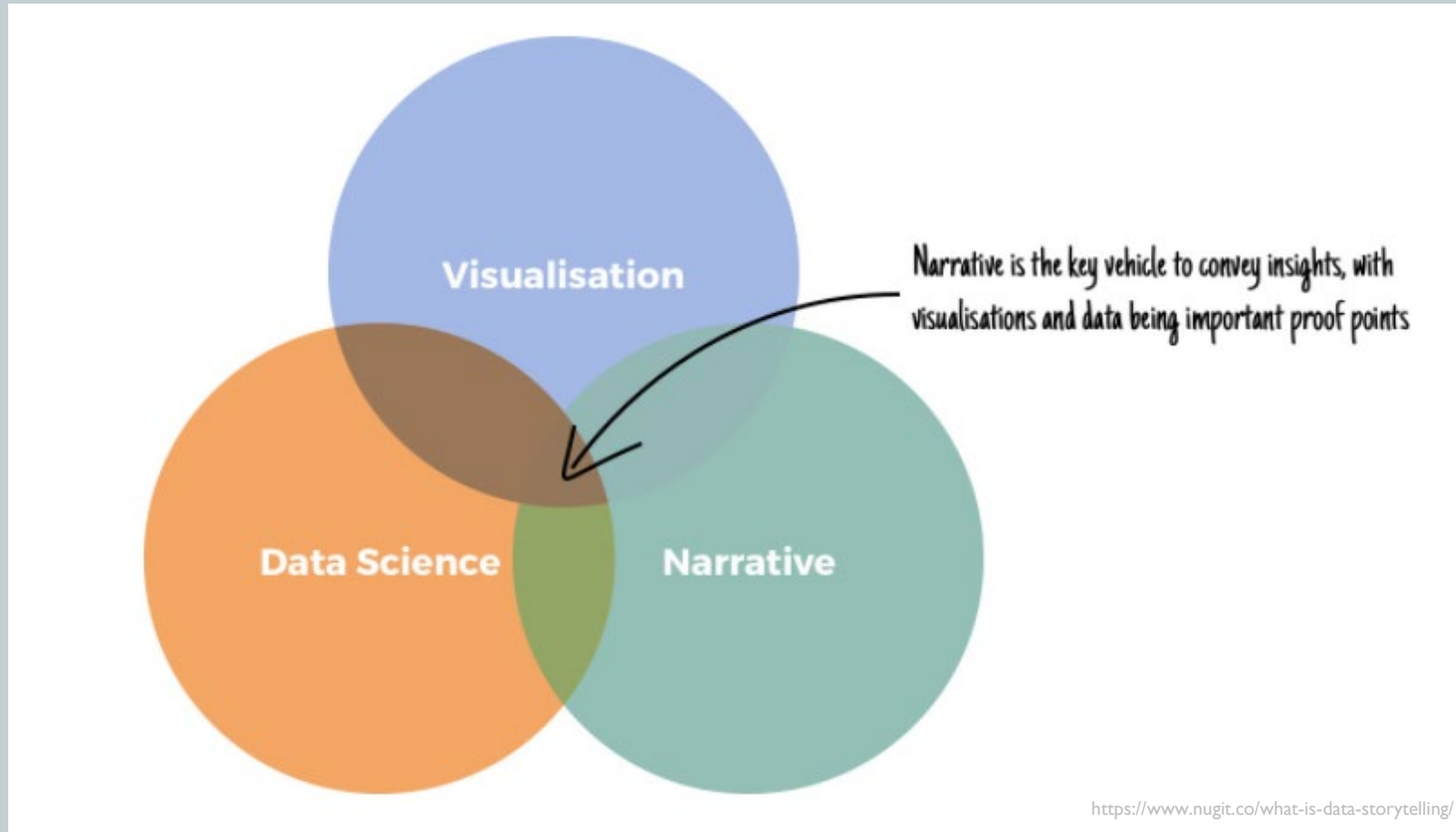


FINDING THE STORY IN YOUR DATA



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Dashboards and spreadsheets only tell
you *what* is happening. But, they do not tell you
why

Facts simply present data; whereas, a story's
narrative provides context, which augments our
understanding and drives valuable insights.

A COST ESTIMATE
CONTAINS MANY
STORIES

Bid Item No.	Bid Item Description		Total Material Cost	Total Labor Cost	Total Equipment Cost	Total Direct Construction Costs
Bid Item: 1	Replace Pit Toilets with New Comfort Station					
	A10	Foundations	\$ 30,028	\$ 33,082	\$ 7,293	\$ 70,403
	A20	Basement Construction	\$ -	\$ -	\$ -	\$ -
	B10	Superstructure	\$ 15,622	\$ 13,198	\$ 460	\$ 29,280
	B20	Exterior Enclosure	\$ 35,992	\$ 29,477	\$ -	\$ 65,469
	B30	Roofing	\$ 18,471	\$ 8,706	\$ -	\$ 27,177
	C10	Interior Construction	\$ 25,573	\$ 9,308	\$ -	\$ 34,881
	C30	Interior Finishes	\$ 4,478	\$ 13,424	\$ -	\$ 17,900
	D20	Plumbing Systems	\$ 26,655	\$ 16,121	\$ -	\$ 42,776
	D30	HVAC	\$ 1,289	\$ 1,170	\$ -	\$ 2,439
	D50	Electrical	\$ 8,753	\$ 9,366	\$ -	\$ 18,119
	F20	Selective Building Demolition	\$ 463	\$ 1,990	\$ 3,862	\$ 6,315
	G10	Site Preparation	\$ 2,188	\$ 4,382	\$ 6,952	\$ 13,502
	G20	Site Improvements	\$ 8,900	\$ 7,300	\$ -	\$ 16,200
	G30	Site Mechanical	\$ 86,213	\$ 32,582	\$ 44,542	\$ 163,337
	G40	Site Electrical	\$ 5,000	\$ -	\$ -	\$ 5,000
	XX	Standard General Conditions	\$ 31,900	\$ 101,200	\$ 18,610	\$ 151,710
Total - Bid Item 1	Replace Pit Toilets with New Comfort Station		\$ 301,503	\$ 281,286	\$ 81,719	\$ 664,508
Bid Item: 2	Construct New Parking Lot & Site Utilities					
	G10	Site Preparation	\$ 2,500	\$ 11,711	\$ 19,776	\$ 33,987
	G20	Site Improvements	\$ 143,581	\$ 36,335	\$ 43,670	\$ 223,586
	G30	Site Mechanical	\$ 12,153	\$ 14,232	\$ 4,241	\$ 30,626
	XX	Standard General Conditions	\$ 12,925	\$ 8,350	\$ 6,500	\$ 27,775
			\$ -	\$ -	\$ -	\$ -
Total - Bid Item 2	Construct New Parking Lot & Site Utilities		\$ 171,159	\$ 70,628	\$ 74,187	\$ 315,974
Bid Item: 3	Picnic Area & Trailhead Improvements					
	G10	Site Preparation	\$ -	\$ 11,860	\$ 4,845	\$ 16,705
	G20	Site Improvements	\$ 59,448	\$ 25,960	\$ 12,270	\$ 97,678
	G30	Site Mechanical	\$ 2,125	\$ 2,275	\$ 330	\$ 4,730
	XX	Standard General Conditions	\$ 5,775	\$ 7,550	\$ 2,500	\$ 15,825
			\$ -	\$ -	\$ -	\$ -
Total - Bid Item 3	Picnic Area & Trailhead Improvements		\$ 67,348	\$ 47,645	\$ 19,945	\$ 134,938
Total Bid Items 1-3			\$ 540,010	\$ 399,559	\$ 175,851	\$ 1,115,420

