

Data Storytelling

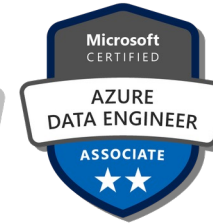
DRIVING RESULT THROUGH DATA STORYTELLING



Presenter



Mohammed Arif, PhD
Lead Data Scientist
Big Data | Machine Learning | AI



Mohammed Arif has more than eighteen (18) years of working experience in Information Communication and Technology (ICT) industry. The highlights of his career are more than seven (7) years of holding various senior management and/or C-Level and had five (5) years of international ICT consultancy exposure in various countries (APAC and Australia), specially on Big Data, Data Engineering, Machine Learning and AI arena.

He is also Certified Trainer for Microsoft & Cloudera.





**WHY DO YOU NEED
THE COURSE?**

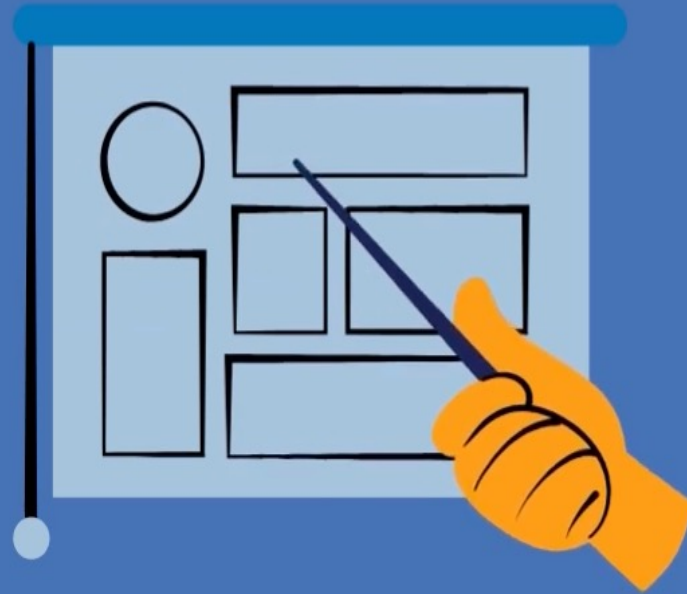


The challenge of many people is not that they

Lack meaningful data

It's that they lack the skill in presenting this data through

**Clear
Stories**



**Impactful
Visuals**

A gap between **you, your data,**
and **your audience.**



A gap between **you, your data,**
and **your audience.**



People are unable to understand the data insights you are presenting

and therefore, are
unable to make the



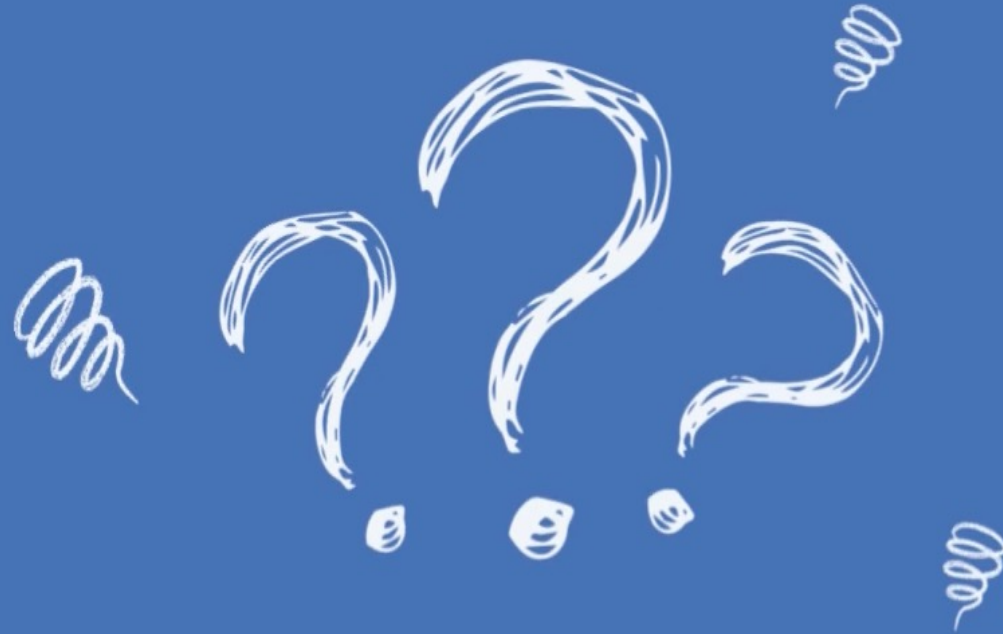
right decisions that
drive desired outcomes.



Data that does NOT
tell a clear story and highlight value



Too much information and clutter in your data visual



Confusion that results in **inaccurate insights,**
and **incorrect conclusions and decisions**



No Story, No Success

No one should have to be
intimidated by data analytics.



Data

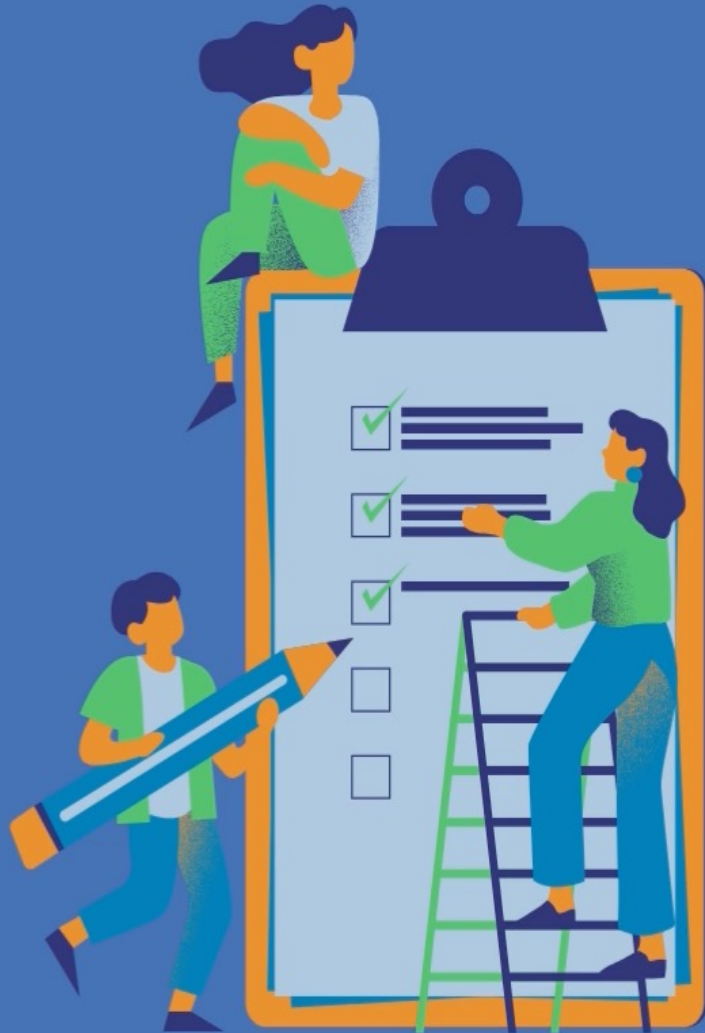


Insights



Action

The 4 D's of Data Storytelling



DISCOVER

the world of DATA STORYTELLING



DEVELOP

compelling DATA STORIES



DESIGN

simple but POWERFUL VISUALS



DRIVE

ACTION and enhanced DECISIONS



Course Outline

COURSE 1

DISCOVER: Enter the World of Data Storytelling

COURSE 2

DEVELOP: Build Your Data Story

COURSE 3

DESIGN: Choose the Right Visuals

COURSE 4

DRIVE: Drive Action through Visuals



LEARNING ROADMAP:

Navigating Your Path to Success

Course 1:
**Driving Change
and Action
through Insight**

Course 2:
**3 C's of Building
Your Data Story**

Course 3:
**Visualizing the
Story**

1

2

3

4

5

6

Course 1:
**Unearthing
Stories in Data**

Course 3:
**The Value
of Visuals**

Course 4:
**Secrets to
Effective Visuals**

1 COURSE

DISCOVER: Enter the World of Data Storytelling



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I. Driving Change and Action through Insight



A. Understanding the Importance of Data



A. Understanding the Importance of Data

1. The Demand for Data Literacy



“The ability to take data—to understand it, to process it, to extract value from it, to visualize it, to communicate it—that's going to be a **hugely important skill in the next decades.**”

Hal Varian
Chief Economist
Google



DATA LITERACY

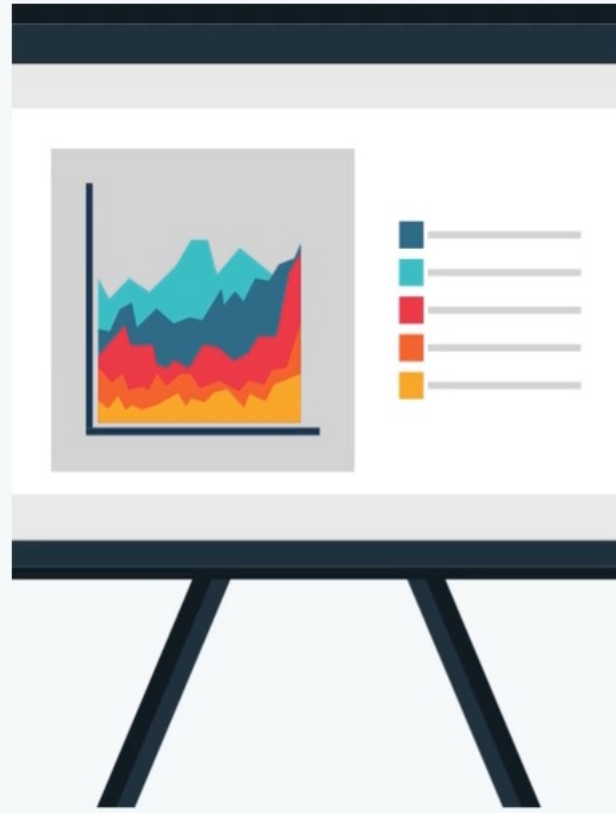
is **essential** in today's Data Economy





Data Literacy

the ability to understand and
communicate or share data
effectively



Even **valuable insights** may lose their potential if not communicated effectively.



A. Understanding the Importance of Data

2. Insights Lead to Change



**WHAT IS AN
INSIGHT?**

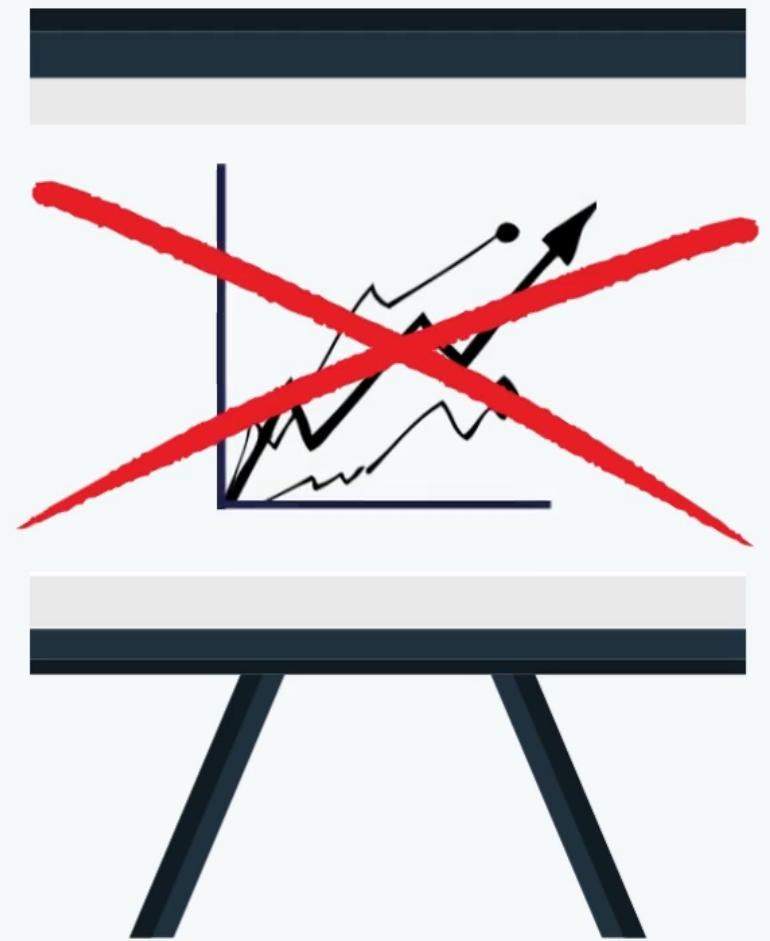
WHAT IS AN INSIGHT?

Gary Klein, Seeing What Others Don't

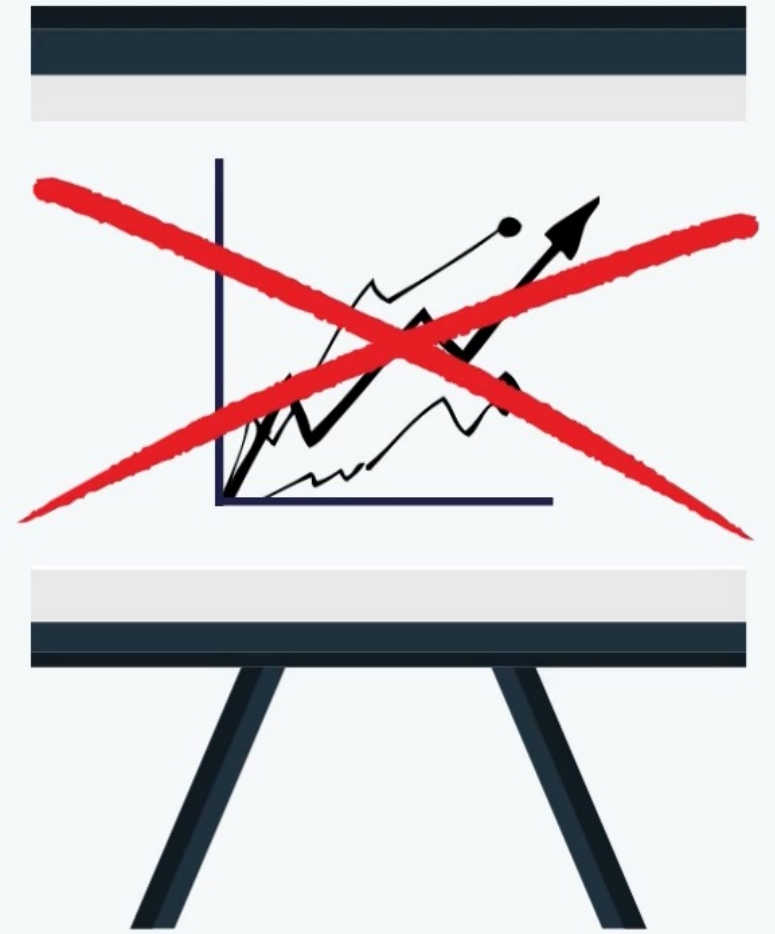
1. Discoveries based on analysis and interpretation of data
2. Unexpected shifts in the way we understand things
3. Transform thinking on ways to create business value
4. Shift us toward a new and better story



If the insight isn't
compelling...



No one will **act** on
it and no **change**
will occur



$y = \frac{\Delta x}{\Delta z}$
 $(x-y)^2 = \frac{\sum (x-m)^2}{n-1}$ $\int (x \pm a)^2$ $Q'' S = \begin{bmatrix} 1 & 0 & 0 \\ 1 & 0 & 1 \\ 0 & 0 & 1 \end{bmatrix}$ $\pi \approx 3,14$
 $\lim_{x \rightarrow 1} \frac{ctgx-2}{2^{11}x^3}$ $P = r^2$ $h = \sqrt{axb}$
 $4x = 8 - 3y^2$ $e = 2,79$
 $B \sum_{n=1}^{\infty} x^n = \frac{x}{1-x}$ $y = 2x^2 + 3x$ $P = \sum_{i=0}^{\infty} x^i$ $\frac{A-C}{C}$
 $\sin x$ $\tan(2a) = \frac{2 \tan(a)}{1 - \tan^2(a)}$ $15 \Delta t = T - \frac{3a}{x}$
 $(x+y)^2 = \left(\frac{y}{2}\right)^2 = x^2 + 2ax + a^2$ $c \ln x \left(\frac{a-x^2}{x}\right) + C$ $\sum_{n=0}^{\infty} \frac{x^n}{n!}$
 $x^2 + y^2 = z^2$ $\frac{\Delta x}{\Delta y} = \lim_{\Delta y \rightarrow 0} \frac{\Delta x + 2}{\Delta y - 1}$ $\sin x$ $e = \cos x + \tan y$ $\int \frac{\sqrt{x+a^2}}{x}$ $X_{1/2} = \frac{b \pm (a-c)}{\sqrt{a}}$
 $(x+a)$ $\sin x$ $e = \cos x + \tan y$ $\int \frac{\sqrt{x+a^2}}{x}$ $X_{1/2} = \frac{b \pm (a-c)}{\sqrt{a}}$
 $= (y-1)^2$ $a+b=c$ $\sin a = -b^3$ $(x+h)$ $S = \int_{t=2}^{t=10} t dt = \frac{\Delta x}{\Delta z} x$

Without **action**,
insights are just
EMPTY NUMBERS



PURPOSEFUL INSIGHTS



**Supercharge
your Proposal**



**Enhanced
Credibility**



**Informed
Audience**

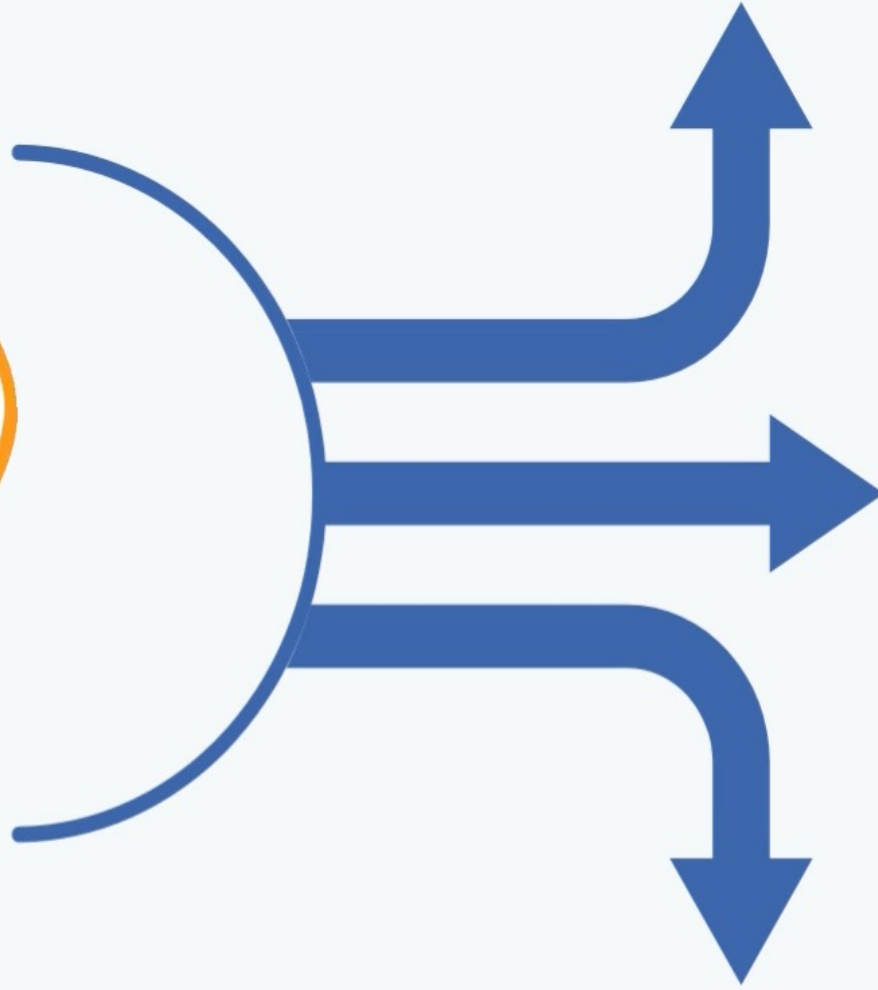


**BE ON THE LOOKOUT FOR
POWERFUL INSIGHTS!**





**One powerful insight can unlock infinite opportunities,
transforming mindsets and driving true change**



**Actionable
Strategies**

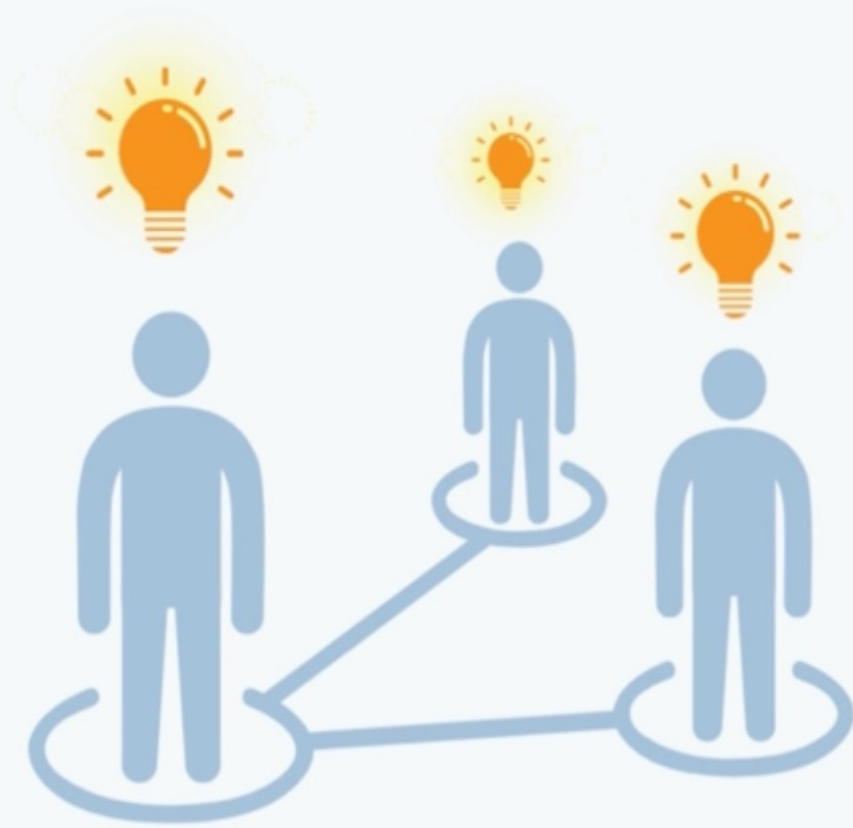


B. From Informing to Communicating

"The goal is to provide **inspiring information** that moves people to **action.**"

Guy Kawasaki
Author and Venture
Capitalist





The impact of your insights
extends beyond yourself.



EFFECTIVE COMMUNICATION

is required to explain your insights
in a way that is **understood** and
motivates action

PRESENTING DATA

=

More than just **INFORMING**, it's

COMMUNICATING





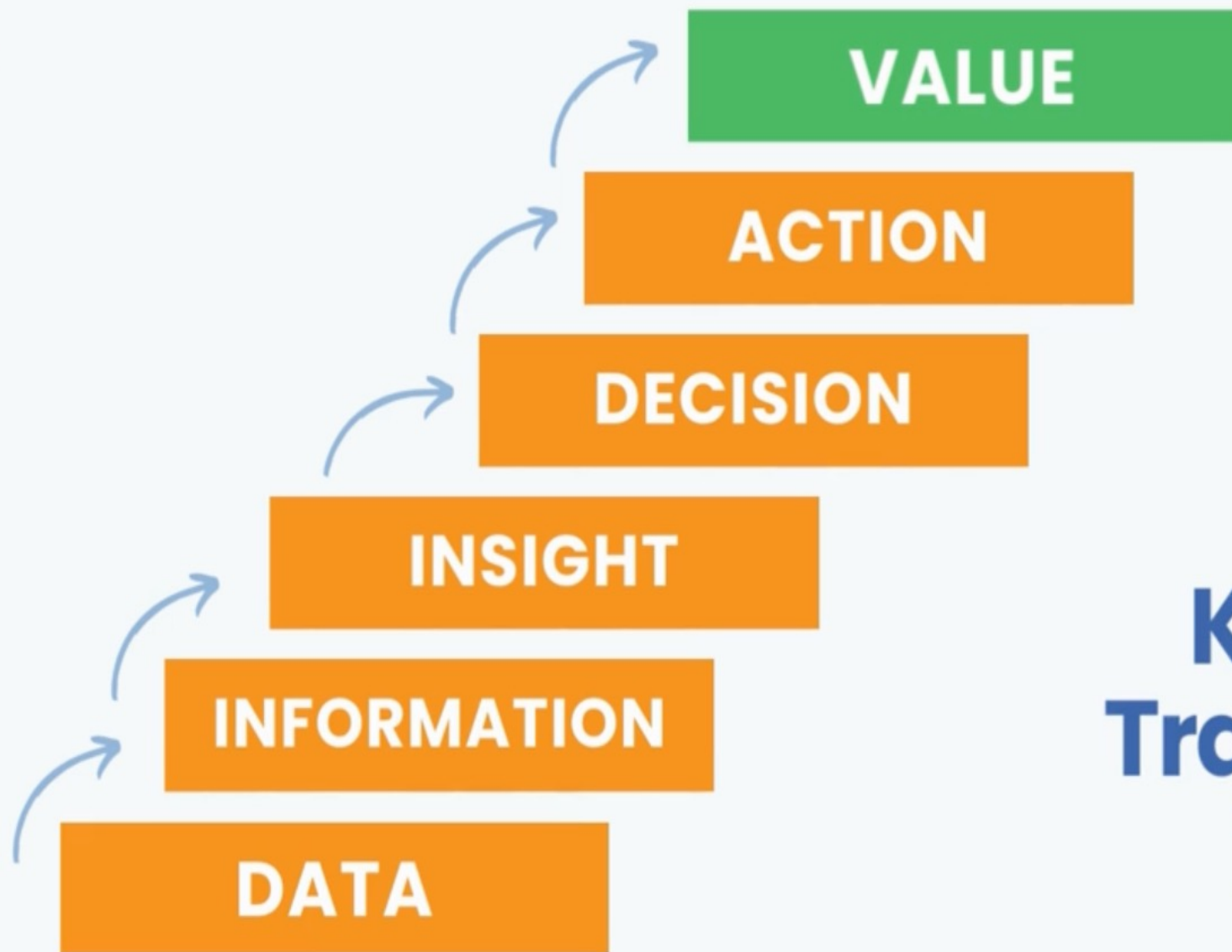
B. From Informing to Communicating

1. Transforming Data into Value

Communication is often **overlooked** as a crucial step in the analytical process.

