

# Graphics Visualization

## Chapter 1: Introduction to the Fundamentals

Reference: Claus O. Wilke (2019), Fundamentals of Data Visualization

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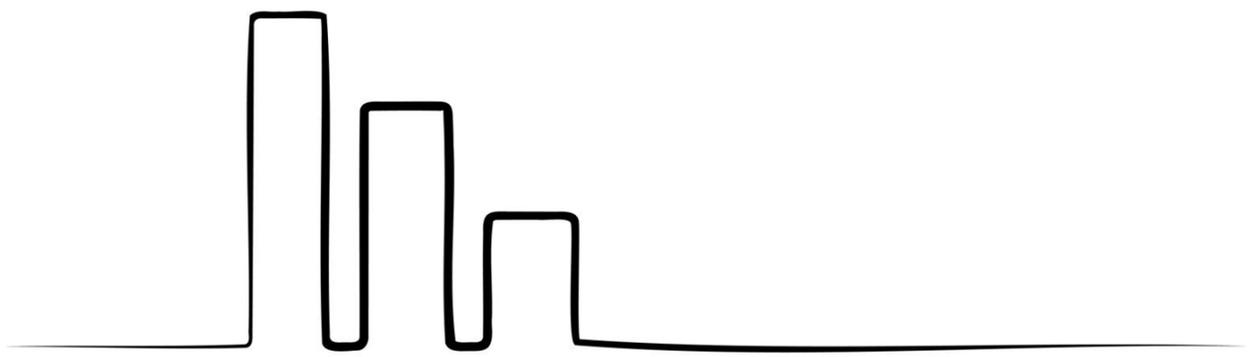
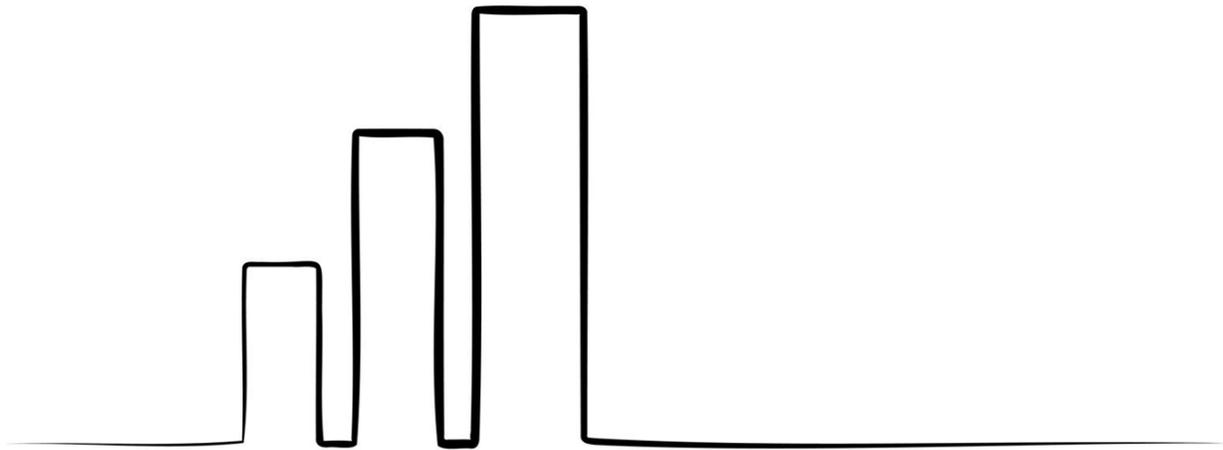
Color data  
Information Visualization Charts

TEXT THE TITLE HERE

Thousand Little Rabbits

Date

[https://slidesdocs.com/presentation/simple-color-business-data-information-visualization-chart-powerpoint-template\\_693ccc4180](https://slidesdocs.com/presentation/simple-color-business-data-information-visualization-chart-powerpoint-template_693ccc4180)



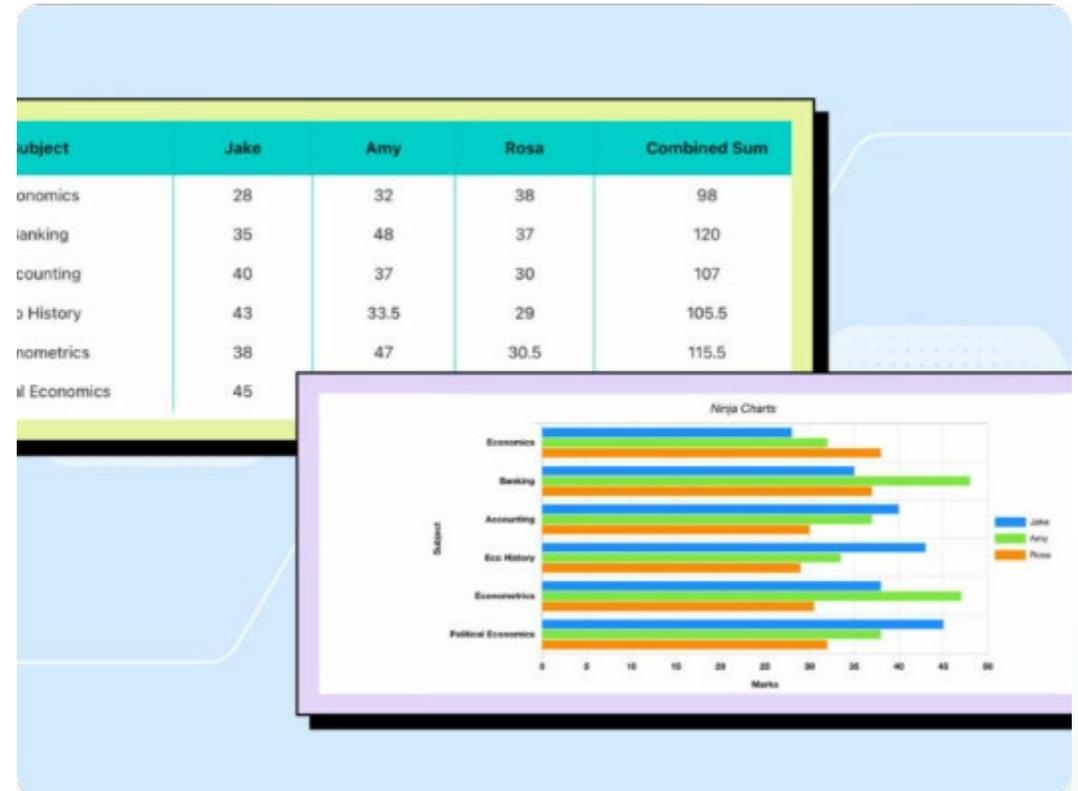
Minimal Line  
Bar Chart  
Showing  
Growth and  
Decline  
Concept

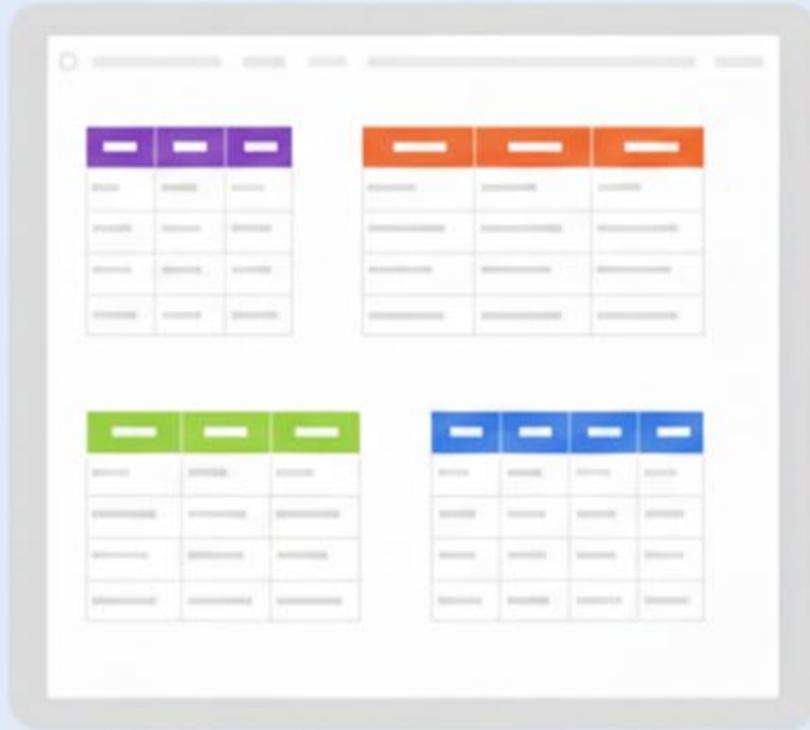
<https://www.vectorstock.com/royalty-free-vector/big-data-visualization-background-modern-vector-21492288>

ABSTRACT  GRAPHICS

# What Is Graphics Visualization?

- ✓ **Visual Representation:** Translating raw data or information into visual forms.
- ✓ **Insight Discovery:** Helps humans see patterns, trends, and relationships at a glance.
- ✓ **Omnipresent:** Essential in science, business, media, and everyday decision -making.





