From Data to Insights

AI for Business Masterclass Series

Dr. Kakia Chatsiou

Lecturer in Computing

Digital Futures Institute/ School of EAST

University of Suffolk

k.chatsiou@uos.ac.uk ▲ t: @kakiac

University
of Suffolk

Welcome – introductions

Business Engagement at the University of Suffolk

University of Suffolk

"Our mission is to transform lives and our region, through education, training, research, business and community engagement."

University of Suffolk

What support we can offer Businesses and Organisations

Consultancy

- *Access to Academics specialising in business area*

CPD/ Training

- *Short courses*
- *Bespoke CPD*

Research/ KTPs

- *Contract Research (Evaluations, Feasibility etc.)*
- *Knowledge Transfer Partnerships – combine expertise, resource and funding to deliver innovative projects*

How can we support you?

Funding applications

- *Help determining applicable funding and submitting proposals*

Access to expert students

- *PhD Students*
- *Internships*
- *Apprenticeships*

State of the art Facilities

- *Facilities for hire – 3D printer suite, innovative workshop space*

University of Suffolk

Sign up to our newsletter:

[Innovation Labs at University of Suffolk | University of Suffolk (uos.ac.uk)](uos.ac.uk)

University of Suffolk

AI 4 Business Masterclass series

- 27-Apr-2022

AI for Business Masterclass 3:

Migrating to the cloud for Smarter Business: How cloud computing can benefit your business

University of Suffolk

CPD classes on Data Science, AI and Cloud Computing topics are planned for Summer 2022.

If interested please get in touch!

University of Suffolk

A Journey from Data to insights

Make informed decisions

Communicate

Analyse & Understand

Ask

Explore

University of Suffolk

A journey from

Data to insights

University of Suffolk
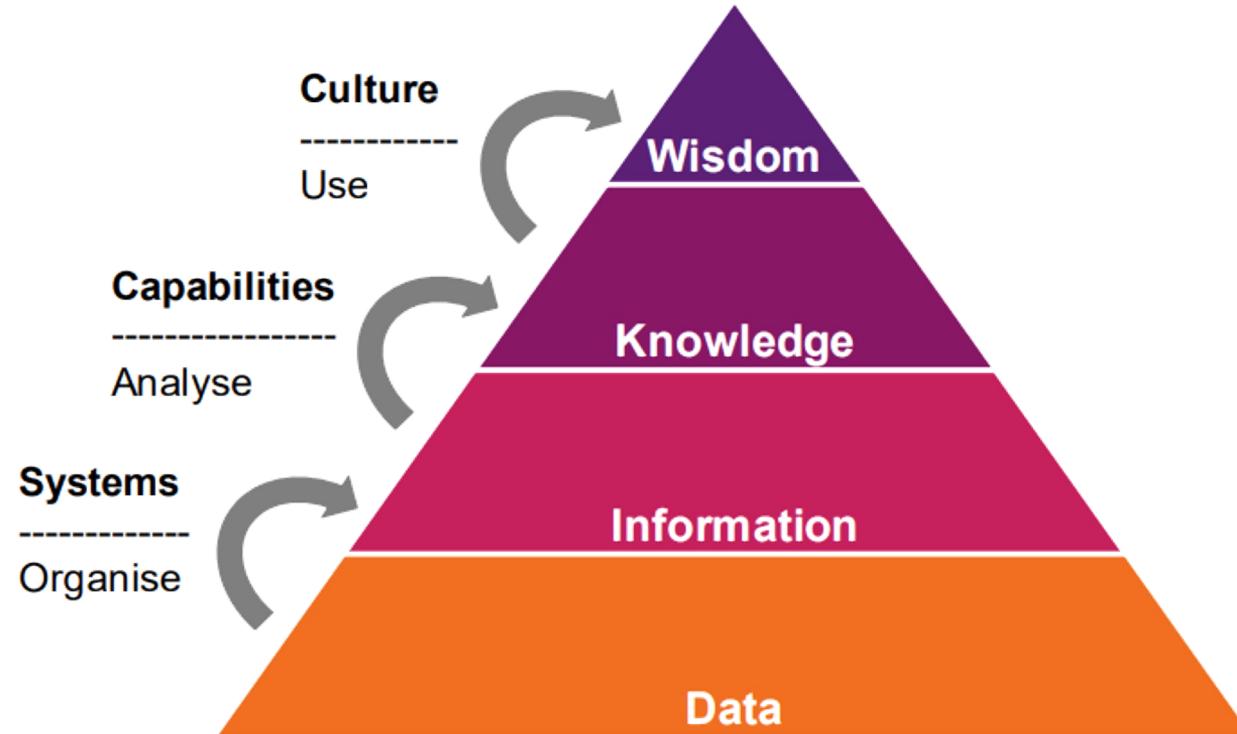
From Data to insights

From data to insights
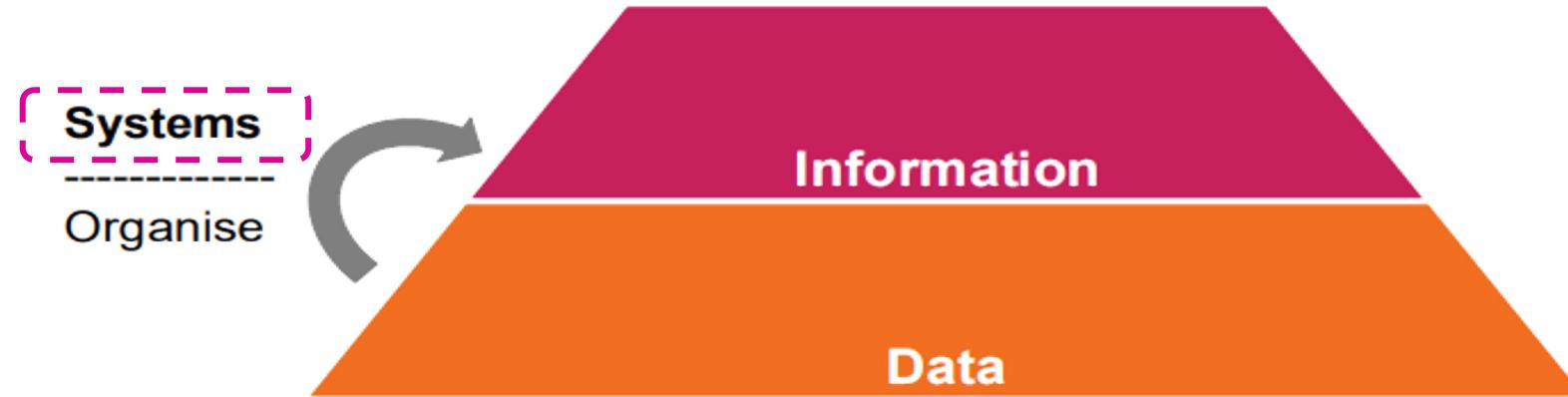
Stage one: Data - Collecting **good quality** data