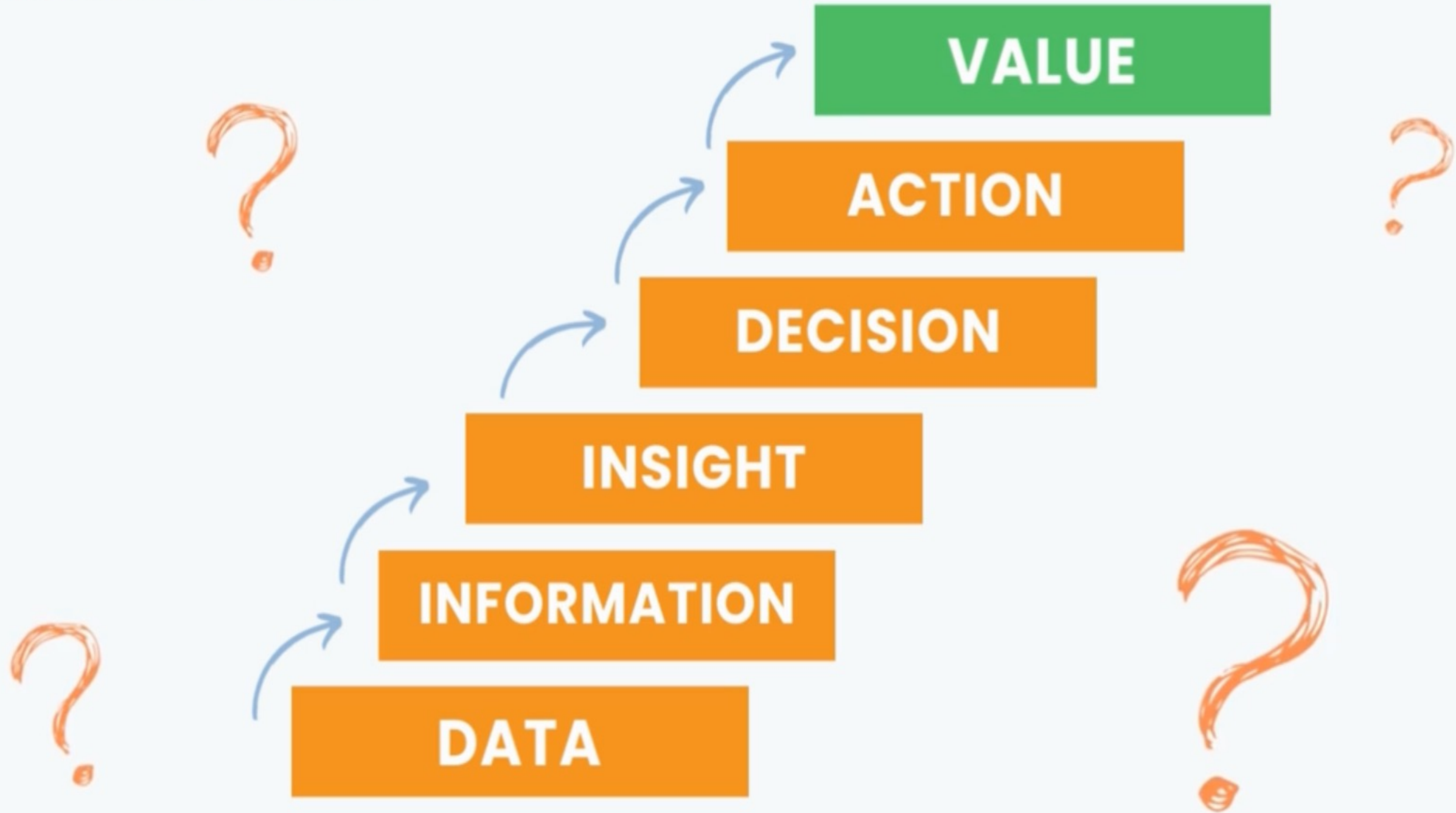


Many people **underestimate** the central role it plays in extracting value from data.

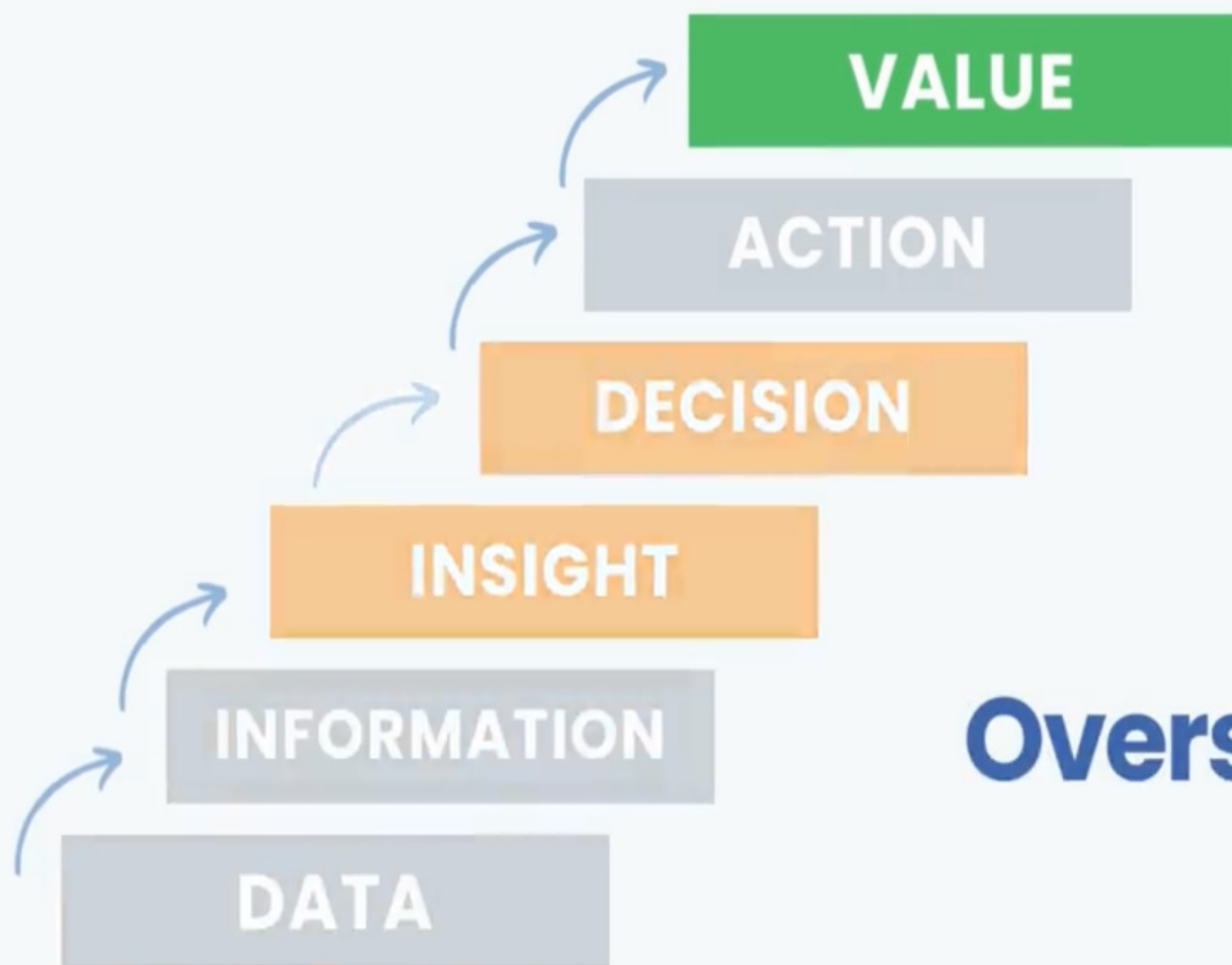


**Key Steps to
Transform Data
into Value**

STEPS TO TRANSFORM DATA INTO VALUE



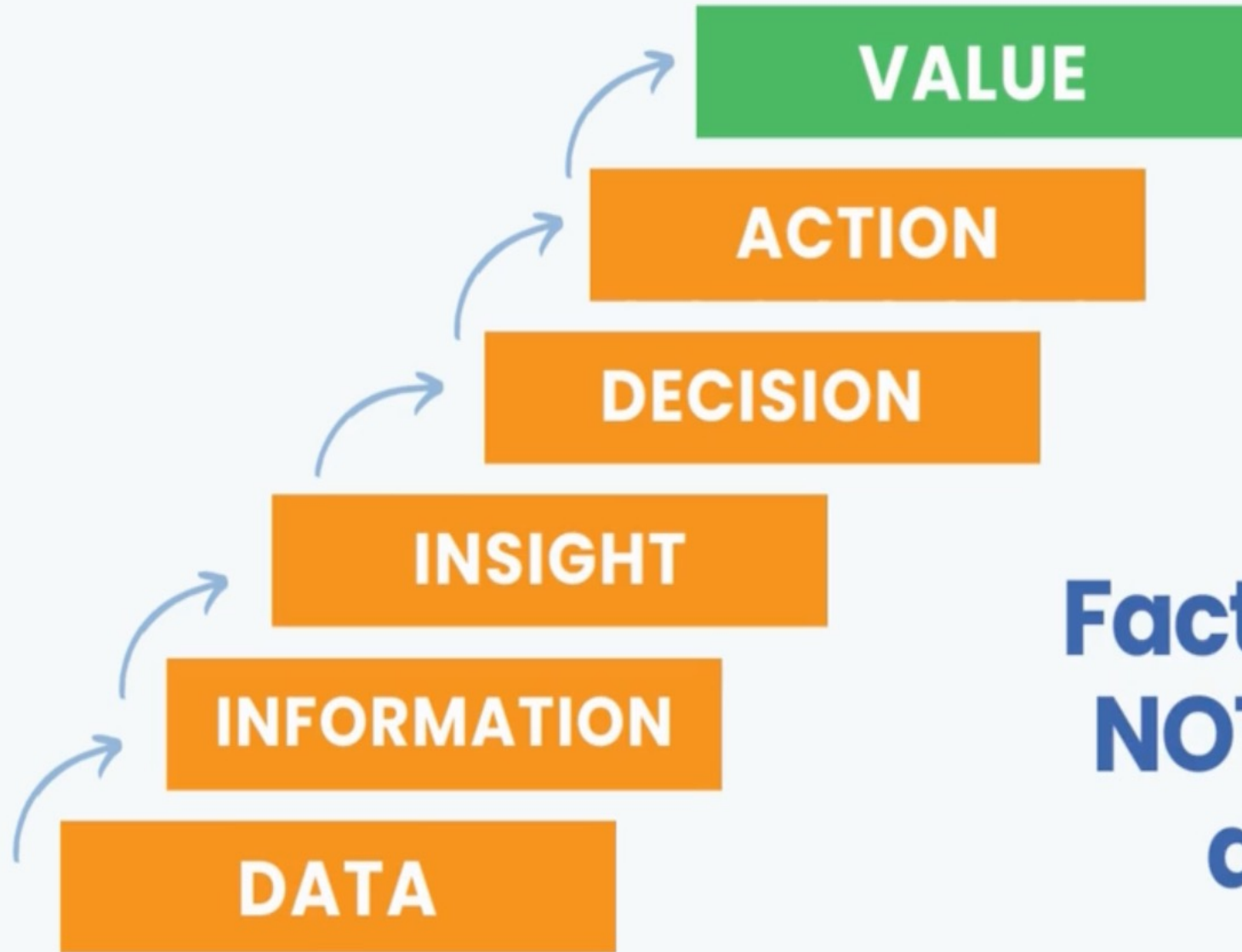
STEPS TO TRANSFORM DATA INTO VALUE



Oversimplified!



STEPS TO TRANSFORM DATA INTO VALUE



**Facts alone will
NOT influence
decision.**



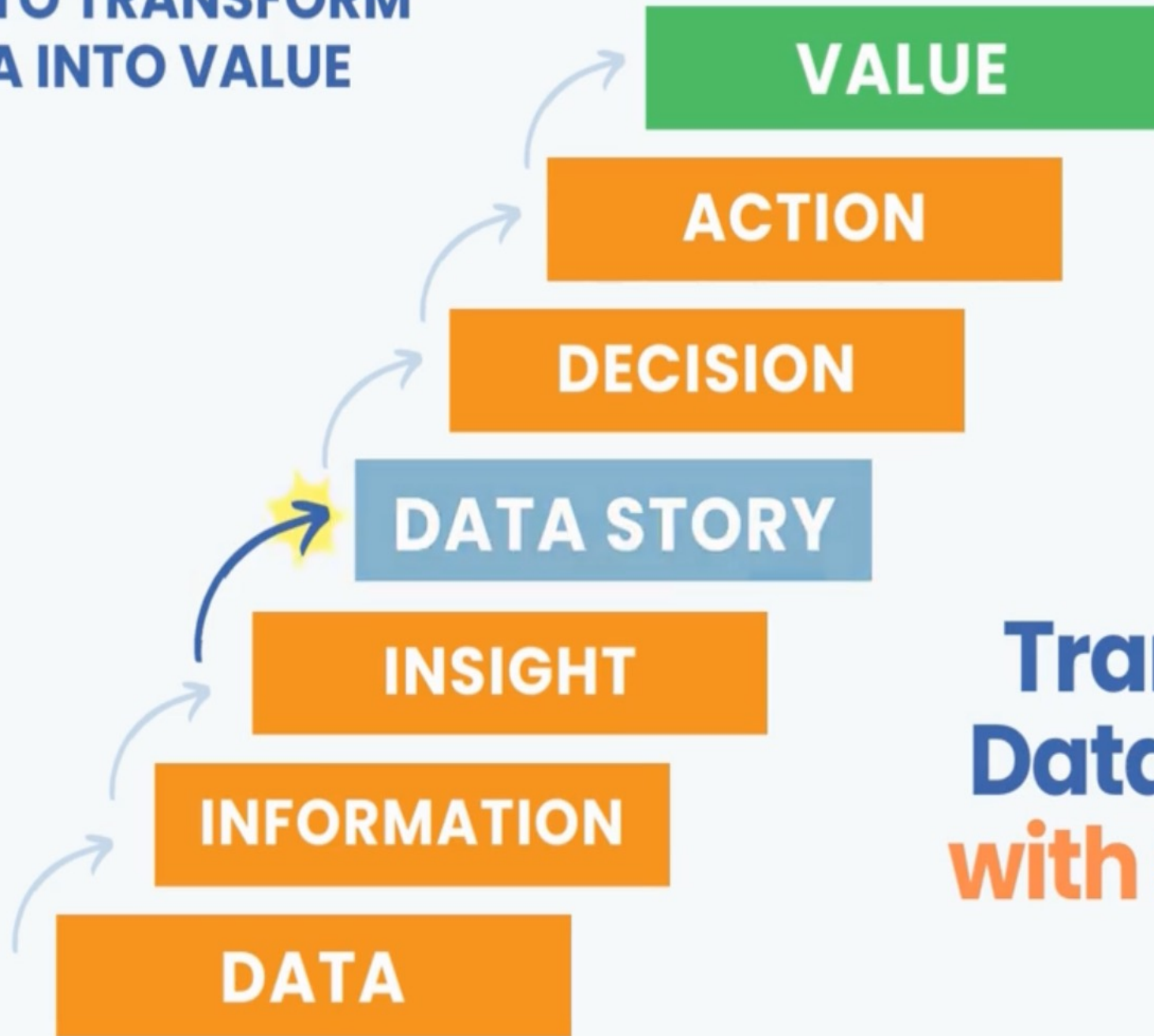
STEPS TO TRANSFORM DATA INTO VALUE



**This is where
Data Storytelling
comes in!**



STEPS TO TRANSFORM DATA INTO VALUE



**Transforming
Data into Value
with Storytelling**



STEPS TO TRANSFORM DATA INTO VALUE



Action.
Change.
Results.





Storytelling can **amplify the power of your data**,
creating a narrative that makes sense to your
audience and **compels them to act.**