COST DRIVER STORY – USING A TABLE

	Materials		Labor		Equipment		Total
Bid Item 1 - Replace Pit Toiets with New Comfort Stator	\$ 301,503	45.4%	\$ 281,286	42.3%	\$ 81,719	12.3%	\$ 664,508
Site Mechanical	\$ 86,213	29%	\$ 32,582	12%	\$ 44,452	54%	\$ 163,247
Exterior Enclosure	\$ 35,992	12%	\$ 32,582	12%	\$ -	0%	\$ 68,574
Standard General Conditions	\$ 31,900	11%	\$ 32,582	12%	\$ 18,610	23%	\$ 83,092
Foundations	\$ 30,028	10%	\$ 32,582	12%	\$ 7,293	9%	\$ 69,903
Other	\$ 117,370	39%	\$ 32,582	12%	\$ 11,364	14%	\$ 161,316
Bid Item 2 - Construct New Parking Lot & Site Utilities	\$ 171,159	54.2%	\$ 70,628	22.4%	\$ 74,187	23.5%	\$ 315,974
Site Improvements	\$ 143,581	84%	\$ 36,335	51%	\$ 43,670	59%	\$ 223,586
Standard General Conditions	\$ 12,925	8%	\$ 8,350	12%	\$ 6,500	9%	\$ 27,775
Site Mechanical	\$ 12,153	7%	\$ 14,232	20%	\$ 4,241	6%	\$ 30,626
Site Preparation	\$ 2,500	1%	\$ 11,711	17%	\$ 19,776	27%	\$ 33,987
Bid Item 3 - Picnic Area & Trailhead Improvements	\$ 67,348	49.9%	\$ 47,645	35.3%	\$ 19,945	14.8%	\$ 134,938
Site Improvements	\$ 59,448	88%	\$ 25,960	54%	\$ 12,270	62%	\$ 97,678
Standard General Conditions	\$ 5,775	9%	\$ 7,550	16%	\$ 2,500	13%	\$ 15,825
Site Mechanical	\$ 2,125	3%	\$ 2,275	5%	\$ 330	2%	\$ 4,730
Site Preparation	\$ -	0%	\$ 11,880	25%	\$ 4,845	24%	\$ 16,725

TOP WBS COST DRIVER STORY – USING A HORIZONTAL BAR CHART

Replacing Toilets with New Comfort Station is Biggest Cost Driver!

Bid Item 1 - Replace Pit Toilets with New Comfort Station

60%

Bid Item 2 - Construct New Parking Lot & Site Utilities

28%

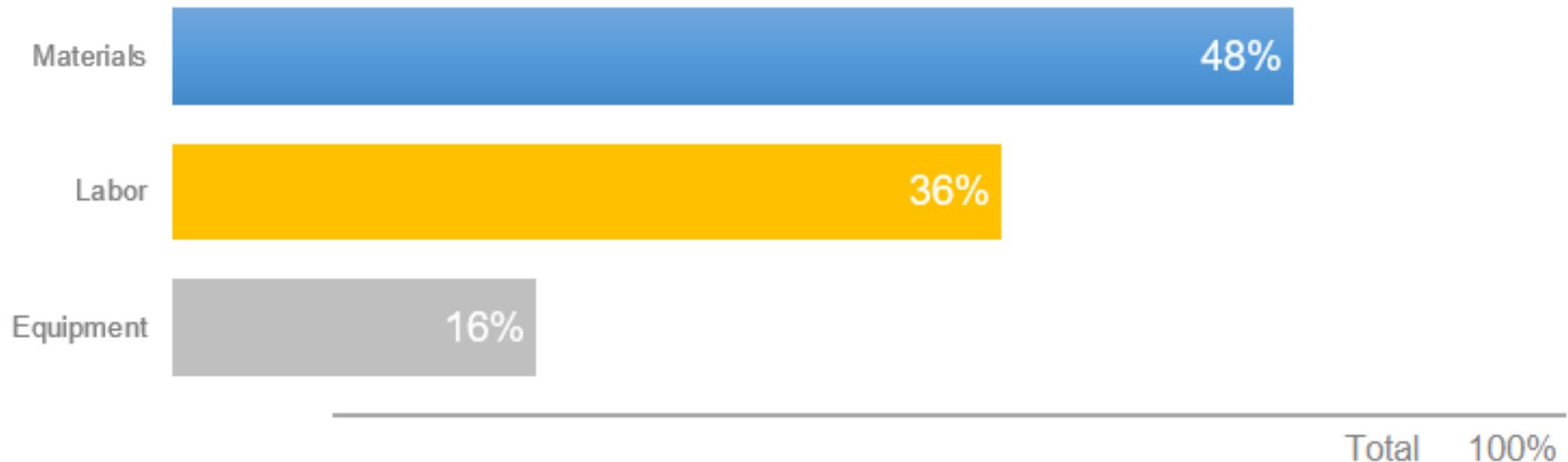
Bid Item 3 - Picnic Area & Trailhead Improvements

12%

Total 100%

DIFFERENT STORY – SAME DATA!

