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Research methods I

Master thesis seminar

12.11.2024

Content

1. **Research principles**
2. **Critically reviewing the literature**
3. **Data – information - knowledge**
4. **Using secondary data**
5. **Collecting primary data**

1

Research principles

Research

- Research is about **systematically obtaining** and **analysing data** to **increase a knowledge** about a topic in which we are interested. In undertaking research, we are trying to **answer a question** or **address a problem**, this often being referred to as ‘meeting the research aim’ or ‘addressing the research objectives’.

Rojon a Saunders, 2012

Data = evidence

No fortune telling

No philosophical views

You cannot solve a problem if there isn’t one!

You cannot overcome a challenge if there isn’t one!

Ask yourself: What business or society problem or challenge are you addressing in your master's thesis?

Be specific!

Problem or challenge

- Defines a clear direction for the study, avoiding vague or overly broad topics.
- Demonstrates the ability to address real-world business challenges, increasing the practical relevance of the research.
- Makes it easier for supervisors and evaluators to assess the thesis based on the problem's importance and the effectiveness of the proposed solution.
- Helps in developing research question and selecting appropriate methods and data collection techniques tailored to solving the specific problem.
- The problem acts as a central reference point for structuring the analysis and discussion in the thesis.

Problem or challenge in various thesis types

- **Applied Thesis:** Focuses on solving practical problems within a company or industry.
- **Academic/Research Thesis:** Emphasizes theory-building or hypothesis testing based on data analysis.
- **Entrepreneurial Thesis:** Involves developing a business plan, strategic plan, or new product/service concept.

All of these types has the same general structure – introduction, theoretical and practical part, recommendations and conclusions. Consult details of the thesis outline with your supervisor.

Applied thesis

- An applied thesis focuses on solving a practical, real-world business problem, often for a specific organization or industry.
- Purpose is to provide actionable solutions or recommendations based on research findings.
- Examples:
  - Developing a digital marketing strategy for a local company.
  - Improving operational efficiency in a manufacturing firm.
  - Optimizing the investment portfolio for a mid-sized asset management firm.
  - Designing and/or developing enterprise information system or software application.
- Key Elements:
  - Problem identification and background analysis.
  - Data collection (often involving company-specific data).
  - Practical recommendations or implementation plan.

Academic/Research Thesis:

- This type of thesis aims to contribute to academic knowledge by exploring theories, testing hypotheses, or building new frameworks.
- Purpose is to advance our understanding within a specific area of business and management.
- Examples:
  - Testing the relationship between employee engagement and productivity in IT sector.
  - Examining the effects of corporate social responsibility on brand perception.
  - The Impact of Corporate Governance on Firm Performance: An Empirical Analysis of European Listed Companies
- Key Elements:
  - Literature review about what is already known.
  - Rigorous data analysis (quantitative or qualitative).
  - Theory development or validation.

Entrepreneurial Thesis

- An entrepreneurial thesis focuses on developing a business idea or venture, often involving the creation of a detailed business plan or feasibility study for a new product, service, or start-up company.
- Purpose is to apply entrepreneurial theories and frameworks to create a viable business concept, demonstrating market understanding and strategic planning skills.
- Examples:
  - Business plan for a tech start-up specializing in AI-driven customer service.
  - Developing a feasibility study for a sustainable e-commerce platform targeting eco-conscious consumers.
  - Designing a go-to-market strategy for a new mobile app targeting health.
- Key Elements:
  - Market Research, Value Proposition, Business Model, Financial Plan, Implementation Plan, etc.

Research question

- It is a central theme of any research.
- Every aspect of research must aim to answer it.
- It determines the research strategy not the other way around!
- It goes beyond the horizon of identifying the subject and object of research.
- You can find explanation and examples here: https://www.youtube.com/watch?v=42-d2HdbyS8

Research question examples

- **What?**
  - What makes our employees leave for our competitors?
- **When?**
  - When is the optimal time for firms to engage in mergers and acquisitions within the banking sector?
- **Where?**
  - Where in the software development lifecycle can AI tools be integrated to achieve the highest productivity gains?

Research question examples

- **Who?**
  - Who are the most influential opinion leaders in shaping consumer preferences for sustainable products?
- **How?**
  - How can a start-up leverage crowdfunding to finance its product launch?
- **Why?**
  - Why do companies outsource marketing research?

If you have a question, you can start searching for answers.

First step in master thesis is to look into literature.

2

Critically reviewing the literature

Literature review is part of every thesis

Literature review main purpose

- To discover explicit recommendations for further research. These can provide you with a superb justification for your own research question(s) and objectives;
- to help you to avoid simply **repeating work** that has been done already;
- to discover and provide an insight into research **approaches, strategies and techniques** that may be appropriate to your own research question(s) and objectives.

Saunders et al., 2009. Research methods for business students

Literature review specific purpose

- Applied Thesis:
- Provides a **theoretical foundation** for understanding the business problem being addressed.
- Helps identify **best practices**, frameworks, and solutions previously applied in similar contexts.
- Supports the development of a **baseline analysis** of the industry or company situation, guiding the methodology and practical recommendations.
- Serves as a **"cookbook" for writing the practical part**, offering a step-by-step guide on how to structure the analysis, choose methods, and apply theoretical concepts effectively.

Literature review specific purpose

- Academic/Research Thesis:

- Establishes the **theoretical background** and existing body of knowledge related to the research topic.
- Helps in identifying **key theories, models, and hypotheses** that will be tested or expanded upon in the thesis.
- Reviews existing **empirical studies**, providing a foundation for the research questions and the formulation of hypotheses.
- Identifies **gaps in the literature**, highlighting areas where further research is needed and justifying the study's relevance.
- Guides the **choice of research methodology** and data analysis techniques by reviewing standard approaches used in similar studies.

Literature review specific purpose

- Entrepreneurial Thesis:
- Reviews **theoretical frameworks** related to entrepreneurship, innovation, and business planning, which can be used to structure the business model.
- Identifies **successful strategies and pitfalls** from previous start-up ventures, offering lessons learned for the new business concept.
- Serves as a **"cookbook" for writing the practical part**, offering a step-by-step guide on how to structure the analysis, choose methods, and apply theoretical concepts effectively.

What is to be critical

- To criticize normally means something negative:
  - The flood situation is critical
  - Critically endangered antelope species
  - The patient's condition is critical
  - Diplomats criticize Obama's actions
- All science is built on the ability of people (peer reviewers) to critically evaluate other people‘s work.