A tablet displaying four data tables arranged in a 2x2 grid. Each table has a distinct header color: purple, orange, green, and blue. The tables contain placeholder text for data rows and columns.

**TABLE**

**VS**



**CHART**

**Table vs. Chart: Which One Helps Works Best for Your Data?**

# Annual Report 2023

We are an international business consultancy firm. This report highlights the company's financial and non financial achievements between 2022 and 2023.



Revenue:  
**\$936,643,903**



Energy consumption:  
**134.6 (kWh/month)**



Profit after tax:  
**\$724,246,309**



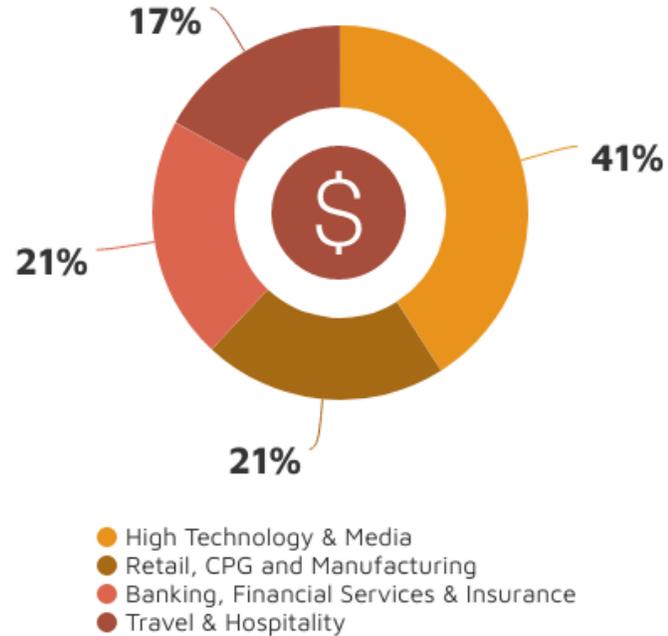
Training per employee:  
**77.13 hours**

**Address:** 908 N Dodge St, Iowa City, IA, 52245

**Website:** [www.globalbusiness.com](http://www.globalbusiness.com) | **Email:** [info@globalbusiness.com](mailto:info@globalbusiness.com)

**Phone Number:** 232-643-2092 | **Fax:** 232-223-8704

## Revenue Distribution by Industry



## Awards & Recognition



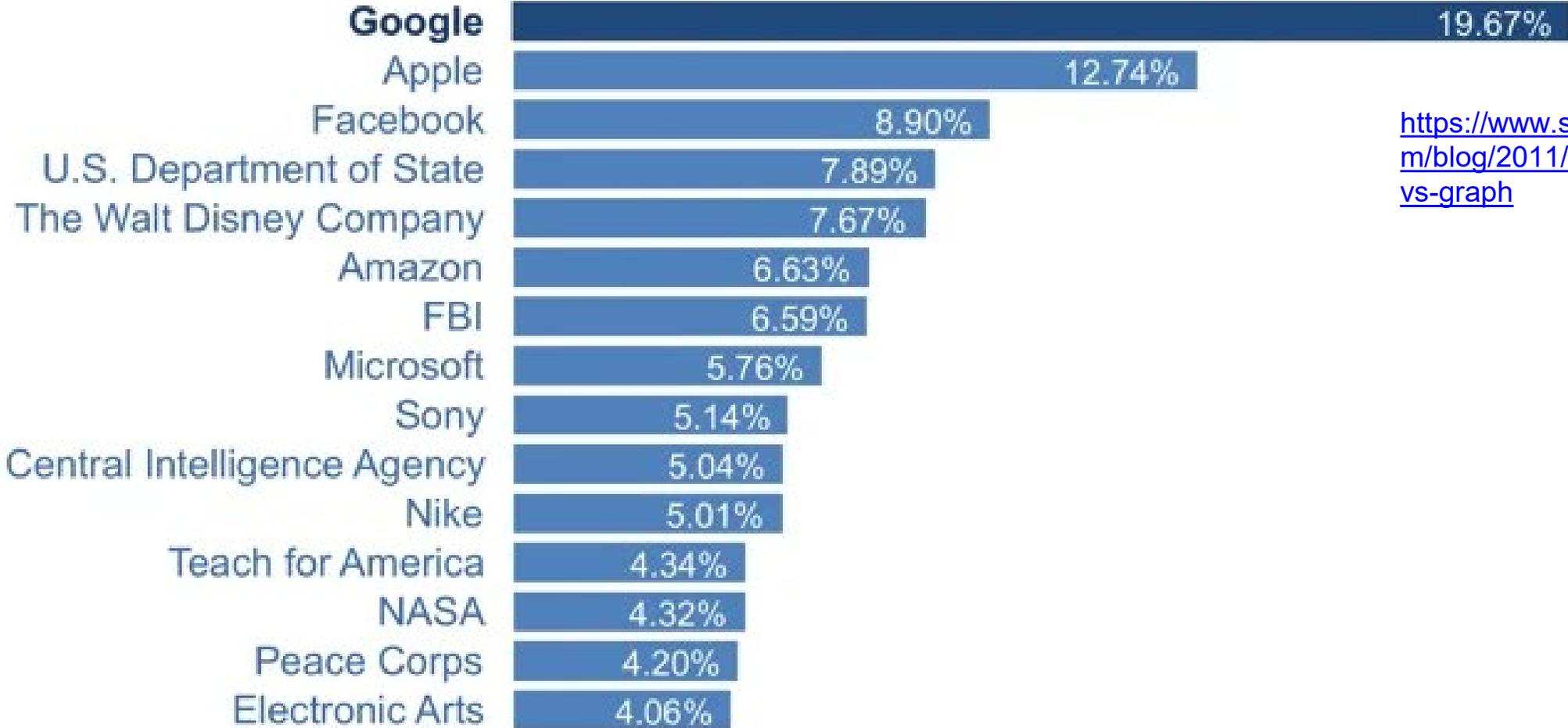
**Financial Times  
Leadership Award**  
for leadership in  
inclusion and diversity.



**ENERGY STAR  
Partner of the Year**  
by the Greenwood  
Institute in 2023.

# Ideal Employers for Young Workers: **Google leads the pack**

Survey results of 6,700 young professionals



<https://www.storytellingwithdata.com/blog/2011/11/visual-battle-table-vs-graph>

The above represents the top 15 companies out of the 150 included in the survey. Companies not shown were chosen by <4% of survey respondents each. Data source: 2011 Universum survey.

# Visualization Is Communication



## The Message

Every visual artifact sends a specific signal. It is a bridge between data and human insight.



