Data Storytelling

DRIVING RESULT THROUGH DATA STORYTELLING

3 COURSE

DESIGN:
Choose the Right Visuals

LEARNING ROADMAP:

Navigating Your Path to Success

Course 1:
Driving Change and Action through Insight

Course 1:
Unearthing Stories in Data

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

Course 3:
The Value of Visuals

Course 3:
Visualizing the Story

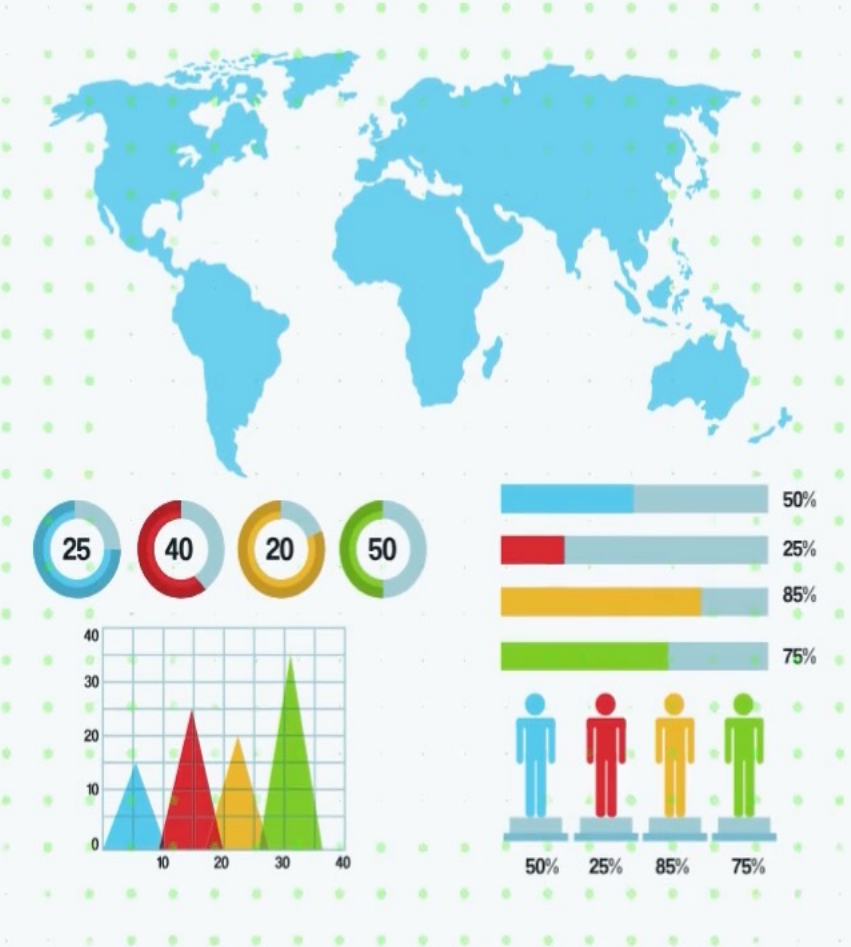
Course 4:
Secrets to Effective Visuals

I. The Value of Visuals

I. The Value of Visuals

A. Rise of the Visual Economy

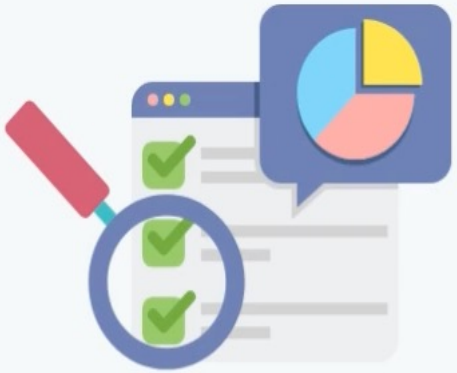
We live in an increasingly visual world.



Visual Economy

Canva's Visual Economy Report (2023)

1,600 global business leaders



Challenges and opportunities in a visual world

Canva's Visual Economy Report (2023)

Global business leaders believe that...

Visuals carry **more authority** in communications

Visual communication tools **contributes to ROI**

Visual communication **helps articulate ideas better**

Visual tools **accelerate sales cycles**

Text-dominant content risks audience engagement

Data Storytelling

Complex Data

Creative and Compelling Visuals

Inspired Audience

I. The Value of Visuals

B. Visual Communication

EFFECTIVE COMMUNICATION

is key to any successful data story.

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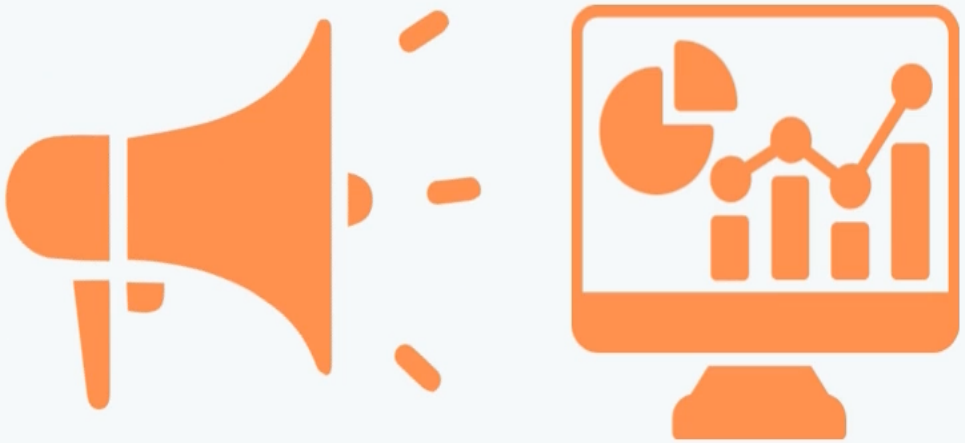
is key to any successful data story.



VISUALS

a crucial part of our **communication landscape**

VISUAL COMMUNICATION

=

the most impactful way to communicate

Visual communication is now a *business imperative.*

Global business leaders agree that **visual communication tools...**

Increase efficiency

Enhance collaboration

Carry more authority

Have a positive return on investment

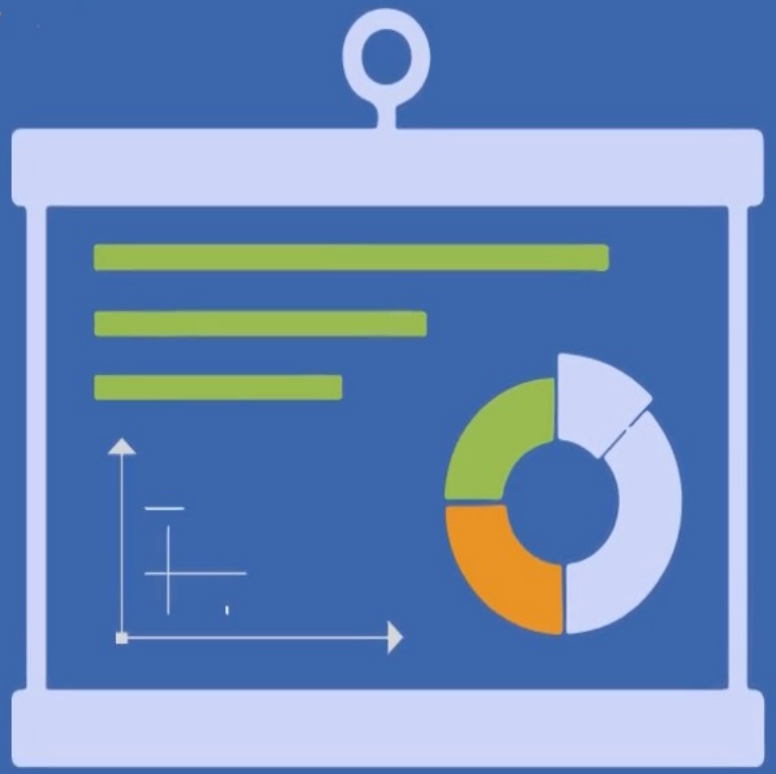
From *Canva Visual Economy Report* (2023)

Data Literacy

the ability to understand and
communicate or **share** data effectively

Design Literacy

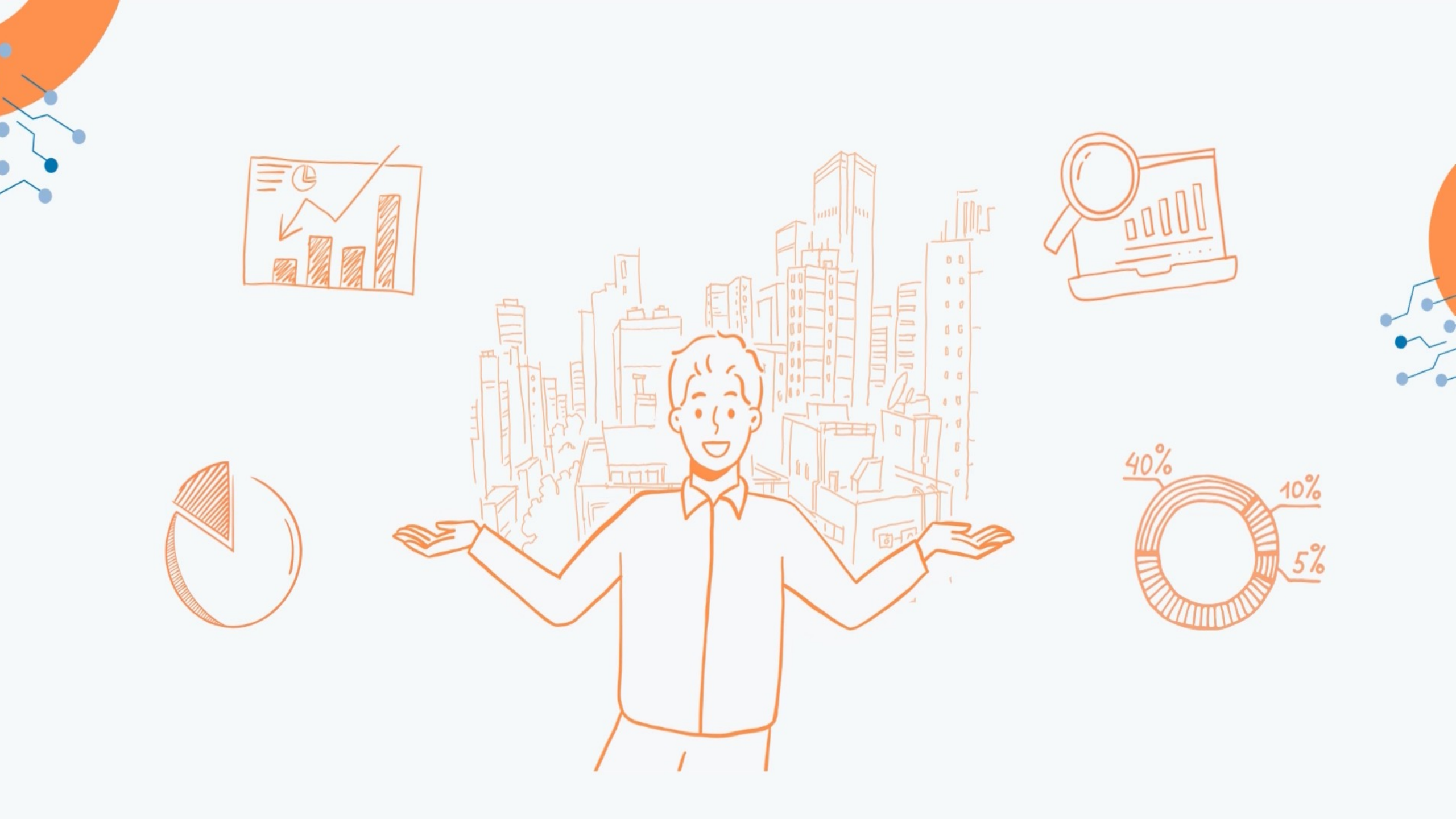
the ability to understand and interpret **visual elements** and their **purpose in communication**



Design Literacy

A skill that is
MORE CRITICAL THAN EVER

Even for those in **non-design roles.**


40%
10%
5%

Design Literacy = A **Must-Have** Skill!

Design Literacy

Design literacy empowers individuals to **interpret** and **appreciate** the visual elements used in data presentation.

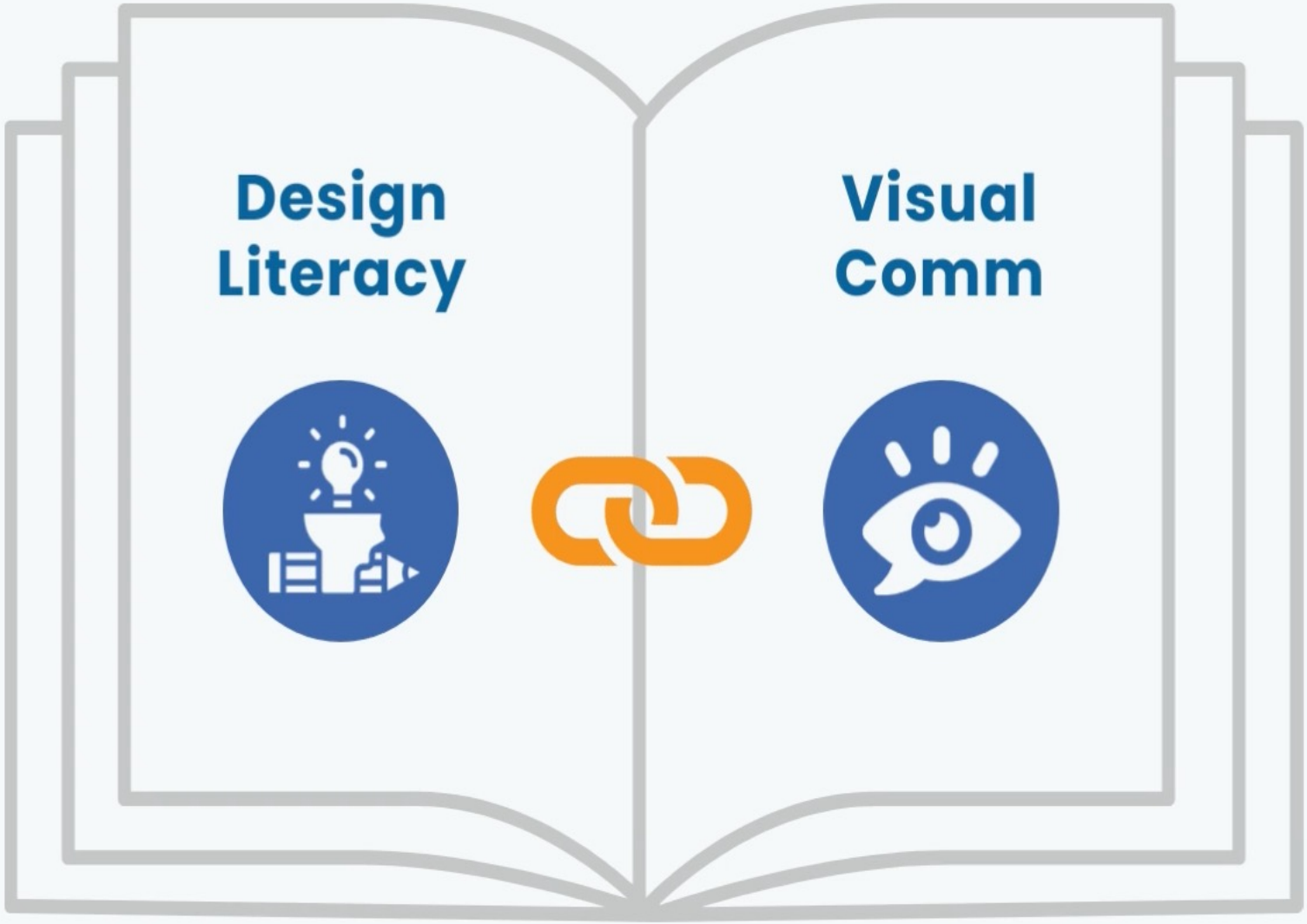
Visual Comm

Design Literacy

Visual Comm

Visual communication uses design principles to create visuals that resonate with the audience.

DATA STORYTELLING



I. The Value of Visuals

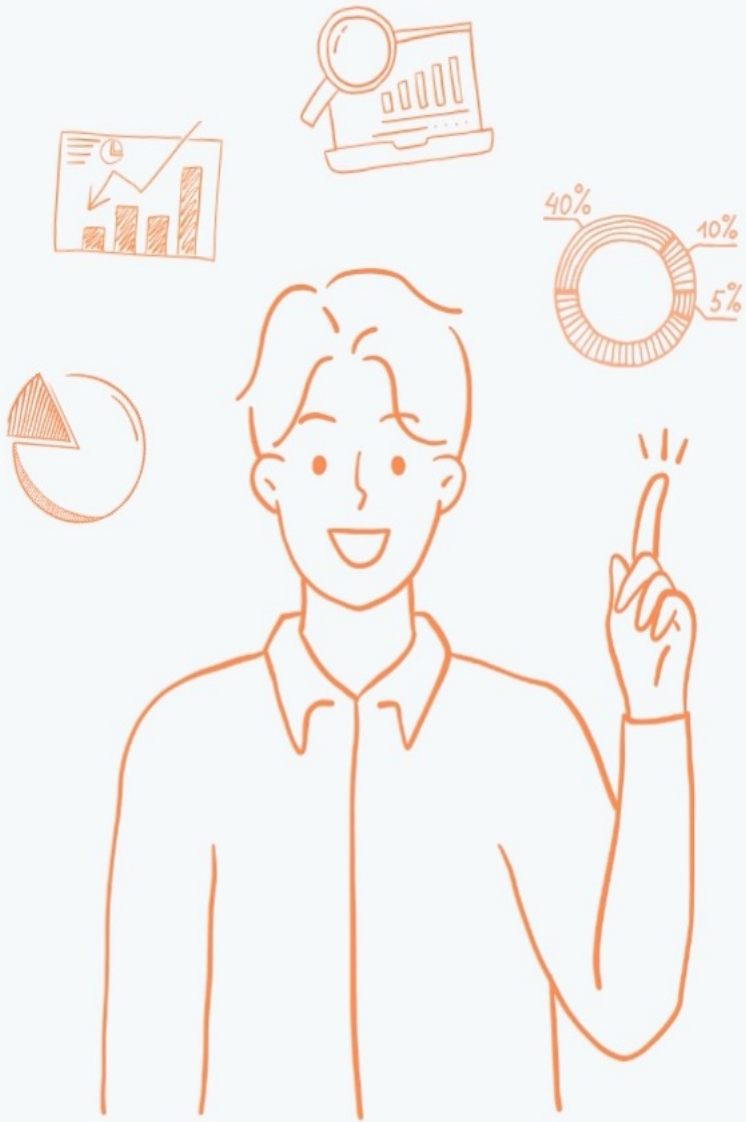
C. Visualization: Bringing Your Data Story to Life

Numbers, on their own, **can be limited** in telling the entire story of your data.

What is Data Visualization?

What is Data Visualization?

- Presents analytical information in a visual format
- Makes data analysis easier and more efficient vs. traditional spreadsheets
- Simplifies data sets into easily understandable visual analogies



Visualization in Data Storytelling

Captivate Your Audience

Convey Key Points Efficiently

Enhance Decisions & Influence Others

Remember!

Effective data visualization can elevate the storytelling experience and present complex data in a clear and compelling manner.

LEARNING ROADMAP:

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COMPLETED

4

Course 3:
The Value of Visuals

5

Course 3:
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6

Course 4:
Secrets to Effective Visuals


Quick
Pitstop
I. The Value of Visuals

LEARNING ROADMAP:

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6

Course 4:
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II. Visualizing the Story

II. Visualizing the Story

A. 6 Types of Data Stories

3 Elements of a Data Story

Data

Story

Visual

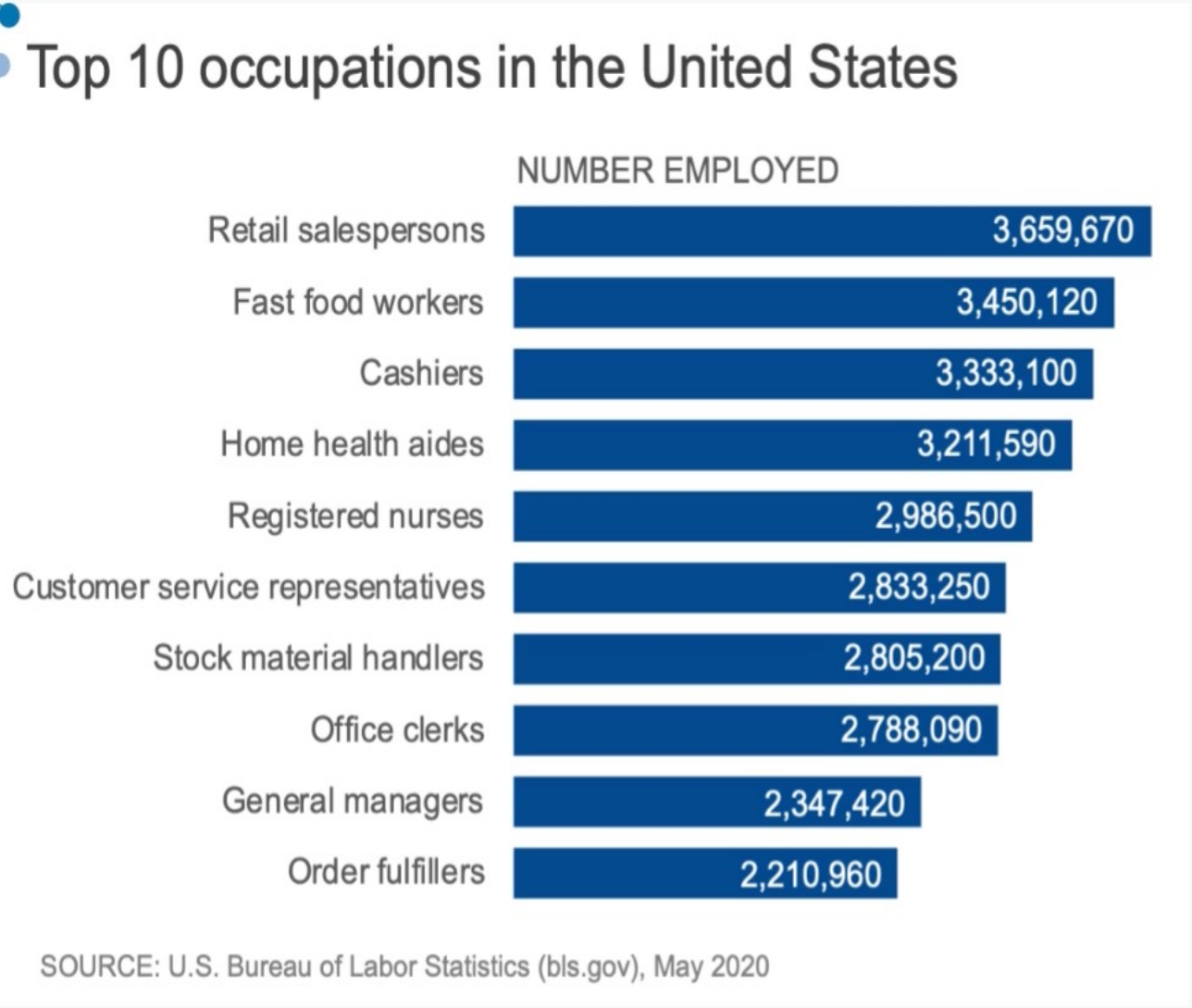
3 Elements of a Data Story

Data

Story

Visual

6 Types of Data Stories



1. RANKINGS

Assign a numerical or ordinal value to items based on their importance or performance.

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Assign a numerical or ordinal value to items based on their importance or performance.

- ✓ Helps compare and prioritize data points
- ✓ Quick way to know results

Top 10 occupations in the United States

SOURCE: U.S. Bureau of Labor Statistics (bls.gov), May 2020

1. RANKINGS

Answers Questions:

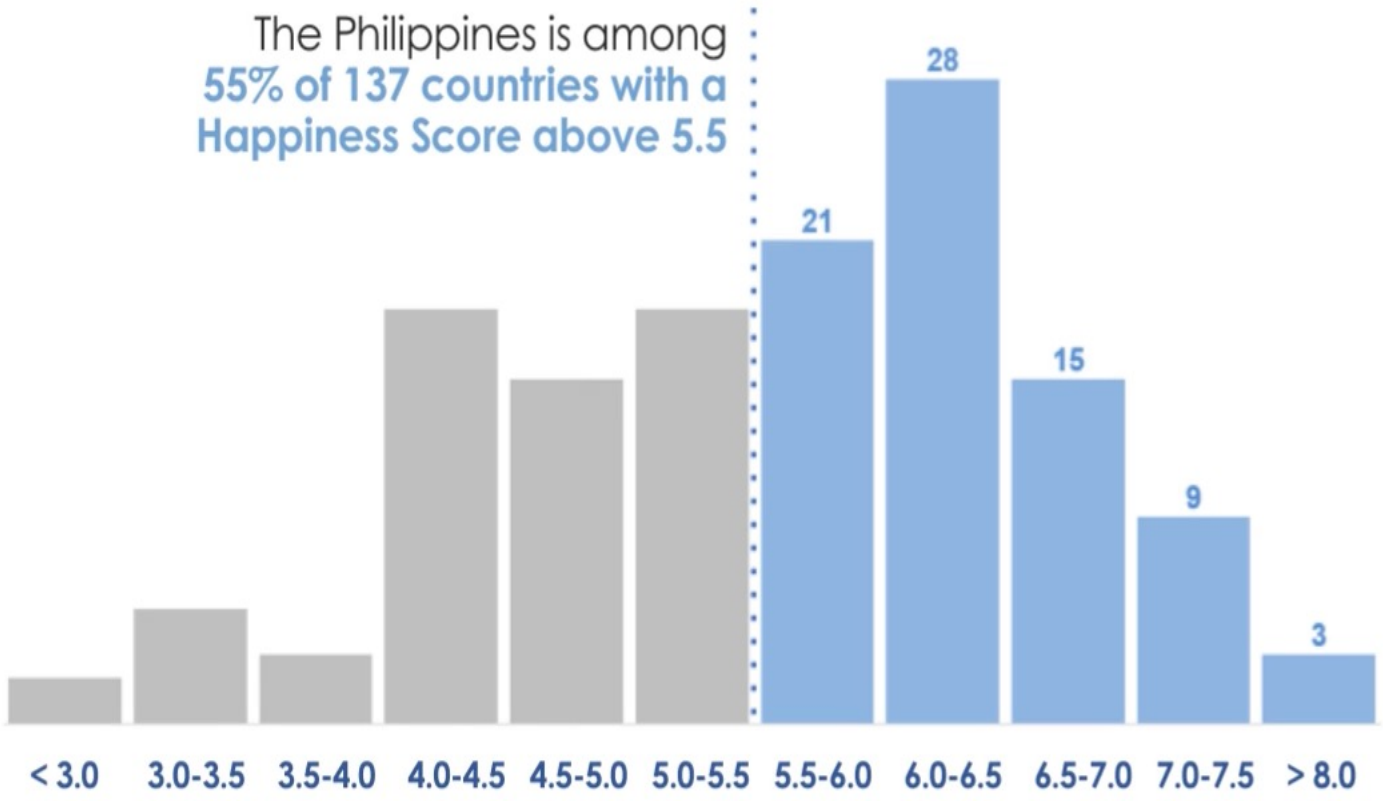
- Who are the **top** performers?
- Who are the **bottom** performers?
- What are the **position rankings** (percentile, quartile, decile)?

1. RANKINGS

Ideal For:

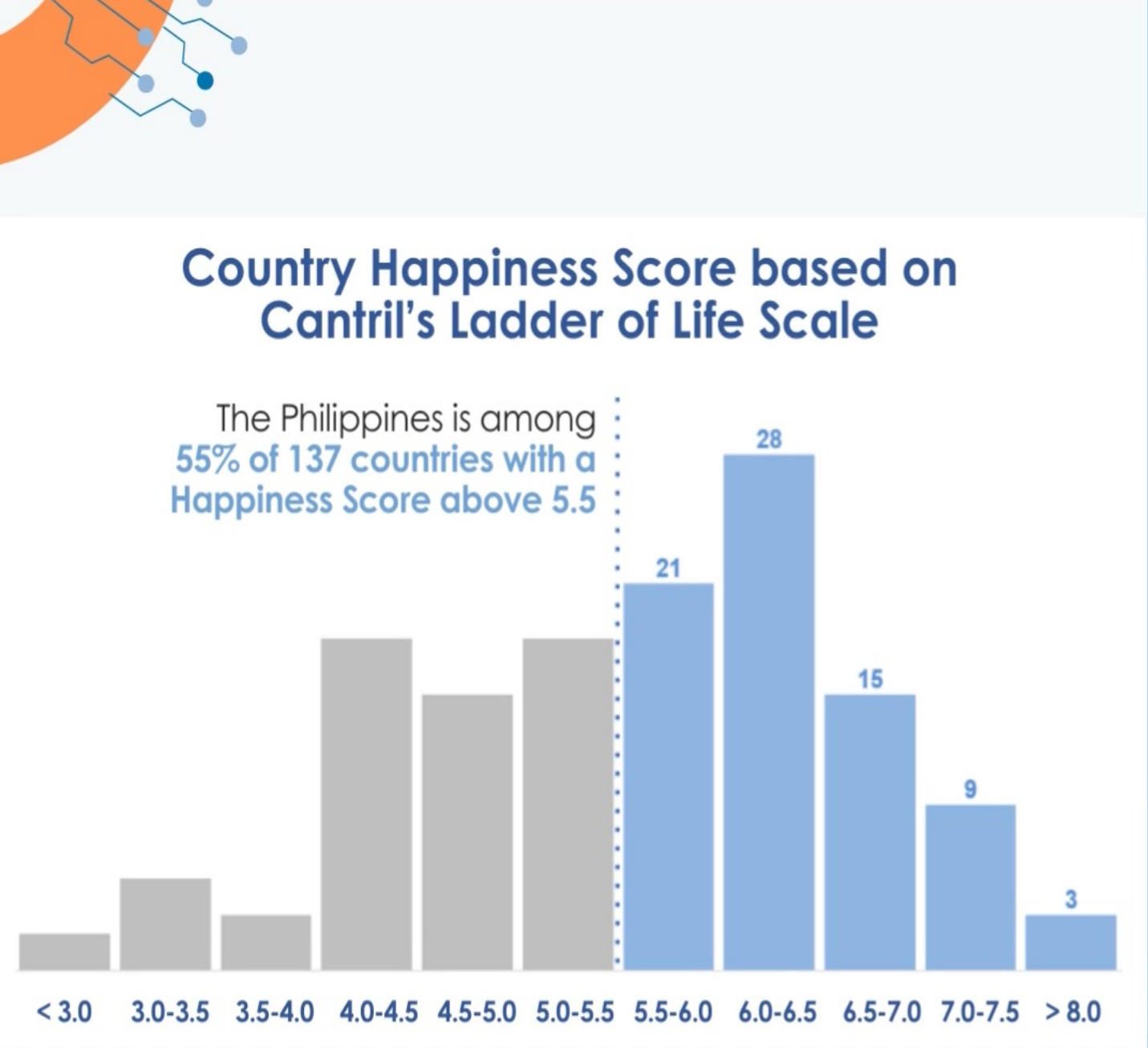
- Bar Charts
- Dot Plots
- Bullet Graphs
- Ranked Lists

Country Happiness Score based on Cantril's Ladder of Life Scale



2. DISTRIBUTIONS

Show how data values are spread across a dataset.