Engagement data   Feedback data

User data   Outcome data

                    Impact data

Data

University of Suffolk
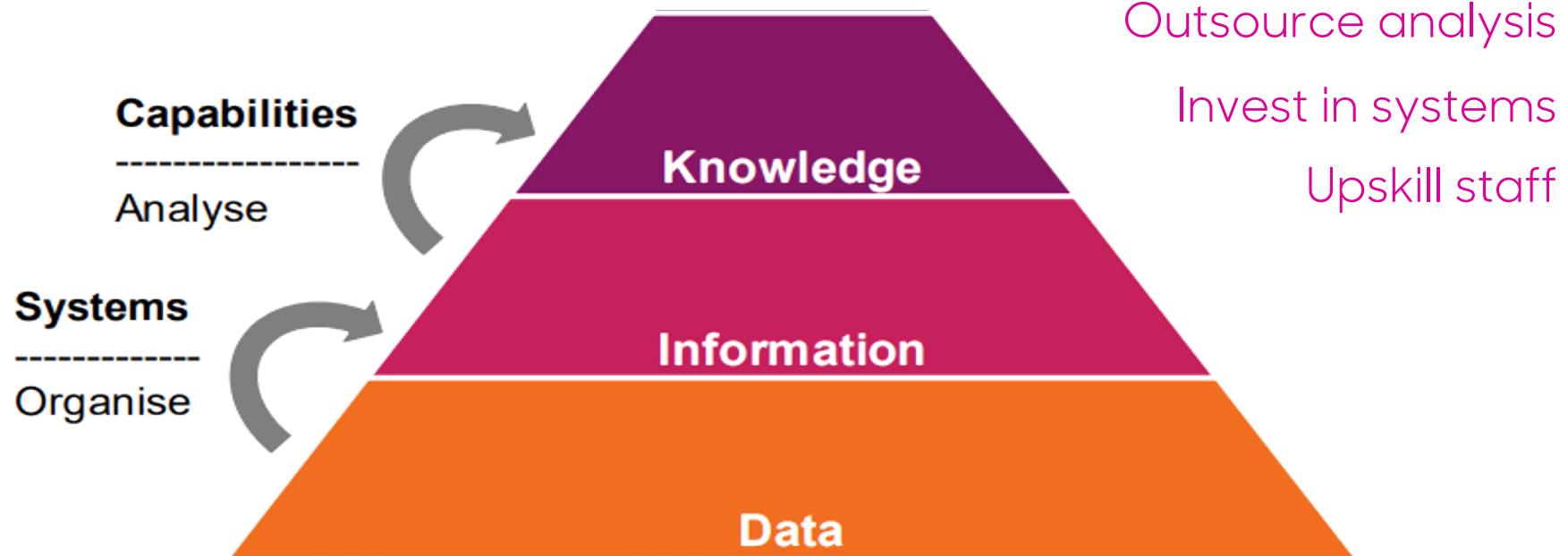
Transforming data into insights
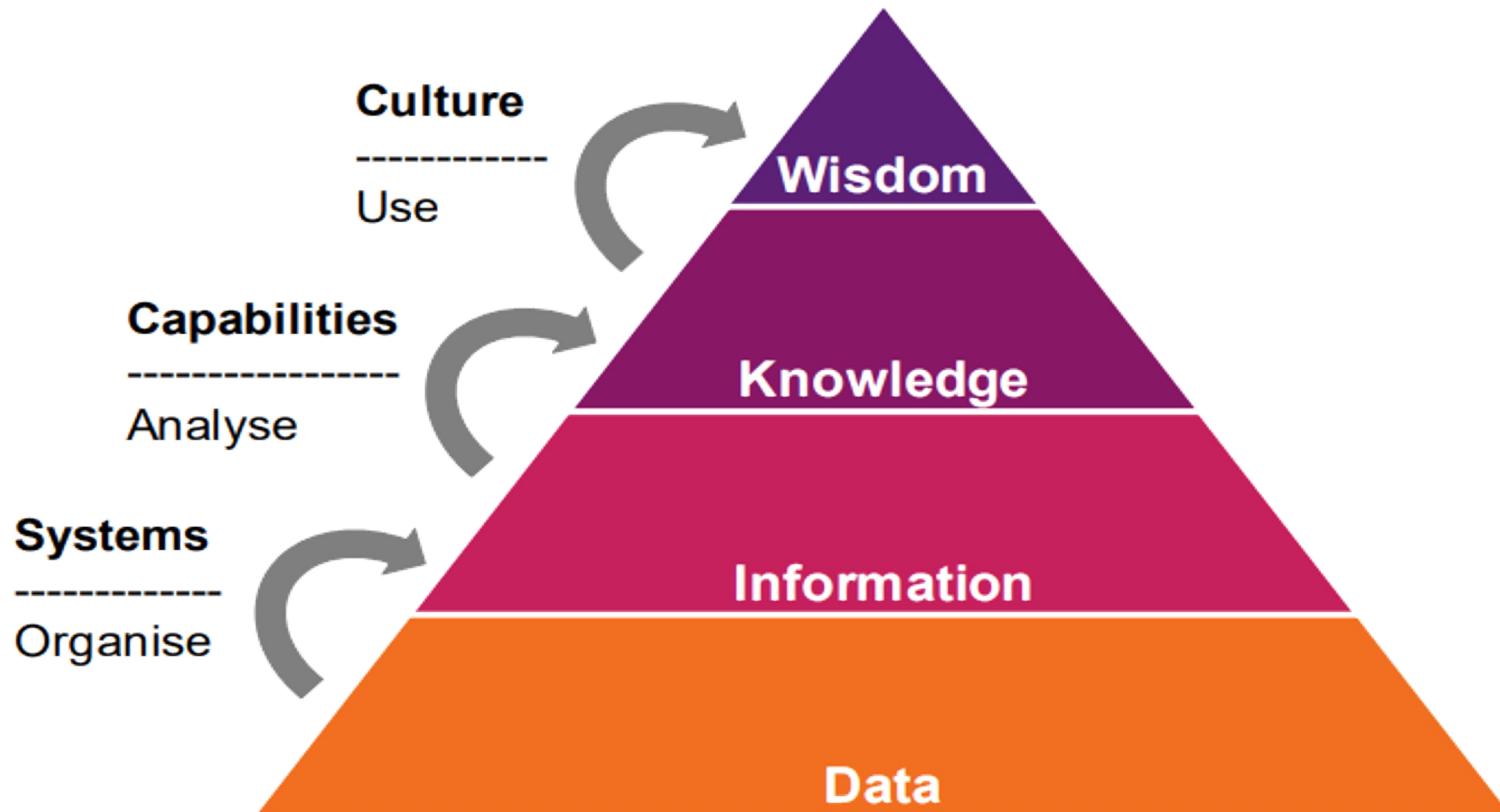
Stage two: Raw data collated and organised

Stage three: Turning information into knowledge

Outsource analysis

Invest in systems

Upskill staff

Stage four: Use this new knowledge to improve

A journey from Data to insights

01	02	03	04	05
Ask	Explore	Analyse & Understand	Communicate	Make informed decisions

University of Suffolk

Data, Data, Data

University of Suffolk
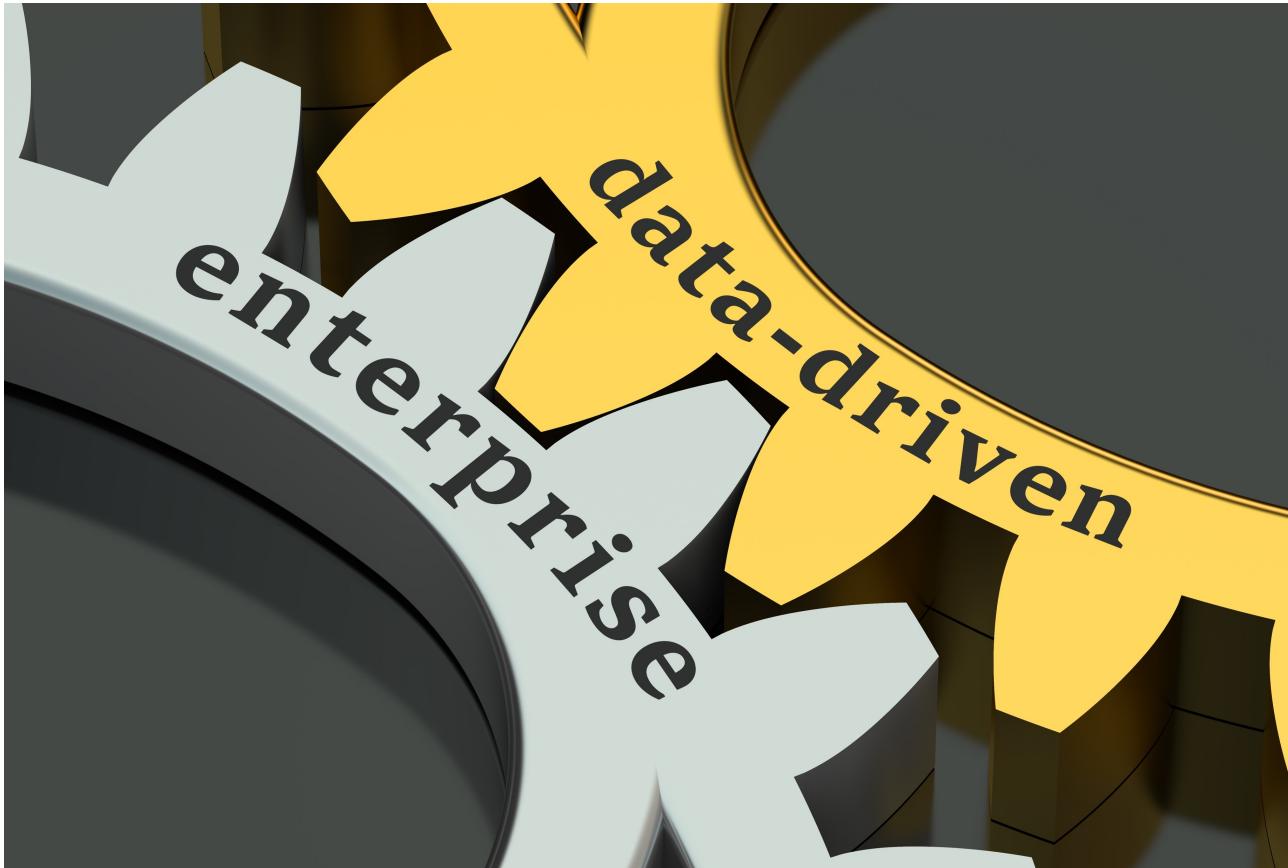
What do you understand by data?