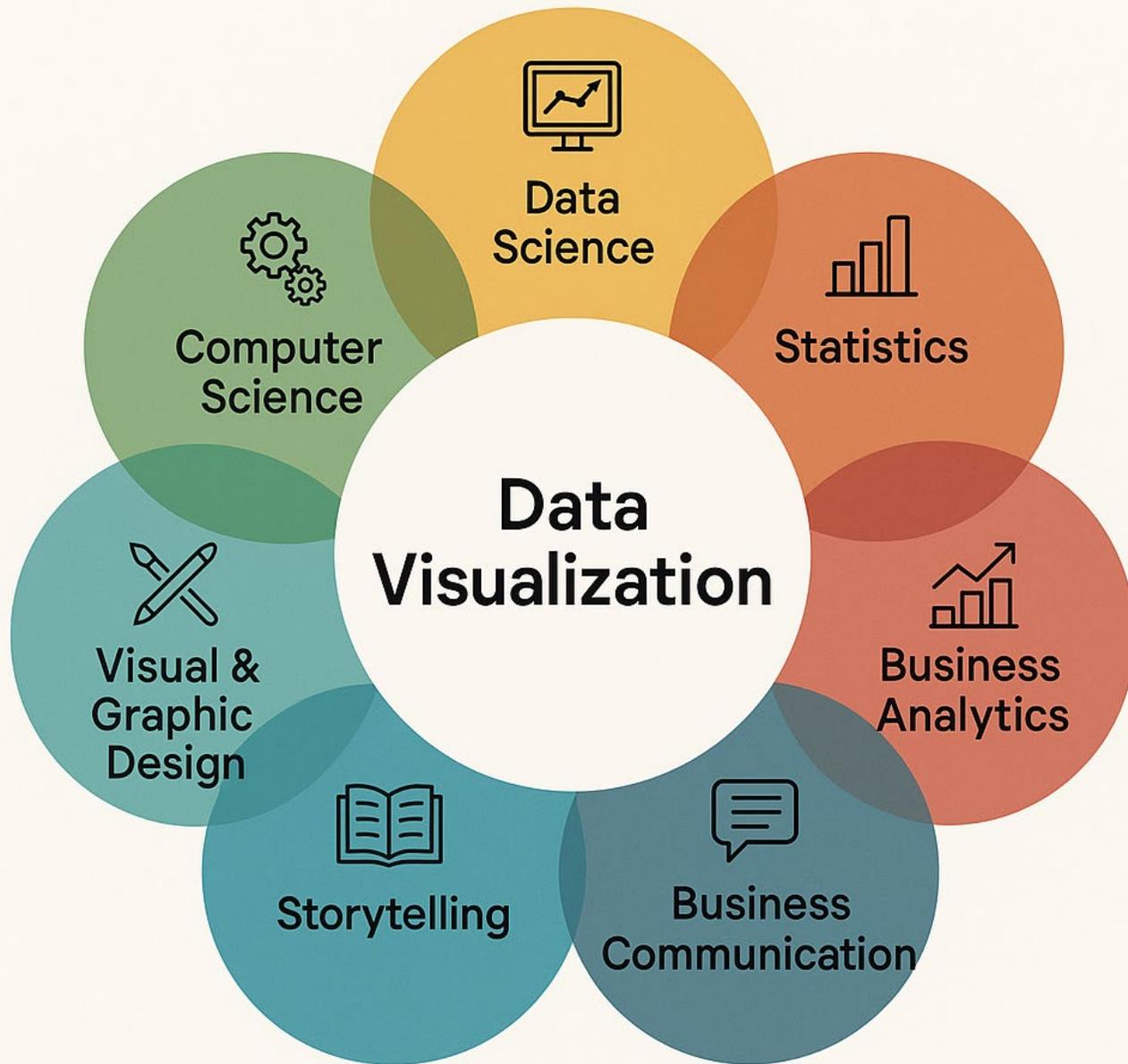
## The Audience

Effective design considers the viewer's expertise, context, and existing mental models.

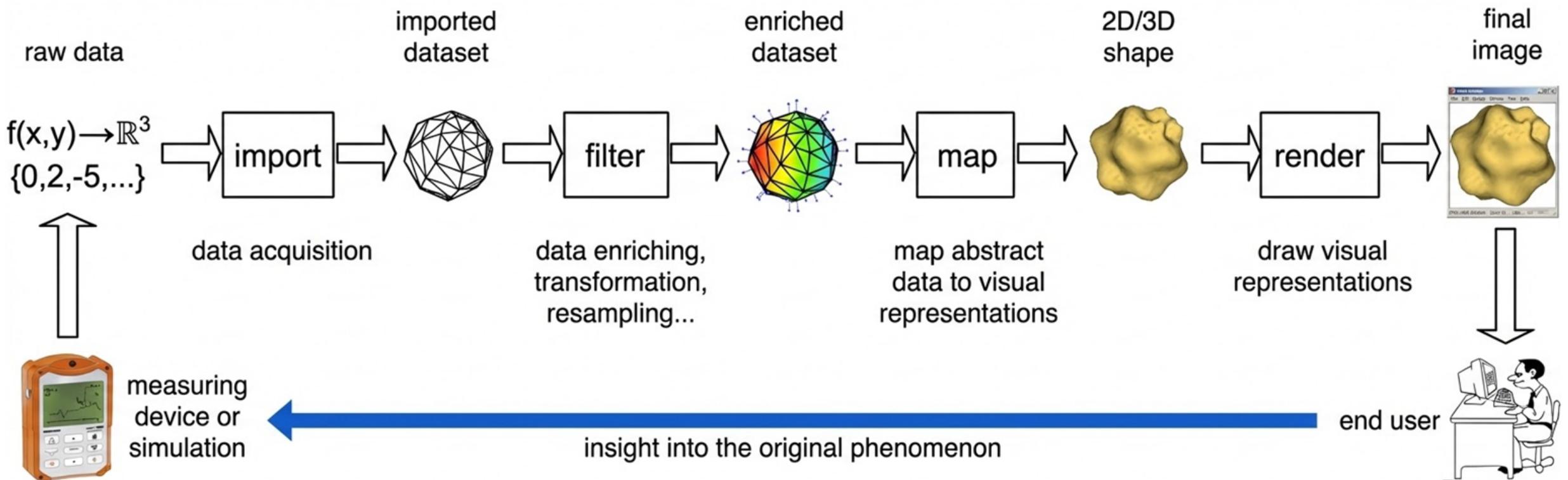


## The Integrity

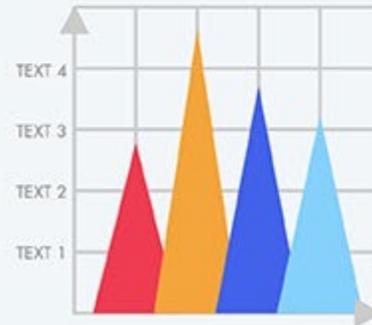
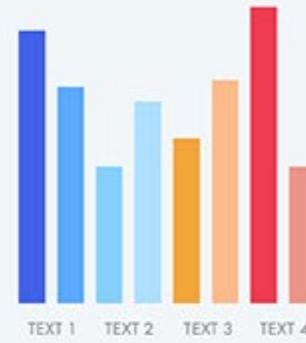
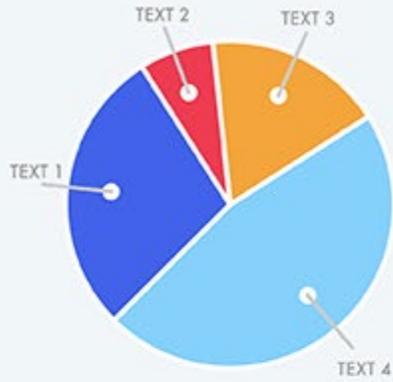
Graphics must be clear and honest. Misleading visuals are as damaging as false text.



<https://medium.com/%40sumayyan-aaz15/data-visualization-a-multidisciplinary-blend-of-art-psychology-and-analytics-cb7062fee6f0>



<https://www.linkedin.com/pulse/data-visualization-pipeline-tesfaye-demissie>

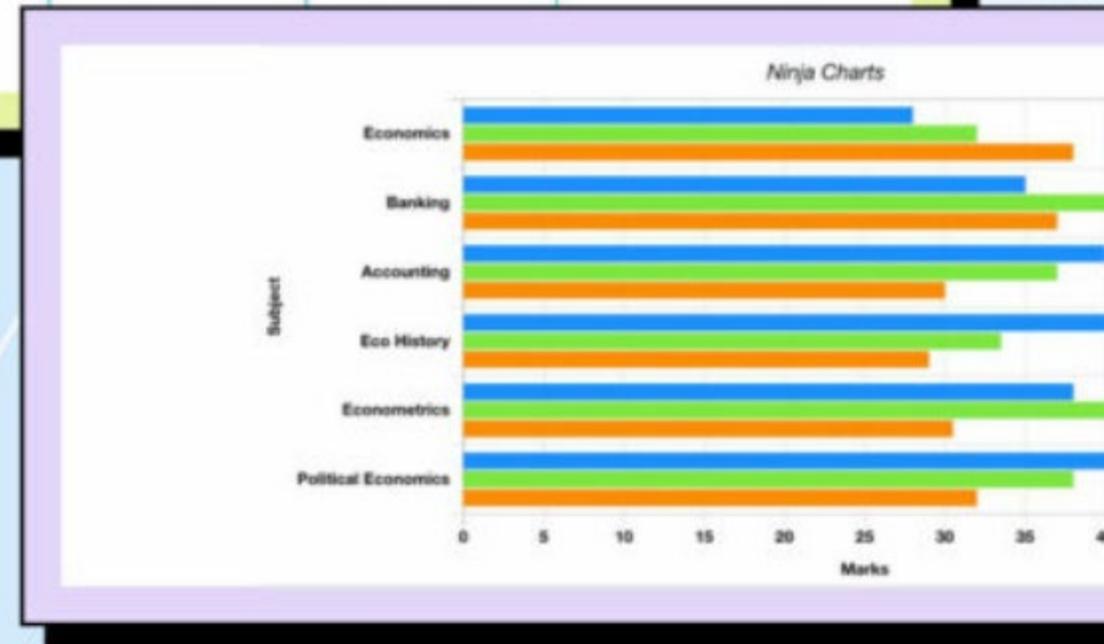


<https://www.linkedin.com/pulse/data-visualization-communicating-insights-effectively-adeyemi-9avxf>

# Why Visuals Matter

- ✓ **Cognitive Speed:** Humans process visual information up to 60,000x faster than text.
- ✓ **Revealing Insights:** Good visuals surface hidden correlations in massive datasets.
- ✓ **High Stakes:** Decisions in policy and health are often made based on visual trends.