**WHAT MAKES UP
A DATA STORY?**



B. From Informing to Communicating

2. Finding Stories in Data with DSV: Data, Story, Visual Diagram

3 Elements of a Data Story



Data



Story



Visual

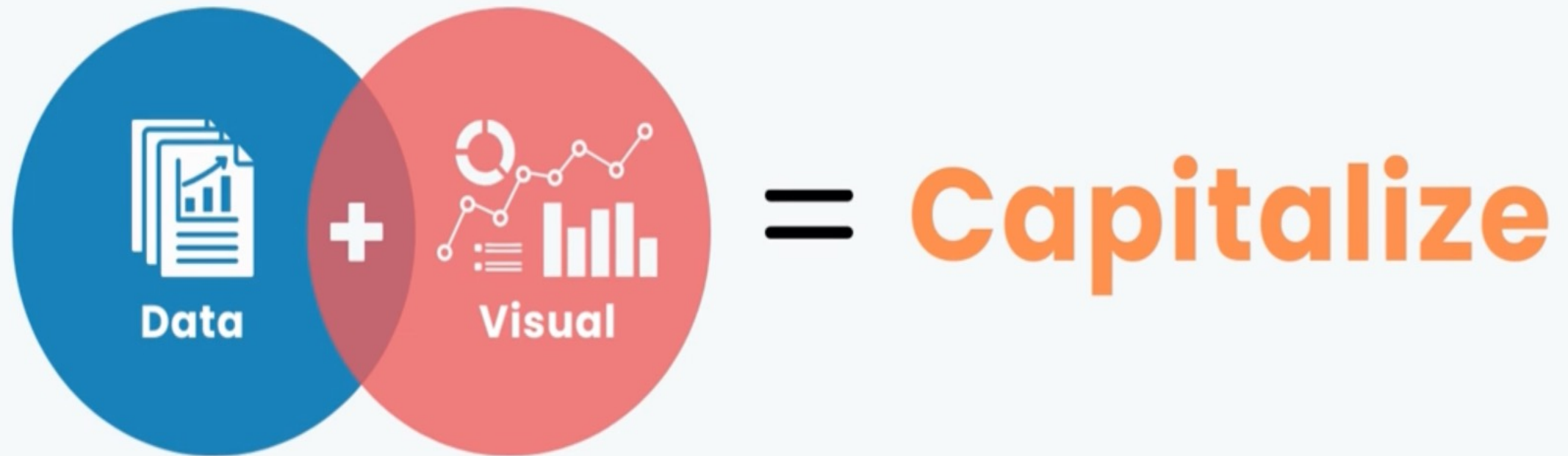
Data, Story, Visual (DSV) Diagram



Data, Story, Visual (DSV) Diagram



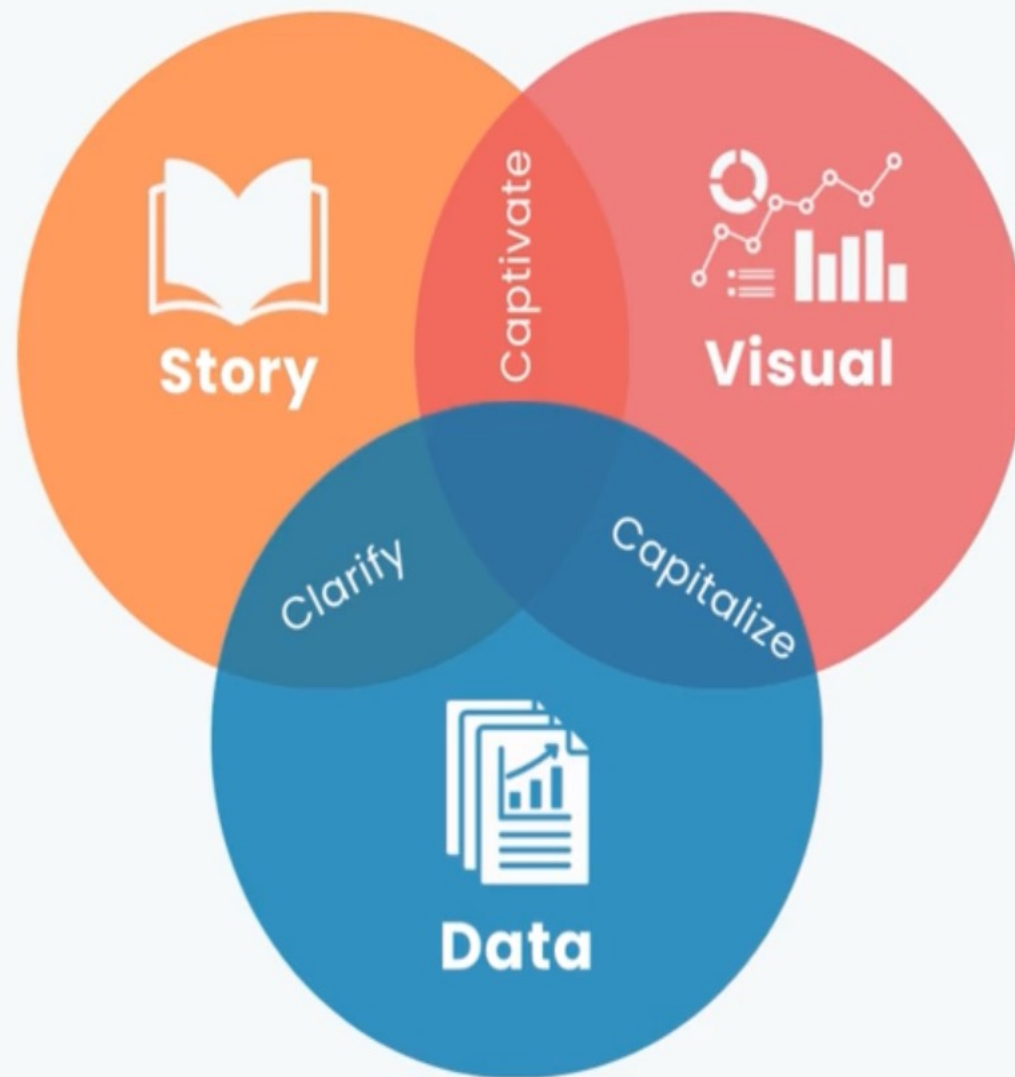
Data, Story, Visual (DSV) Diagram



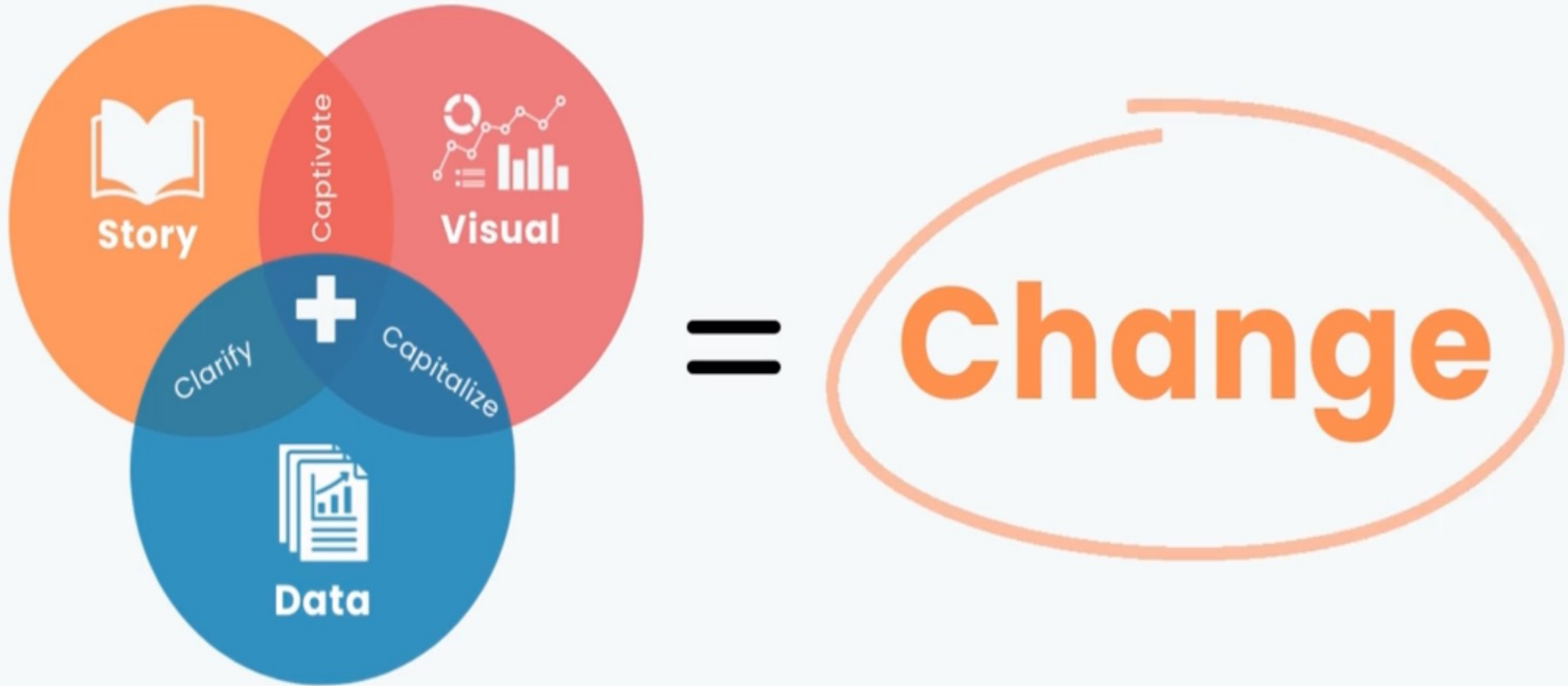
Data, Story, Visual (DSV) Diagram



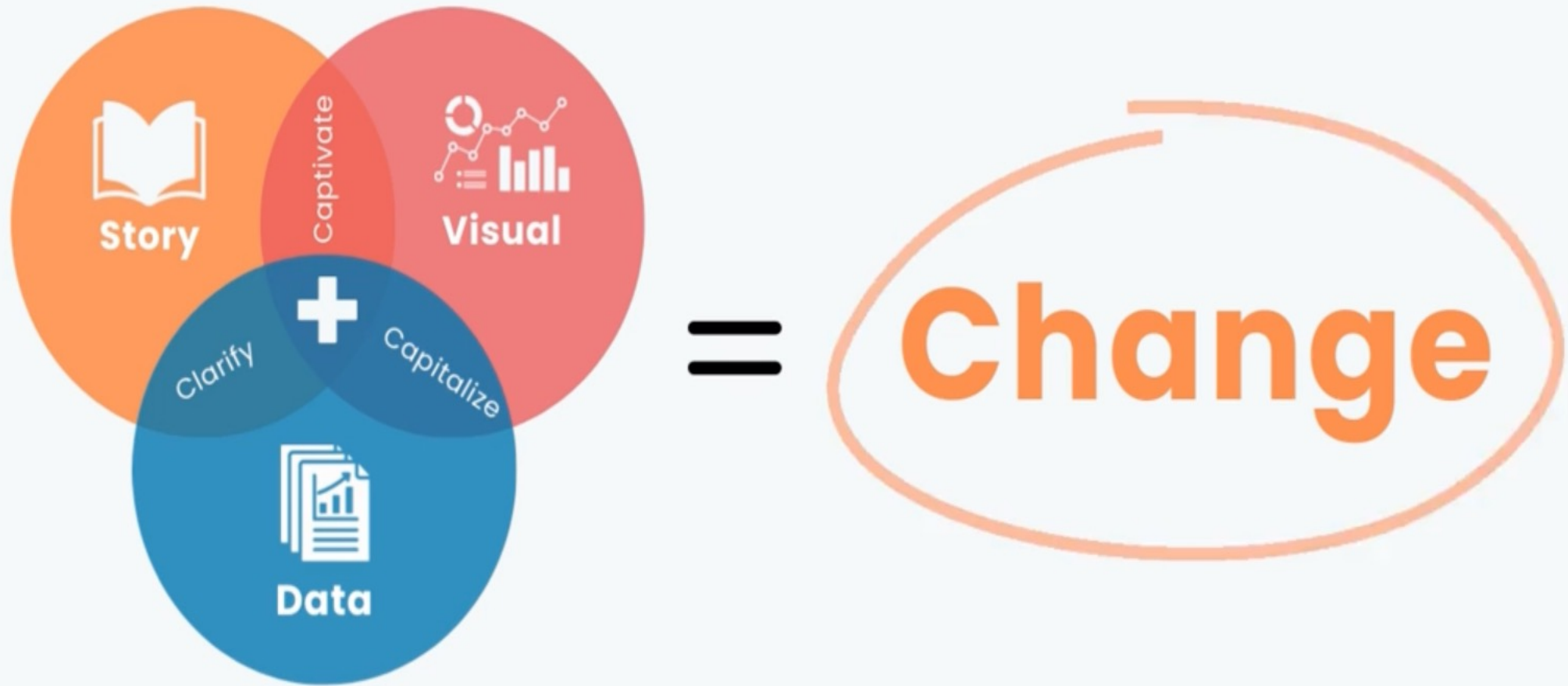
Data, Story, Visual (DSV) Diagram



Data, Story, Visual (DSV) Diagram



Data, Story, Visual (DSV) Diagram



A powerful data story that *influences action* and *drives results*!

Data, Story, Visual (DSV) Diagram



LEARNING ROADMAP:

Navigating Your Path to Success

COMPLETED

Course 1:
**Driving Change
and Action
through Insight**

Course 2:
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Quick Pitstop

**I. Driving Change and
Action through Insight**



LEARNING ROADMAP:

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II. Unearthing the Stories in Data



**Many of us struggle to
bring storytelling into our
everyday business lives.**

Quarterly
Business
Review

Project or
Product
Update

Change
Management
Initiative





MISSED OPPORTUNITY
to make an impact, influence
decisions, and drive business forward!



Storytelling



Storytelling has emerged as a powerful way to humanize the communication of information, **especially in the digital age.**



Data storytelling uses the same core concepts
to better communicate data insights

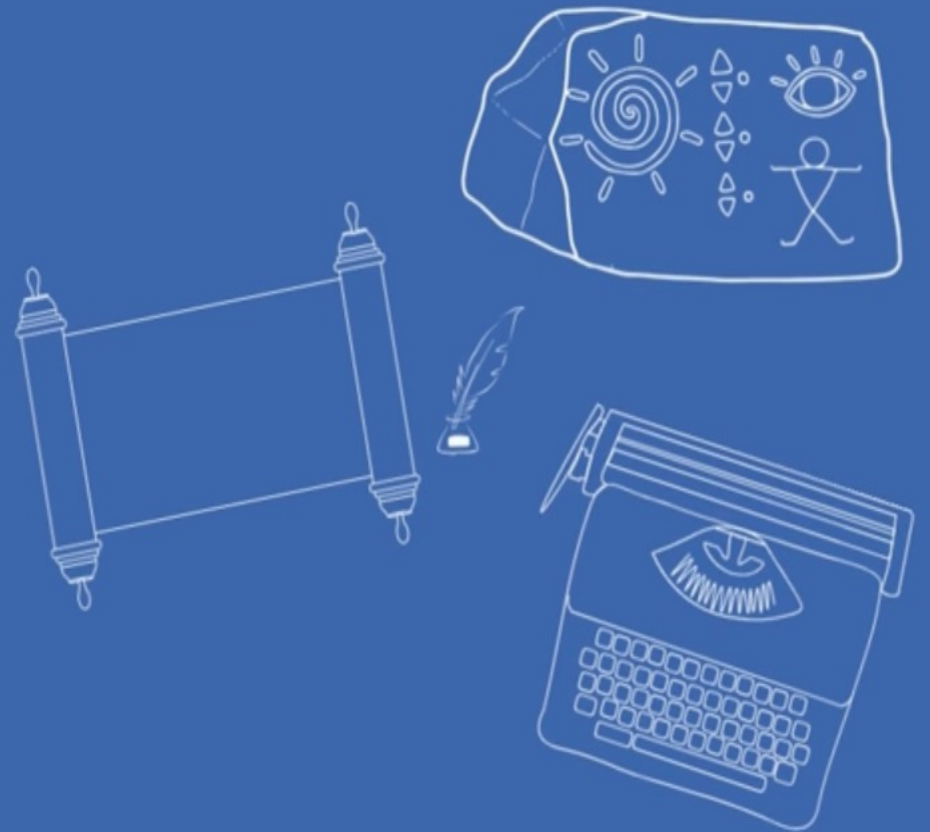


II. Unearthing the Stories in Data

A. Why are Stories Effective?

1.

**Storytelling is the
oldest form of
teaching in history**





Storytelling served as a
mode of **LEARNING**.



Storytelling

Knowledge

Storytelling

Cultural
Standards

Moral Values

Social Bonds



Digital Age

Stories continue to appeal to us just as much as they did to our ancient ancestors.

2.

**Human brains are
hardwired to understand
information through stories**





**Our brains prefer stories
over pure data.**



**Our brains prefer stories
over pure data.**



Remember!

Decisions are not only based on logic, but **emotion as well.**





Excellent storytellers see the value in data, not just as a dump of information, but for the **meaning and insights they bring to a story.**


3.

**Stories are more
persuasive than
statistics**





Storytelling = a powerful delivery mechanism
for sharing insights and ideas



More **Memorable**
and **Persuasive**
than just pure facts

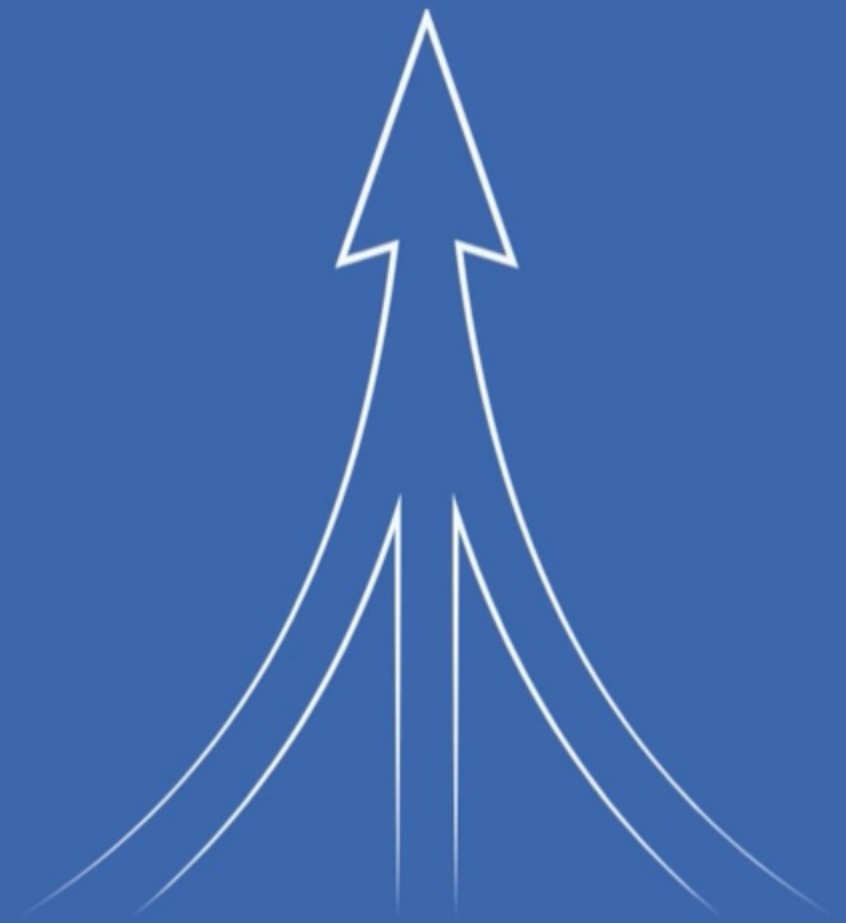


A ***story*** that connects emotionally with an audience is **far more engaging** than a barrage of ***statistics***.



4.

**Data stories
drive action**





How **effectively** you
communicate an insight can be
measured by **what effect it has**
on your audience.



How **effectively** you
communicate an insight can be
measured by **what effect it has**
on your audience.



Drive Action



4 Key Objectives for Data Communication

4 Key Objectives for Data Communication



Capture



Understand



Recall

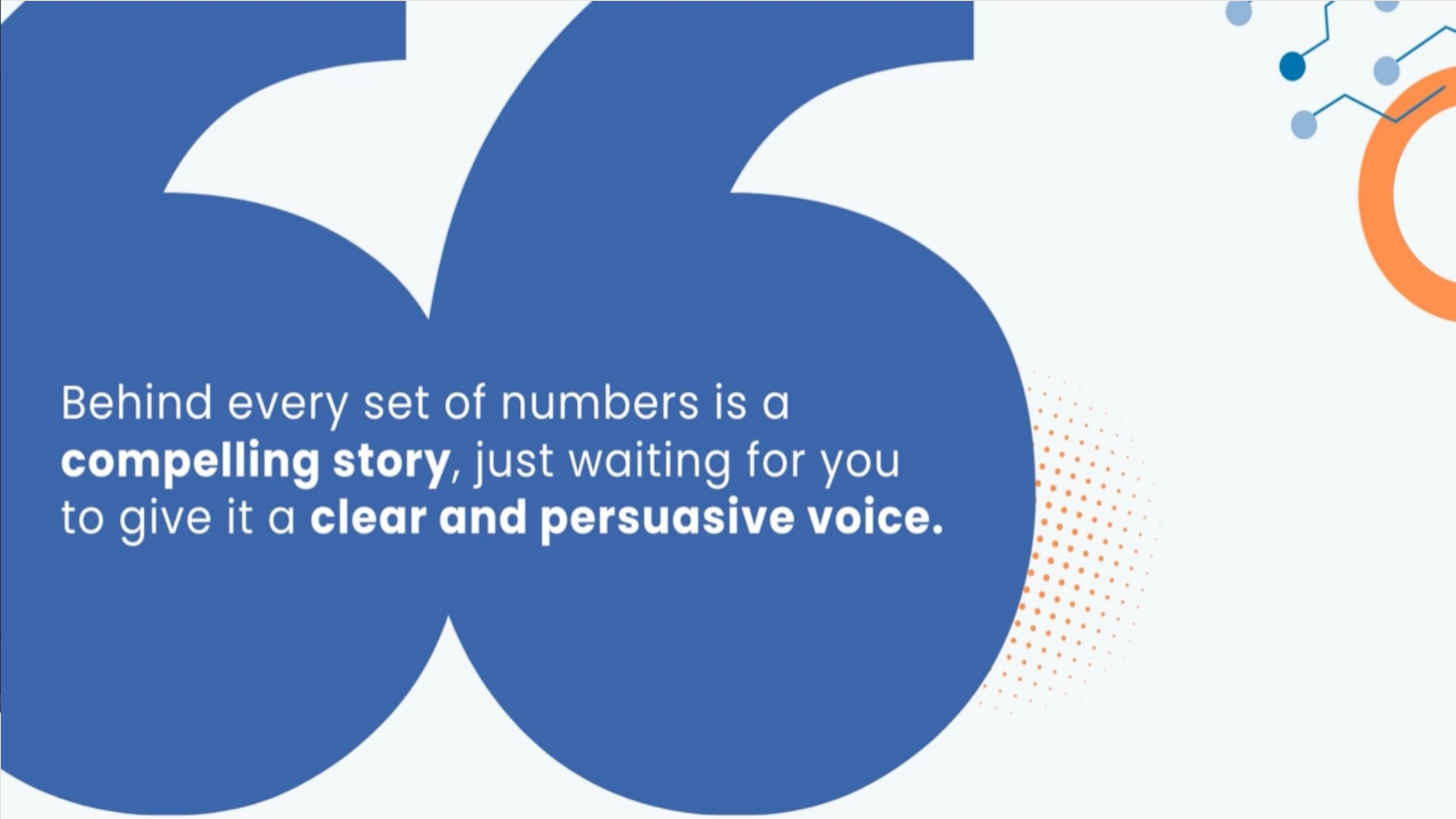


Act



II. Unearthing the Stories in Data

B. Defining Data Storytelling

The background features a large blue shape on the left containing white text. To the right, there is a decorative orange and white dotted pattern. In the top right corner, there is a network diagram with blue nodes and lines, and a large orange circle.

Behind every set of numbers is a
compelling story, just waiting for you
to give it a **clear and persuasive voice.**



What is Data Storytelling?

What is Data Storytelling?

Data storytelling is a structured approach for communicating data insights



Data



Story



Visual



Data Storytelling

The practice of using **data and analytics** to deliver a **compelling story**, strengthened by **visuals** that emphasize what's **important**, while keeping things **simple** and **free of bias**, in order to create a **deep understanding** of the insight, and **inspire action** leading to **desired outcomes**.



Data Storytelling

APPROACH \neq *Sophisticated, Advanced*

You're there to take the data you have, and make it **simple, understandable**, and **convincing** to your audience.



C. Data Storytelling: When is it Best to Use?



**Not all insights need to be
crafted into narratives.**



**DATA STORYTELLING
IS NECESSARY IN THE
STORY SPACE**

DATA STORYTELLING IS NECESSARY IN THE STORY SPACE.



Insight falls *within* Story Zone = **USE DATA STORY**



Complexity

Value

HARD + MID-HIGH =

Data Story is **required** (Story Space)



Insight falls **outside** Story Zone =

DATA STORY NOT NECESSARY





II. Unearthing the Stories in Data

D. Bad vs. Good Data Storytelling

3 Elements of a Data Story



Data



Story



Visual

Must follow the **CORRECT ORDER!**

The Data Story Sequence



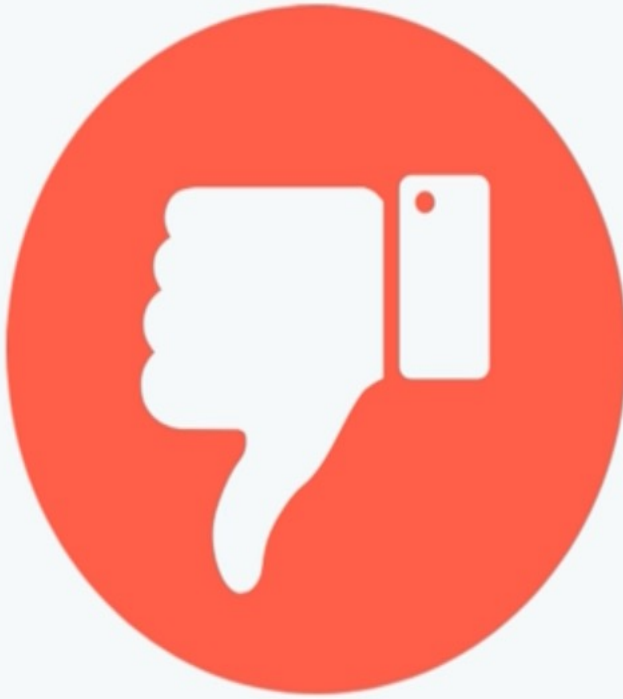
Data



Story



Visual



D. Bad vs. Good Data Storytelling

1. Bad Data Storytelling



Not all data is
communicated through
impactful stories and
effective visuals



Data Storytelling
requires ample
knowledge, skill,
and **practice.**

**FAILURE TO
INSPIRE ACTION**

=

**FAILURE TO
COMMUNICATE
YOUR DATA STORY**



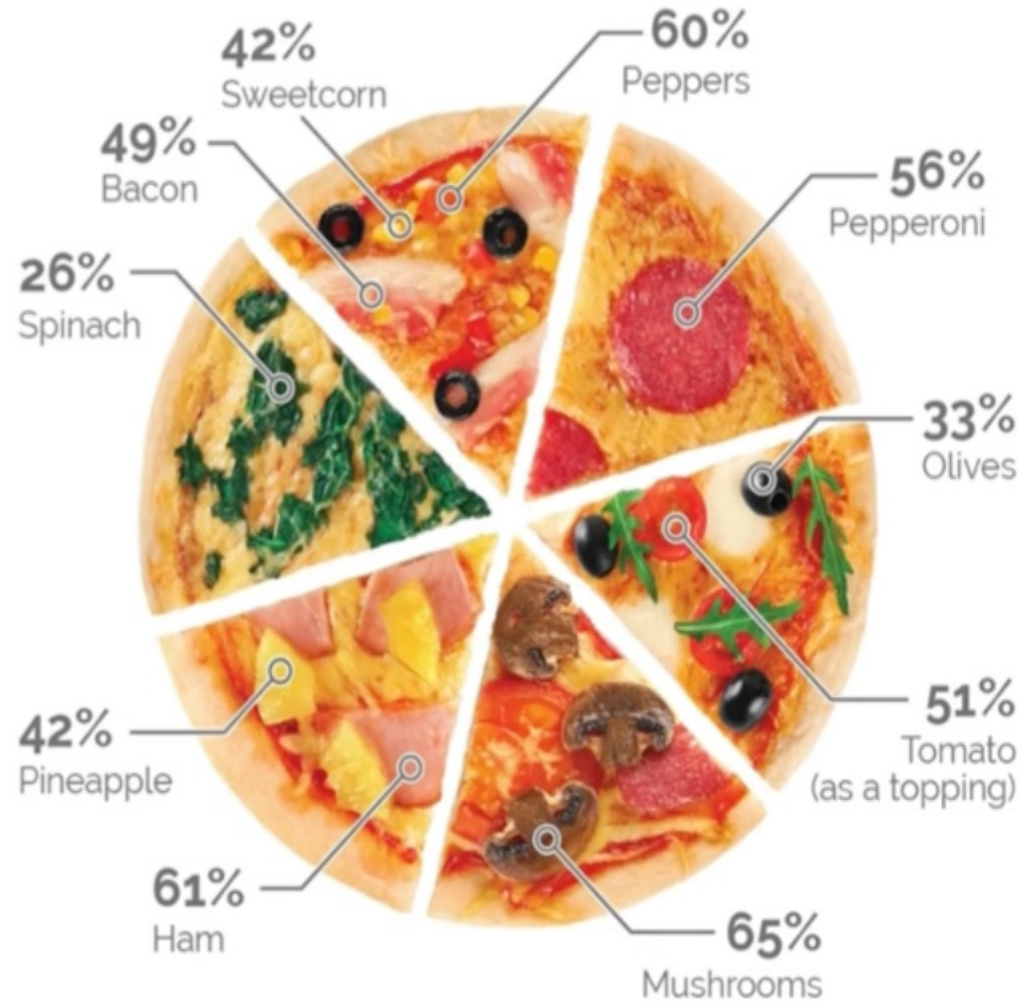
Bad Data **Storytelling** **Examples**



Pizza Topping Pie Chart

Mushroom is the UK's most liked pizza topping

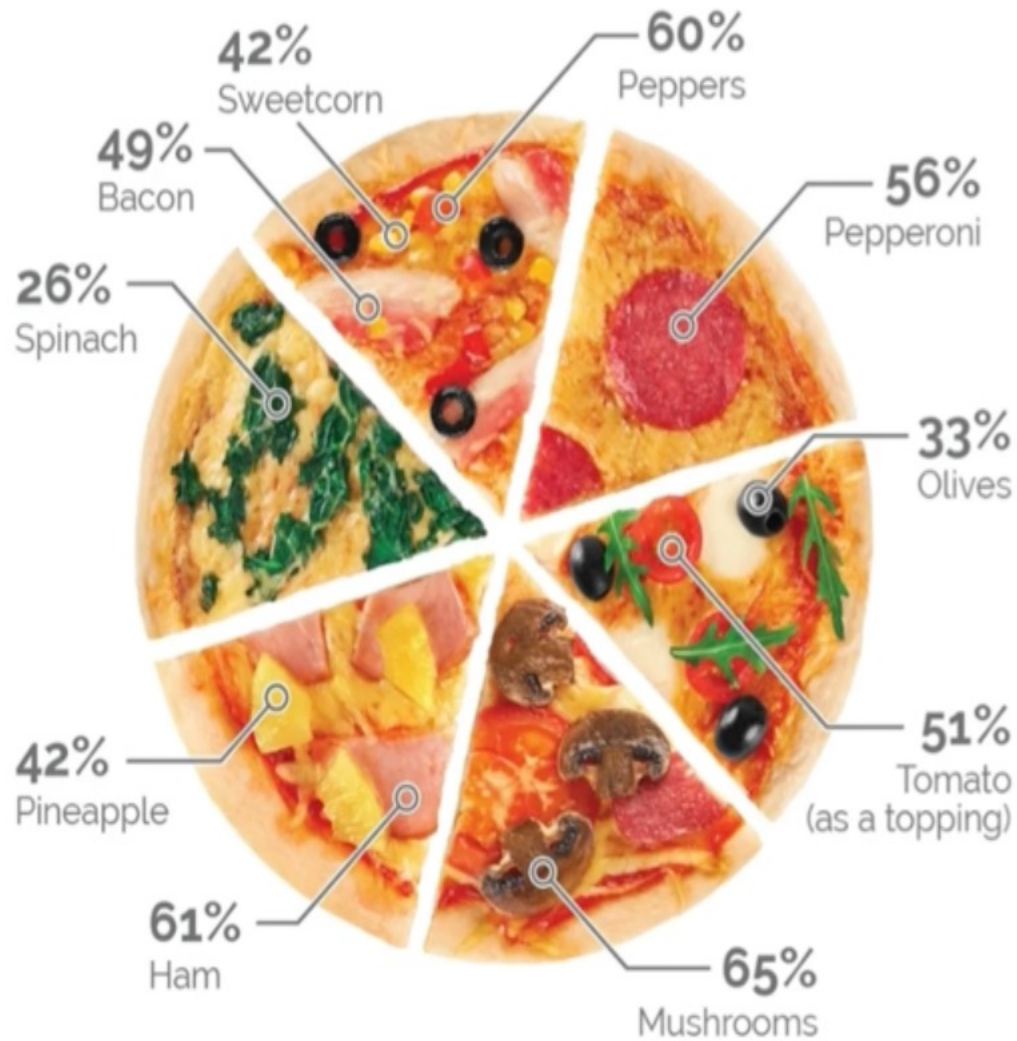
Generally speaking, which of the following toppings do you like on a pizza? Select as many as you like



