

# Introduction to Business Analytics: Communicating with Data

## Module 4

Professor Kevin Hartman

# In This Module



## Module 4: Getting Your Story Across

### Key Concepts

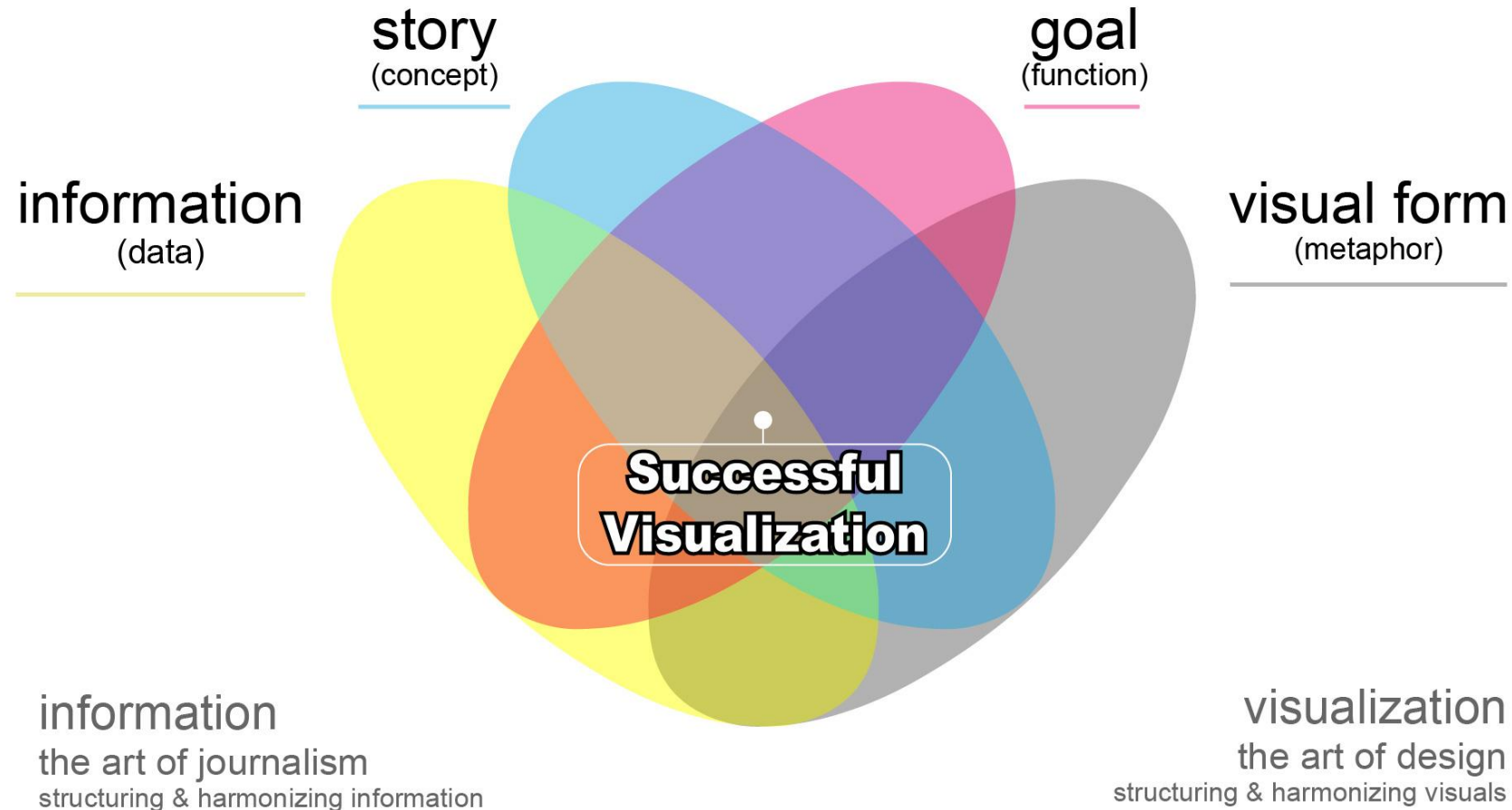
Enriching content through contrast

Bringing sophistication to charts

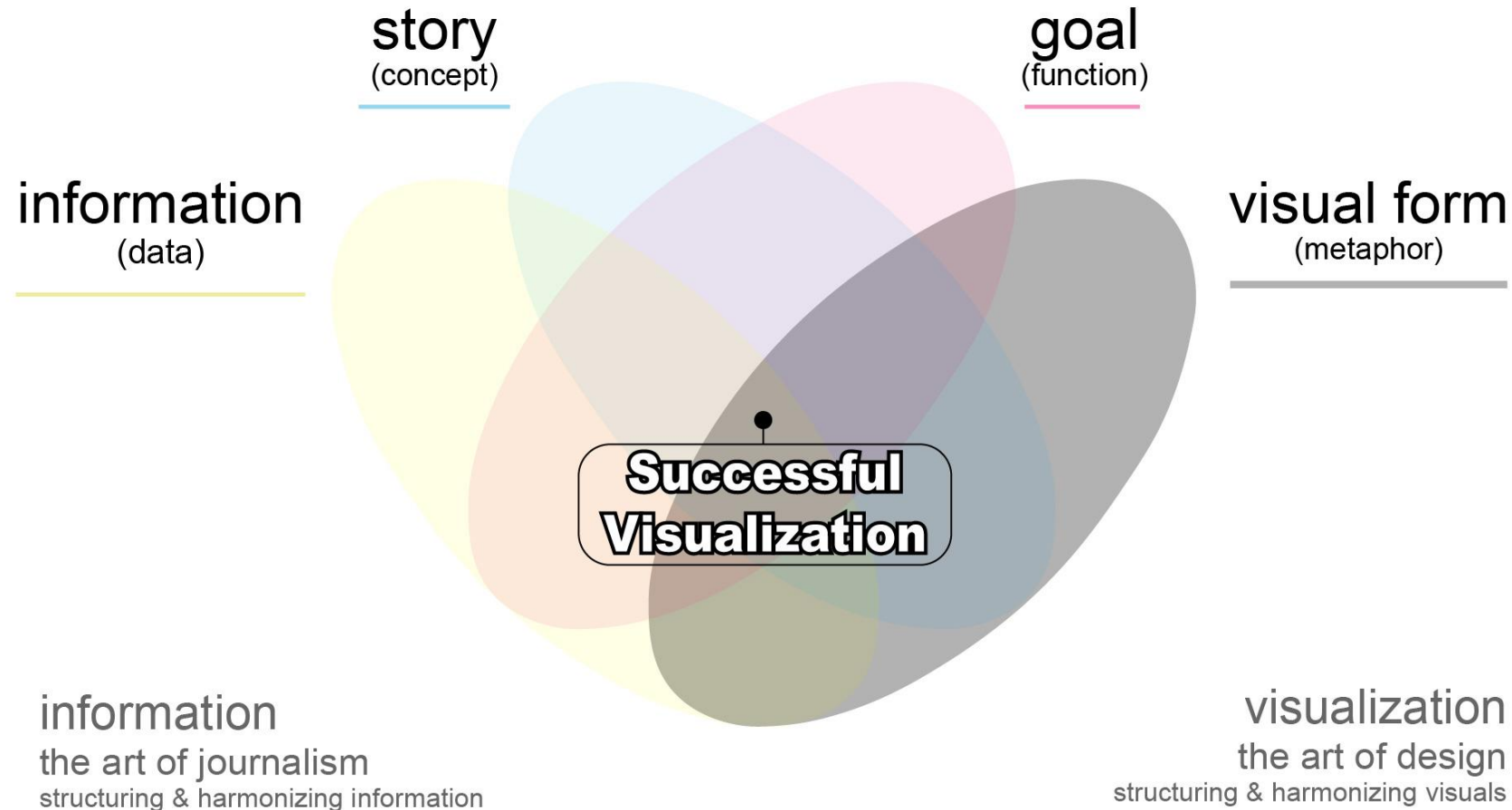
Improving chart legibility

Presenting dataviz with impact

# McCandless Offers a Thorough Definition of Good Data Stories



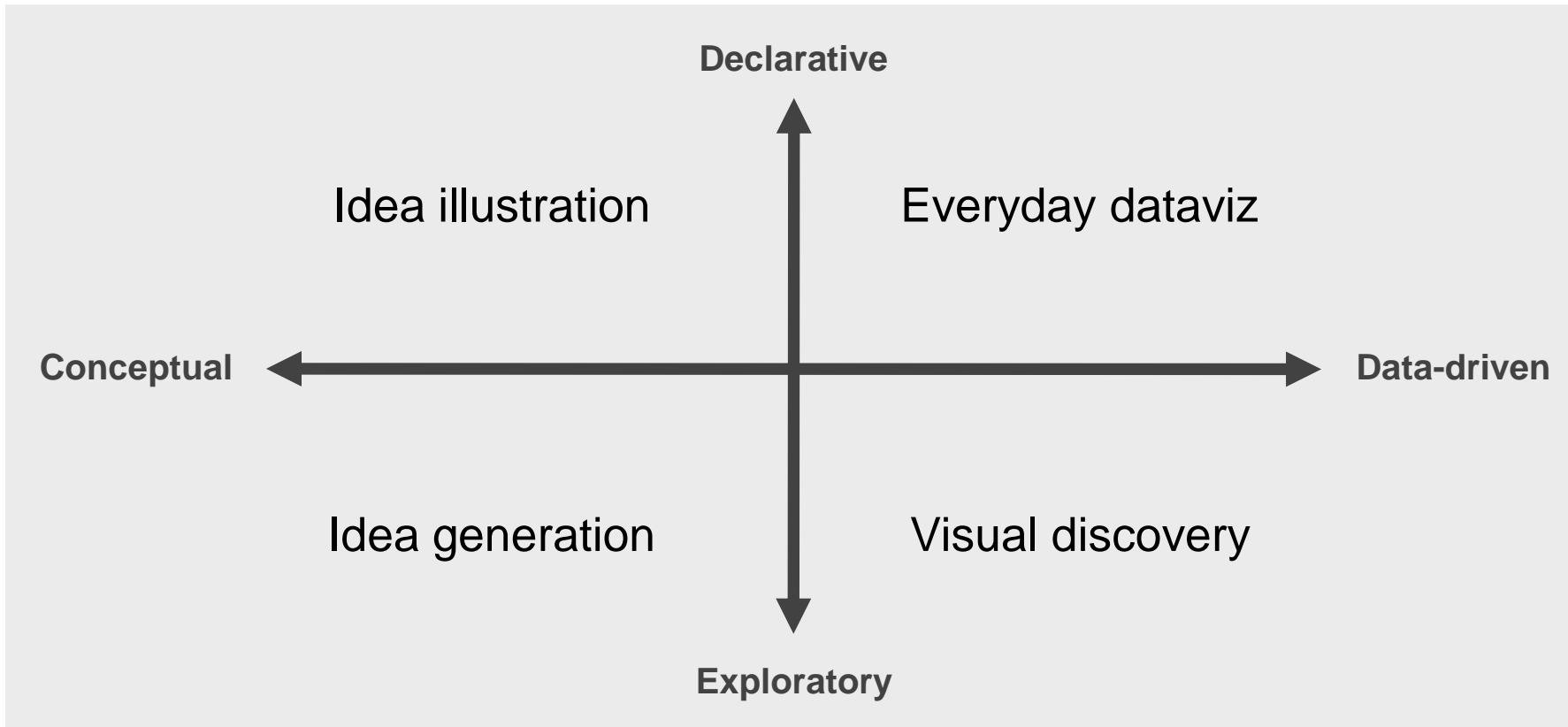
# McCandless Offers a Thorough Definition of Good Data Stories



