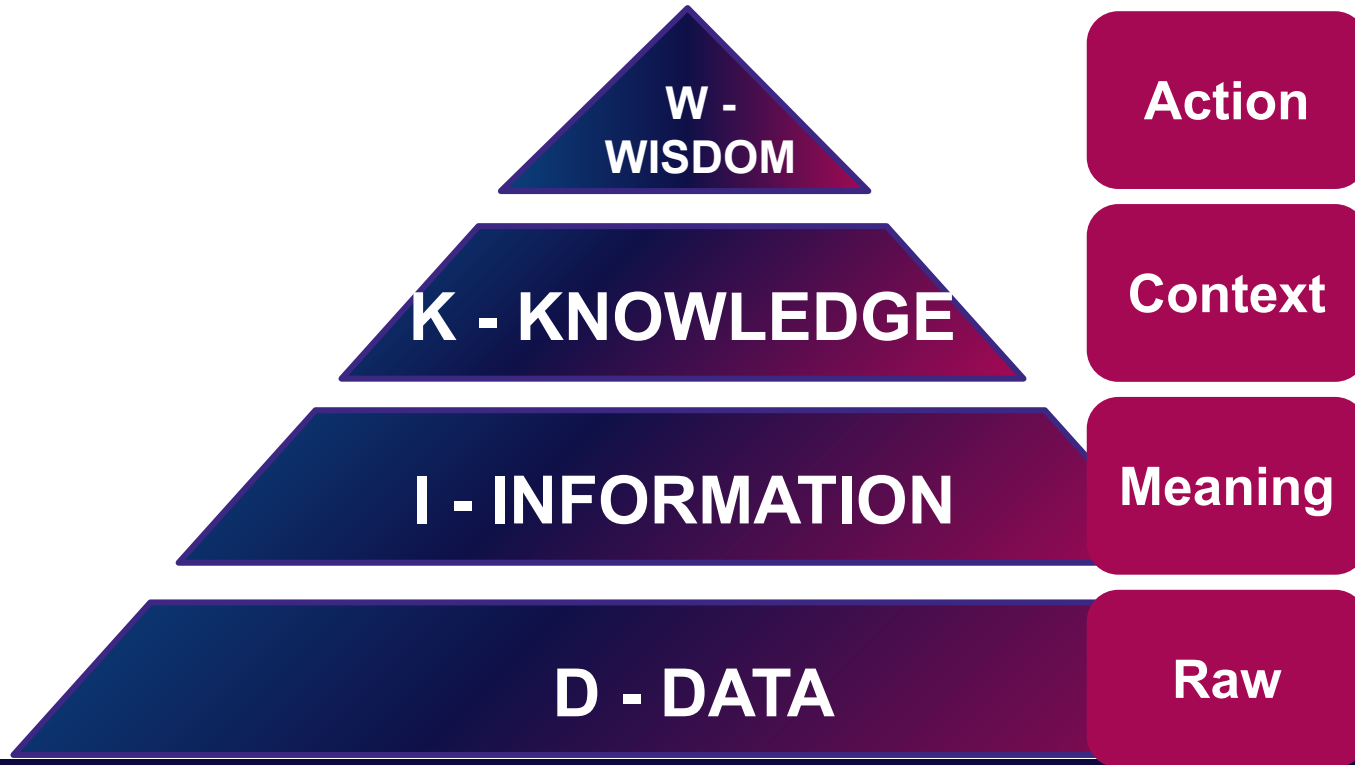


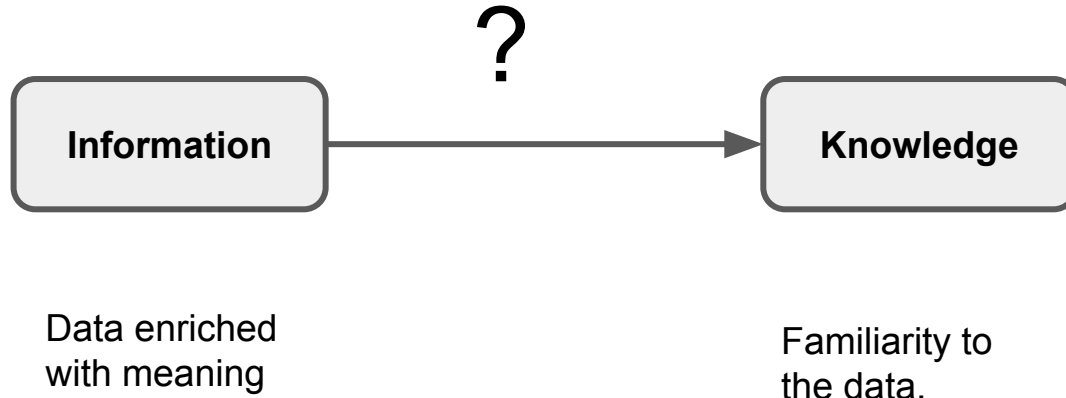
From Information to Knowledge

Angelica Lo Duca
angelica.loduca@iit.cnr.it

The **DIKW** Pyramid



* **Introduction to Data Visualization & Storytelling: A Guide For The Data Scientist** by Jose Berengueres and Marybeth Sandell. Independently published, 2019



Number of homeless in a population of 1,000 in 2021

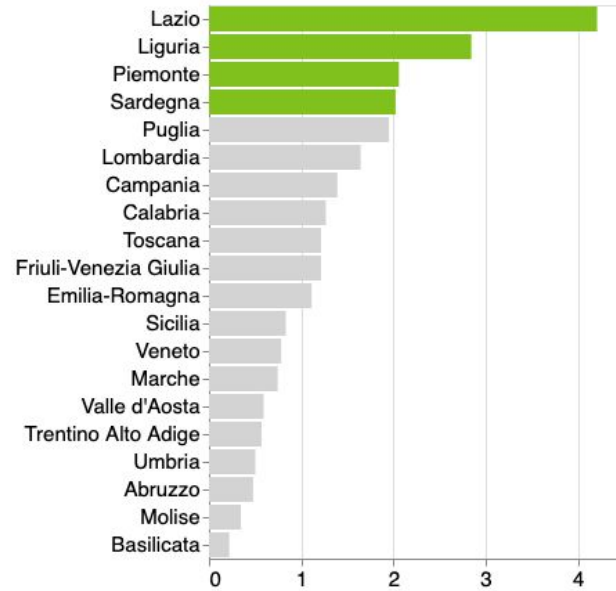




Image by [Leroy Skalstad](#) from [Pixabay](#)



Image by [Sri Harsha Gera](#) from [Pixabay](#)



Image by [Myriams-Fotos](#) from [Pixabay](#)

Alcuni anni fa passeggiavo per il centro di Firenze, in via del Corso, in una tiepida sera di primavera. A un certo punto mi imbattei in un giovane che stava sulla strada: non sono sicuro che fosse un senza fissa dimora, comunque certamente stava sulla strada.