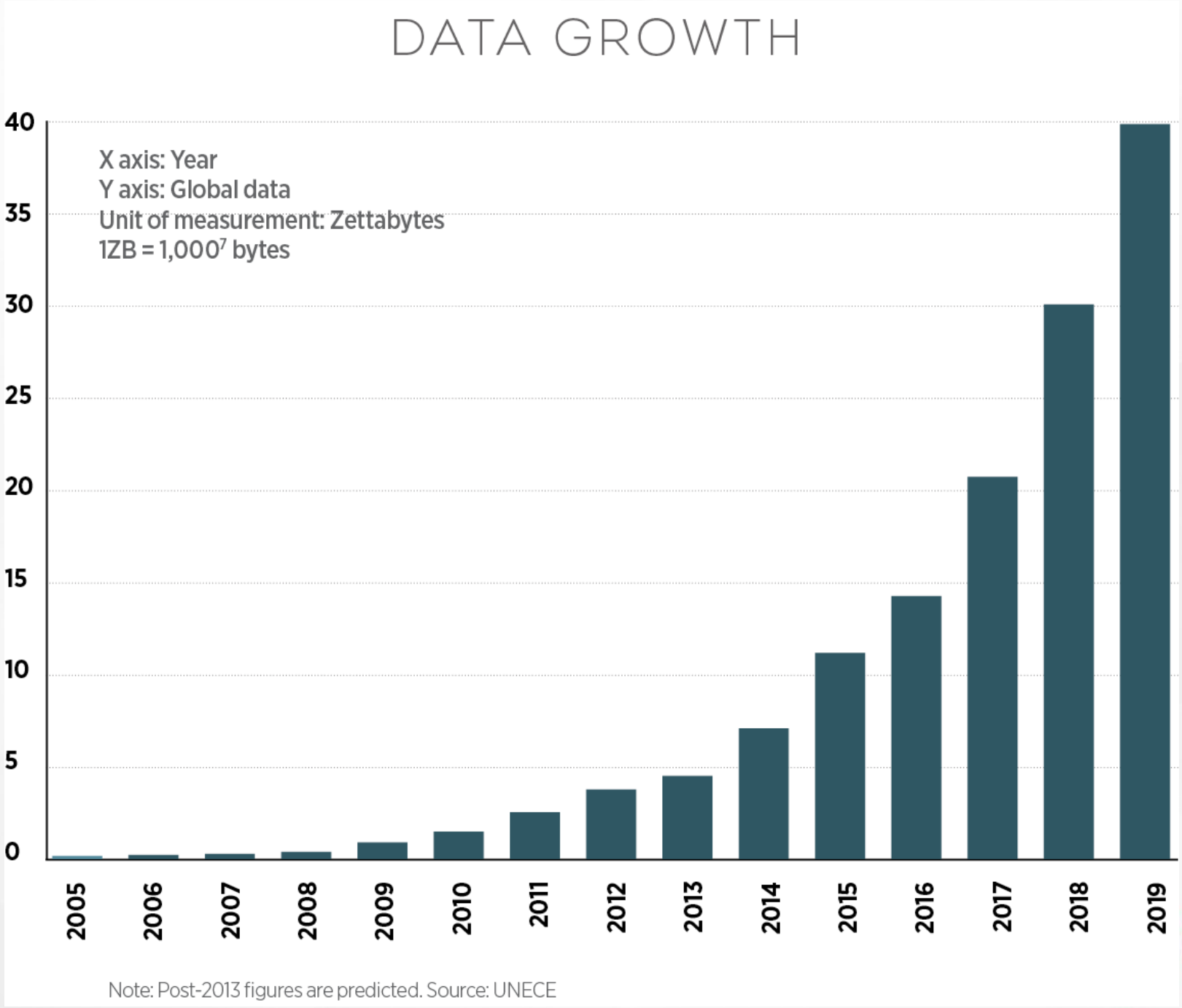
What is to be critical

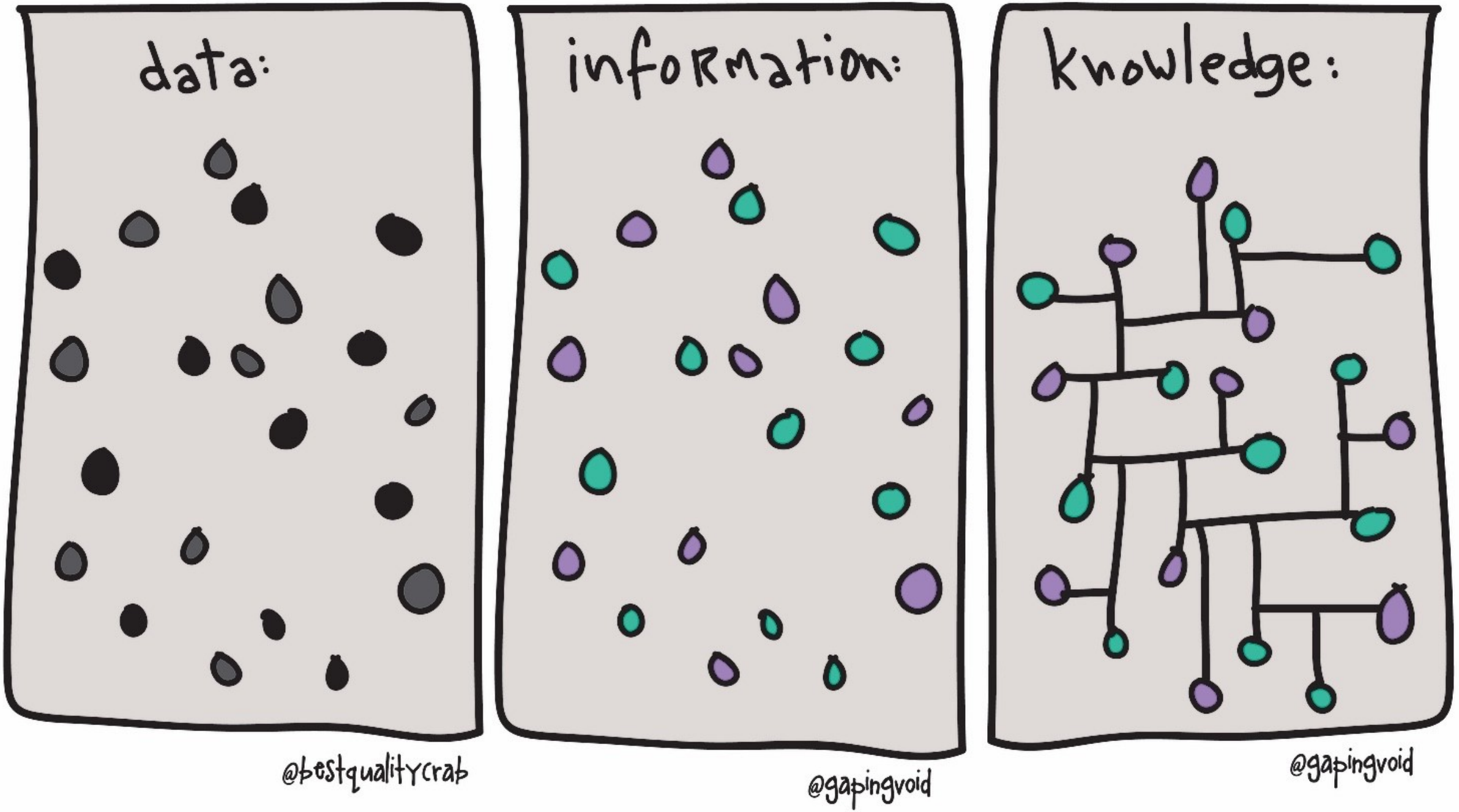
- Ability to assess the validity and strength of arguments
- Ability not to take information as automatically true and valid
- Ability to see the wider context
- Ability to critique using counter-arguments and provide effective feedback
- Ability to critically evaluate one's own work