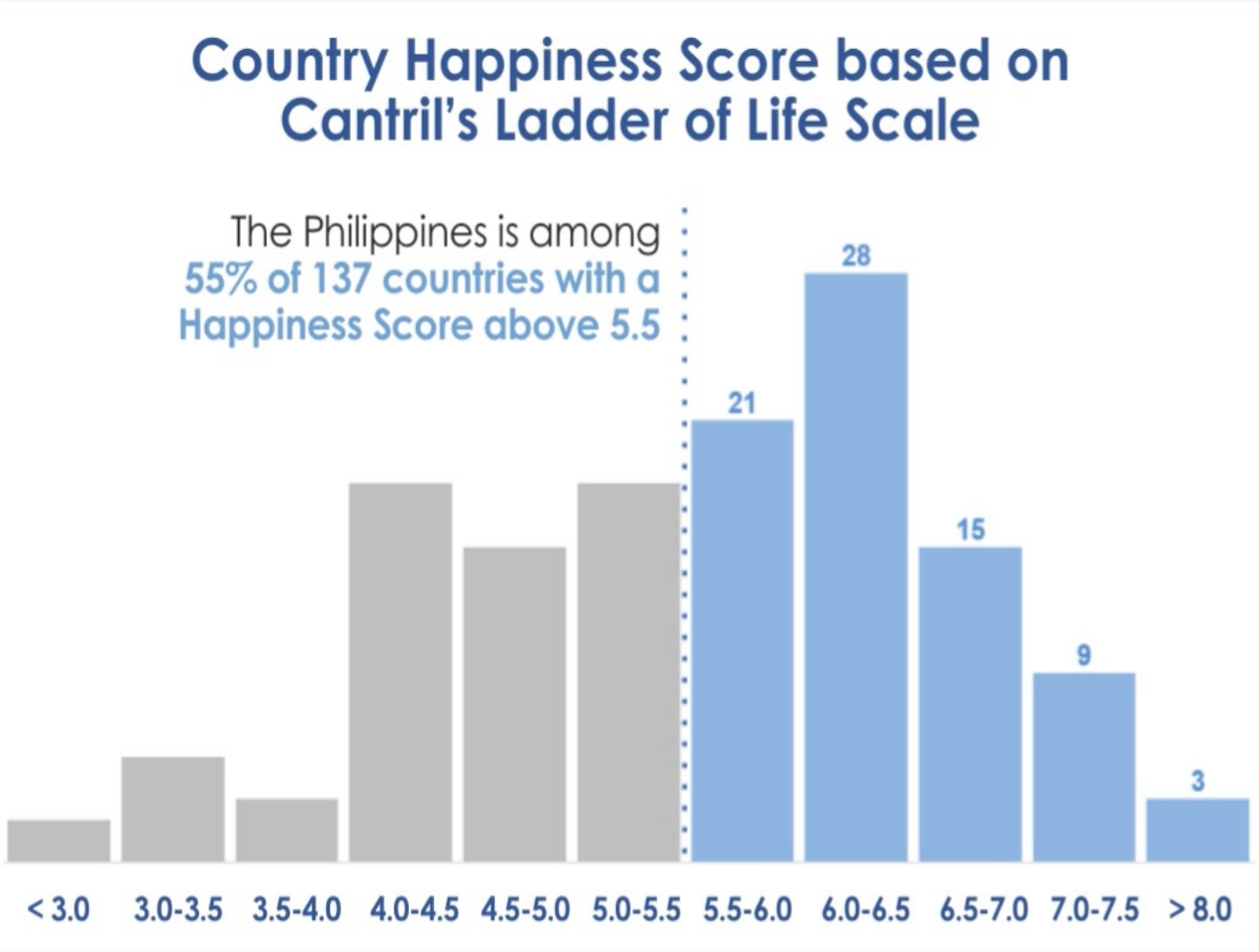


2. DISTRIBUTIONS

Show how data values are spread across a dataset.

- ✓ Looks at frequency and patterns of different values
- ✓ Indicated by shape of the data distribution
- ✓ Generate insightful descriptive stats

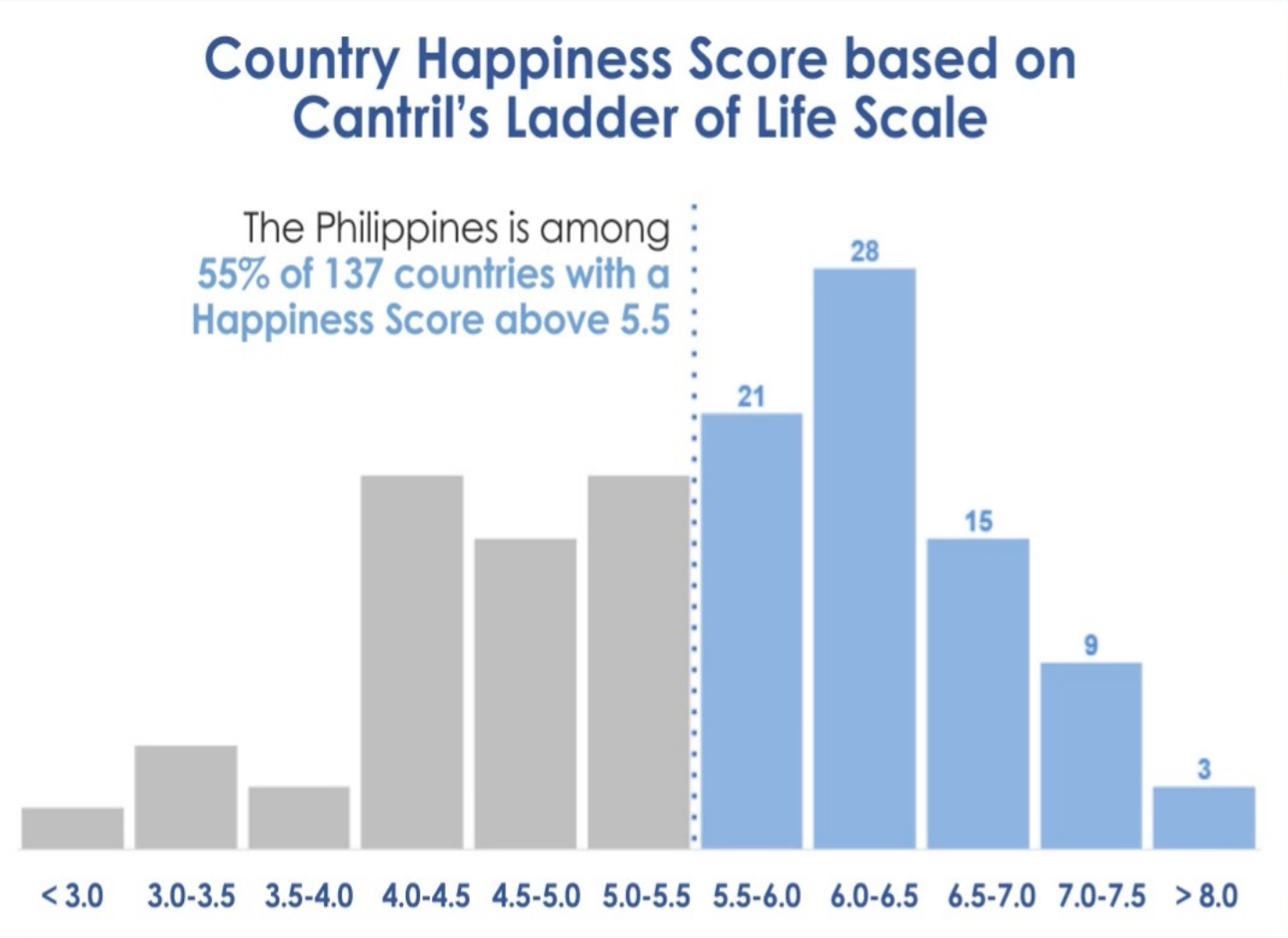
2. DISTRIBUTIONS



Answers Questions:

- What is the **range** of values?
- What is the **mean, median, mode**?
- What is the **standard deviation/spread of values**?

2. DISTRIBUTIONS

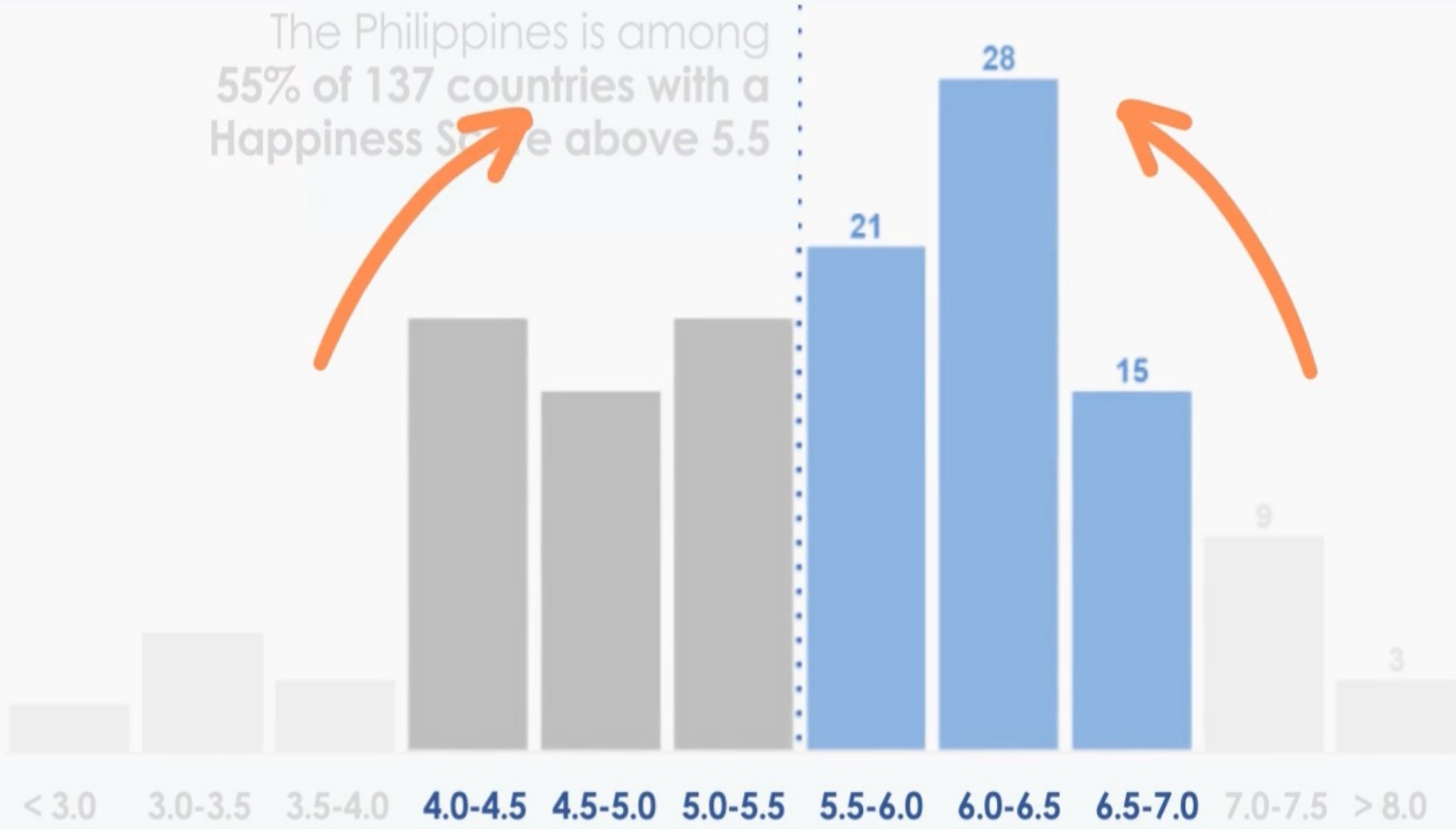


Ideal For:

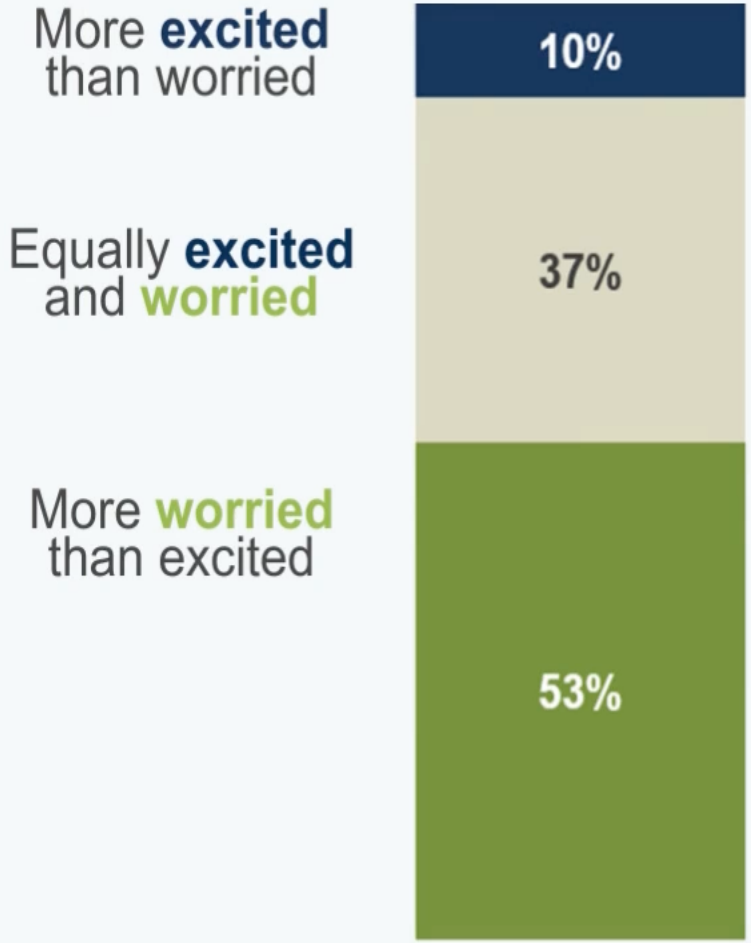
- Histograms
- Box Plots
- Frequency Polygons

2. DISTRIBUTIONS

Country Happiness Score based on Cantril's Ladder of Life Scale

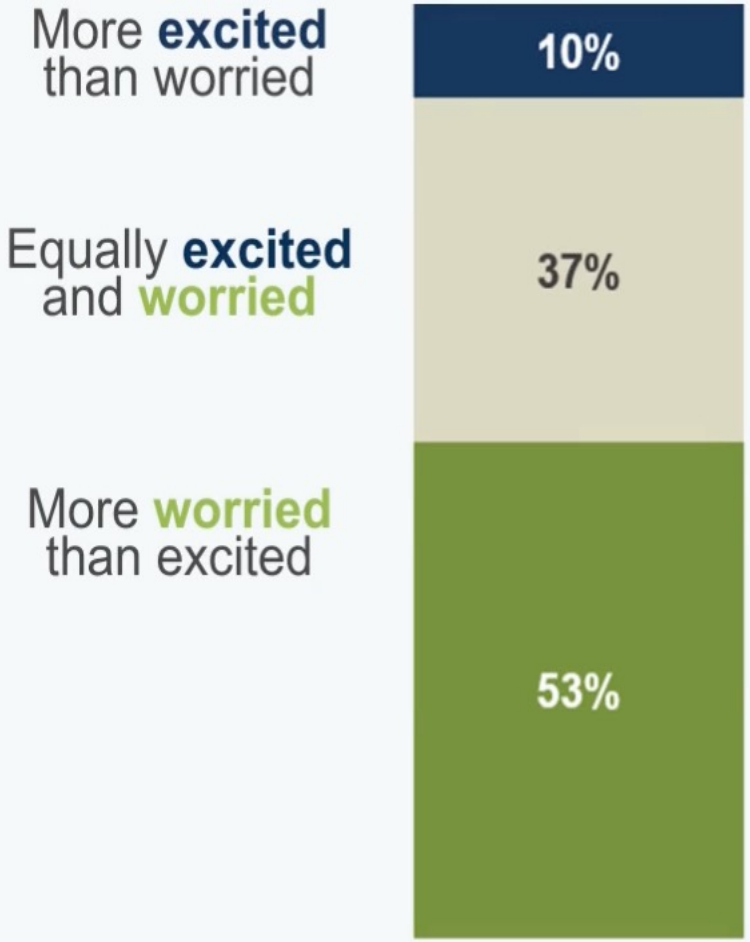


Employee perception about the impact of Artificial Intelligence on their job.



3. PROPORTIONS

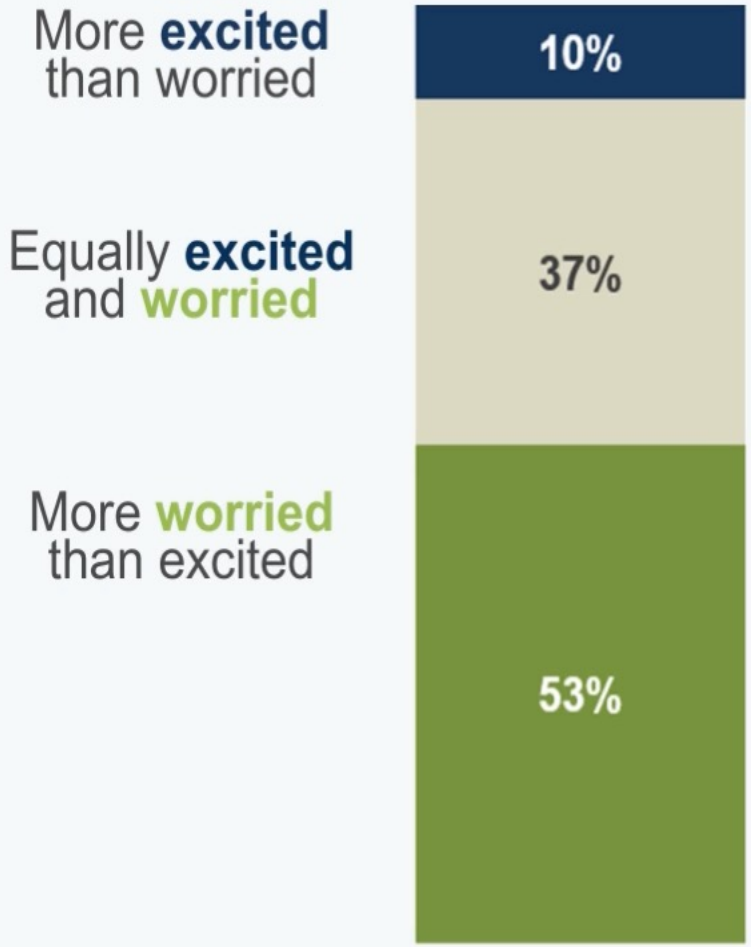
Employee perception about the impact of Artificial Intelligence on their job.



3. PROPORTIONS

Analyzes the relative size or share of a specific category within a dataset.

Employee perception about the impact of Artificial Intelligence on their job.

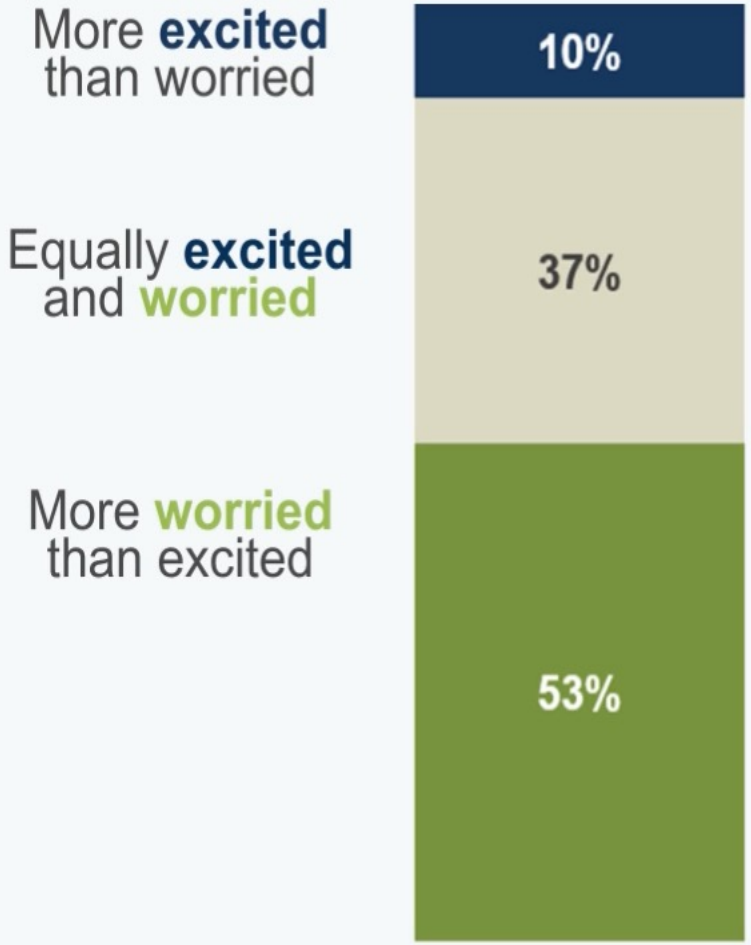


3. PROPORTIONS

Analyzes the relative size or share of a specific category within a dataset.

- ✓ Frequency of an outcome in relation to total observations
- ✓ Identify a part of a whole
- ✓ Shows you which variable or factor contributes more

Employee perception about the impact of Artificial Intelligence on their job.

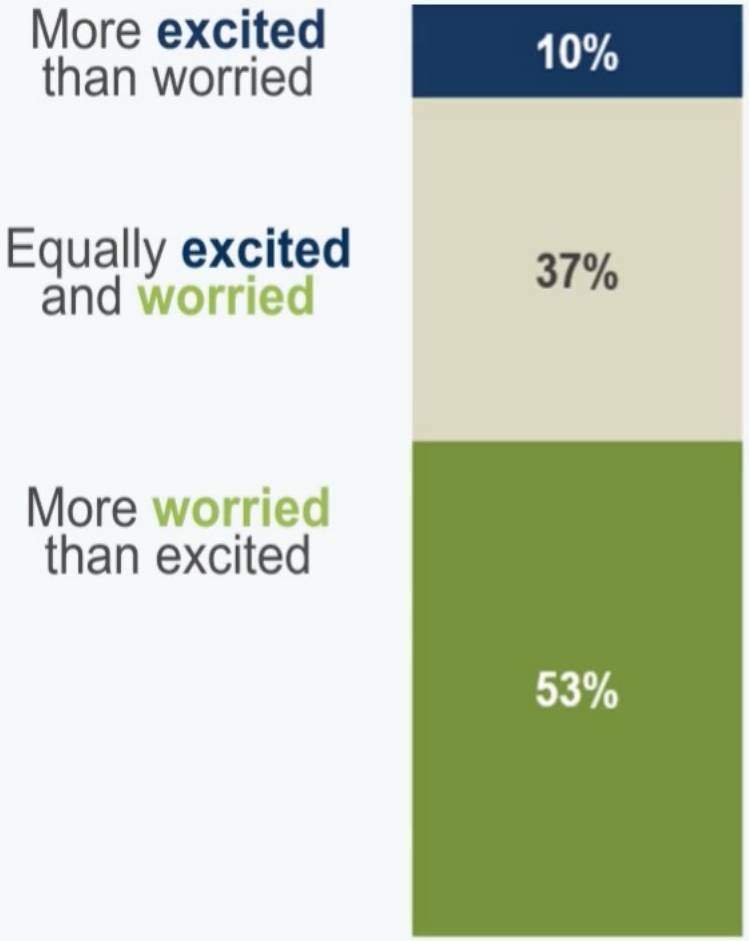


3. PROPORTIONS

Answers Questions:

- Which has the largest or lowest relative **contribution**?
- Which has the largest or lowest relative **weight**?

Employee perception about the impact of Artificial Intelligence on their job.

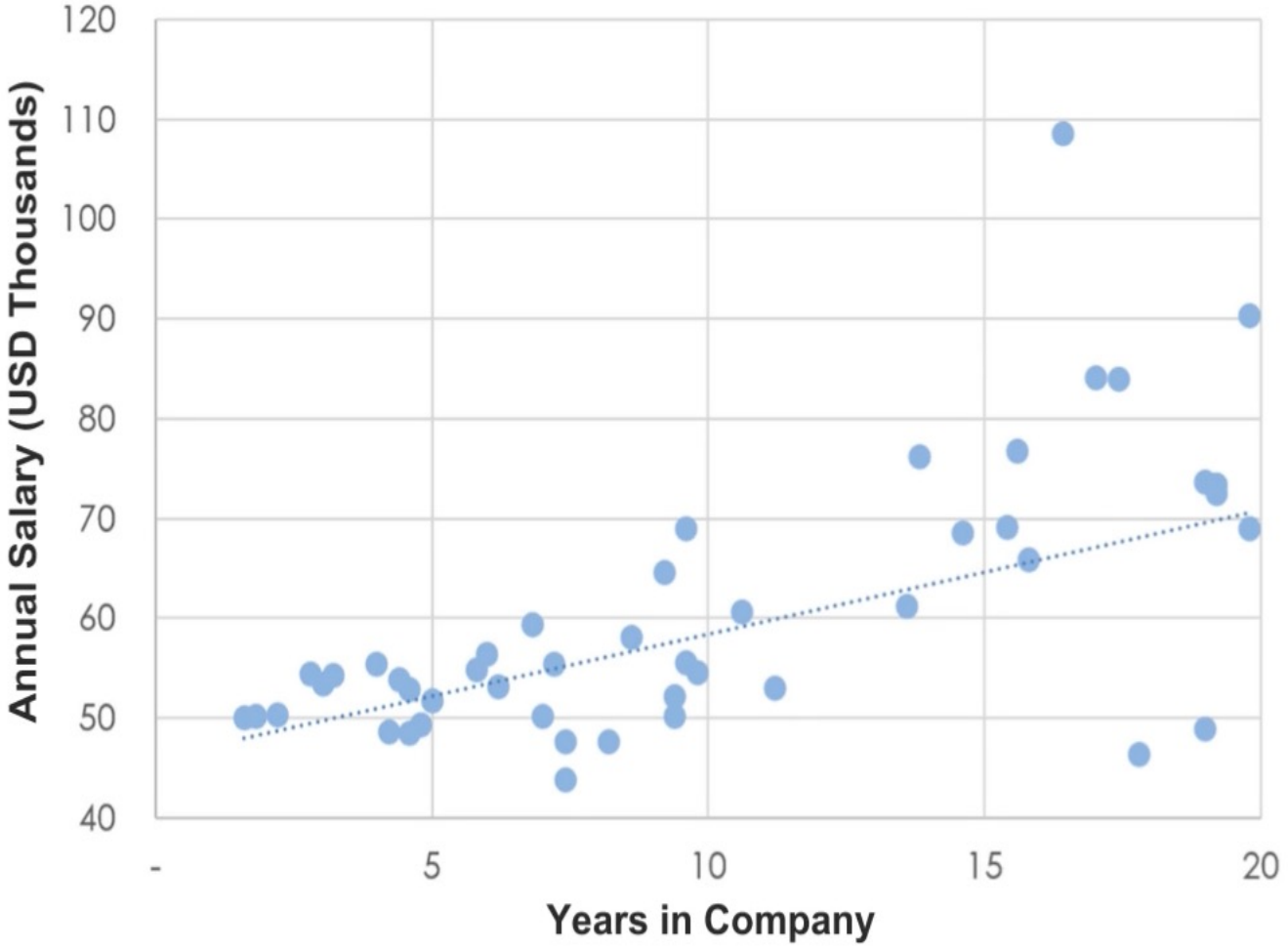


3. PROPORTIONS

Ideal For:

- Pie Charts
- Bar Charts
- Stacked Bar Charts
- Treemaps

In general, **annual salary increases with tenure**, as highly experienced personnel are given more critical roles with performance-based compensation.



4. CORRELATIONS

Examines the statistical relationship between two or more variables

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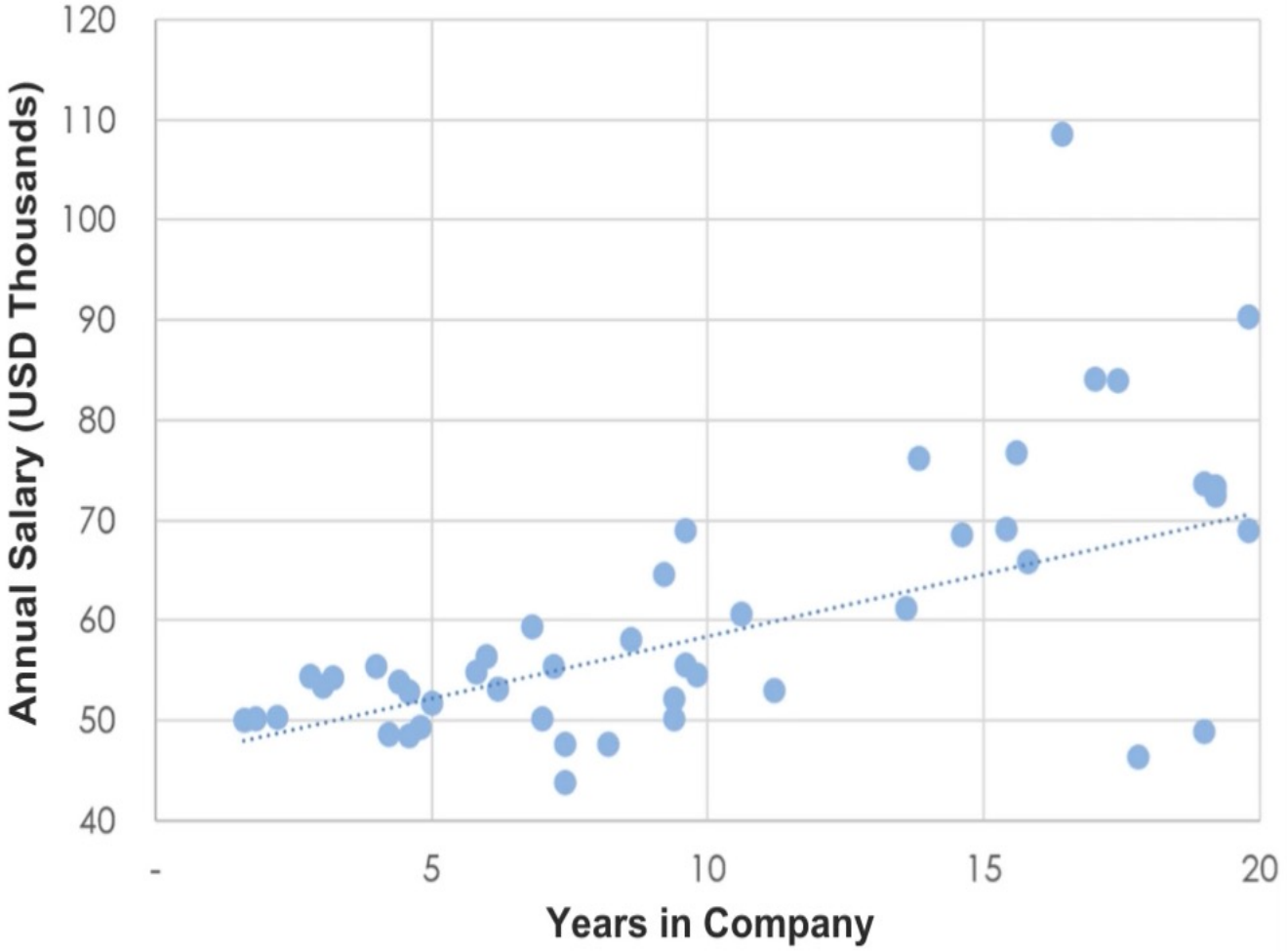


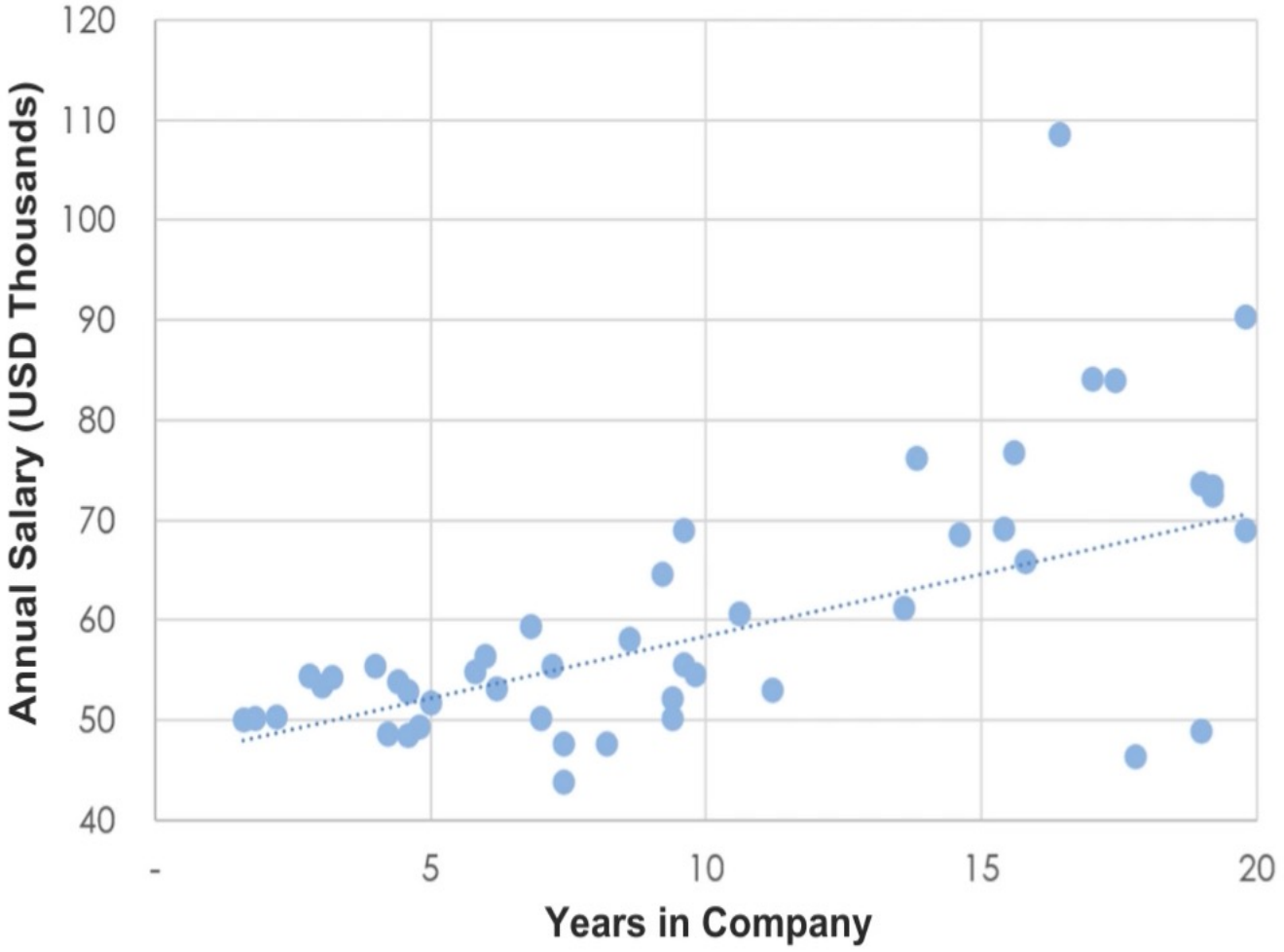
4. CORRELATIONS

Examines the statistical relationship between two or more variables

- ✓ Identify patterns and connections within datasets
- ✓ Reveal strength and direction of relationship between variables

"If I control this variable, I can increase/decrease the output."

