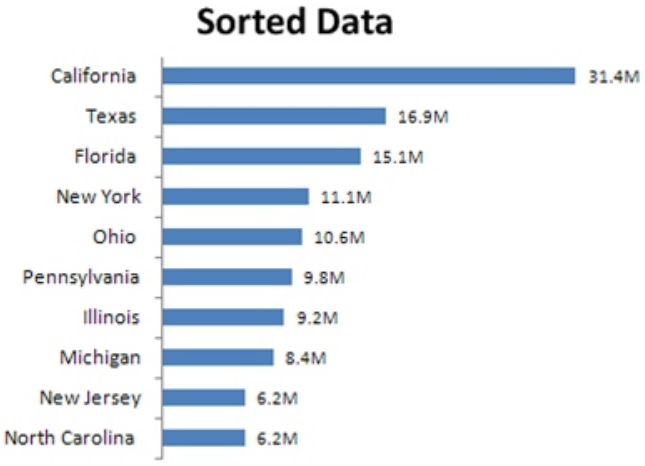


5. Make Effective Use of Chart Titles
You can use chart titles to add an extra layer of information, presenting analysis derived from the data presented in the chart.



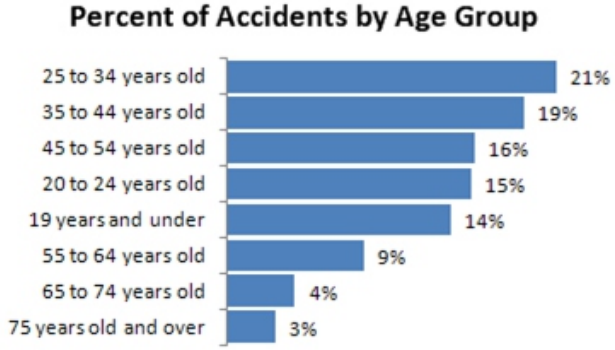
6. Sort Your Data Before Charting
Unless there is an obvious natural order such as age or time, it's generally good practice to sort your data when charting. By sorting, I mean sort the source data that feeds your chart in Ascending or Descending order by data value.

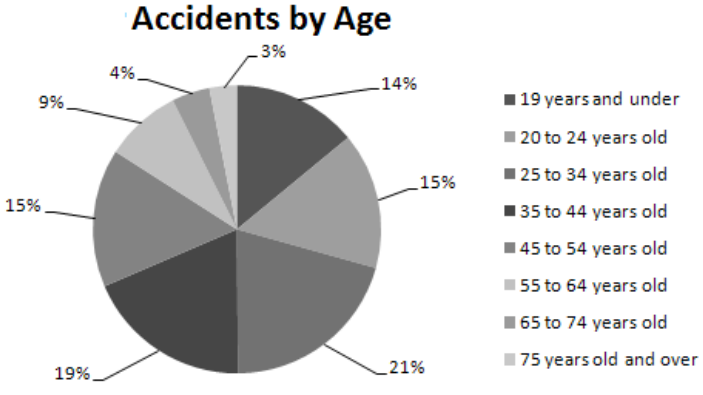




7. Limit the use of Pie charts

- Pie Charts typically take up more space than their cousins the line and bar charts.
- Pie charts can't clearly represent more than two or three data categories.
- Bar Charts are an ideal alternative to Pie Charts.