3

Data – information - knowledge

Data, information , knowledge




data:
information:
knowledge:
@bestqualitycrab
@gapingvoid
@gapingvoid

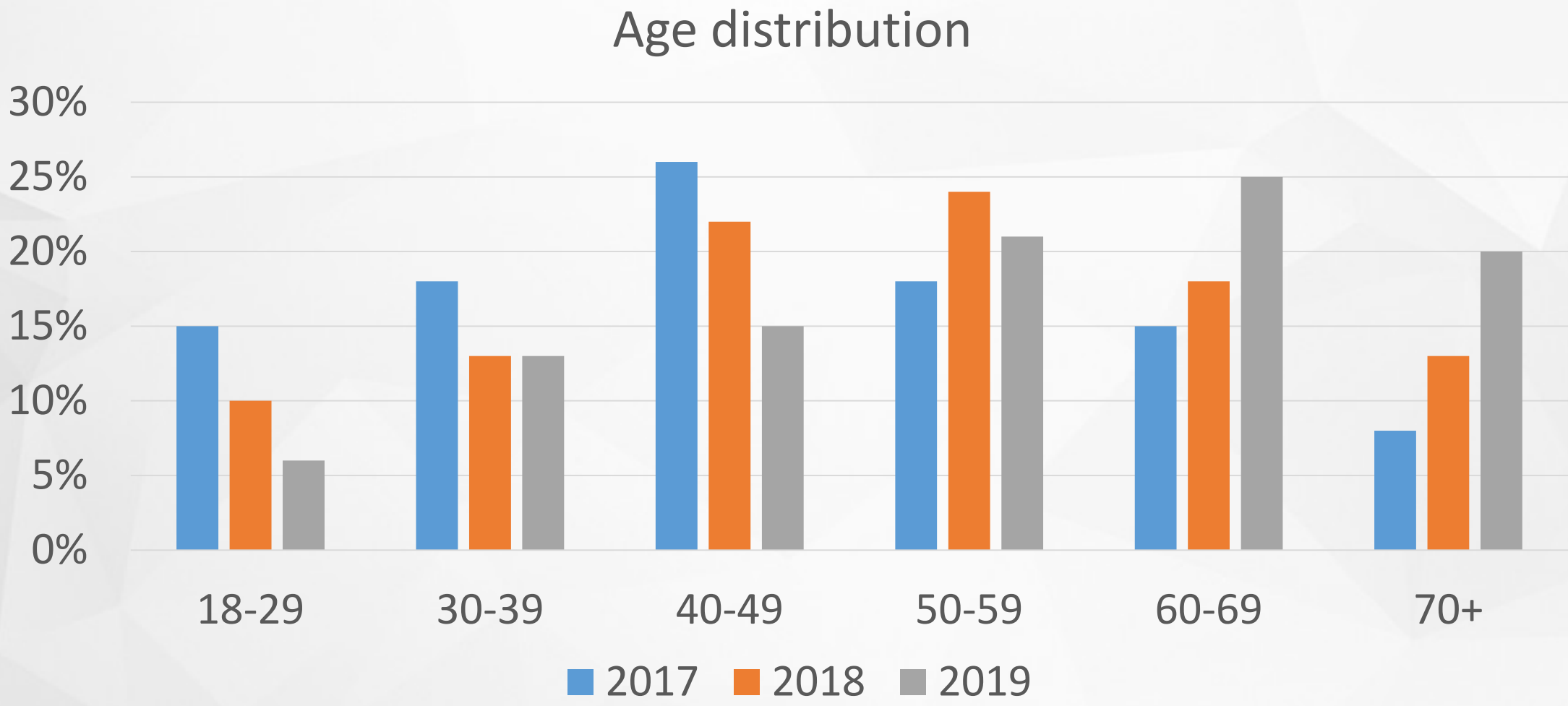
Data and information differences

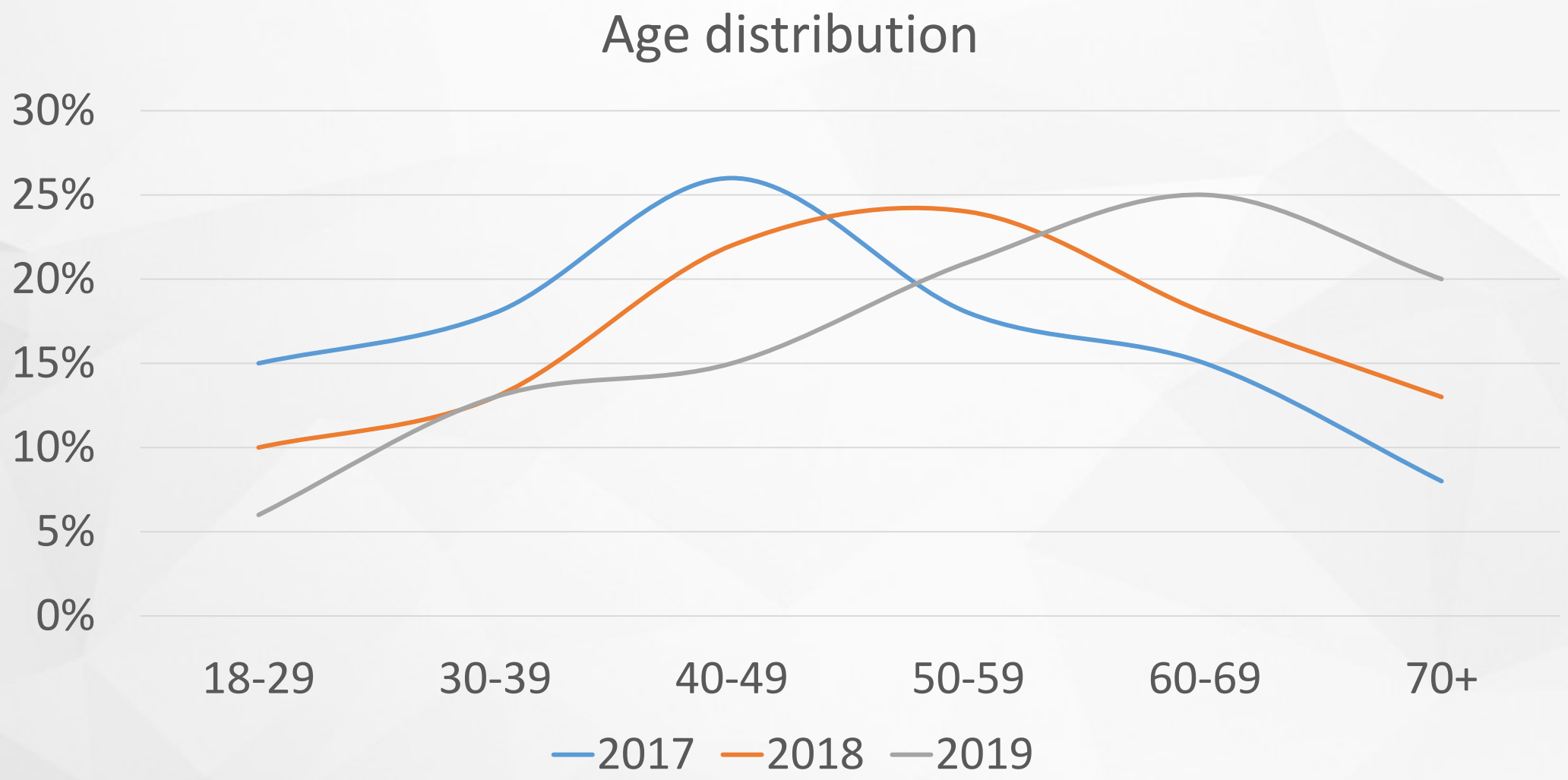
- **Data** is the most basic form of knowledge, e.g. the brand of butter sold to a particular customer in a certain town. This statistic is of little worth in itself but may become meaningful when combined with other data.
- **Information** is a combination of data that provide decision-relevant knowledge, e.g. the brand preferences of customers in a certain age category in a particular geographic region.