In general, **annual salary increases with tenure**, as highly experienced personnel are given more critical roles with performance-based compensation.



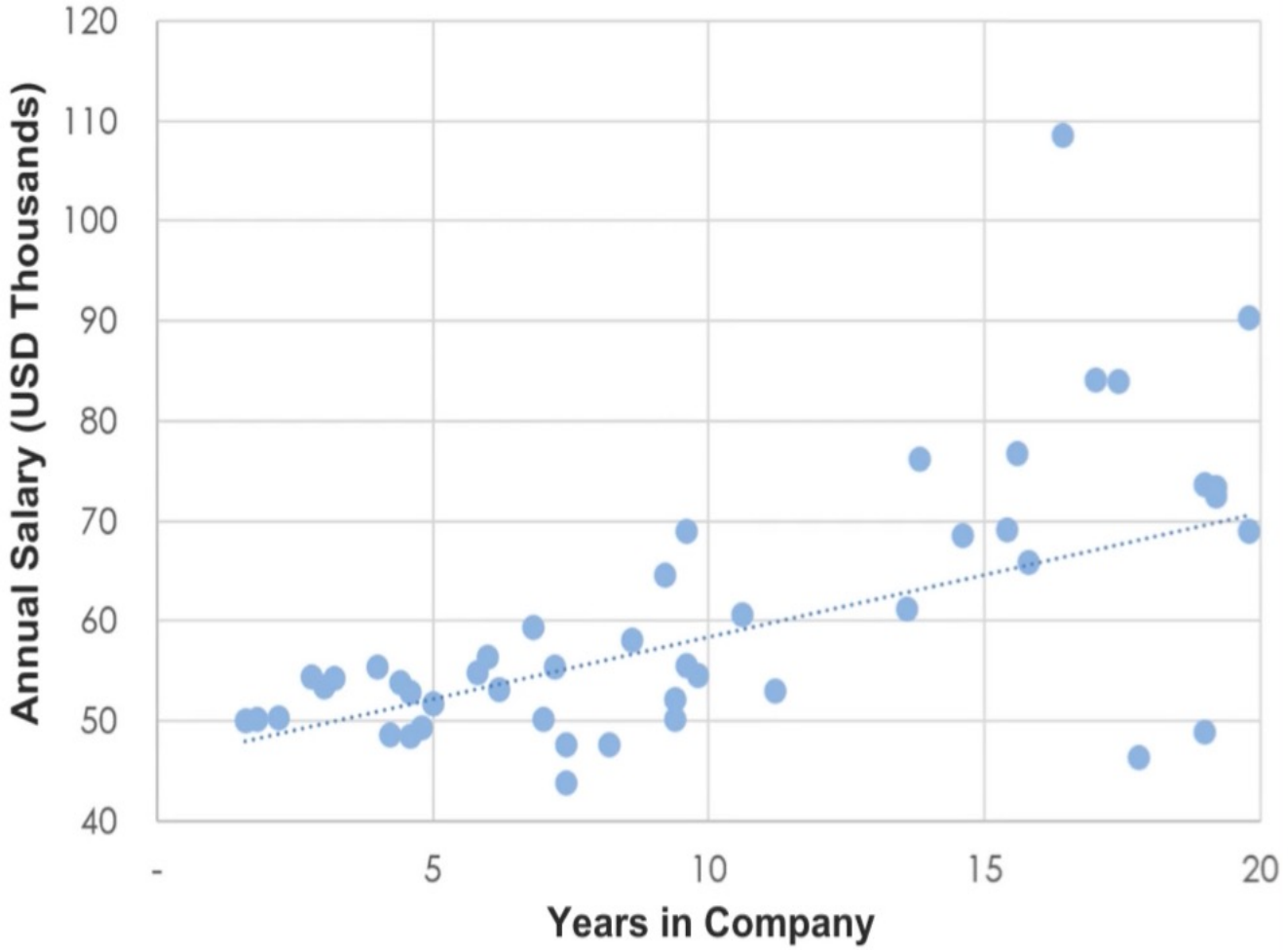
4. CORRELATIONS

Answers Questions:

- Which factors have a **positive/ negative relationship** with the result?
- Which factors have a **weak/no relationship** with the result?

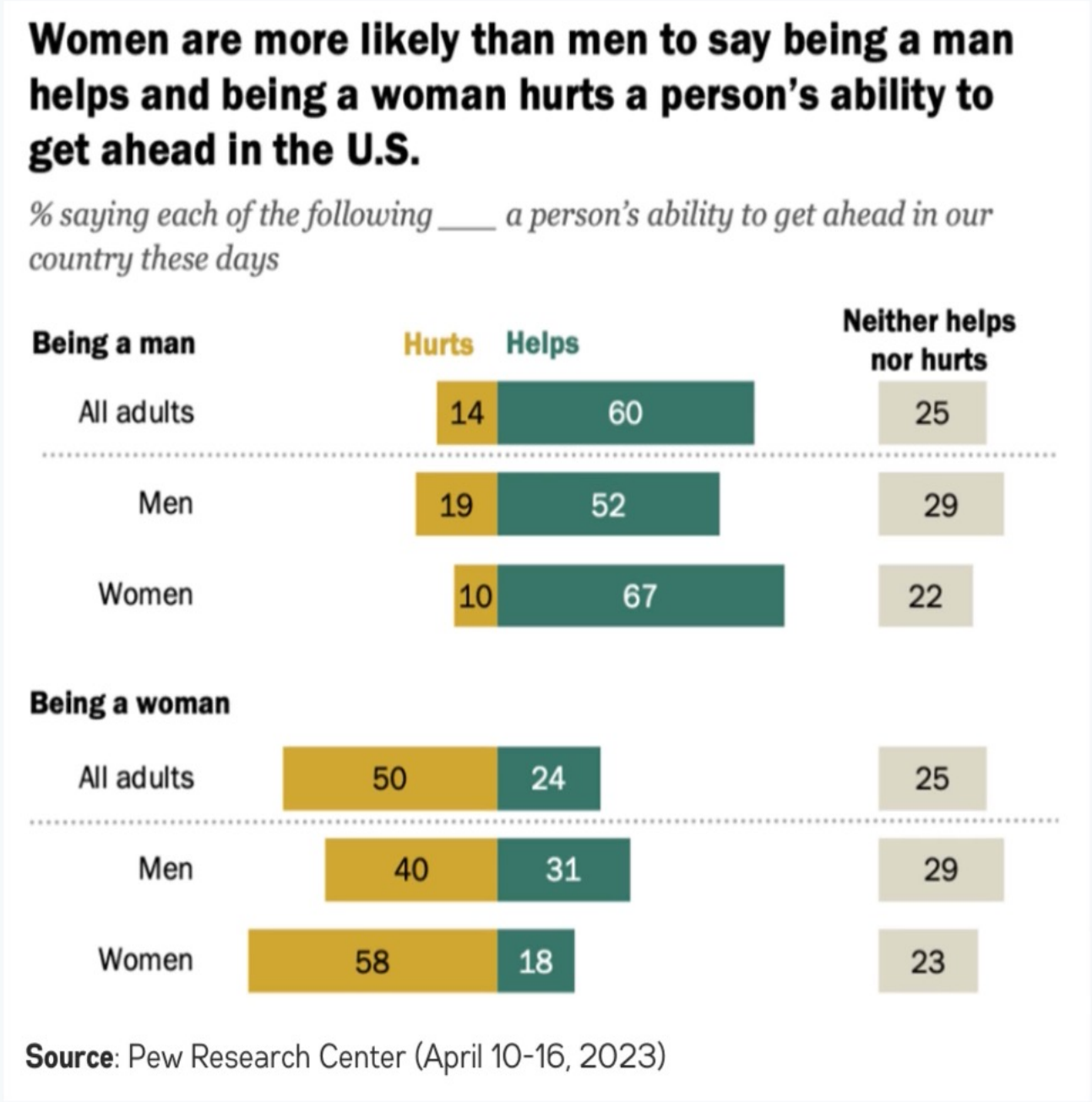
4. CORRELATIONS

In general, **annual salary increases with tenure**, as highly experienced personnel are given more critical roles with performance-based compensation.



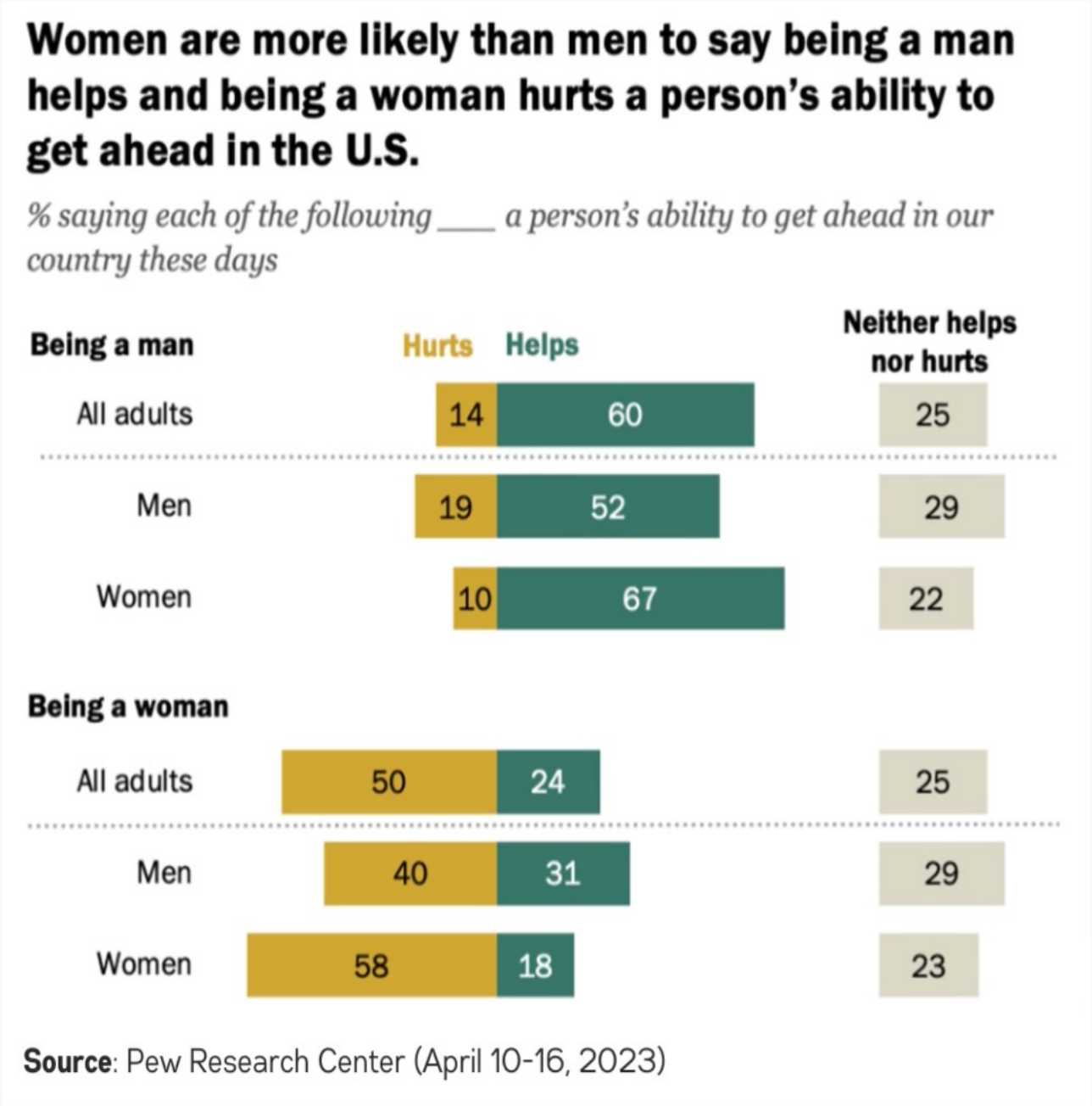
Ideal For:

- Scatterplots
- Line Graphs
- Heatmaps
- Bubble Charts



5. COMPARISONS

Examining and contrasting different variables to identify similarities, differences, or patterns.



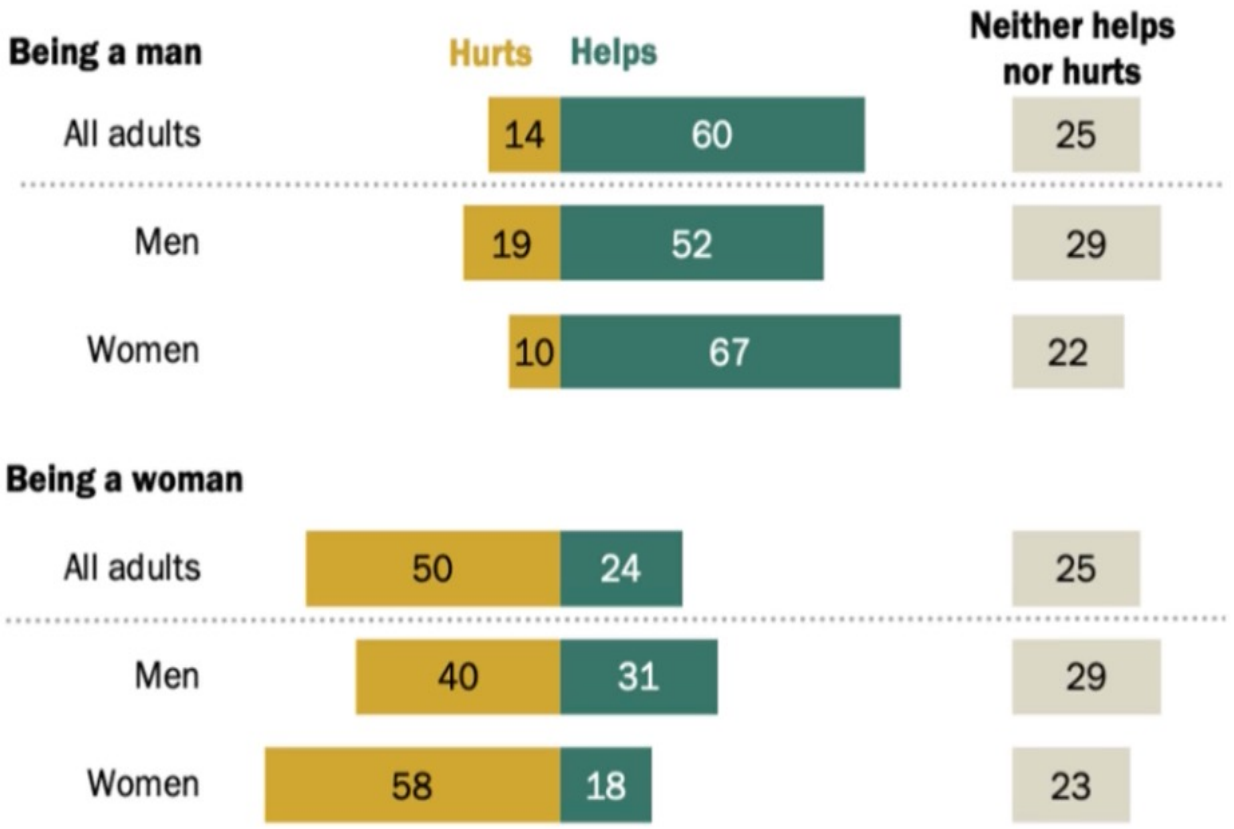
5. COMPARISONS

Examining and contrasting different variables to identify similarities, differences, or patterns.

- ✓ Highlight relationships and trends between the compared elements
- ✓ Provide valuable insights for decision-making

Women are more likely than men to say being a man helps and being a woman hurts a person's ability to get ahead in the U.S.

% saying each of the following ___ a person's ability to get ahead in our country these days



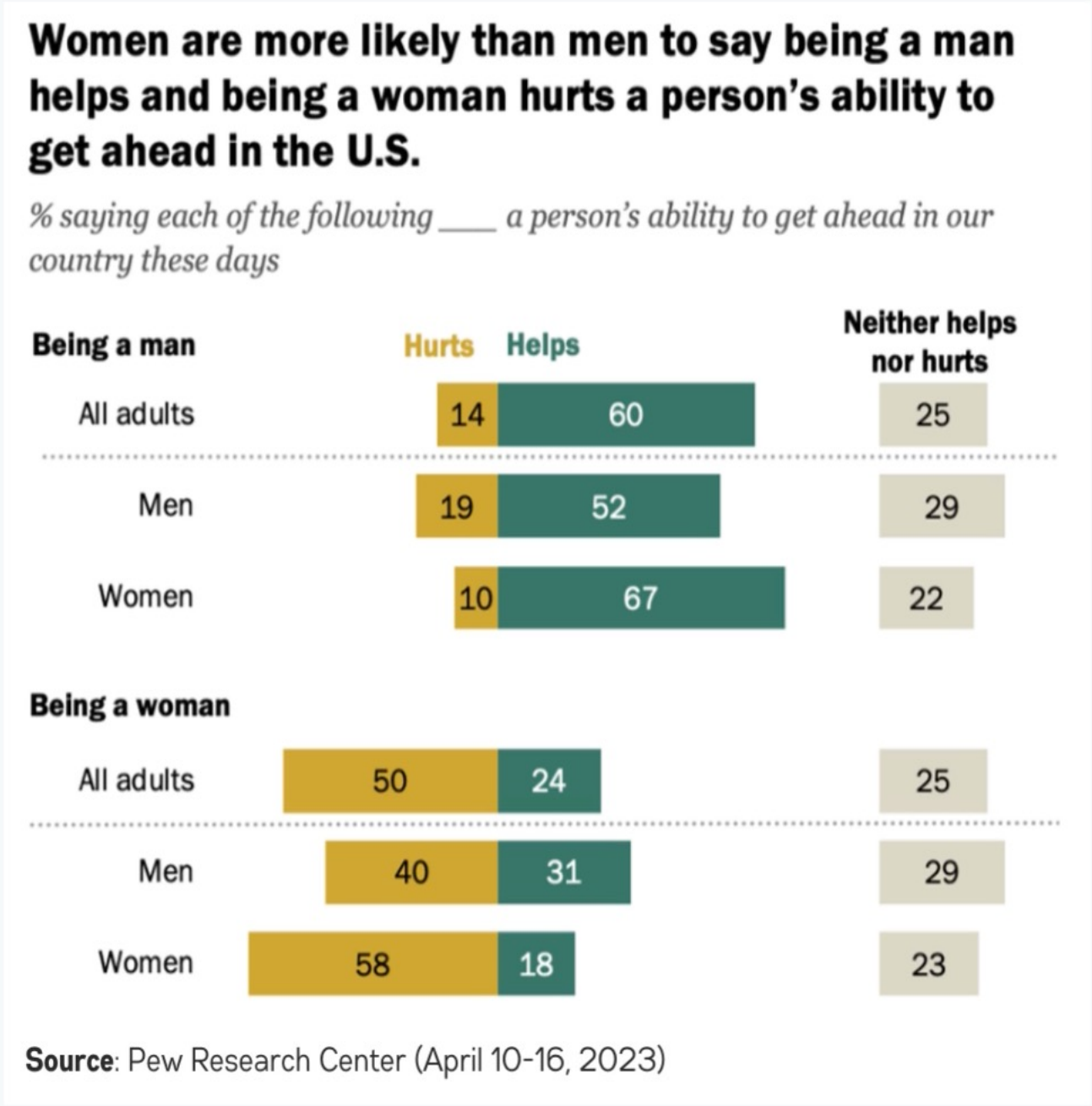
Source: Pew Research Center (April 10-16, 2023)

5. COMPARISONS

Answers Questions:

- How does each item/category or entity/class differ in terms of:
  - Ranking
  - Distribution
  - Composition/contributing factors
  - Correlation of selected factors
  - Change in behavior or attribute values over time

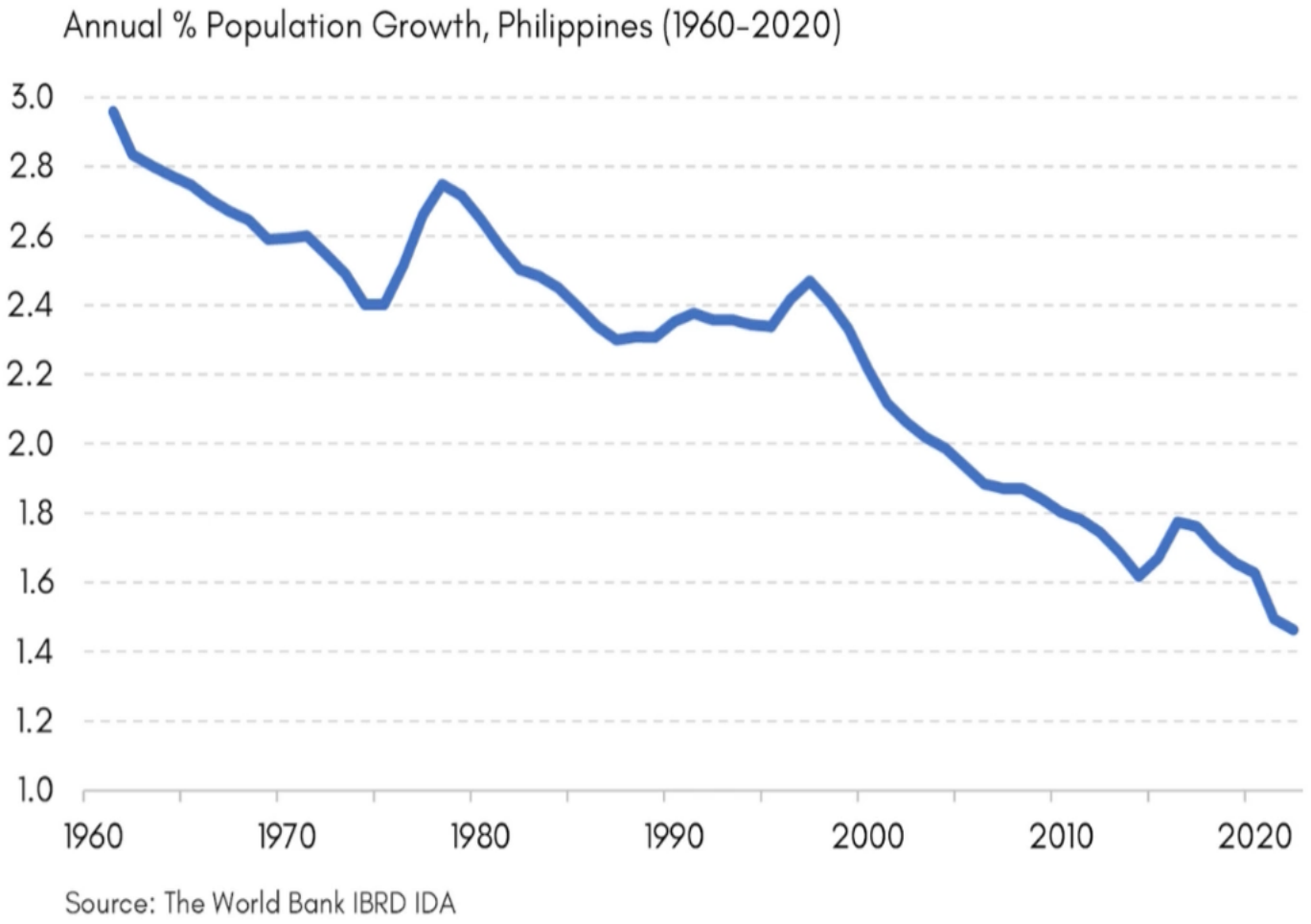
5. COMPARISONS



Ideal For:

- Bar Charts
- Line Graphs
- Pie Charts
- Stacked Bar Charts

The Philippines has experienced a general decline in population growth over the past 6 decades.



6. CHANGE OVER TIME

Focuses on how a particular variable or set of variables evolves and varies over a specific period

The Philippines has experienced a general decline in population growth over the past 6 decades.

6. CHANGE OVER TIME

Focuses on how a particular variable or set of variables evolves and varies over a specific period

- ✓ Understand patterns, trends, and changes that occur in data over time
- ✓ Informs decisions and strategies based on historical data

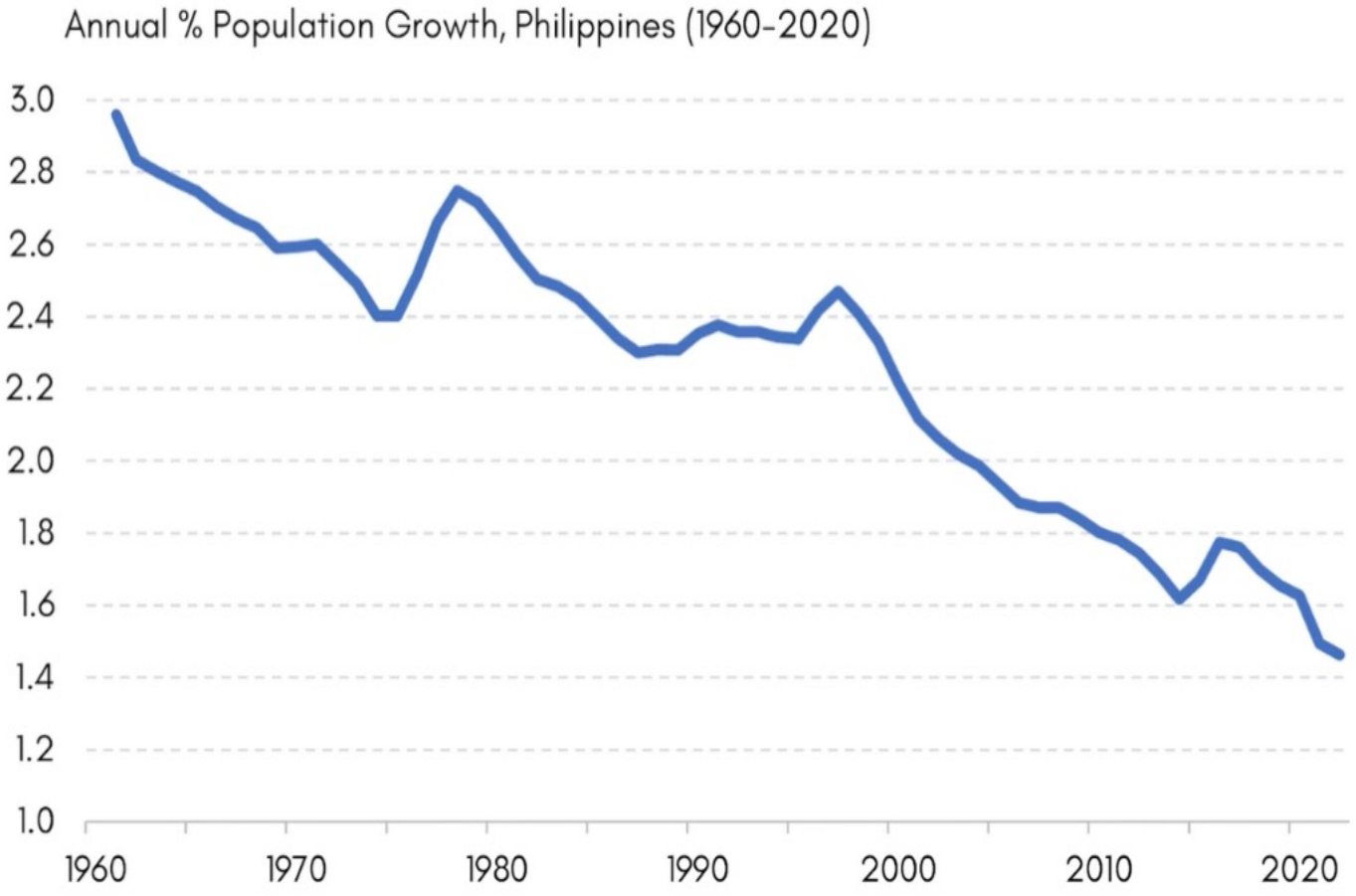
The Philippines has experienced a general decline in population growth over the past 6 decades.

6. CHANGE OVER TIME

Answers Questions:

- Is the trend consistently **increasing**/**decreasing**/**random**?
- Is there a **seasonal** pattern?
- Was there a **change** in:
  - Ranking
  - Distribution
  - Proportions
  - Correlation

The Philippines has experienced a general decline in population growth over the past 6 decades.



Source: The World Bank IBRD IDA

6. CHANGE OVER TIME

Ideal For:

- Line Graphs
- Bar Charts
- Time Series
- Area Charts
- Scatterplots
- Heatmaps

6 Types of Data Stories

6 Types of Data Stories

The first step to knowing which visual would be ideal for your data story!

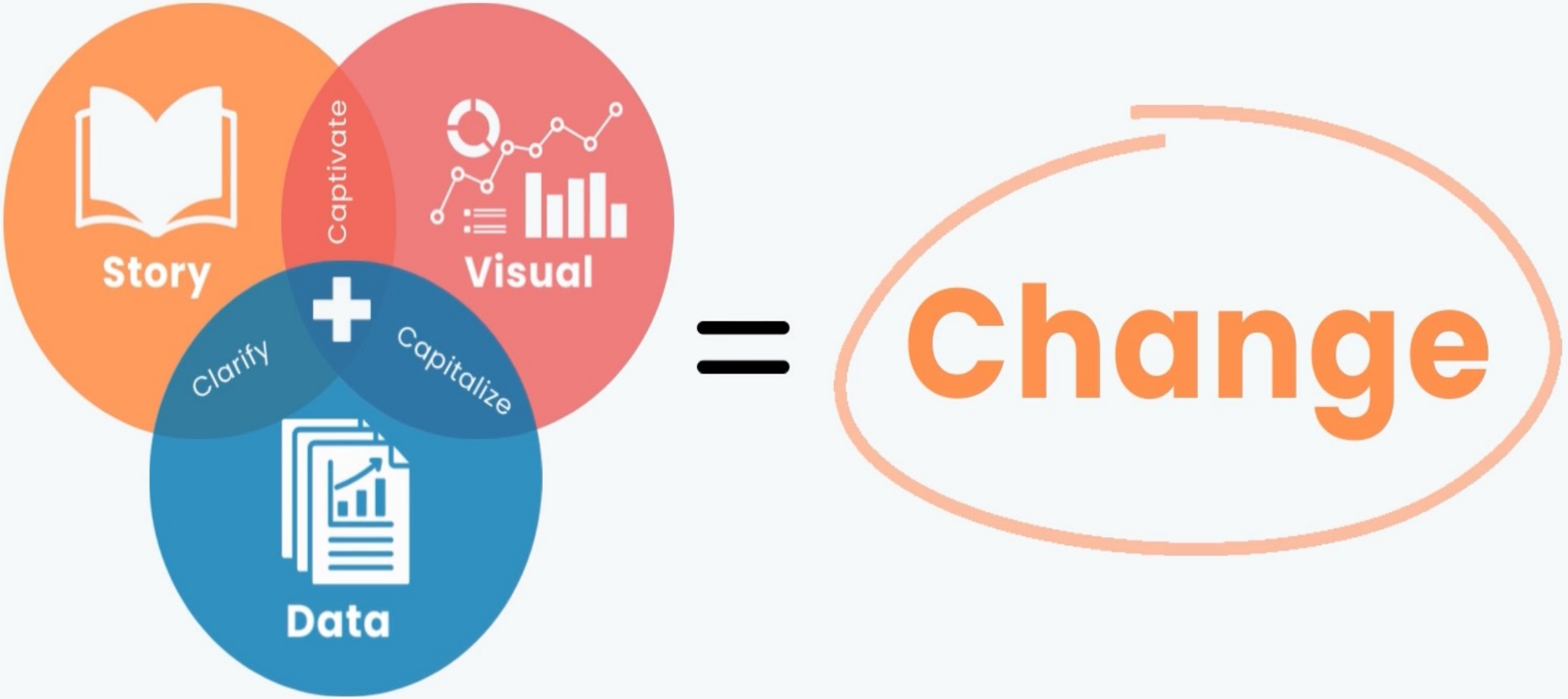
A. 6 Types of Data Stories

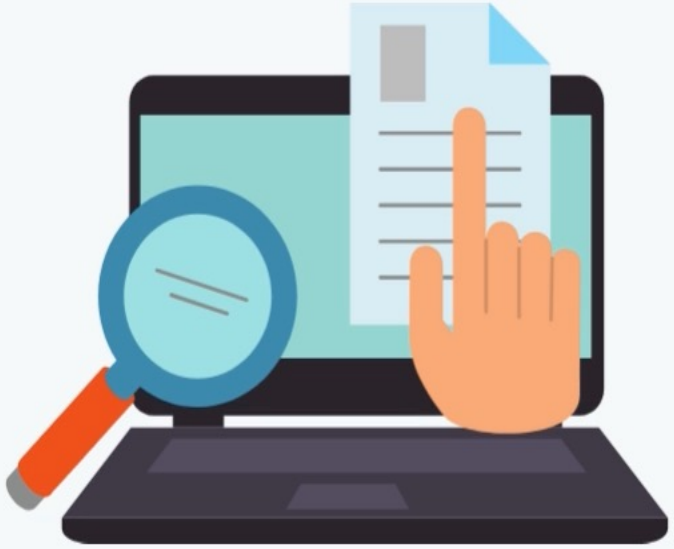
Case Study: Wealth and Health of Nations

Remember!