Mi guardò e mi fece: “Ce l’hai qualche soldo?” Io mi fermai e lo osservai, colpito dai suoi occhi chiari e limpidissimi. “Vorrei bere qualcosa”, proseguì. Senza pensarci troppo, mi chinai verso di lui, gli allungai 10 euro e gli dissi: “Mi raccomando, spendili solo per bere alla mia salute, non ci fare nient’altro”. La buttai sull’ironia, non volevo fargli la predica.

Il giovane si mise a ridere. Io stavo per rialzarmi e per andarmene, perché lo avevo già aiutato, avevo già fatto la mia opera buona, quando lui mi disse: “Lo potremmo fare insieme”.

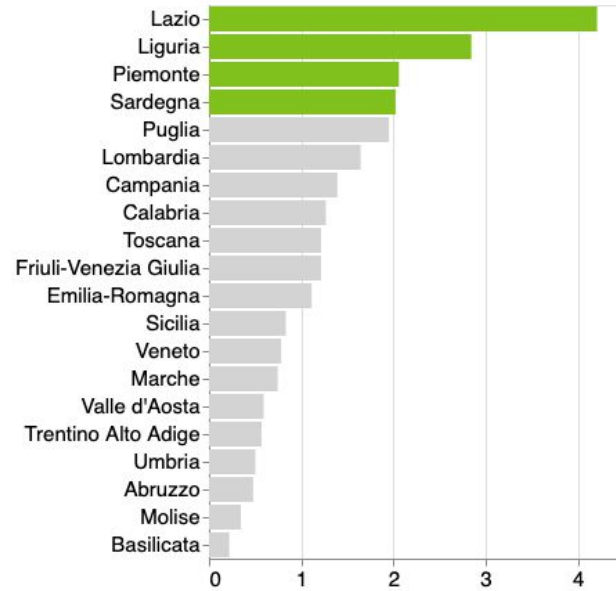
Rimasi un pò sbalordito e interdetto: non mi aspettavo questa insolita richiesta; pensavo di essermela cavata dandogli dei soldi. Questa richiesta inaspettata poneva la relazione a un altro livello. “Lo potremmo fare insieme”, mi ridisse con dolcezza e con quegli occhi penetranti.

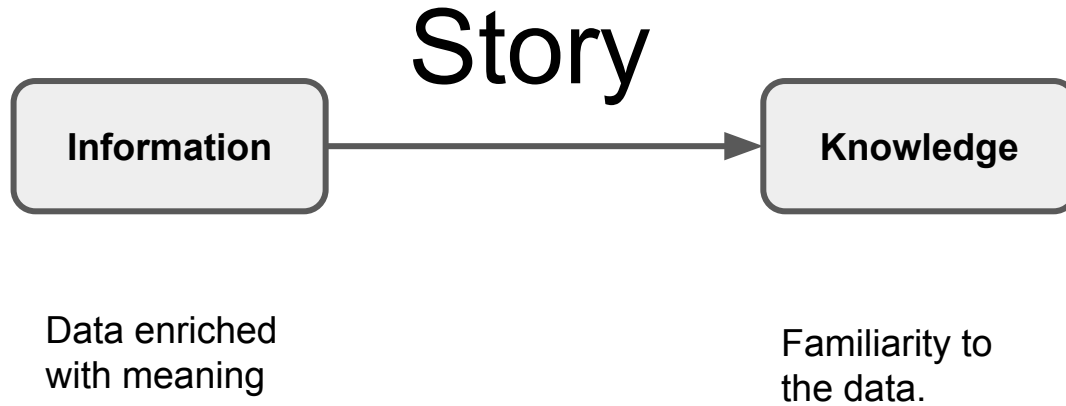
Io potevo accampare scuse: in fondo era tardi e volevo andare a cena, ma non riuscii a fare nient’altro che dirgli: “Perché no?”. In centro a Firenze non mancano di certo le osterie. Trascorremmo più di due ore, o forse tre, a bere del buon vino e a parlare come vecchi amici. Lui parlava di sé e mi raccontava, io di me e gli raccontavo.

Alla fine della serata, era tardissimo, ci abbracciamo, dopo che io gli avevo fatto il mio fervorino: “Guarda, se vuoi conosco un pò di gente, se vuoi dormire al riparo ti posso aiutare a trovare un alloggio”. Fulminante la sua risposta: “C’ho messo tanto tempo a diventare libero e tu mi vuoi rimettere in gabbia?”.

Poi, mentre me ne stavo per andare, mi richiamò, io tornai indietro, mi abbracciò e mi sussurrò: “Stasera mi sono risentito un uomo”. E io, di rimando: “Anch’io”. (S. Olianti, A. Jacopozzi, Lo sguardo dell’altro. Per un’etica della cura e della compassione, EMP, Padova, 2020, pp.54-55).

Number of homeless in a population of 1,000 in 2021

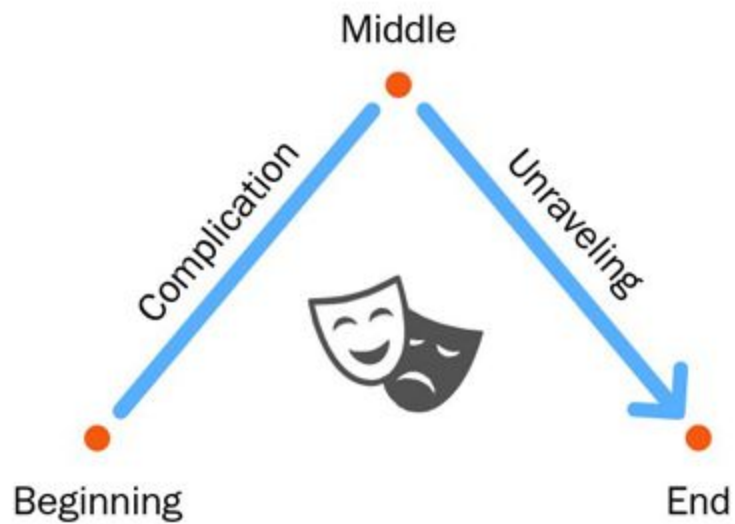




Story adds context to data.