Examples

Your sales team might have customer information in their personal email account or on social media.
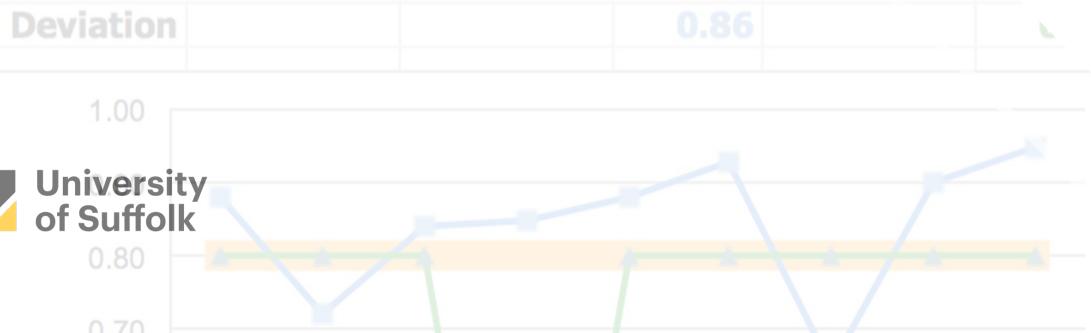
There could be some customer information stored in your old email program, and some stored in the new program you've just upgraded to.

There could be customers who made purchases but were never entered into your CRM.
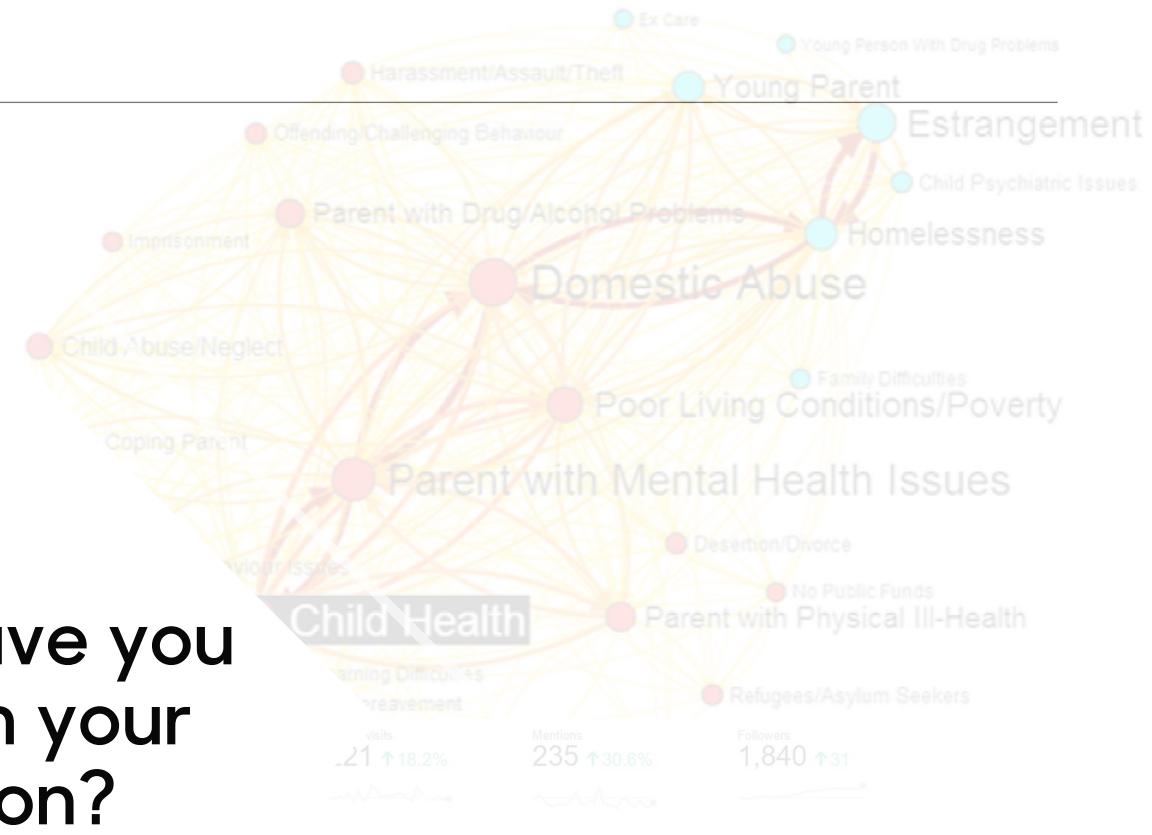
University of Suffolk

What data have you been using in your organization?

Sli.do #598269

University of Suffolk

Slido poll

Sli.do #598269

University
of Suffolk

Types of data

Qualitative

- Text & stories (non-numerical)
- Provide insights into experiences, behaviours or beliefs
- Answers: how? Why?

Examples:
- Focus groups
- Observations
- Interviews
- Document analysis

Quantitative

- Numerical
- Can be quantified and statistically analysed
- Draw connections between factors
- Answers: what? How many? Who?

Examples:
- Surveys
- Questionnaires
- Administrative data

University of Suffolk
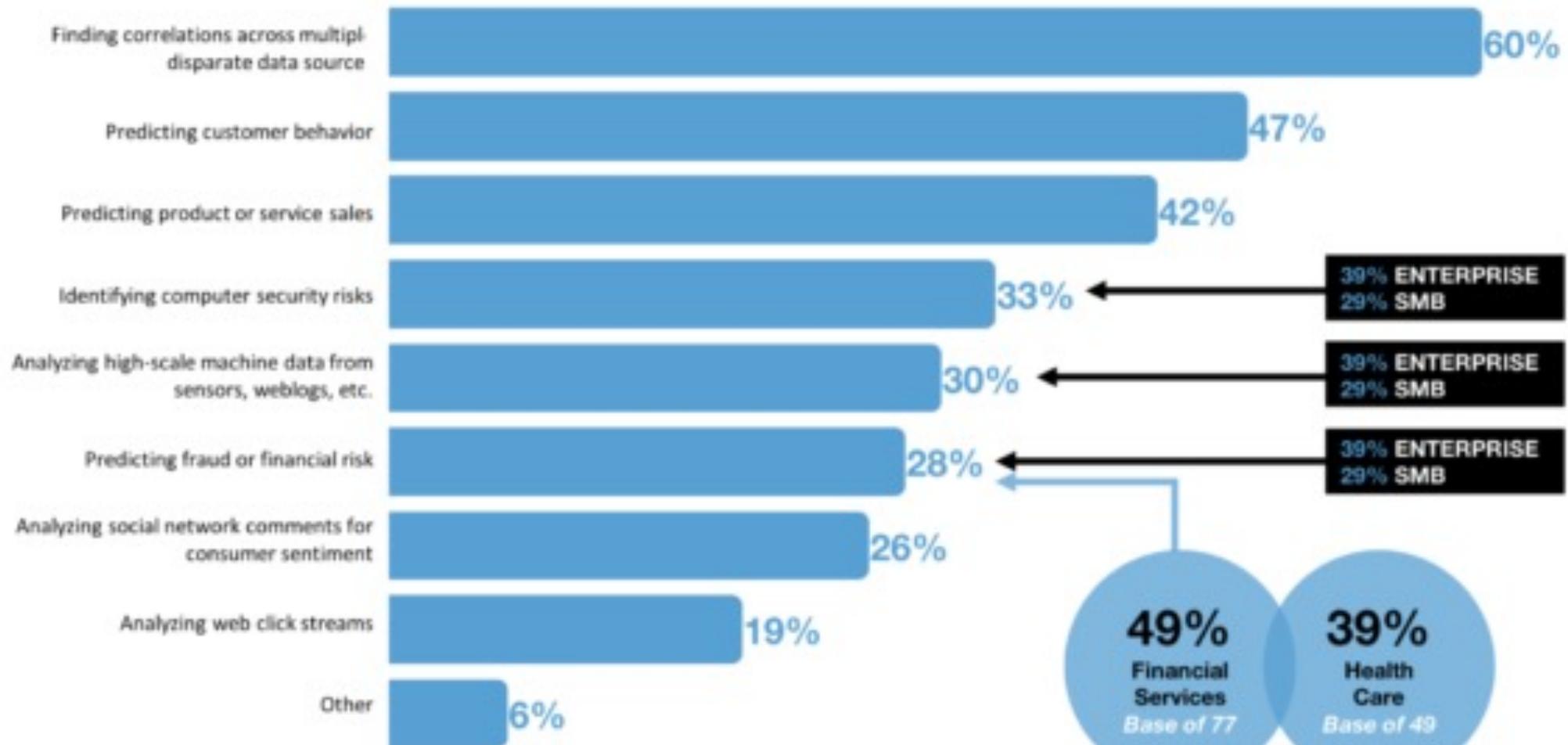
Why turn data to insights?