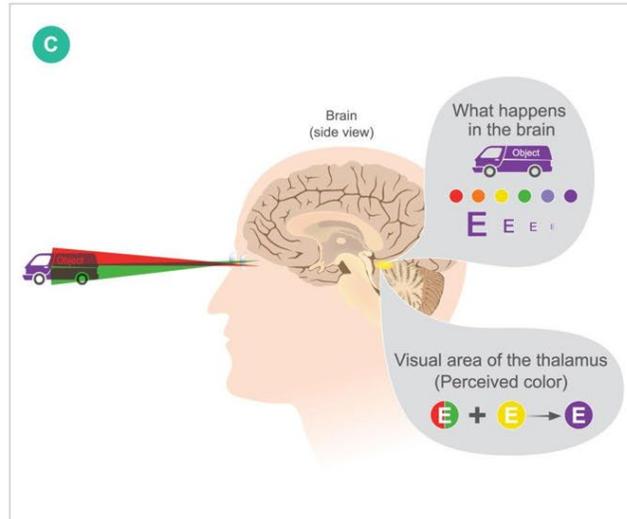
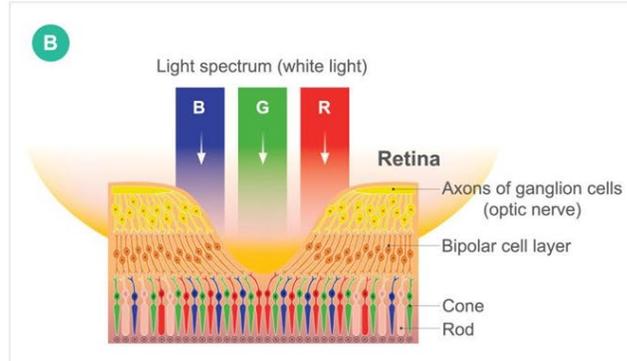
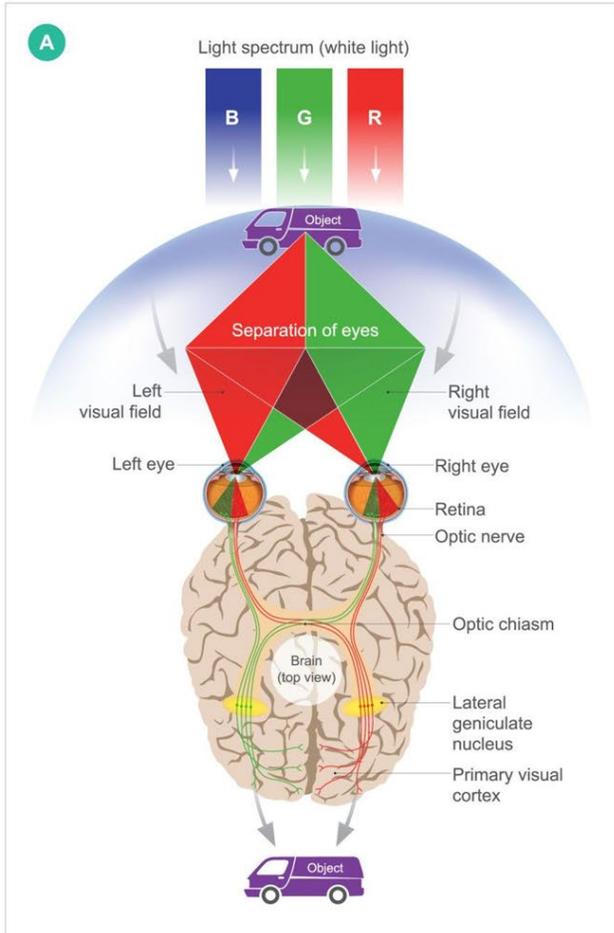
Jake	Amy	Rosa	Combined Sum
28	32	38	98
35	48	37	120
40	37	30	107
43	33.5	29	105.5
38	47	30.5	115.5
45			



# Visualization Process

(human vision)

# Visualization Process human vision.



# OUR BRAIN PROCESSES VISUALS 60,000x FASTER THAN TEXT



**90%**

OF INFO TRANSMITTED  
TO THE BRAIN IS VISUAL



**50%**

OF YOUR BRAIN IS ACTIVE  
IN VISUAL PROCESSING



**70%**

OF YOUR SENSORY RECEPTORS  
ARE IN YOUR EYES



**80%**

OF PEOPLE REMEMBER  
WHAT THEY SEE



Source:  
<https://kirkwood.pressbooks.pub/foundationsindigitalmarketing/chapter/visual-storytelling/>

## Overview of Data Visualization Types

<https://www.upgrad.com/blog/data-visualization-for-decision-making/>



# Good vs Poor Visualization

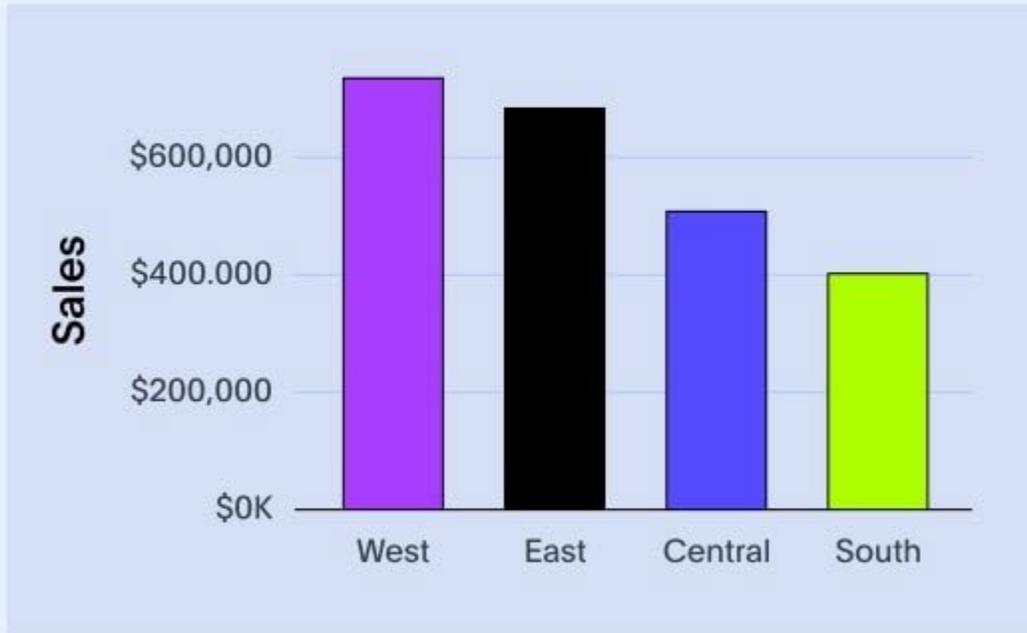
## ✓ Good Design

Includes clear, legible labels and intuitive spacing. Uses proper scales that avoid confusion and design that supports the core message.

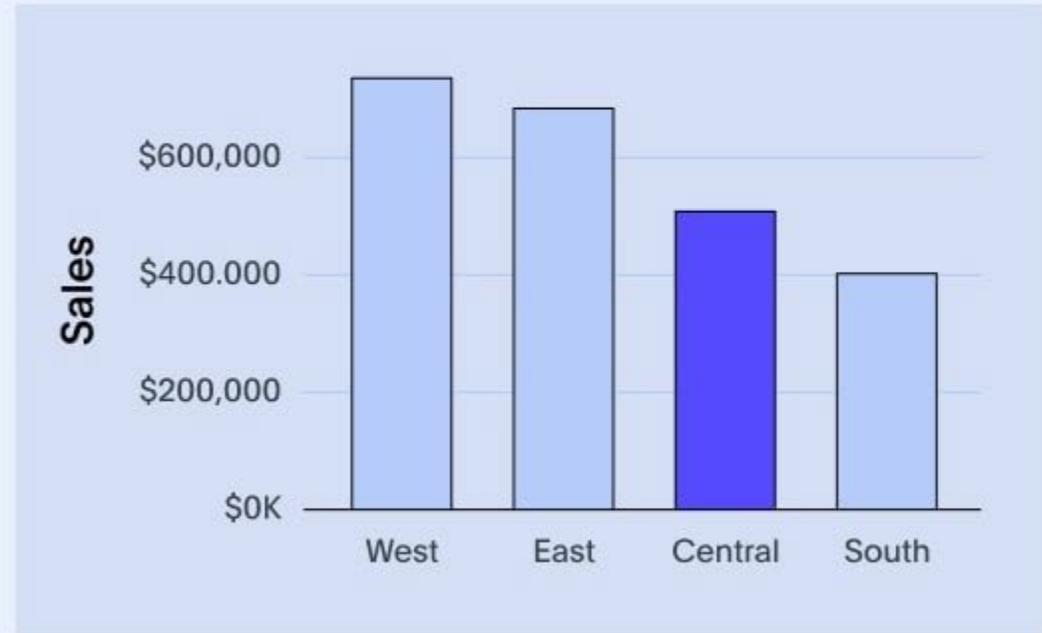
## ✗ Poor Design

Often cluttered with "chart -junk." Features distorted axes or misleading scales that obscure the reality of the underlying data.