Other items not depicted include: onions (62%), chicken (56%), beef (36%), chillies (31%), jalapeños (30%), pork (25%), tuna (22%), anchovies (18%). 2% of people say they only like Margherita pizzas

Mushroom is the UK's most liked pizza topping

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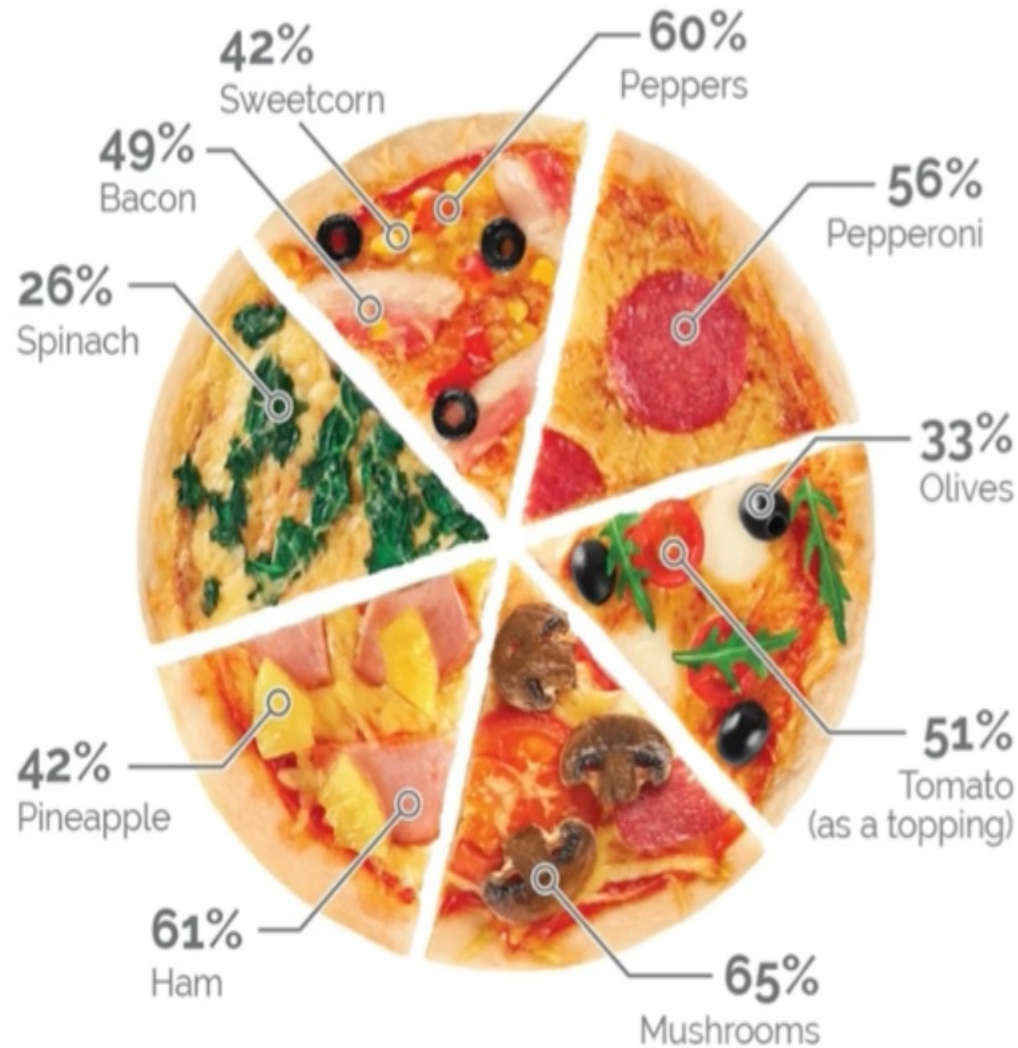
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Pizza Topping Pie Chart

Nice pizza graphic...

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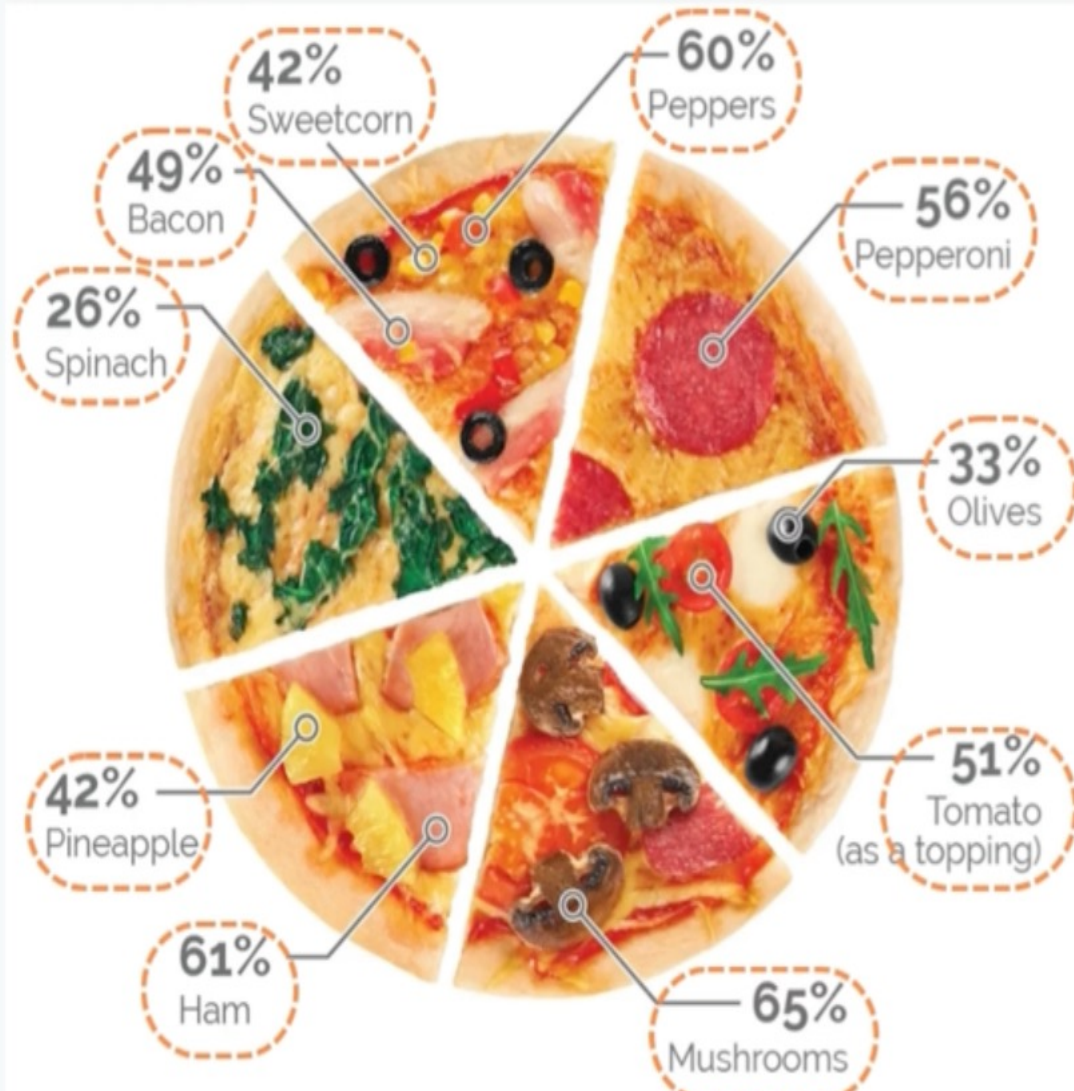
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Pizza Topping Pie Chart

Nice pizza graphic?
**but this pie-chart
doesn't make sense!**

Mushroom is the UK's most liked pizza topping

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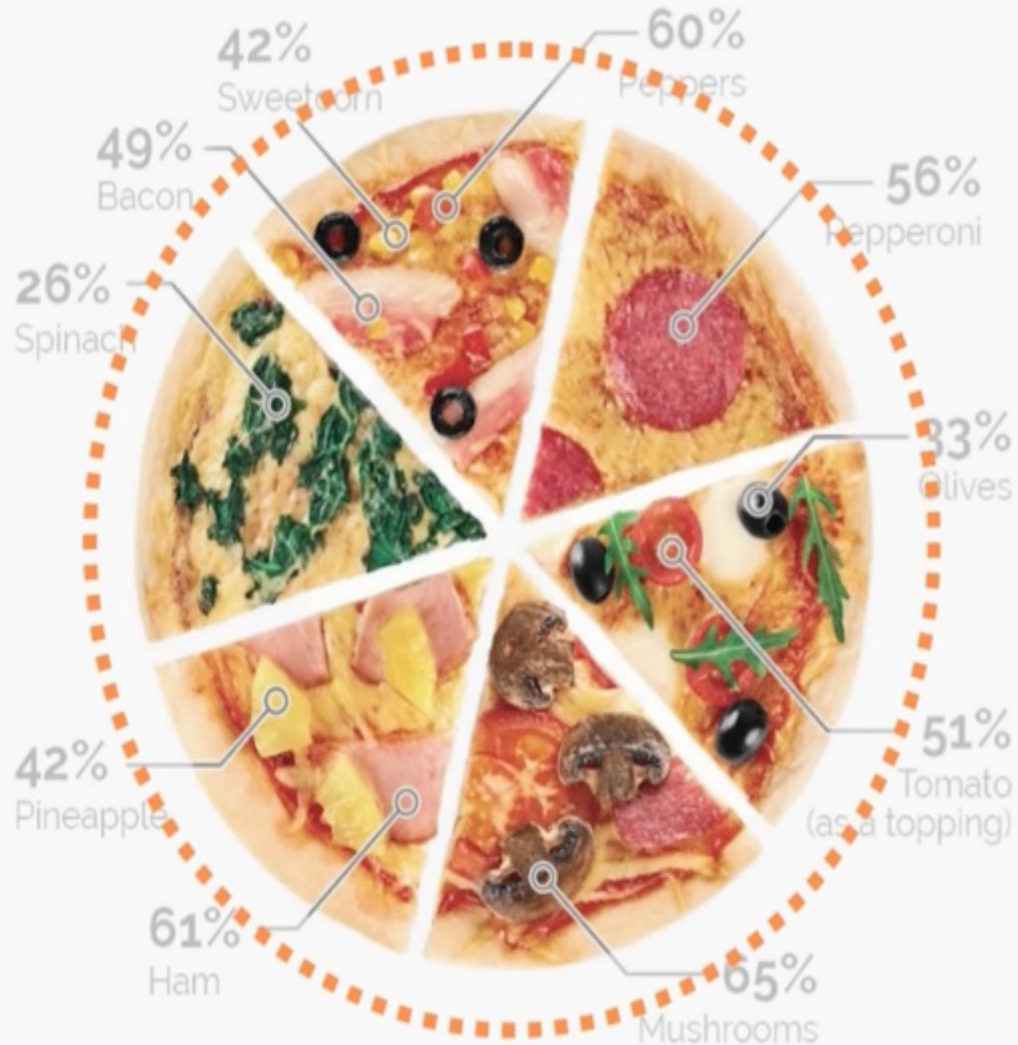
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Pizza Topping Pie Chart

- Percentage of toppings are confusing; **don't add up to 100%**

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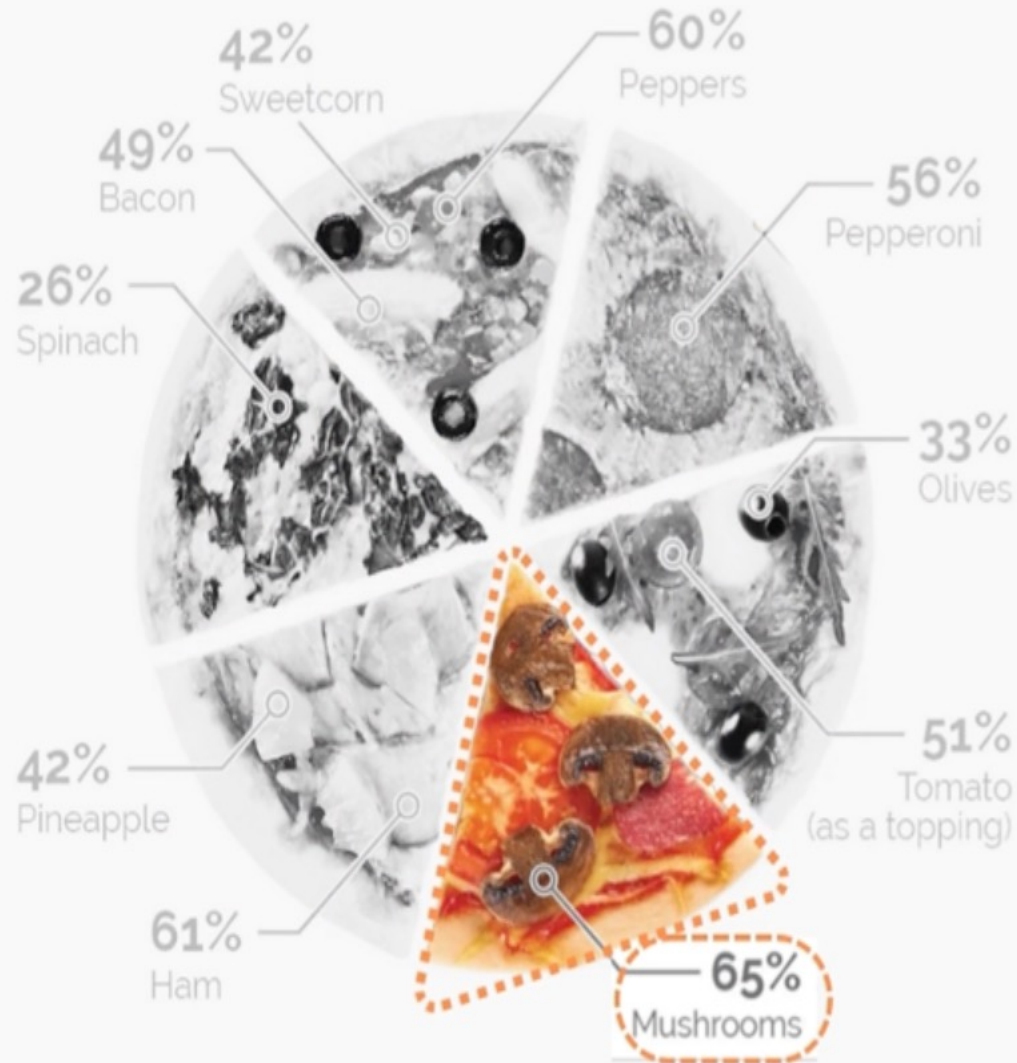
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Pizza Topping Pie Chart

- Percentage of toppings are confusing; **don't add up to 100%**
- Pizza graphic **conflicts** with pie chart function

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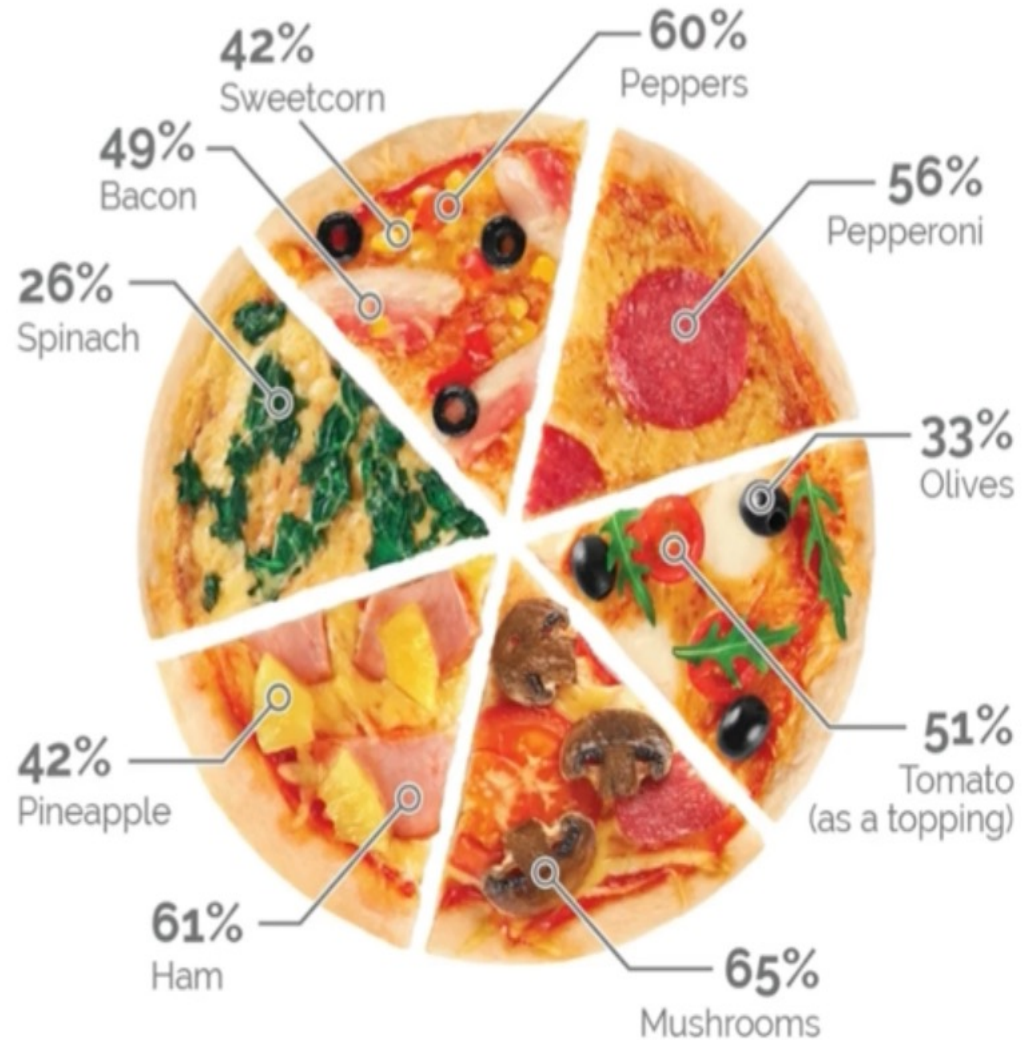
Pizza Topping Pie Chart

- Percentage of toppings are confusing; **don't add up to 100%**
- Pizza graphic **conflicts** with pie chart function
- Sizes of the slices do not reflect the percentages

Pizza Topping Pie Chart

Mushroom is the UK's most liked pizza topping

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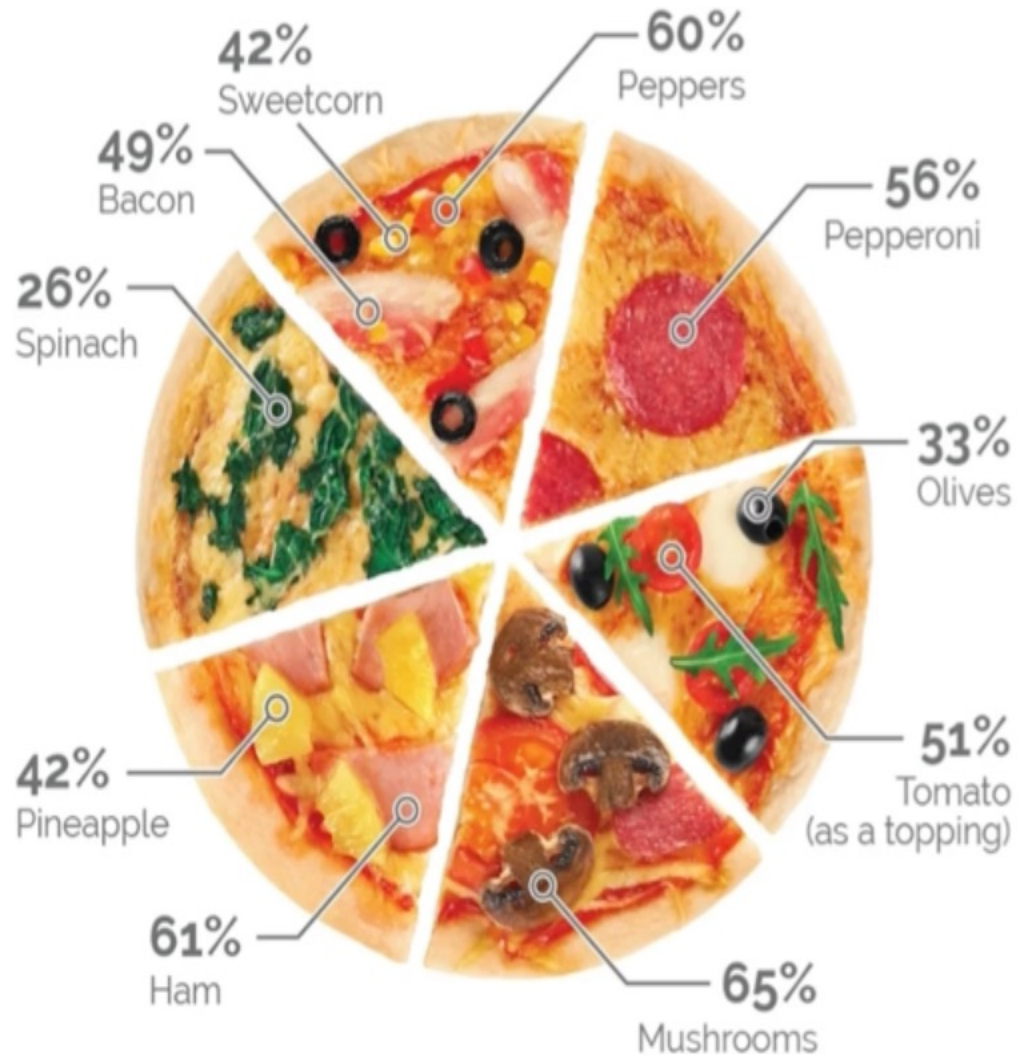


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Pizza Topping Pie Chart

~~DATA STORY SEQUENCE~~

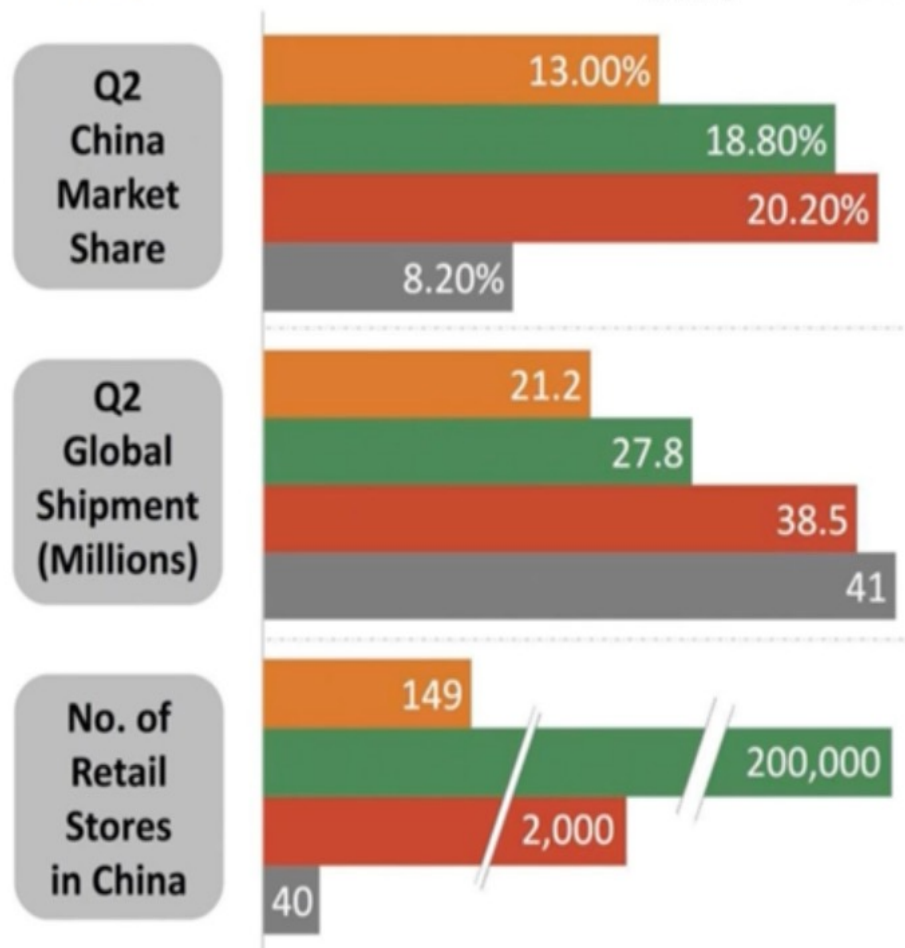
~~Data → Story → Visual~~

Visual was prioritized over **Story**

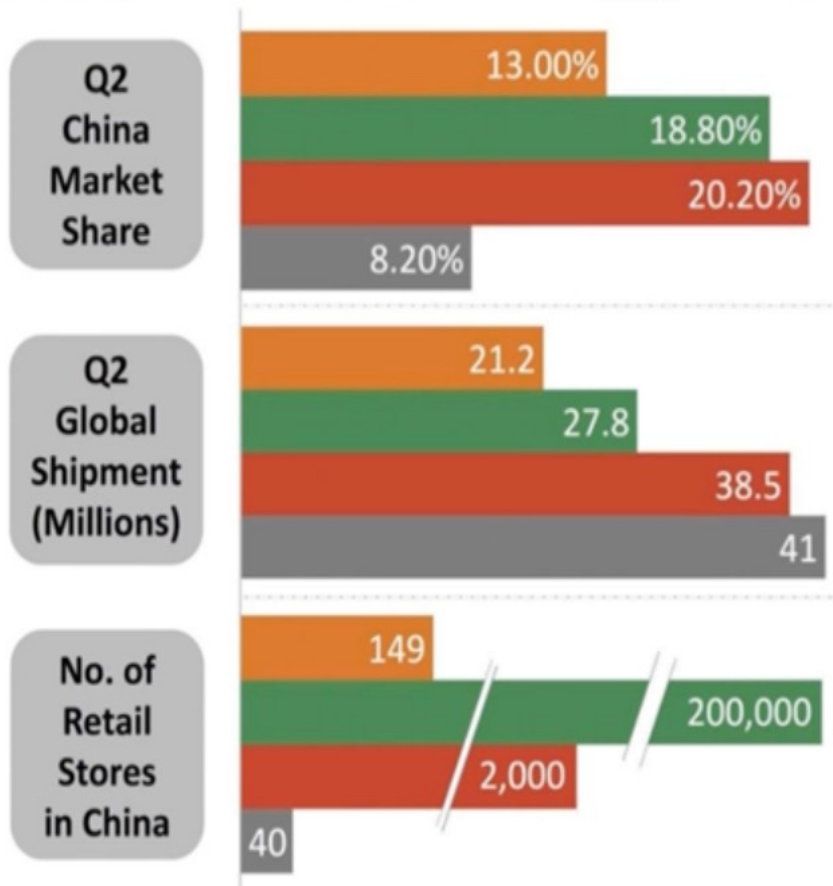
Xiaomi vs. World's Biggest Smartphone Makers



How **Xiaomi** Stacks Up Against The World's Biggest Smartphone Makers



How **Xiaomi** Stacks Up Against The World's Biggest Smartphone Makers



Source: Counterpoint Research, IDC, Xiaomi, Apple, Huawei, Chinese Media Reports

Forbes

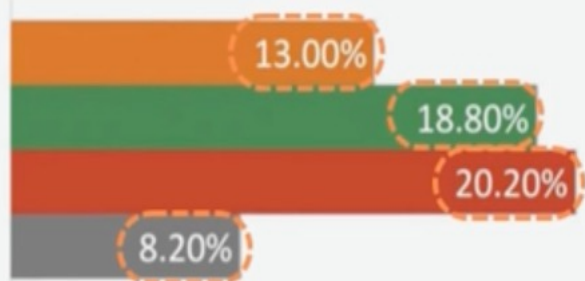
**Xiaomi vs. World's Biggest
Smartphone Makers**

An **existing agenda**
(Xiaomi vs. Other Brands)
can affect **how the data**
is presented!