# Each Quadrant Requires Different Forms of Visualization



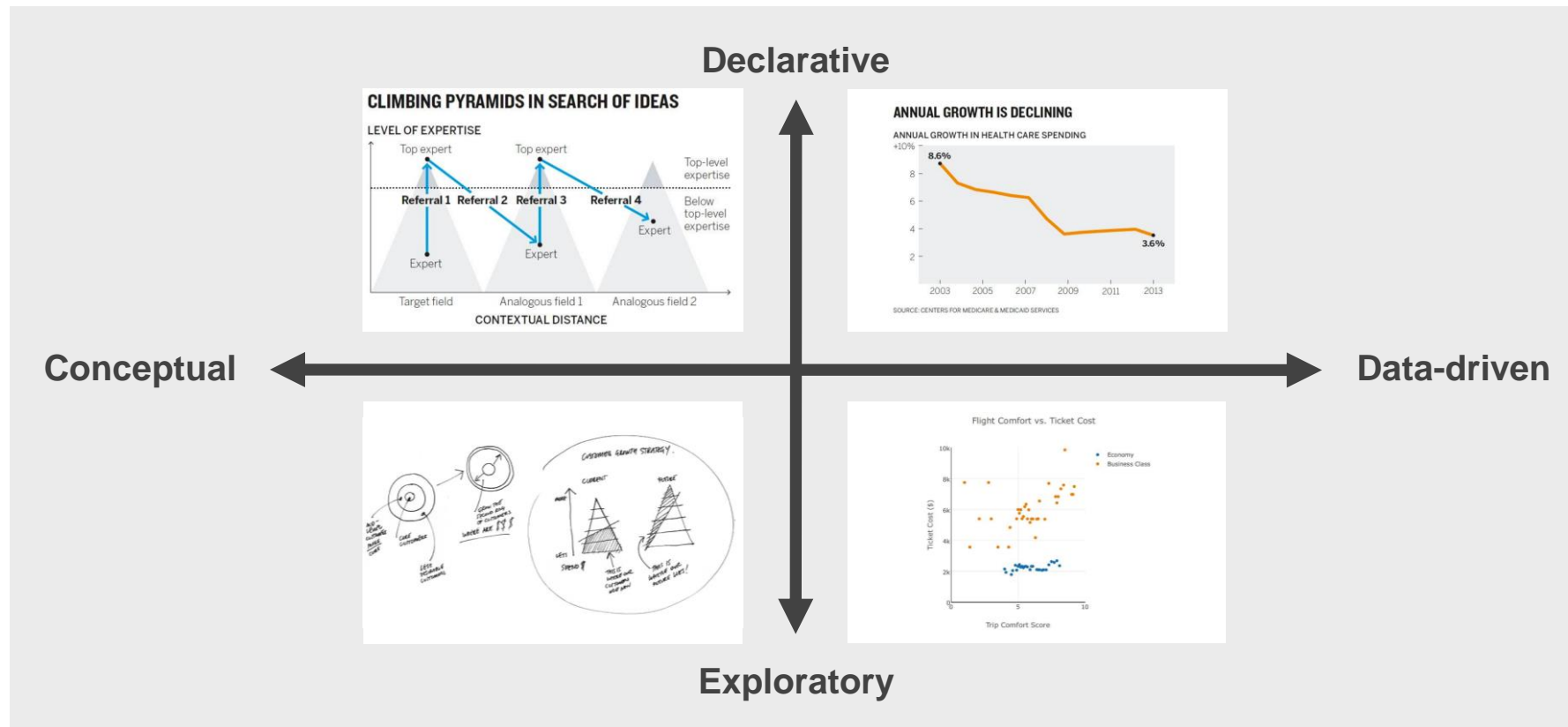
The four types of charts



# Data Storytelling Is Best Done When Charts Are Involved



The four types of charts

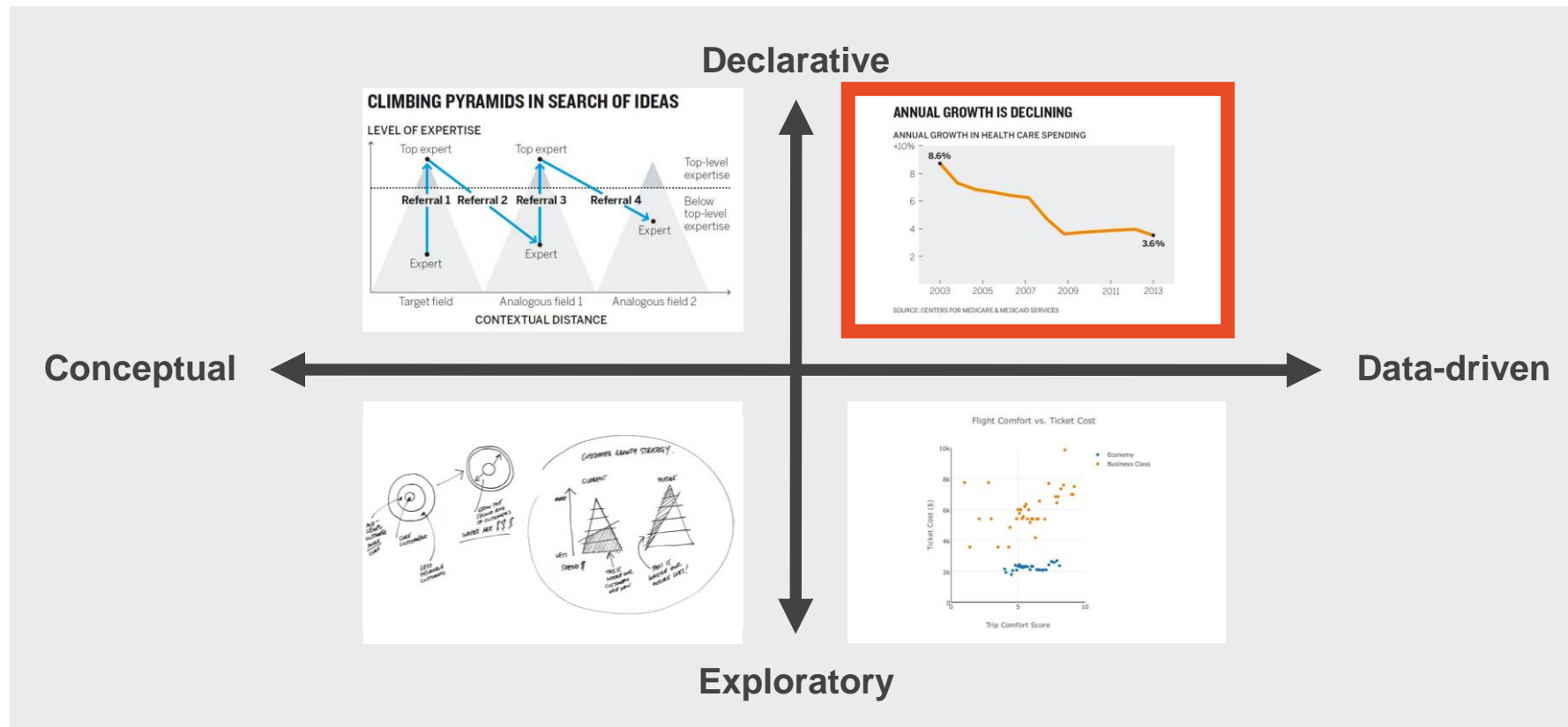


Source: Adapted from Scott Berinato, "Good Charts: The HBR Guide to Making Smarter, More Persuasive Data Visualizations."

# Data Storytelling Is Best Done When Charts Are Involved



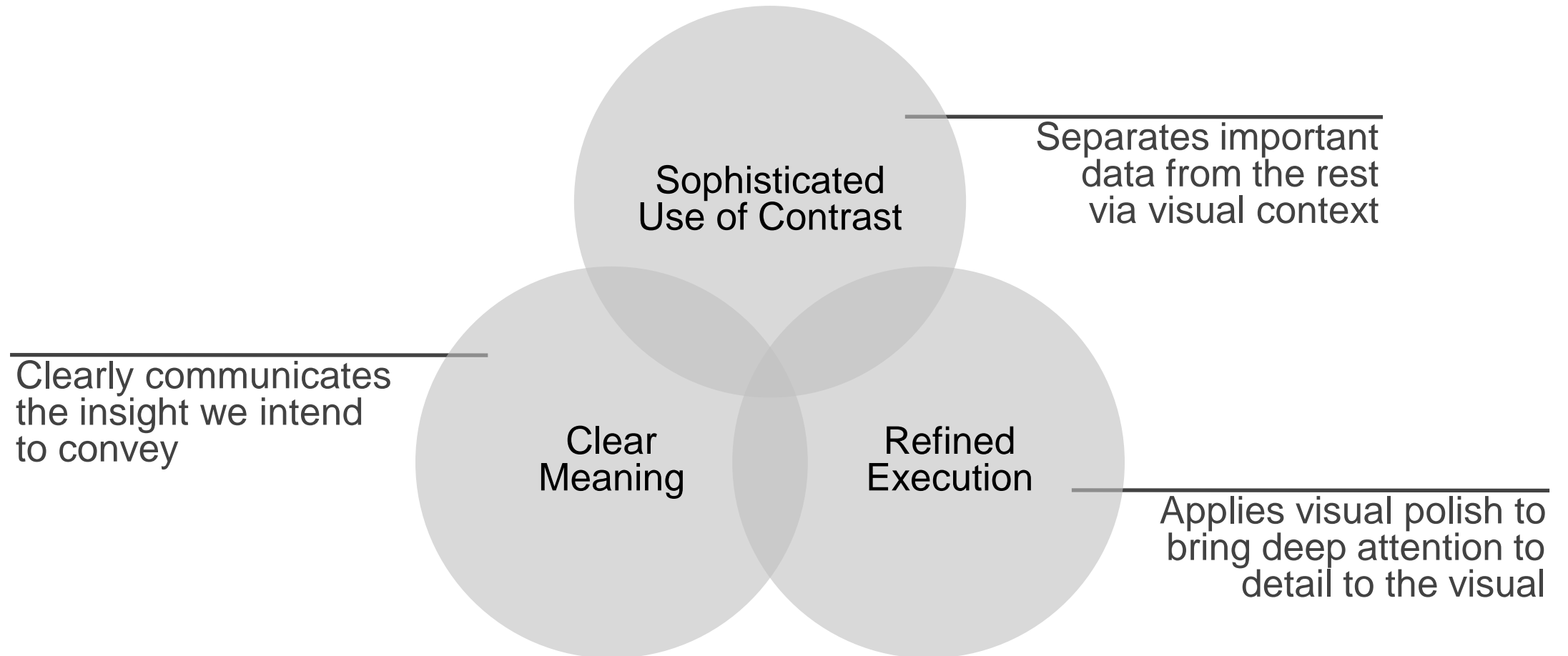
The four types of charts



Source: Adapted from Scott Berinato, "Good Charts: The HBR Guide to Making Smarter, More Persuasive Data Visualizations."



# Good Visual Form Has Three Essential Elements





A background photograph of four students in a classroom setting. Two male students in the background are working on laptops. In the foreground, two female students are sitting on a bench, smiling and looking at a yellow notebook. The image is partially covered by a blue gradient overlay on the right side.