## Before



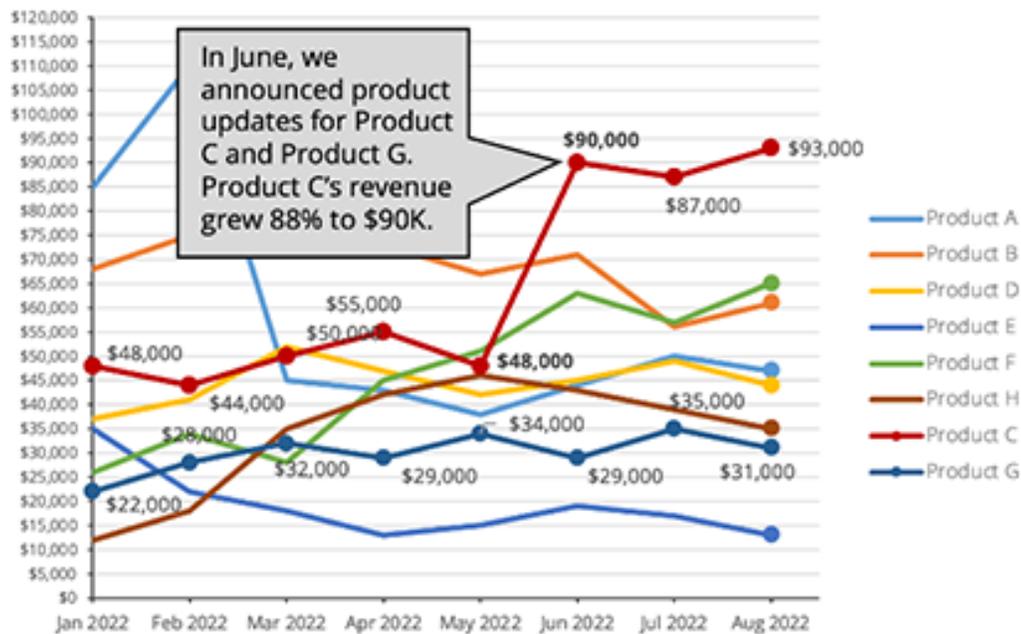
## After



<https://www.thoughtspot.com/data-trends/data-visualization/bad-data-visualization-examples>

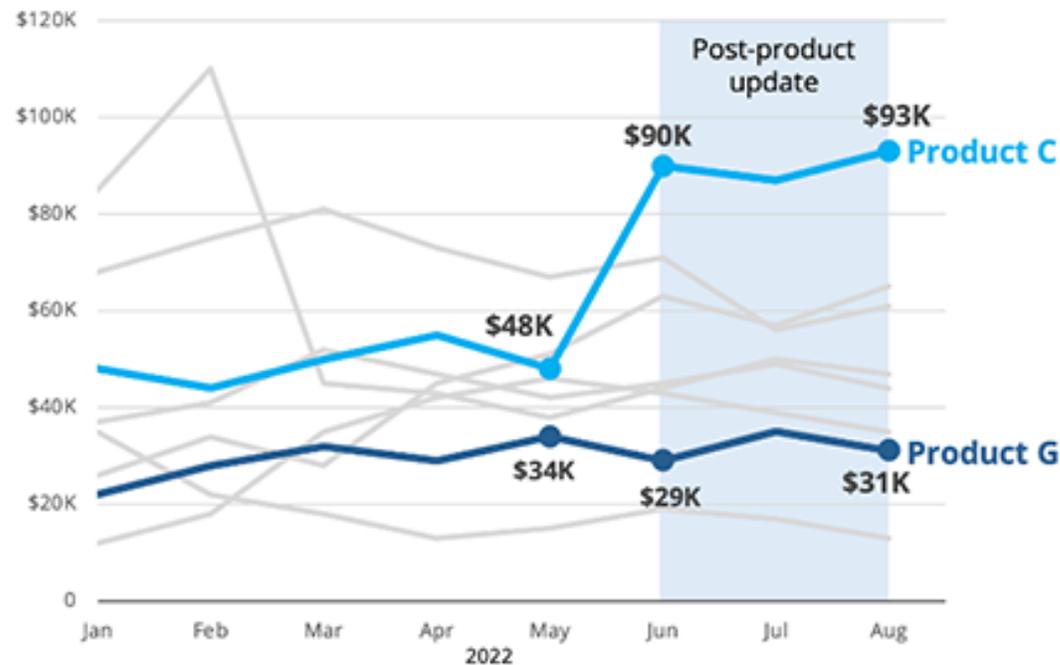
## With Clutter

### Top Products by Monthly Sales



## Without Clutter

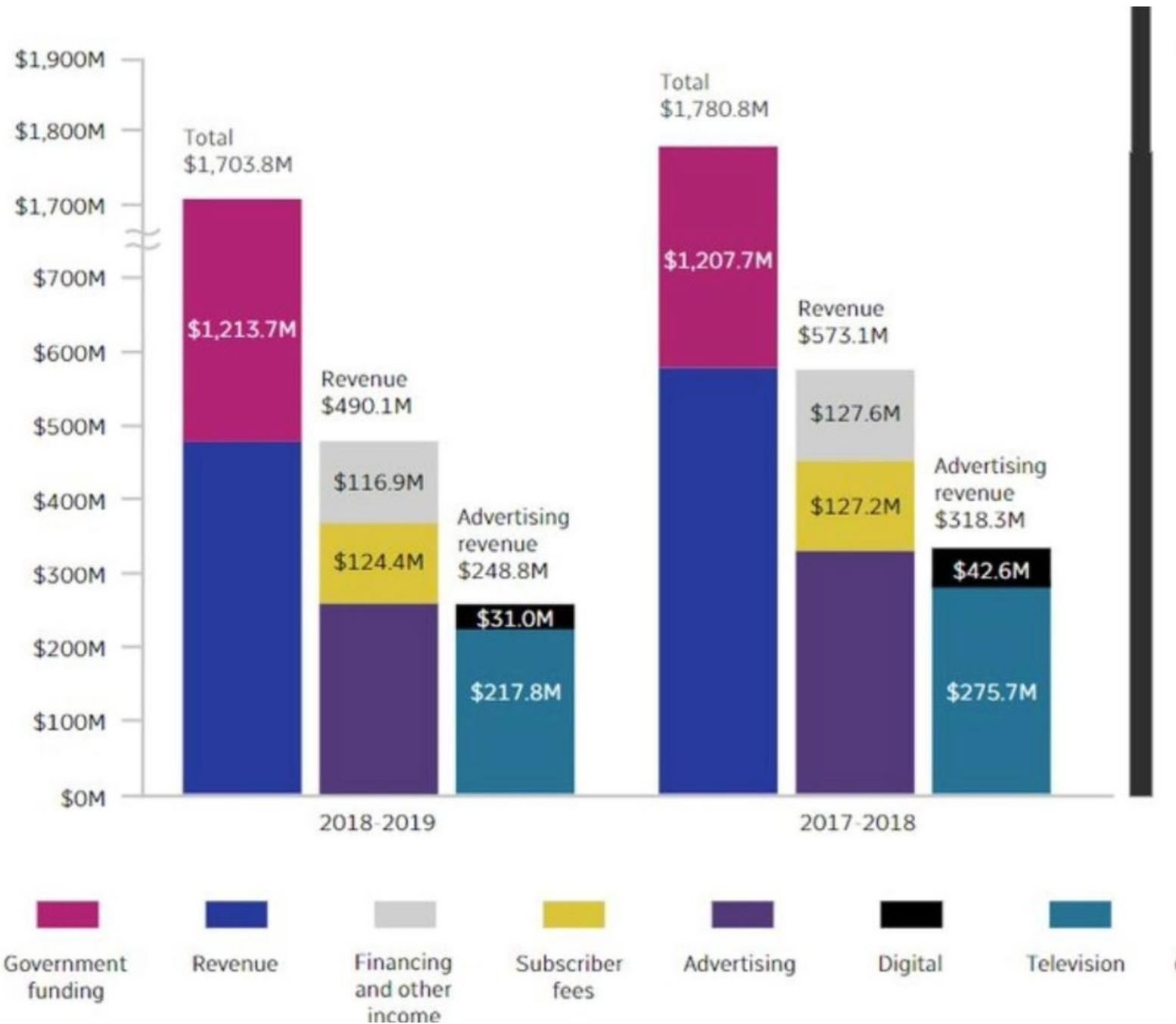
**Product C's update** drove a **\$90K sales increase (88%↑)** but **Product G's update** has slowed sales (7%↓)



Effectivedatastorytelling.com

<https://www.effectivedatastorytelling.com/post/a-data-storytellers-guide-to-avoiding-clutter>

<https://www.polymersearch.com/blog/10-good-and-bad-examples-of-data-visualization>



# Wilke's Taxonomy of Errors



## Ugly Figures

Aesthetic issues only. The data is clear and correct, but the design is unappealing or unprofessional.