	A	B	C	D	E	F	G	H	I
1									
2		2017			2018			2019	
3	Age	Gender	Cash spend	Age	Gender	Cash spend	Age	Gender	Cash spend
4	26	Man	125,00 €	56	Man	22,00 €	25	Women	125,00 €
5	28	Women	25,00 €	55	Women	13,00 €	55	Women	25,00 €
6	59	Women	122,00 €	19	Man	85,00 €	18	Women	122,00 €
7	64	Women	12,00 €	44	Women	12,00 €	45	Women	12,00 €
8	22	Man	54,00 €	25	Man	54,00 €	22	Man	54,00 €
9	56	Man	35,00 €	36	Man	22,00 €	35	Man	35,00 €
10	55	Women	12,00 €	35	Women	56,00 €	48	Women	12,00 €
11	18	Man	25,00 €	35	Man	55,00 €	71	Man	25,00 €
12	45	Women	15,00 €	37	Women	18,00 €	45	Man	15,00 €
13	25	Man	10,00 €	48	Man	25,00 €	25	Women	10,00 €
14	36	Women	25,00 €	27	Women	25,00 €	36	Man	25,00 €
15	38	Man	38,00 €	55	Man	38,00 €	41	Man	38,00 €
16	34	Man	12,00 €	68	Man	35,00 €	34	Man	12,00 €
20	19	Women	28,00 €	48	Man	25,00 €	33	Women	28,00 €

Can we make decision based on these customer data?

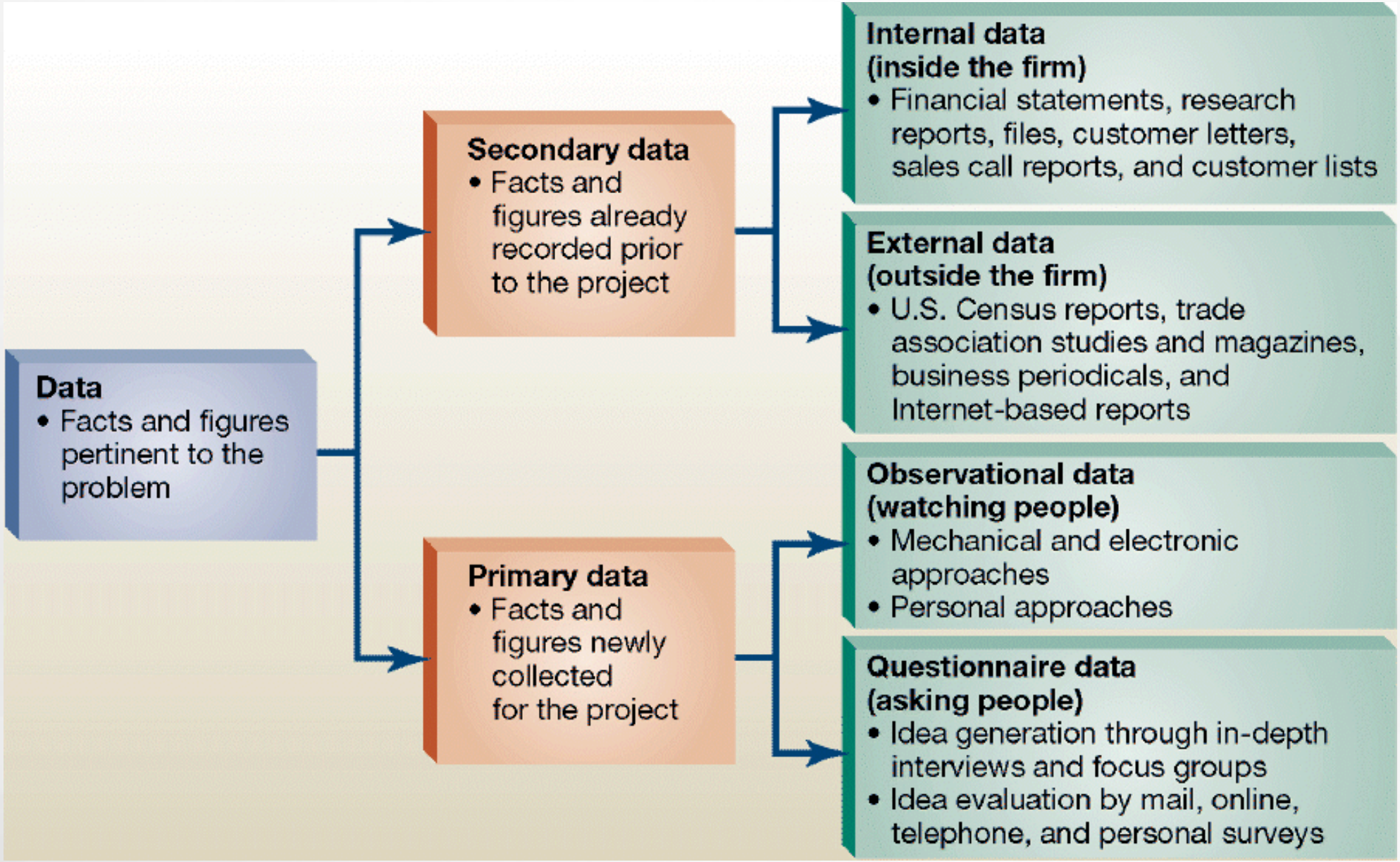
Age	2017	2018	2019
18-29	15%	10%	6%
30-39	18%	13%	13%
40-49	26%	22%	15%
50-59	18%	24%	21%
60-69	15%	18%	25%
70+	8%	13%	20%


Age distribution
30%
25%
20%
15%
10%
5%
0%
18-29
30-39
40-49
50-59
60-69
70+
2017
2018
2019


Age distribution
30%
25%
20%
15%
10%
5%
0%
18-29
30-39
40-49
50-59
60-69
70+
2017
2018
2019

Research data types

- Primary data
  - Do not exist at the beginning of the research project
  - Data collected throughout the project
- Secondary data
  - Data already existing
  - Reports, statistical data, business data, reused data, analytical data.


Data
• Facts and figures pertinent to the problem
Secondary data
• Facts and figures already recorded prior to the project
Primary data
• Facts and figures newly collected for the project
Internal data (inside the firm)
• Financial statements, research reports, files, customer letters, sales call reports, and customer lists
External data (outside the firm)
• U.S. Census reports, trade association studies and magazines, business periodicals, and Internet-based reports
Observational data (watching people)
• Mechanical and electronic approaches
• Personal approaches
Questionnaire data (asking people)
• Idea generation through in-depth interviews and focus groups
• Idea evaluation by mail, online, telephone, and personal surveys

WHAT'S THE DIFFERENCE BETWEEN QUANTITATIVE AND QUALITATIVE DATA?

Quantitative Data

- Countable or measurable, relating to numbers.
- Tells us how many, how much, or how often.
- Fixed and universal, "factual."
- Gathered by measuring and counting things.
- Analyzed using statistical analysis.