How to build a story

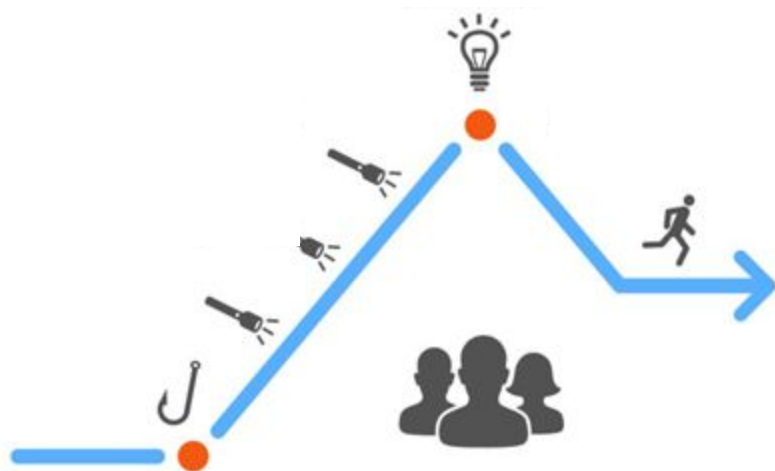
ARISTOTLE'S TRAGEDY STRUCTURE



CAMPBELL'S HERO'S JOURNEY

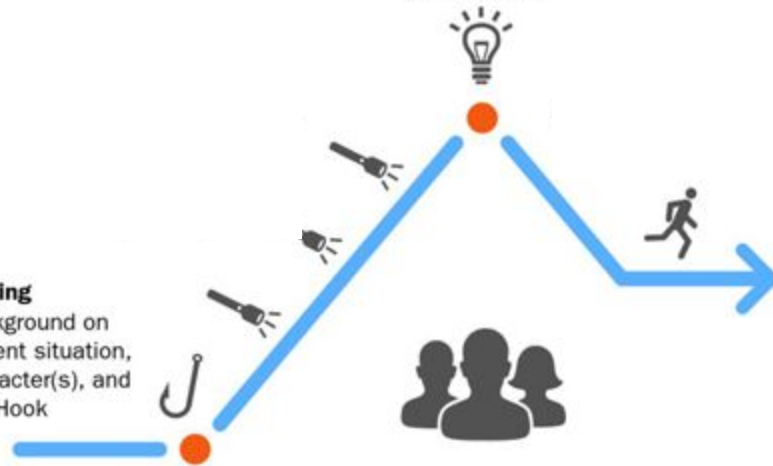


DATA STORYTELLING ARC



DATA STORYTELLING ARC

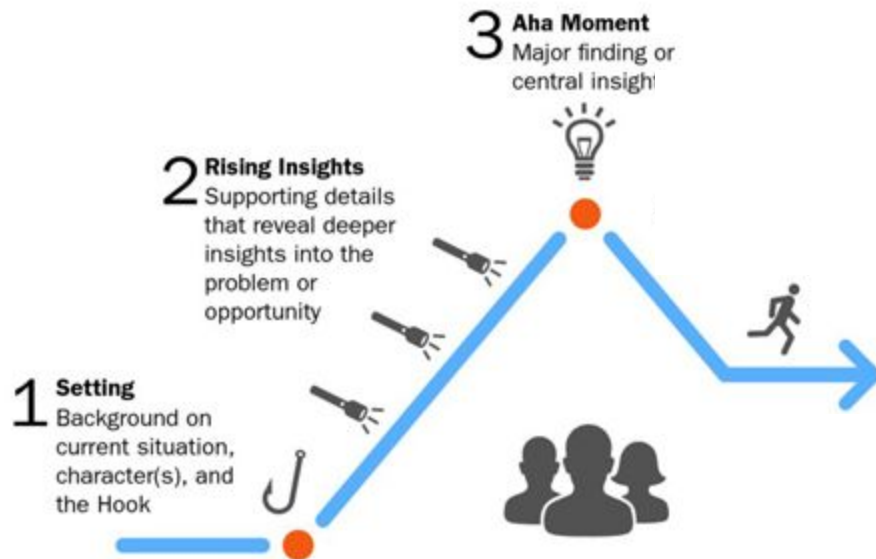
- 1 Setting**
Background on
current situation,
character(s), and
the Hook



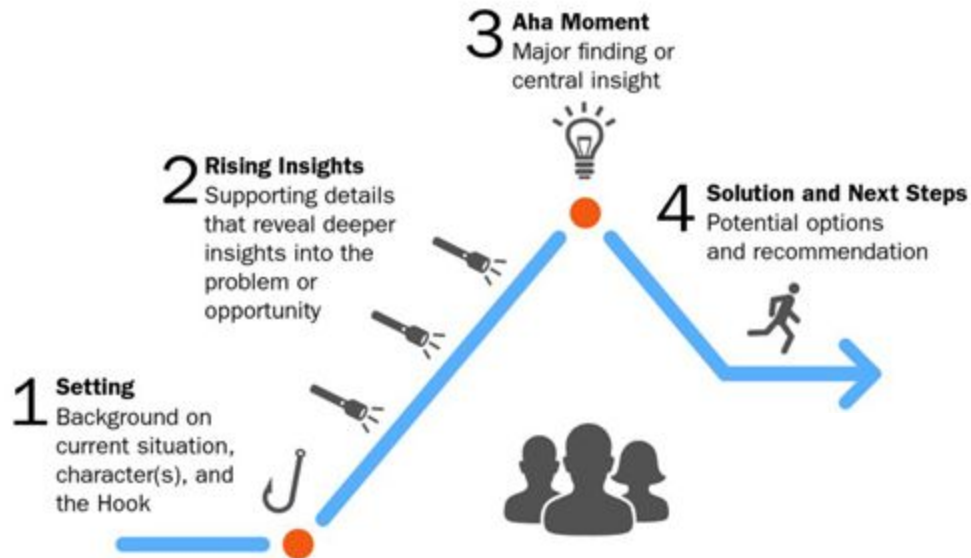
DATA STORYTELLING ARC



DATA STORYTELLING ARC



DATA STORYTELLING ARC



DATA STORYTELLING ARC



Steps to build a story

1. Identify your Aha Moment
2. Find your Beginning (the Hook and Setting)
3. Select your Rising Insights
4. Empower your audience to Act (Wisdom)

Your chart is a *piece* of your global story,
i.e. it's a *story point*.

ECOMMERCE DATA STORY EXAMPLE



What is status quo?
What unexpectedly
changed?

ECOMMERCE DATA STORY EXAMPLE



What is status quo?
What unexpectedly
changed?



What influenced or
contributed to the
change?

ECOMMERCE DATA STORY EXAMPLE



What is status quo?
What unexpectedly
changed?