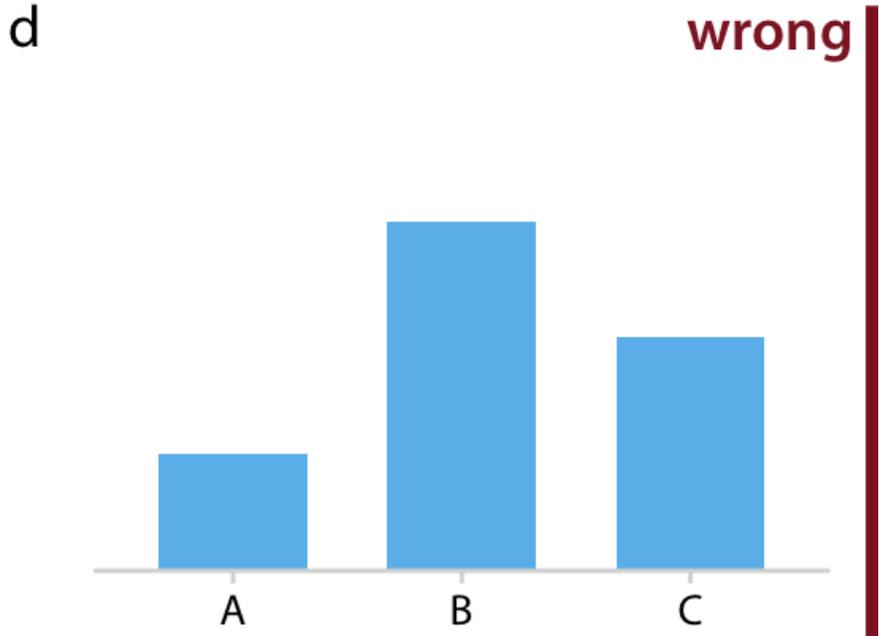
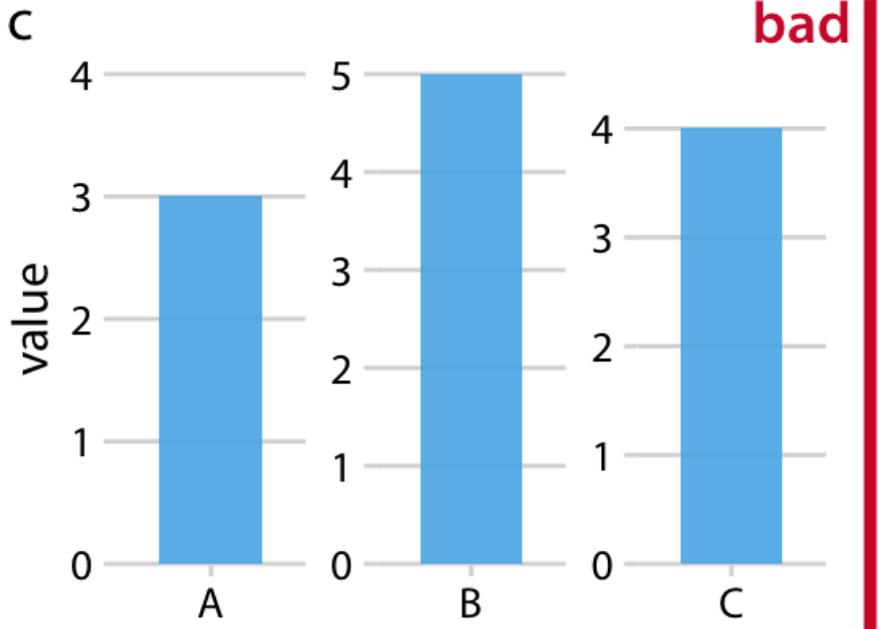
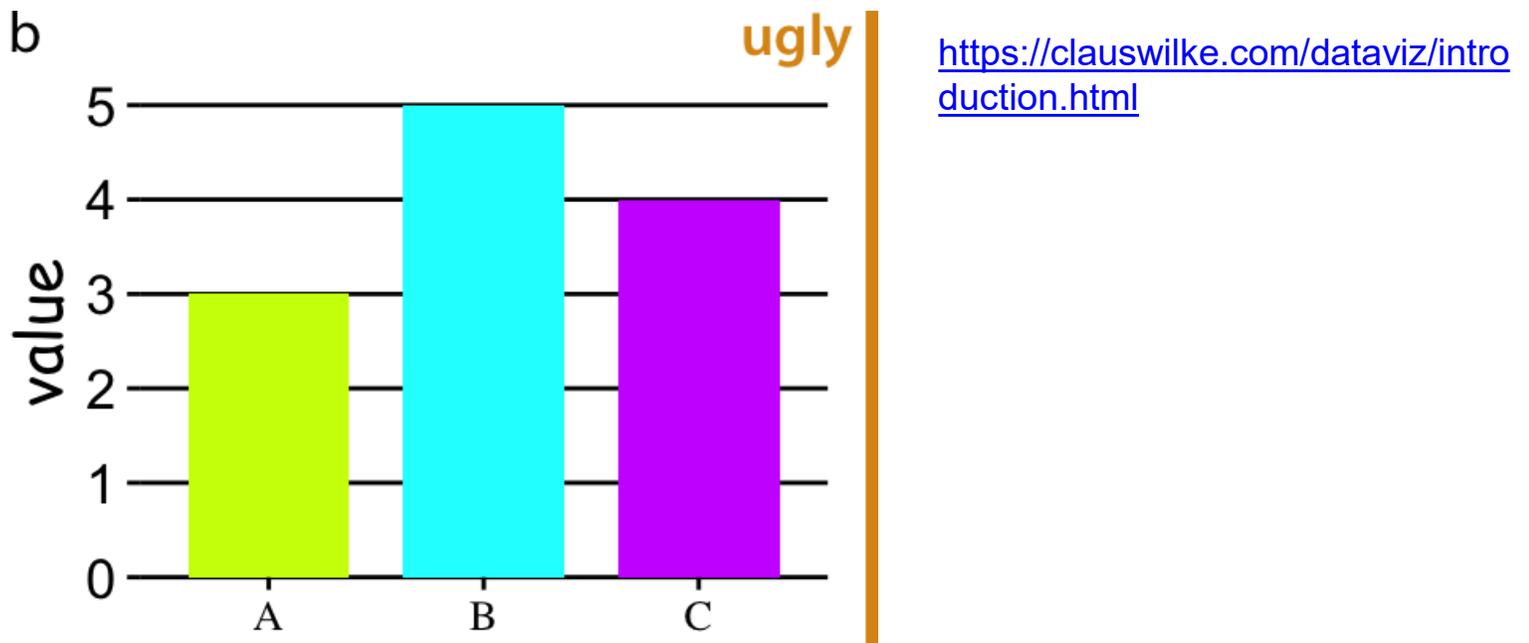
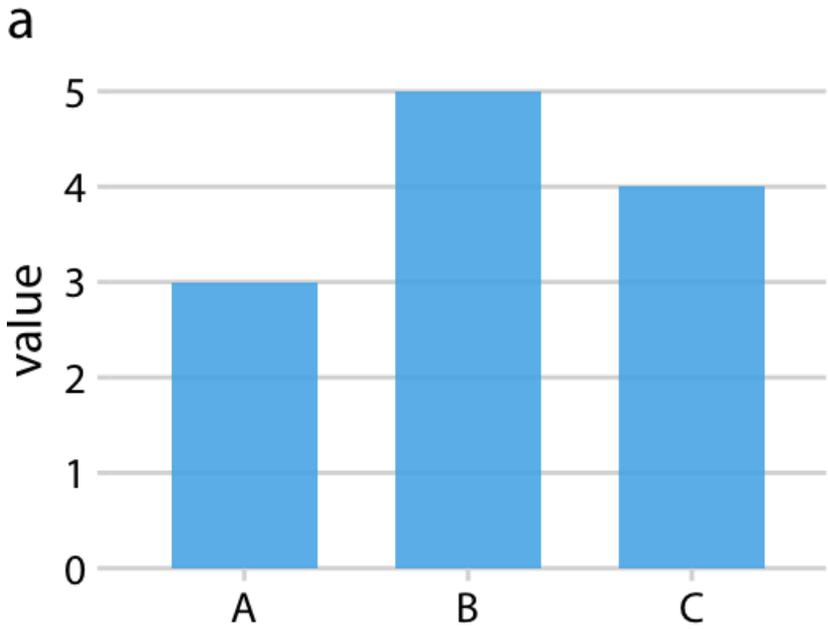
## Bad Figures