How **Xiaomi** Stacks Up Against The World's Biggest Smartphone Makers



Q2
China
Market
Share



Q2
Global
Shipment
(Millions)



No. of
Retail
Stores
in China



Source: Counterpoint Research, IDC, Xiaomi, Apple, Huawei, Chinese Media Reports

Forbes

Xiaomi vs. World's Biggest Smartphone Makers

- **Market Share:** Doesn't total 100%. Data was excluded.

How **Xiaomi** Stacks Up Against The World's Biggest Smartphone Makers



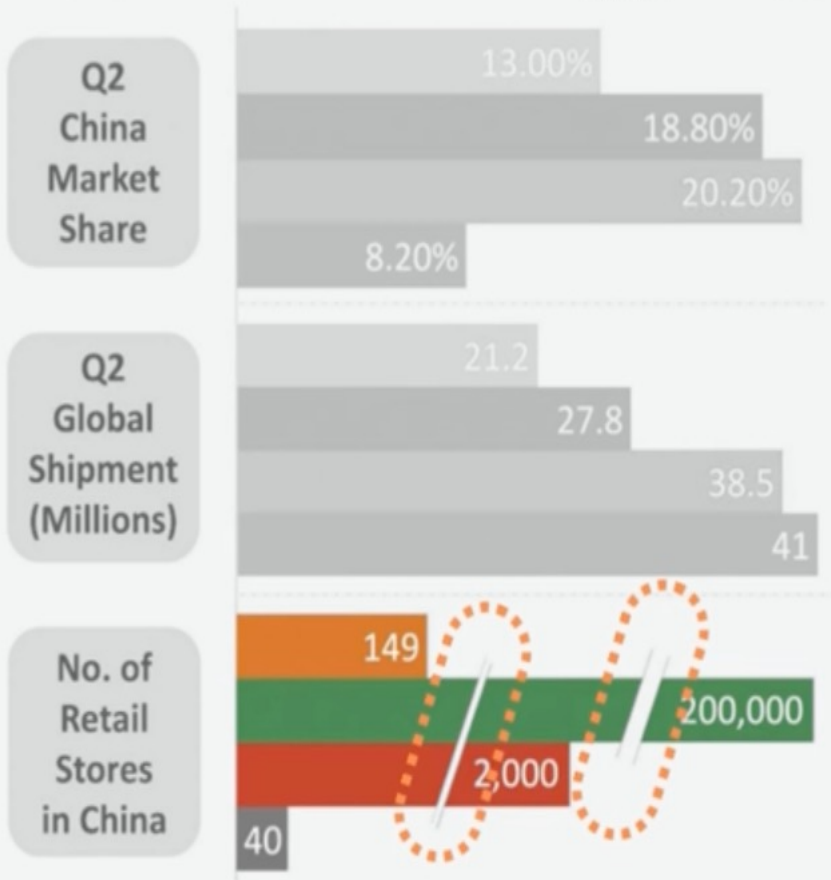
Source: Counterpoint Research, IDC, Xiaomi, Apple, Huawei, Chinese Media Reports

Forbes

Xiaomi vs. World's Biggest Smartphone Makers

- **Market Share:** Doesn't total 100%. Data was excluded.
- **Global Shipment:** Labels not clear. Millions of what?

How **Xiaomi** Stacks Up Against The World's Biggest Smartphone Makers



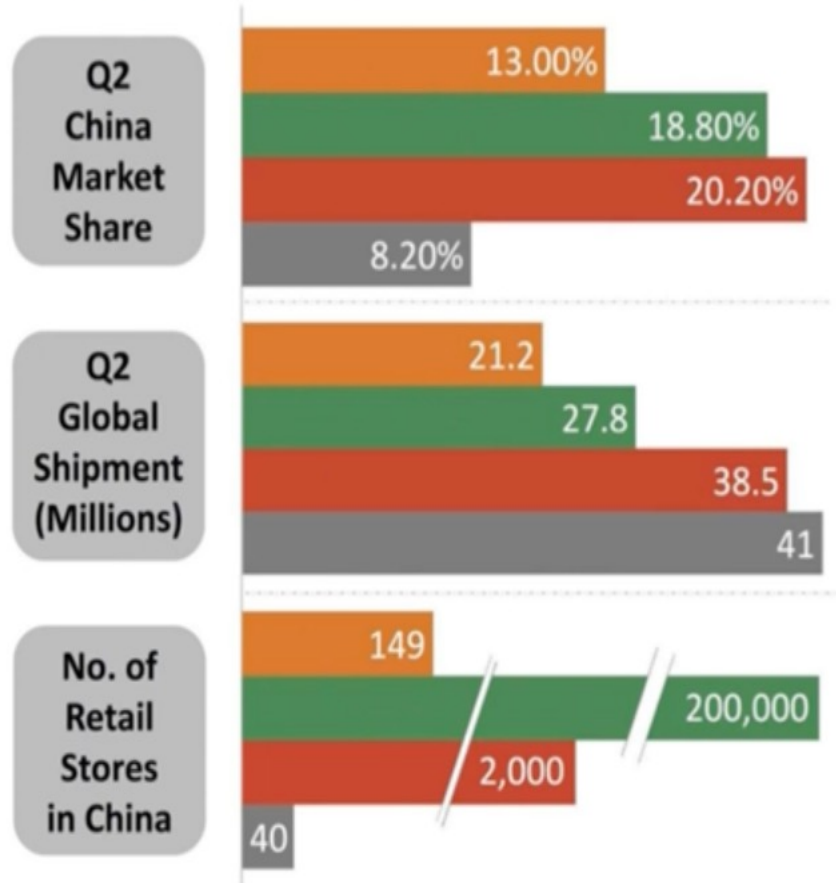
Source: Counterpoint Research, IDC, Xiaomi, Apple, Huawei, Chinese Media Reports

Forbes

Xiaomi vs. World's Biggest Smartphone Makers

- **Market Share:** Doesn't total 100%. Data was excluded.
- **Global Shipment:** Labels not clear. Millions of what?
- **Retail Stores:** Slashes placed on bars. Graph is not to scale.

How **Xiaomi** Stacks Up Against The World's Biggest Smartphone Makers



Source: Counterpoint Research, IDC, Xiaomi, Apple, Huawei, Chinese Media Reports

Forbes

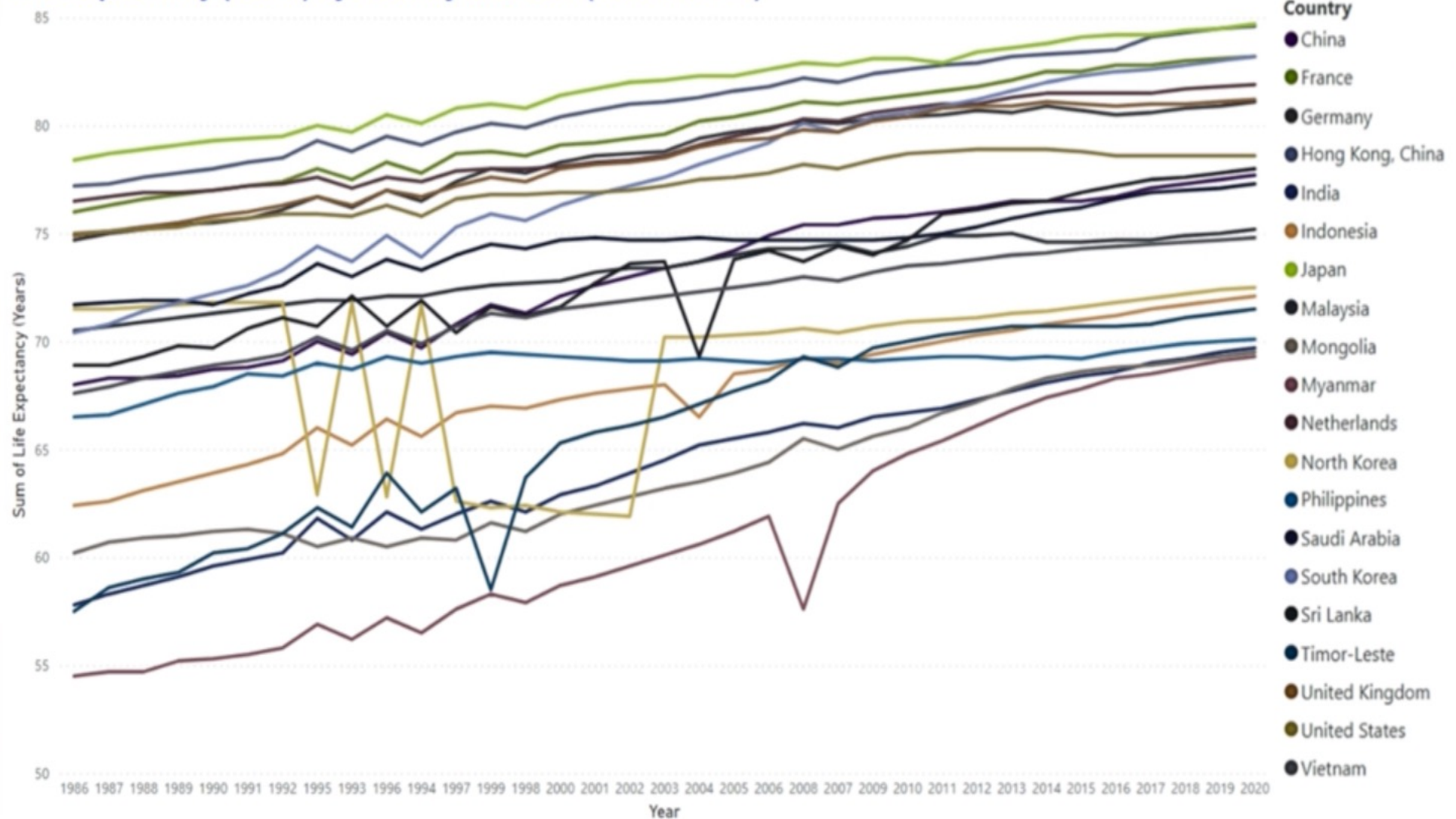
Xiaomi vs. World's Biggest Smartphone Makers

~~DATA STORY SEQUENCE
(Data → Story → Visual)~~

Story was prioritized over **Data**

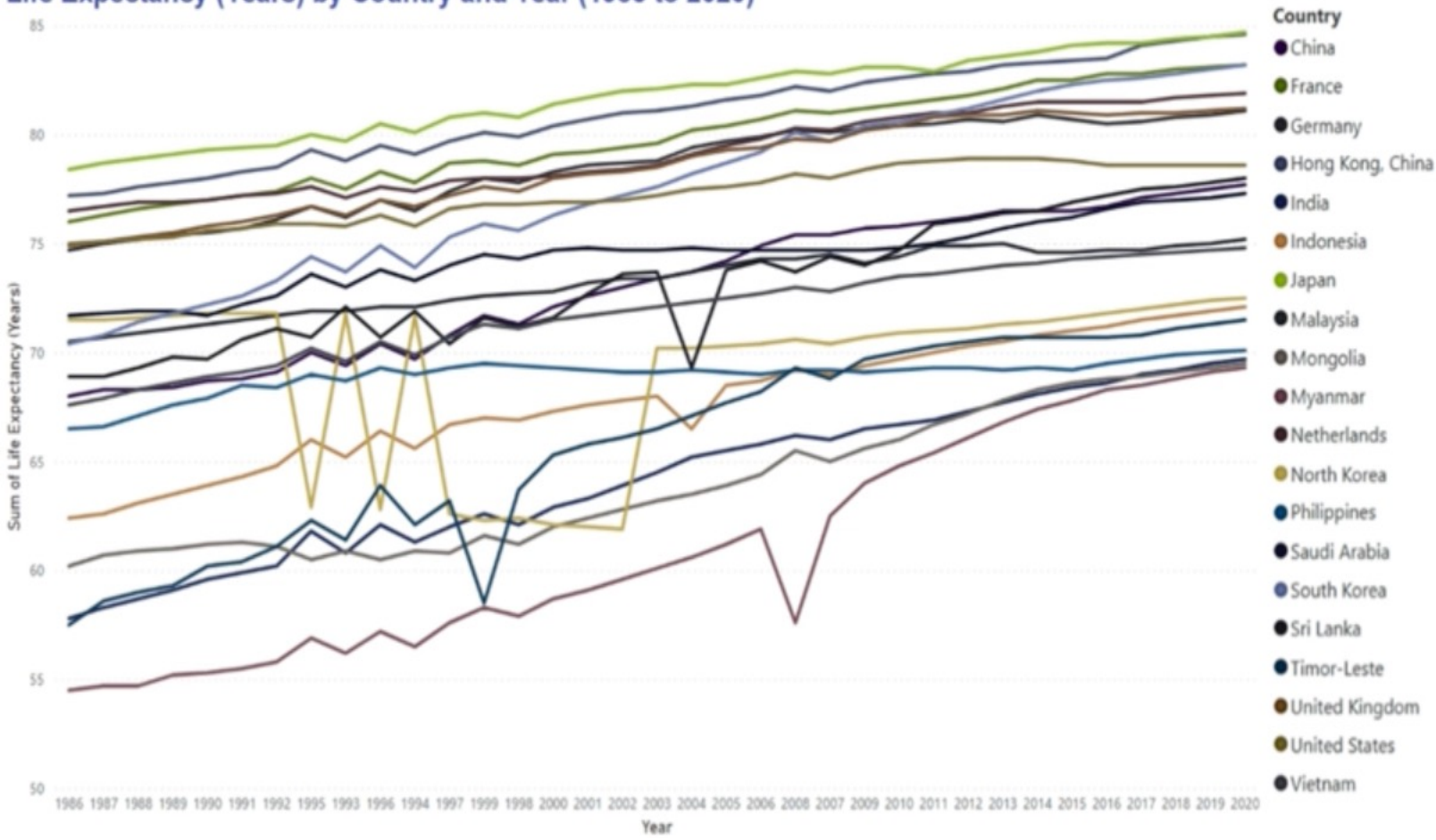
Life Expectancy by Country and Year

Life Expectancy (Years) by Country and Year (1985 to 2020)



Life Expectancy by Country and Year

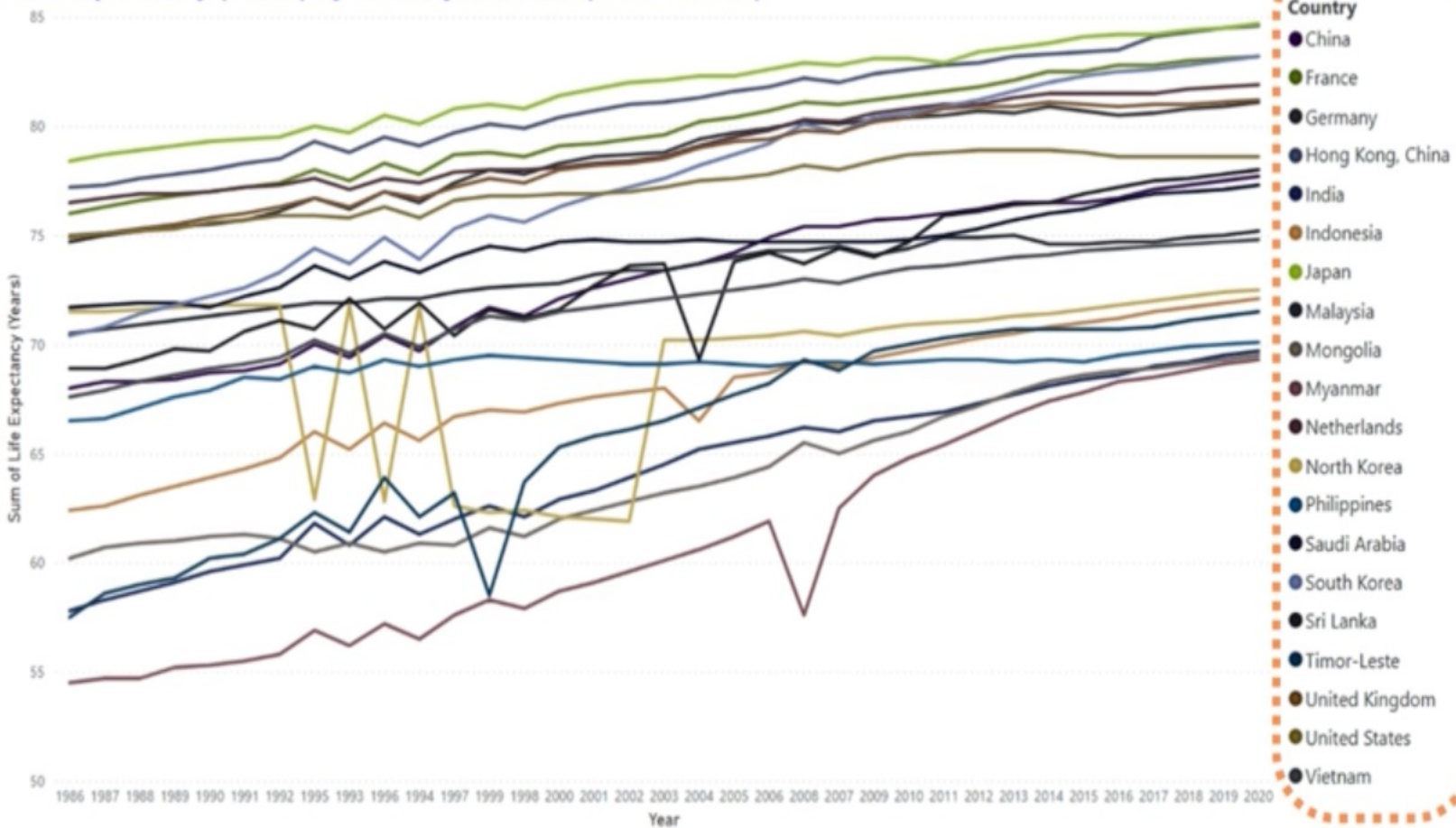
Life Expectancy (Years) by Country and Year (1985 to 2020)



Just because you **CAN** fit everything on one chart, doesn't mean you **SHOULD!**

Life Expectancy by Country and Year

Life Expectancy (Years) by Country and Year (1985 to 2020)

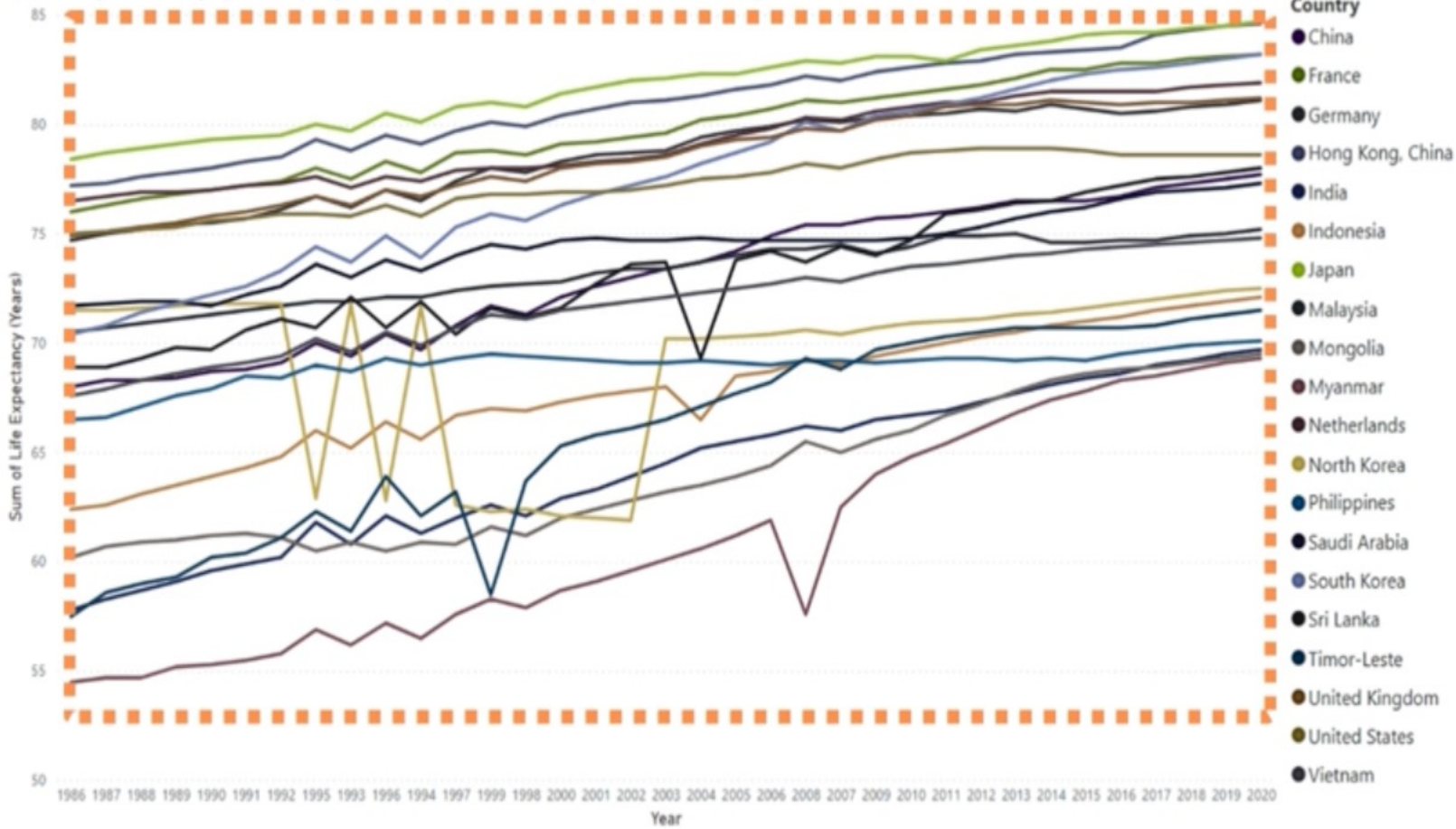


- Overloaded with way too many series (20 countries)