- Data analysis can help your organisation enhance stakeholder engagement

- A.I. and machine learning can complement human interventions to reduce risk and manage demand

- Internal data can allow you to make savings and improve efficiencies

- Data can provide greater market and demographic insight

University of Suffolk

Why turn data to insights?

- Open data can be used allow organisations to be true innovators and improve the service user experience

- Data can demonstrate impact in order to secure future funding

- Data can measure project success and outcomes

- Data analysis can predict future demand and identify where services are needed most

University of Suffolk

Data can help businesses solve challenges

Challenge	Percentage	Enterprise/SMB
Finding correlations across multiple disparate data source	60%	
Predicting customer behavior	47%	
Predicting product or service sales	42%	
Identifying computer security risks	33%	39% ENTERPRISE / 29% SMB
Analyzing high-scale machine data from sensors, weblogs, etc.	30%	39% ENTERPRISE / 29% SMB
Predicting fraud or financial risk	28%	39% ENTERPRISE / 29% SMB
Analyzing social network comments for consumer sentiment	26%	
Analyzing web click streams	19%	
Other	6%	

49% Financial Services Base of 77

39% Health Care Base of 49

University of Suffolk

Q: What challenges is your organization aiming to solve with its data-driven initiatives?

A journey from Data to insights

01 Ask

02 Explore

03 Analyse & Understand

04 Communicate

05 Make informed decisions

University of Suffolk
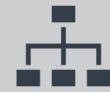
Define your core organization/business aims

What is your business trying to accomplish?

What does success look like?

Align IT and Business strategy objectives to Data strategy.

Identify a champion to sponsor change

University of Suffolk

Conduct a data audit

Identify available data and data gaps

- what data do you have that will help you measure your performance and predict future trends? What are you missing?

- is it of good quality and coverage? is it of the right level of detail for the analysis?

- is updated with the right frequency to answer the question effectively?

- where is it housed? who owns them?

- how is it gathered?

University
of Suffolk

A journey from Data to insights

01
Ask

02
Explore

03
Analyse & Understand

04
Communicate

05
Make informed decisions

University of Suffolk

Use your favourite tool

- Excel (yes, it's fine)
- Power BI
- Statistical Packages (R, SPSS, STATA)
- Programming Languages (Python, Java, other?)

University of Suffolk

Slido poll

Sli.do #598269

JAGAN · 4Y AGO · 43,543 VIEWS

▲ | 199   Edit My Copy | 480

What's in a review? - Yelp ratings EDA

Python · Yelp Dataset

Notebook   Data   Logs   Comments (20)

Run

793.0s

🕐 Version 22 of 22

Beginner   Data Visualization   Exploratory Data Analysis   Online Communities   Geospatial Analysis

Table of Contents:

1. Introduction
2. Imports
3. Ratings distribution

Table of Contents

Table of Contents:

1.Introduction:

Airbnb Bordeaux- a Business data analysis

Notebook   Data   Logs   Comments (6)

▲ 17   Copy & Edit   23
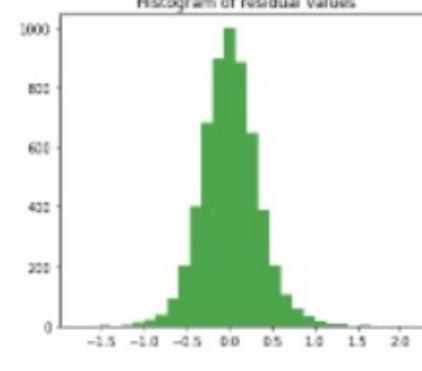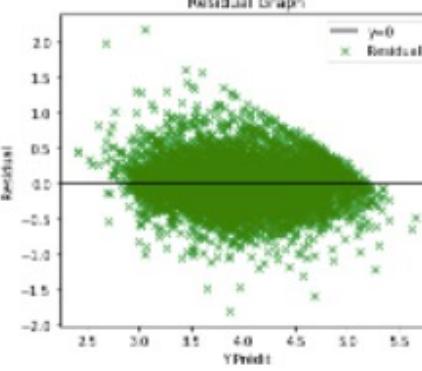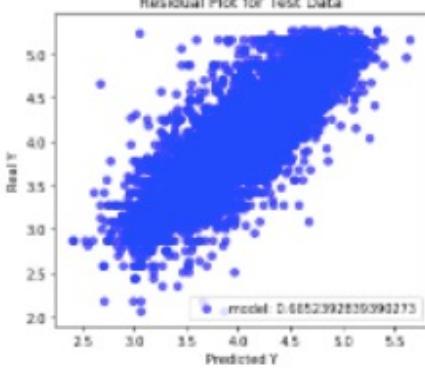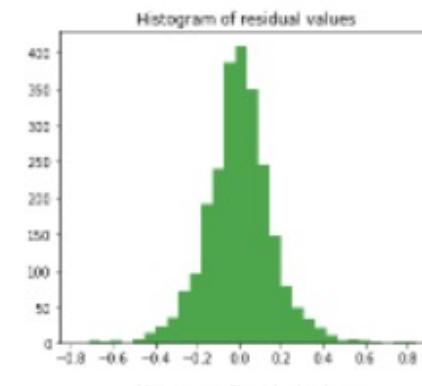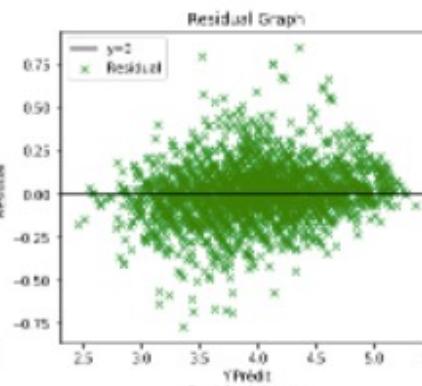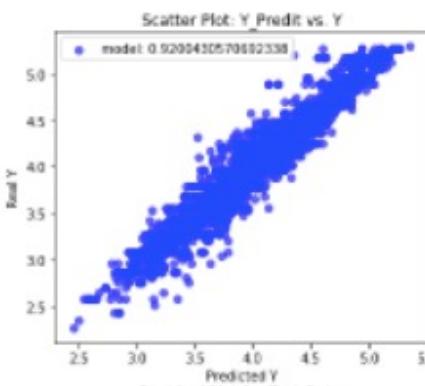
In [32]:
```
plots(Xgb_model2)
```

Thanks you for reading up to here; if you found it useful, please grant a small upvote to this kernel.
Thanks you :)

Q Search

AMAR SHAW · 3Y AGO · 76,561 VIEWS

▲ 131

Copy & Edit 290

Product Recommendation System for e-commerce

Python · Amazon - Ratings (Beauty Products), Home Depot Product Search Relevance

Notebook   Data   Logs   Comments (14)

Competition Notebook
Home Depot Product Search Relevance

Run
25.1s

⟲ Version 3 of 3

pandas   Matplotlib   NumPy   Business

Amar Shaw

- Computer Science Engineering,(August, 2019)

Table of Contents

Product Recommendation Syste...

Recommendation System - Part I

A journey from Data to insights

01	02	03	04	05
Ask	Explore	Analyse & Understand	Communicate	Make informed decisions