Qualitative Data

- Descriptive, relating to words and language.
- Describes certain attributes, and helps us to understand the "why" or "how" behind certain behaviors.
- Dynamic and subjective, open to interpretation.
- Gathered through observations and interviews.
- Analyzed by grouping the data into meaningful themes or categories.

4

Using secondary data

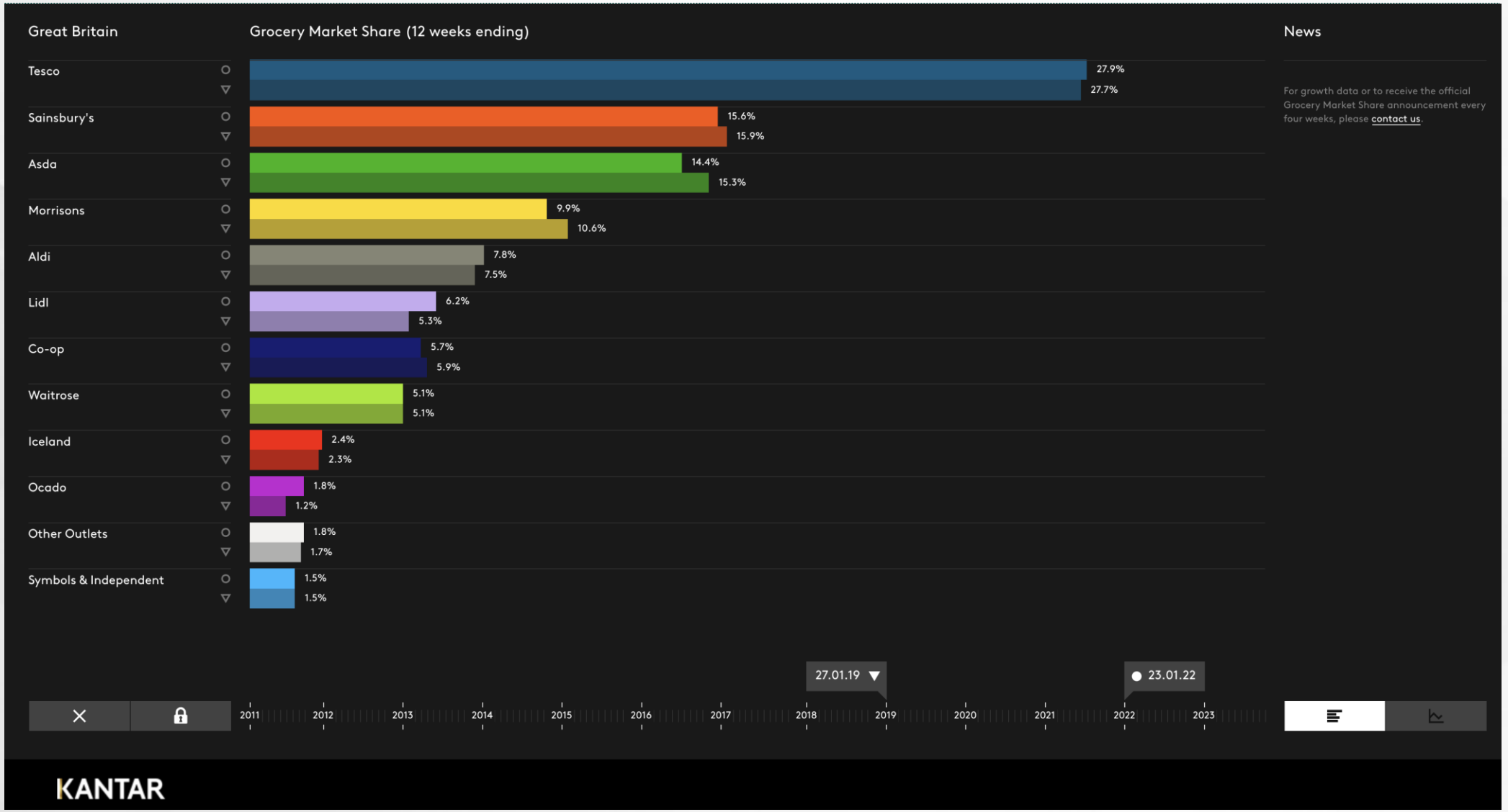
Big data
Téma

+ Porovnání

Celosvětově | 2004–současnost | Všechny kategorie | Vyhledávání na webu

Zájem v průběhu času

https://www.kantarworldpanel.com/



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https://www.ons.gov.uk/employmentandlabourmarket/peopleinwork/earningsandworkinghours/bulletins/lowandhighpayuk/2022