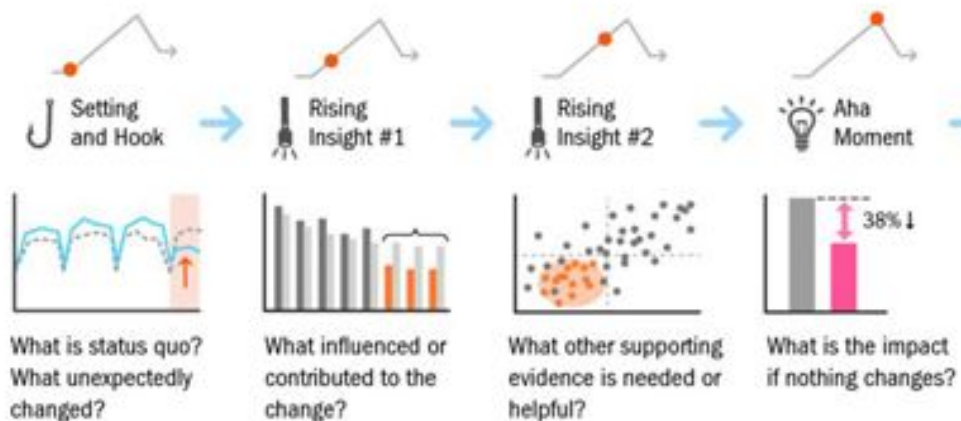


What influenced or
contributed to the
change?

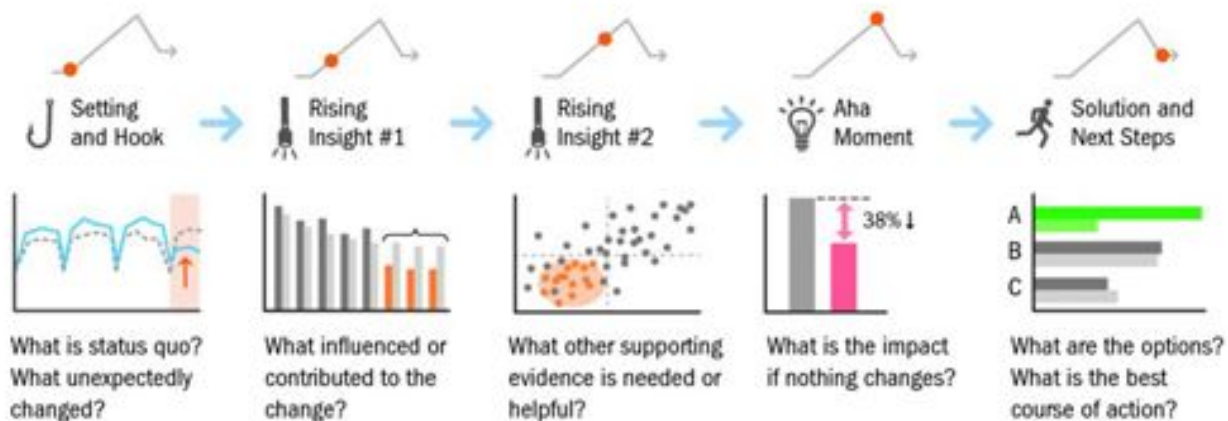


What other supporting
evidence is needed or
helpful?

ECOMMERCE DATA STORY EXAMPLE



ECOMMERCE DATA STORY EXAMPLE



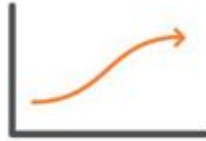
Types of story points

NINE COMMON TYPES OF STORY POINTS

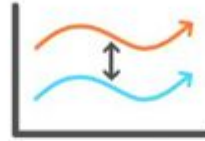


Types of story points

NINE COMMON TYPES OF STORY POINTS



Change over time



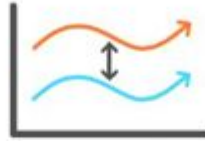
Relationship

Types of story points

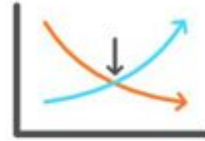
NINE COMMON TYPES OF STORY POINTS



Change over time



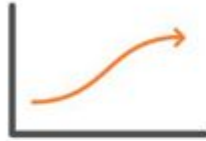
Relationship



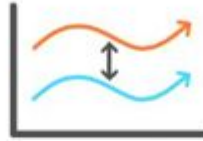
Intersection

Types of story points

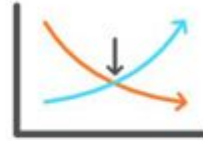
NINE COMMON TYPES OF STORY POINTS



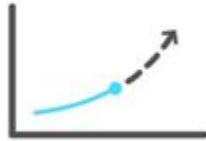
Change over time



Relationship



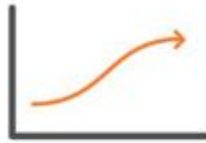
Intersection



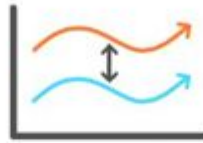
Project forward

Types of story points

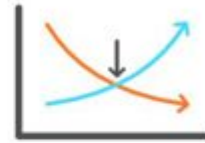
NINE COMMON TYPES OF STORY POINTS



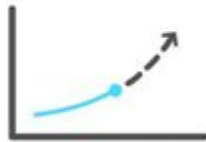
Change over time



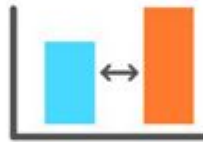
Relationship



Intersection



Project forward



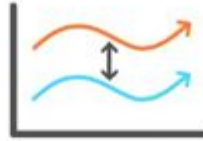
Compare and contrast

Types of story points

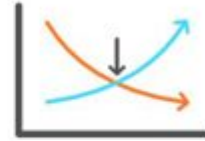
NINE COMMON TYPES OF STORY POINTS



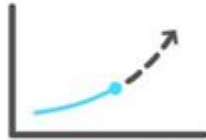
Change over time



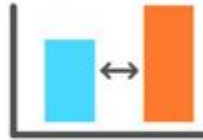
Relationship



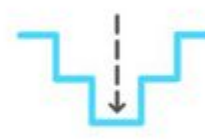
Intersection



Project forward



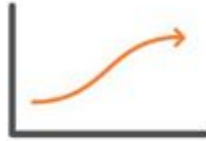
Compare and contrast



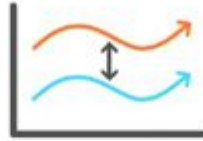
Drill down

Types of story points

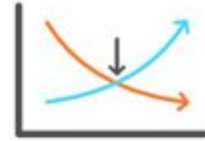
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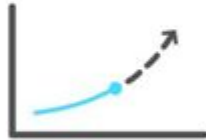
Change over time