Site Improvement Materials for New Parking Lot and Utilities Drive Overall Cost



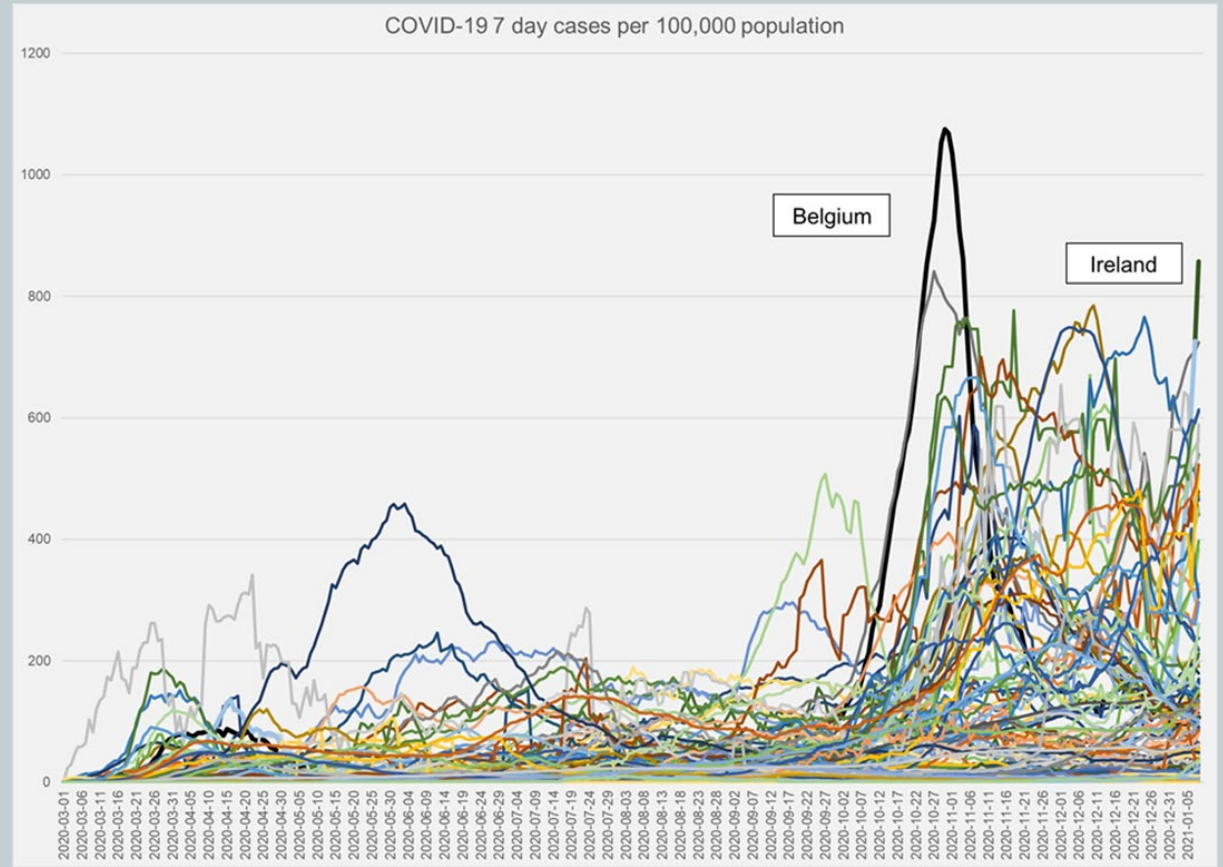
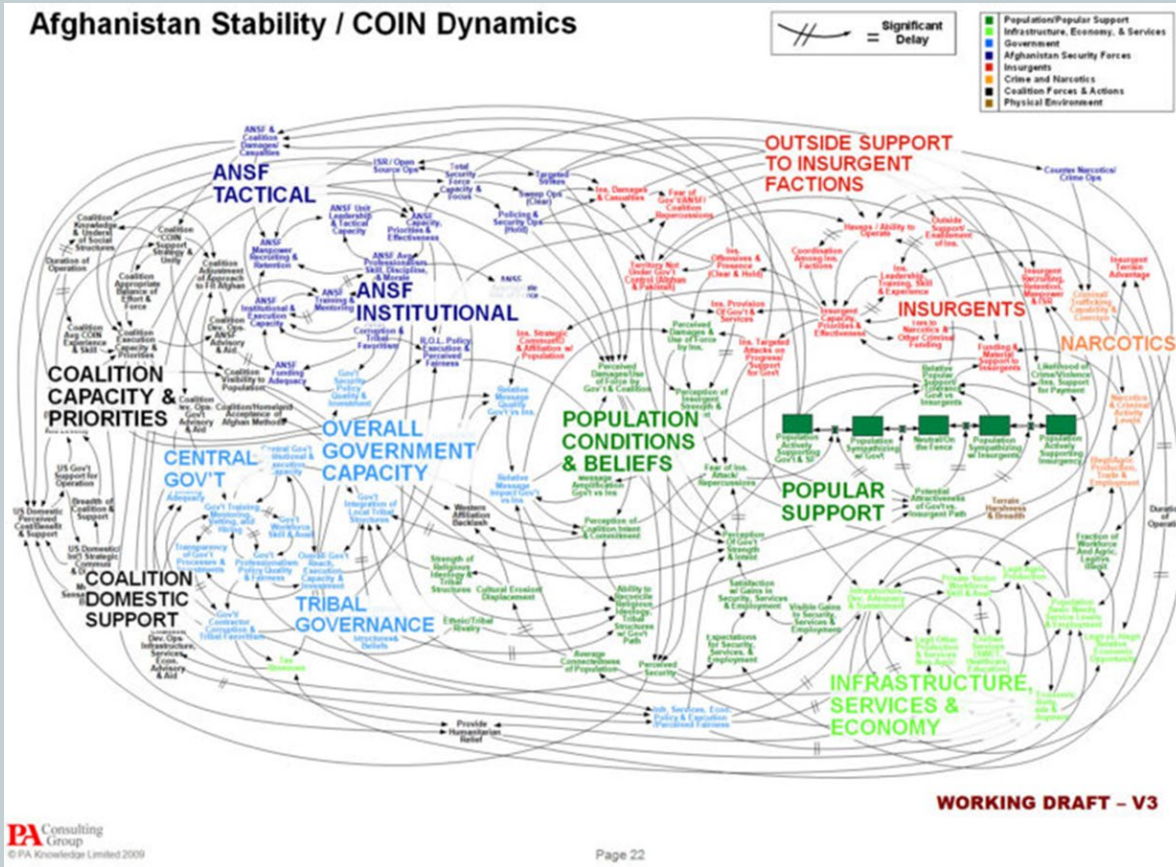
SAME STORY, DIFFERENT VISUAL – USING SIMPLE TEXT