University of Suffolk

4. Analyse your data (to get insights)

recommendations for how to apply analytics to extract business-critical insights

data visualization is key: data easier to understand and interpret

interaction with the data should be possible by all
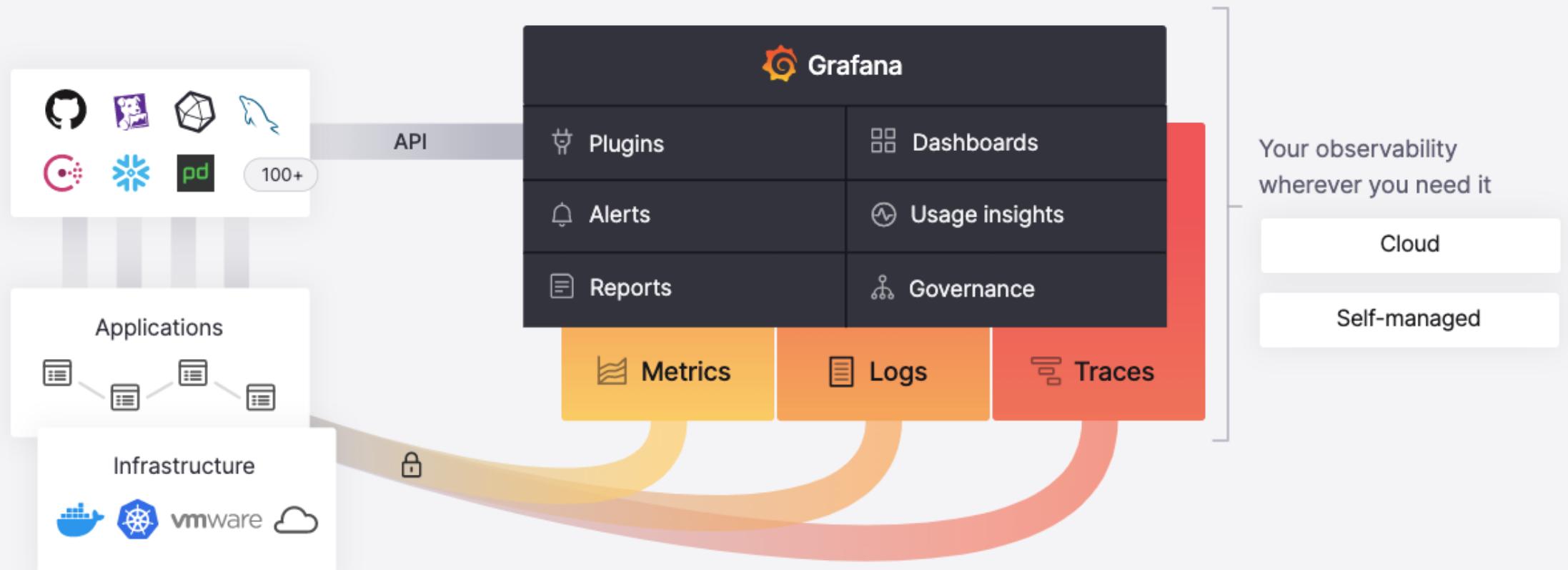
processes should be automated as much as possible to allow for widespread use

everyone should be able to create reports from the data

University of Suffolk

Success stories →

Compose and scale observability with one or all pieces of the stack

100+

API

Grafana

⚡ Plugins	▦ Dashboards
🔔 Alerts	◷ Usage insights
🗎 Reports	⬡ Governance

≋ **Metrics**   🗎 **Logs**   ☰ **Traces**

Applications

Infrastructure

vmware

🔒

Your observability
wherever you need it

Cloud

Self-managed

A journey from Data to insights

01	02	03	04	05
Ask	Explore	Analyse & Understand	Communicate	Make informed decisions

University of Suffolk

What is data visualisation?

Data viz is a graphical representation of information and data.
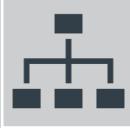
With visual elements like charts, graphs and maps, data visualisation tools provide an accessible way to see and understand trends, outliers and patterns in data.

Essential part of working with data

You can summarise large amounts of information into an easy to digest format

"one picture is a thousand words"

No need to see the raw data

Things to consider when creating a data viz

What are the types of measures, features or categories that you intend to plot?

Who is the audience?

What is the story you would like to tell to the reader?

What makes a good visualisation?
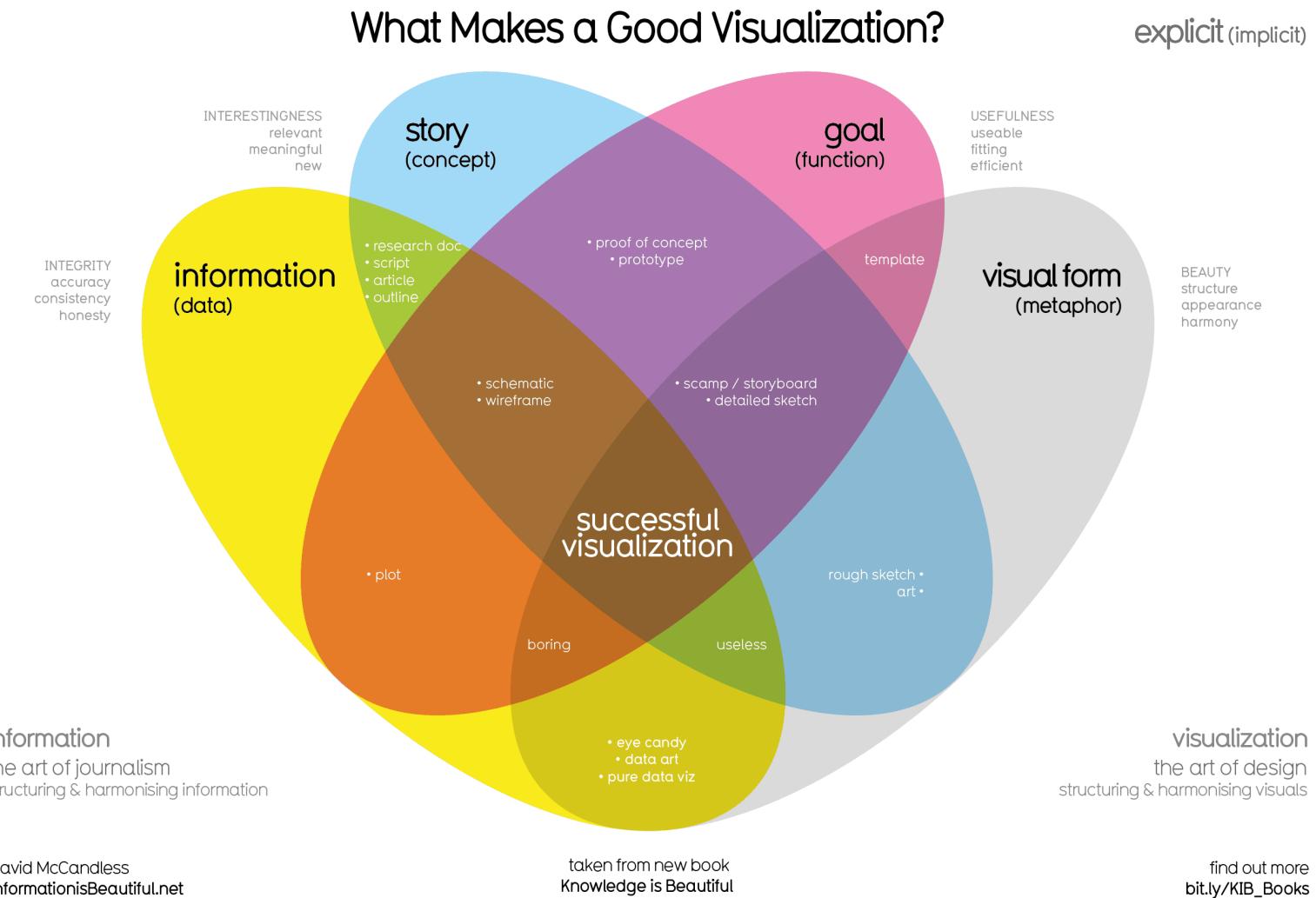
McCandless (2014) (Knowledge is beautiful)

1. Information (data) +
2. Story (concept) +
3. Goal (function) +
4. Visual form (a metaphor) =

A successful visualisation

What makes a good visualisation?

What Makes a Good Visualization?

explicit (implicit)

INTERESTINGNESS
relevant
meaningful
new

story
(concept)

goal
(function)

USEFULNESS
useable
fitting
efficient

INTEGRITY
accuracy
consistency
honesty

information
(data)

• research doc
• script
• article
• outline

• proof of concept
• prototype

template

visual form
(metaphor)