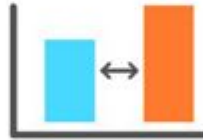
Relationship



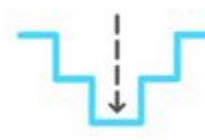
Intersection



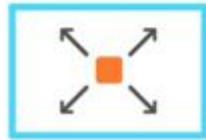
Project forward



Compare and contrast



Drill down



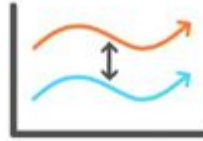
Zoom out

Types of story points

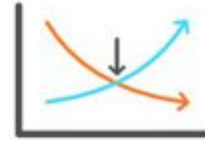
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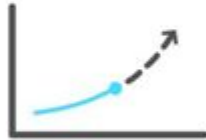
Change over time



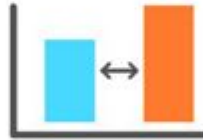
Relationship



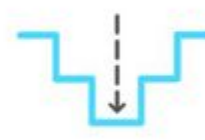
Intersection



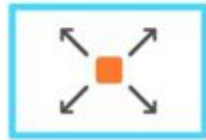
Project forward



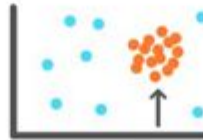
Compare and contrast



Drill down



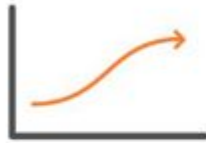
Zoom out



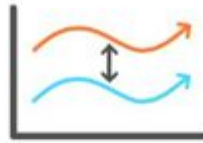
Cluster

Types of story points

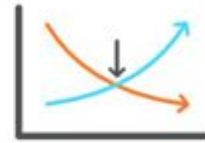
NINE COMMON TYPES OF STORY POINTS



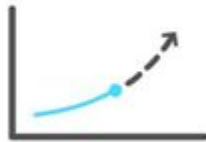
Change over time



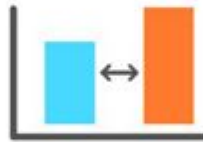
Relationship



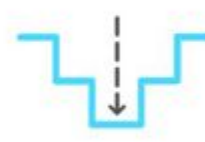
Intersection



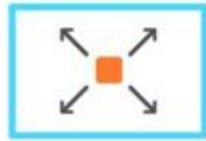
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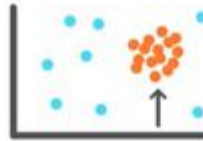
Compare and contrast



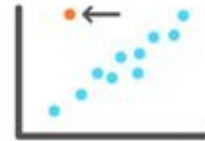
Drill down



Zoom out



Cluster



Outlier

HOW TO ADD A HERO TO YOUR DATA STORY

1



Determine
where your
insights
intersect
with people

HOW TO ADD A HERO TO YOUR DATA STORY

1



Determine
where your
insights
intersect
with people

2



Build a data-
driven profile
of your hero

HOW TO ADD A HERO TO YOUR DATA STORY

1



Determine
where your
insights
intersect
with people

2



Build a data-
driven profile
of your hero

3



Give your
hero an
identity

Photos
Images

HOW TO ADD A HERO TO YOUR DATA STORY

1



Determine
where your
insights
intersect
with people

2



Build a data-
driven profile
of your hero

3



Give your
hero an
identity

4



Give your
hero a voice

Surveys
Interviews

...

HOW TO ADD A HERO TO YOUR DATA STORY

1



Determine where your insights intersect with people

2



Build a data-driven profile of your hero

3



Give your hero an identity

4



Give your hero a voice

5



Show your hero's journey

STEPS TO TURN INFORMATION INTO KNOWLEDGE

Background
Set the context

Rising Interest
Explain the problem

Reveal the Insight
Describe your discovery

Thinking
Give the audience the time to think

Next Steps
Describe the possible solutions

HOW TO IMPLEMENT IN A CHART

Annotations, Crediting

Color, Size

Main chart

Interactivity

Title, Subtitle

STEPS TO TURN INFORMATION INTO KNOWLEDGE

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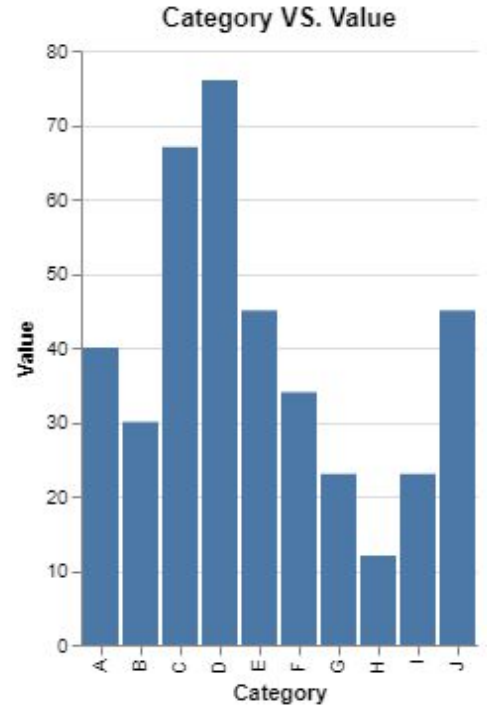
Interactivity

Title, Subtitle

Annotation types

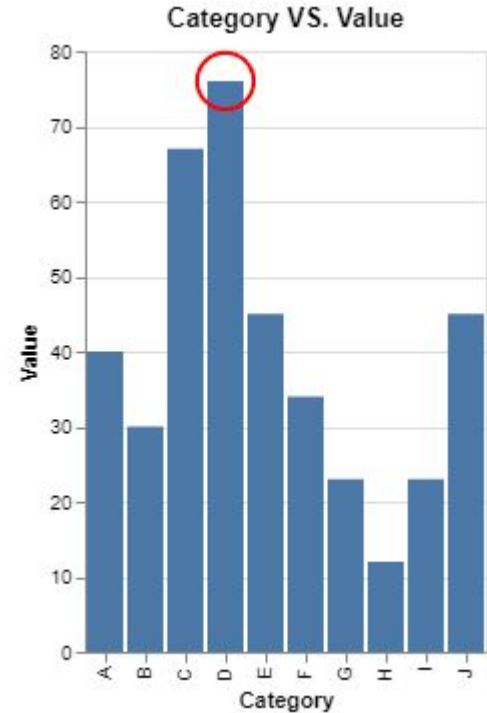
Text: Use it to label axes, add titles, explain data

In the last quarter, the company has distributed its investments equally among all categories.