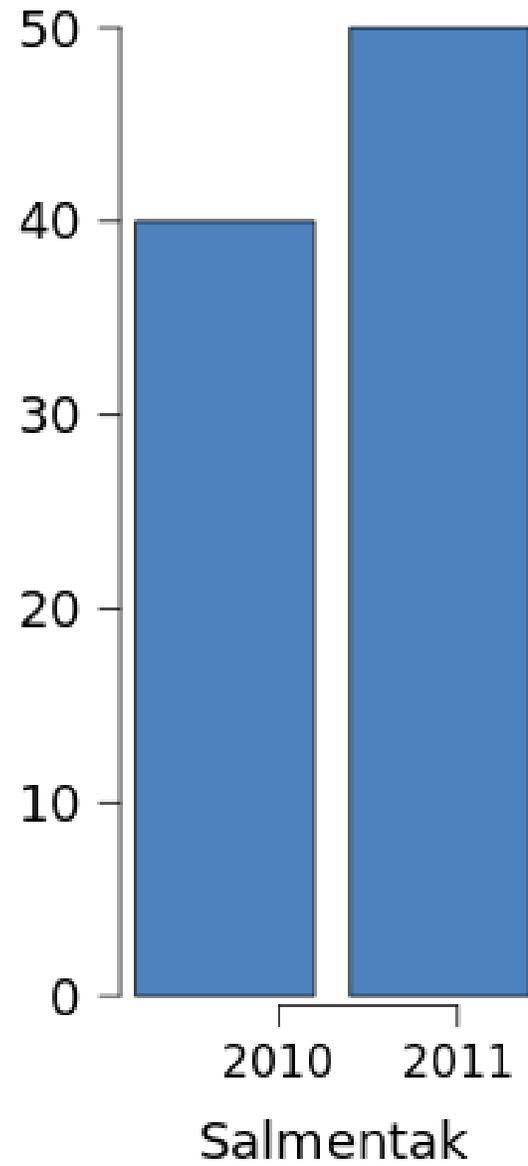
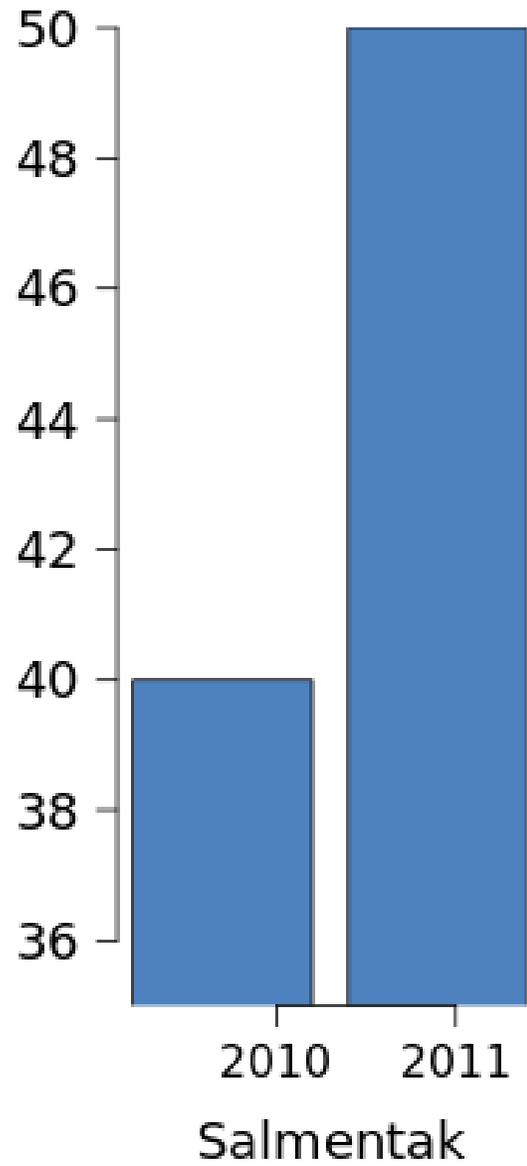
Perceptual problems. The design choices make it difficult or misleading for the eye to interpret values.



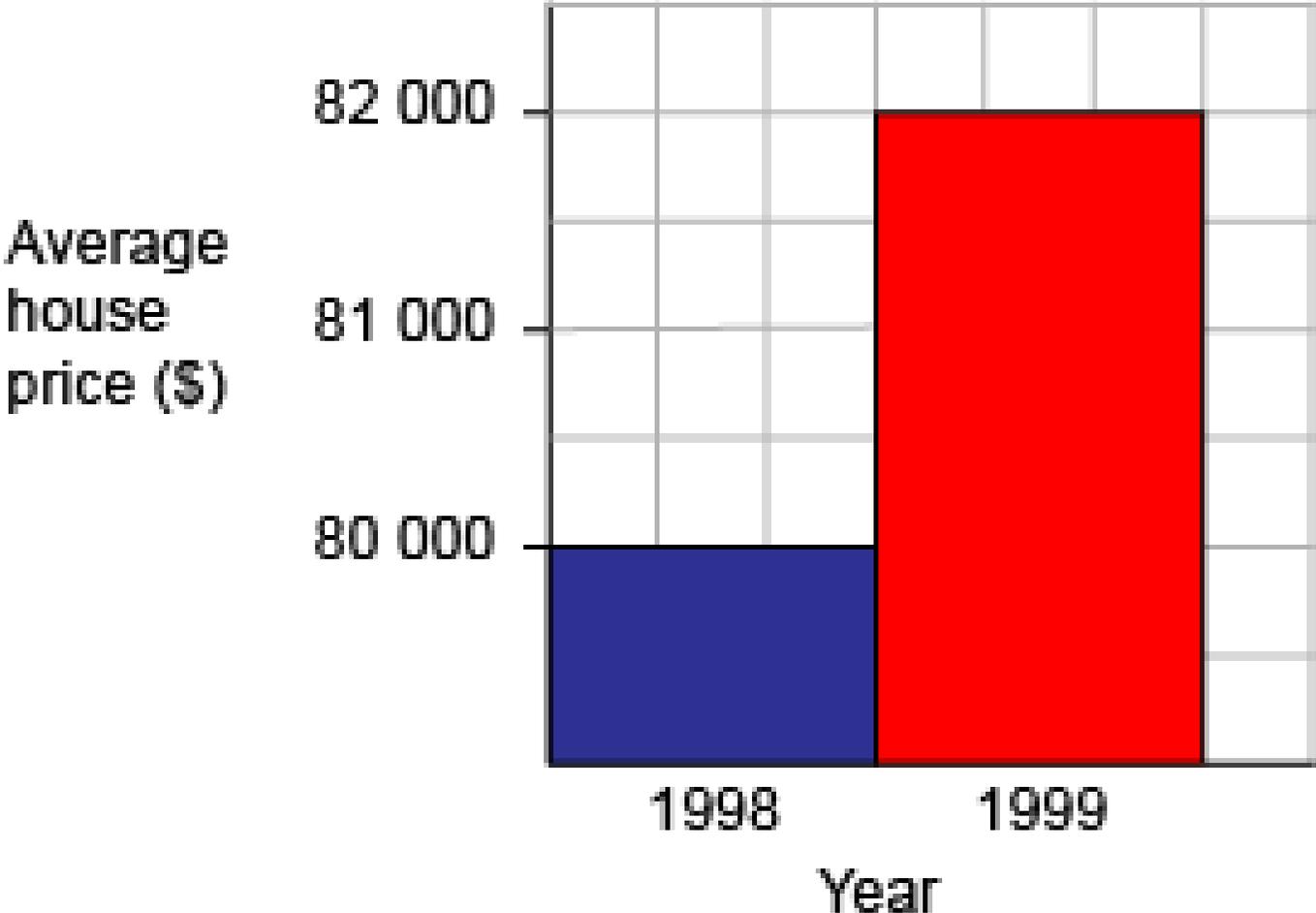
## Wrong Figures

Mathematically incorrect. The data is plotted using flawed logic or incorrect calculations.