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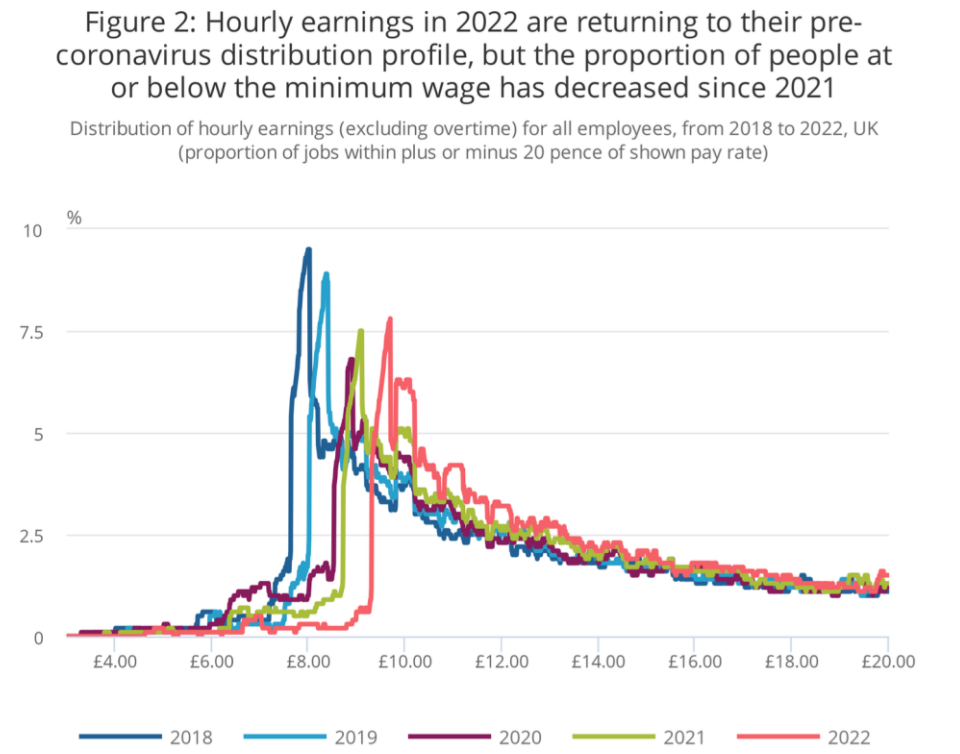
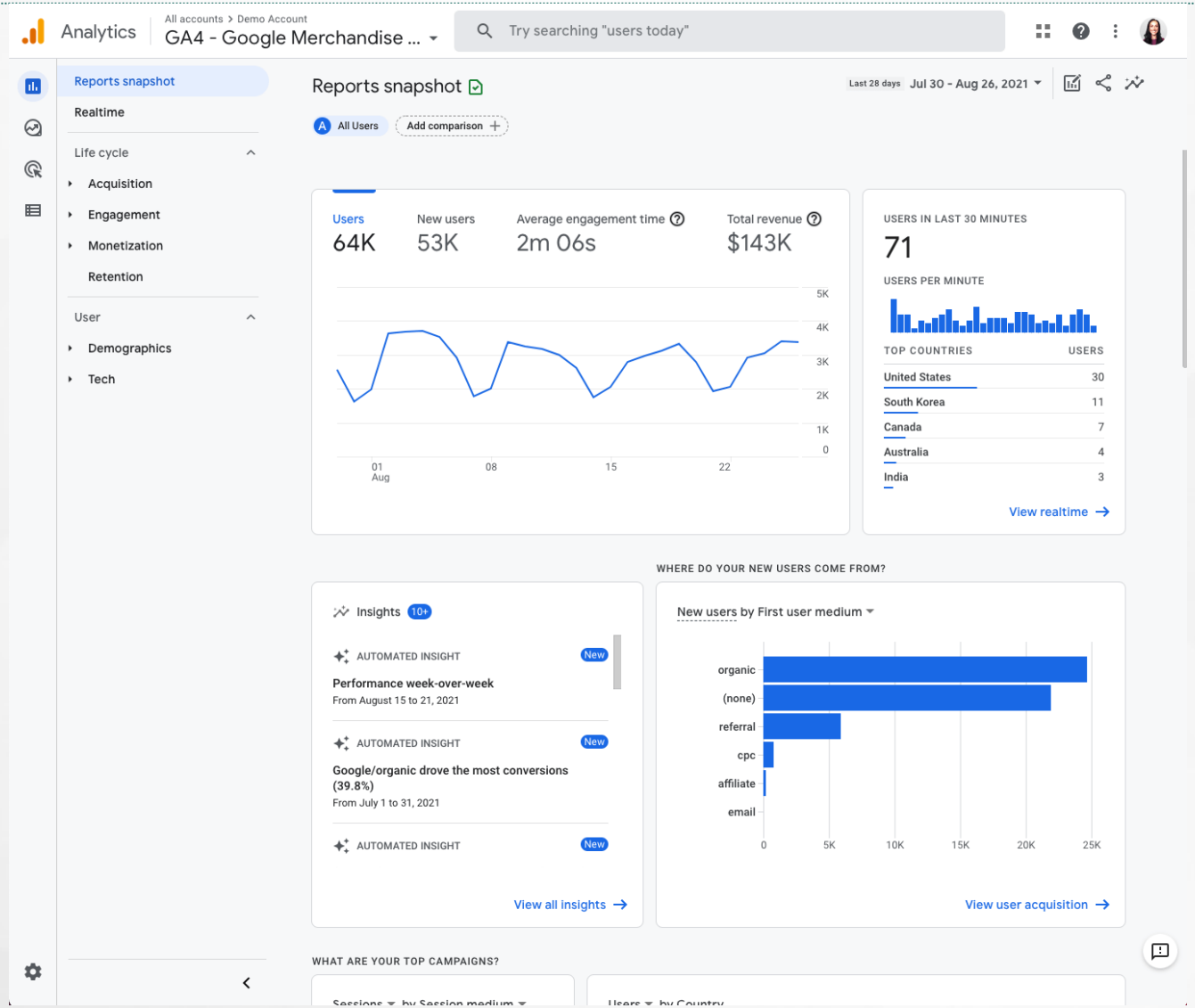
4 . Distribution of pay

Figure 2: Hourly earnings in 2022 are returning to their pre-coronavirus distribution profile, but the proportion of people at or below the minimum wage has decreased since 2021

Distribution of hourly earnings (excluding overtime) for all employees, from 2018 to 2022, UK (proportion of jobs within plus or minus 20 pence of shown pay rate)



Source: Office for National Statistics – Annual Survey of Hours and Earnings (ASHE)


Analytics
All accounts > Demo Account
GA4 - Google Merchandise ...
Try searching "users today"
Reports snapshot
Realtime
Life cycle
Acquisition
Engagement
Monetization
Retention
User
Demographics
Tech
Reports snapshot
Last 28 days Jul 30 - Aug 26, 2021
All Users
Add comparison
Users 64K
New users 53K
Average engagement time 2m 06s
Total revenue $143K
5K
4K
3K
2K
1K
0
01 Aug
08
15
22
USERS IN LAST 30 MINUTES
71
USERS PER MINUTE
TOP COUNTRIES USERS
United States 30
South Korea 11
Canada 7
Australia 4
India 3
View realtime
WHERE DO YOUR NEW USERS COME FROM?
Insights 10+
AUTOMATED INSIGHT New
Performance week-over-week
From August 15 to 21, 2021
AUTOMATED INSIGHT New
Google/organic drove the most conversions (39.8%)
From July 1 to 31, 2021
AUTOMATED INSIGHT New
View all insights
New users by First user medium
organic
(none)
referral
cpc
affiliate
email
0
5K
10K
15K
20K
25K
View user acquisition
WHAT ARE YOUR TOP CAMPAIGNS?
Sessions by Session medium
Users by Country

starbucks 4w
Message received. ✨ Caramel Ribbon Crunch Frappuccino® Drink.

carl33nn 3w
best drink ,my to-go😊
1 like Reply

starbucks 3w
Thanks for sipping with us!
1 like Reply

chiaraparadis_ 4w
Always love those caramel ribbons!! A shot of goodness...
1 like Reply

starbucks 4w
@chiaraparadis_ Cheers to sticky-sweet goodness in every cup!
2 likes Reply

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Advantages of secondary data

- **Cost and Time Efficiency:**
- Secondary data is typically less costly and quicker to obtain than primary data. Since it's already collected and often readily accessible, researchers can save significant resources in terms of both time and money.

Advantages of secondary data

- **Broad Scope and Variety:**
- Secondary data can provide a broad perspective that primary data might not be able to offer. It often includes a wide range of information collected for various purposes that can be useful for comprehensive research.

Advantages of secondary data

- **Longitudinal Analysis:**
- It enables researchers to conduct longitudinal studies, examining trends and developments over time, which would be resource-intensive or impossible to do using primary data.

Advantages of secondary data

- **Comparative Studies and Benchmarking:**
- Secondary data allows for comparisons across different studies, sectors, or countries. It can be used for benchmarking against industry standards or competitors.

Advantages of secondary data

- **Feasibility and Preliminary Insights:** It helps in assessing the feasibility of research projects. Researchers can use secondary data to gain preliminary insights into a topic, which can guide the design and approach of primary research.
- **Supporting Primary Data:** Secondary data can complement and reinforce findings from primary research, adding depth and context to the analysis.

Disadvantages of secondary data

- **Relevance Issues:** The data may not be entirely relevant to the current research objectives or questions, as it was collected for a different purpose.
- **Quality and Accuracy Concerns:** The accuracy and reliability of secondary data can be questionable, especially if the sources are not credible or the data collection methods were flawed.
- **Outdated Information:** Secondary data might be outdated, making it less useful for current studies, particularly in fast-changing fields.

“Data collection methods were flawed…”

- How do you know?
- How can you critically evaluate secondary data?