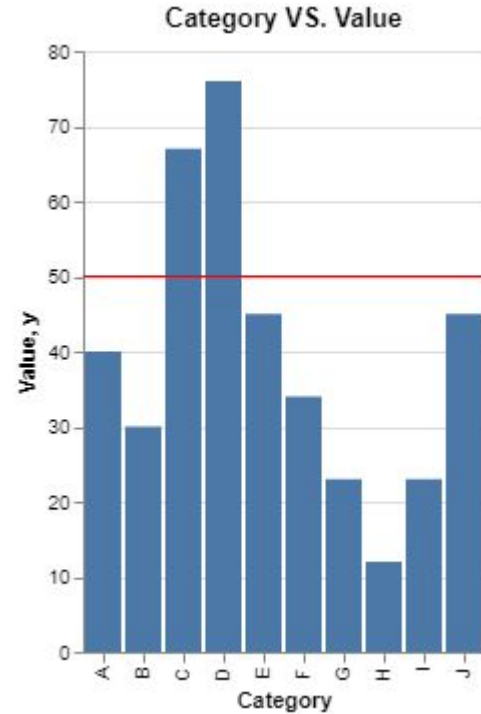
Annotation types

Circle: Add it to a chart to highlight specific data points, such as outliers or essential data points that may not be immediately apparent from the chart itself



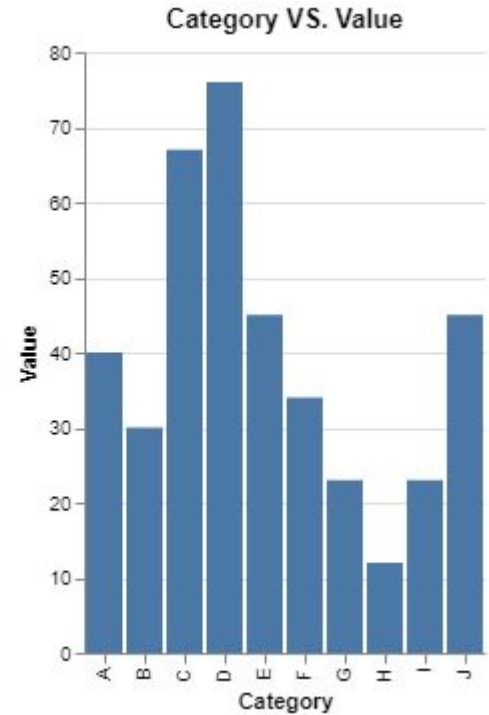
Annotation types

Line: Use it to show trends or a specific threshold, baseline, or target value



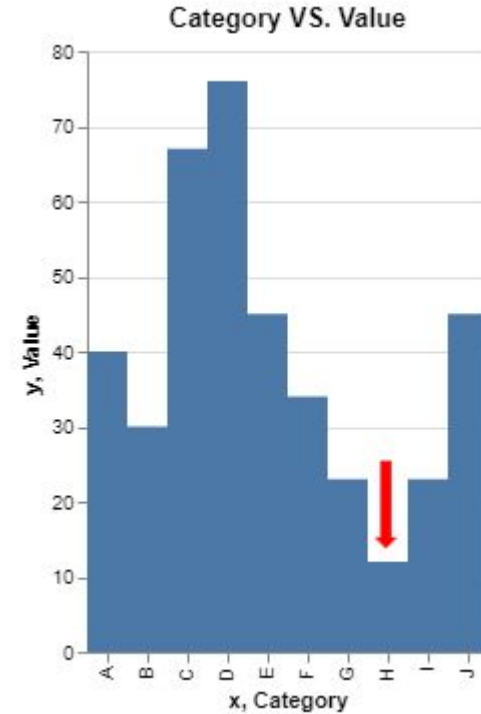
Annotation types

Image: Use it to add logos, icons, or other visual elements that help reinforce the chart's message



Annotation types

Arrow: Use it to show direction or to highlight specific data points



Credit images and add data source

STEPS TO TURN INFORMATION INTO KNOWLEDGE

Background
Set the context

Rising Interest
Explain the problem

Reveal the Insight
Describe your discovery

Thinking
Give the audience the time to think

Next Steps
Describe the possible solutions

HOW TO IMPLEMENT IN A CHART

Annotations, Crediting

Color, Size

Main chart

Interactivity

Title, Subtitle

Color

Country Level Sales Rank Top 5 Drugs

Rainbow distribution in color indicates sales rank in given country from #1 (red) to #10 or higher (dark purple)

Country	A	B	C	D	E
AUS	1	2	3	6	7
BRA	1	3	4	5	6
CAN	2	3	6	12	8
CHI	1	2	8	4	7
FRA	3	2	4	8	10
GER	3	1	6	5	4
IND	4	1	8	10	5
ITA	2	4	10	9	8
MEX	1	5	4	6	3
RUS	4	3	7	9	12
SPA	2	3	4	5	11
TUR	7	2	3	4	8
UK	1	2	3	6	7
US	1	2	4	3	5

Color

Country Level Sales Rank Top 5 Drugs

Rainbow distribution in color indicates sales rank in given country from #1 (red) to #10 or higher (dark purple)

Country	A	B	C	D	E
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IND	4	1	8	10	5
ITA	2	4	10	9	8
MEX	1	5	4	6	3
RUS	4	3	7	9	12
SPA	2	3	4	5	11
TUR	7	2	3	4	8
UK	1	2	3	6	7
US	1	2	4	3	5