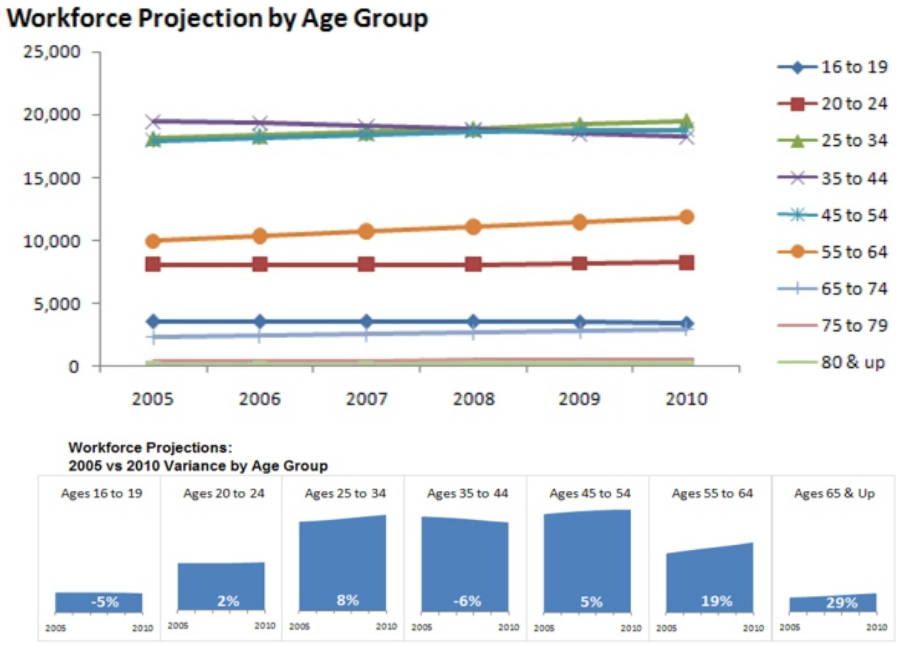




8. Don’t be afraid to parse data into separate charts

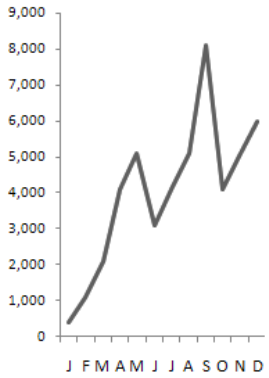
A single chart can lose its effectiveness if you try to plot too much data into it.

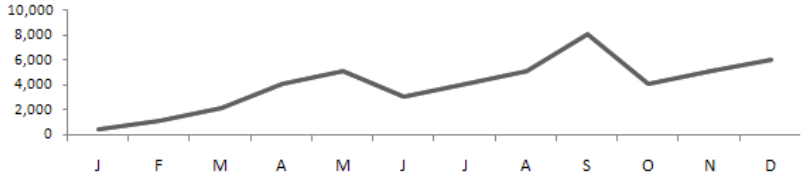
Step back and try to boil down what exactly the chart needs to do. Keep in mind what the ultimate purpose of the chart is.



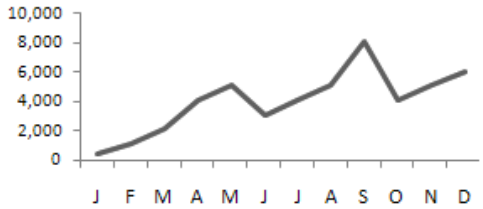
9. Maintain Appropriate Aspect Ratios

A skewed aspect ratio can distort your charts, exaggerating the trend in charts that are too tall, and flattening the trend in charts that are too wide.





Generally speaking, the most appropriate aspect ratio for a chart is one where the width of the chart is about twice as long as the height is tall.

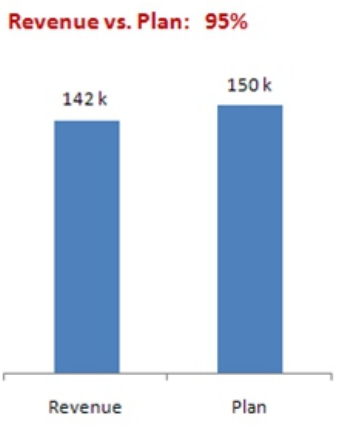


10. Don’t be afraid to not use a chart

You typically use a chart when there is some benefit to visually seeing, trends, relationships, or comparisons.

Ask yourself if there is a benefit to seeing your data in chart form. If the data is relayed better in a table, then that’s how it should be presented.

Should you want to research the topic more, click the link below:



Revenue	142,000
Plan	150,000
Variance	95%

https://material.io/design/communication/data-visualization.html#selecting-charts