BEAUTY
structure
appearance
harmony

• schematic
• wireframe

• scamp / storyboard
• detailed sketch

**successful
visualization**

• plot

rough sketch •
art •

boring

useless

information
the art of journalism
structuring & harmonising information

• eye candy
• data art
• pure data viz

visualization
the art of design
structuring & harmonising visuals

David McCandless
InformationisBeautiful.net

taken from new book
Knowledge is Beautiful

find out more
bit.ly/KIB_Books

Choosing the best chart for your data

University of Suffolk

The Fantastic Five
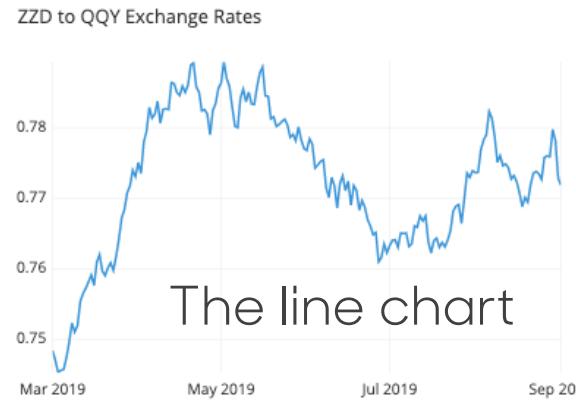
The bar chart
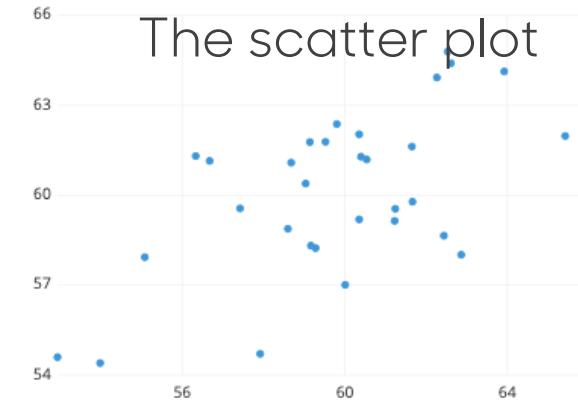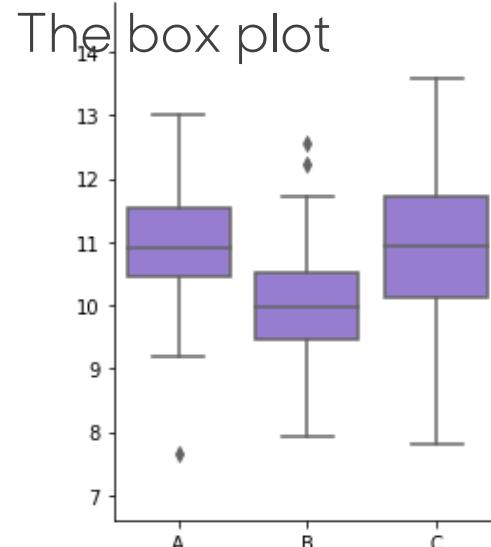
The line chart
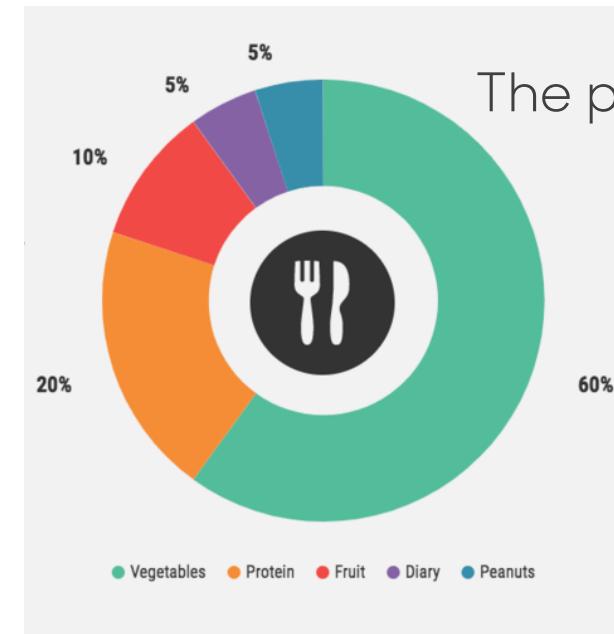
The scatter plot

The box plot

The pie chart

How to choose the best chart for your data?

Is the purpose of your visualisation to:

1. **Inform?**
   - You are trying to convey a data point?
2. **Compare?**
   - You are trying to compare categories or show composition?
3. **Show Change?**
   - You would like to depict change over time or by location?
4. **Organise?**
   - You are trying to show groupings, rankings or processes?
5. **Reveal relationships?**
   - You are showing groupings rankings or processes?
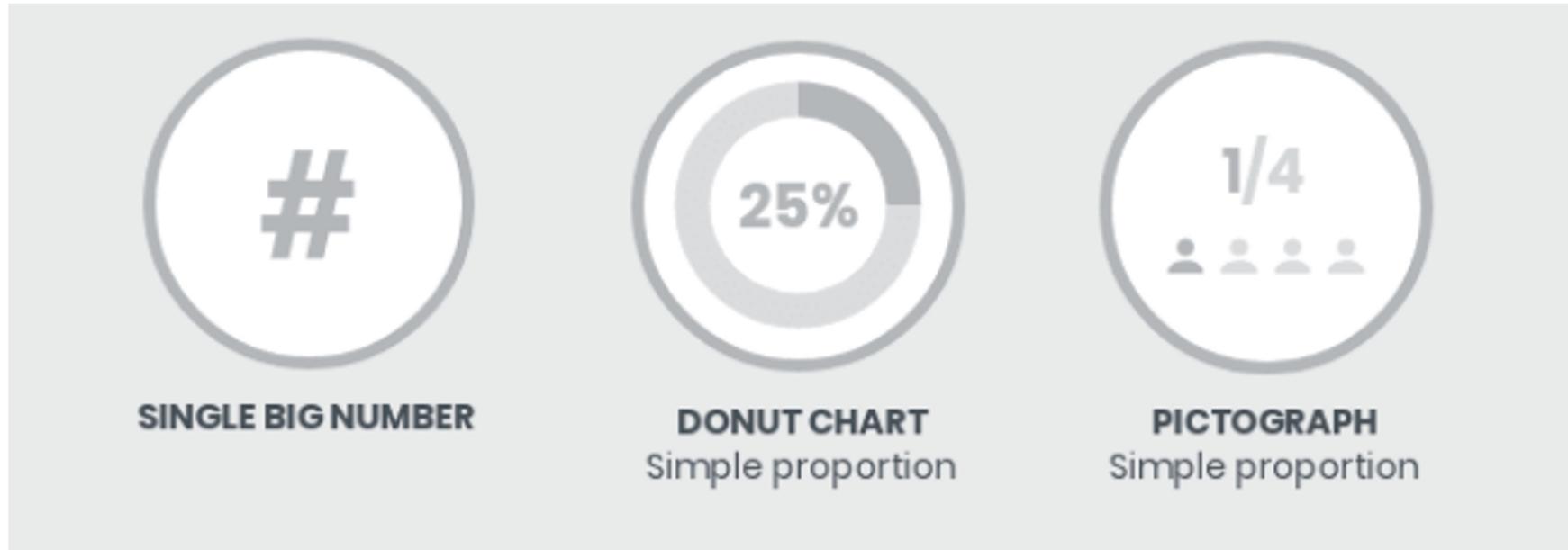
1. If you are trying to inform, use...

SINGLE BIG NUMBER

DONUT CHART
Simple proportion

PICTOGRAPH
Simple proportion

These convey data points very clearly!

AIRBORN ILLNESS'S
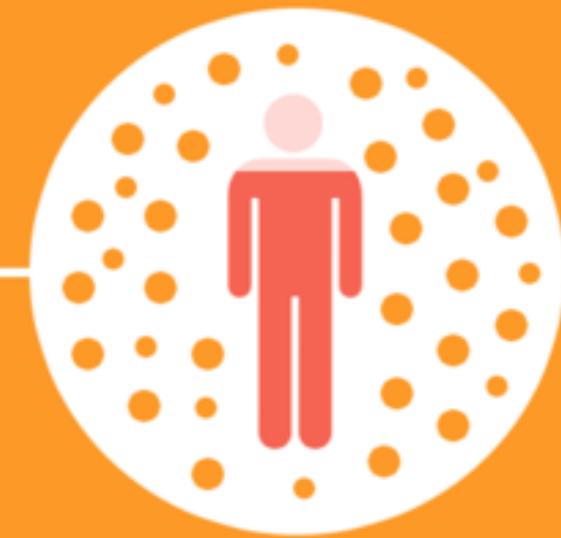
25%

of people have an efficient immune system to fight off a **few airborne pathogens.**

50%

of people have an efficient immune system to fight off a **many airborne pathogens.**
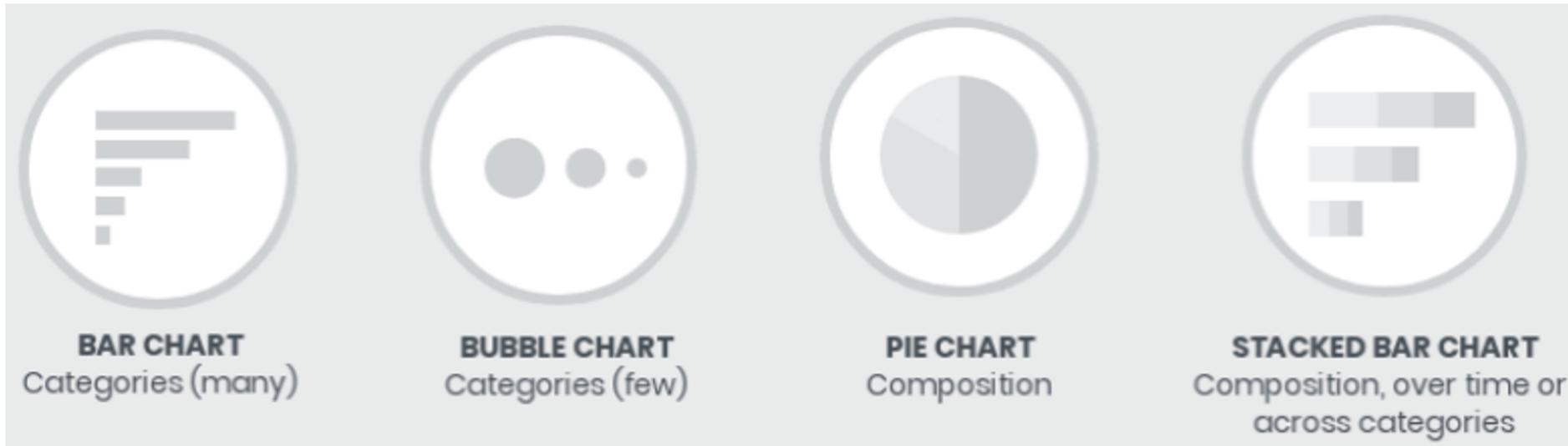
75%

of people have an efficient immune system to fight off a **most airborne pathogens.**