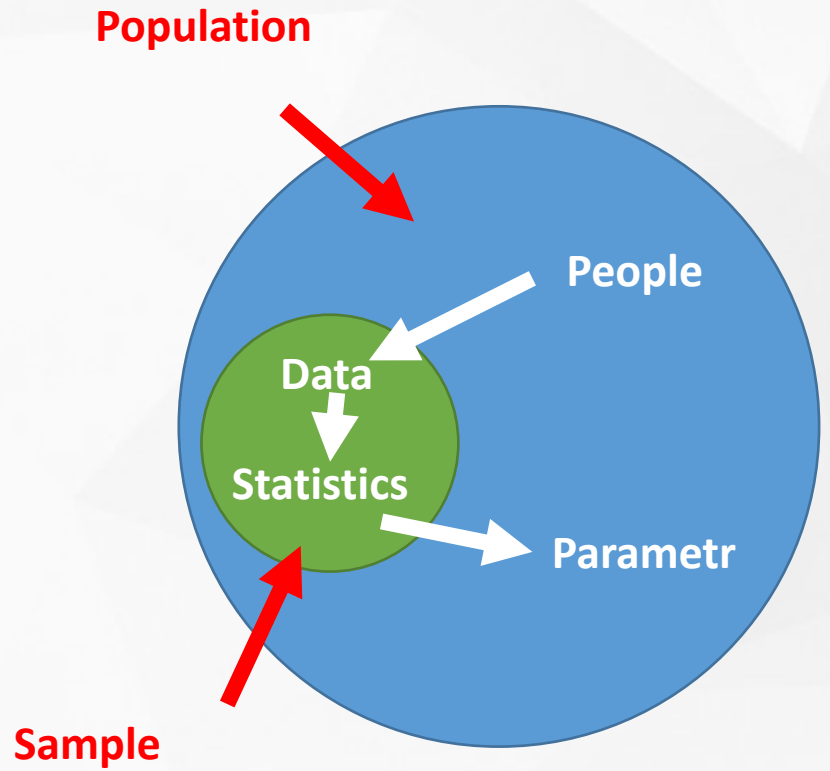
- By understanding the methods of primary data collection.

5

Collecting primary data

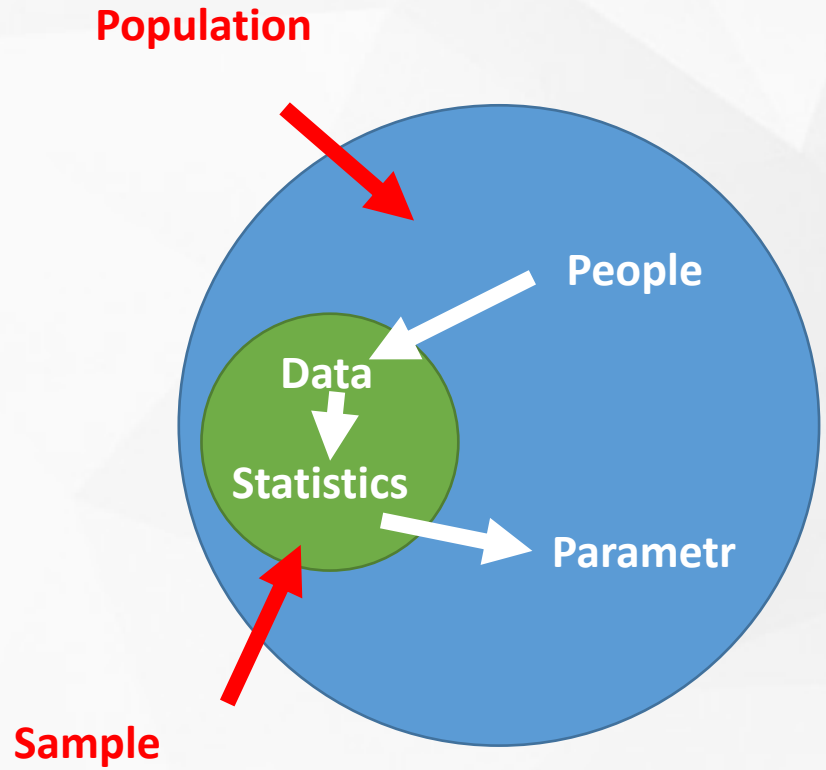
Sample and sample size

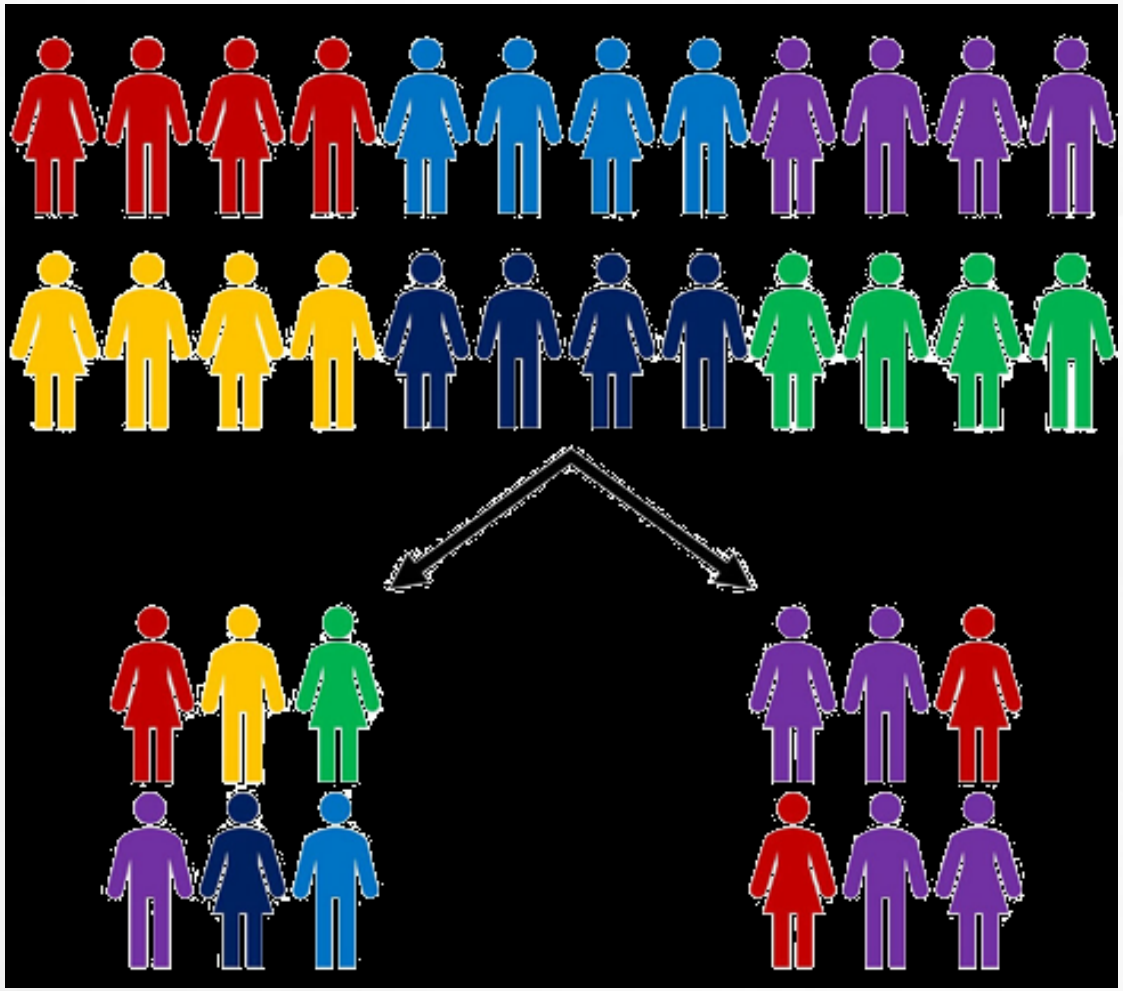
- Sample is a part of population which, when collected properly, can produce results which are generalizable.
- Greater the sample size more reliable the results are.
- Reality = Parametr + Error



Sample and sample size

- Two questions we need to adress:
  - Who?
  - How much?