A good data story combines **BOTH** **story** and **visual**

Data, Story, Visual (DSV) Diagram





CASE STUDY:

Hans Rosling's Wealth and Health of Nations (2009)

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Hans Rosling's Wealth and Health of Nations (2009)

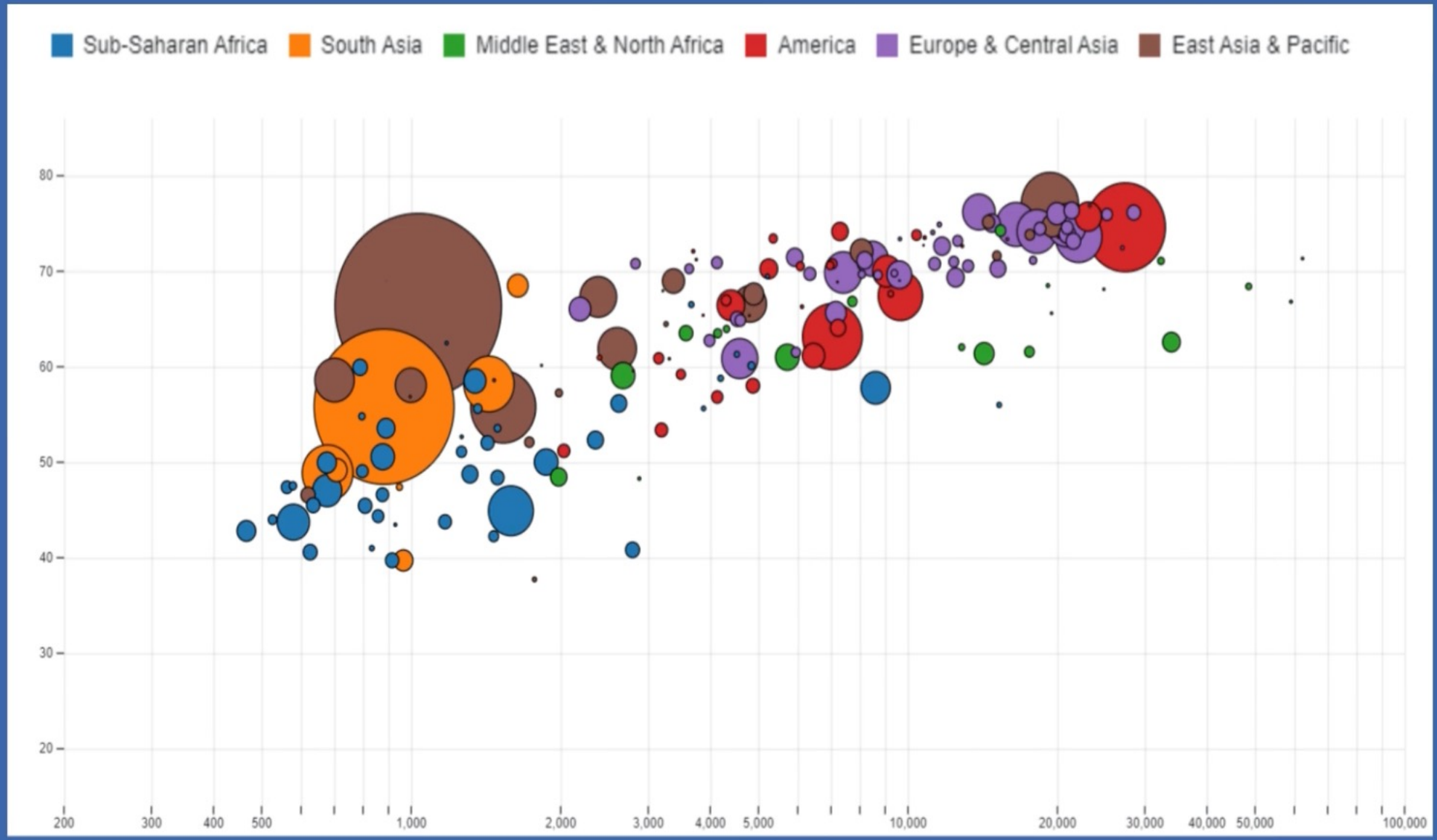
Economic Prosperity and Life Span

200 countries, 200 years, 120,000 numbers

CASE STUDY:

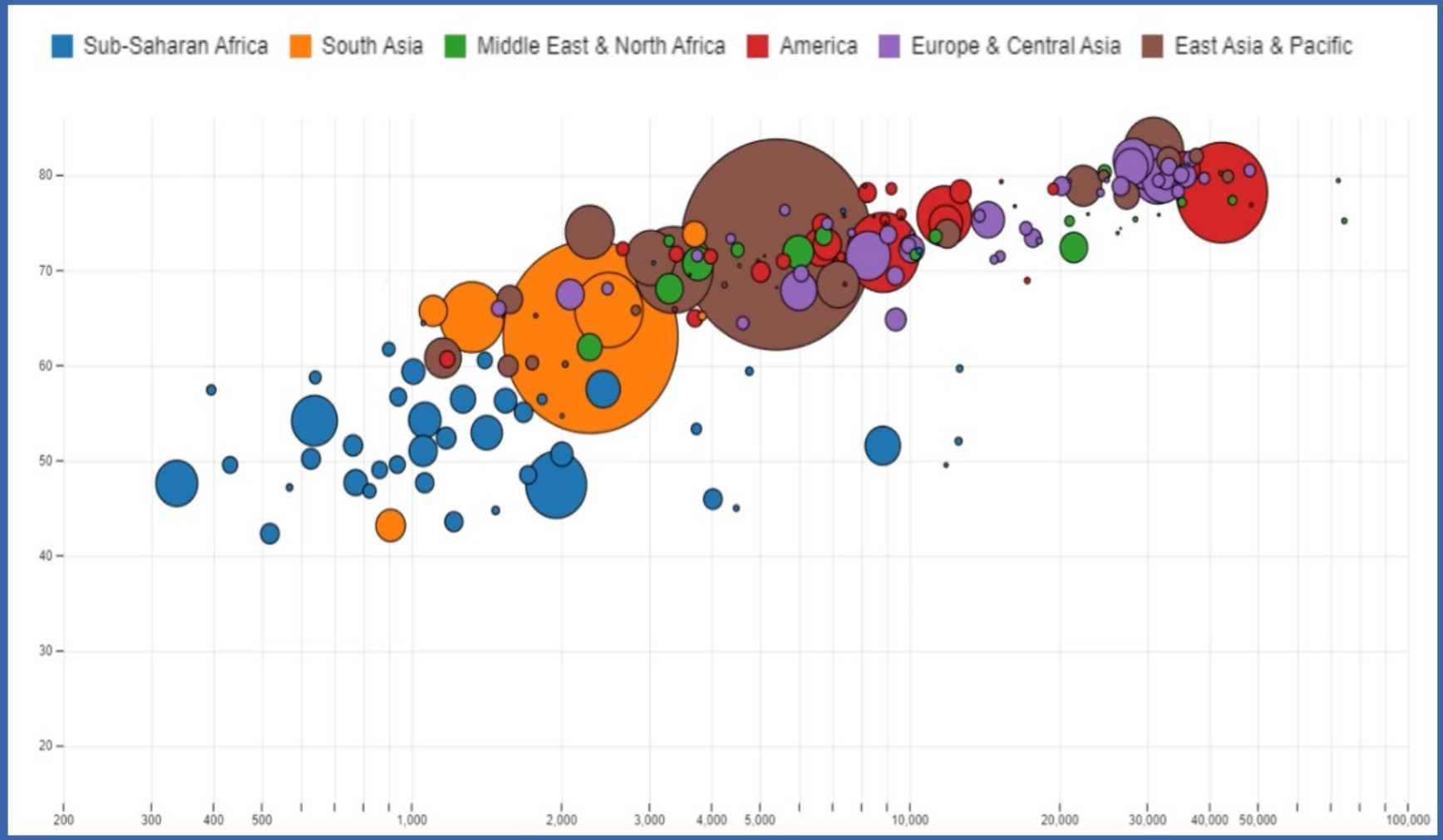
Hans Rosling's Wealth and Health of Nations (2009)

Wealth and Health of Nations (1810-2009)

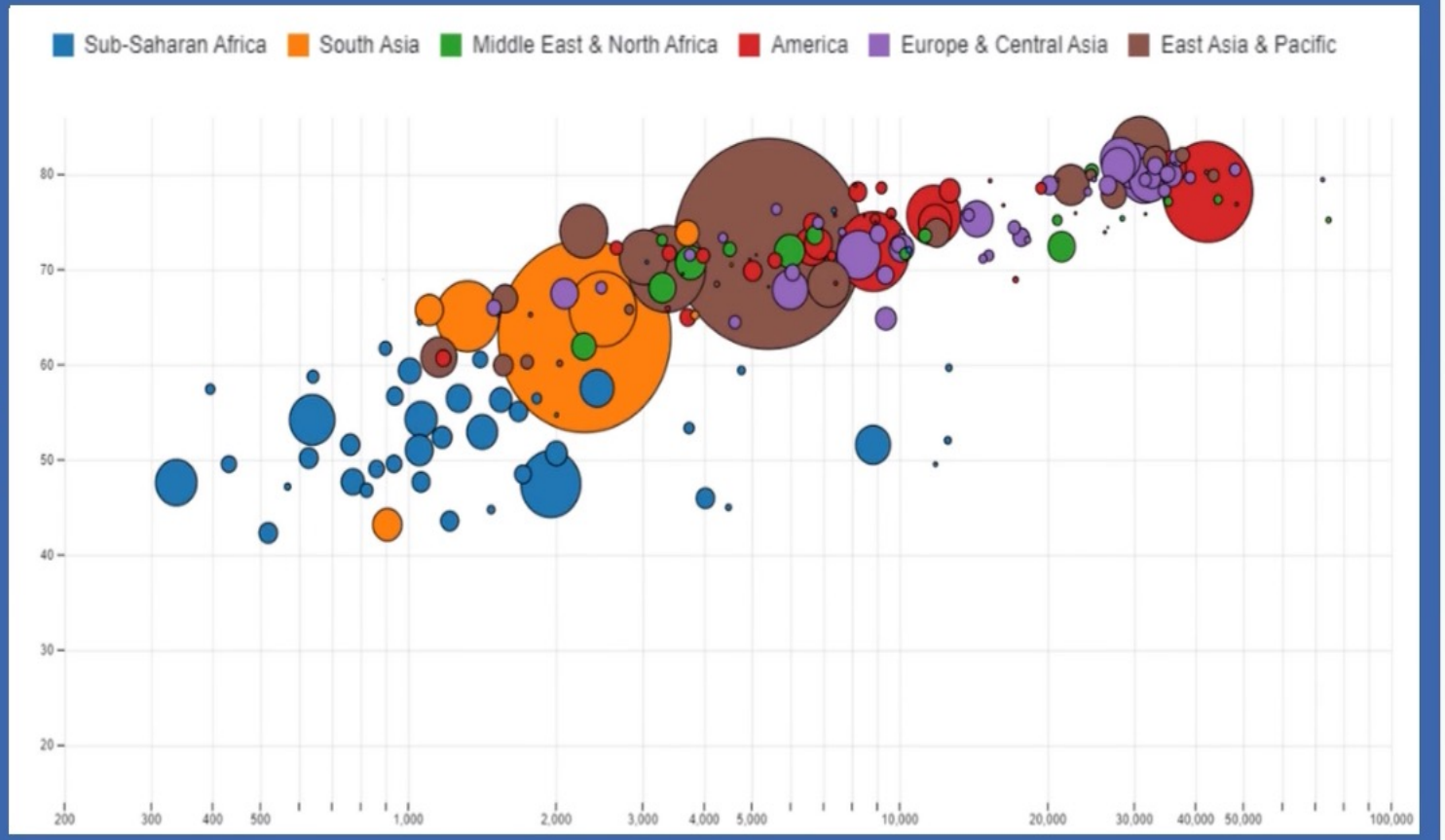


Captured 6 Variables!

Life Span, Income, Country, Population, Region, Year



Wealth and Health of Nations (1810-2009)



RECAP:

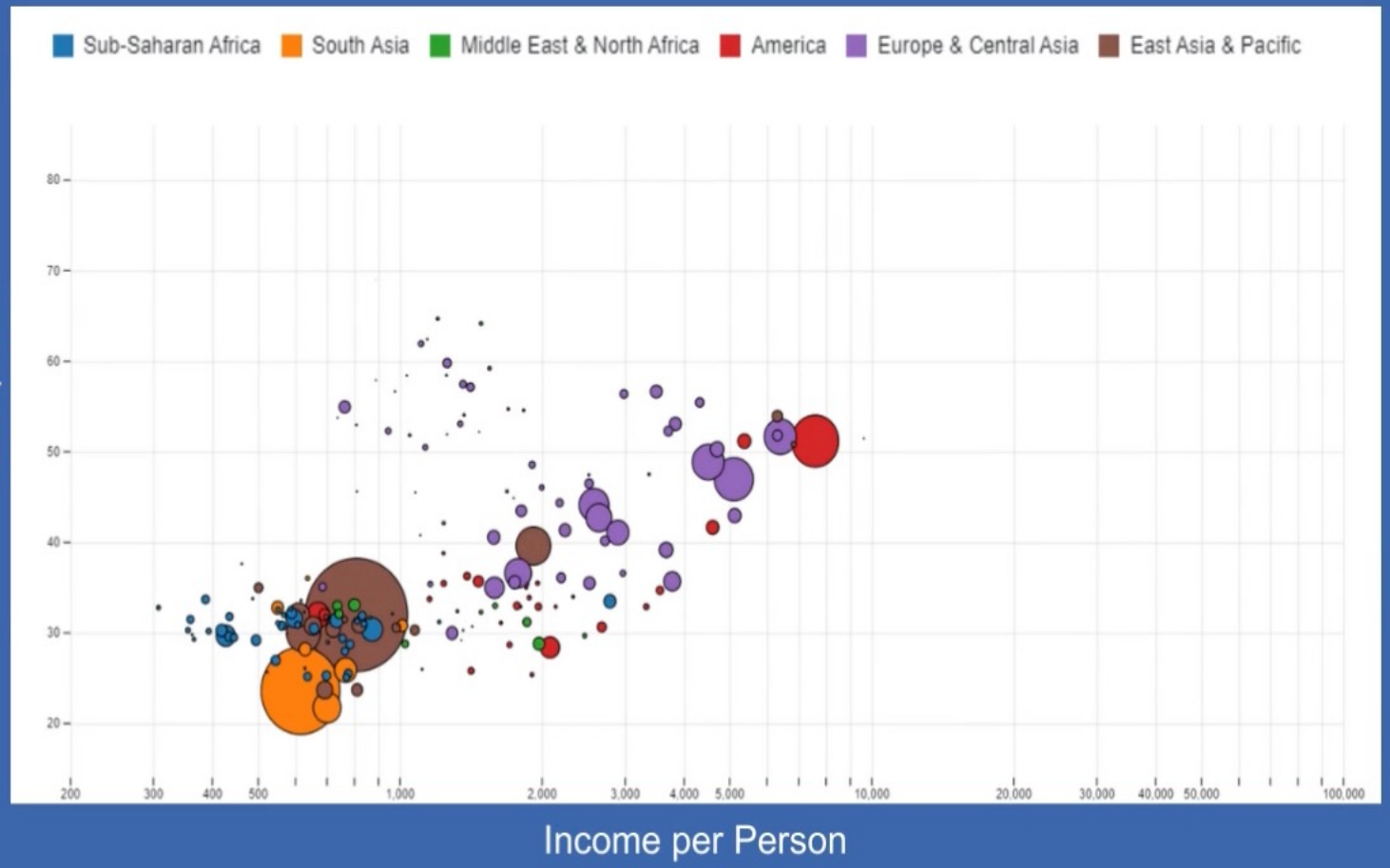
What's the Story?

Wealth and Health of Nations (1810-2009)

1810

Most of the world was poor and sick

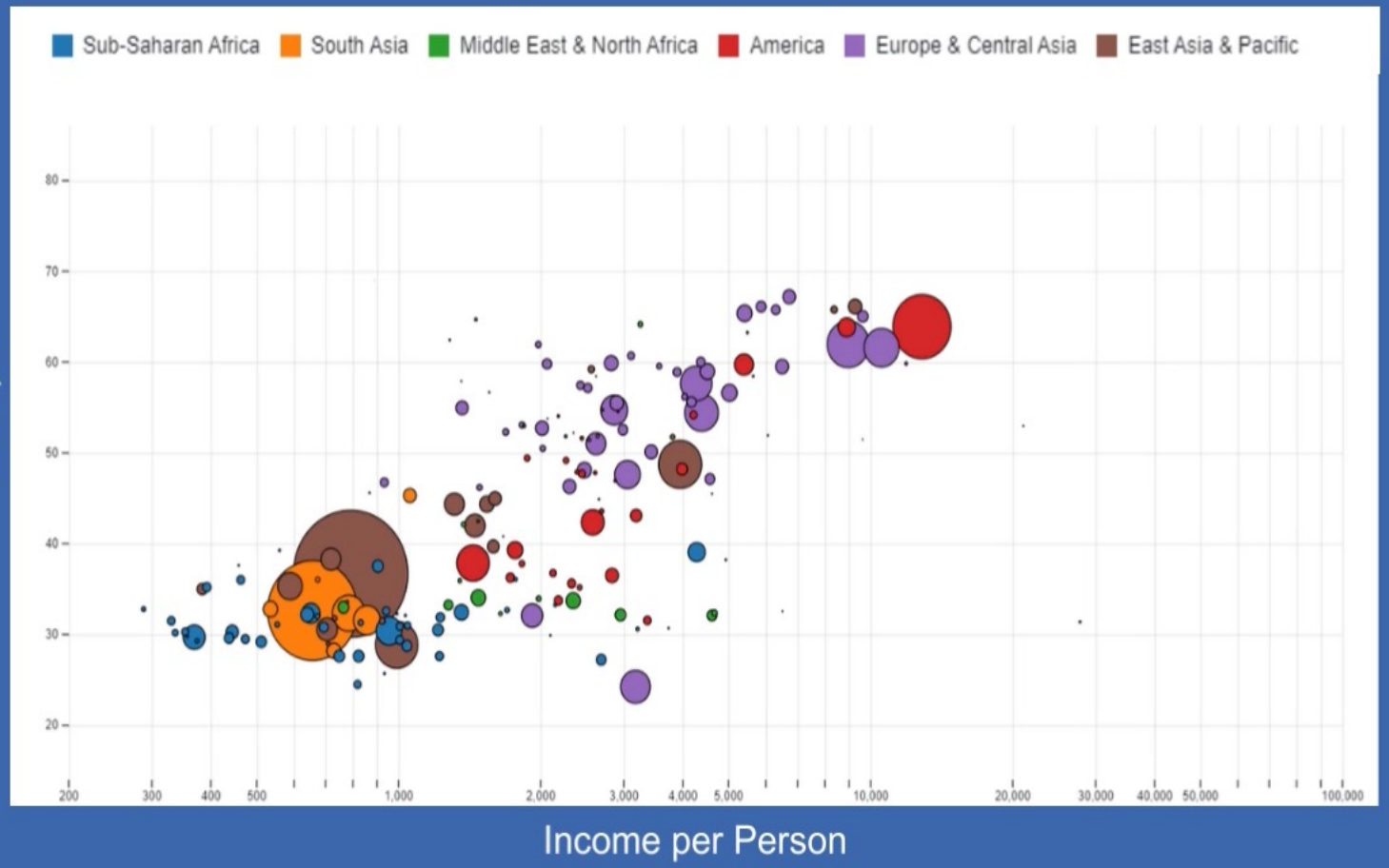
Wealth and Health of Nations (1810-2009)



1820s–1900s

Industrial Revolution boosted countries from all-time low in income and life span

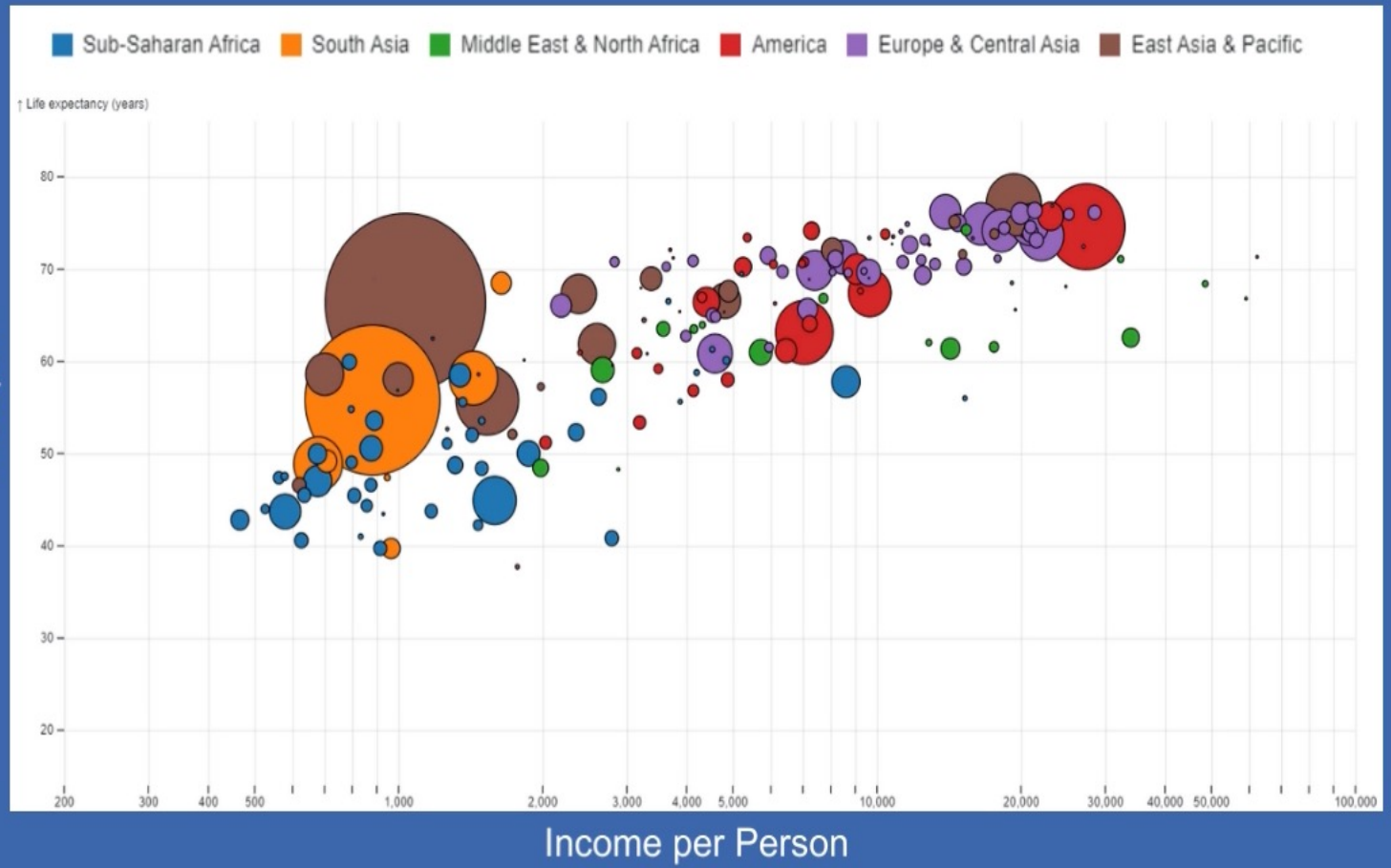
Wealth and Health of Nations (1810-2009)



1900s-1940s

Nations pulled through **major world events** with a steady rise to wealth and health in favor of the West

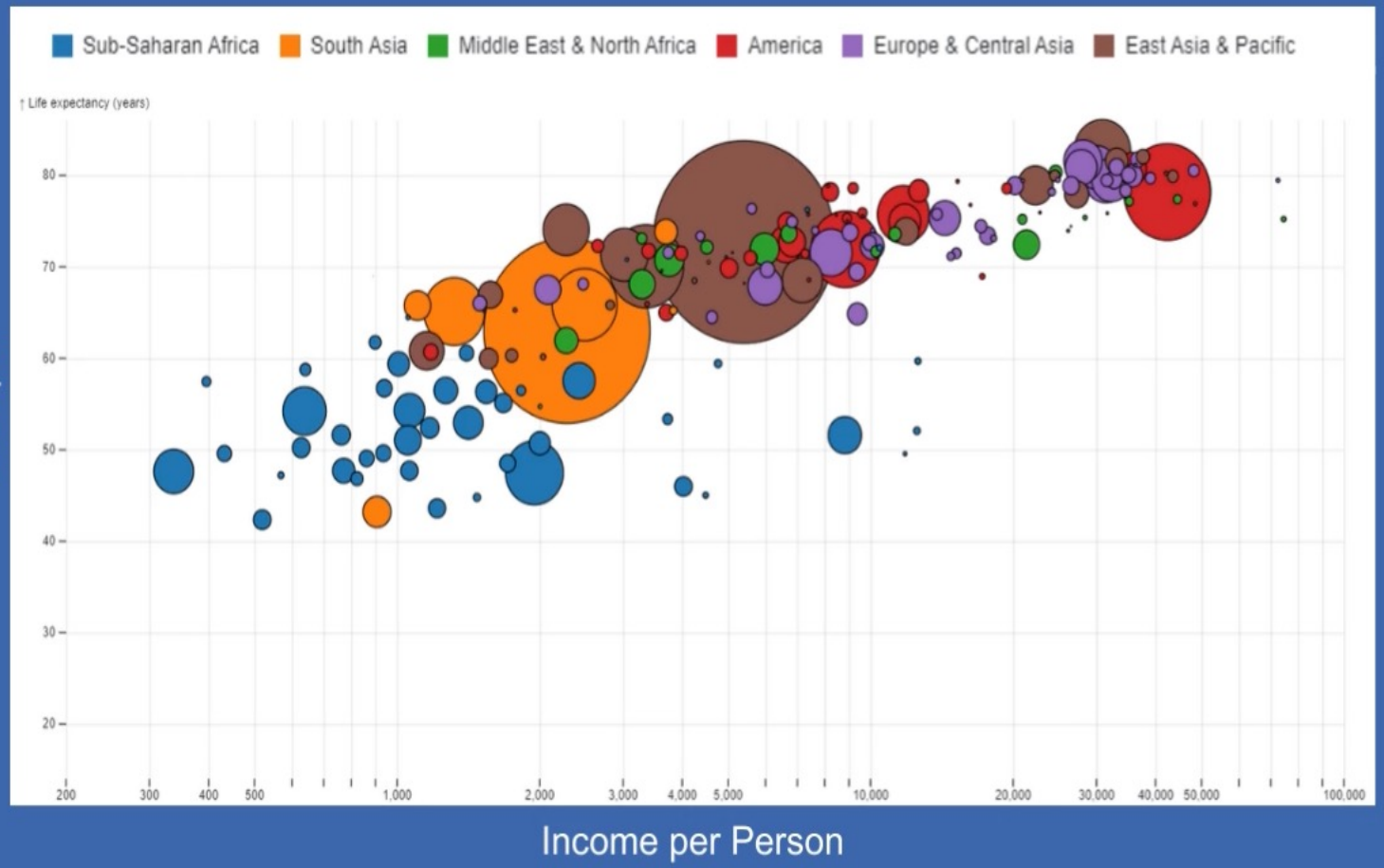
Wealth and Health of Nations (1810-2009)



1950s–2000s

Former poor and sick countries became **emerging economies**, catching up to the West and Europe.

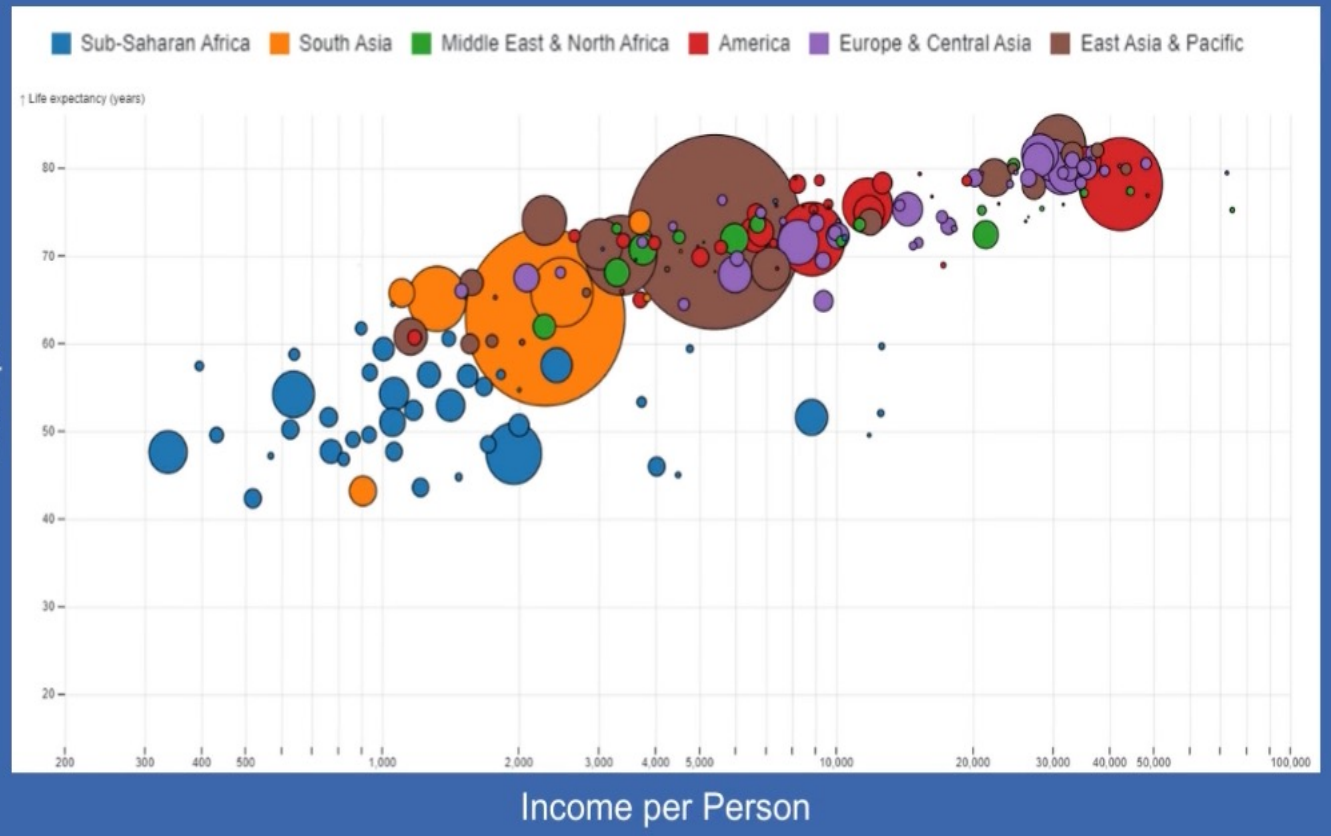
Wealth and Health of Nations (1810–2009)



20th Century

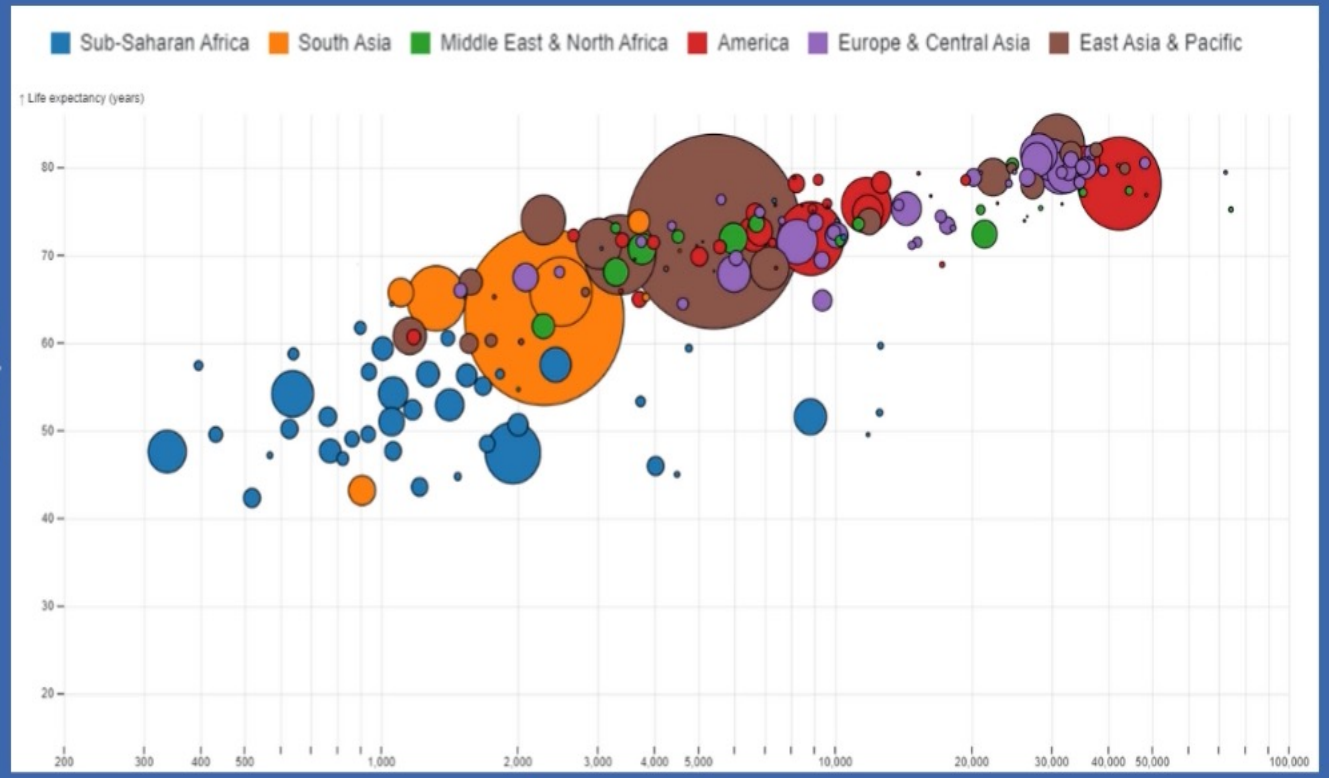
Countries **veered away** from poor and sick quadrant, and **continue to progress** toward the rich and healthy side

Wealth and Health of Nations (1810-2009)



What is this trying to tell us?