Life Expectancy by Country and Year

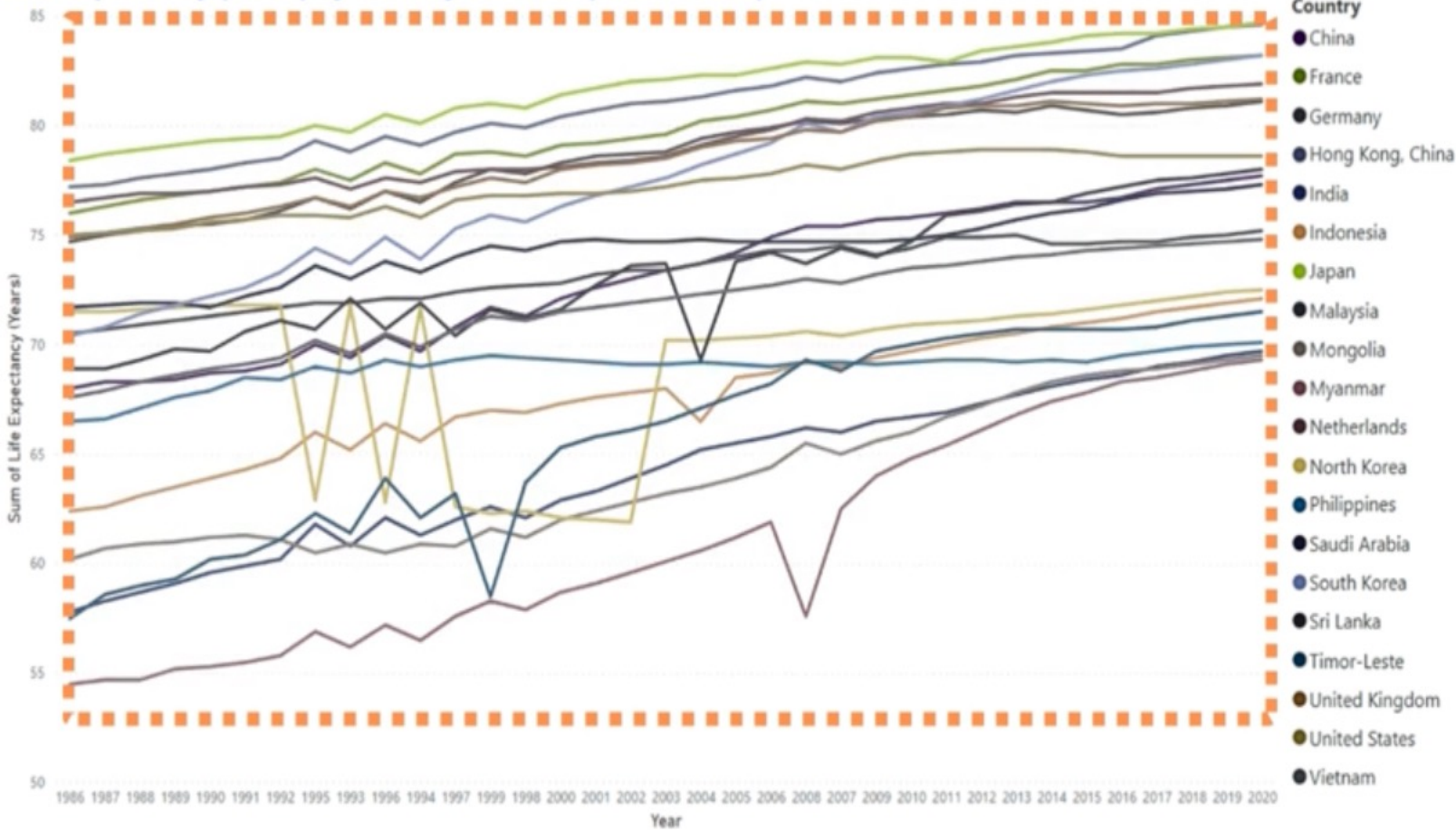
Life Expectancy (Years) by Country and Year (1985 to 2020)



- Overloaded with way too many series (20 countries)
- Different lines overlap, values are hard to identify

Life Expectancy by Country and Year

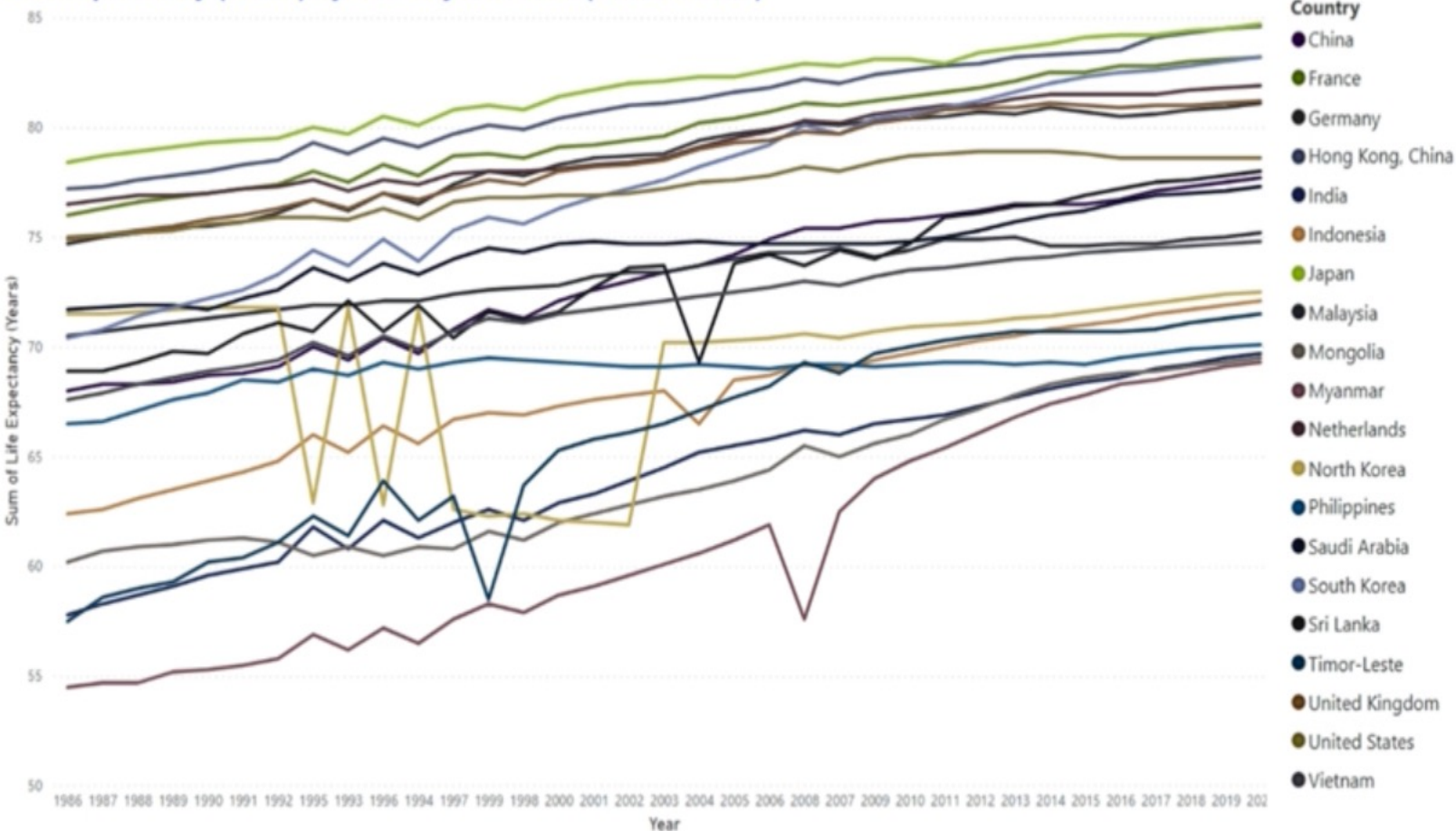
Life Expectancy (Years) by Country and Year (1985 to 2020)



- Overloaded with way too many series (20 countries)
- Different lines overlap, values are hard to identify
- Too many similar colors, hard to distinguish and compare

Life Expectancy by Country and Year

Life Expectancy (Years) by Country and Year (1985 to 2020)



~~DATA STORY SEQUENCE~~
(Data → Story → Visual)

Data was prioritized without giving importance to the **Story** and the **Visual**.

When the **story** is not extracted based on the **data** and the **visual** is not designed to tell the story, you'll run into different sorts of problems.



Data



Story



Visual



D. Bad vs. Good Data Storytelling

2. Good Data Storytelling



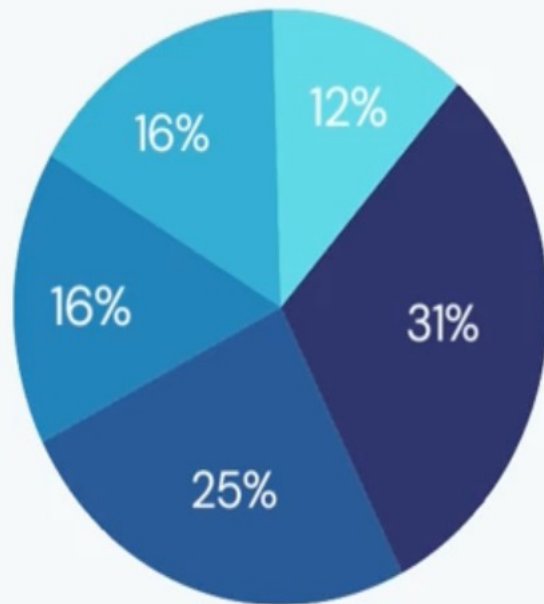
Good Data Storytelling Examples



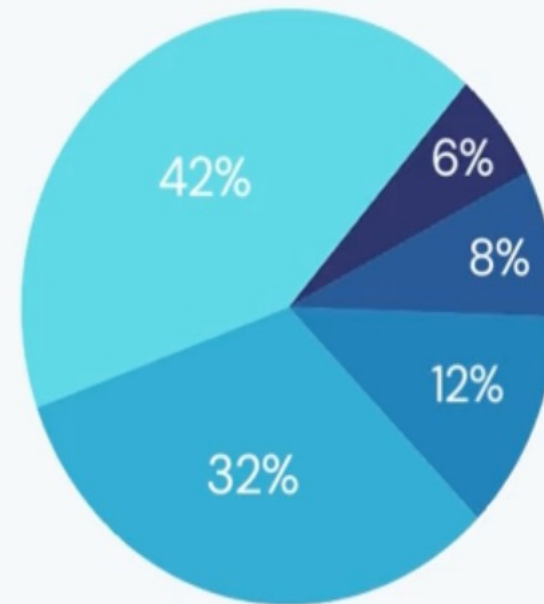
Data Science Workshop Feedback

Data Science Workshop Feedback Survey

Interest in Data Science
BEFORE the workshop



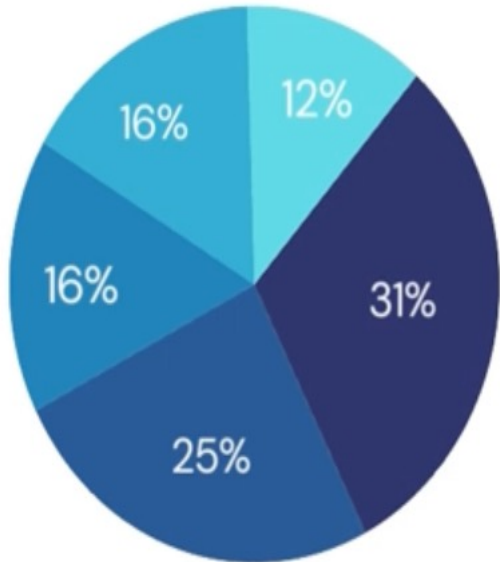
Interest in Data Science
AFTER the workshop



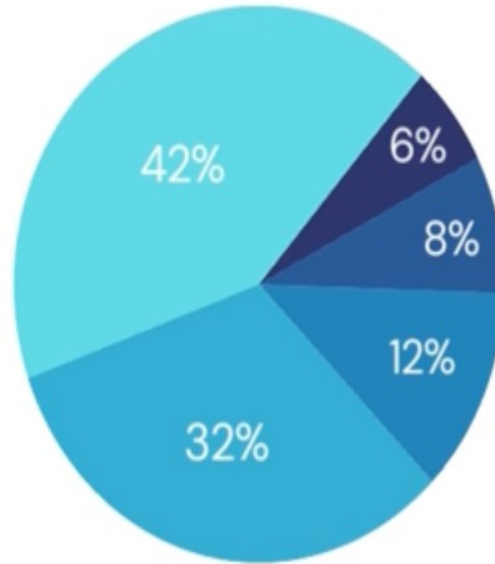
■ Bored ■ Not great ■ OK ■ Kind of Interested ■ Excited

Data Science Workshop Feedback Survey

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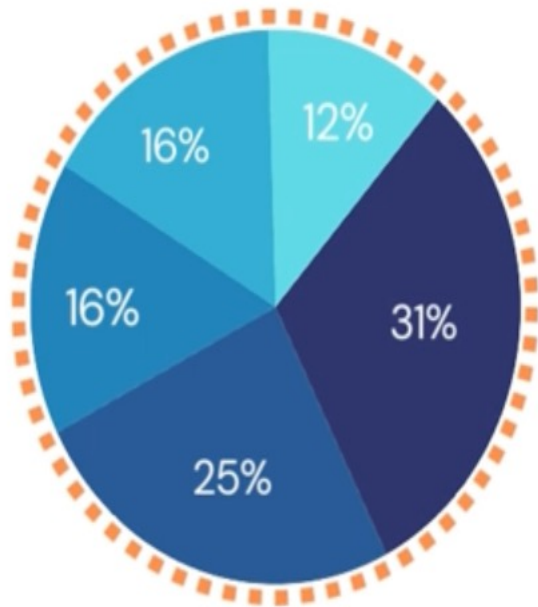
Data Science Workshop Feedback

Shows survey results,
but what's the story?

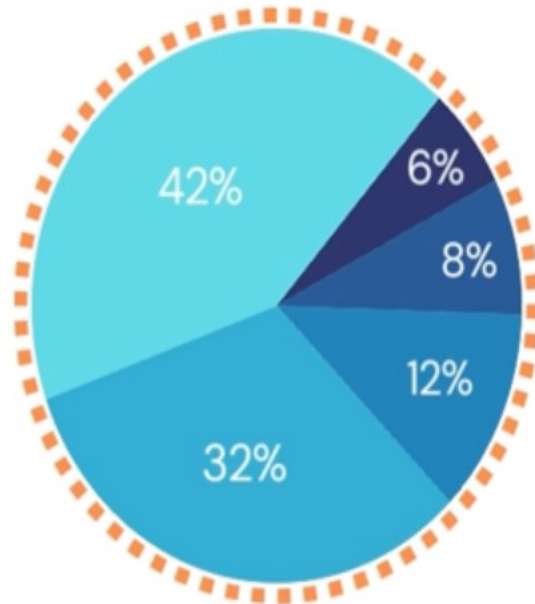


Data Science Workshop Feedback Survey

Interest in Data Science
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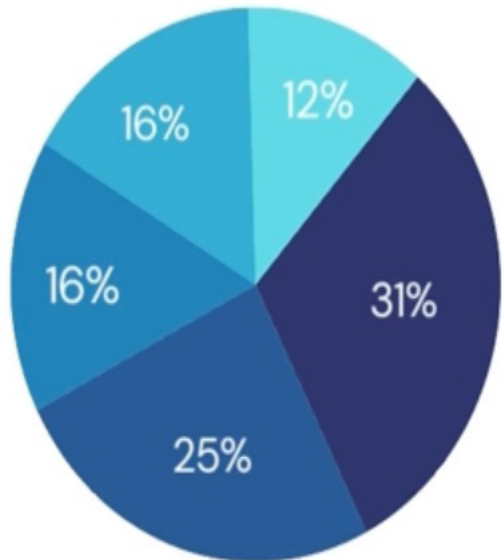
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Data Science Workshop Feedback

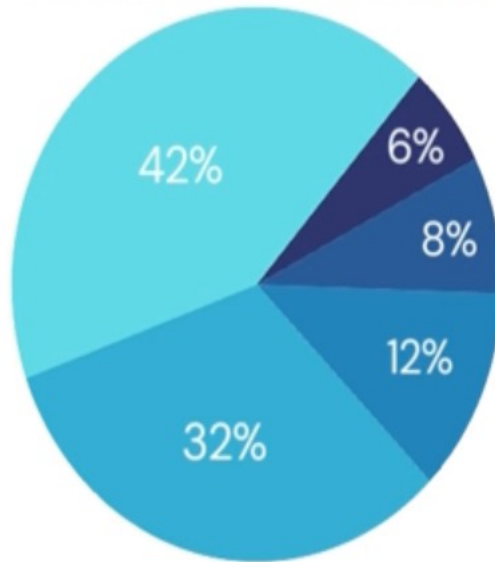
- Uses pie chart to visualize the data

Data Science Workshop Feedback Survey

Interest in Data Science **BEFORE** the workshop



Interest in Data Science **AFTER** the workshop



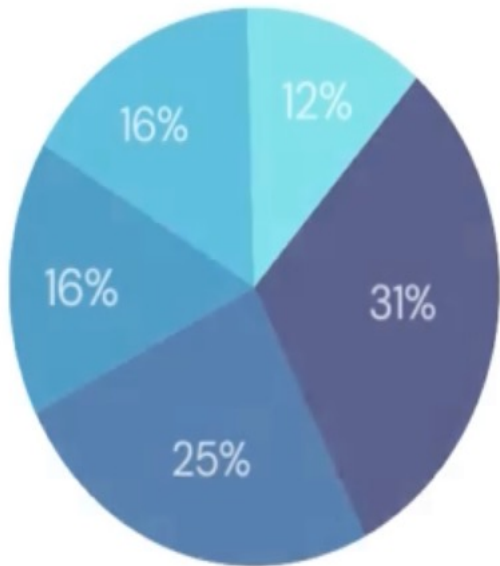
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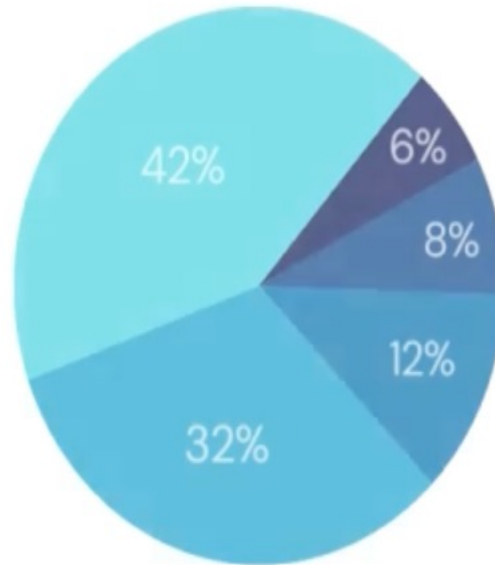
- Uses pie chart to visualize the data
- Unclear what **BEFORE** and **AFTER** comparison is trying to show

Data Science Workshop Feedback Survey

Interest in Data Science
BEFORE the workshop



Interest in Data Science
AFTER the workshop



■ Bored ■ Not great ■ OK ■ Kind of Interested ■ Excited

Data Science Workshop Feedback

- Uses pie chart to visualize the data
- Unclear what **BEFORE** and **AFTER** comparison is trying to show
- Takes time to analyze

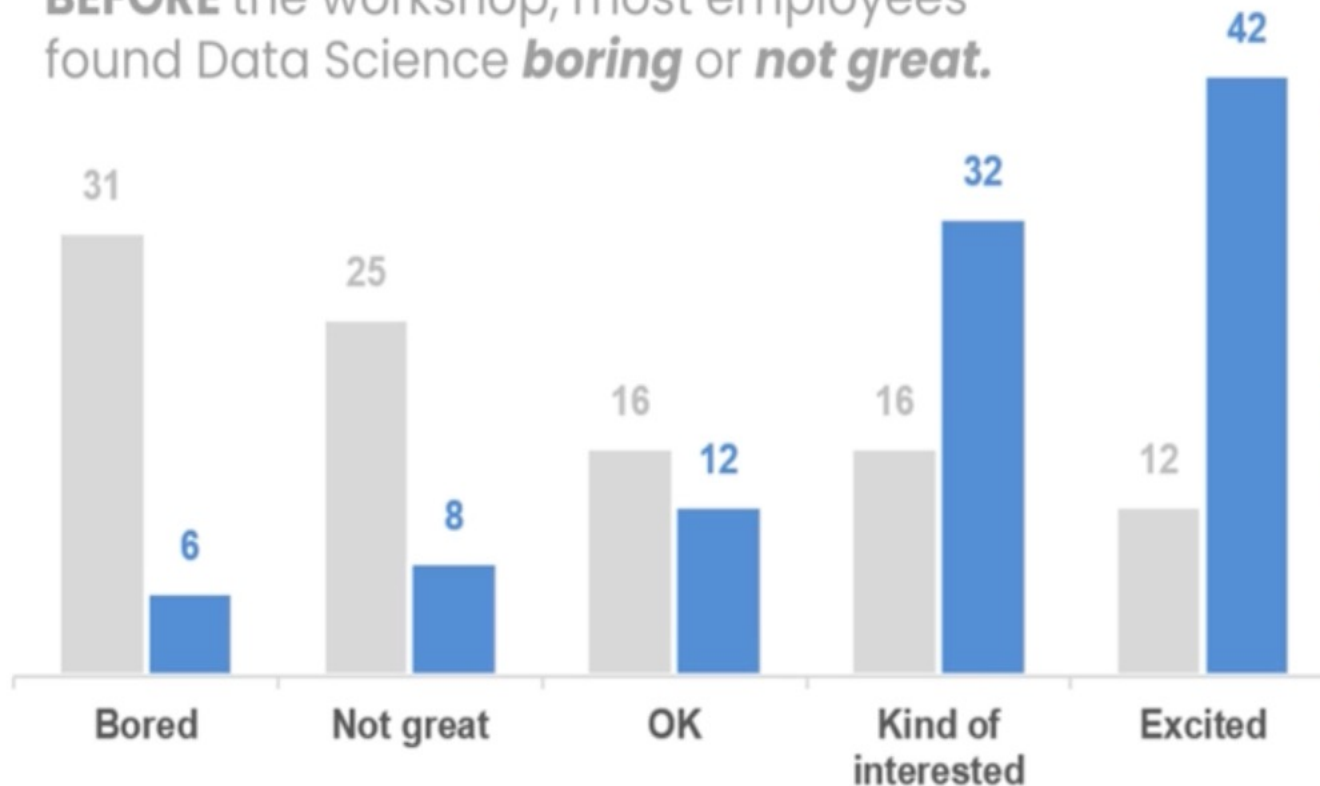


Data Science Workshop Feedback

Did the Workshop improve employee interest in Data Science?

The first run of the Data Science Workshop was successful!
We recommend including this as a standard training.

BEFORE the workshop, most employees found Data Science *boring* or *not great*.