Module 4 Lesson 1

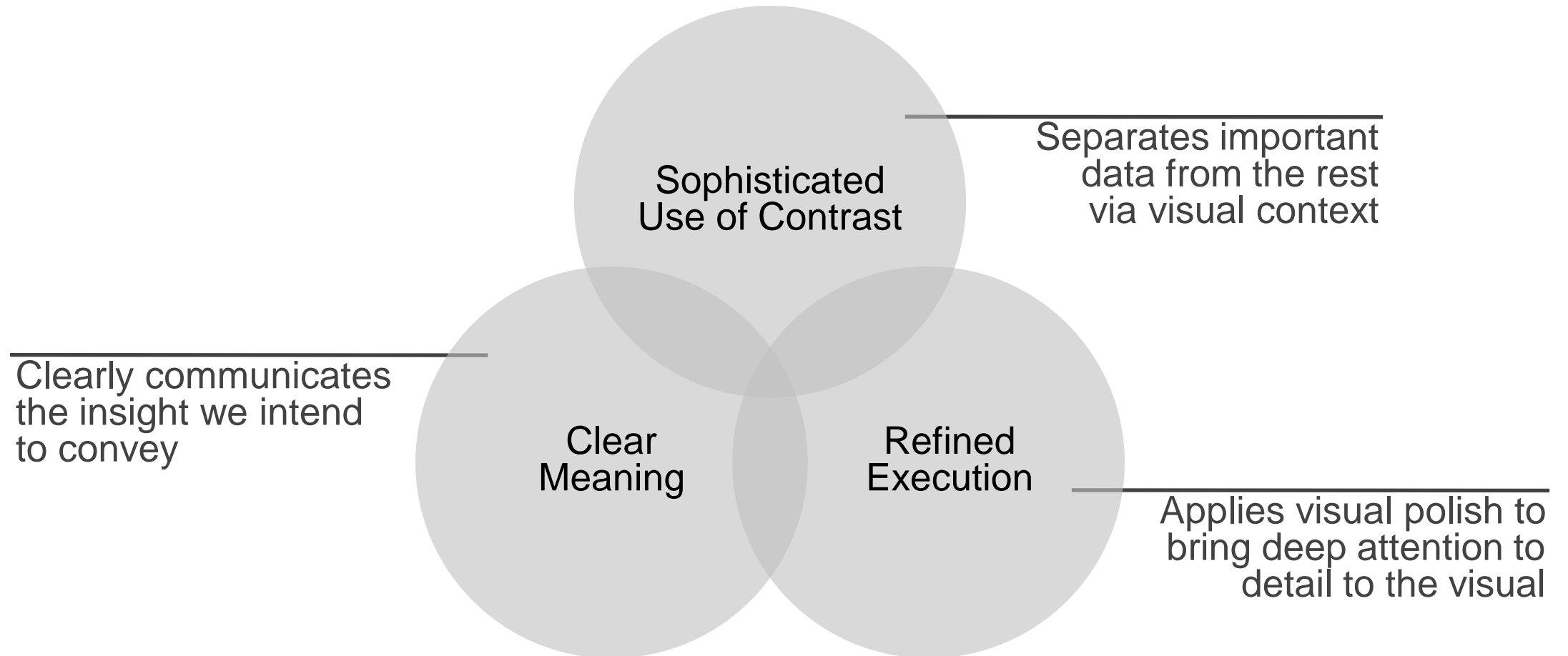
# Creating Inviting Dataviz

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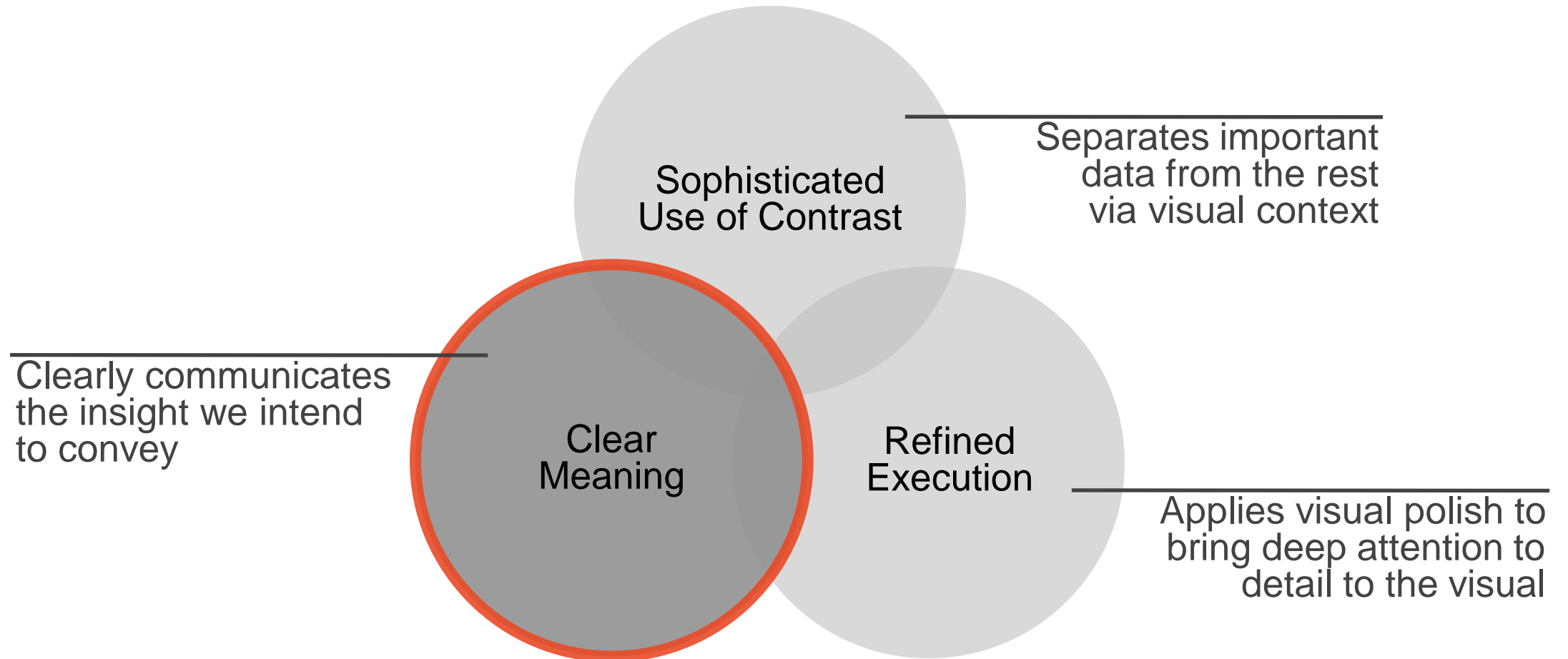


A set of simple rules guide the creation of inviting dataviz, ensuring that a visualization's meaning is easily understood

# Good Visual Form Has Three Essential Elements

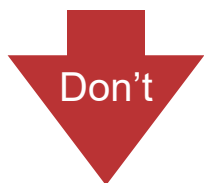


# Good Visual Form Has Three Essential Elements



# Follow These Rules When Creating Headlines for Data Visuals

I



Don't permit typography to oppress the underlying data



Keep the typography simple. The headline can be either bold or a couple of sizes larger

Don't use all caps or knock white type out of black.

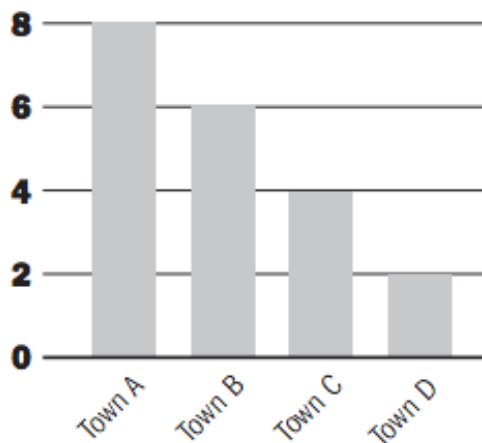
Don't use bold italic.

Don't use bold for the numbers on the scale.

Don't set type at an angle.

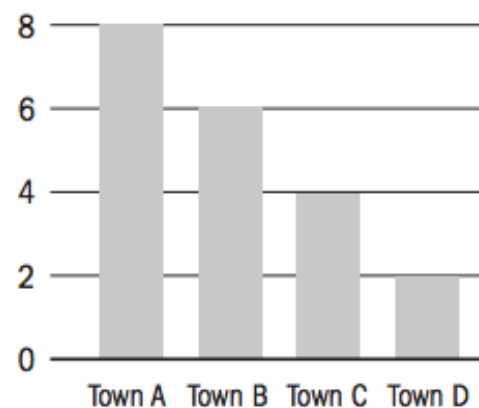
## HEADLINE OF THE CHART

***A brief description that outlines what the data shows***

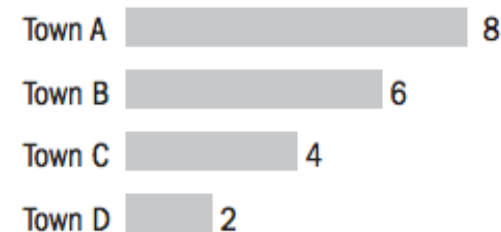


## Headline of the chart

A brief description that outlines what the data shows



Alternatively, chart the data as horizontal bars to accommodate long names.



# Follow These Rules When Creating Headlines for Data Visuals



## Basic Guidelines

- Use clear, concise language in the headline
- Explain plainly and unambiguously what the chart presents
- Place the headline above the dataviz, aligned to the left side of the chart
- Print the headline horizontally, make it bold, and a few font sizes larger than other chart elements

## Pro Tips

- Avoid using acronyms or abbreviations in your headline
- Avoid using clever headlines, regardless of how comfortable you are with the data (you can bring personality to your talk through your presentation style)
- Flip rapidly through the pages of your presentation, reading only the chart headlines. Did you include all the topics you intended to cover? Are they in the proper order?

# Follow These Rules When Creating Subtitles for Data Visuals



## Basic Guidelines

- Include a subtitle on every chart you make
- Write your subtitle in plain language that concisely conveys the insight the audience should take from your chart
- Avoid intellectually blank statements
- Place the subtitle directly below the headline, above the dataviz, and aligned to the left
- Print the subtitle in a “normal” (i.e., not bold) font a few sizes smaller than the headline

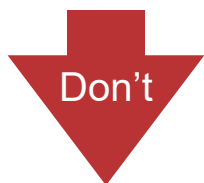
## Pro Tips

- Avoid using acronyms or abbreviations in your subtitle
- Flip rapidly through the pages of your presentation reading only the chart subtitles. Did you include all of your insights? Are they in the proper order?



# Legends and Labels Should Simplify, Not Complicate, Charts

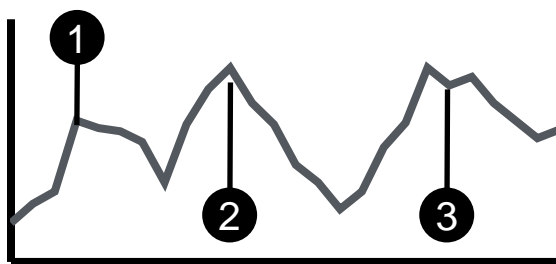
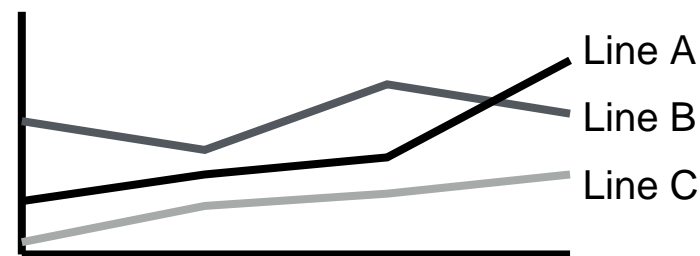
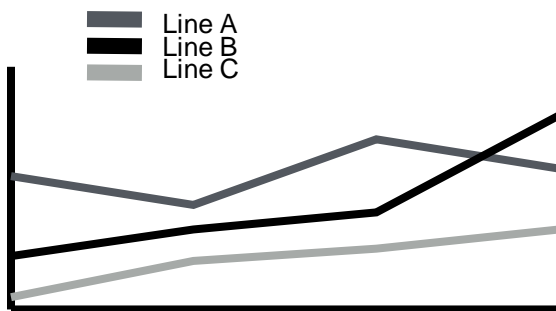
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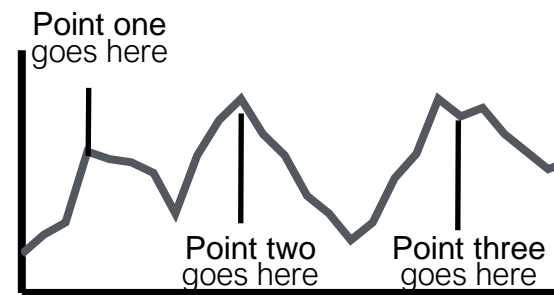
A legend or insight separated from the line requires readers to do extra work



Direct labeling allows the reader to identify data quickly and focus on patterns



- 1 Point one
- 2 Point two
- 3 Point three

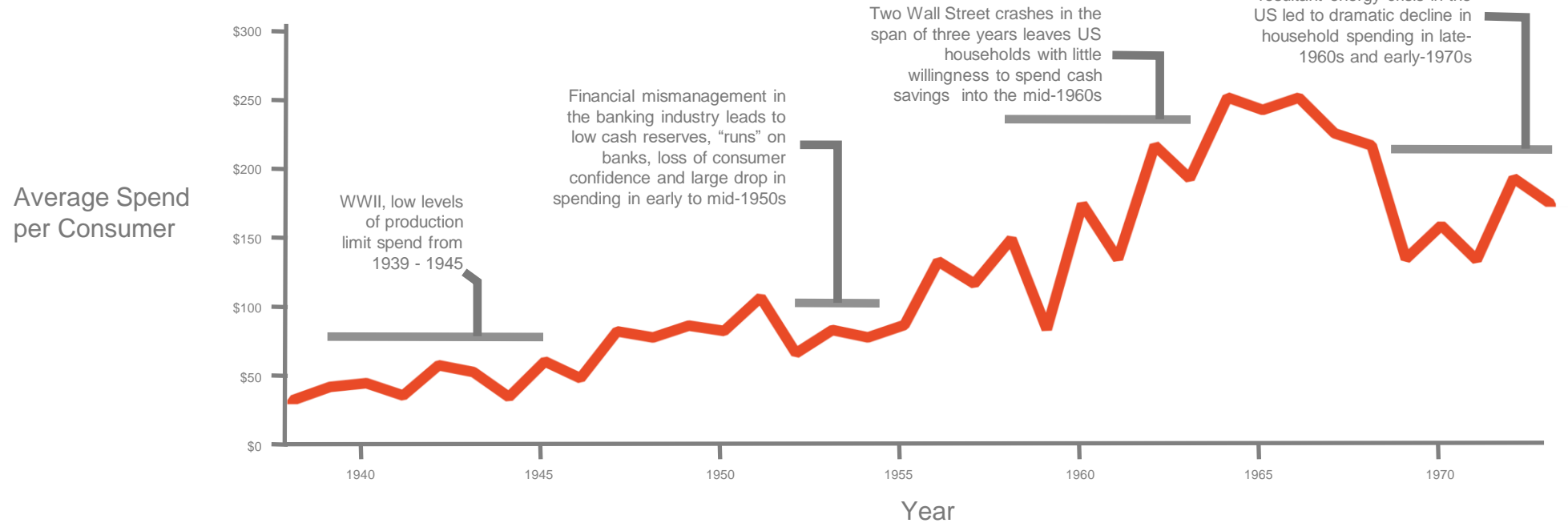


# Annotations are tools that direct attention to important areas of a chart



## Consumer Spending In The United States

Crisis in the economy significantly impacts spending



A background image showing a group of students in a classroom. In the foreground, three female students are sitting on a bench, smiling and looking at a yellow notebook. One student is holding a pen. In the background, two male students are sitting on a bench, looking at a laptop. The scene is brightly lit with large windows in the background.