Wealth and Health of Nations (1810-2009)

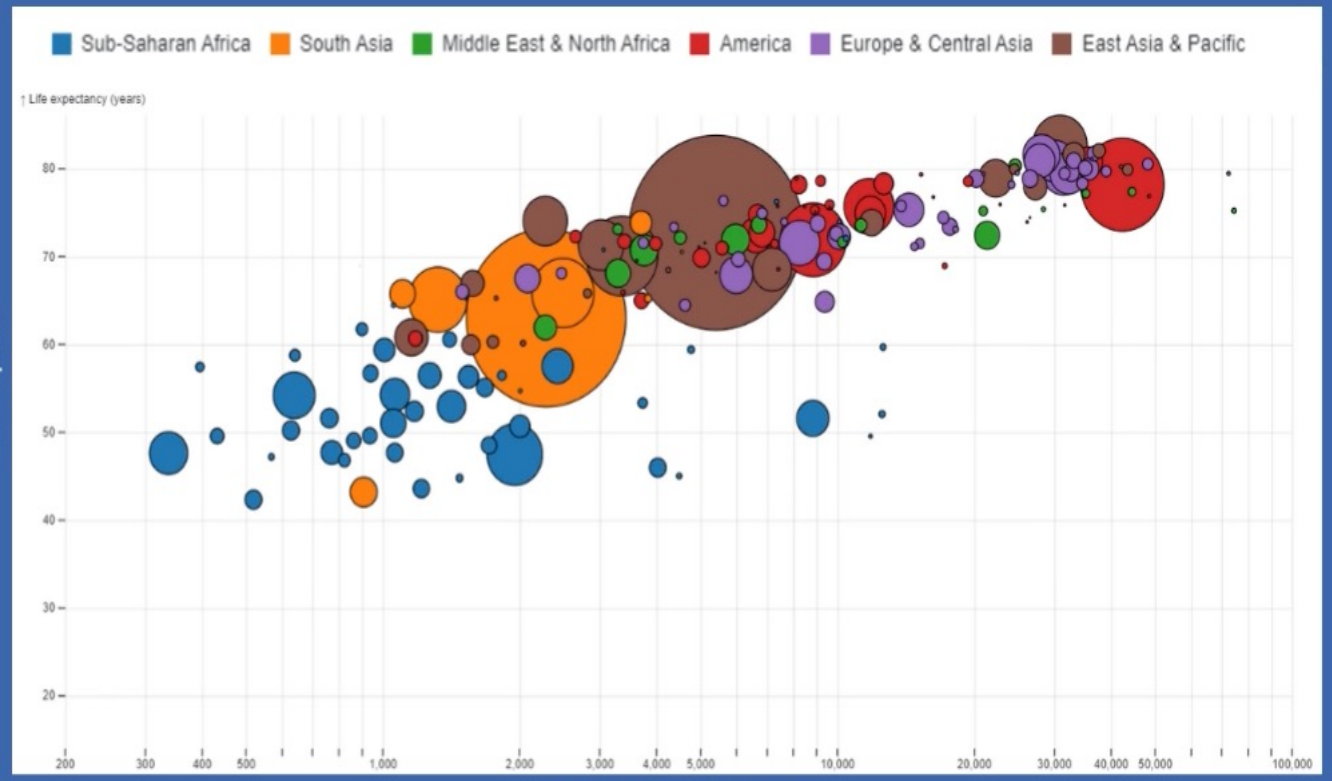


What is this trying to tell us?

Key Insight Unlocked:

After 200 years, majority of countries have become **wealthier** and **healthier**.

Wealth and Health of Nations (1810-2009)



What is this trying to tell us?

Upward Trend

- Income per Person
- Life Span

Bottomline: The world we live in today is **radically different** from the world it used to be!

We are continually heading toward **higher** income, **healthier** lifestyles, and **longer** life spans.

WHICH TYPES OF DATA STORIES WERE USED?

WHICH TYPES OF DATA STORIES WERE USED?

5 out of 6!

Rankings

Top & Bottom Countries by:

- Life Span
- Income per Person

Distribution

Quadrants where countries are:

- **Lower Left:** Sick and Poor
- **Upper Right:** Rich and Healthy

Correlation

Positive relationship between:

- Income per Person
- Life Span

Comparison

Between Countries

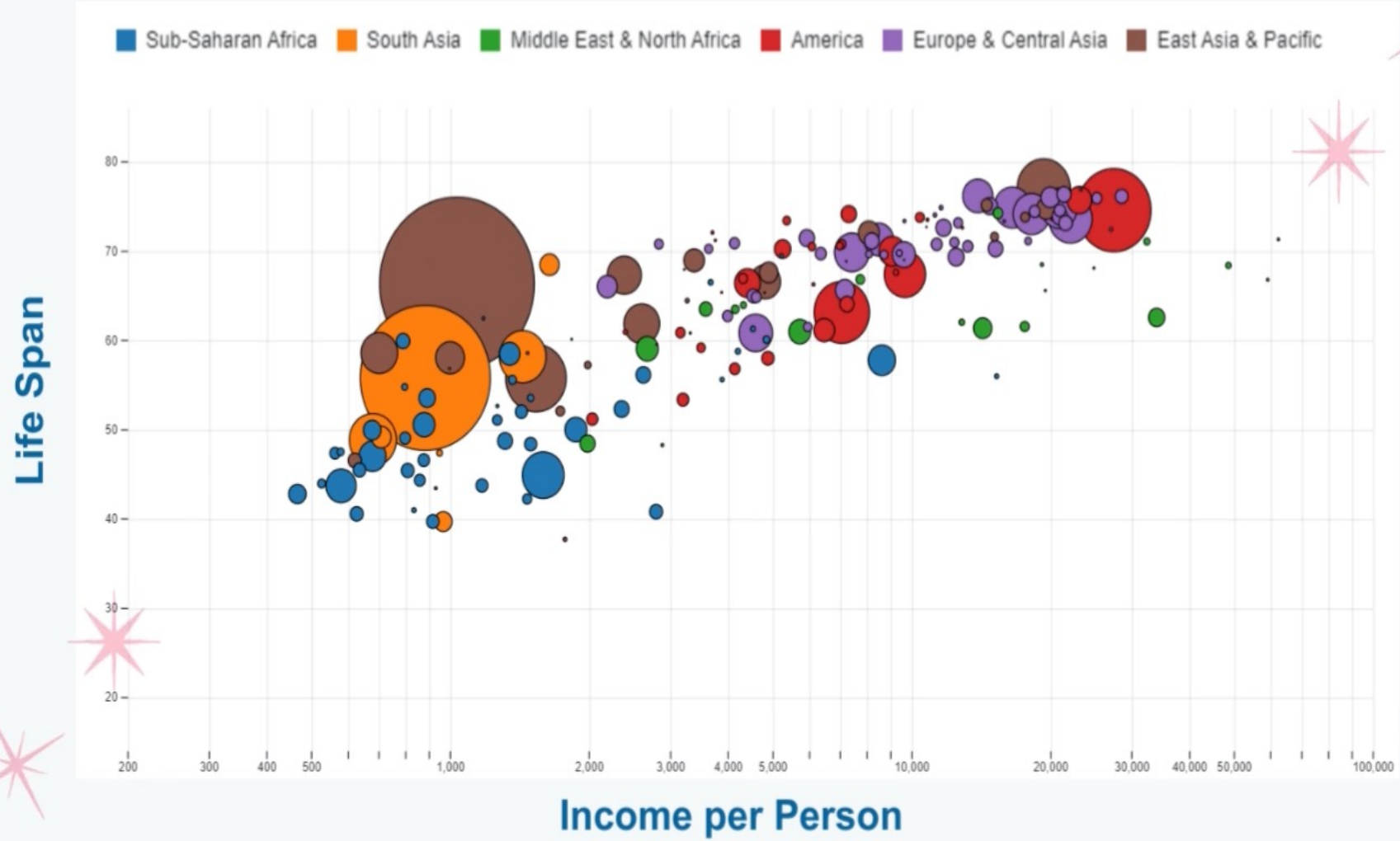
- Income per Person
- Life Expectancy

Change Over Time

Rankings Distribution

Correlation Comparison

Great Visual. Impactful Story. Powerful Data.



II. Visualizing the Story

B. Choosing the Right Visuals

B. Choosing the Right Visuals

1. Graphical Perception

Graphical Perception

(McGill and Cleveland, 1984)

The visual decoding of information encoded on a graph.

Graphical Perception

(McGill and Cleveland, 1984)

The visual decoding of information encoded on a graph.

Position

Length

Slope

Angle

Area

Intensity

Color

Shape

Graphical Perception

(McGill and Cleveland, 1984)

The visual decoding of information encoded on a graph.

PERCEPTUAL TASKS

Position

Length

Slope

Angle

Area

Intensity

Color

Shape

Perceptual Tasks that Common Charts Use:

Most Efficient

Position

Length

Slope

Angle

Area

Intensity

Color

Shape

Least Efficient

- Position → Scatter Plot
- Length → Bar Chart
- Slope / Angle → Line Chart
- Area → Pie Chart
- Intensity → Heat Map
- Color / Shape → Stacked Bar Chart

Dot Plots and Bar Charts are very effective.

They use position and length to convey information.

Position

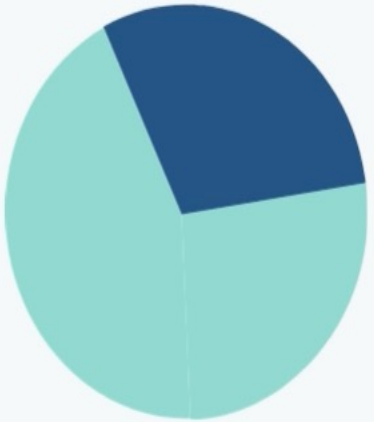
Length

Pie Charts and Donut Charts are less effective.

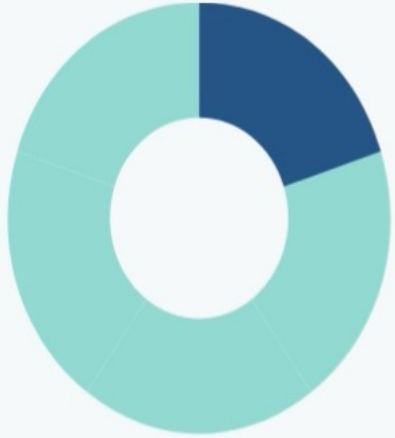
The human-eye **cannot perceive 2D areas** and **angles** that well.

Area

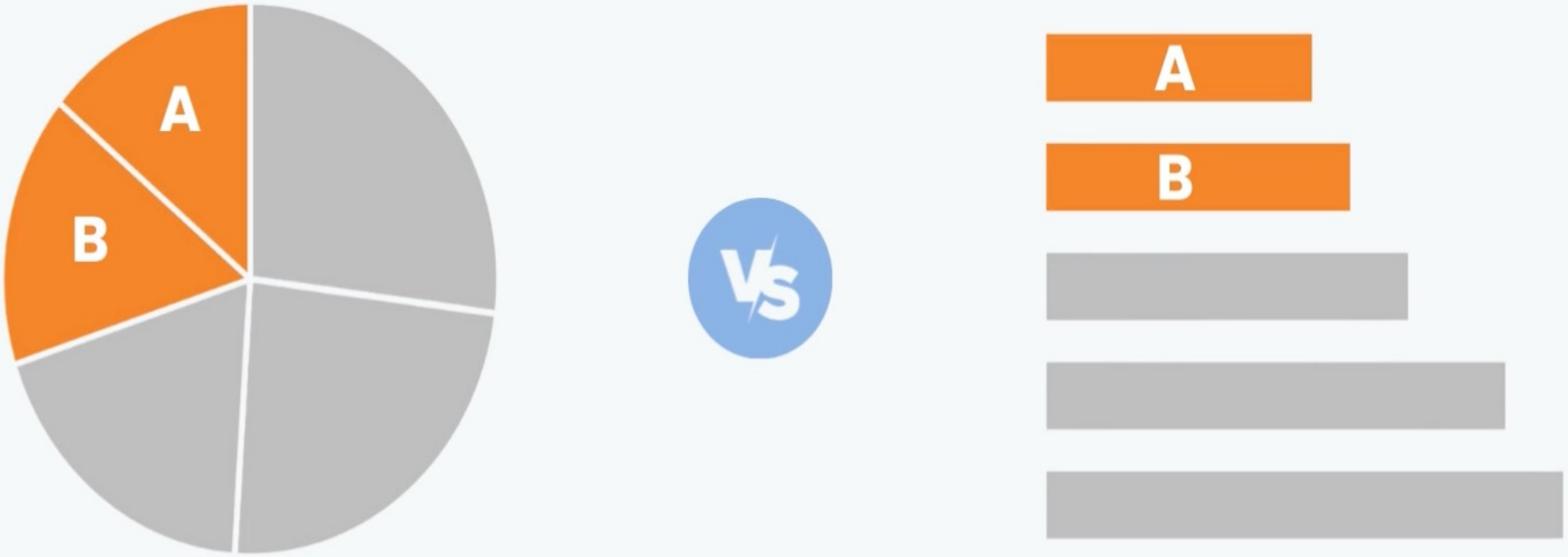
Angle



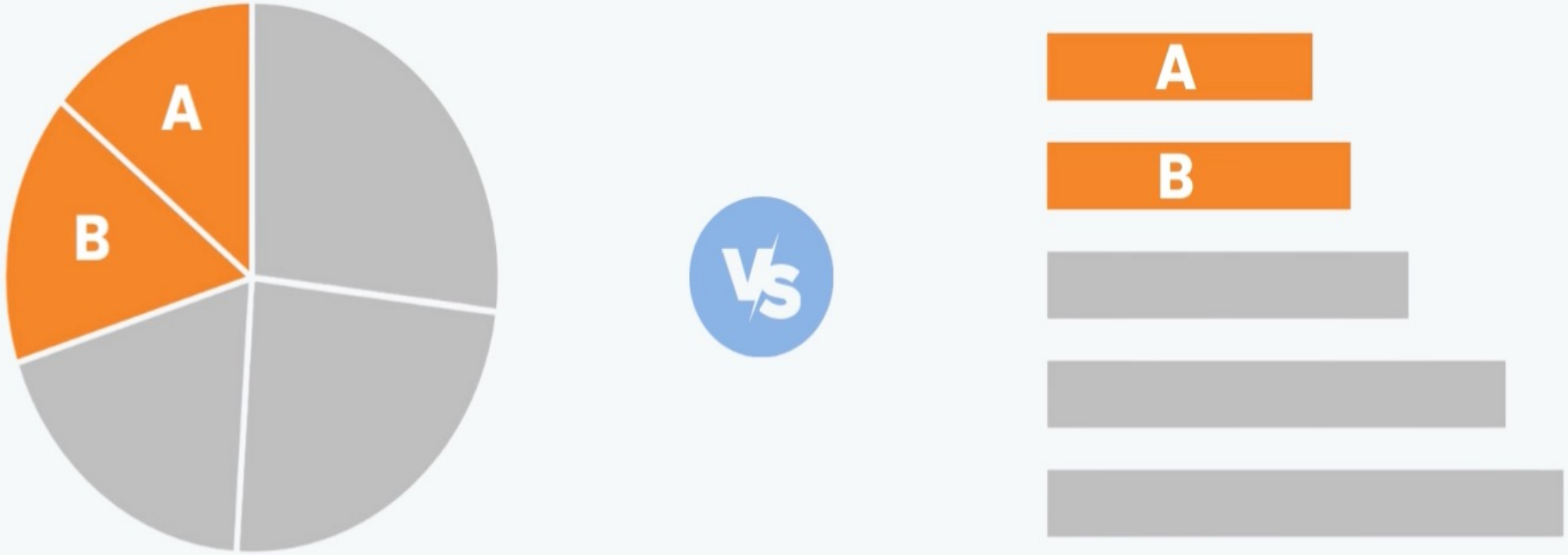
Area



Pie Chart vs. Bar Graph



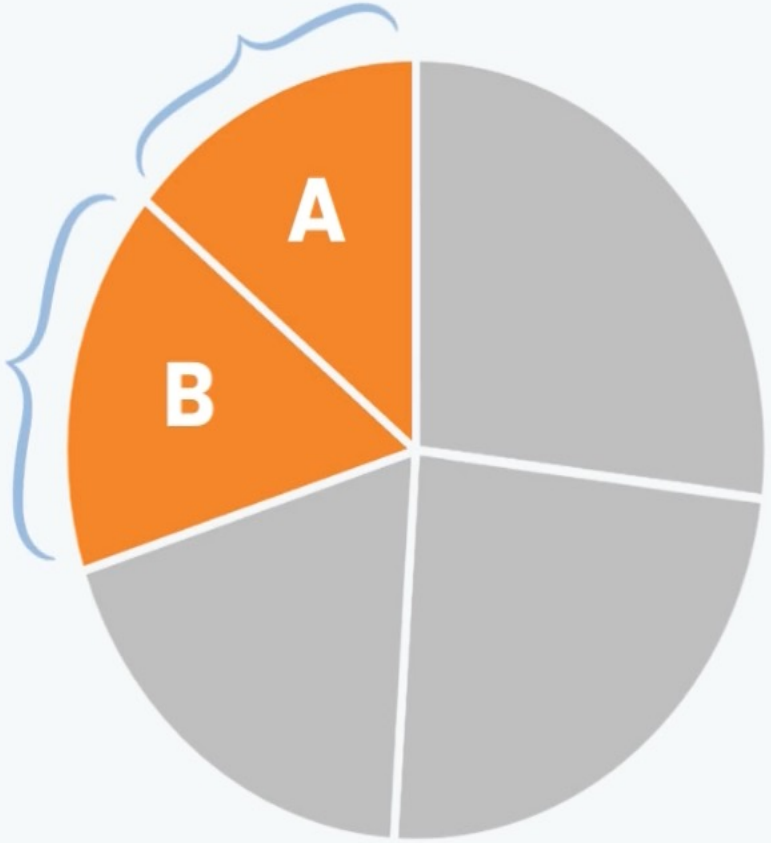
Between A and B, can you tell which is larger?



Limitation of Pies:

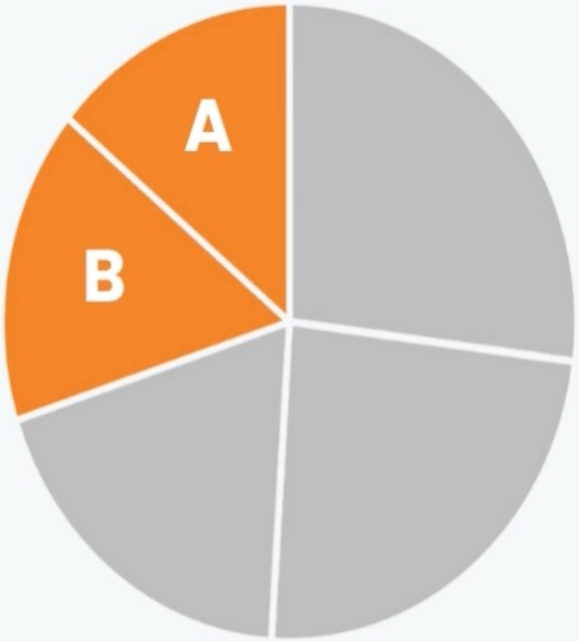
Humans eyes **aren't well-equipped to estimate areas** as compared to lengths

Between A and B, can you tell which is larger?



Comparing A and B is much easier in the Bar Graph.

Harder



VS

Easier

Core Example:

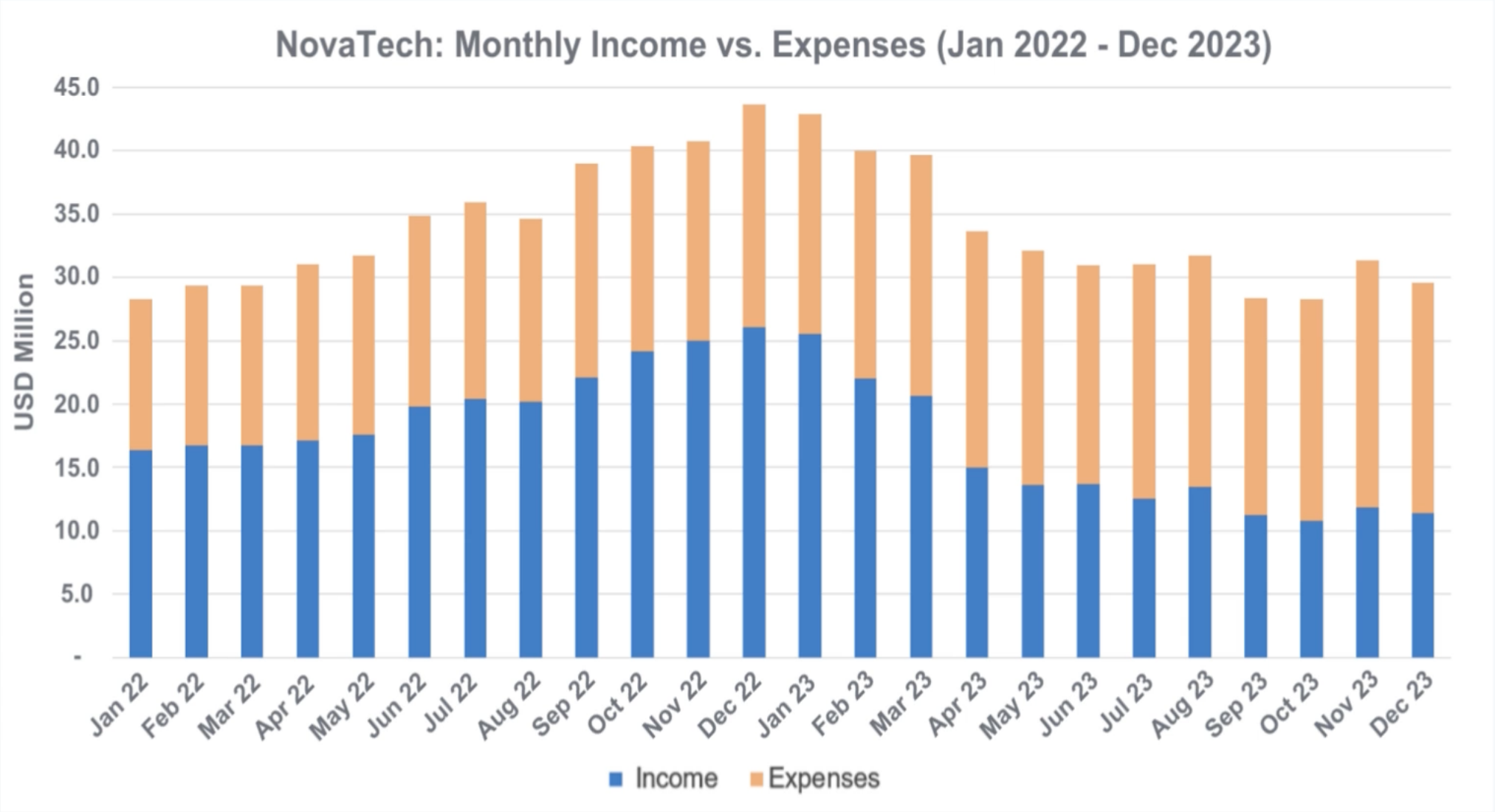
Choosing the Right Visual

6 Types of Data Stories

Types of Data Visuals

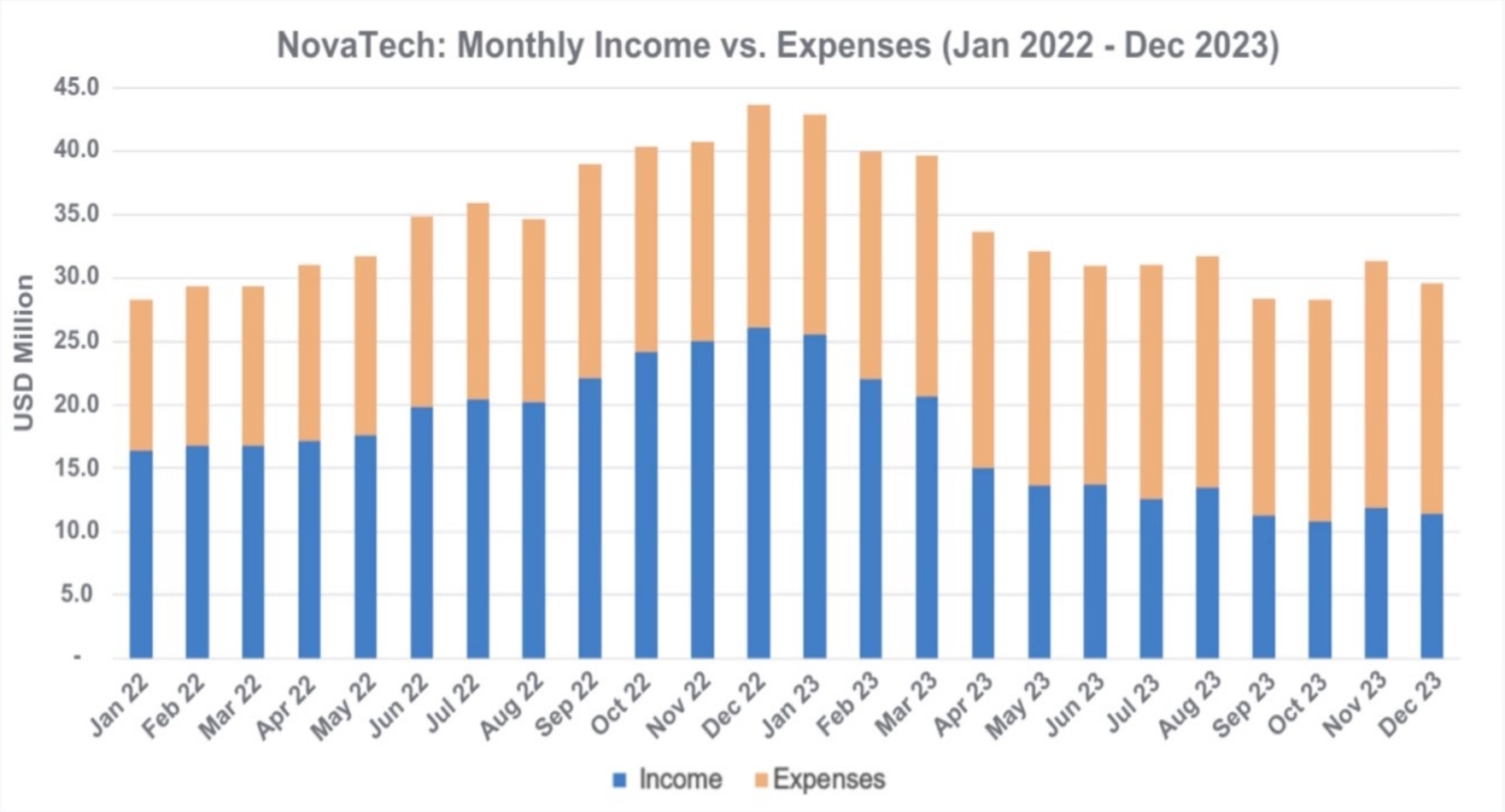
Core Example:

NovaTech Company's Stacked Bar Chart



Core Example:

NovaTech Company's Stacked Bar Chart

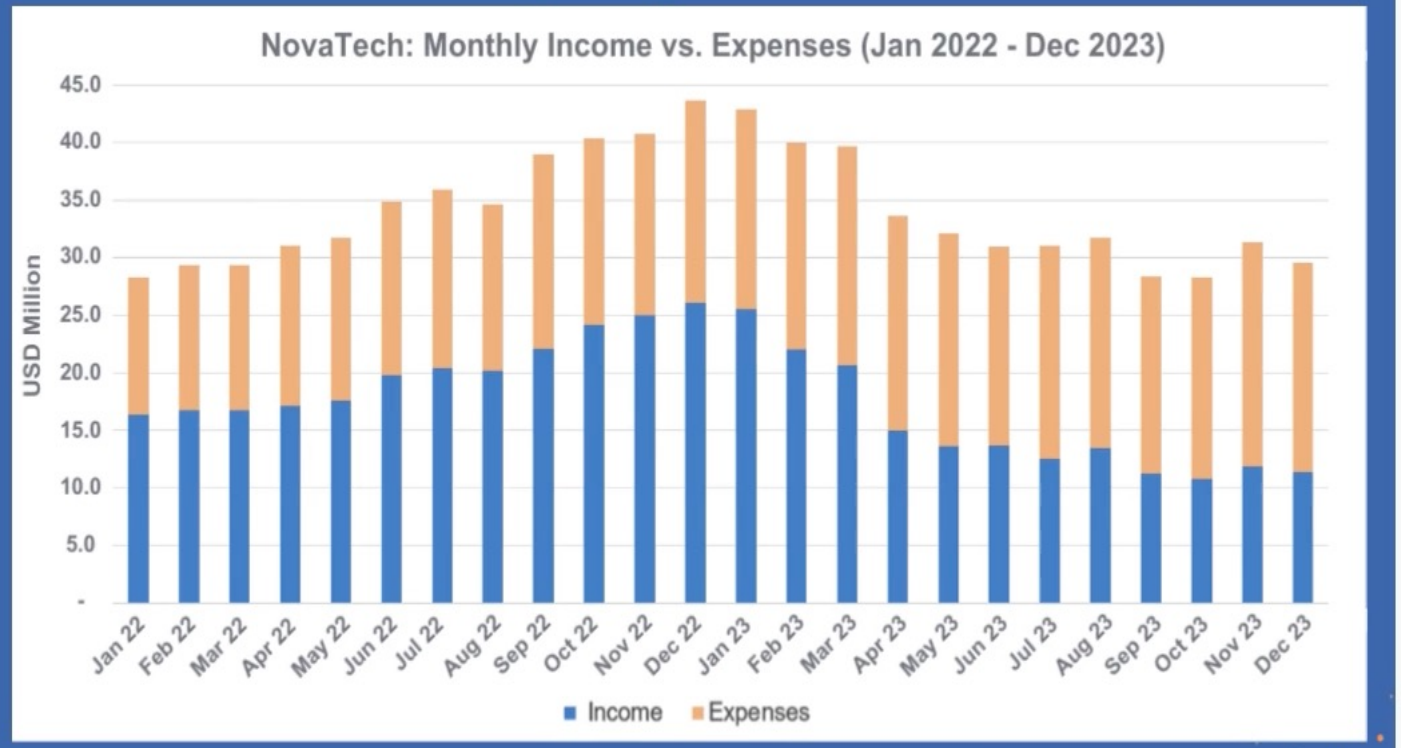


✗ Story is **NOT** clear

✗ Key insight is **NOT** visible

Core Example:

NovaTech Company's Stacked Bar Chart

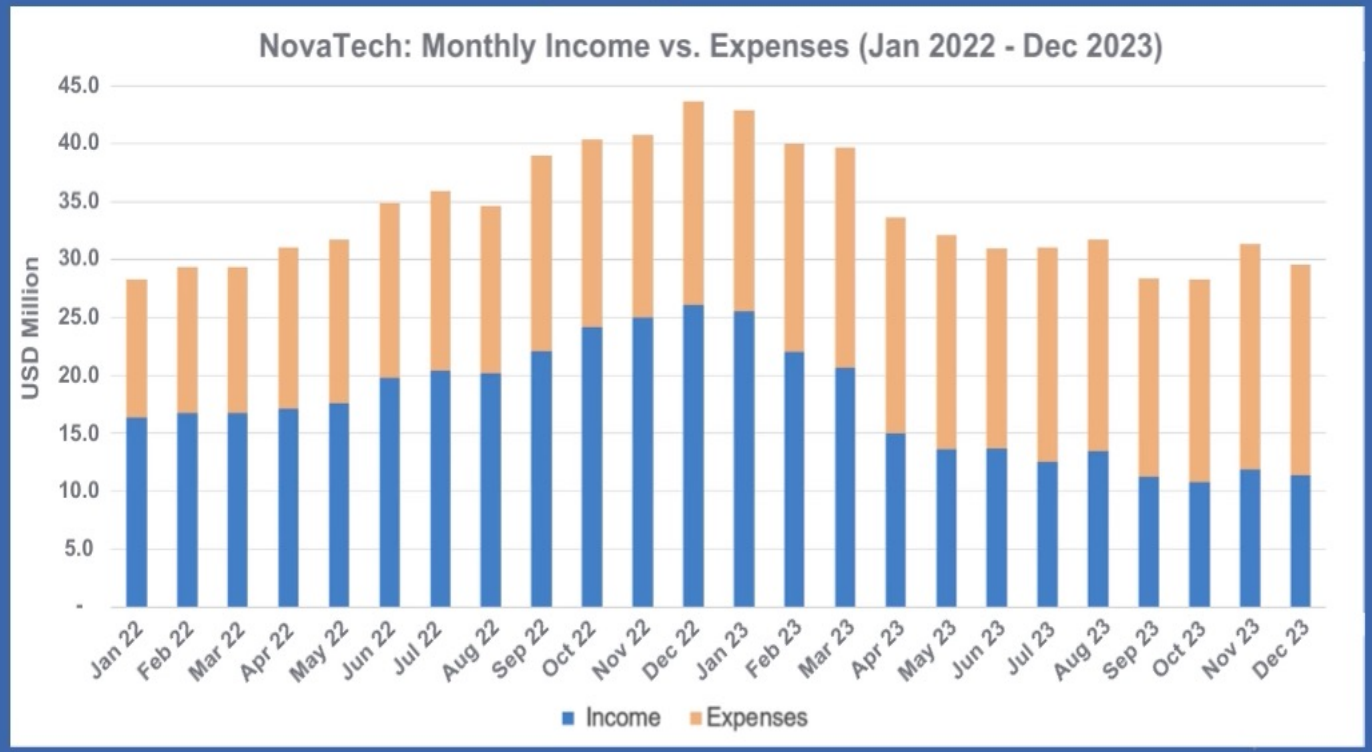


Which Type of Data Story?