Top 5 drugs: country-level sales rank

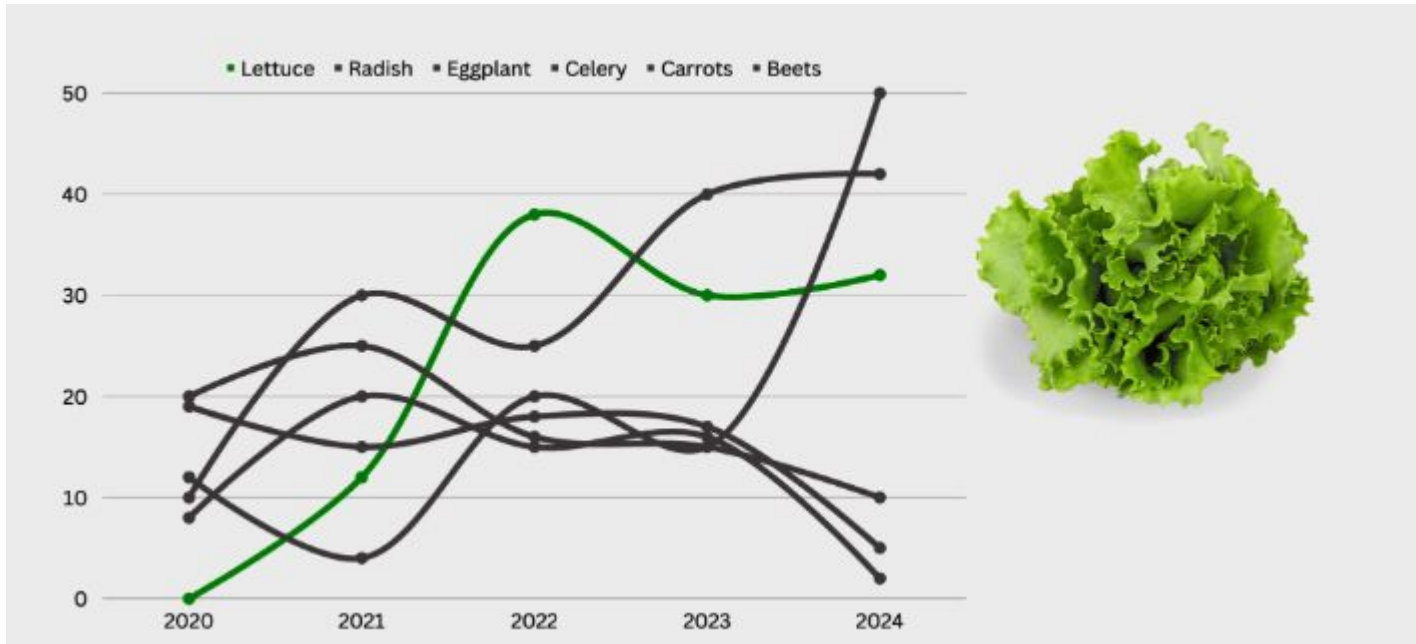
RANK 1 2 3 4 5+

COUNTRY DRUG	A	B	C	D	E
	Australia	1	2	3	6
Brazil	1	3	4	5	6
Canada	2	3	6	12	8
China	1	2	8	4	7
France	3	2	4	8	10
Germany	3	1	6	5	4
India	4	1	8	10	5
Italy	2	4	10	9	8
Mexico	1	5	4	6	3
Russia	4	3	7	9	12
Spain	2	3	4	5	11
Turkey	7	2	3	4	8
United Kingdom	1	2	3	6	7
United States	1	2	4	3	5