54%

of material costs are driven by **site improvements** or **mechanical upgrades**

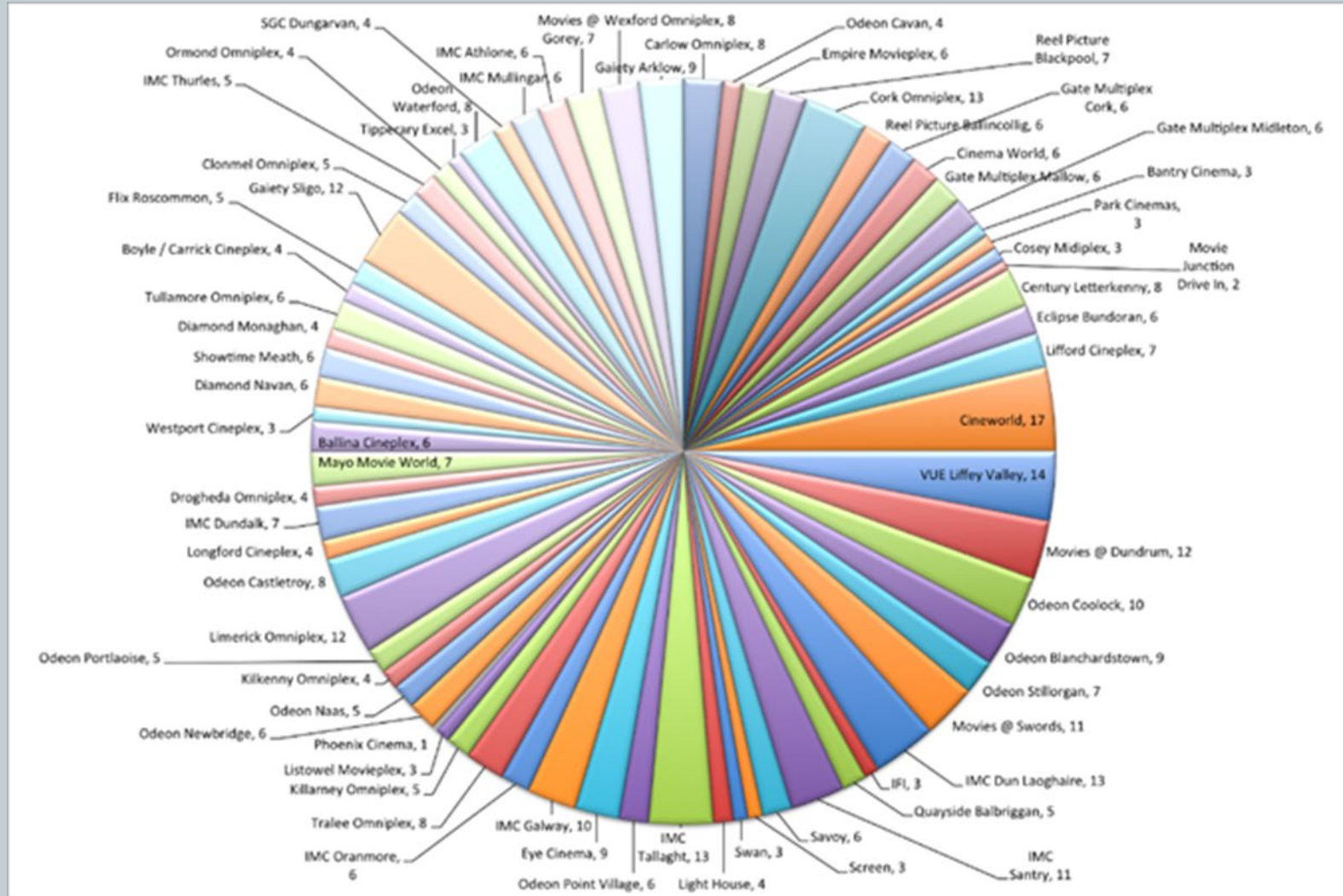
BAD CHART EXAMPLES

AVOID SPAGHETTI GRAPHS!



BAD CHART EXAMPLES

NO PIE GRAPHS EITHER!



DREADFUL VISUALS ARE A WIDESPREAD ISSUE, BUT THERE ARE MYRIAD WAYS TO FIX THEM!

foreword

“Power Corrupts. PowerPoint Corrupts Absolutely.”

—Edward Tufte, Yale Professor Emeritus¹

We’ve all been victims of bad slideware. Hit-and-run presentations that leave us staggering from a maelstrom of fonts, colors, bullets, and highlights. Infographics that fail to be informative and are only graphic in the same sense that violence can be graphic. Charts and tables in the press that mislead and confuse.

introduction

Bad graphs are everywhere

I encounter a lot of less-than-stellar visuals in my work (and in my life—once you get a discerning eye for this stuff, it’s hard to turn it off). Nobody sets out to make a bad graph. But it happens. Again and again. At every company throughout all industries and by all types of people. It happens in the media. It happens in places where you would expect people to know better. Why is that?

To be competitive, we recommend introducing our product *below* the \$223 average price point in the \$150–\$200 range

Retail price over time by product

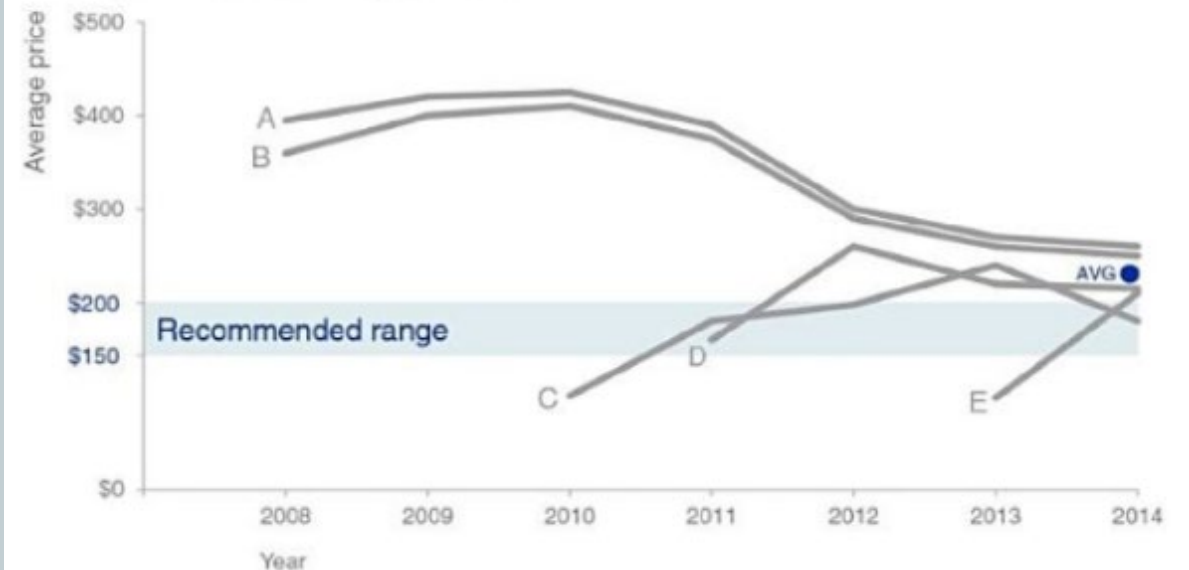
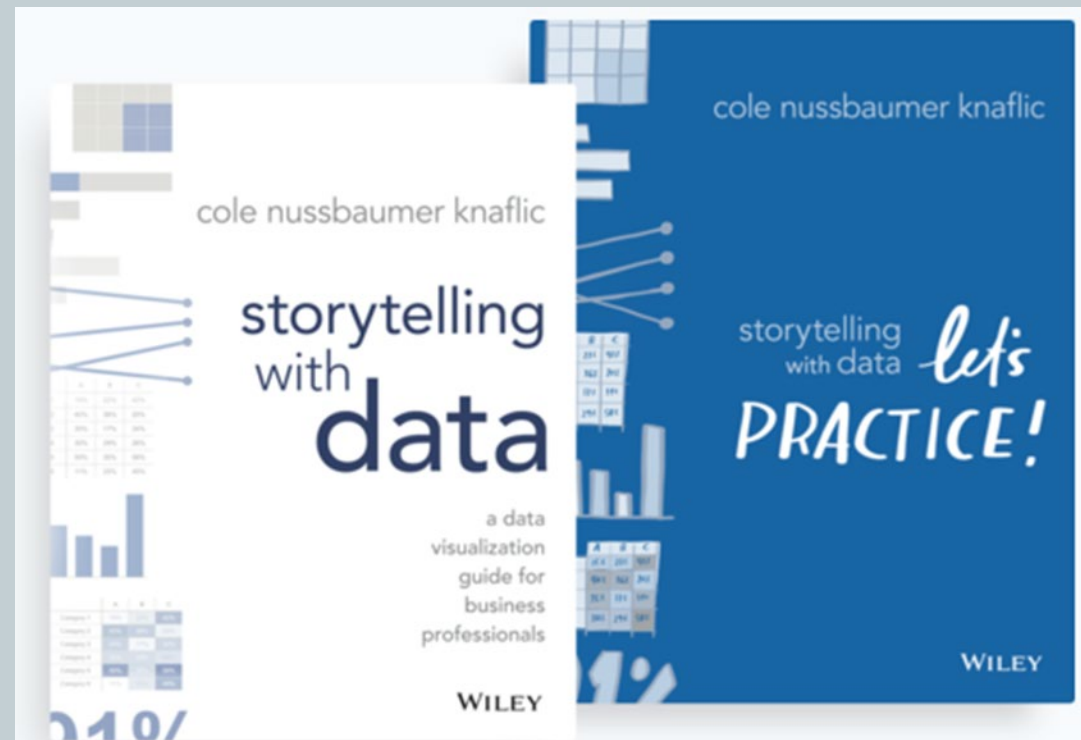