Module 4 Lesson 2

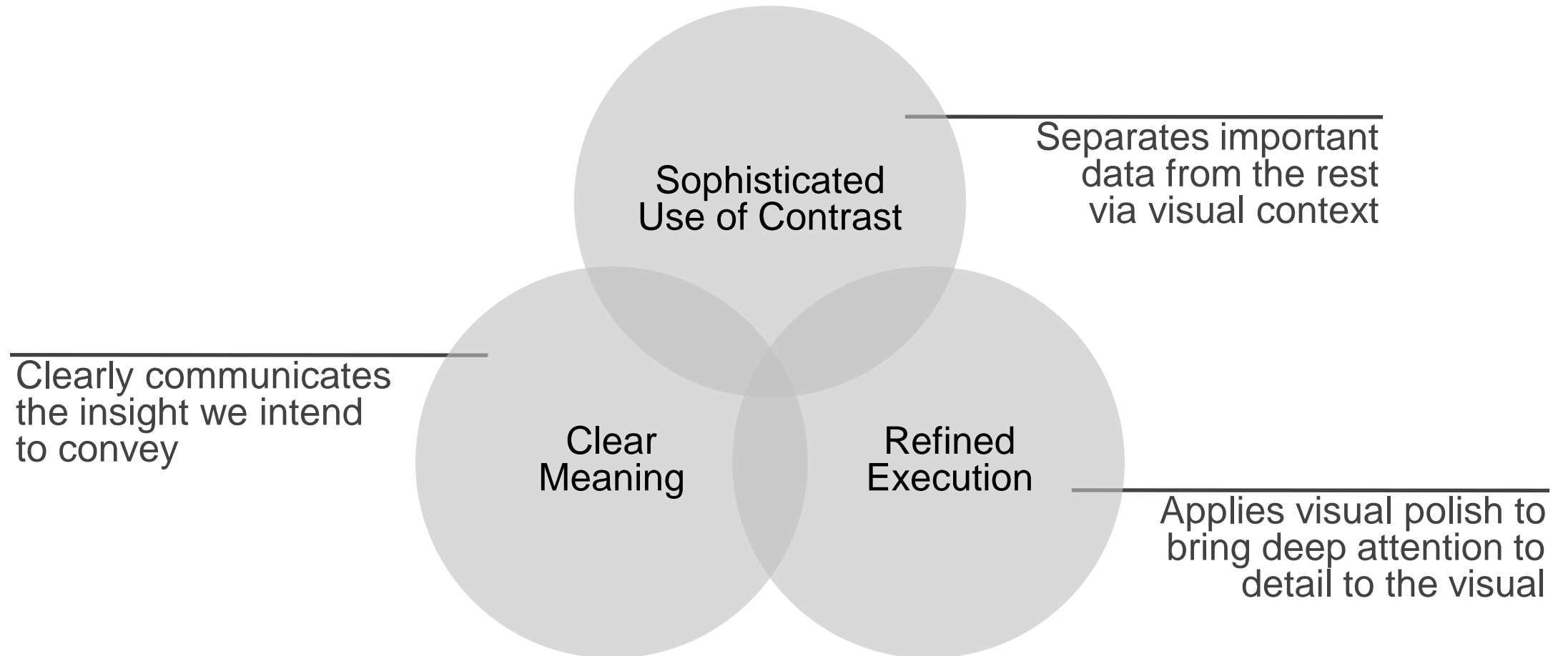
# Bringing Sophistication to Charts

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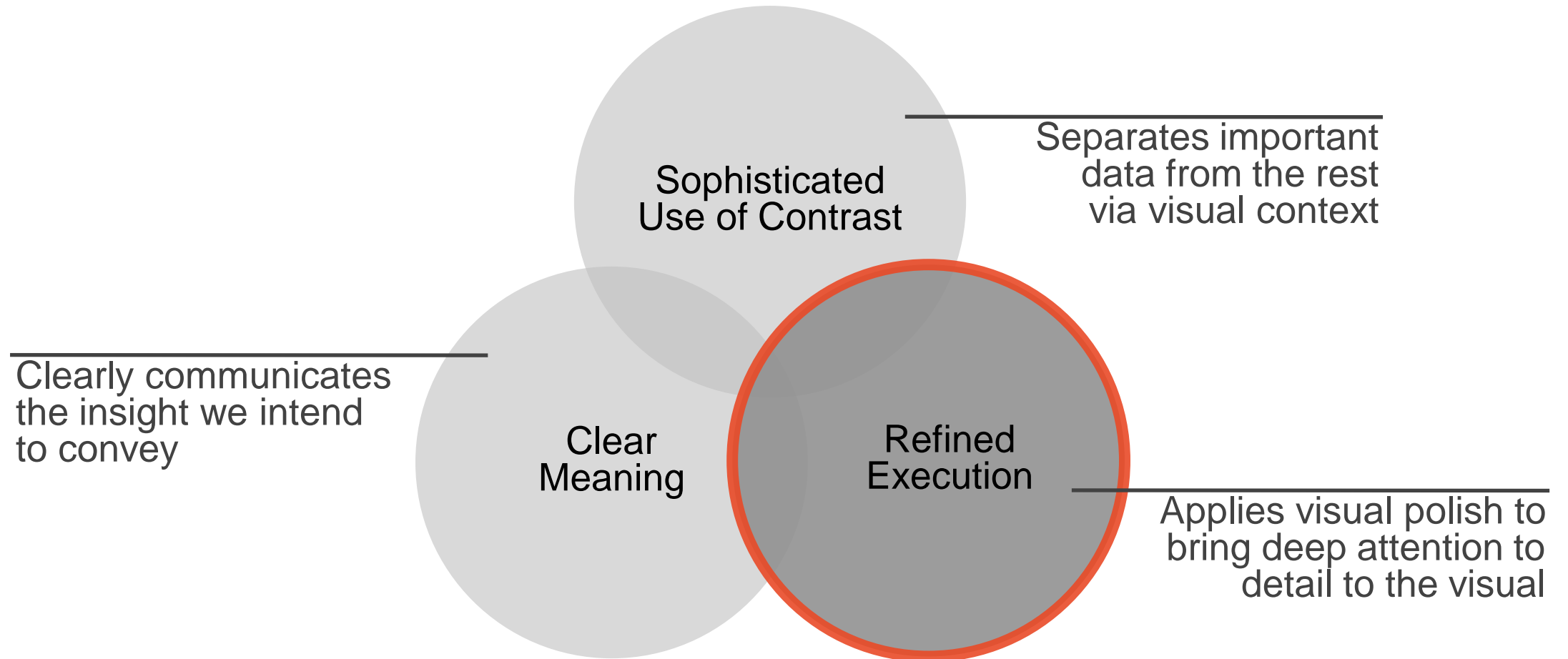


Careful attention to detail will ensure dataviz is effective and efficient in communicating insight

# Good Visual Form Has Three Essential Elements



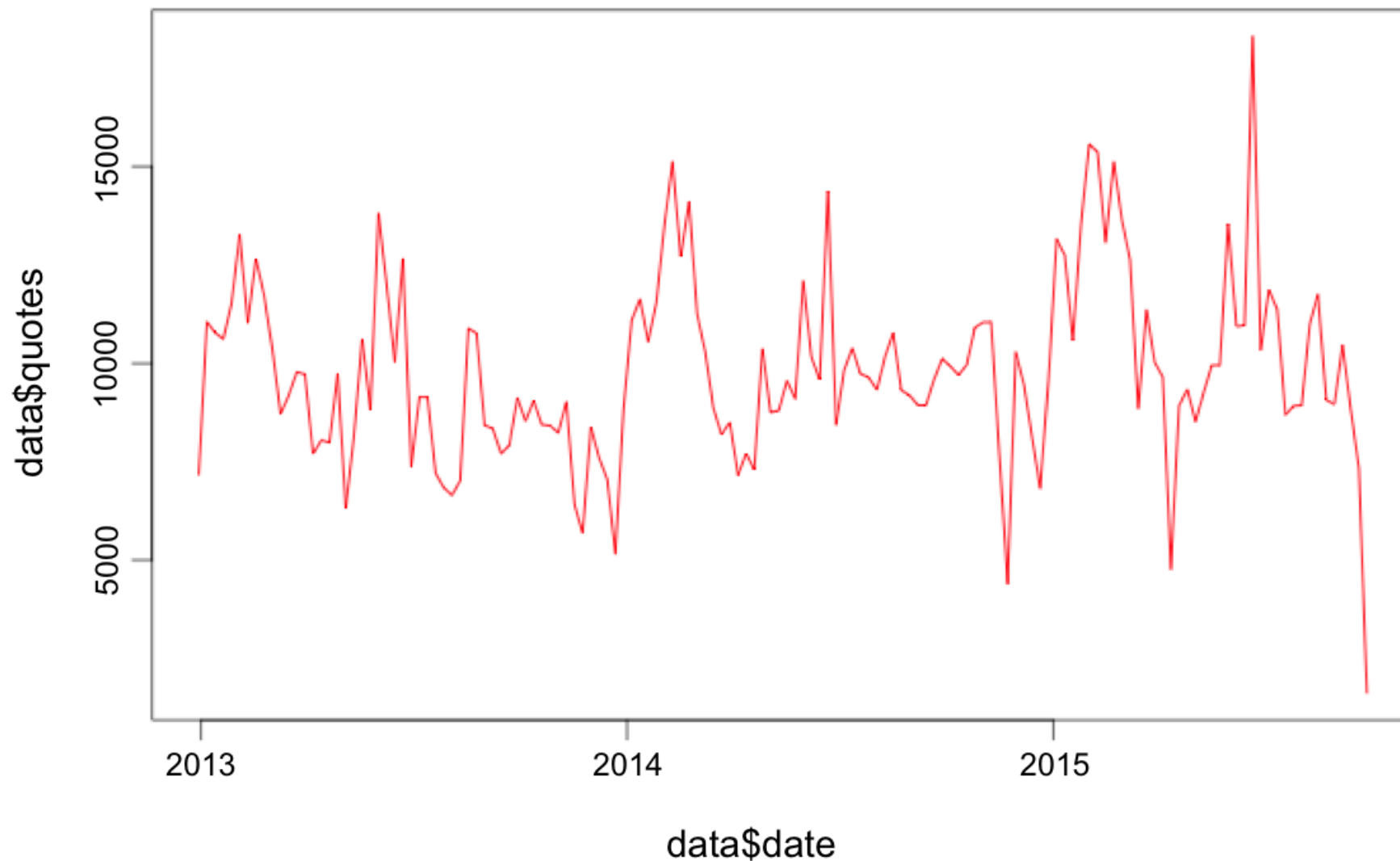
# Good Visual Form Has Three Essential Elements



PR



# Plot — Time Series



# London Cycle Hire Journeys

Thicker, yellower lines mean more journeys



Data: 3.2 Million Journeys (from TfL)  
Routing: Ollie O'Brien (@oobr) + OpenStreetMap cc-by-sa  
Buildings: OS Opendata Crown Copyright 2011  
Map: James Cheshire (@spatialanalysis)

<http://spatialanalysis.co.uk/2012/02/great-maps-ggplot2/>

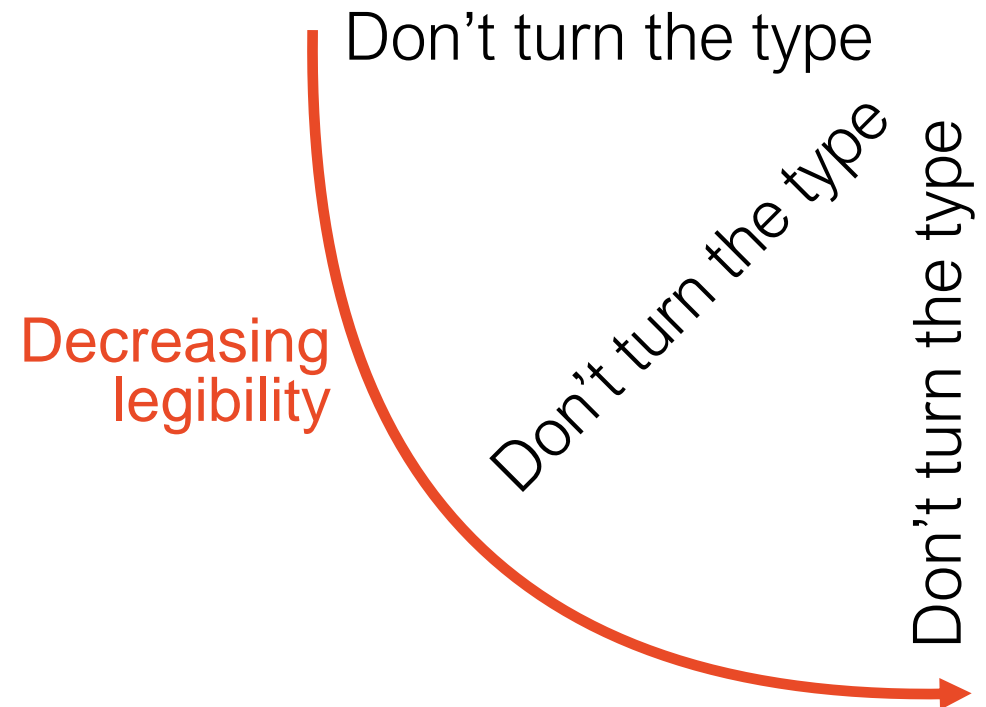
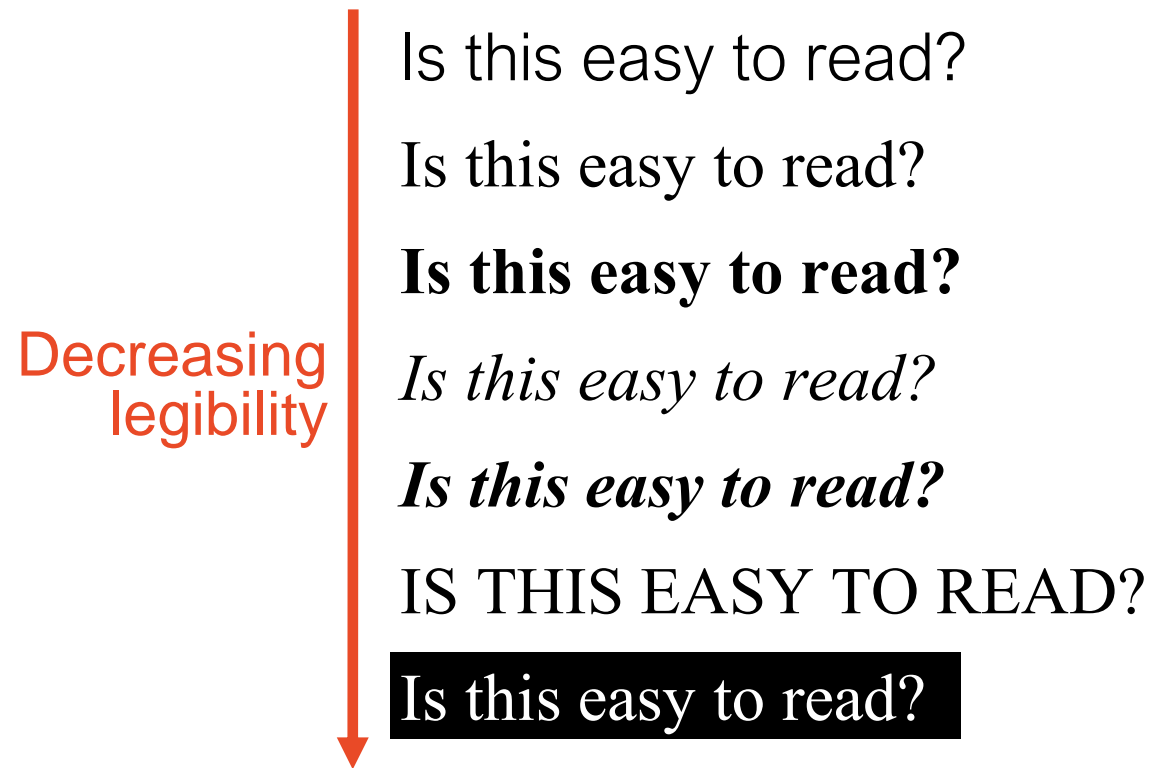