Extracted from ColorWise by Kate Strachnyi, O'Reilly Media, 2022

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ColorWise

A DATA STORYTELLER'S GUIDE TO
THE INTENTIONAL USE OF COLOR



KATE STRACHNYI



Extracted from ColorWise by Kate Strachnyi, O'Reilly Media, 2022

STEPS TO TURN INFORMATION INTO KNOWLEDGE

Background
Set the context

Rising Interest
Explain the problem

Reveal the Insight
Describe your discovery

Thinking
Give the audience the time to think

Next Steps
Describe the possible solutions

HOW TO IMPLEMENT IN A CHART

Annotations, Crediting

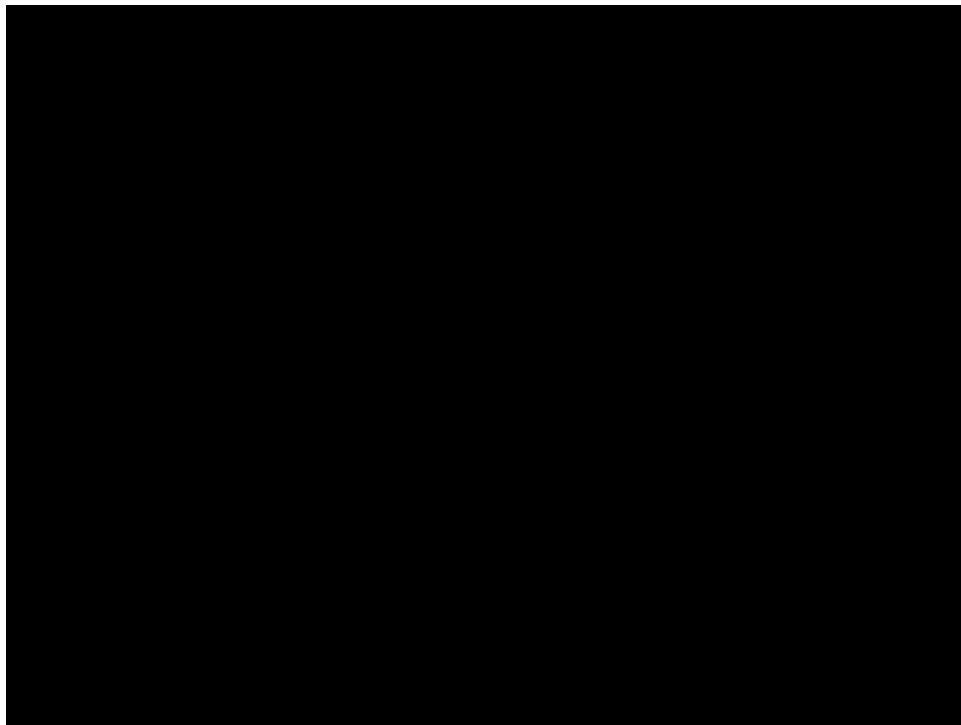
Color, Size

Main chart

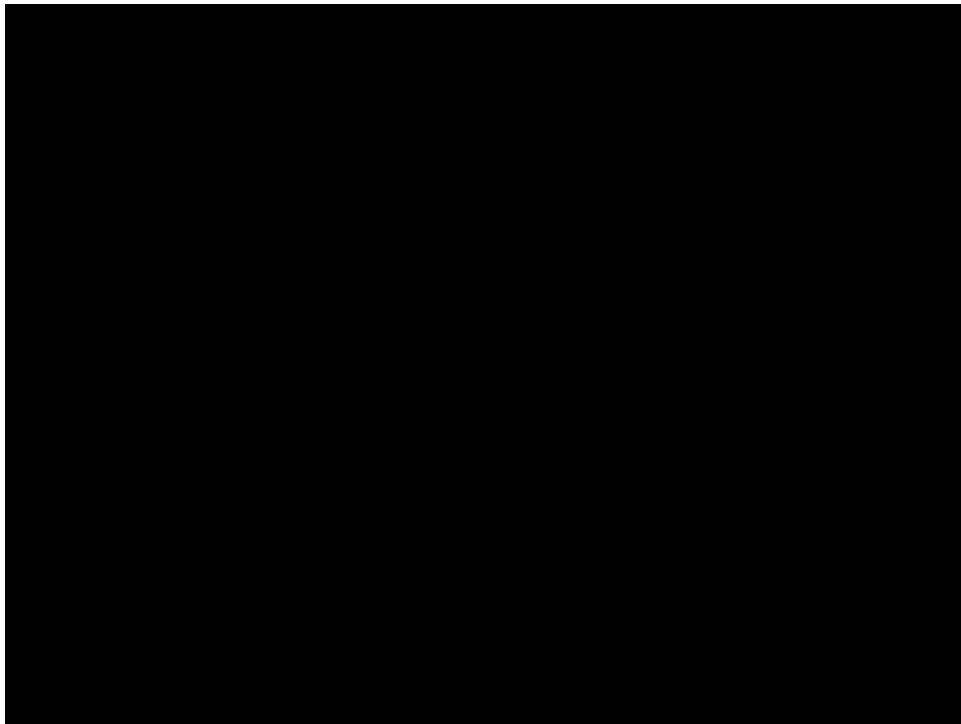
Interactivity

Title, Subtitle

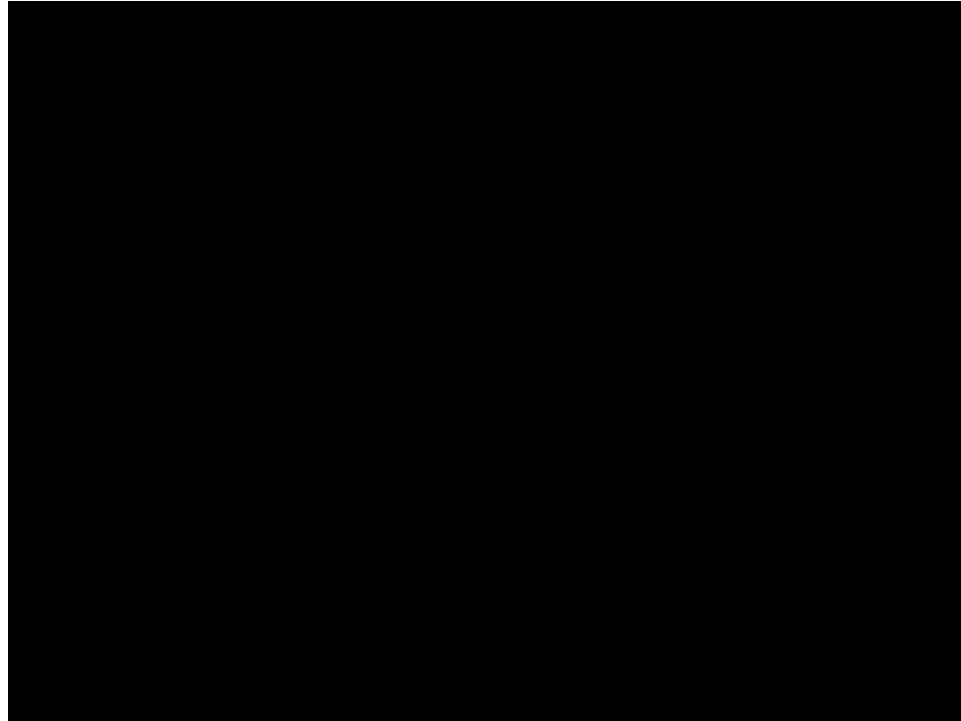
Add a tooltip



Add a slider



Dropdown menu



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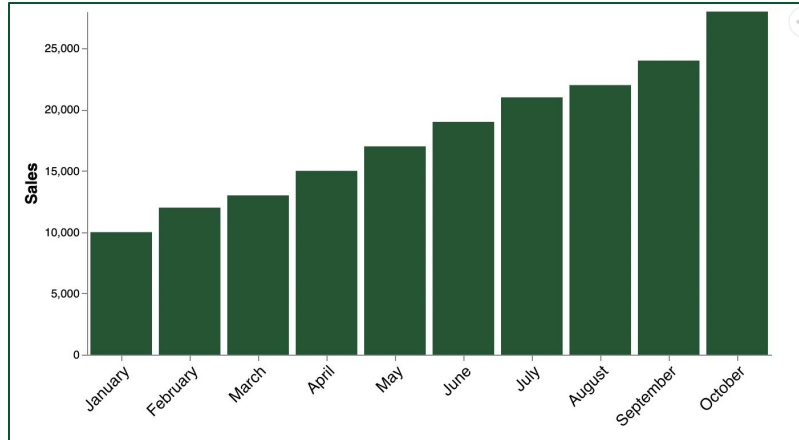
Main chart

Interactivity

Title, Subtitle

Type of titles

- **Question:** This type of title is often used to pique the reader's curiosity and encourage them to read on. Use this title type only if the chart provides answers or explores a topic
- **Definitive statement:** This title makes a clear, concise statement about the chart's content. This title type works well for informative or persuasive charts, as it tells the reader exactly what to expect. Use this title type only if we have enough data to support the statement
- **Descriptive:** It provides a clear summary of the main point or argument of the chart
- **Funny:** Use this title's type to capture the reader's attention, set a tone or mood, or express a unique perspective.



QUESTION TITLE

What Caused the Steady Increase in Sales Over the Past 10 Months?

DEFINITIVE STATEMENT

10-Month Sales Trends Show a Clear and Steady Increase

DESCRIPTIVE TITLE

A Look at the Sales Growth Over a 10-Month Period

FUNNY TITLE

From a Trickle to a Torrent:
The Sales Surge of the last 10 months!



Data Storytelling:

The Three Little Pigs Example

With
descriptive
headlines

With
explanatory
headlines



Data Storytelling:

The Three Little Pigs Example

With
descriptive
headlines

Top natural predators of pigs



With
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Wind resistance by material type



With
explanatory
headlines

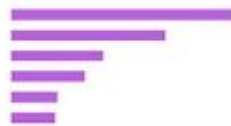


Data Storytelling:

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Top natural predators of pigs



Wind resistance by material type



Wolf meat recipes by star rating
and ease of preparation



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Wolves kill 23% more pigs than the next biggest predator





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After steel, **bricks** are the next strongest building material for wind resistance





Data Storytelling: The Three Little Pigs Example

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Wolf meat recipes by star rating and ease of preparation



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After steel, **bricks** are the next strongest building material for wind resistance



Grandma's wolf stew is both highly rated and easy to prepare



Effectivedatastorytelling.com

Extracted from:

https://www.linkedin.com/posts/brentdykes_datastorytelling-data-storytellingwithdata-activity-7008888471440306176-kqSW/?originalSubdomain=bm