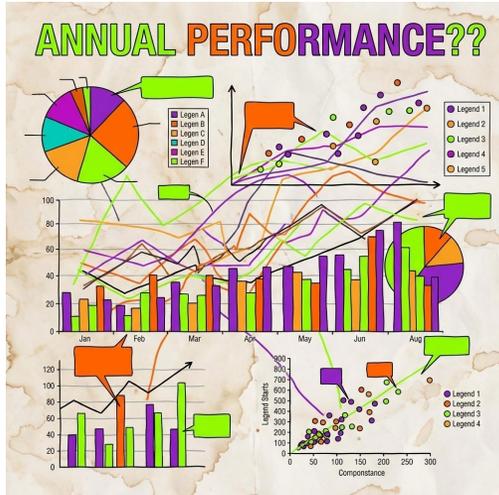




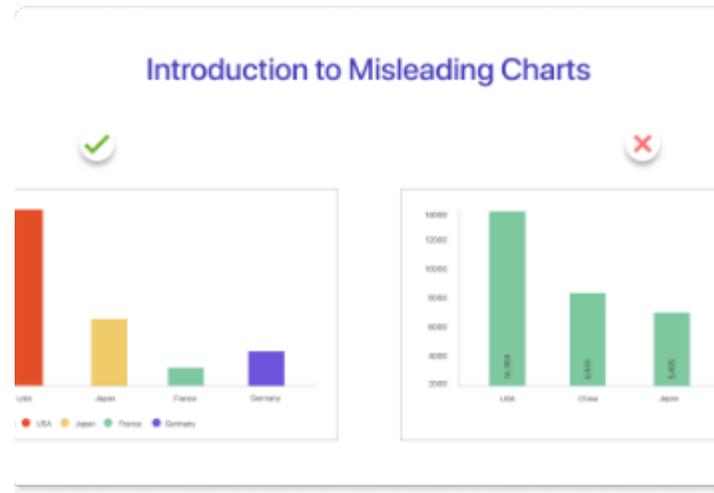
### "Massive increase in house prices this year"



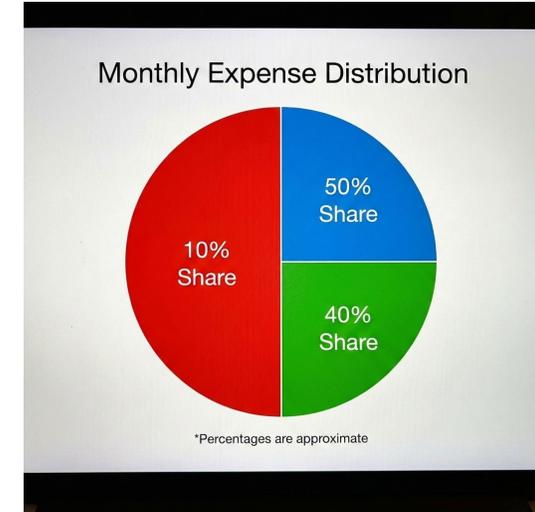
# Identifying Critical Errors



Ugly: Poor Aesthetics



Bad: Perceptual Bias



Wrong: Data Errors

# Course Philosophy & Scope

- ✓ **Static Focus:** Mastering the core principles of static figures before interactive ones.
- ✓ **Principles First:** Understanding *why* design works is more vital than which software is used.
- ✓ **Design Decisions:** Every choice—color, axis, type—must be intentional and justified.



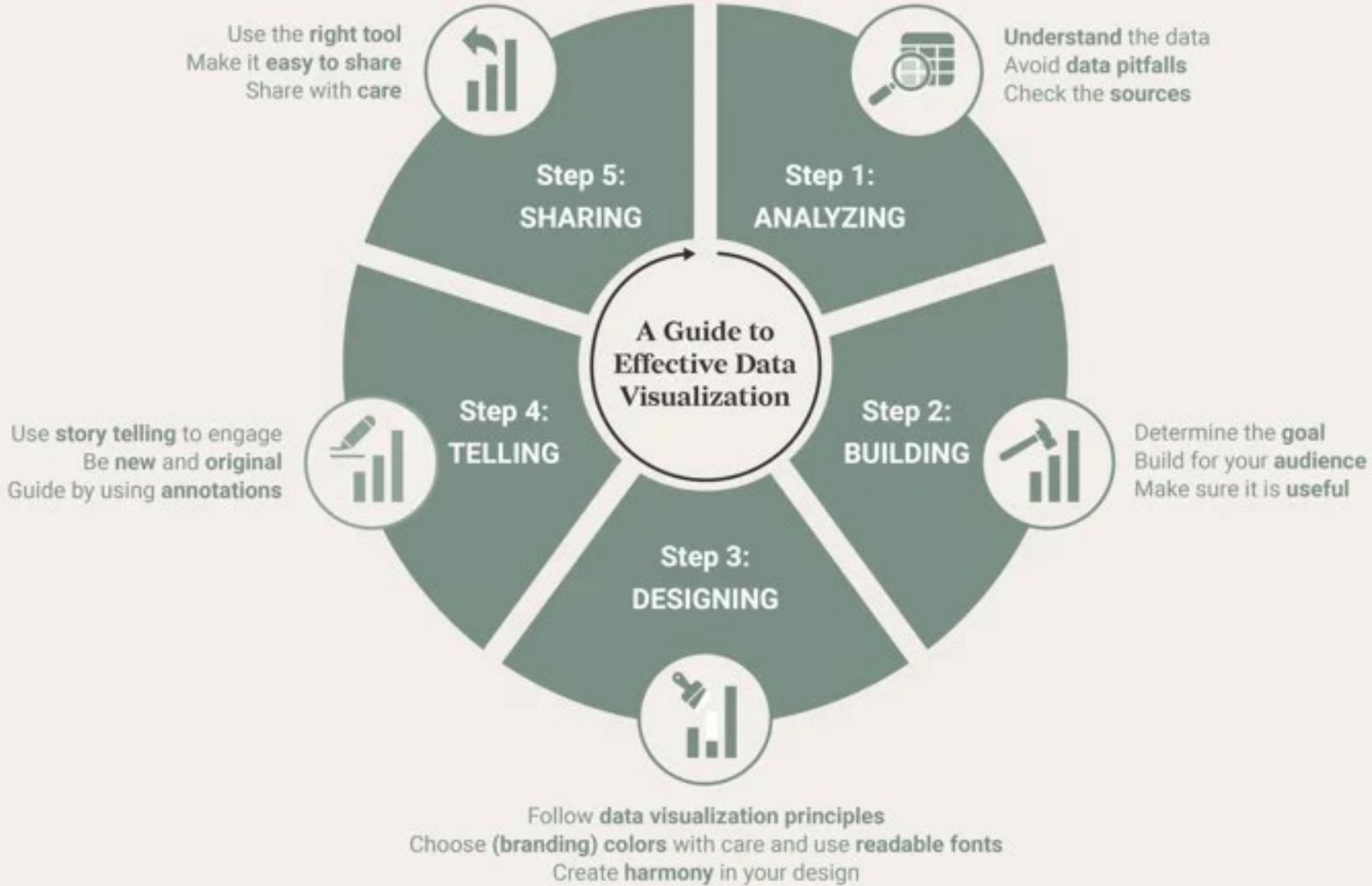
## Static charts

- + Focuses on the main message
- + Applicable for multiple media
- + More control over storytelling
- + Better for data explanation
- + Faster to make
- + Fewer accessibility issues
- Read only
- Hard to update
- Strict linear storytelling

## Interactive charts

- + Deliver multiple insights
- Limited cross-device support
- Choice overload
- + Better for data exploration
- Takes time and money
- Accessibility issues
- + More data can be shown
- + Easy to update
- + Engaging interactivity
- + Focus on details
- Complex structure

<https://www.datylon.com/blog/pros-and-cons-of-static-and-interactive-charts>



# Summary Checklist

# 1st

Priority: Communication

- ✓ Visualization is a sophisticated form of **structured communication** .
- ✓ Design errors are not just "ugly" —they can lead to **false conclusions** .
- ✓ The goal is to improve **human understanding** through disciplined design.

COMING UP NEXT

# Graphic Design Principles

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Typography



Hierarchy



Color Theory

# Image Sources



<https://ninjatables.com/wp-content/uploads/2023/07/Charts-vs-Tables-for-test-results-1024x536.jpg>

Source: [ninjatables.com](https://ninjatables.com)

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[https://www.tempo.io/\\_next/image?url=https%3A%2F%2Fimages.ctfassets.net%2F99u0kepfatsy%2F78eqcOrkaFT6bGFdXX1GsU%2Fcc2d0272093cbe4d020faf8dcd019a34%2FMessy-Pie-Chart-1024x712.jpg&w=3840&q=75](https://www.tempo.io/_next/image?url=https%3A%2F%2Fimages.ctfassets.net%2F99u0kepfatsy%2F78eqcOrkaFT6bGFdXX1GsU%2Fcc2d0272093cbe4d020faf8dcd019a34%2FMessy-Pie-Chart-1024x712.jpg&w=3840&q=75)

Source: [www.tempo.io](https://www.tempo.io)

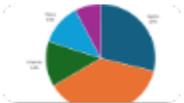
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<https://mokkupai.s3.ap-south-1.amazonaws.com/files/assets/blogs/resources/d3c3b36c-a654-41d5-afea-0e6cd62db5aa.png>

Source: [www.mokkupai.ai](https://www.mokkupai.ai)

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<https://bernoff.com/wp-content/uploads/2024/08/image-22.png>

Source: [bernoff.com](https://bernoff.com)