Which Type of Data Story?

Core Example:

NovaTech Company's Stacked Bar Chart



What We Know:

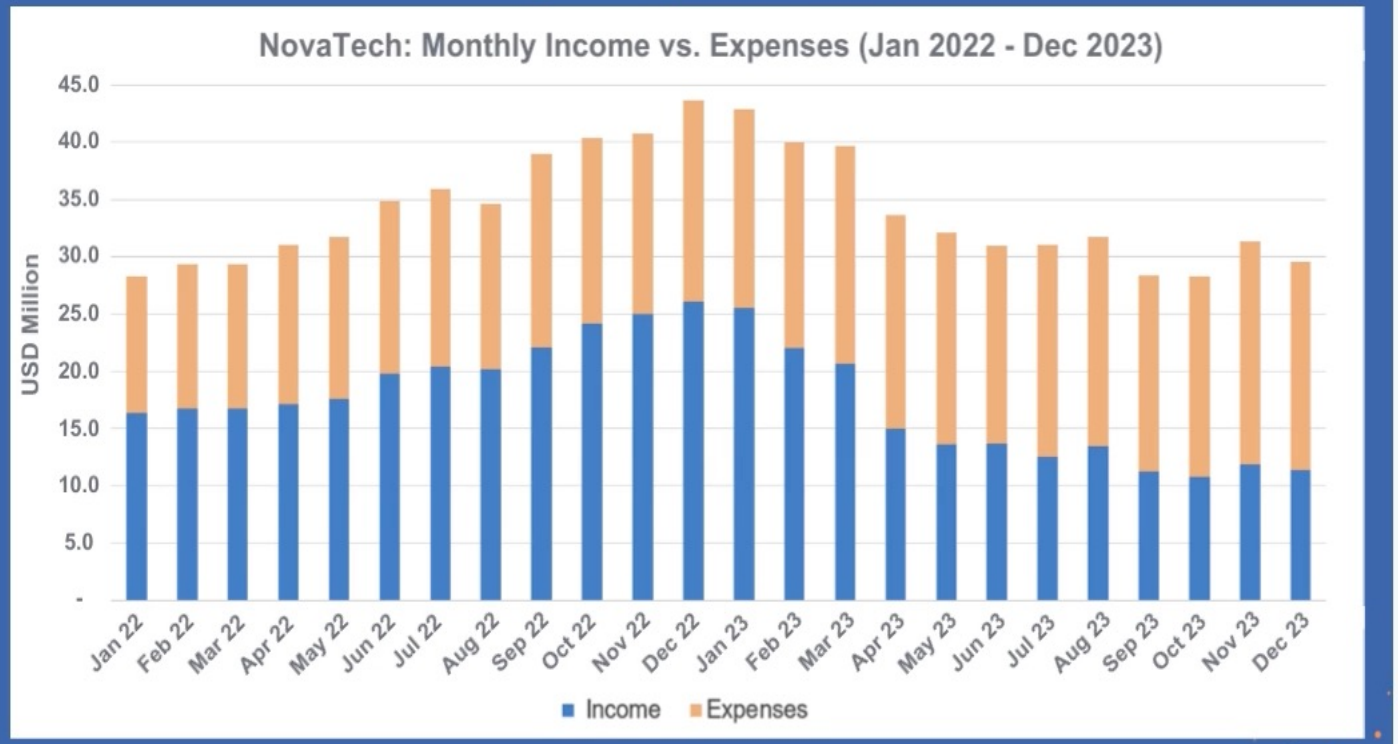
Jan 2022 – Oct 2022

- Income is consistently higher than Expenses
- Stable profits from Model A and B

Which Type of Data Story?

Core Example:

NovaTech Company's Stacked Bar Chart



What We Know:

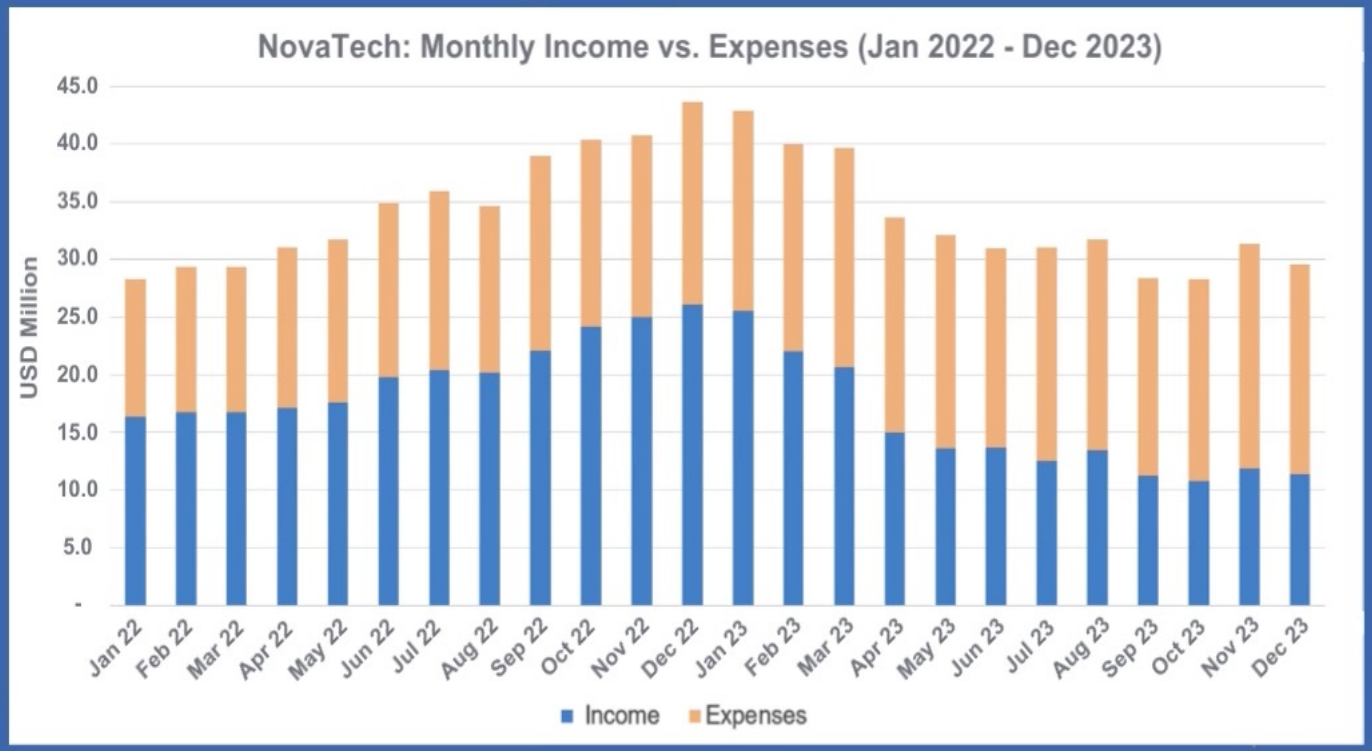
November 2022

- Launch of new Model C
- Halted sales of Model A and B

Which Type of Data Story?

Core Example:

NovaTech Company's Stacked Bar Chart



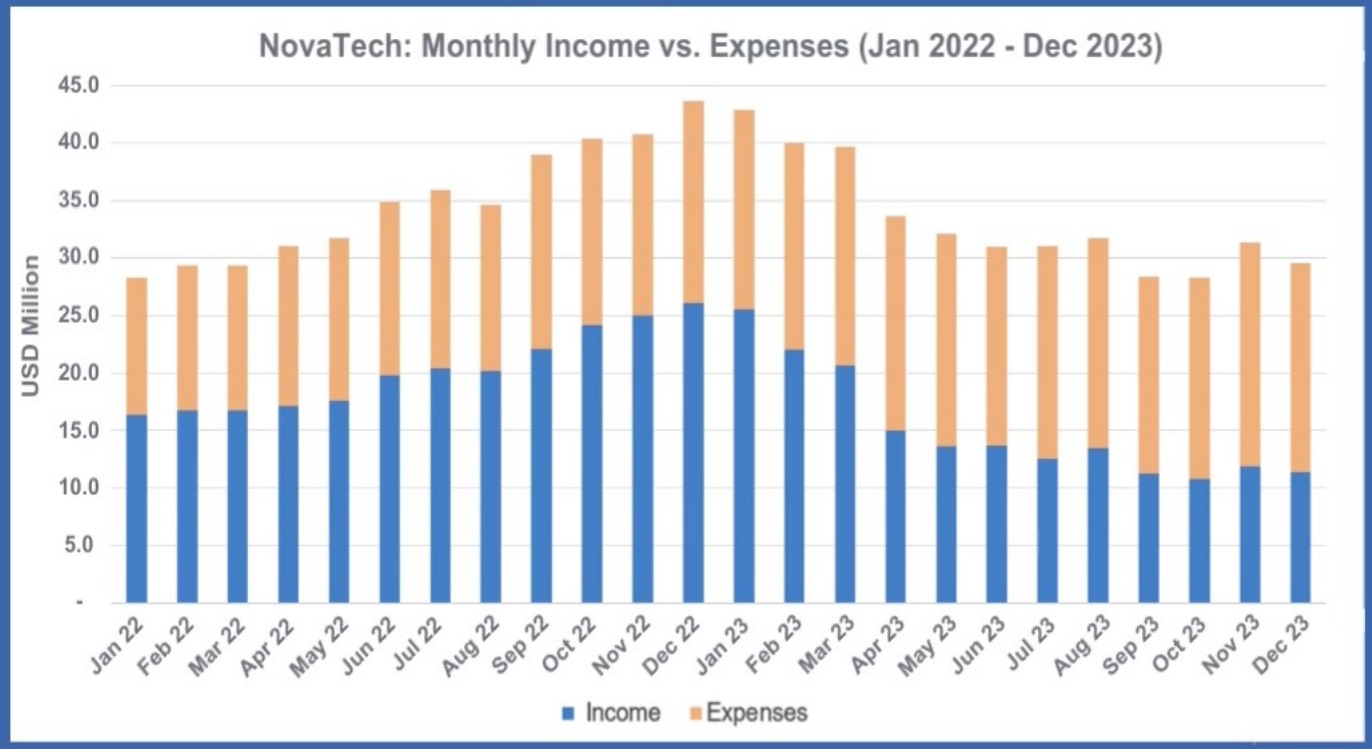
What We Know:

Model C was unsuccessful

- Downward trend of losses Nov 2022 onward

Core Example:

NovaTech Company's Stacked Bar Chart



Which Type of Data Story?

✓ Time Series Data

- Income and Expenses over 2 years

✓ Trend or Pattern

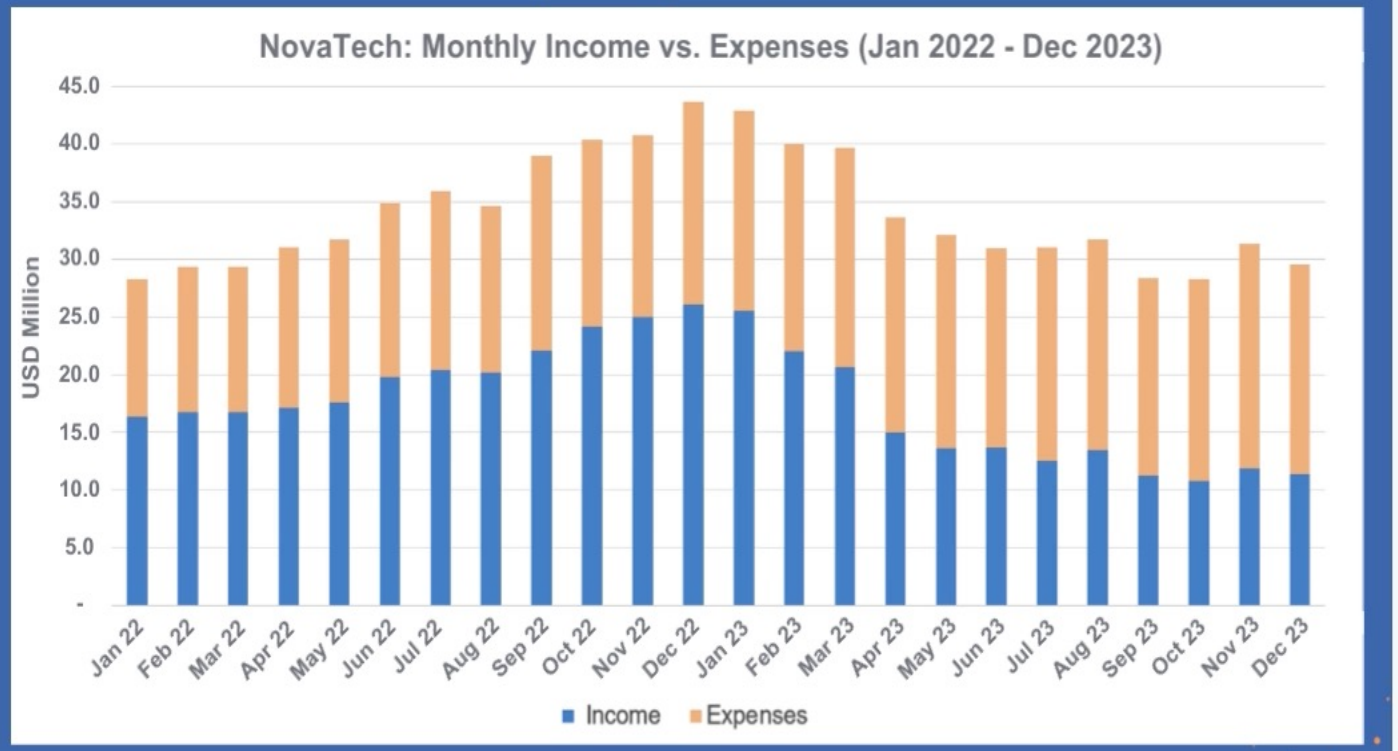
- Movement of Income and Expenses

✓ Change over Time

- Before and after the new strategy

Core Example:

NovaTech Company's Stacked Bar Chart



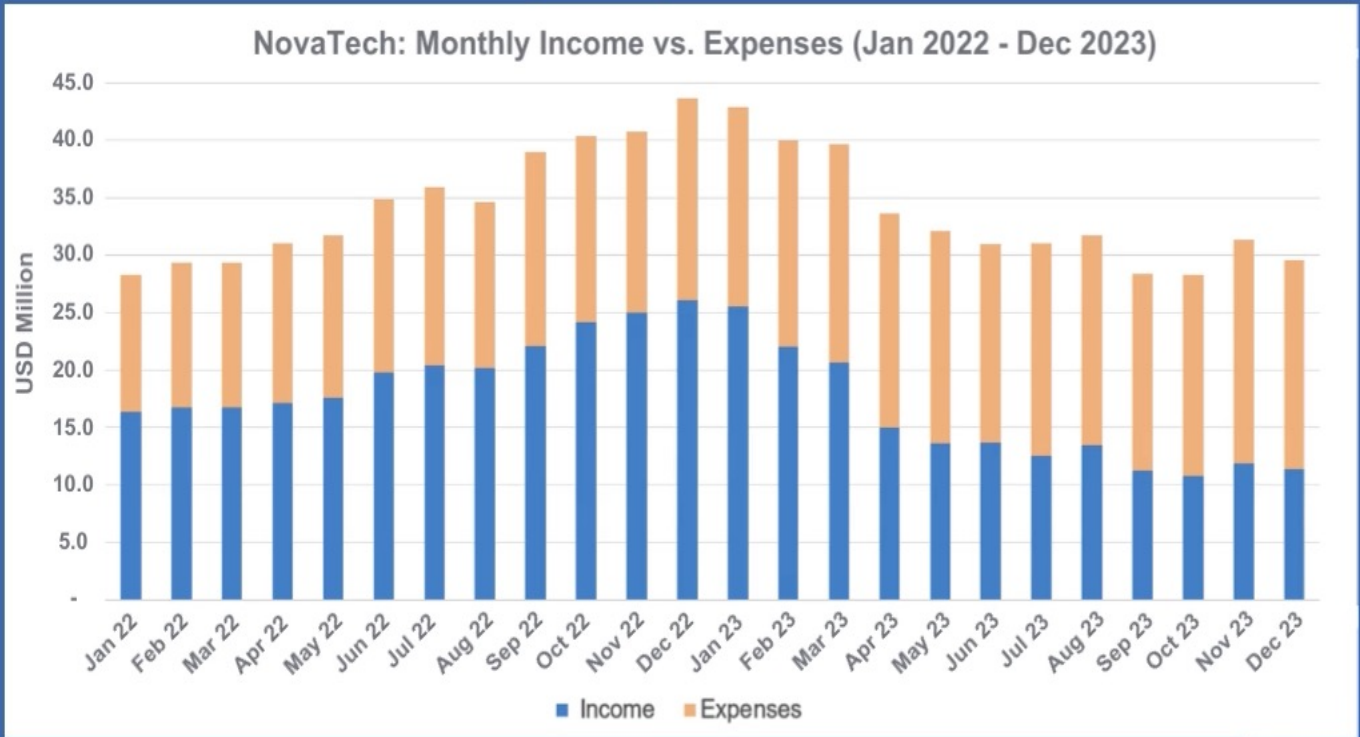
Which Type of Data Story?

- Rankings
- Distributions
- Proportions
- Correlations
- Comparisons
- Change Over Time

Which Type of Data Story?

Core Example:

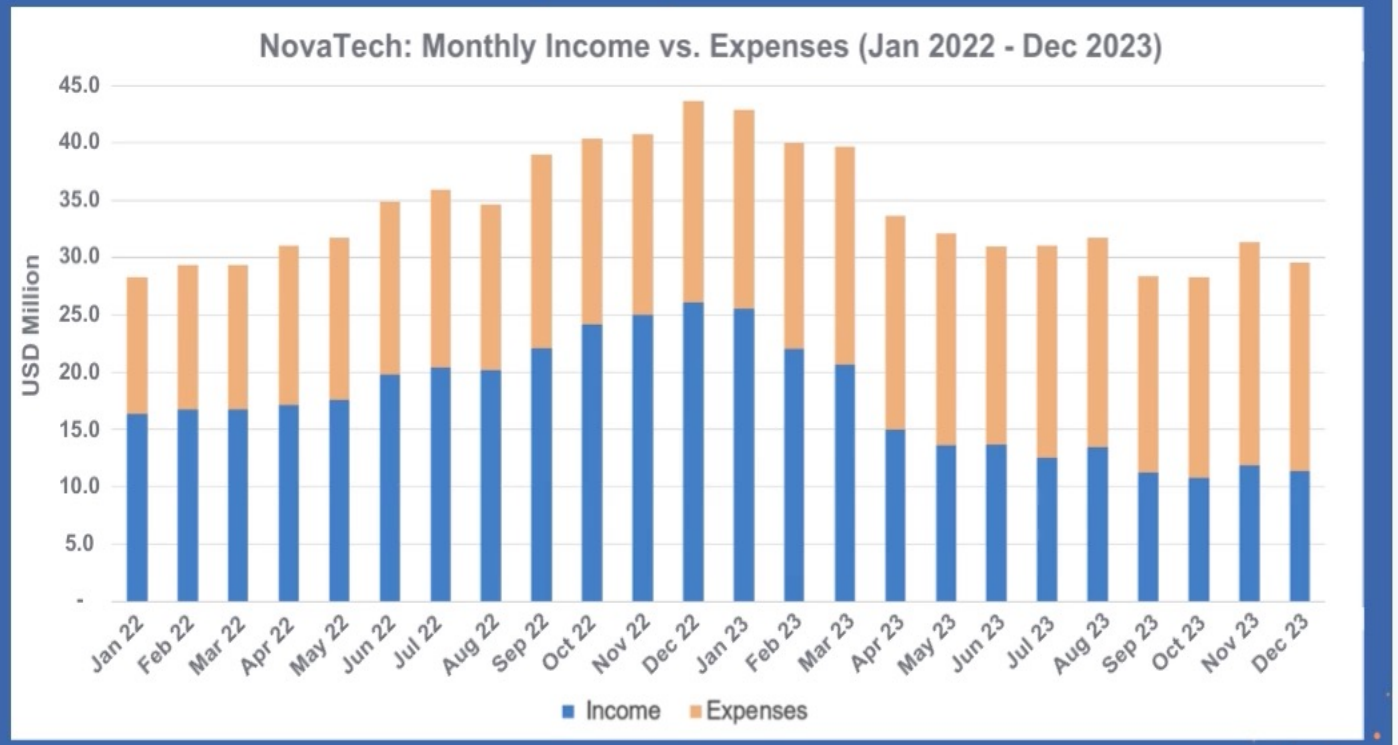
NovaTech Company's Stacked Bar Chart



Change Over Time

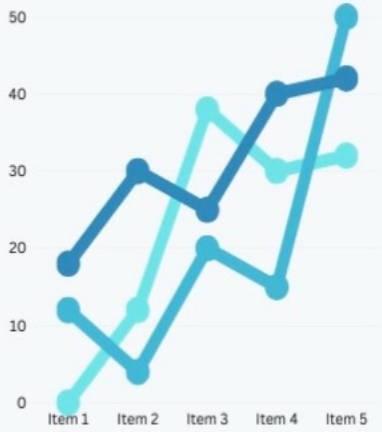
Core Example:

NovaTech Company's Stacked Bar Chart



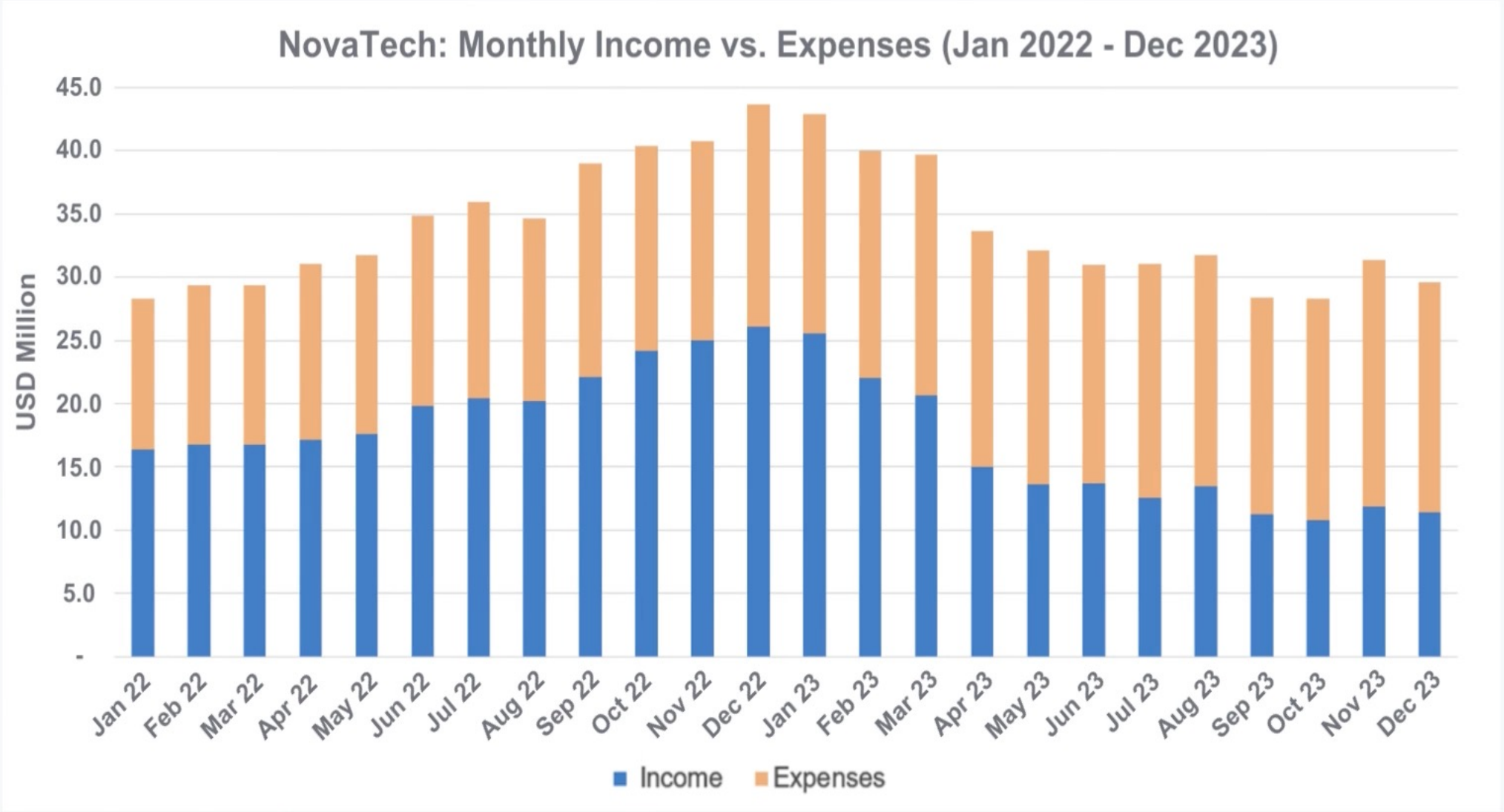
Change Over Time

Line Graph

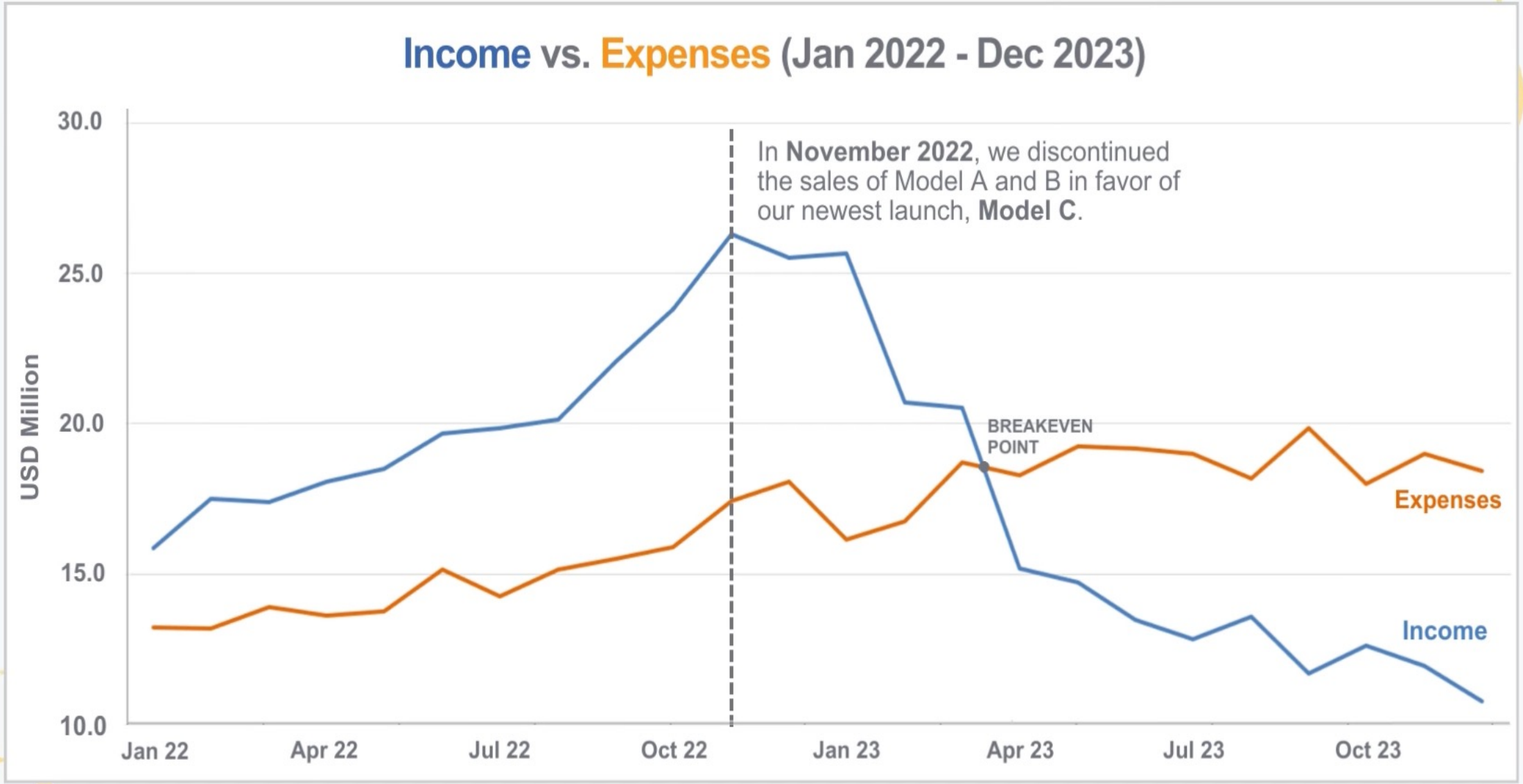


Transform Your Visual with Data Storytelling!