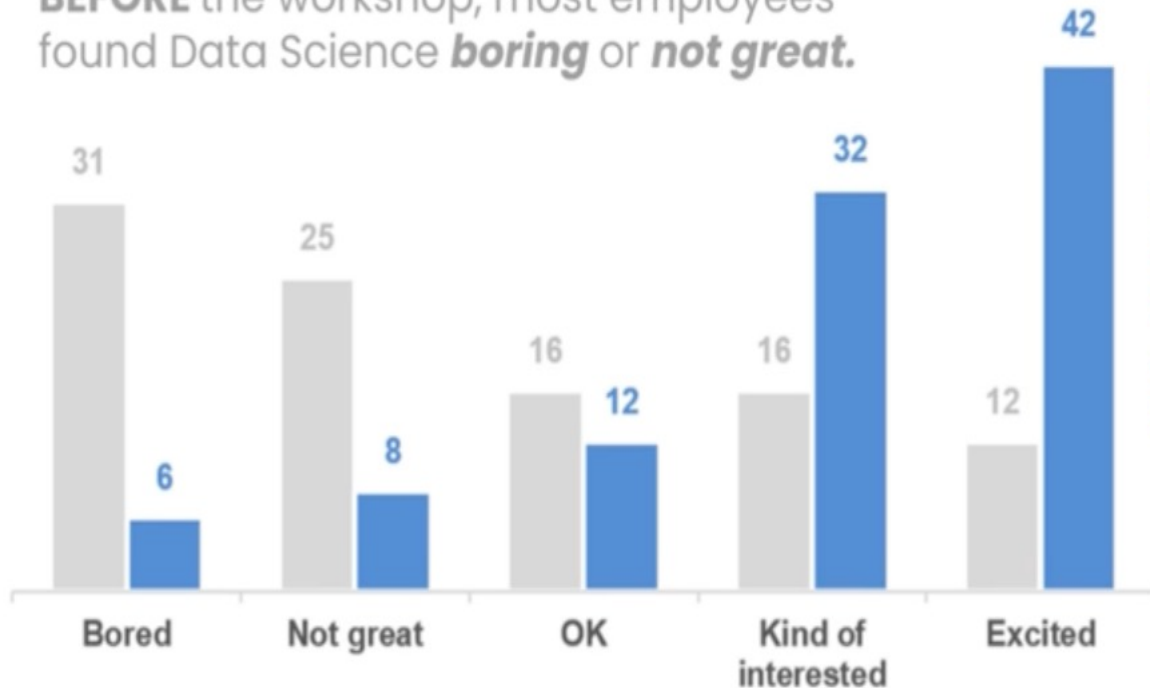
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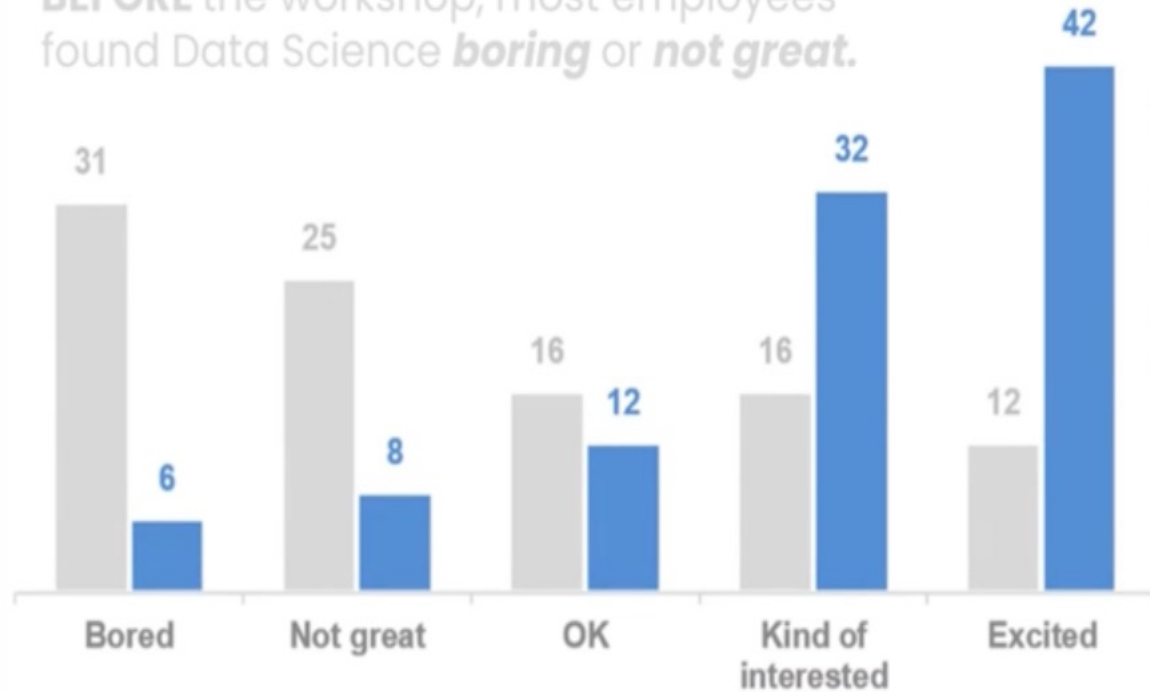
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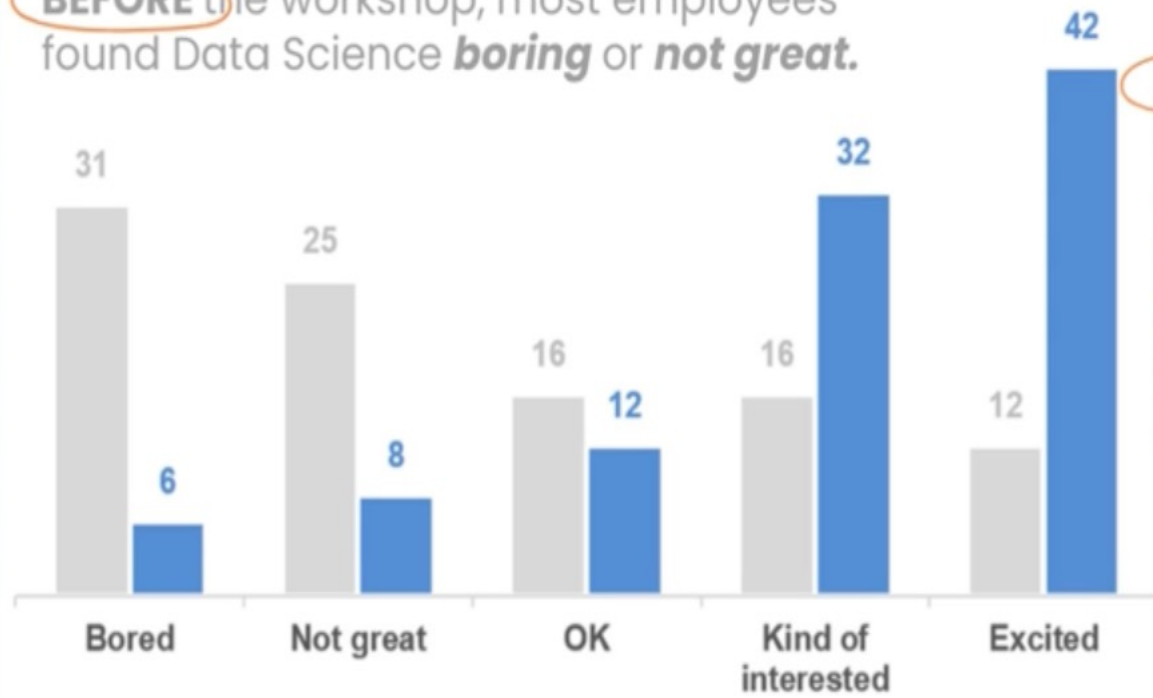
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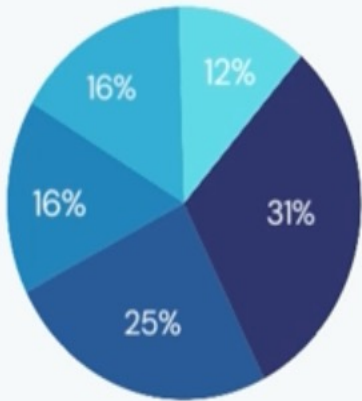
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- Simple **clustered bar graph** = BEFORE and AFTER comparison clear
- **Simple colors** to highlight most important data
- **Annotations** help explain the result (Before, After)

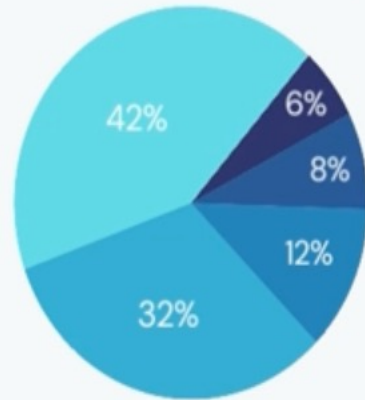
Data Science Workshop Feedback

Data Science Workshop Feedback Survey

Interest in Data Science **BEFORE** the workshop



Interest in Data Science **AFTER** the workshop



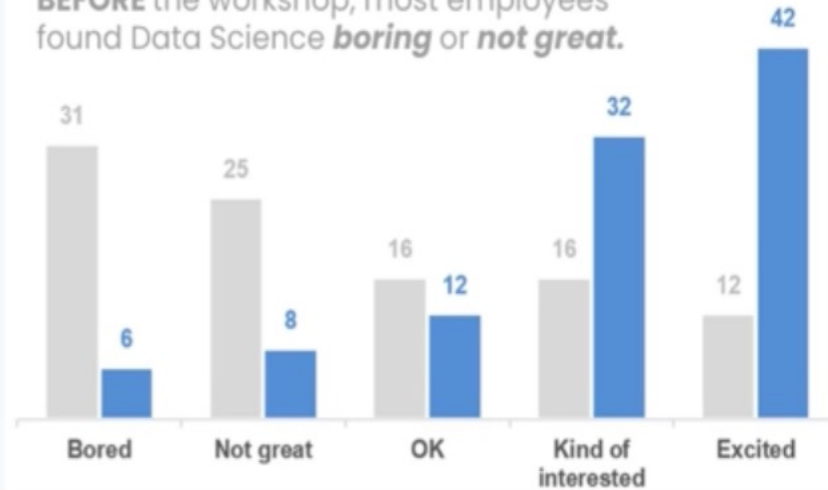
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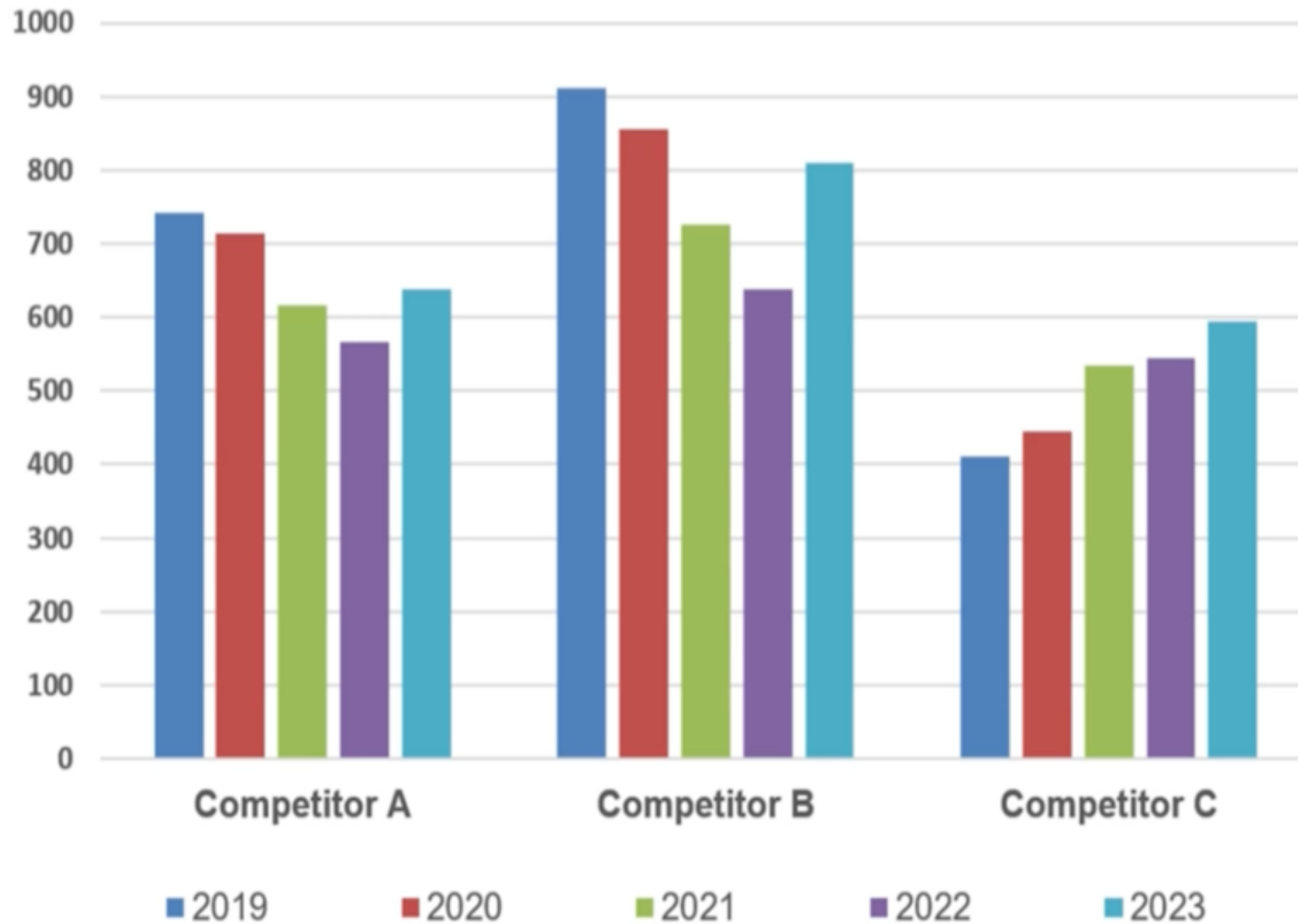
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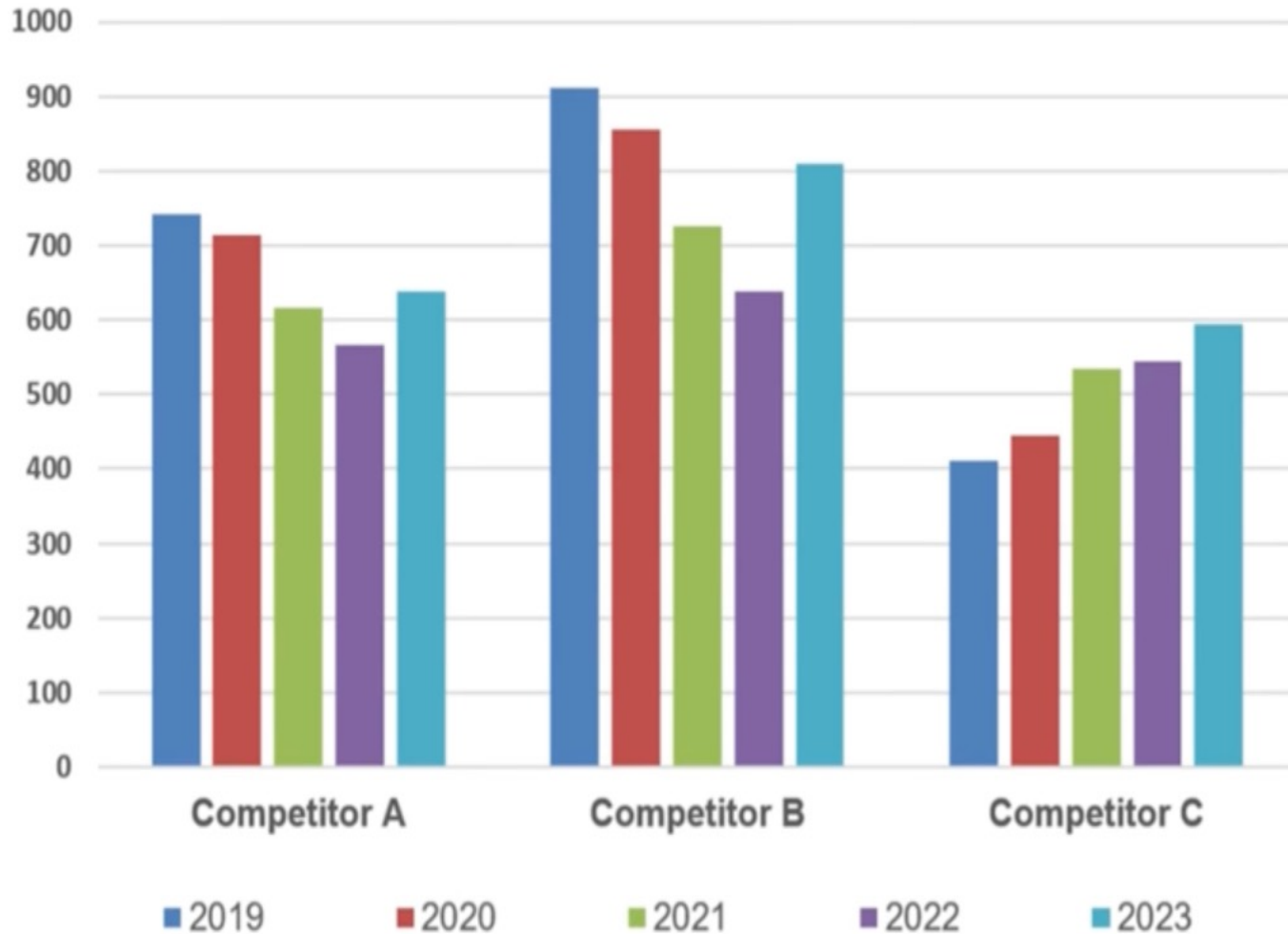
Average Selling Price of Competitors

Average Selling Price of Competitor Products (2019 - 2023)



Average Selling Price of Competitors

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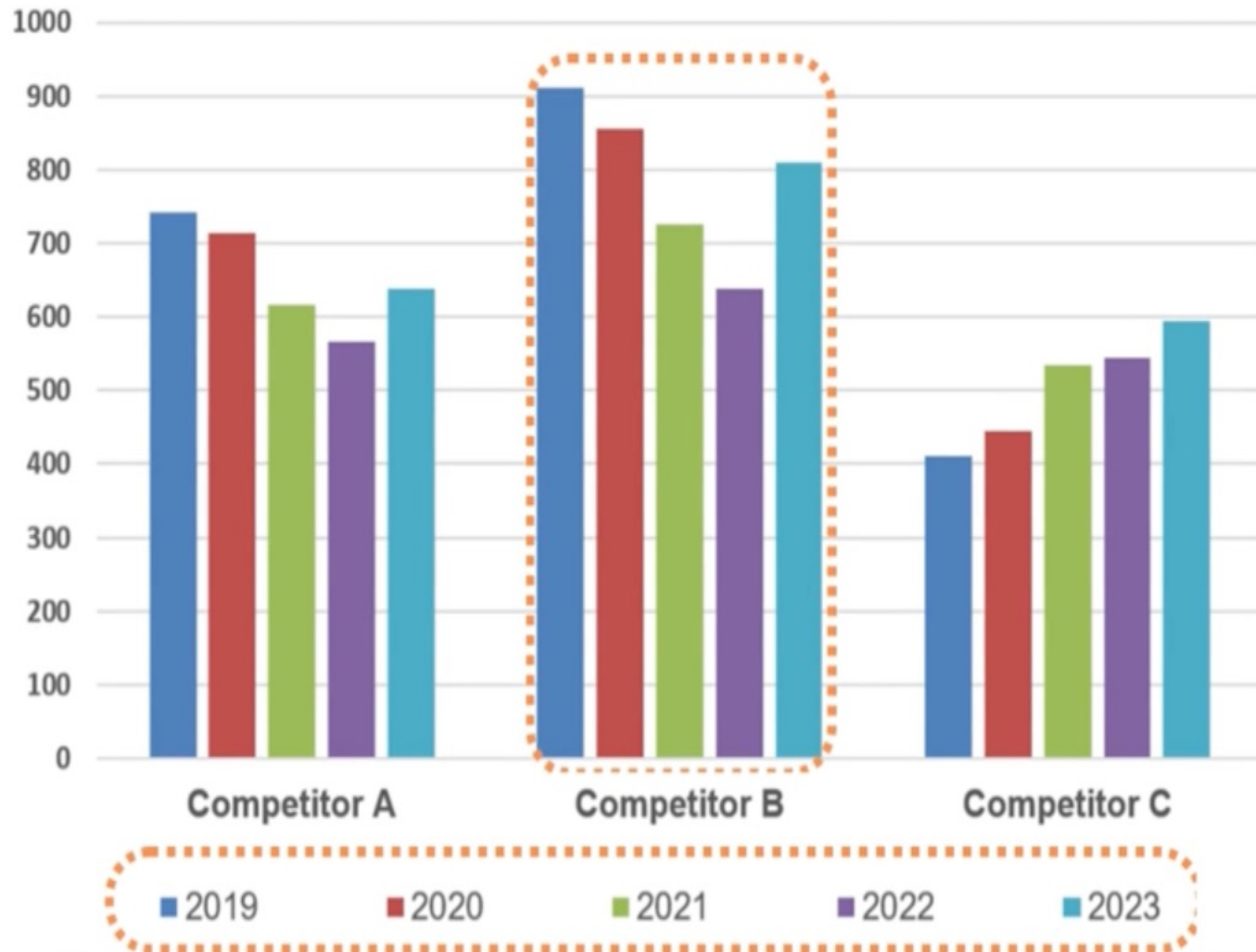


- **Data story is unclear.**
What's the key insight?



Average Selling Price of Competitors

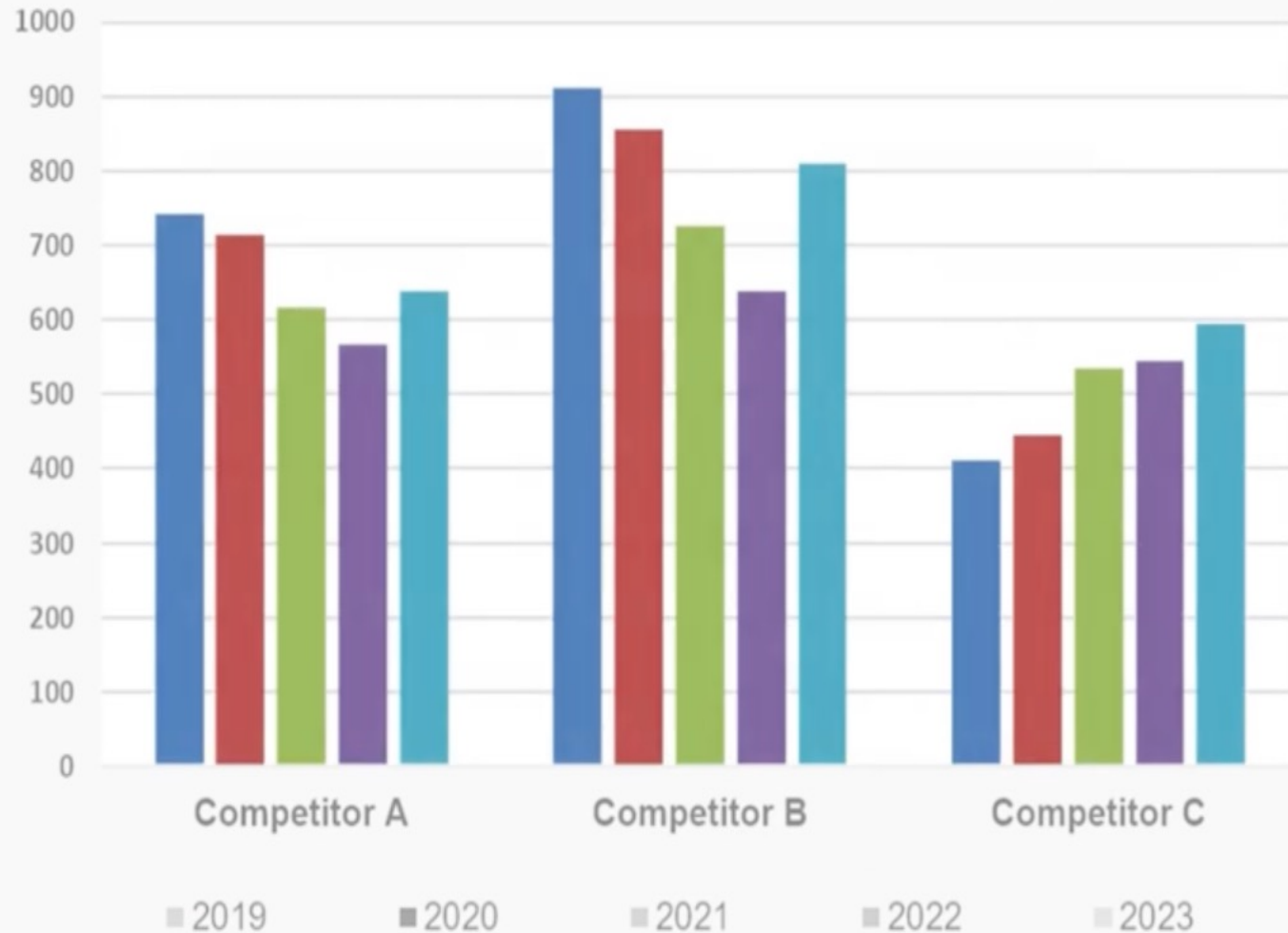
Average Selling Price of Competitor Products (2019 - 2023)



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- Uses Multiple-series bar graph to distinguish years

Average Selling Price of Competitors

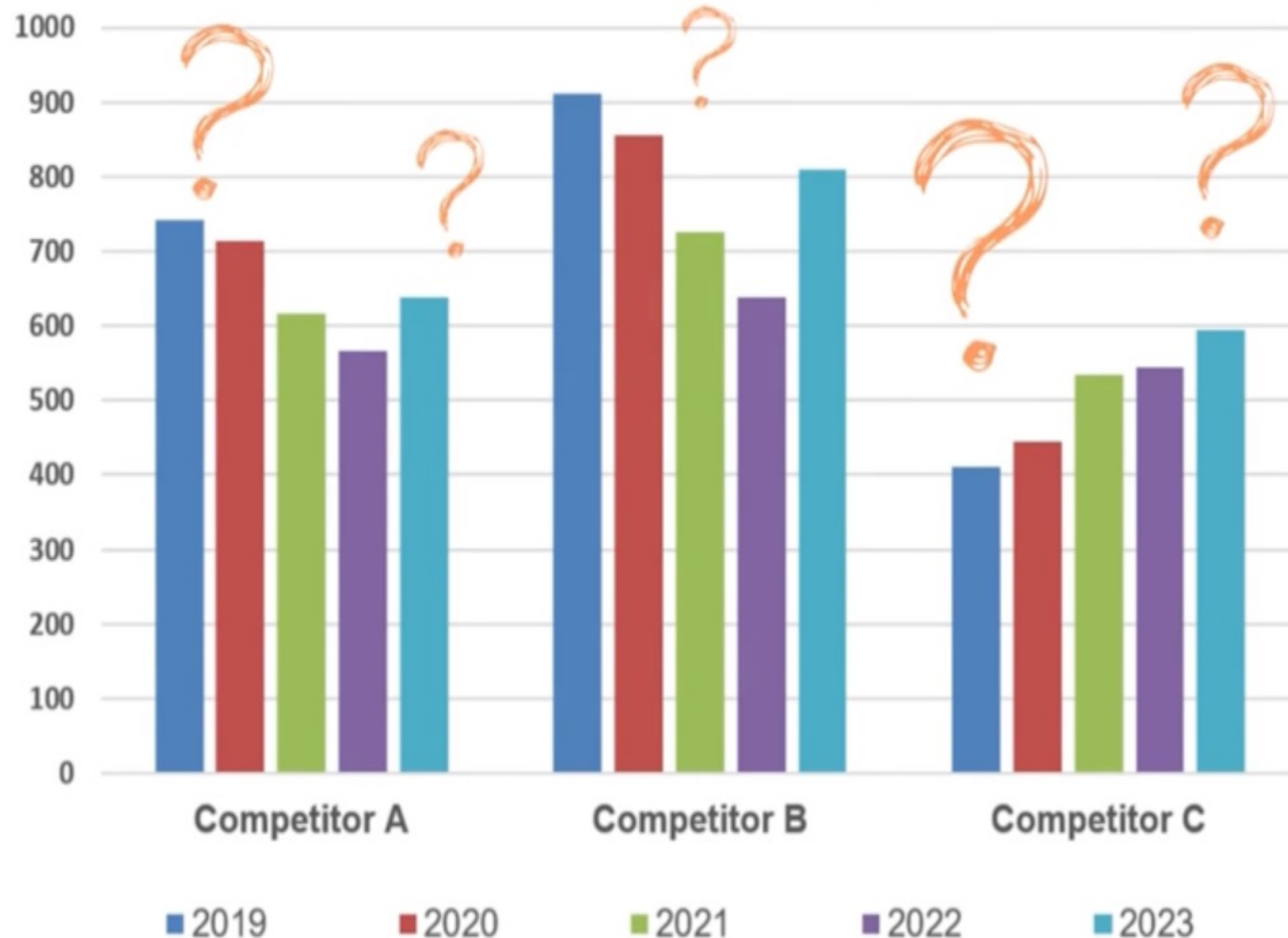
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- **Data story is unclear.** What's the key insight?
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- Many colors are **visually overwhelming**