2. If you are trying to compare, use...

BAR CHART
Categories (many)

BUBBLE CHART
Categories (few)

PIE CHART
Composition

STACKED BAR CHART
Composition, over time or across categories
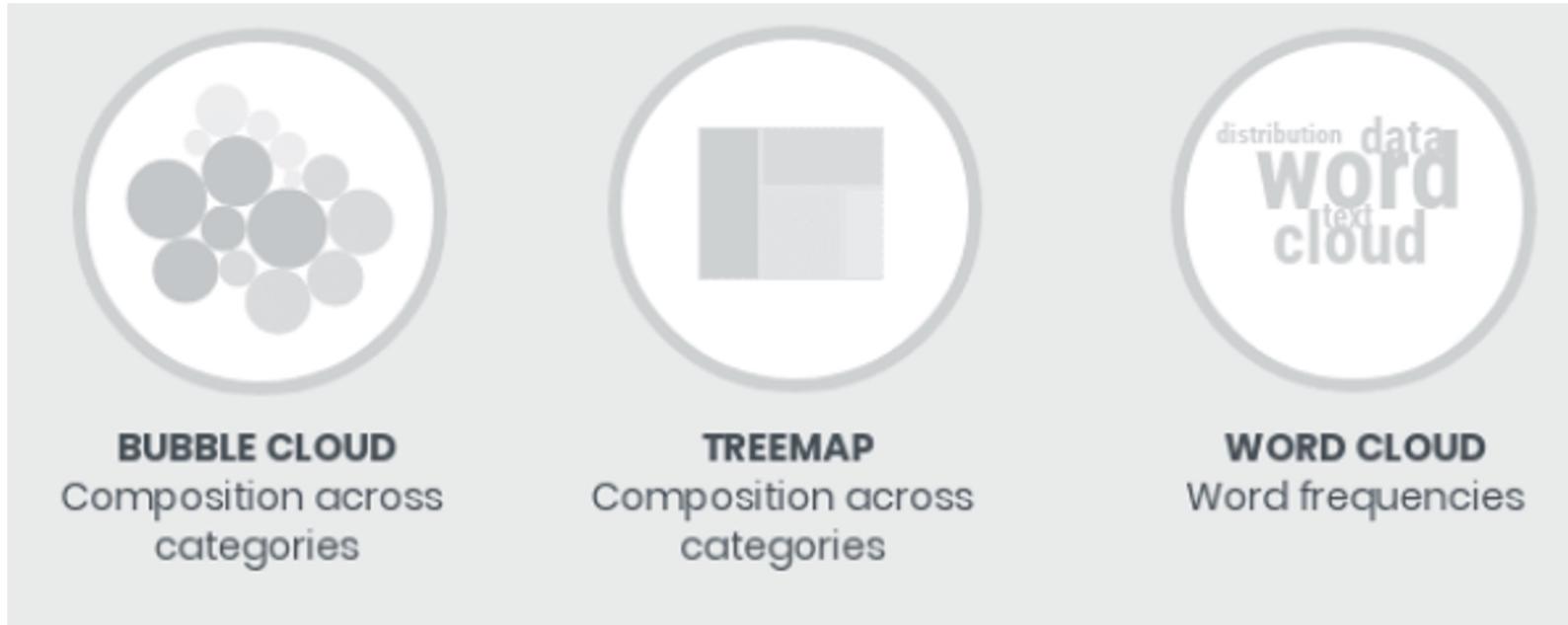
To help you compare categories or show composition

2. If you are trying to compare, use...

BUBBLE CLOUD
Composition across
categories

TREEMAP
Composition across
categories

WORD CLOUD
Word frequencies
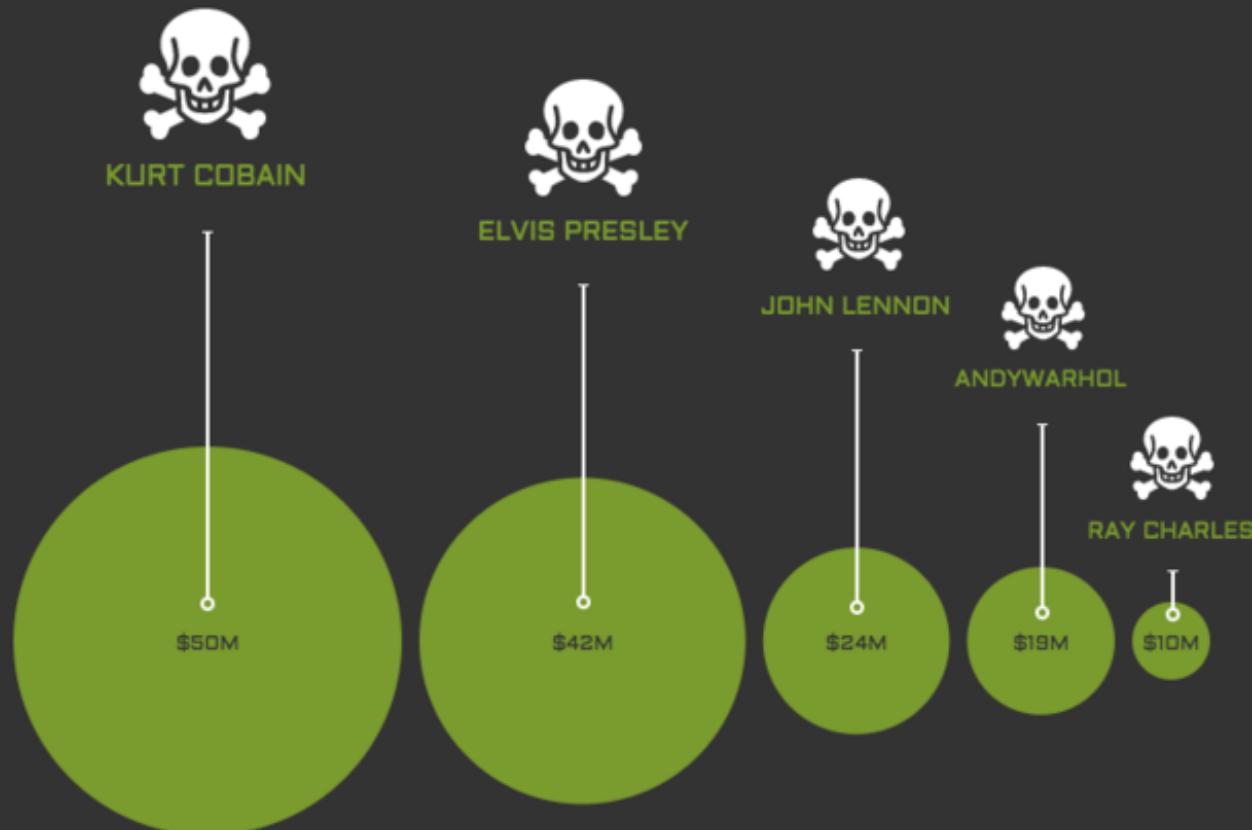
To help you compare categories or show composition
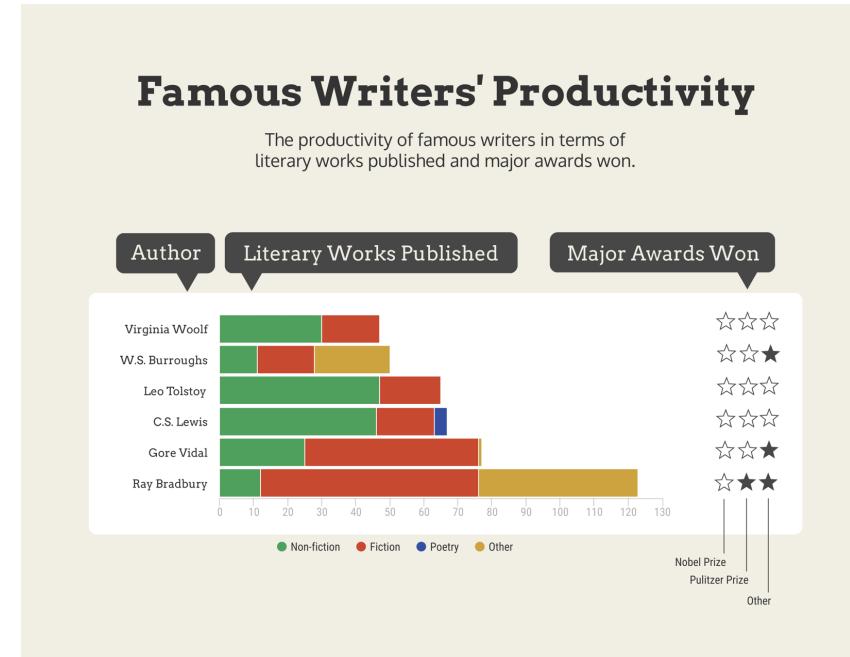
Source: Venngage.com