“

We don't all start out writing editorials. We start by learning the alphabet

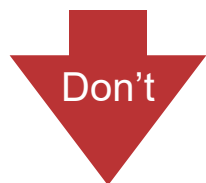
— Dona Wong

# Follow a Few Basic Rules to Ensure Type Legibility in Charts





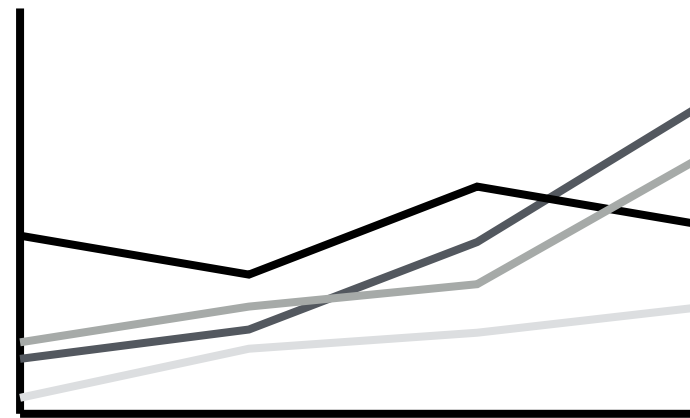
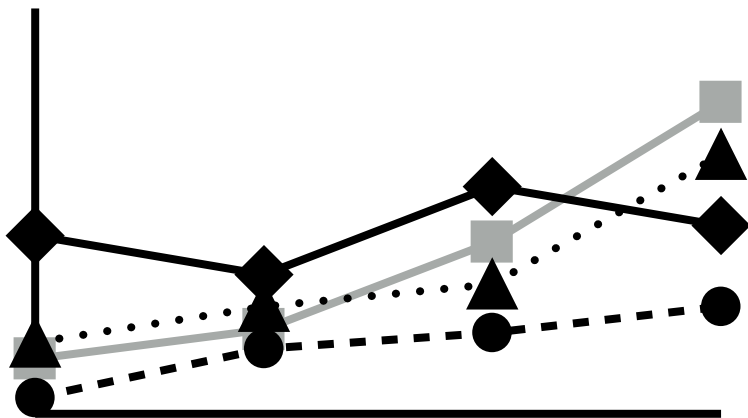
# Line Charts Should Strive for Clean Lines and Clear Signals



It is tempting to try all the line styles and data symbols, but they only obscure the chart's information



Keep the maximum number of lines to three or possibly four and keep the style simple and uncomplicated



# Sophisticated Execution of Dataviz

## Requires Attention to Detail



Careful attention to detail will ensure dataviz is effective and efficient in communicating insight

“Work product” graphics do not need to feature refined execution

Effort — and two or more applications — transforms visual discovery output into presentation-worthy graphics

Removal of clutter from a chart is the most impactful way to improve its readability

A background image showing a group of students in a classroom. In the foreground, three female students are sitting on a bench, smiling and looking at a yellow notebook. One student is holding a pen. In the background, two male students are sitting on a bench, looking at a laptop. The scene is brightly lit with large windows in the background.

Module 4 Lesson 3

# Improving Chart Legibility



# Improving Chart Legibility



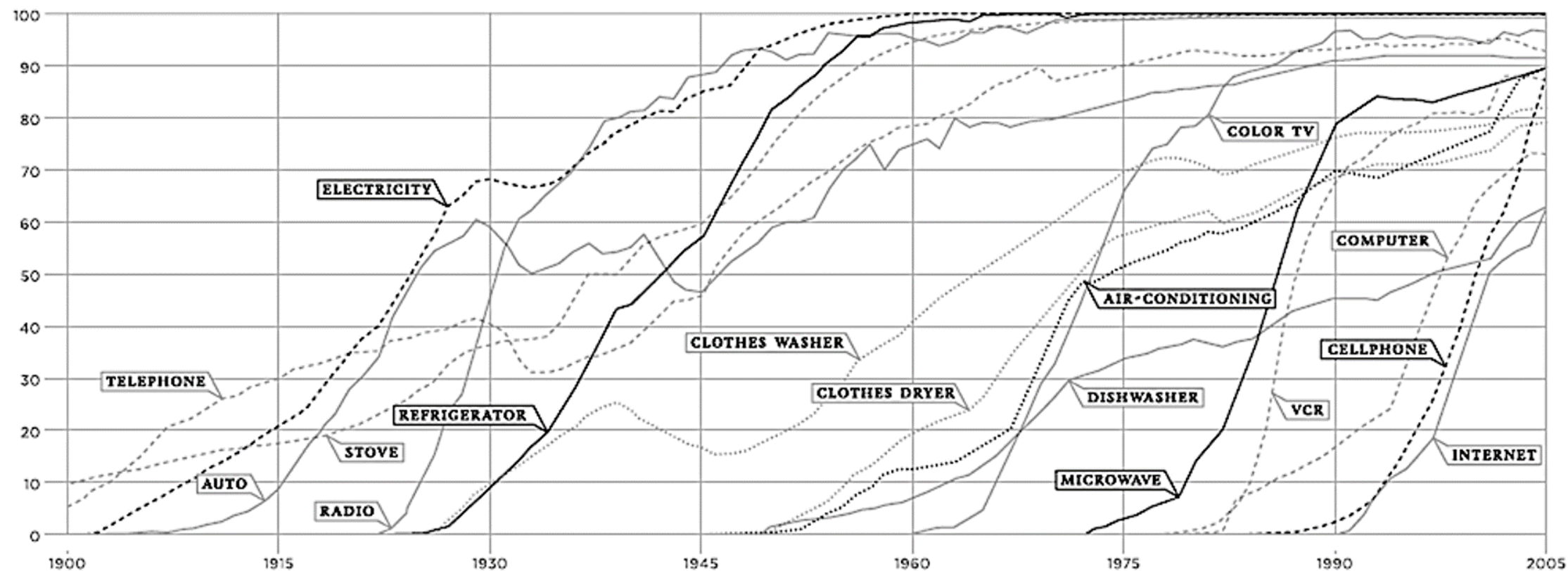
Taking a graphic from near  
meaningless to clear and insightful  
demonstrates the power of Wong's  
guidelines

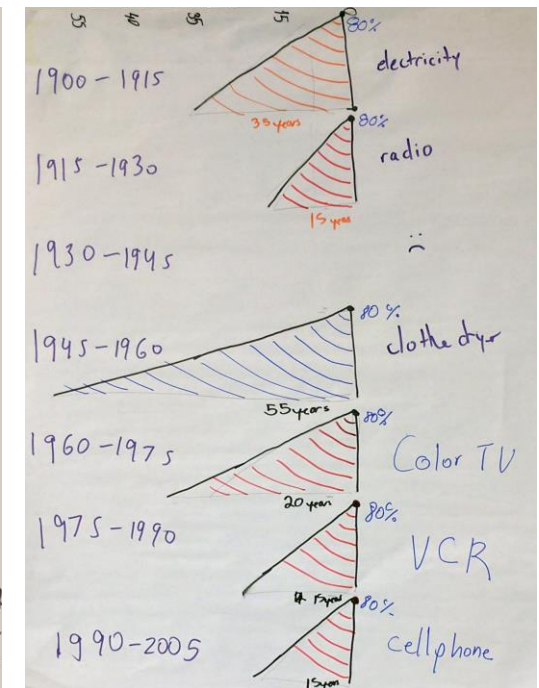
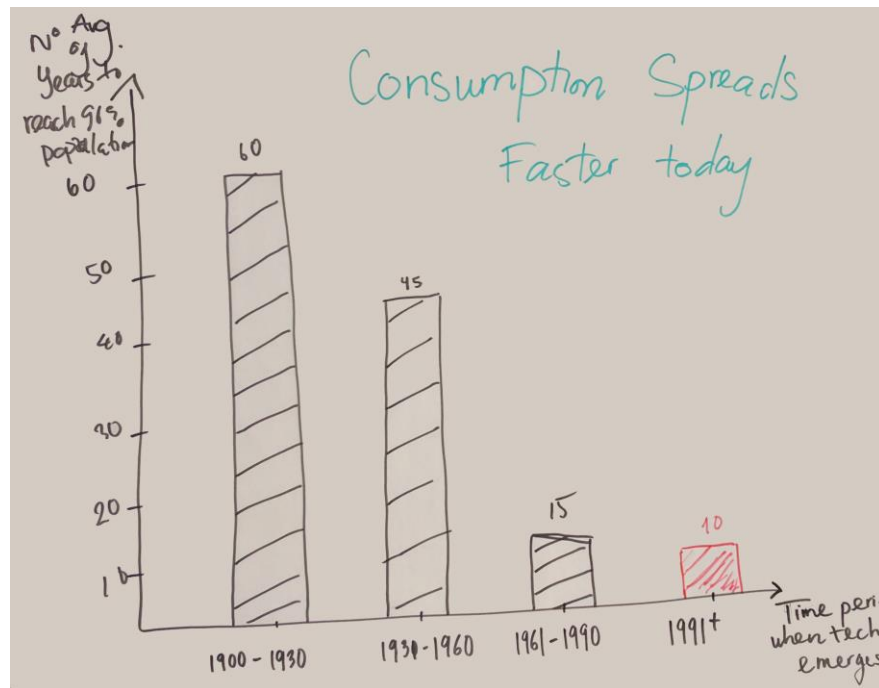
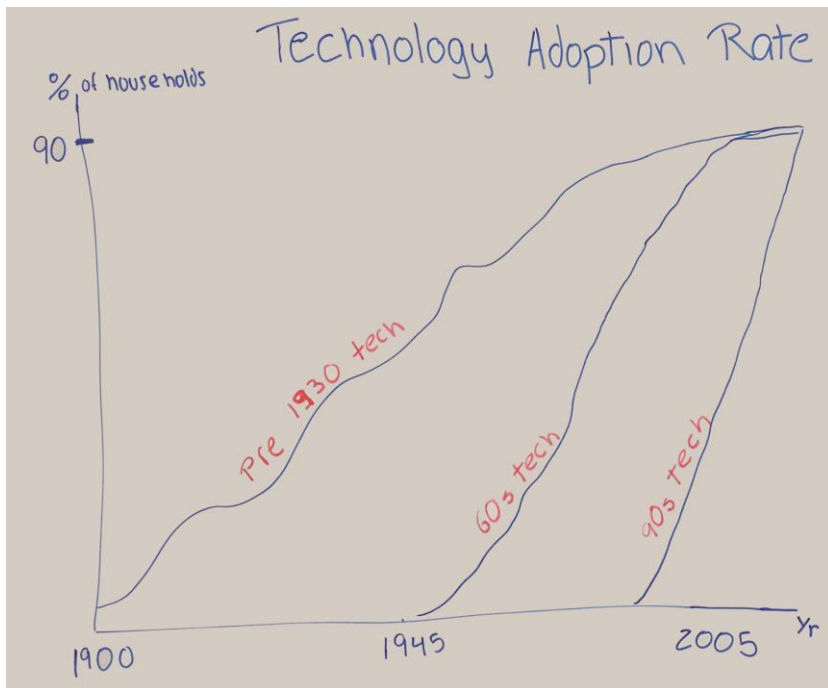
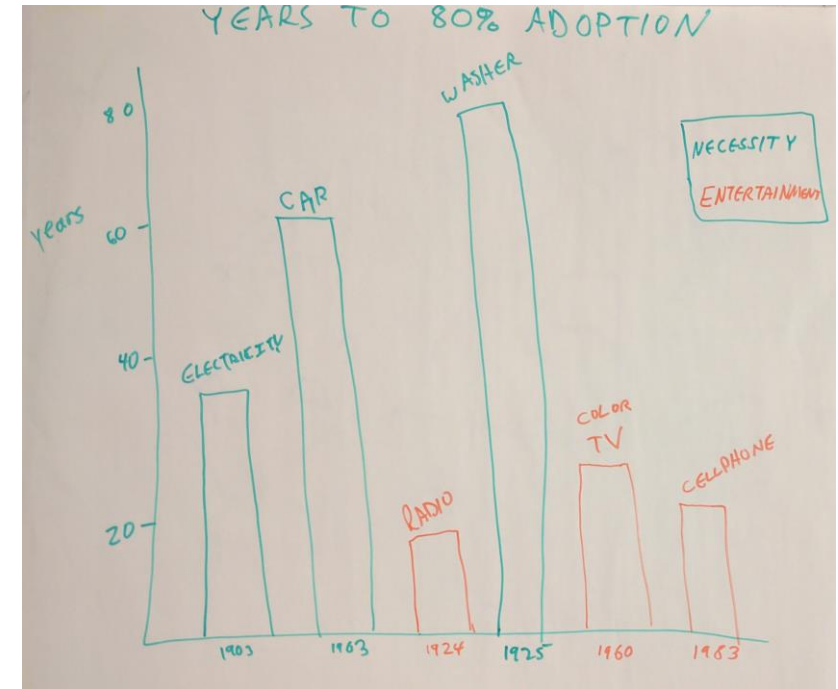
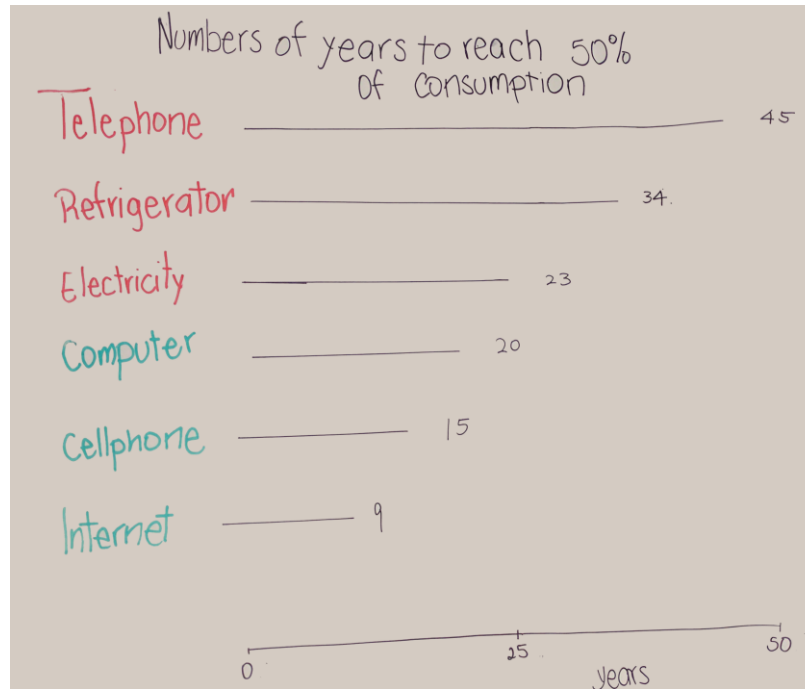
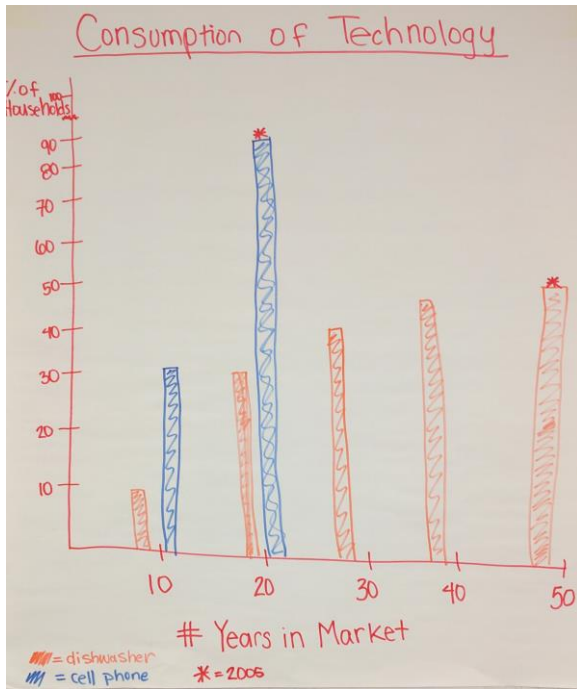