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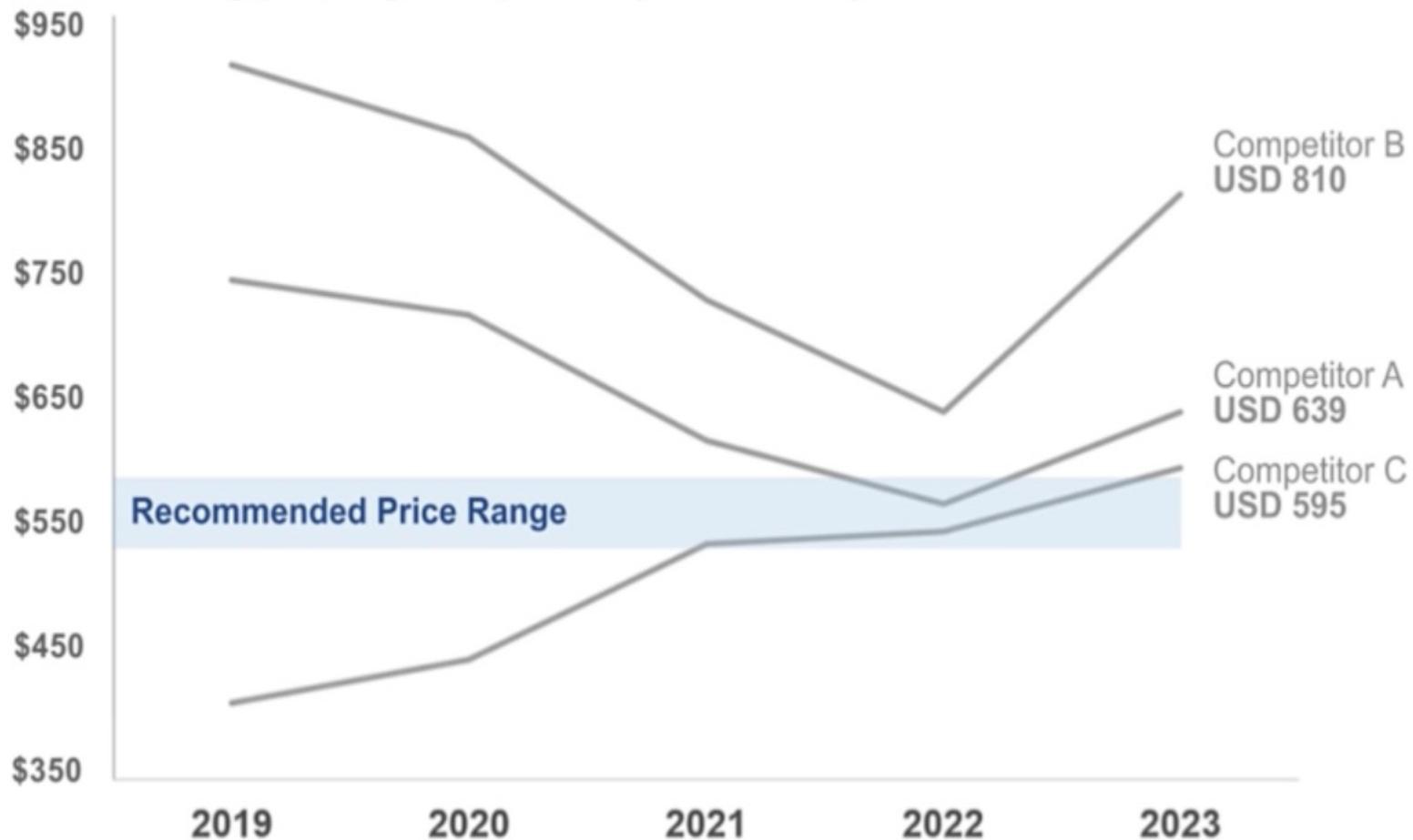


- **Data story is unclear.** What's the key insight?
- Uses Multiple-series bar graph to distinguish years
- Many colors are **visually overwhelming**
- Does **not communicate or persuade** to take action

Average Selling Price of Competitors

To be competitive, we recommend introducing our product in the **USD 540 to 590 price range**.

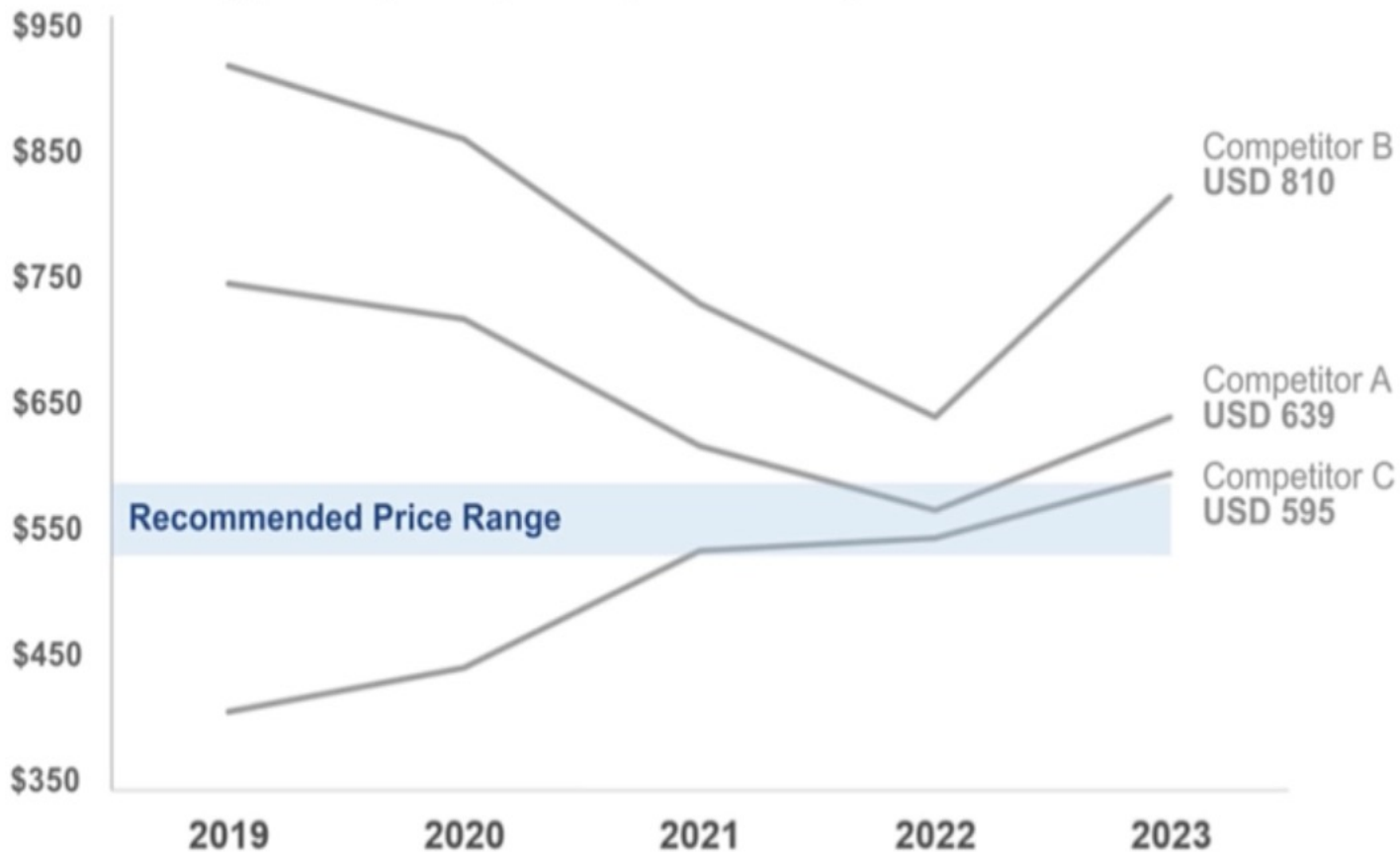
Selling price by competitor (2019 - 2023)



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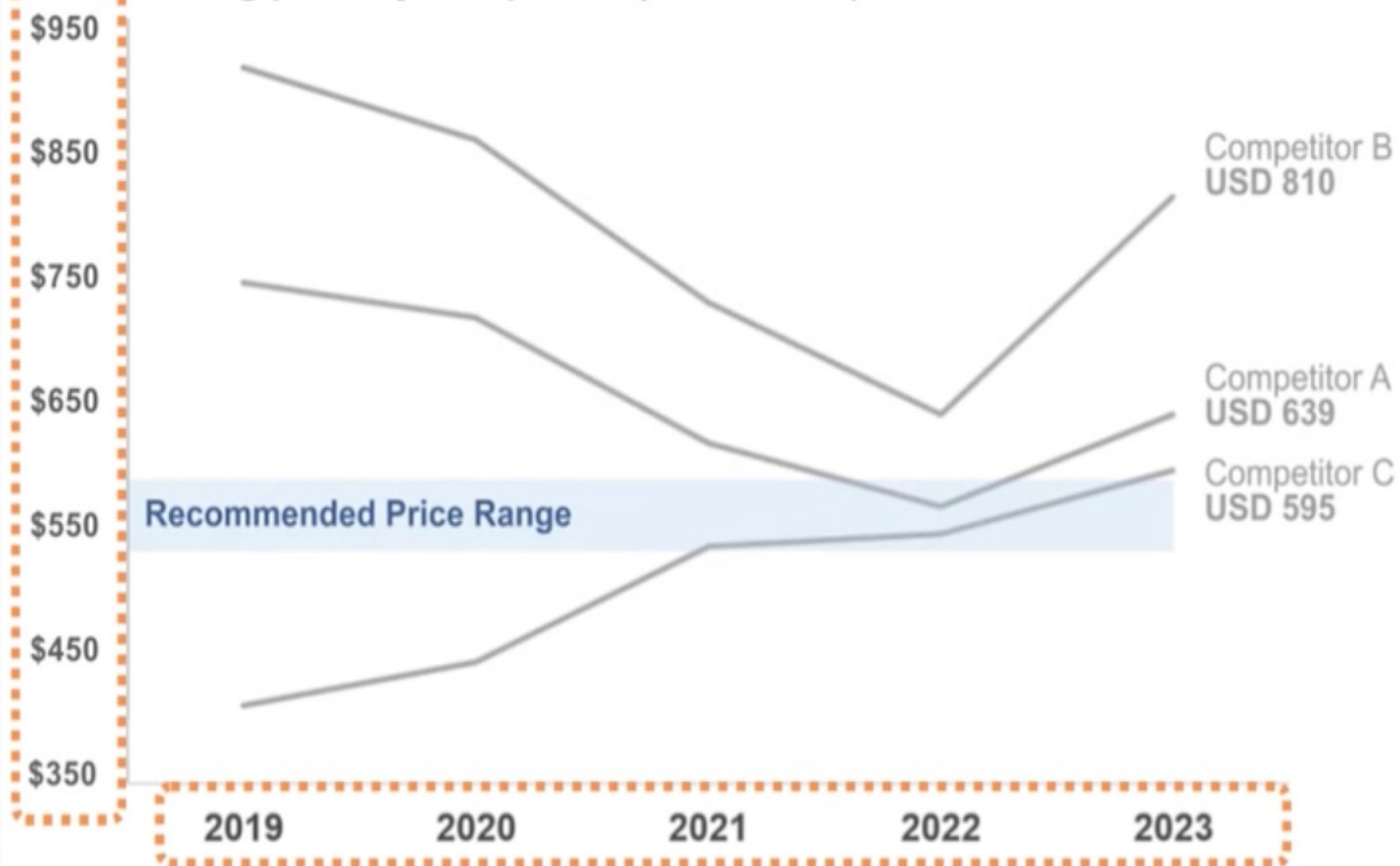


- Title clearly **provides key insight** and **call to action**

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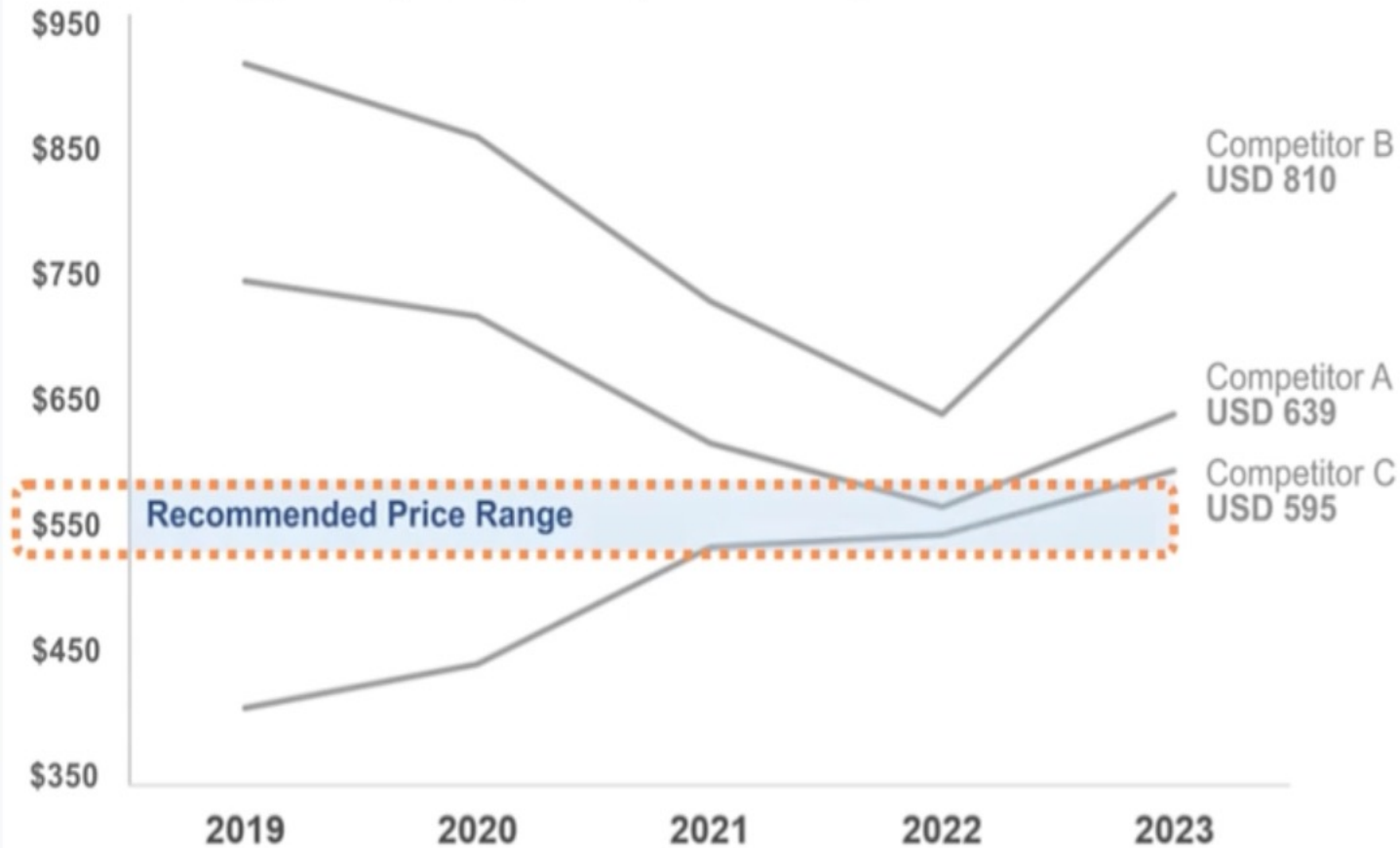


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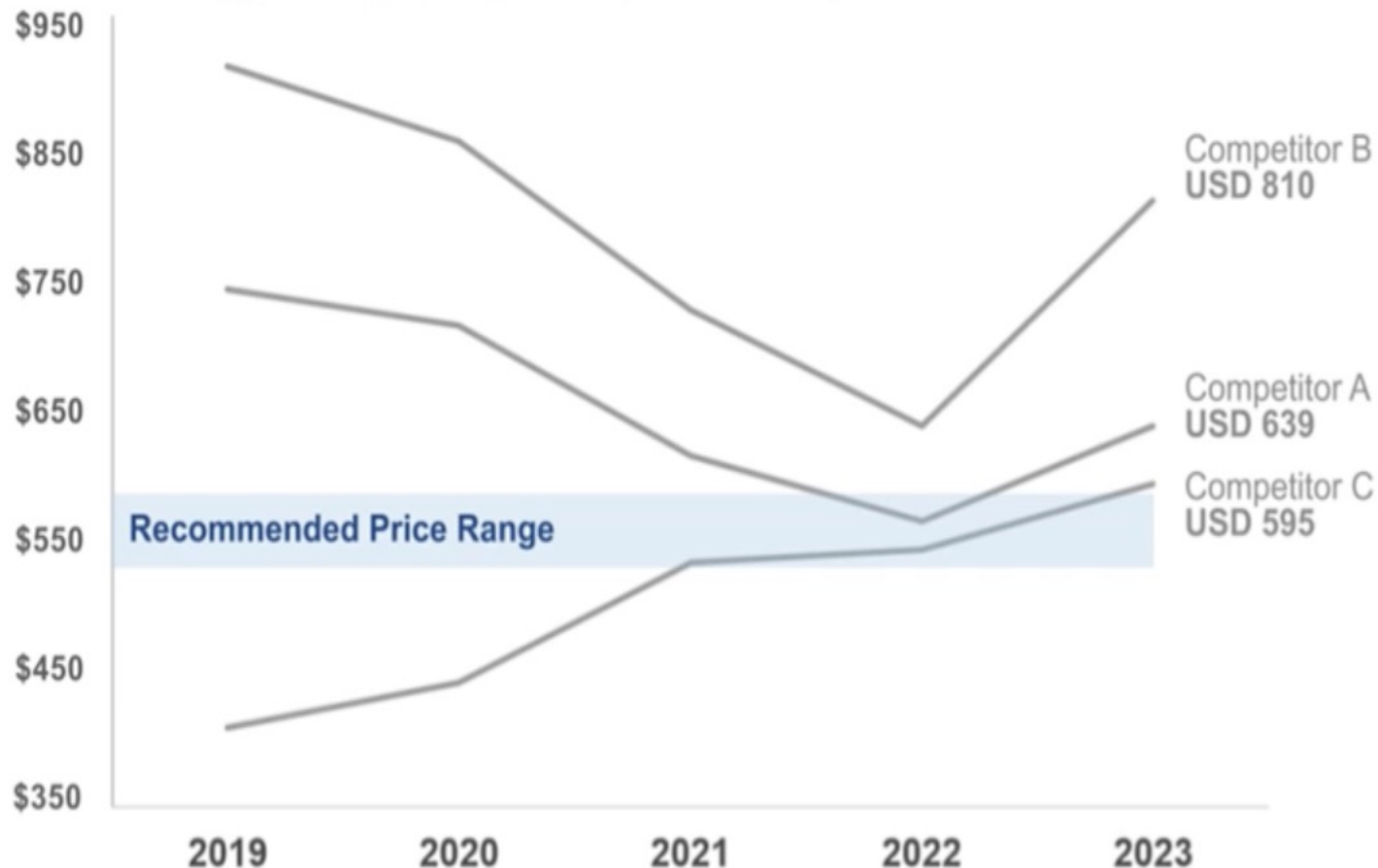


- Title clearly **provides key insight** and **call to action**
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- Color only used to **emphasis key data:**
 - **Blue strip** shows recommended range

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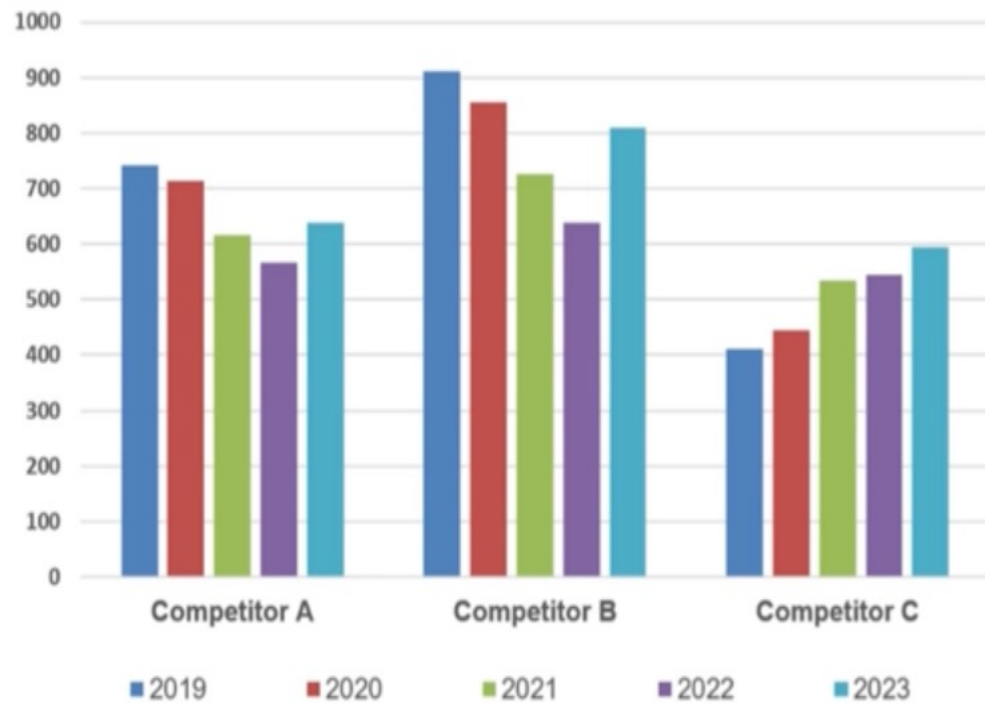
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 - **Blue title** to explain

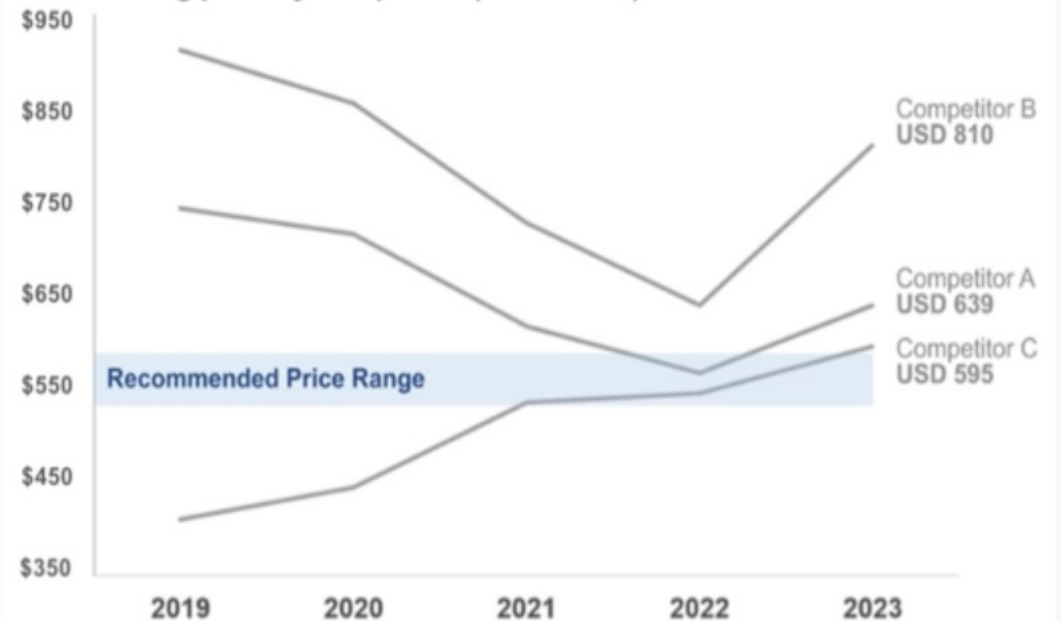
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LEARNING ROADMAP:

Navigating Your Path to Success

Course 1:
**Driving Change
and Action
through Insight**



2

Course 1:
**Unearthing
Stories in Data**

COMPLETED

Course 2:
**3 C's of Building
Your Data Story**

3

4

Course 3:
**The Value
of Visuals**

Course 3:
**Visualizing the
Story**

5

Course 4:
**Secrets to
Effective Visuals**

6



Quick Pitstop

II. Unearthing the
Stories in Data



End of Course 1