FIGURE 0.7 Example 3 (after): storytelling with data

STORYTELLING WITH DATA



INTRODUCTION

The Storytelling with Data and Let's Practice books were written for anyone who plans to **use data to communicate** something to others with the goals of

- Creating **effective** data visuals,
- Keeping your **audience's attention** on your presentation, and
- **Influencing decisions** using your data story



<https://infographicworld.com/data-visualization-data-storytelling/>

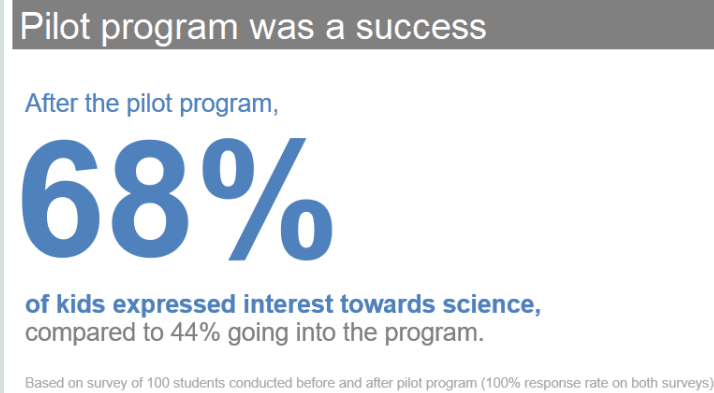
THE IMPORTANCE OF STORYTELLING

- People love to hear stories!
 - They are useful for both **entertaining as well as educating** by providing a fun way to share knowledge and experiences
 - Storytelling helps your **audience to connect** with your data and **care about** your message
 - <https://www.youtube.com/watch?v=mSi0kmqOBu4>
- The world is getting inundated with information
 - Data is the **new “precious metal”**
 - Determining meaningful ways to **sift through massive amounts of data** to find the most important information requires **new skills**

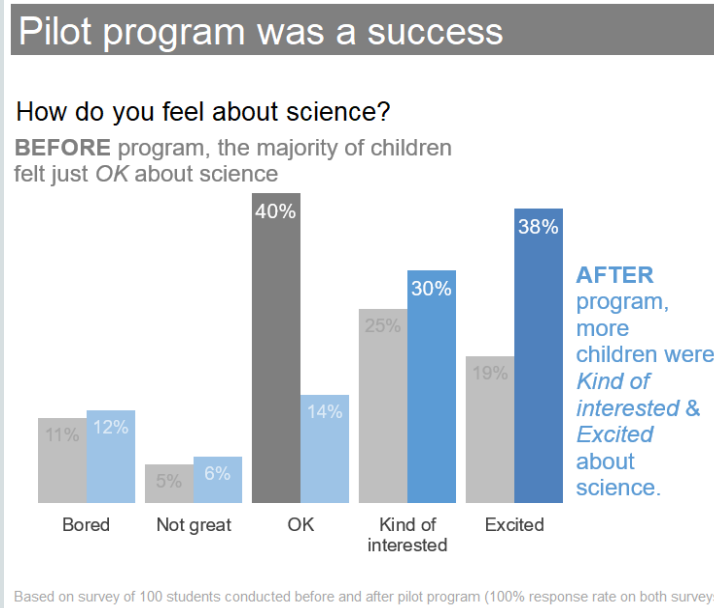


STORYTELLING WITH DATA OVERVIEW

- Understand the **context**
 - Know with **whom** you will be communicating to, what they **need to know**, and how you will **deliver** your message
 - Employ the **3-minute story**, the **Big Idea**, and **storyboarding** to articulate your findings
- Choose an appropriate **visual display**
 - When highlighting a number or two, **simple text** is best
 - Line charts work well with **continuous data**
 - Bar charts are perfect for showing **categorical data**, but must have a **zero baseline**
 - **Avoid 3D, pie charts, and secondary axes**



Show the **numbers** directly



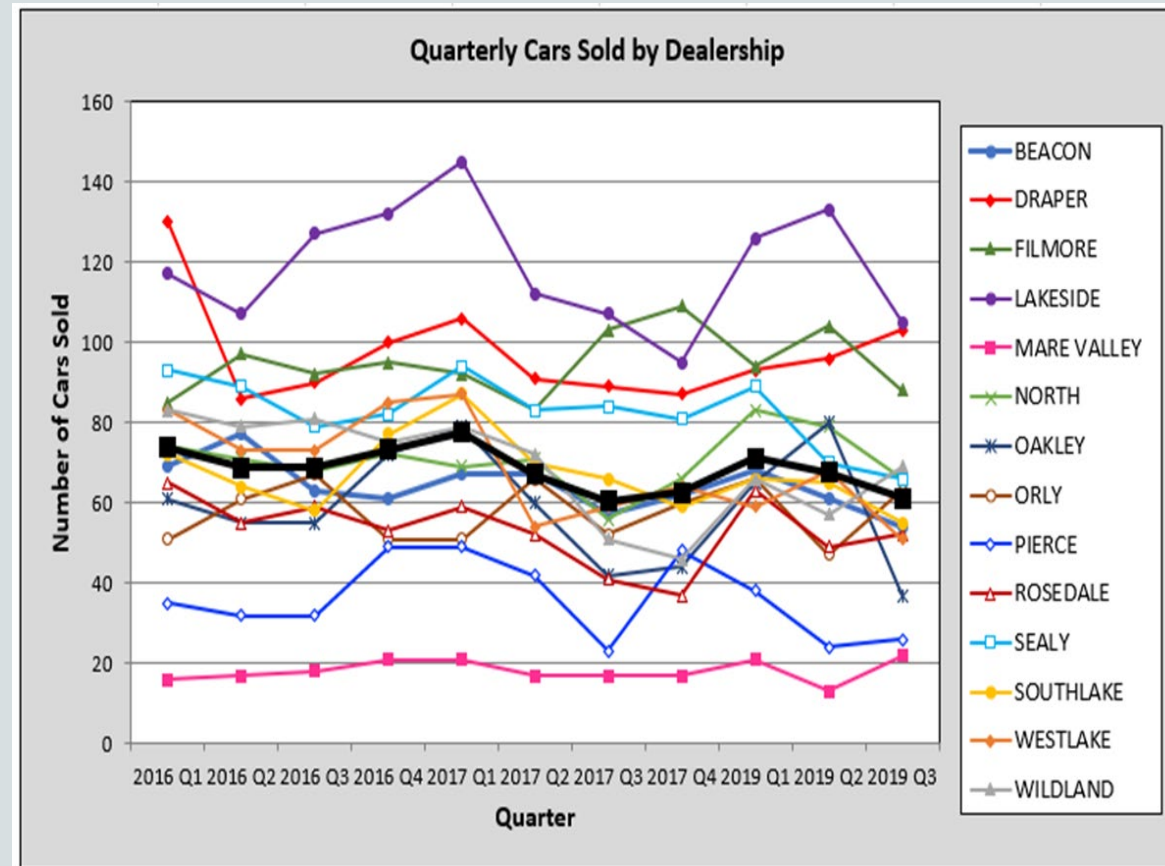
Use a simple **bar graph** when **comparing** two things

- Keep them **close together**
- Align them to a **common baseline**

STORYTELLING TECHNIQUES

Eliminate clutter!