bellabeat

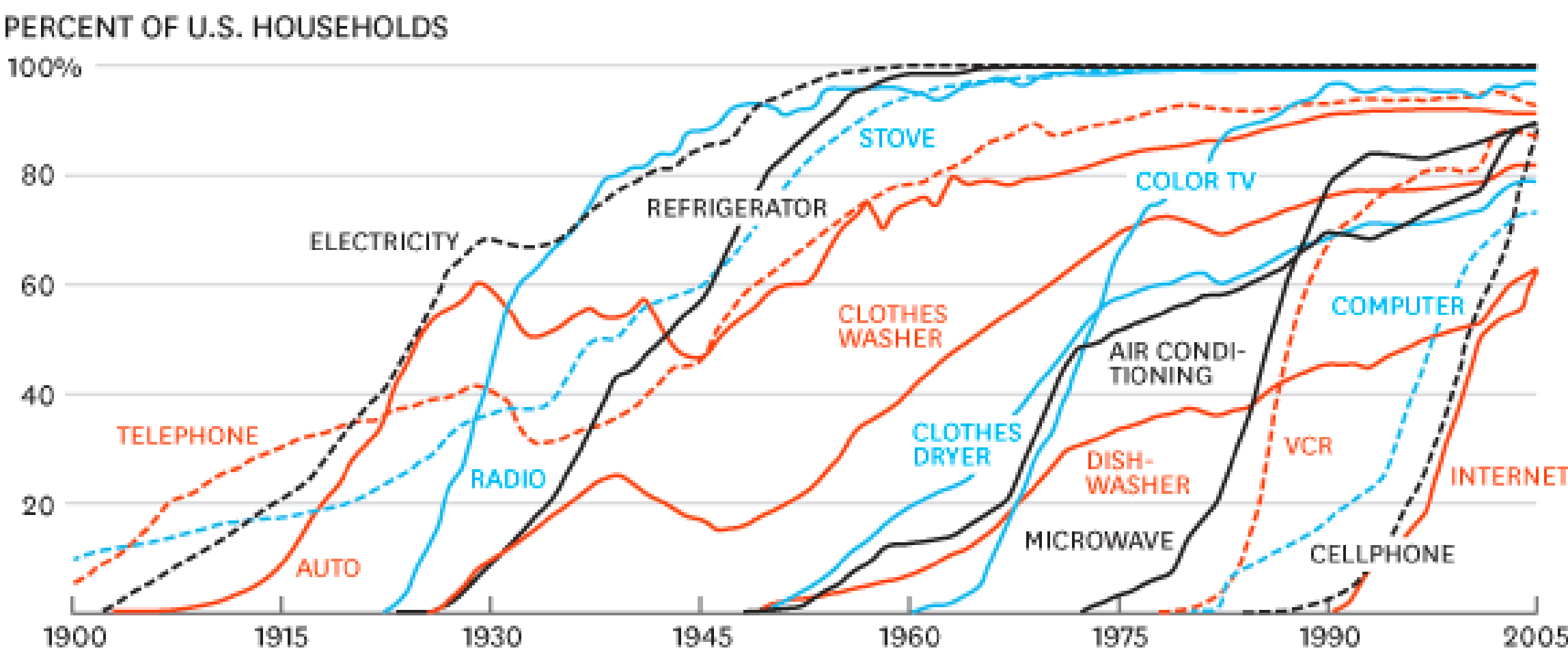




PERCENT OF  
U.S. HOUSEHOLDS



# CONSUMPTION SPREADS FASTER TODAY

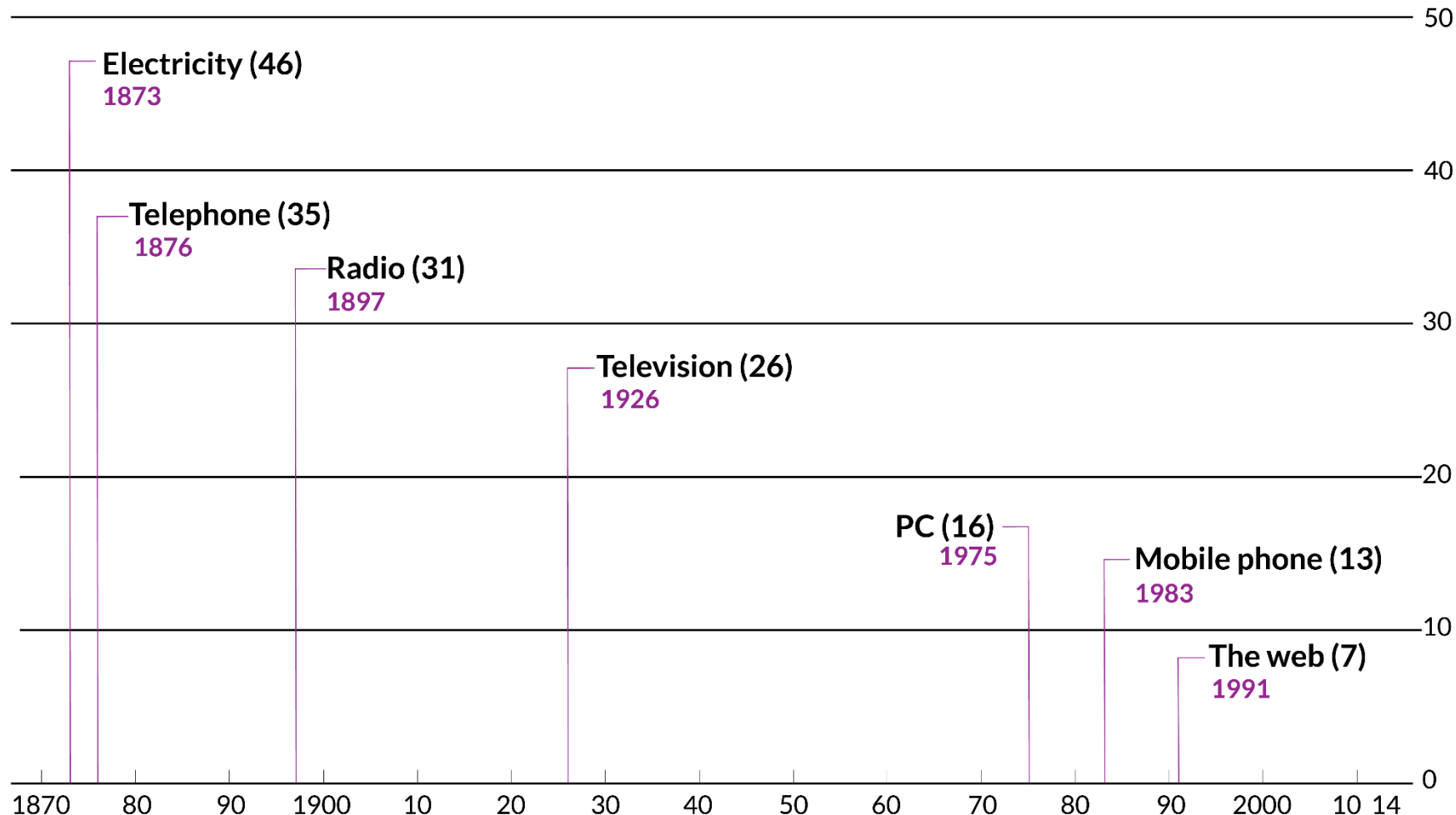


Source: *New York Times*, Nicholas Felton



# Technology Adoption

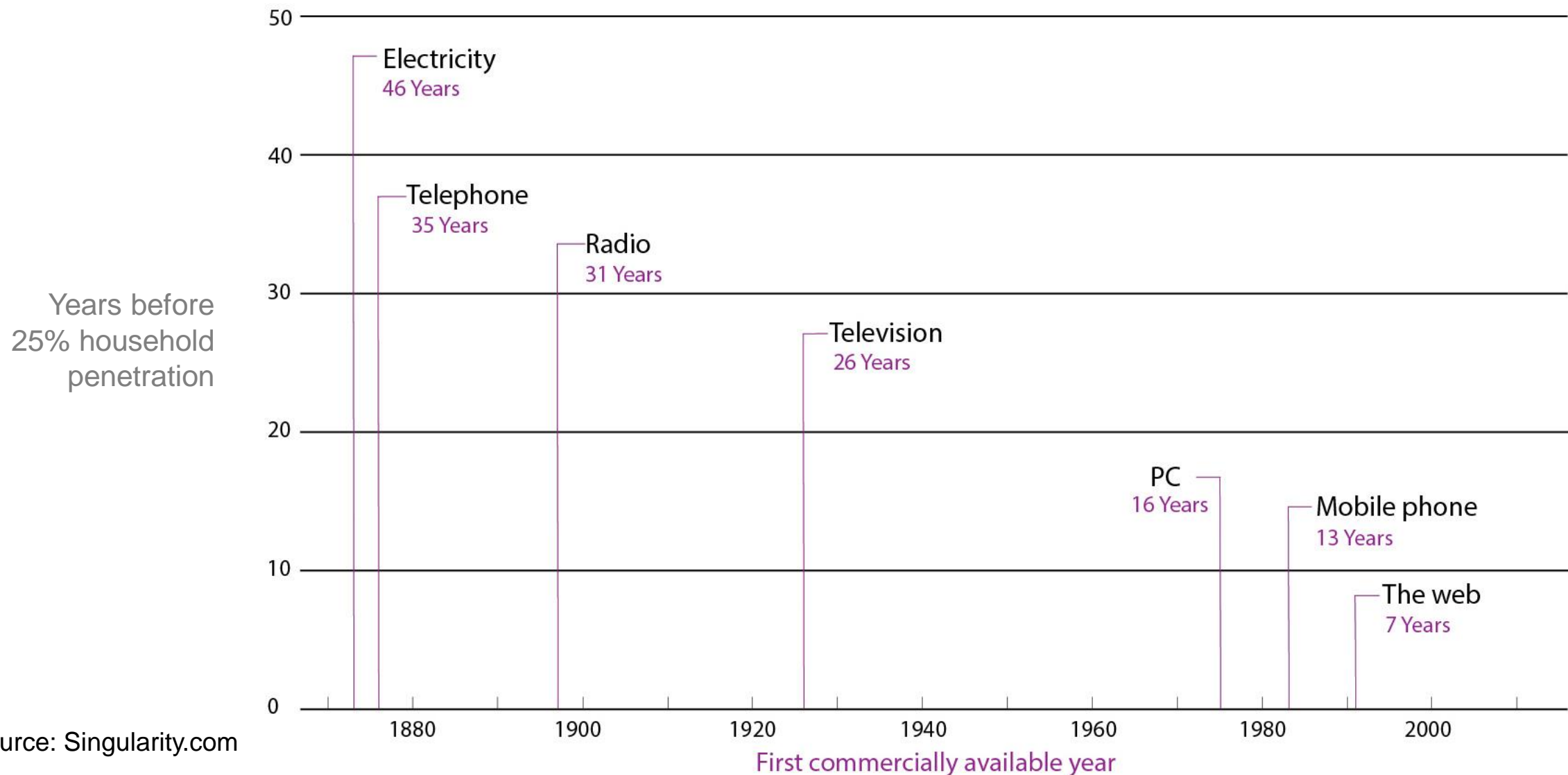
Years until used by one-quarter of American Population