Comparing multiple values
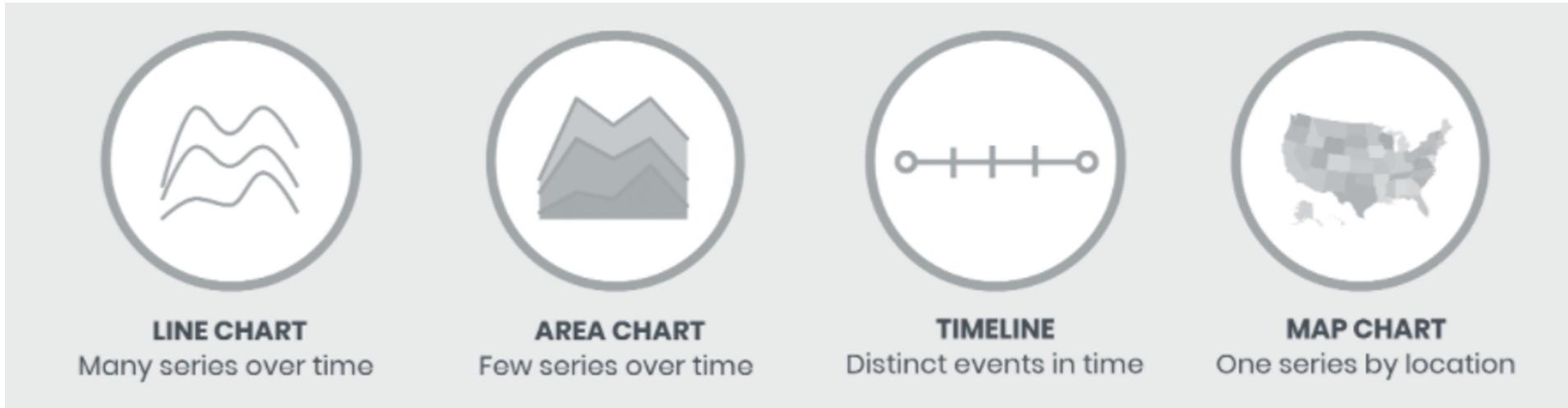
- Bar charts are the best!

- You might need more than one bar charts if too many relationships

3. If you are trying to show change, use...

LINE CHART
Many series over time

AREA CHART
Few series over time

TIMELINE
Distinct events in time

MAP CHART
One series by location

To help you show change over time or by location

Use a map series to show changes in location data over time

Market Segmentation Report
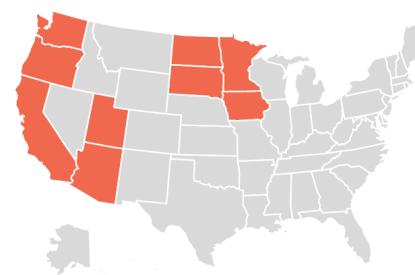
Geographic Analysis

From 2015 to 2017, we saw dramatic growth of our customer base across the **Midwest** and the **West Coast** of the United States. Our 2018 goal is to target the **Eastern Seaboard**, including New York, Florida, and North Carolina.
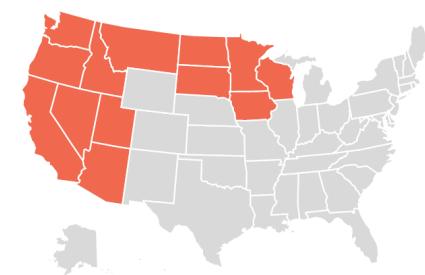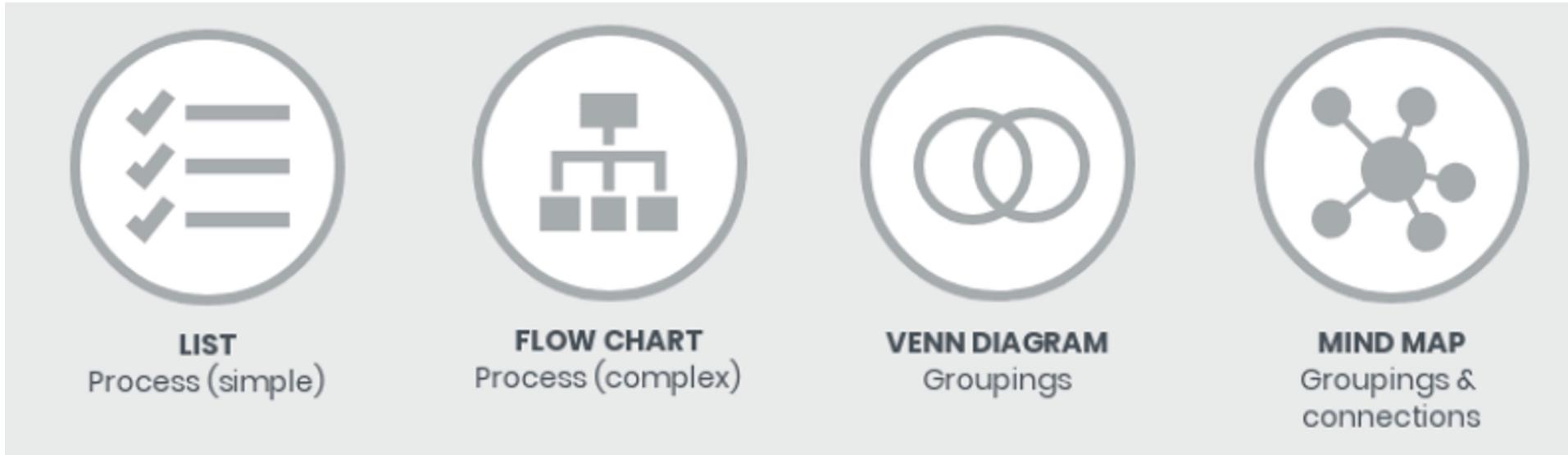
2015 **2016** **2017**

4. If you are trying to organise info, use...

LIST
Process (simple)

FLOW CHART
Process (complex)

VENN DIAGRAM
Groupings

MIND MAP
Groupings & connections

To help you show groupings, rankings or processes

5. If you are trying to show relationships, use...

SCATTER PLOT
Relationship between two continuous variables

HISTOGRAM
Distribution of one variable

MULTI-SERIES CHART
Relationship between multiple series over time

To help you reveal relationships like correlations or distributions

Where to get inspiration from?

- https://informationisbeautiful.net/
- https://looker.com/blog/different-types-graphs-charts-uses
- http://selection.datavisualization.ch/
- https://infovis-wiki.net/wiki/Main_Page

A journey from Data to insights

01	02	03	04	05
Ask	Explore	Analyse & Understand	Communicate	Make informed decisions

University of Suffolk

A journey from Data to insights

01	02	03	04	05
Ask	Explore	Analyse & Understand	Communicate	Make informed decisions

University of Suffolk

Q & A session

Resources

University
of Suffolk

Try it yourself!

- Designing your Data strategy? Use the ODiTT Data Strategy worksheet to help you get started: https://bit.ly/ODiTT-DataStrategy

- Planning your data audit? Use this worksheet instead: https://bit.ly/ODiTT-DataAudit

University of Suffolk

Additional Material & Resources

- Example of a GDPR data audit exercise:
  - https://ico.org.uk/media/2615577/parish-councils-data-audit-exercise.pdf
- SAS White paper:
  - https://www.sas.com/content/dam/SAS/en_us/doc/whitepaper1/5-essential-components-of-data-strategy-108109.pdf
- HESA data strategy:
  - https://www.hesa.ac.uk/support/tools/data-capability/signposting/strategy
- Creating an enterprise data strategy:
  - http://docs.media.bitpipe.com/io_10x/io_100166/item_417254/Creating%20an%20Enterprise%20Data%20Strategy_final.pdf
- Building a global data strategy
  - https://globaldatastrategy.files.wordpress.com/2015/08/success_stories_global_data_strategy_burbank_enterprisedataversity_2015.pdf
- What's your Data Strategy?
  - https://hbr.org/2017/05/whats-your-data-strategy

University of Suffolk

University
of Suffolk