- Anything that does not support your message should be **excluded**
- Leverage **Gestalt** principles for how people see things and **use contrast** strategically
- Align all elements and maintain adequate **white space**



STORYTELLING TECHNIQUES

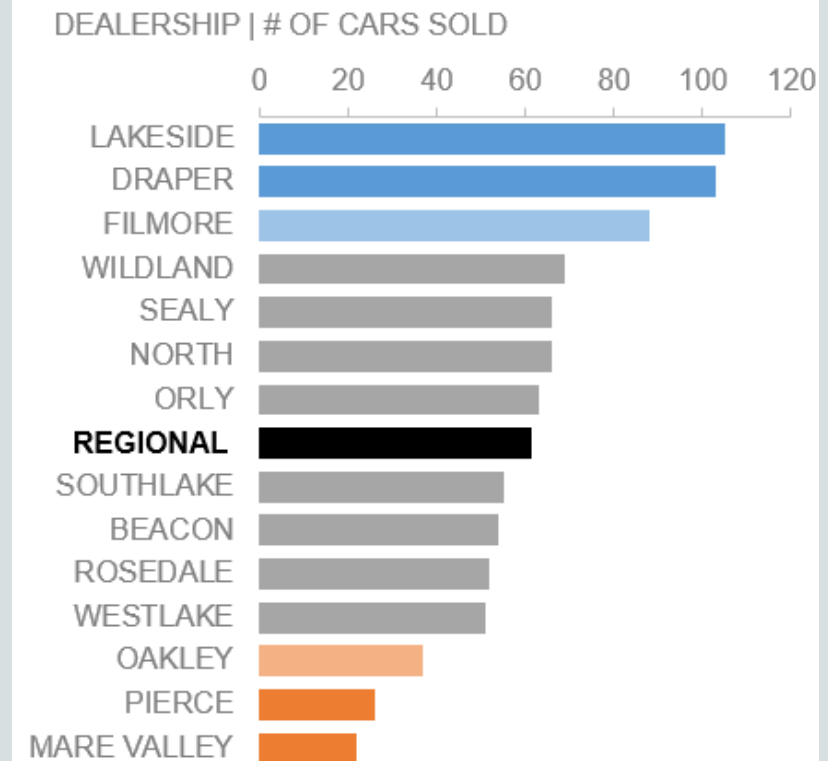
Focus attention where you want it

- Rely on the power of **preattentive attributes** to **signal where to look**

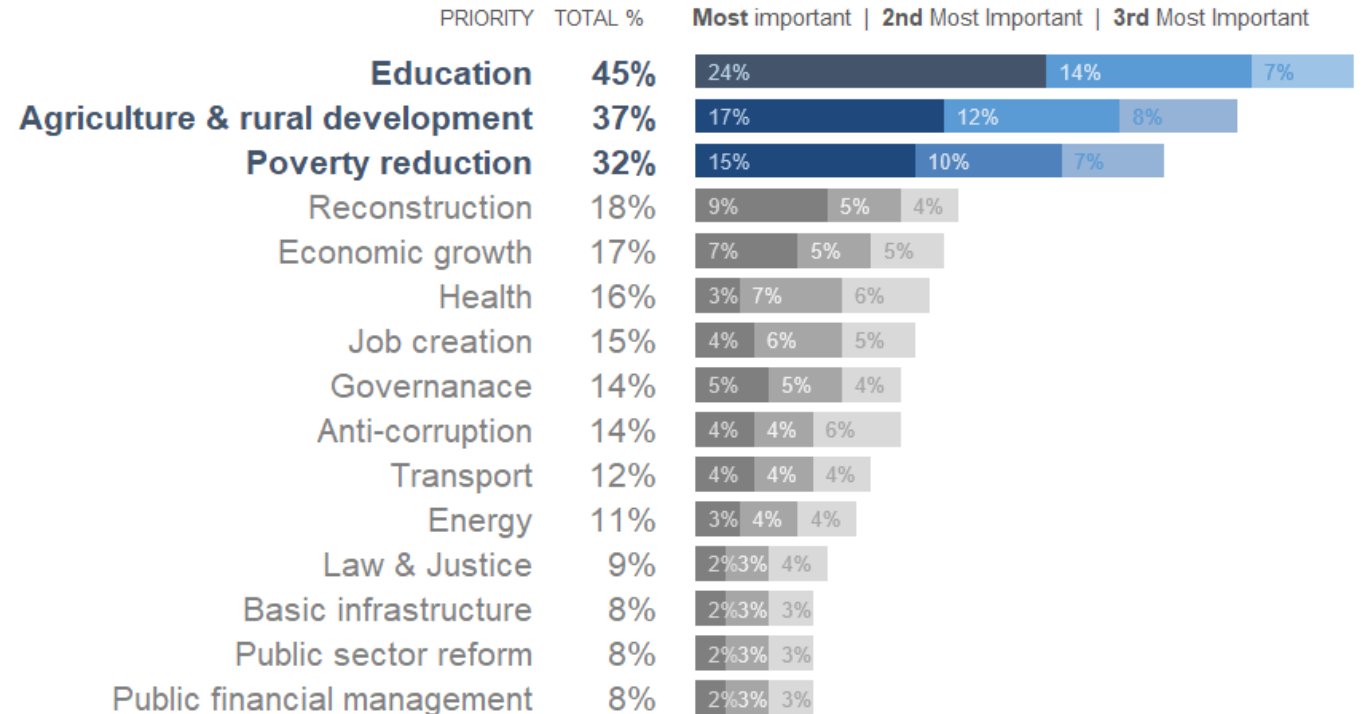
Think like a **designer**

- Include **visual affordances** that tell the audience how to read your graphic
- Use **highlighting** and **text** to label and explain the story