First commercially available year

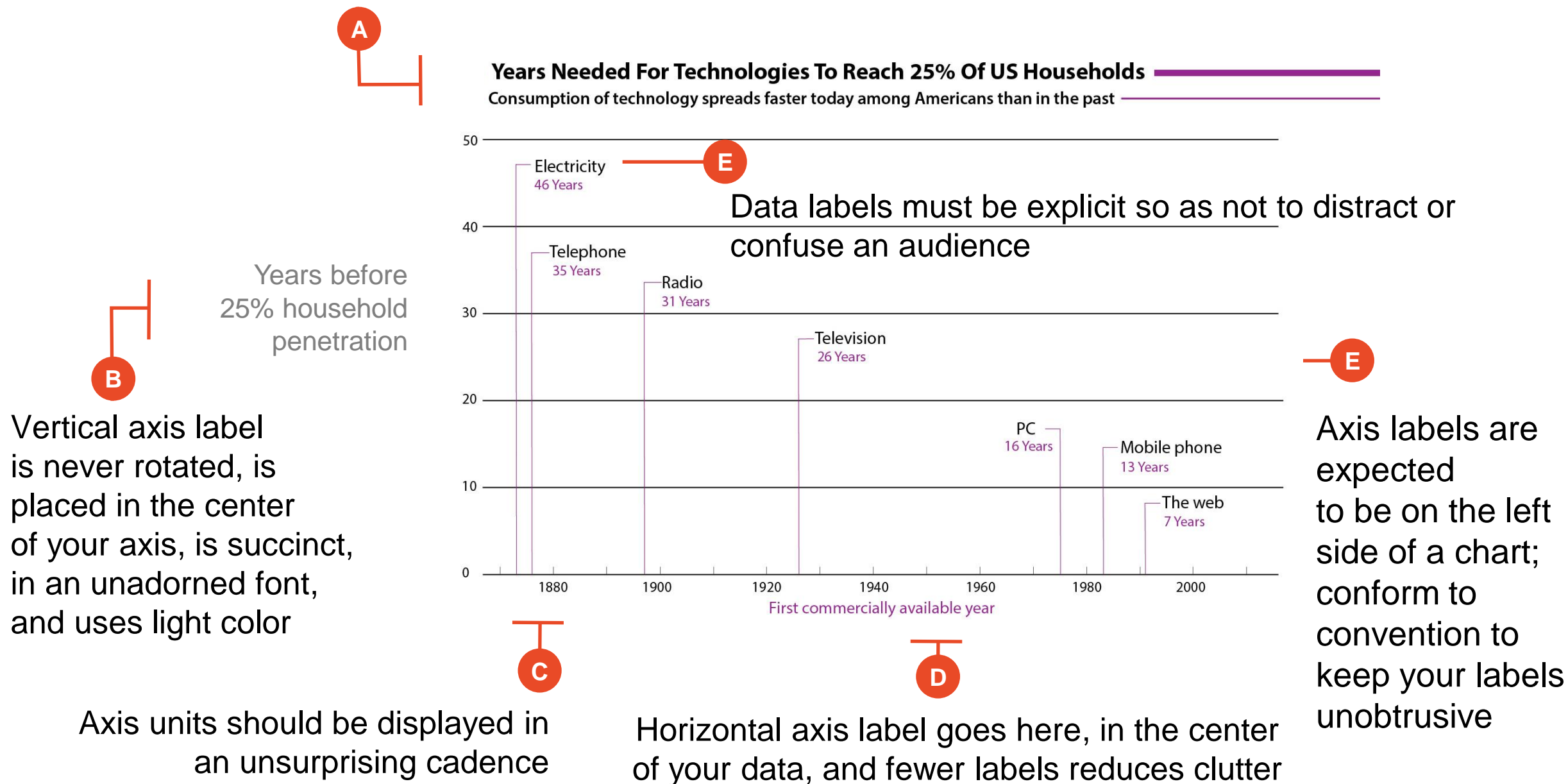
## Years Needed For Technologies To Reach 25% Of US Households

Consumption of technology spreads faster today among Americans than in the past





A bold, succinct chart title in title caps, bolded, and in a large font (but not too large) that plainly names the chart, with a subtitle written as a brief sentence that presents the key takeaway from the chart



# Use Tests to Improve Your Design



**The Spartan test:** Would eliminating this change anything? If the answer is no, get rid of it. Earn your reader's trust by giving them only what they need

**The peek test:** Where is your eye drawn? Look away from your visual for 5 seconds, then back to it. This is most likely the place your audience's eye will be drawn as well

**The colleague test:** Think your visual is perfect? Have a colleague take a look. Give them minimal context and 10–15 seconds to process and ask what they would take away

A background image showing a group of students in a classroom or hallway. In the foreground, three female students are sitting on a bench, looking at a yellow notebook and smiling. In the background, two male students are sitting on a bench, looking at a laptop. The scene is brightly lit with large windows in the background.

Module 4 Lesson 4

# Presenting Dataviz with Impact

# Presenting Dataviz with Impact



The style with which your visualizations are presented is just as, if not more, important as the content itself

# Remember the McCandless Method When Presenting Dataviz

- Step 1 Introduce the graphic by its name (and its story)
- Step 2 Explain the graphic by answering your audience's questions
- Step 3 State the insight your graphic produces
- Step 4 Offer up examples that support the insight
- Step 5 Tell them why the insight matters to them

# Information Is Beautiful



(Creemers, 2010)





(Creemers, 2010)



# McCandless Offers a Great Example of How to Present Data



This is the 'Billion-\$Dollar-O-Gram' and this image arose out of frustration I had with the reporting of billion dollar amounts in the press. That is, they're meaningless without context. '\$500 billion for this pipeline, \$20 billion for this war' it doesn't make any sense. So the only way to understand is visually and relatively.

So I scraped a load of reported figures from various news outlets and then scaled the boxes according to those amounts. And the colors here represent the motivation behind the money: purple is fighting and red is giving money away and green is profiteering.

And what you can see straight away is you start to have a different relationship to the numbers. You can literally see them. But more importantly you start see patterns and connections between numbers that would otherwise be scattered across multiple news reports.

Let me point out some I really like:

OPEC's revenues green box here, \$780 billion a year. And this little pixel in the corner of \$3 billion? That's their climate change fund.

Americans are incredibly generous people. Over \$300 billion-a-year donated to charity every year. Compared with the amount of foreign aid given by the top 17 industrialized nations at \$120 billion.

And then of course the Iraq war predicted to cost just \$60 billion back in 2003 and then mushroomed slightly after Afghanistan and Iraq now to \$3,000 billion.

So now it's great because now we have this texture and we can add numbers to as well. So we say, 'well, a new figure comes out and, let's see, African debt...how much of this diagram might be taken up by the debt Africa owes to the West?' Let's take a look. So there it is: \$227 billion is what Africa owes.

And the recent financial crisis, how much of this diagram might that figure take up? What did that cost the world? Let's take a look at that. Dooosh! I think is the appropriate sound effect from that much money: \$11,900 billion.

So by visualizing this information we've turned it into a landscape that you can explore with your eyes. Kind of map, really. An 'Information Map'. And when you're lost in information, an Information Map is kind of useful.

# McCandless Offers a Great Example of How to Present Data



1 Introduce the graphic by its name (and its story): Begin the presentation of your graphic by establishing the visual as the star of the show

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# McCandless Offers a Great Example of How to Present Data



2 Explain the graphic by answering your audience's questions: Acclimate your visual beginning at the highest level and working down to the lowest required detail, answering your audience's questions in simple, plain English before the questions are asked — and remember that less is more!

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# McCandless Offers a Great Example of How to Present Data



**3** State the insight your graphic produces: Give your audience the insight they will see before you dive into the supporting details of your data story

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# McCandless Offers a Great Example of How to Present Data



4 Offer up examples that support the insight: Give as many interesting examples from your data as you can to substantiate your insight and wow your audience by saving the best for last

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# McCandless Offers a Great Example of How to Present Data



**5** Tell them why the insight matters to them: Restate your insight and leave the visual by telling the audience precisely what your insight means to them.

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Let me point out some I really like:

OPEC's revenues green box here, \$780 billion a year. And this little pixel in the corner of \$3 billion? That's their climate change fund.

Americans are incredibly generous people. Over \$300 billion-a-year donated to charity every year. Compared with the amount of foreign aid given by the top 17 industrialized nations at \$120 billion.

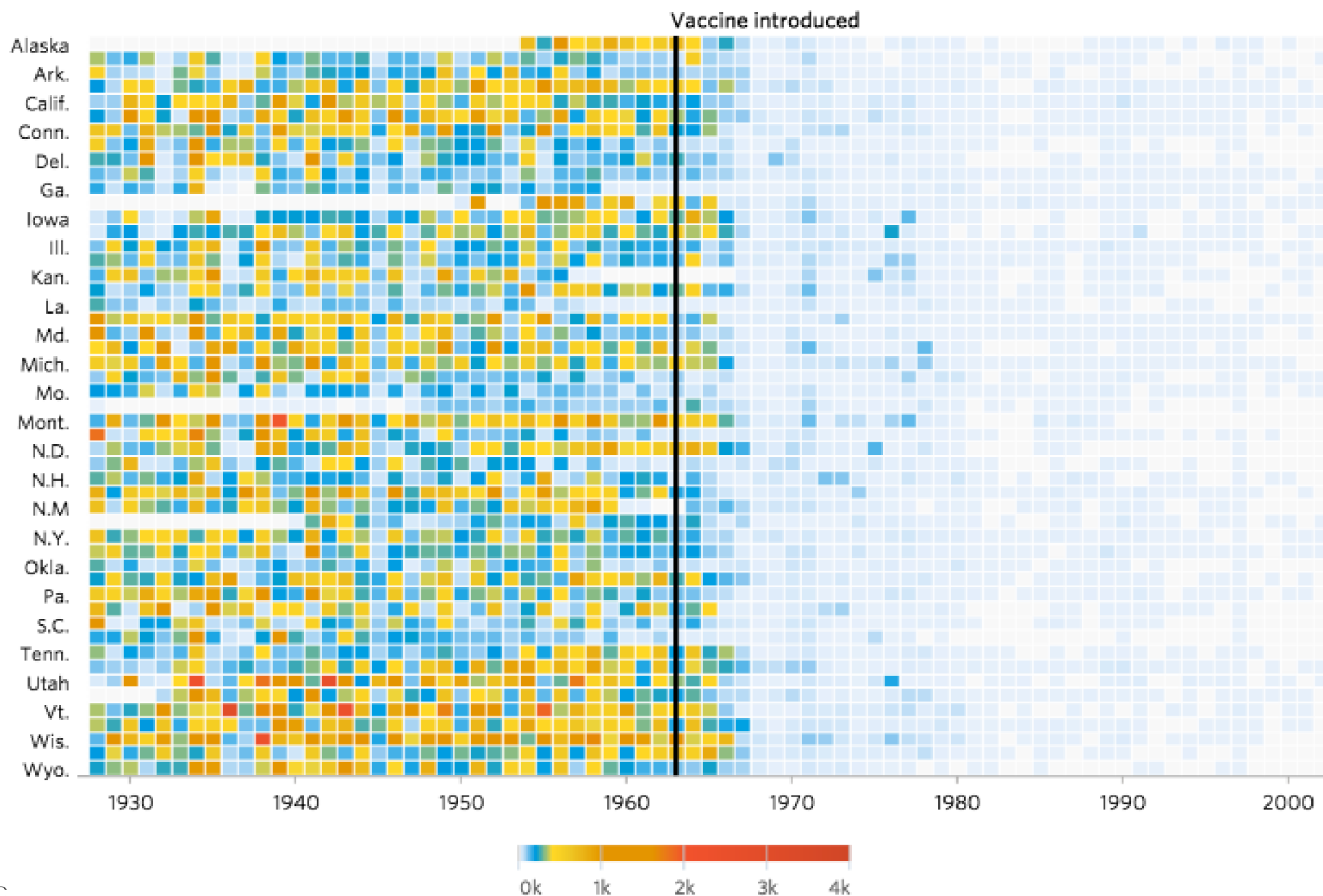
And then of course the Iraq war predicted to cost just \$60 billion back in 2003 and then mushroomed slightly after Afghanistan and Iraq now to \$3,000 billion.