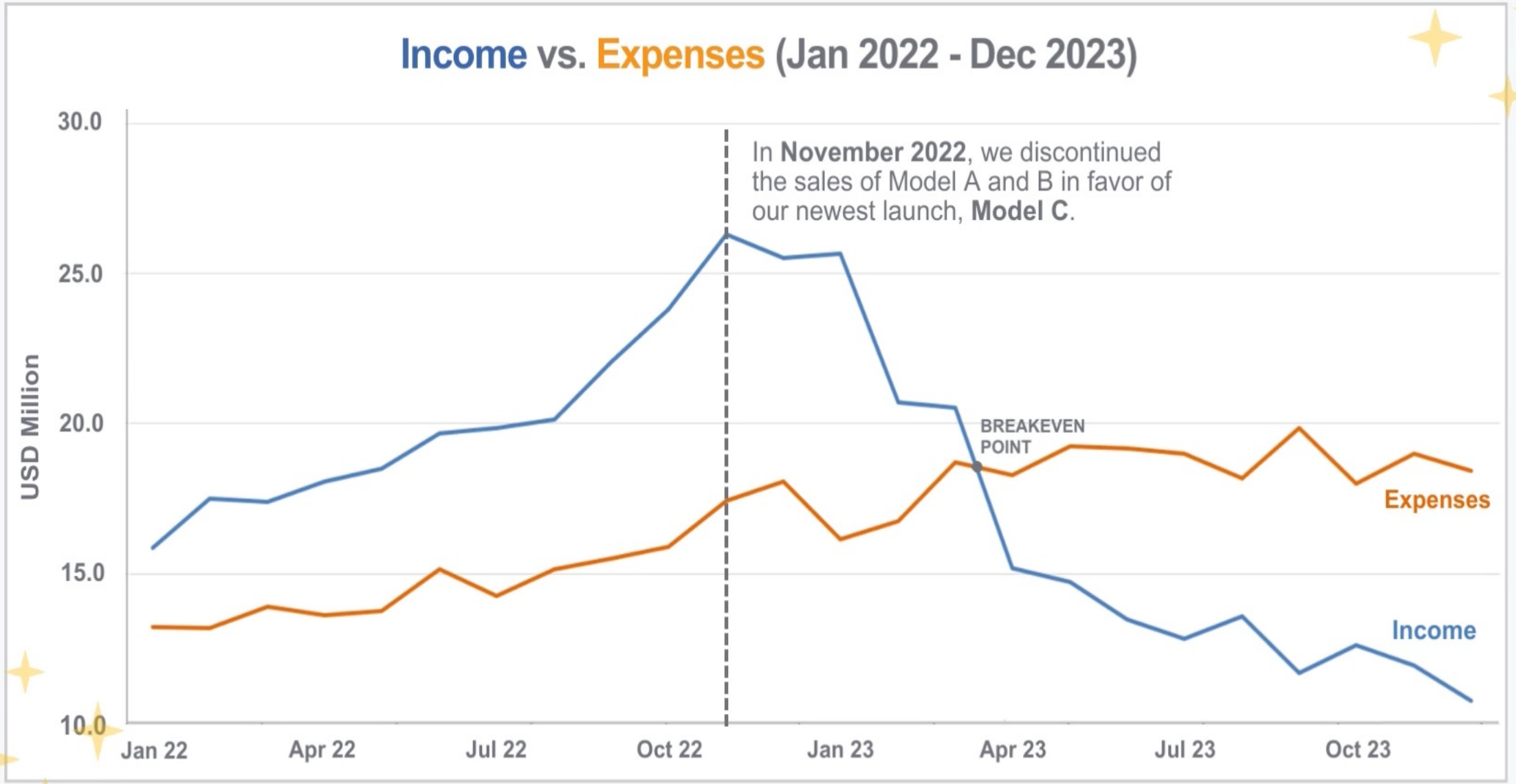
Core Example: **BEFORE**

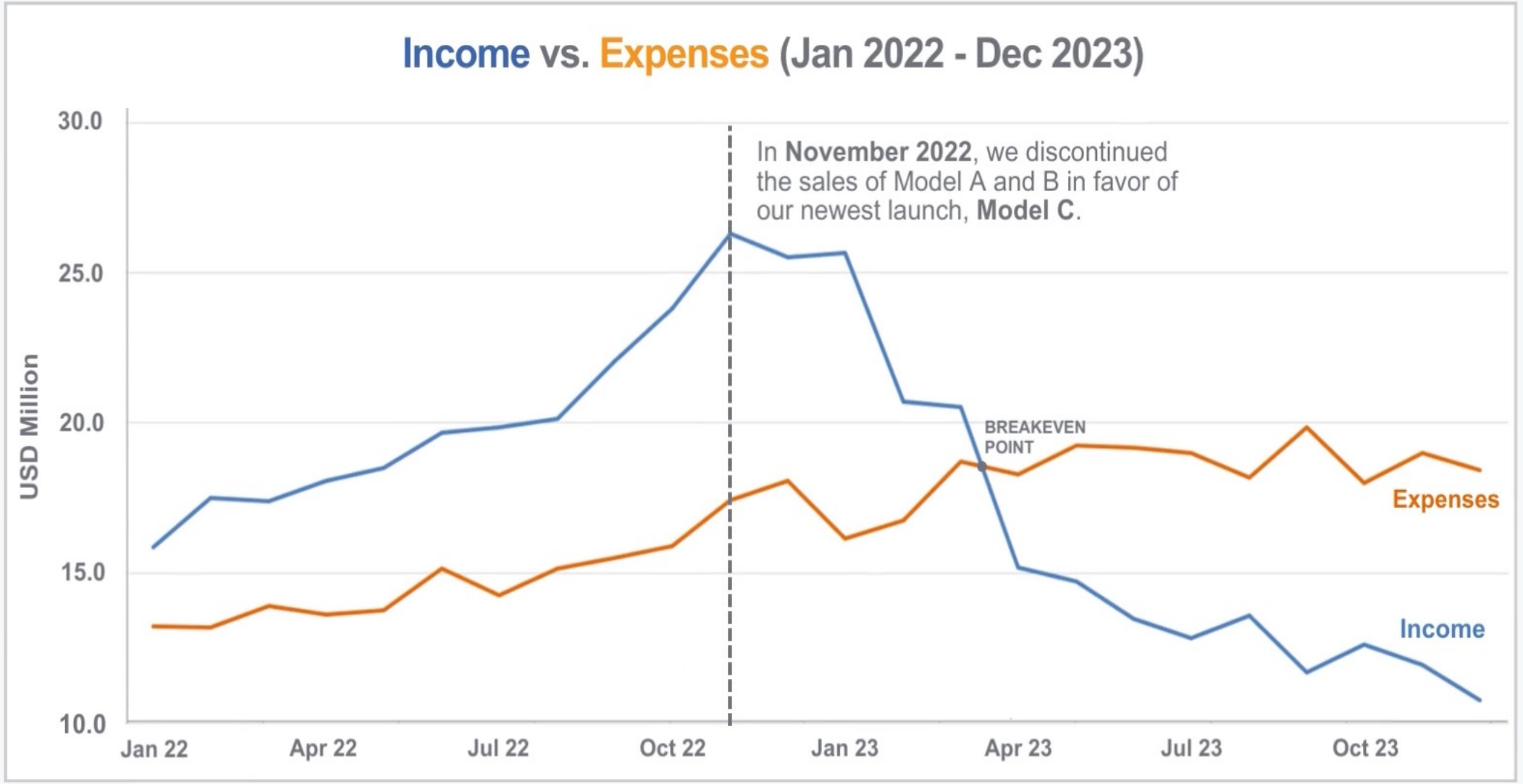


Core Example: **AFTER**



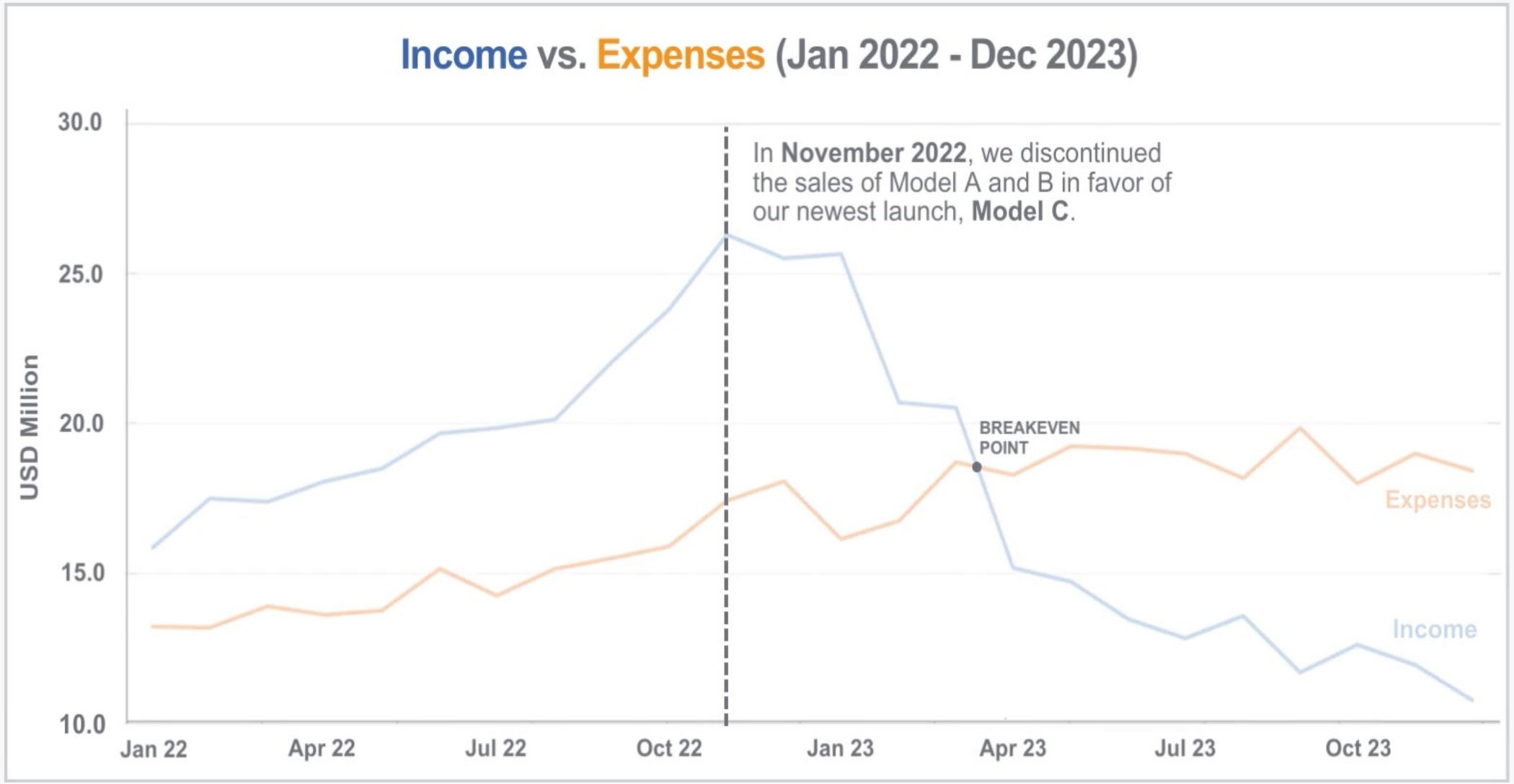
Same Story, Told Better!





Graph Type: Multiple series line graph

- Analyzing change over time

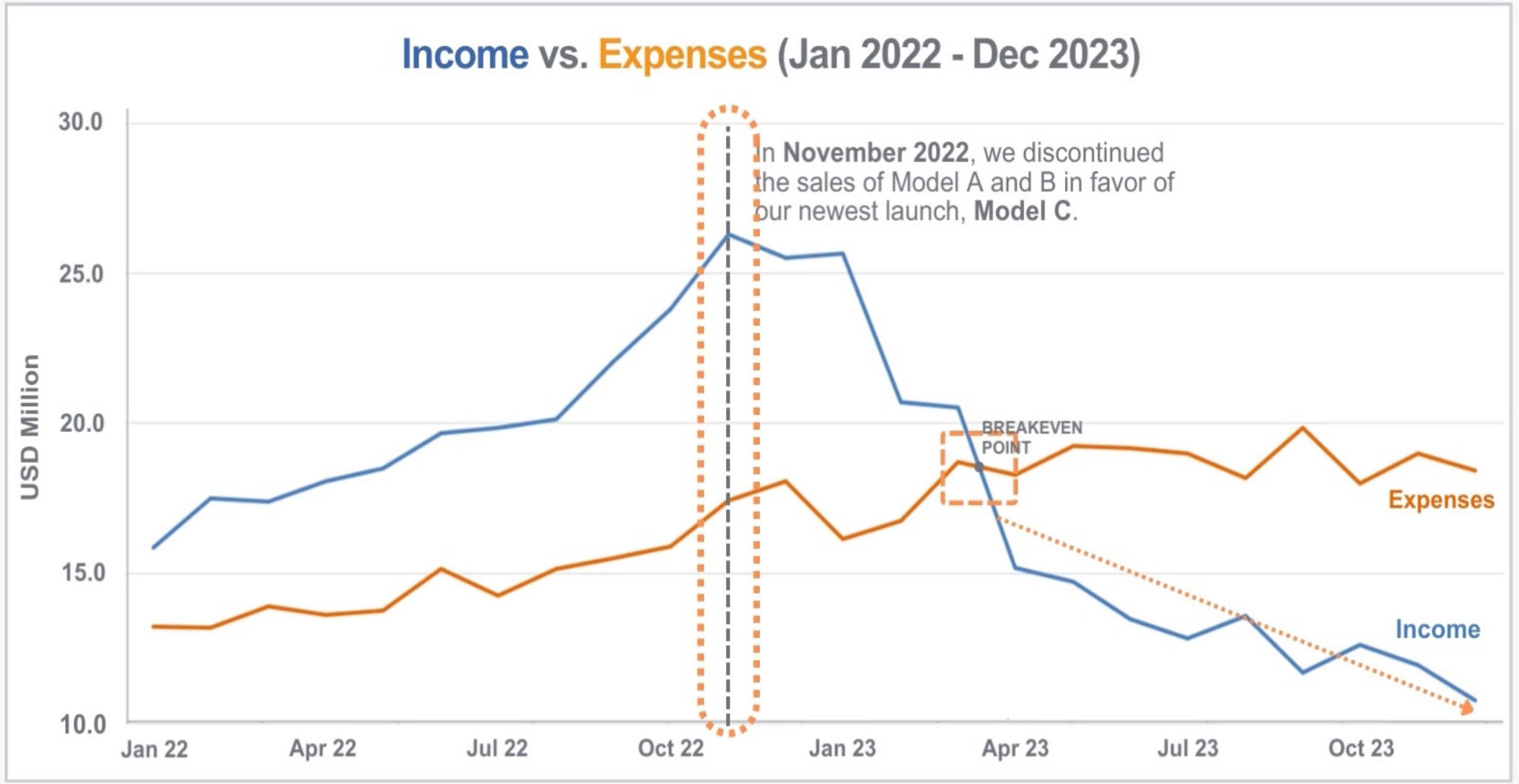


Colored Lines: Income (***blue***) & Expenses (***orange***)

- Profits were consistent for a time

Dotted Line: New Strategy Implemented (Nov 2022)

- Net losses past **Breakeven Point**



Dotted Line: New Strategy Implemented (Nov 2022)

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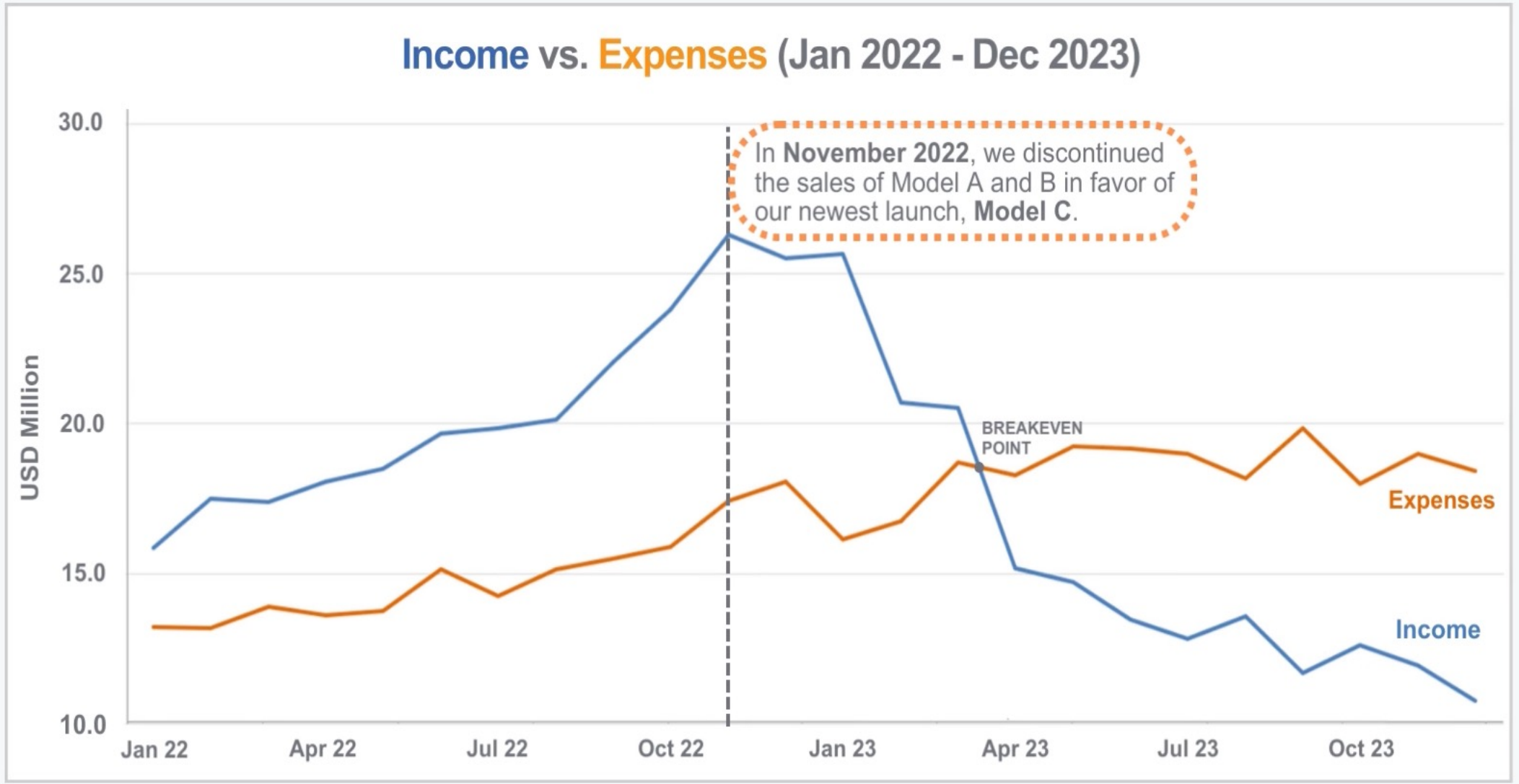
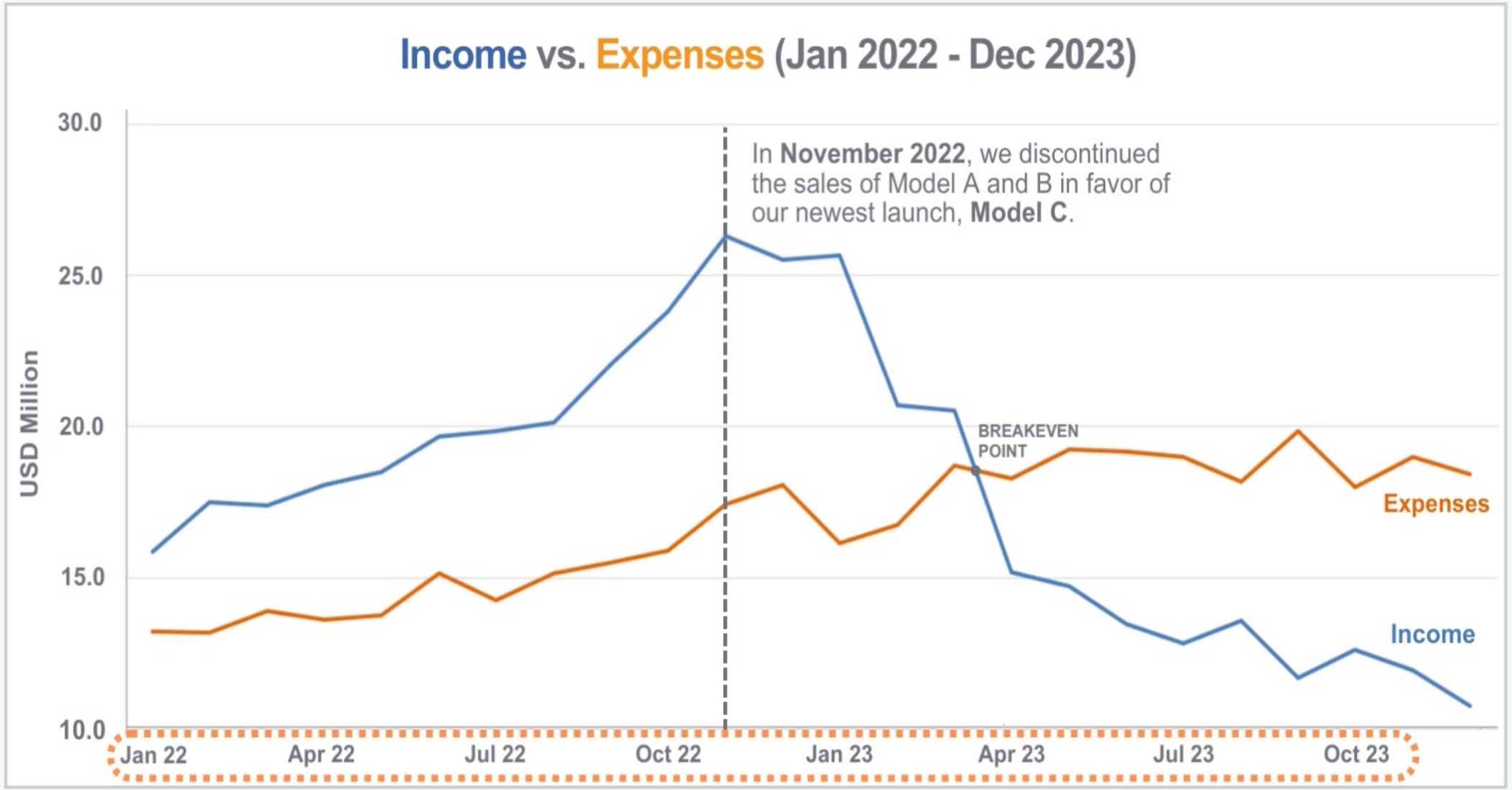


Annotations: Explain Cause of Net Losses

- Discontinued **Models A & B** in favor **Model C**

Design: Clean Lines, Two Colors, Good Spacing



Labels: Months indicated on x-axis = **every 3 months**

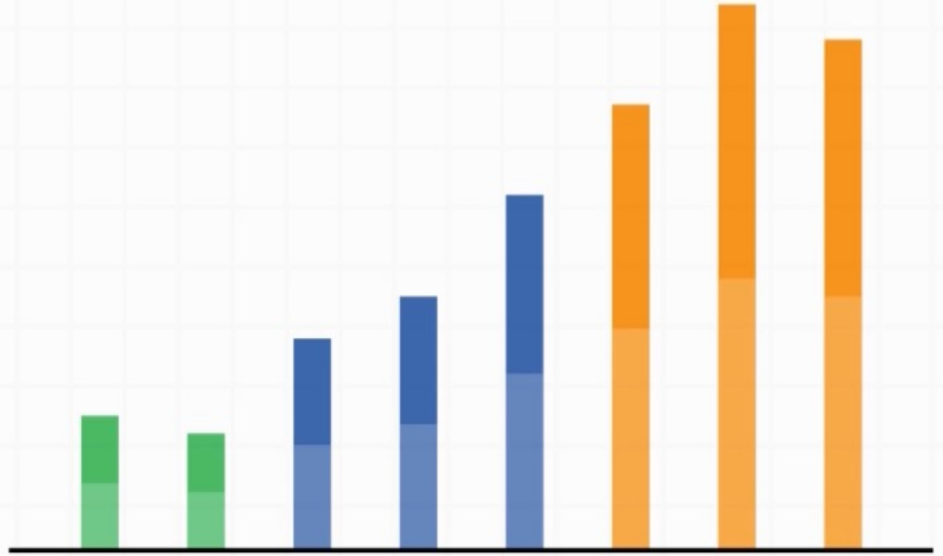
Choosing the right visuals that fit the right type of data story makes all the difference in bringing your data story to life.

II. Visualizing the Story

C. Clarifying Your Message: Hybrid Titles

HYBRID TITLES

- ✓ Contemporary approach to titling
- ✓ Multifunctional purpose



3 Components of a Hybrid Title

Insight

Call to Action

Legend

Example:

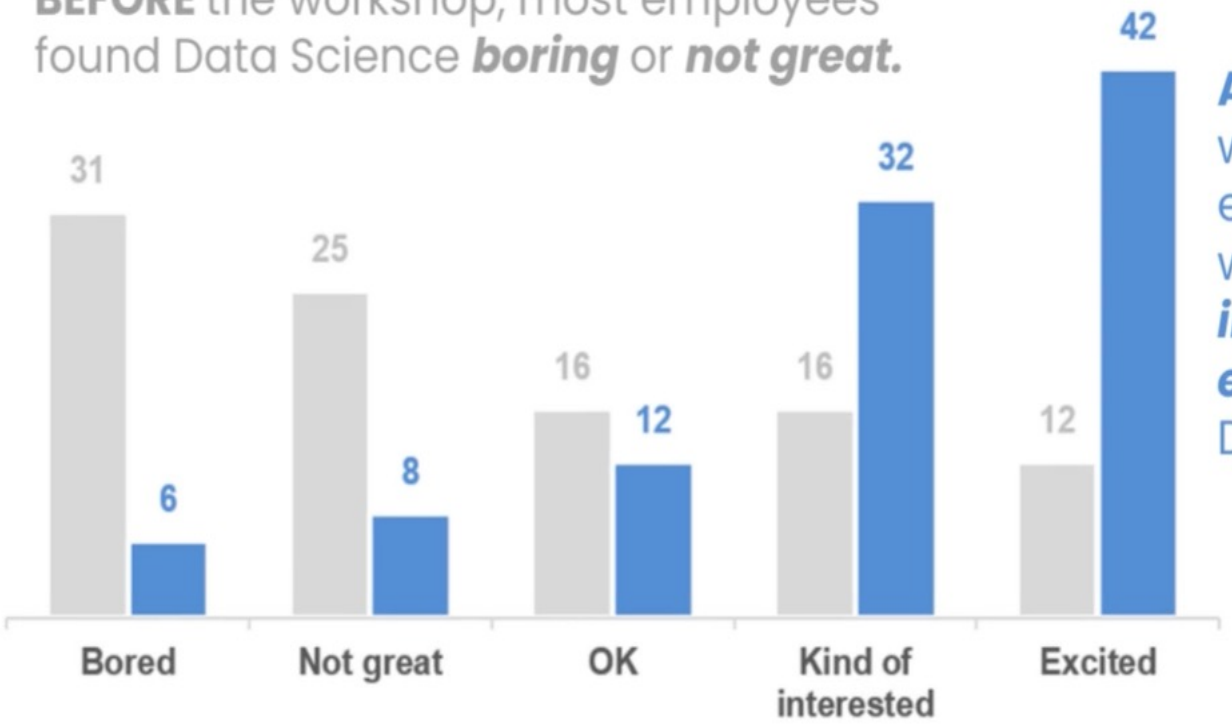
Data Science Workshop Feedback

The first run of the Data Science Workshop was successful!

We recommend including this as a standard training.

More employees are interested in data science **after** the workshop vs. **before**.

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



AFTER the workshop, most employees were ***kind of interested*** and ***excited*** about Data Science.

Hybrid Title

1 Insight

"The first run of the Data Science Workshop was successful!"

Example:

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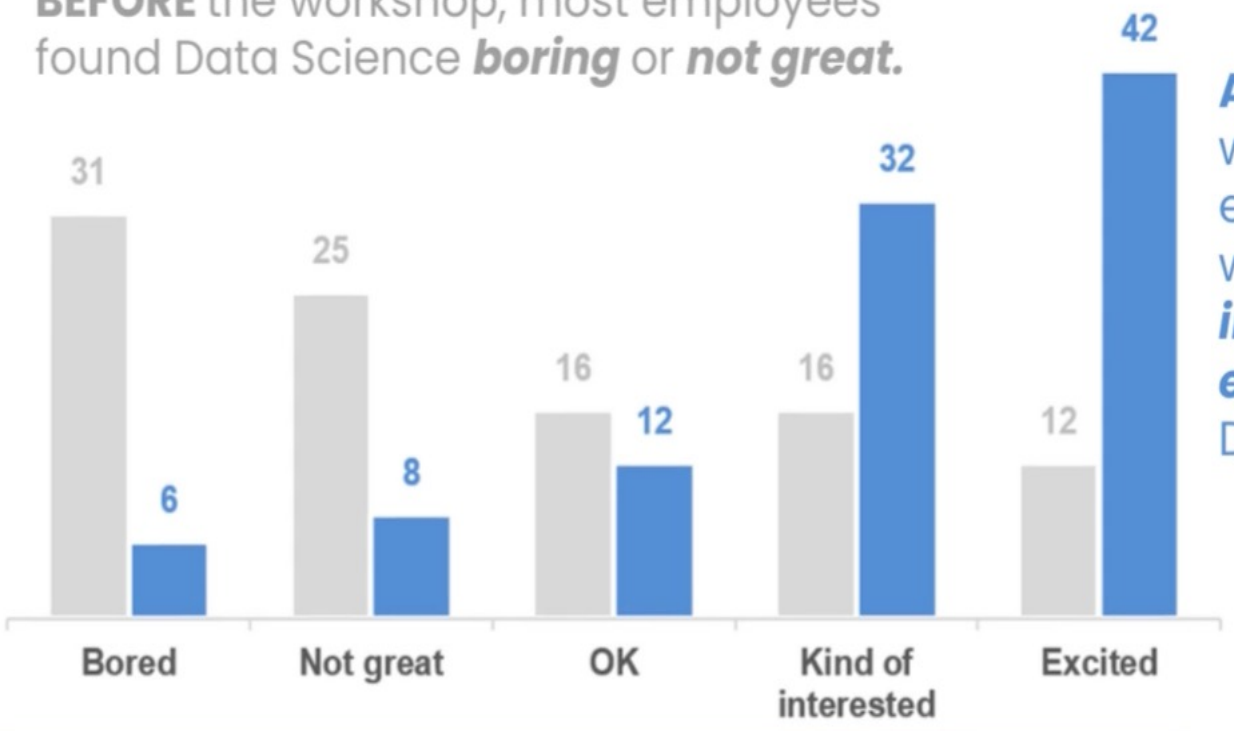

AFTER the workshop, most employees were ***kind of interested*** and ***excited*** about Data Science.

Hybrid Title

2 Call to Action

"We recommend including this as a standard training."

Example:

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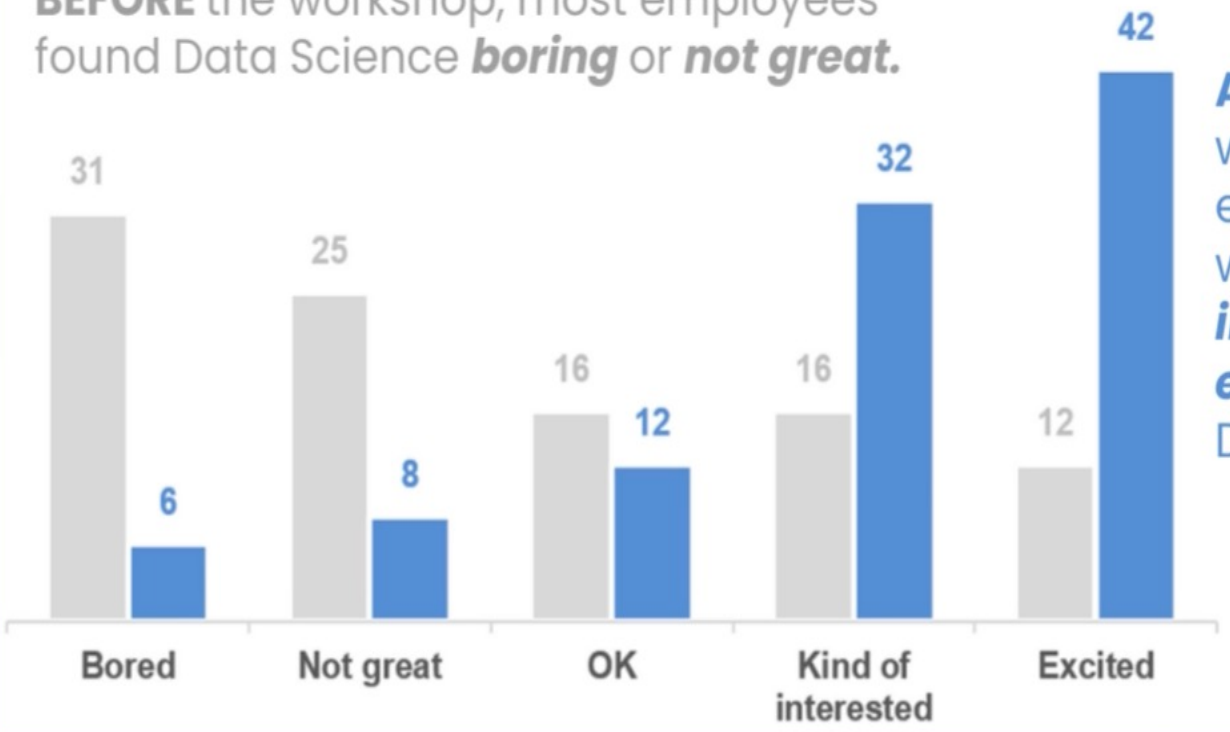

AFTER the workshop, most employees were ***kind of interested*** and ***excited*** about Data Science.