Car sales by dealership: Q3



Top 15 development priorities, according to survey



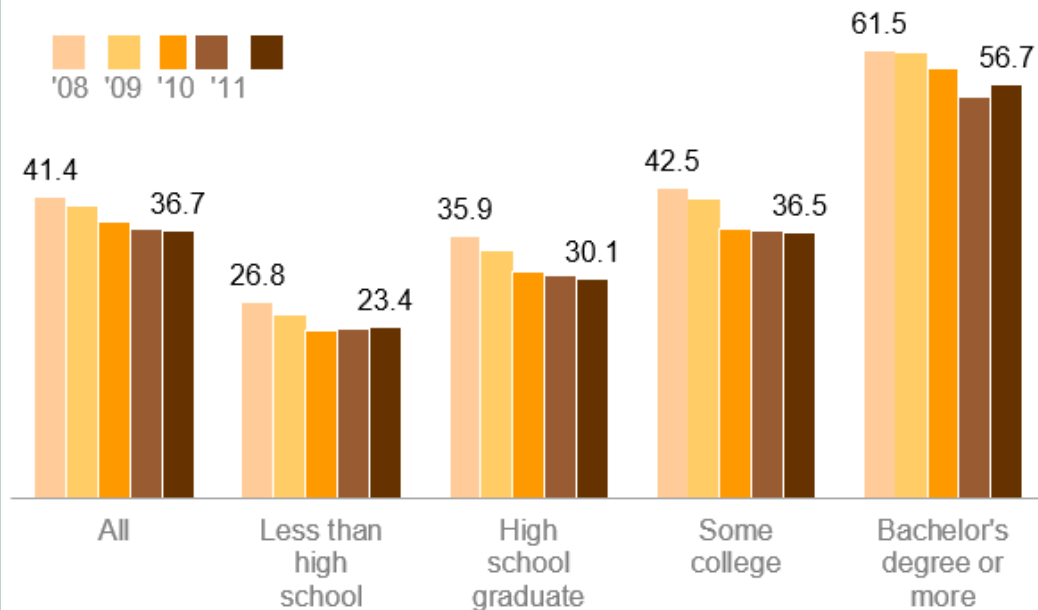
N = 4,392. Based on responses to item, *When considering development priorities, which one development priority is the most important? Which one is the second most important priority? Which one is the third most important priority?* Respondents chose from a list. Top 15 shown.

PACK LOTS OF DATA INTO A STACKED HORIZONTAL BAR GRAPH

SIMPLIFY THE DATA

New Marriage Rate by Education

Number of newly married adults per 1,000 marriage eligible adults



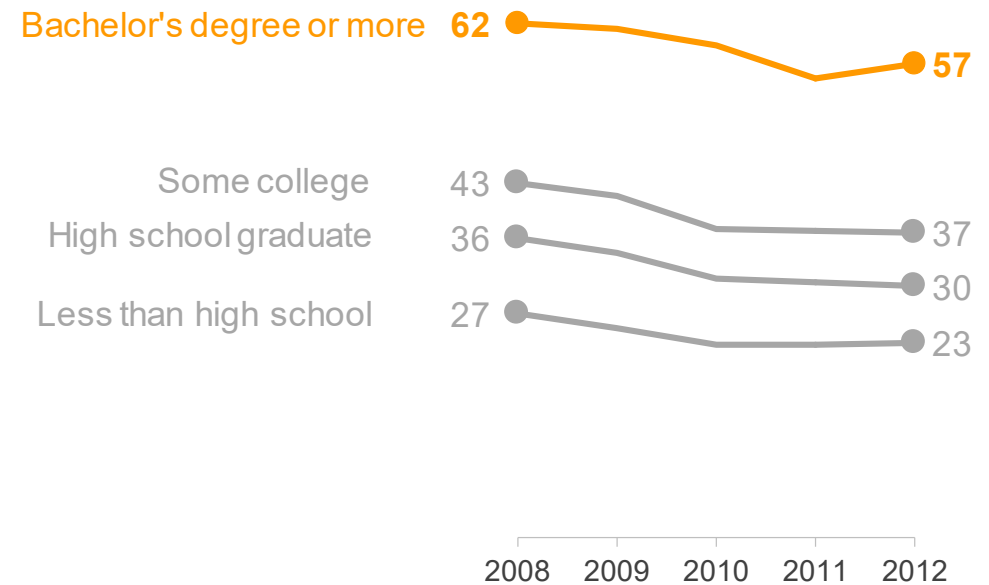
Note: Marriage eligible includes the newly married plus those widowed, divorced or never married at interview.

Source: US Census

Adapted from PEW RESEARCH CENTER

New marriage rate by education

Number of newly married adults per 1,000 marriage eligible adults



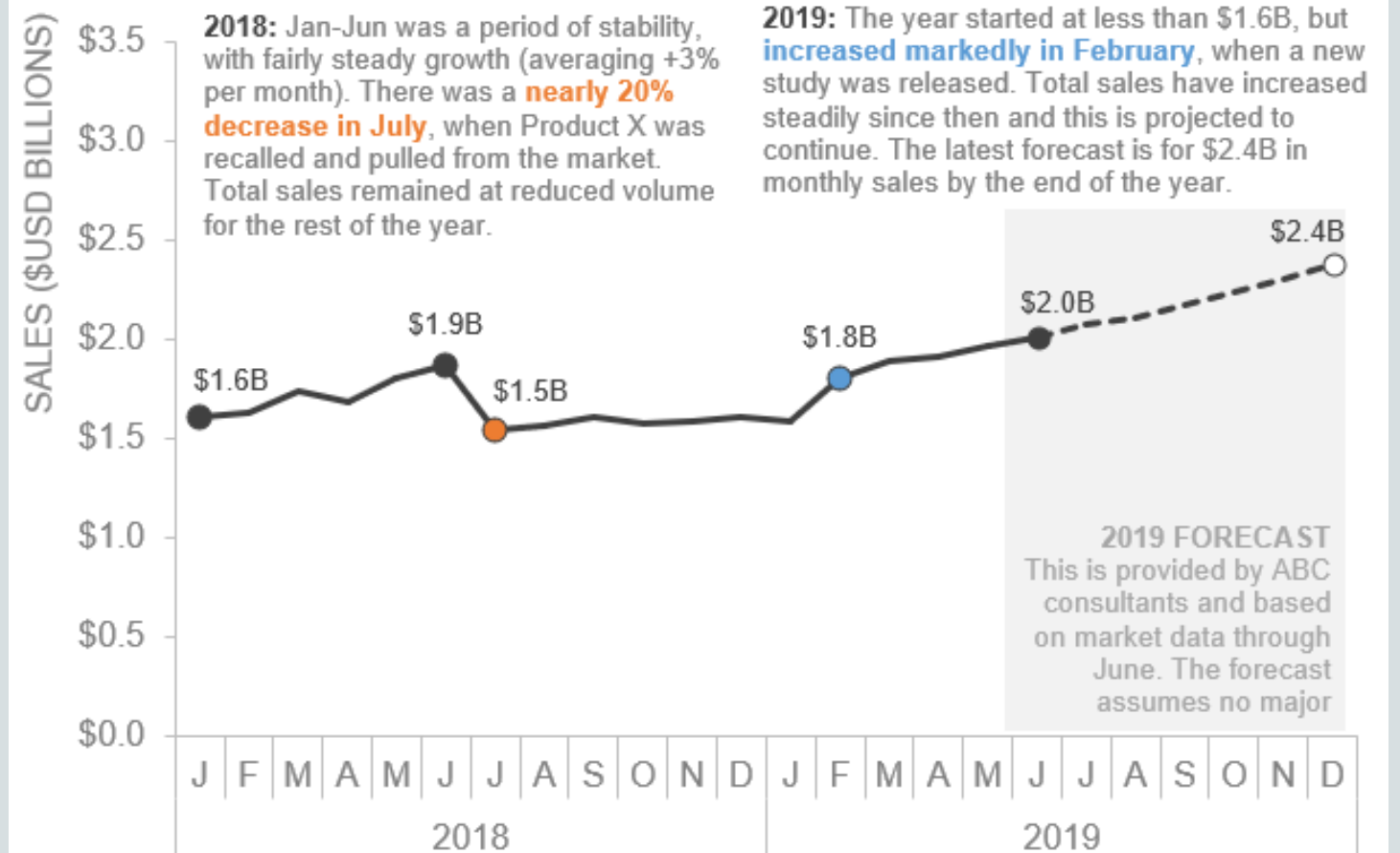
Note: Marriage eligible includes the newly married plus those widowed, divorced or never married at interview.