So now it's great because now we have this texture and we can add numbers to as well. So we say, 'well, a new figure comes out and, let's see, African debt...how much of this diagram might be taken up by the debt Africa owes to the West?' Let's take a look. So there it is: \$227 billion is what Africa owes.

And the recent financial crisis, how much of this diagram might that figure take up? What did that cost the world? Let's take a look at that. Dooosh! I think is the appropriate sound effect from that much money: \$11,900 billion.

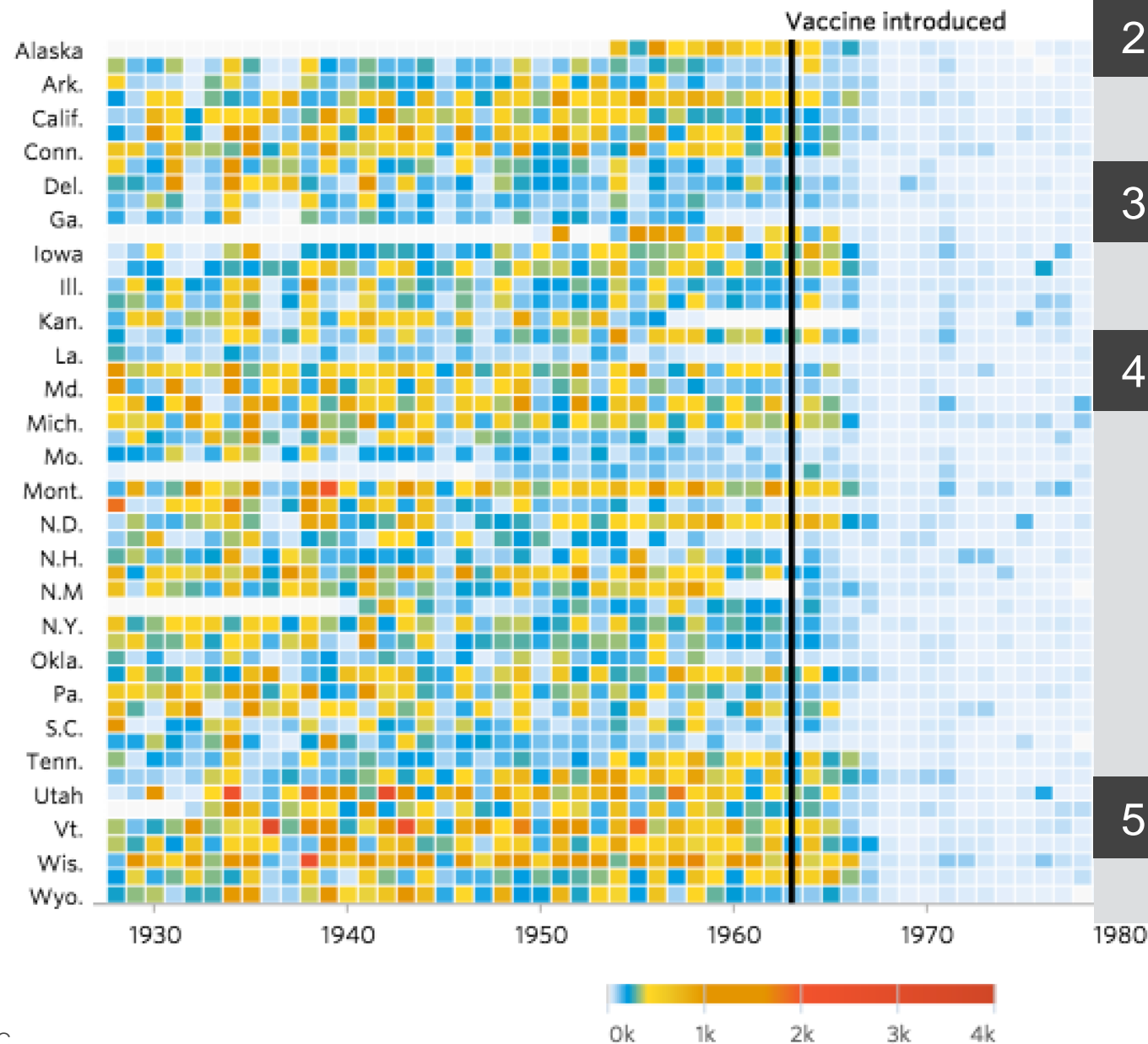
So by visualizing this information we've turned it into a landscape that you can explore with your eyes. Kind of map, really. An 'Information Map'. And when you're lost in information, an Information Map is kind of useful.

# Measles





# Measles



1

This is the number of cases of measles in the United States from 1928 to 2002

2

Every state is represented. Each box is equal to one year's worth of cases in a state. The color of the box indicates the number of measles cases, where the dark red boxes mean more cases and the lighter blue ones mean fewer cases

3

What this graphic reveals is that the introduction of the measles vaccine in 1963 had a dramatic impact on the occurrence of the disease in the United States, clearly demonstrating why vaccines are so vital to our nation's health

4

Nearly everyone in the United States got measles before there was a vaccine, and hundreds died from it each year. Today, most doctors have never seen a case of measles

An epidemic of German measles (rubella) in 1964–1965 infected 12½ million Americans, killed 2,000 babies, and caused 11,000 miscarriages. In 2012, 9 cases of rubella were reported to CDC

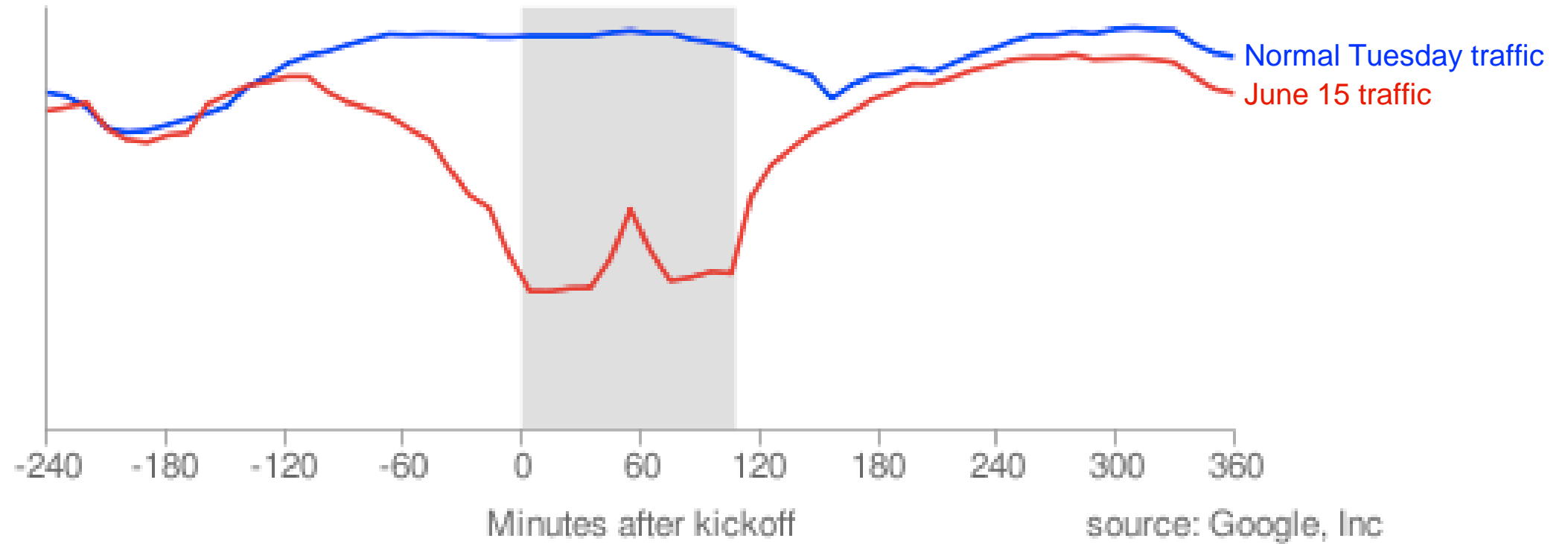
More than 350,000 cases of measles were reported from around the world in 2011, with outbreaks in the Pacific, Asia, Africa, and Europe. In that same year, 90% of measles cases in the United States were associated with cases imported from another country. Only the fact that most Americans are vaccinated against measles prevented these clusters of cases from becoming epidemics

5

Disease rates are low in the United States today. But if we let ourselves become vulnerable by not vaccinating, a case that could touch off an outbreak of some disease that is currently under control is just a plane ride away

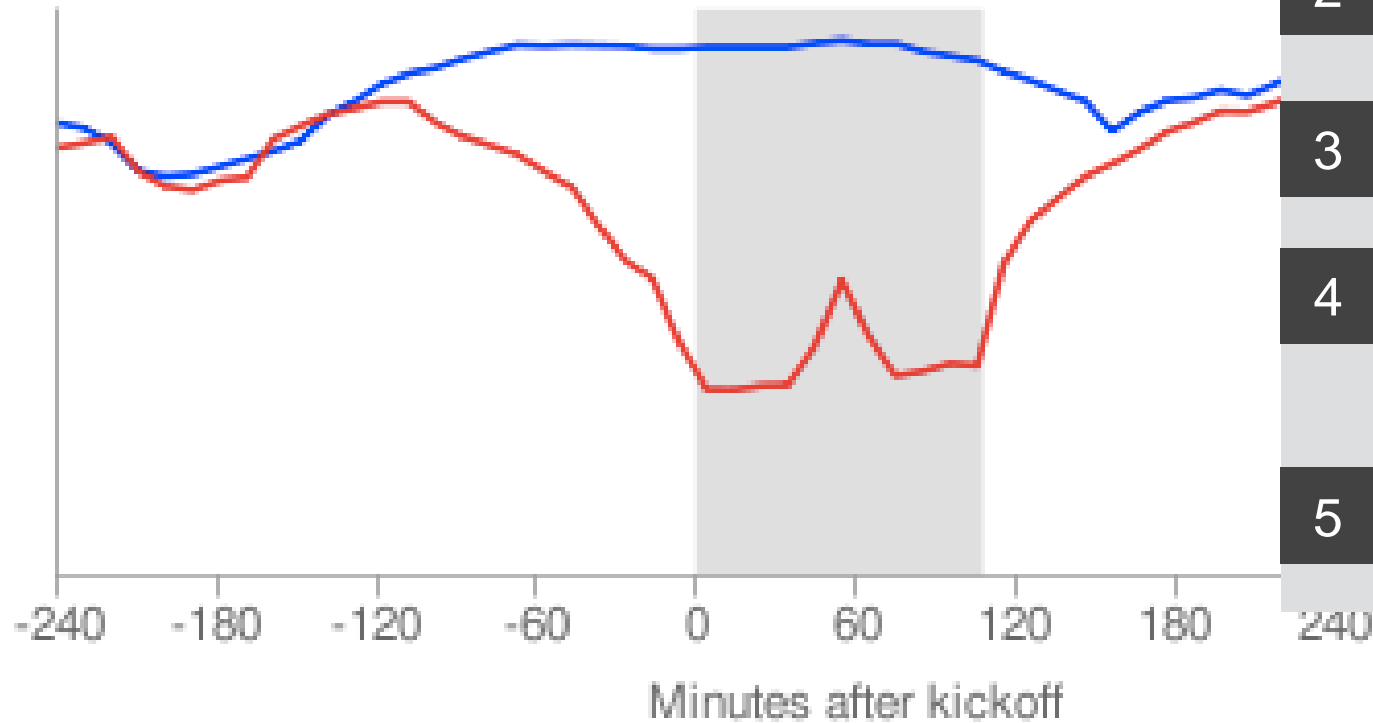
# Brazil's Google.com Query Volume

Interest in soccer outweighs interest in anything else



# Brazil's Google.com Query Volume

Interest in soccer outweighs interest in anything else



1

This is a graph of Google.com query volume in Brazil

2

The blue line represents traffic on a normal Tuesday. The red line represents traffic on June 15, 2010, the day Brazil played its first game of the 2010 World Cup against North Korea

3

The chart clearly demonstrates just how dedicated Brazilians are to supporting their national soccer team

4

The volume of queries plummeted when the match began, spiked during halftime, fell again when the match resumed, and then quickly rose after the match finished, which is very much in stark contrast to how Brazilians use Google.com on a typical, non-match day

5

Fans of many countries claim to have the best, most loyal supporters with great passion. But data such as these make a strong case that Brazil is home to the most devoted fans in the world

source: Google, Inc

# Remember the McCandless Method When Presenting Dataviz

- Step 1 Introduce the graphic by its name (and its story)
- Step 2 Explain the graphic by answering your audience's questions
- Step 3 State the insight your graphic produces
- Step 4 Offer up examples that support the insight
- Step 5 Tell them why the insight matters to them

# Ensure the Impact of Your Dataviz Through Careful Presentation

The style with which you present your dataviz can have just as much impact as the graphic itself

Questions in your audience's mind distract from your presentation—eliminate them before they are asked

Insights should precede substantiating facts—eliminate tension from your story, as drama can distract

Five-step McCandless Method helps ensure your dataviz is presented the right way

# In This Module



## Module 4: Getting Your Story Across

### Key Concepts

Creating inviting dataviz

Bringing sophistication to charts

Improving chart legibility

Presenting dataviz with impact

# References



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