Hybrid Title

3 Legend

*"More employees are interested in data science **after** the workshop vs. **before.**"*

Example:

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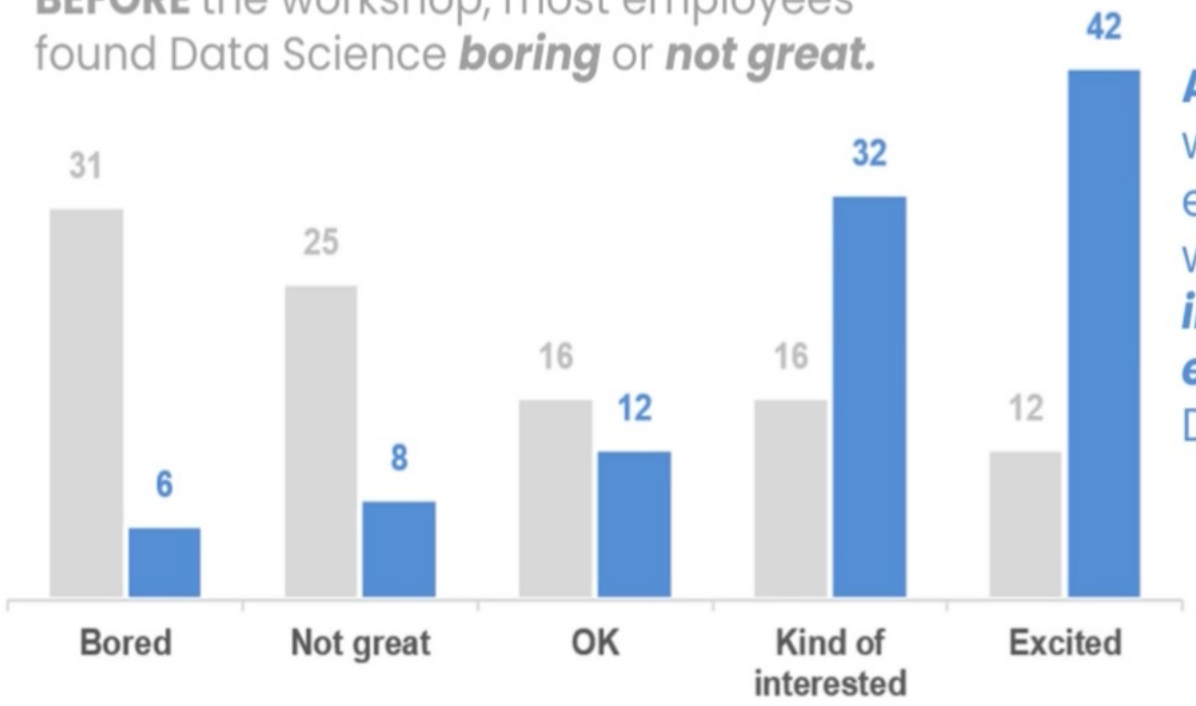


AFTER the workshop, most employees were ***kind of interested*** and ***excited*** about Data Science.

Hybrid Title

1. Insight
2. Call to Action
3. Legend

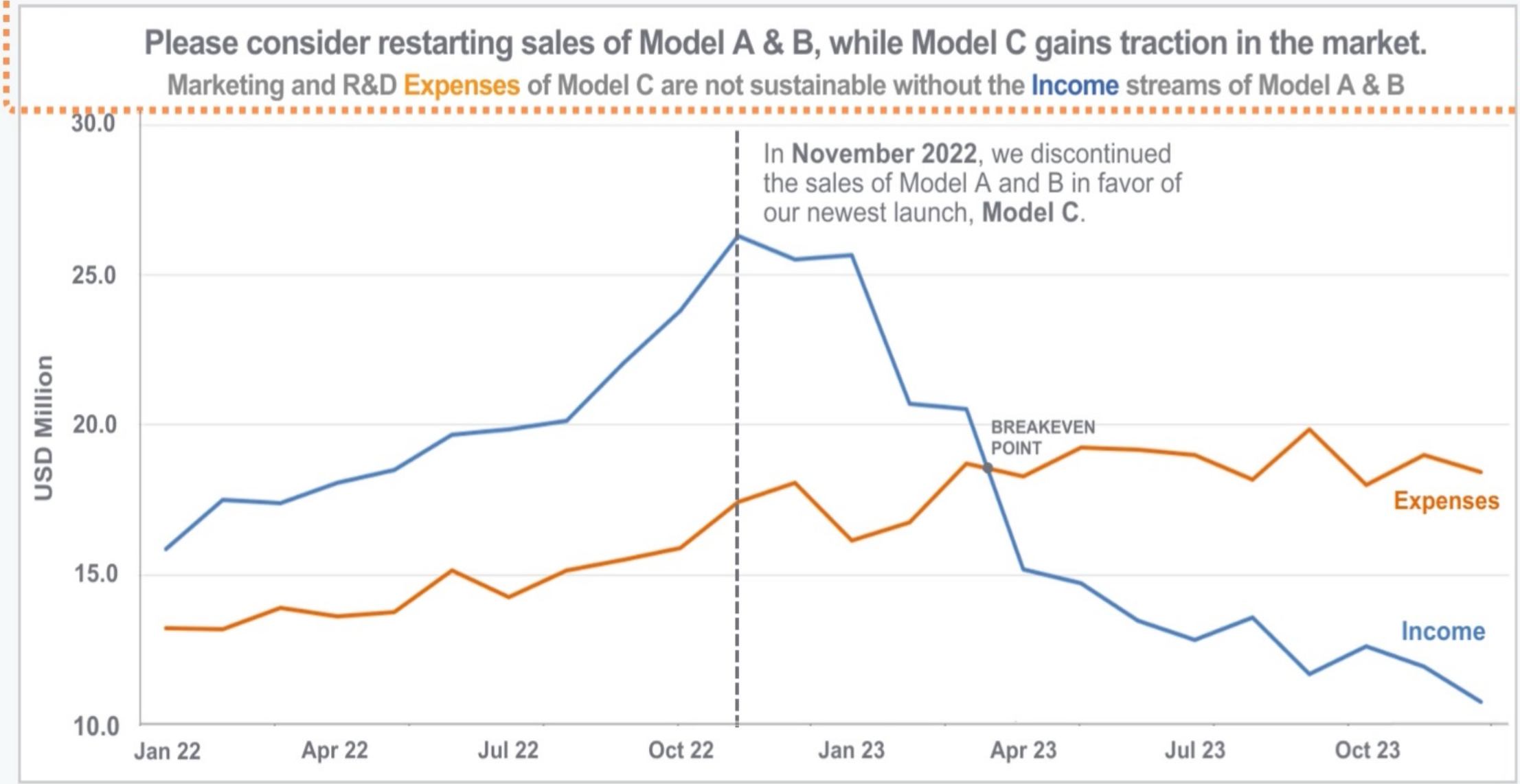
Core Example: **NovaTech Company**

Core Example: **NovaTech Company's Hybrid Title**

Expenses are greater than **income** due to our change in strategy.

Please consider restarting sales of Model A & B, while Model C gains traction in the market.

Marketing and R&D **Expenses** of Model C are not sustainable without the **Income** streams of Model A & B



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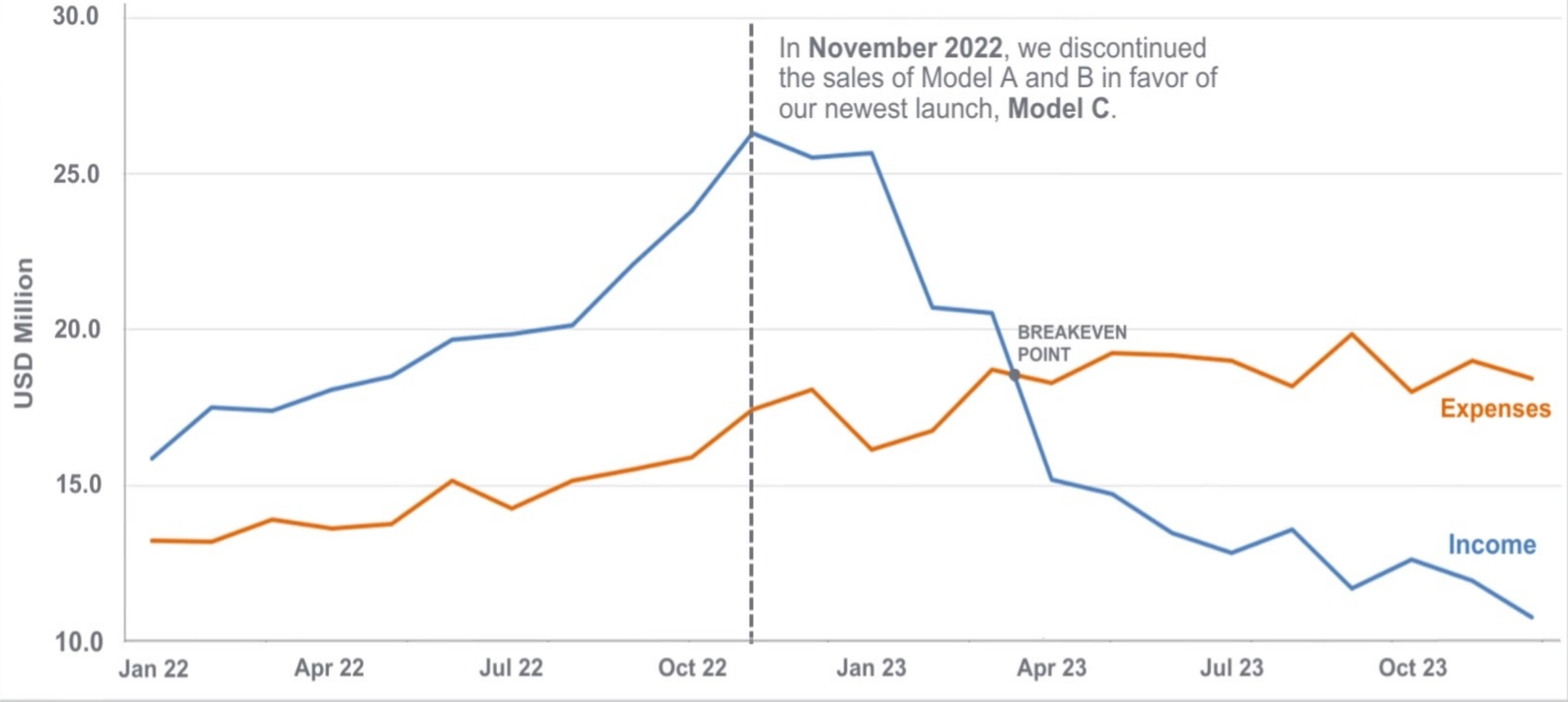

1 Insight

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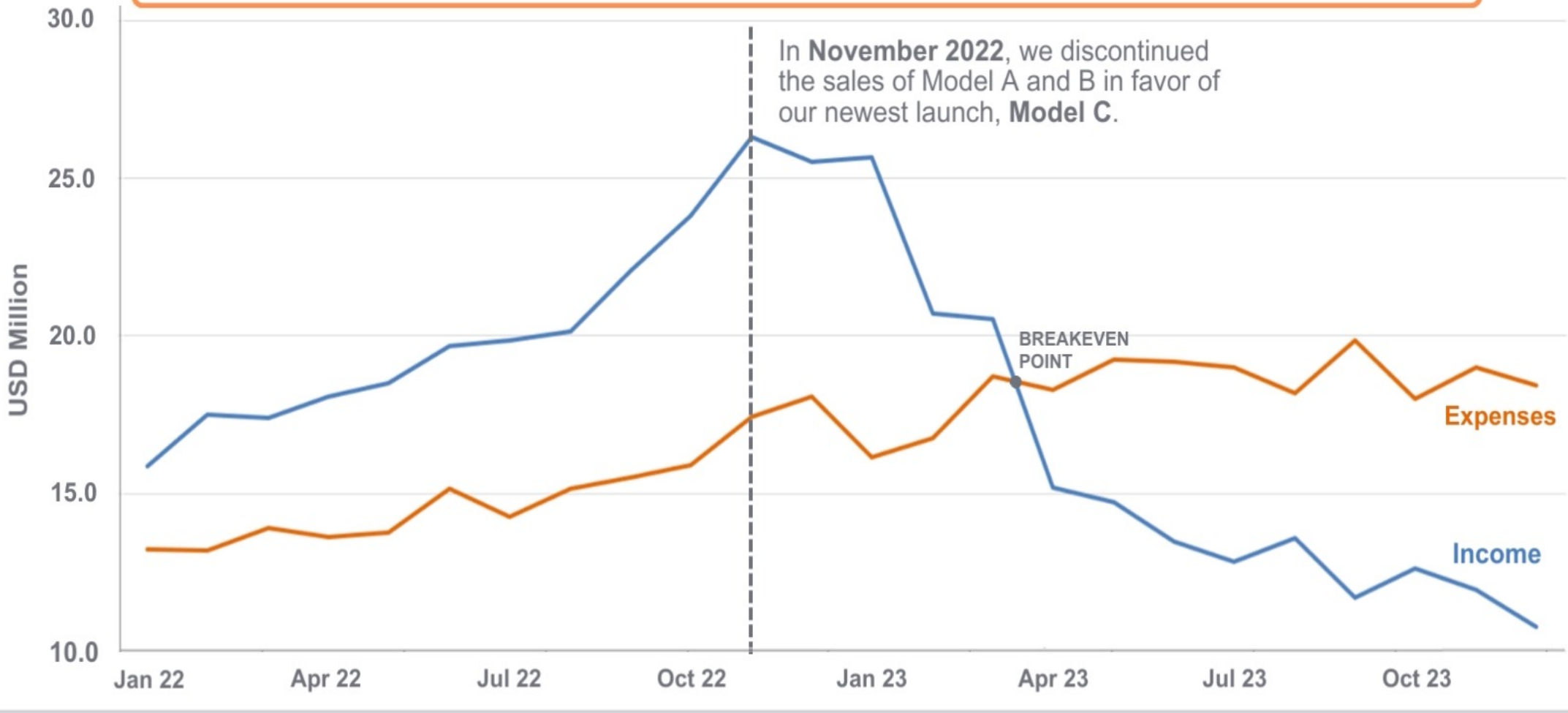

1 Insight

*Marketing and R&D **Expenses** of Model C are not sustainable without **Income** streams of Model A & B*

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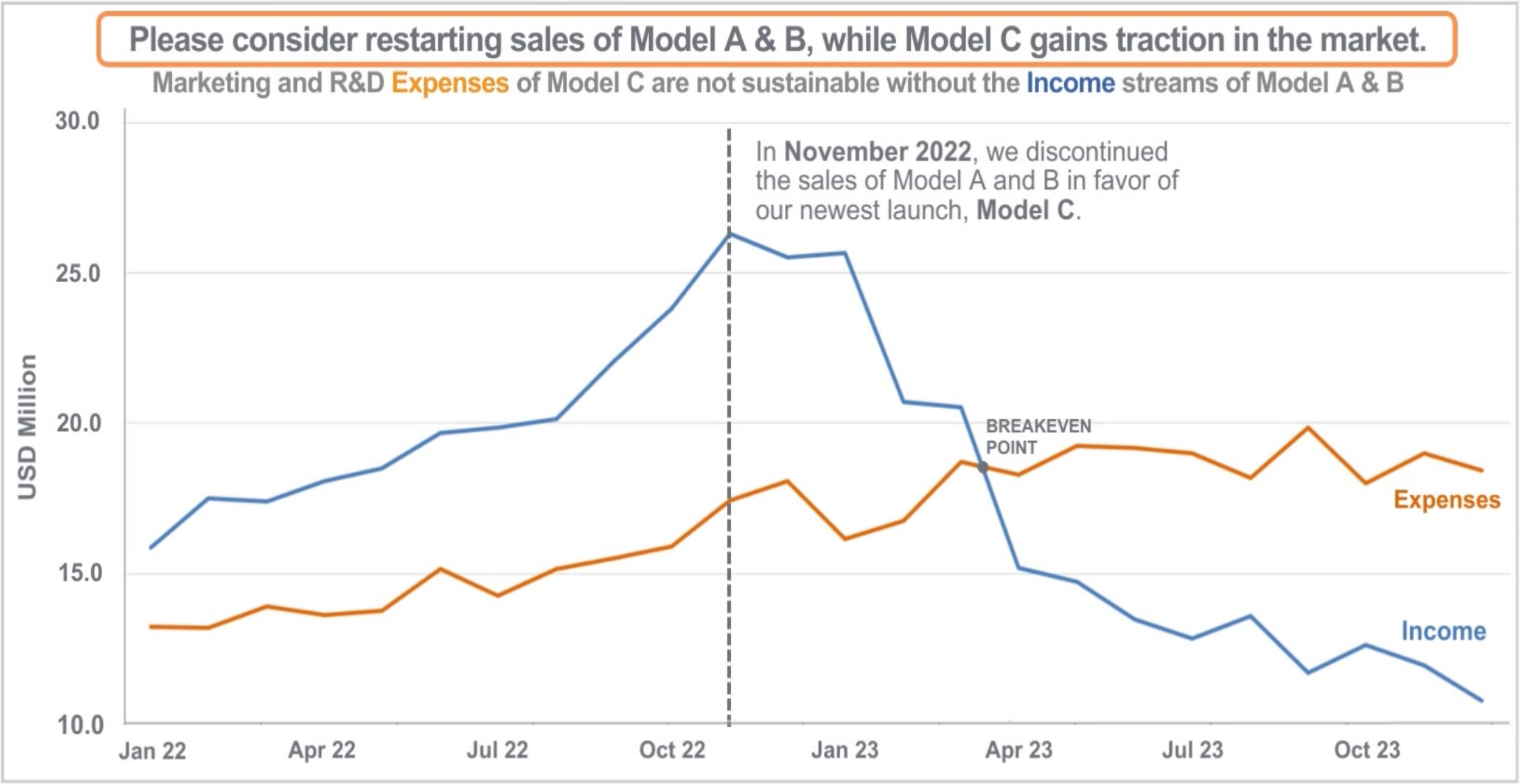

2 Call to Action

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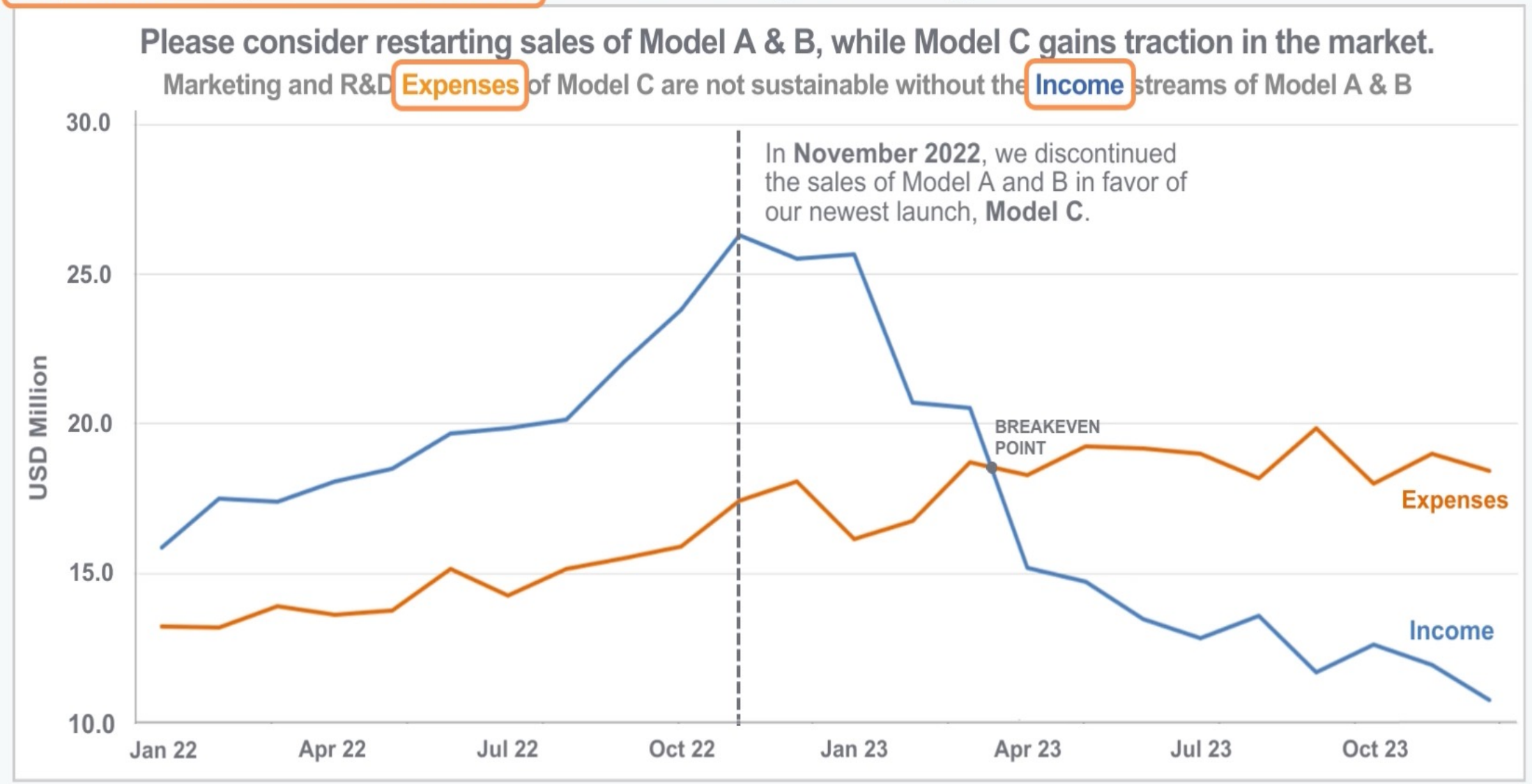
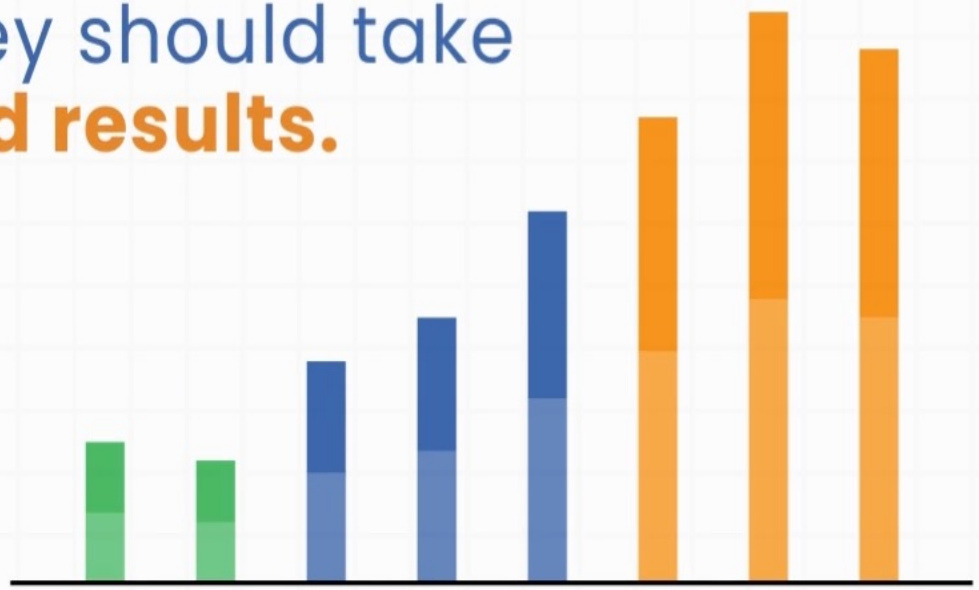


3 Legend *Expenses* & *Income*

HYBRID TITLES

clarify your **key data insight** and provide the audience with the **next steps** they should take to achieve **desired results.**



How is HYBRID TITLE different from THE MAIN POINT?

HYBRID TITLE VS. MAIN POINT

- Main title of your data visual
- Should be concise
- First thing your audience reads

- Summarizing conclusion
- Explains insight and recommendation
- Placed after data visual

HYBRID TITLE

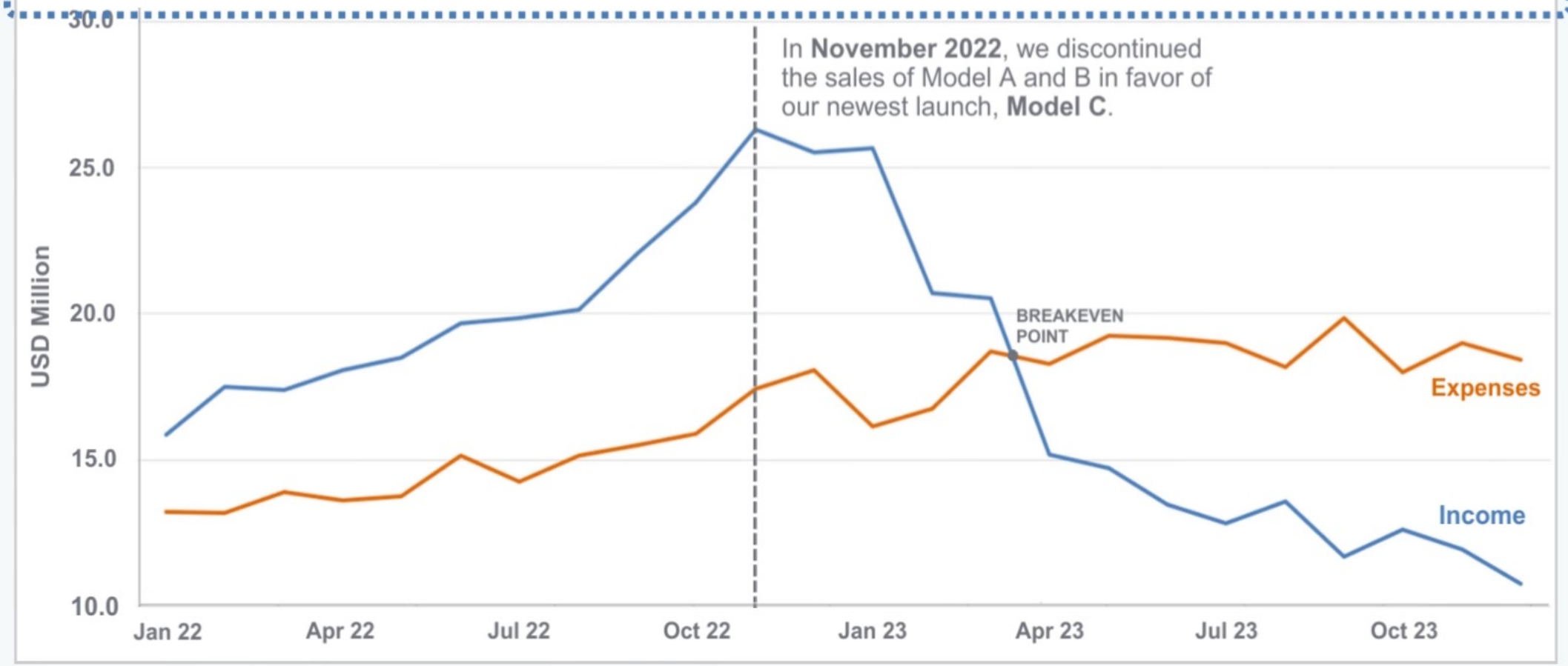
+

MAIN POINT

Expenses are greater than **income** due to our change in strategy.

Please consider restarting sales of Model A & B, while Model C gains traction in the market.

Marketing and R&D **Expenses** of Model C are not sustainable without the **Income** streams of Model A & B



Our new **Model C has not been profitable** and the losses we incurred are **no longer sustainable**, because of this failure we recommend **reintroducing revenue streams** from Model A & B; **please approve of this strategic shift.**

SLIDE 1

HYBRID TITLE

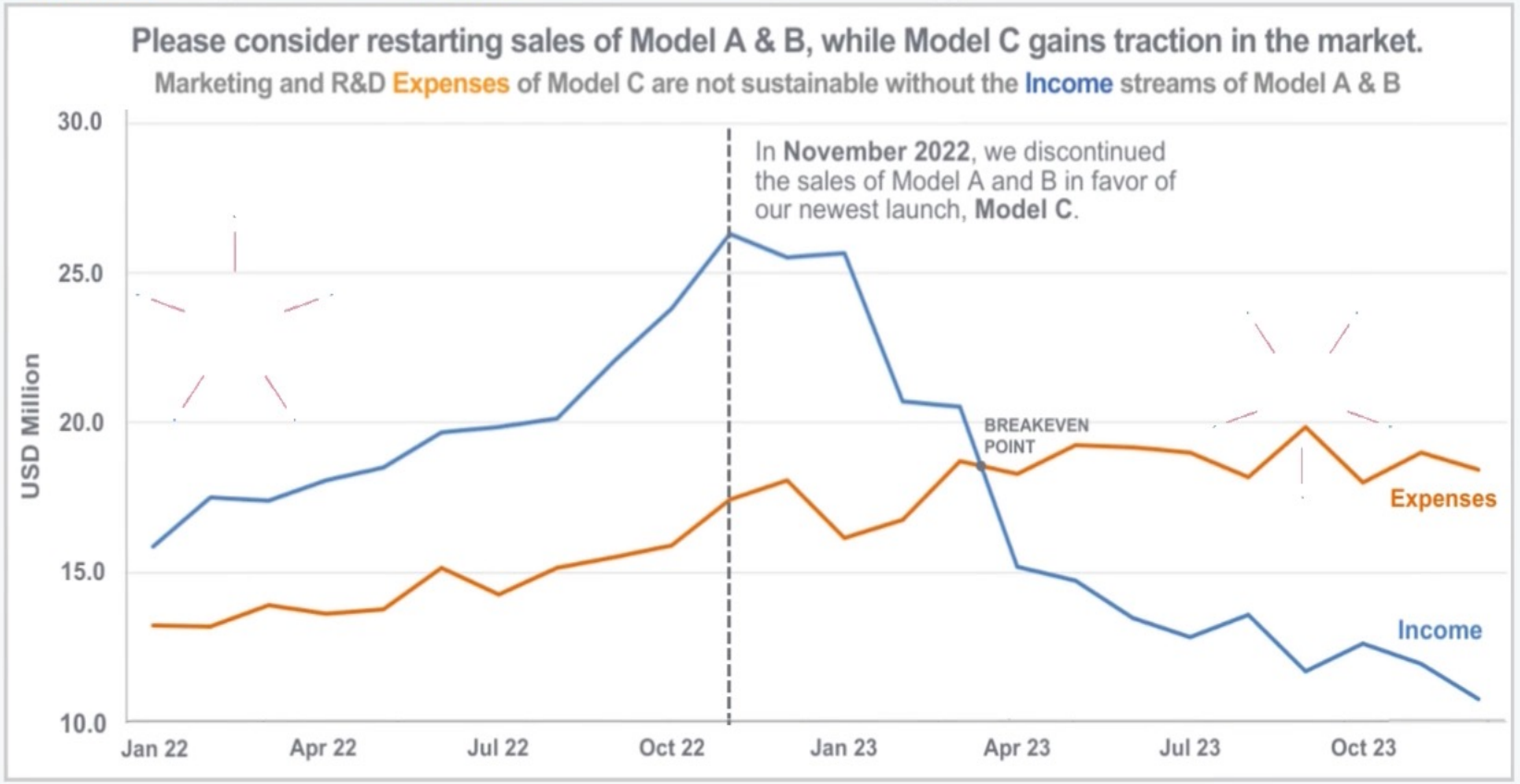
MAIN POINT

SLIDE 2

Our new **Model C has not been profitable** and the losses we incurred are **no longer sustainable**, because of this failure we recommend **reintroducing revenue streams** from Model A & B; **please approve of this strategic shift.**

Your Data Visual...

Expenses are greater than **income** due to our change in strategy.



...completed and elevated by DATA STORYTELLING!

LEARNING ROADMAP:

Navigating Your Path to Success

Course 1:
Driving Change and Action through Insight

Course 1:
Unearthing Stories in Data

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

Course 3:
The Value of Visuals

COMPLETED

Course 3:
Visualizing the Story

5

6

Course 4:
Secrets to Effective Visuals


Quick
Pitstop
II. Visualizing the Story