Source: US Census

Adapted from PEW RESEARCH CENTER

CREATE A VISUAL HIERARCHY

Market size over time



TELL A STORY USING ANIMATION

- Have a **plot**, some **twists**, and a **call to action** in order to create **tension**
- Live presentations allow you to “**walk**” **the audience** through the story of the visual
 - You build up to the overall results and conclusions over a **series of slides** or animation
 - However, a **standalone annotated version** is necessary
 - **Tells the story** without the voiceover
 - Ignoring these different needs can result in “**slideument**”
 - Challenge is when you provide **too much data** at once, you lose your audience’s attention
 - **Leveraging animation** to walk the audience through the story is better
 - First step is to start with just a view of the **blank graphic**
 - Audience will have **to listen to you** to understand the finer details of what they are seeing

STORY PROGRESSION

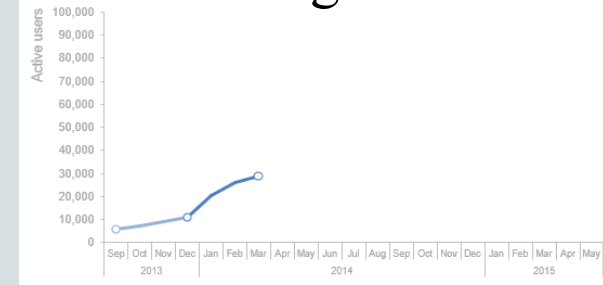
Moonville: active users over time



Data source: ABC Report. For purpose of analysis "active user" is defined as the number of unique users in the past 30 days.

Build **anticipation** and retain audience's attention

Moonville: active users over time



Data source: ABC Report. For purpose of analysis "active user" is defined as the number of unique users in the past 30 days.

Users increased due to **friends and family promotion**

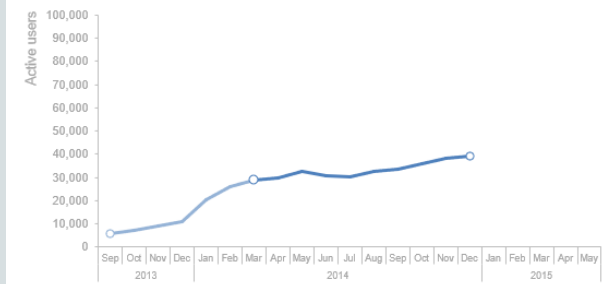
Moonville: active users over time



Data source: ABC Report. For purpose of analysis "active user" is defined as the number of unique users in the past 30 days.

Blue dot is **starting point** for the story

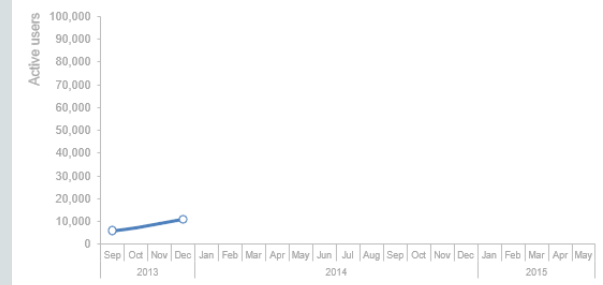
Moonville: active users over time



Data source: ABC Report. For purpose of analysis "active user" is defined as the number of unique users in the past 30 days.

Growth flattened during time when **game was updated**

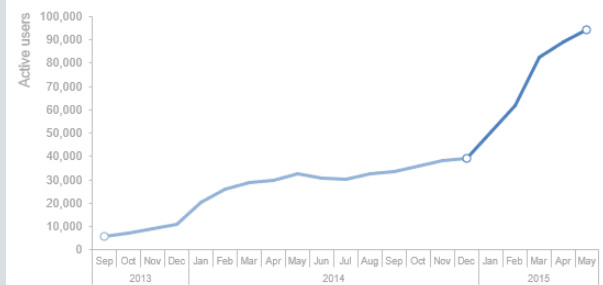
Moonville: active users over time



Data source: ABC Report. For purpose of analysis "active user" is defined as the number of unique users in the past 30 days.

Despite no marketing, # of **users doubled**

Moonville: active users over time



Data source: ABC Report. For purpose of analysis "active user" is defined as the number of unique users in the past 30 days.

Revamped game and **social media** partnerships helped game to **go viral**

Annotated version captures **salient points** made during live story telling

DETAILED
ANNOTATED
VERSION

Moonville: active users over time



Data source: ABC Report. For purpose of analysis "active user" is defined as the number of unique users in the past 30 days.

TIPS FOR FINDING THE STORY IN YOUR DATA

Data storytelling is part science and part art (like cost estimating!)

- There are several **best practices** and **guidelines** to follow including
 - **Knowing your audience** and composing your story to meet their **needs**
 - Leveraging **Gestalt** design principles, using **preattentive attributes**, etc. to create a **visual hierarchy of information**

Rely on your artistic side to be **creative** and embrace **diversity**

- There are **multiple ways** to **communicate** with data and have **fun**
 - **Exploring alternate visuals** can help you discover your **data story**
 - **Declutter** your visuals so that you **draw attention** to what matters most
 - Push data **to the back** so it does not compete for the main message
 - Include only what you need to **tell the story**, so it is **easy to understand**
- **Iterate** and seek **feedback** from others about your graphics



SEEK INSPIRATION THROUGH GOOD EXAMPLES

- Use these websites to inspire you as you create your presentations
 - **Chart Chooser** <http://labs.juiceanalytics.com/chartchooser/index.html>
 - Download as Excel or PowerPoint templates and insert your own data
 - **Chartmaker Directory** <http://chartmaker.visualisingdata.com/>
 - Explore the matrix of chart type by tool and click the circles to see solutions and examples
 - **Graphic Continuum** <https://policyviz.com/?s=graphic+continuum>
 - The poster includes more than 90 graphic types grouped into six categories
 - Also, check out the related Match It Game and Cards as well as three ways to annotate your graphs
 - **Interactive Chart Chooser** <https://depictdatastudio.com/charts/>
 - Explore the interactive chart chooser using filters

EXPLORE ADDITIONAL RESOURCES

- With **Datawrapper**, you can create visualizations like the one below from Let's Practice in minutes instead of hours!
 - https://www.datawrapper.de/_/FqaTB/
 - It's free to use and no sign-in is needed to try it out yourself
- With **Flourish**, explore and explain your data with stunning visualizations and stories
 - <https://flourish.studio/features/>
 - Publish, present or download a free public version (No need to code or install software)
- With **Google Data Studio**, unlock the power of your data with interactive dashboards and beautiful reports that inspire smarter business decisions
 - <https://datastudio.google.com/overview>
 - It is easy and free!