Minimum sample size

Calculator.net FINANCIAL FITNESS & HEALTH

home / math / sample size calculator

Sample Size Calculator

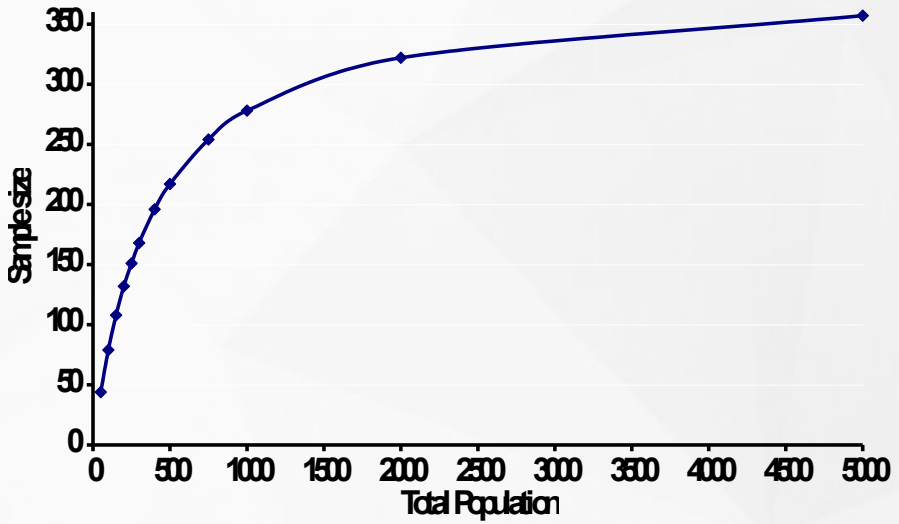
Modify the values and click the Calculate button to use

Find Out The Sample Size

This calculator computes the minimum number of necessary samples to meet the desired statistical constraints.

Confidence Level:	95%	
Margin of Error:	5 %	
Population Proportion:	50 %	Use 50% if not sure
Population Size:		Leave blank if unlimited population size.

Calculate Clear



Favourite colour example

- In a class, teacher ask students what is their favourite colour.
- The realtime results goes like this:

Respondent	Answer	Results PINK in %	Results GREEN in %	Change
1	Pink	100	0	No data
2	Green	50	50	50%
3	Green	33,5	66,5	16,5%
4	Pink	50	50	16,5%
5	Green	40	60	10%
6	Green	33,5	66,5	6,5%
7	Green	28	72	5,5%
8	Pink	37	63	9%
9	Pink	44	56	7%
10	Pink	50	50	6%

Sample size in qualitative studies

- The data collection takes place as long as there is no condition in which further examination of the selected sample does not bring new substantial information.
- **Theoretical saturation**
- The goal of qualitative research is not generalization, so it is not the aim of the results to relate to the whole population but to reveal the connections and causes of a certain behavior of customers.

Primary data collection methods

- Survey
  - Interview
  - Questionnaire
- Observation
- Experiment

Data collection techniques - qualitative

- Deep interviews
- Focus group discussions
- Expert consultations
- Observation

Data collection techniques - quantitative

- Face to face interviews
- Telephone interviews
- Postal survey
- Electronic survey
- Observation
- Experiment

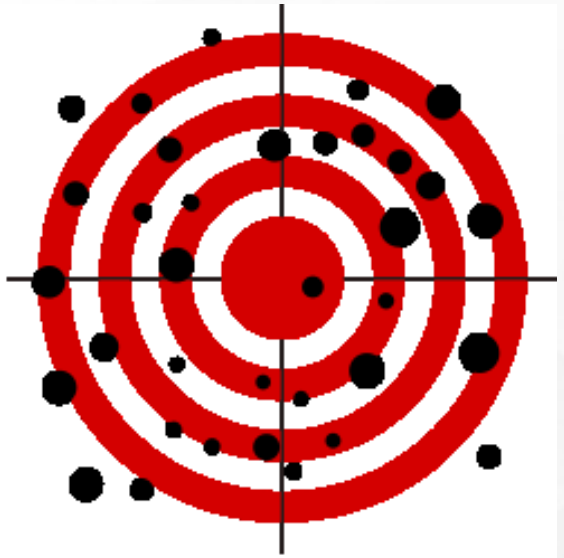
Validity

- Valid questions are those that give us answers exactly what we ask - what is the main goal of research.

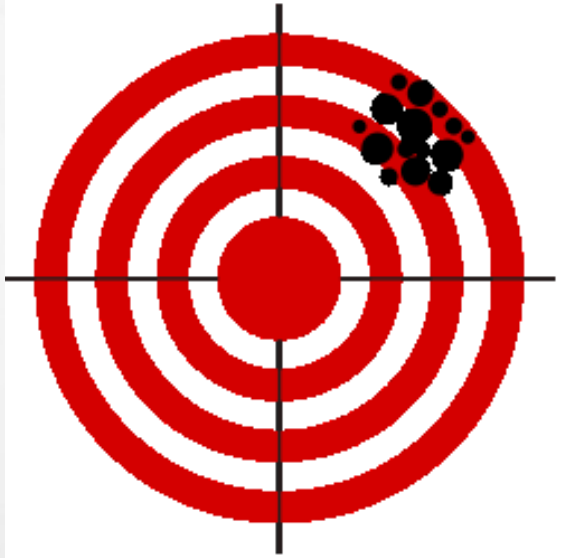
Reliability

- It expresses the degree of sustainability of research tools.
- To what extent the question remains reliable and still valid in further iterations - for example, in other time, social and cultural conditions.

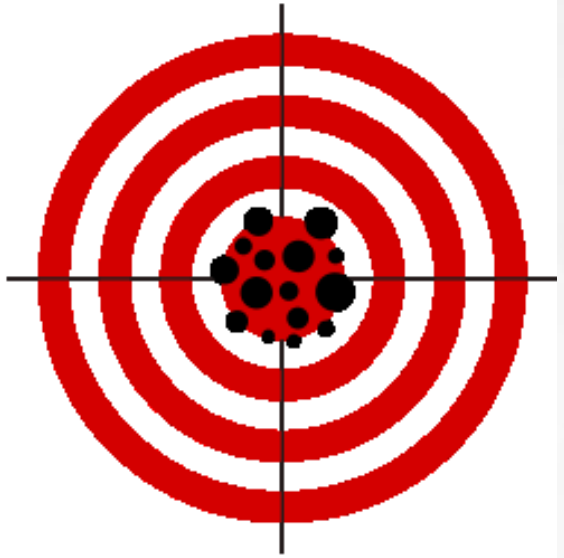
Unreliable & Unvalid



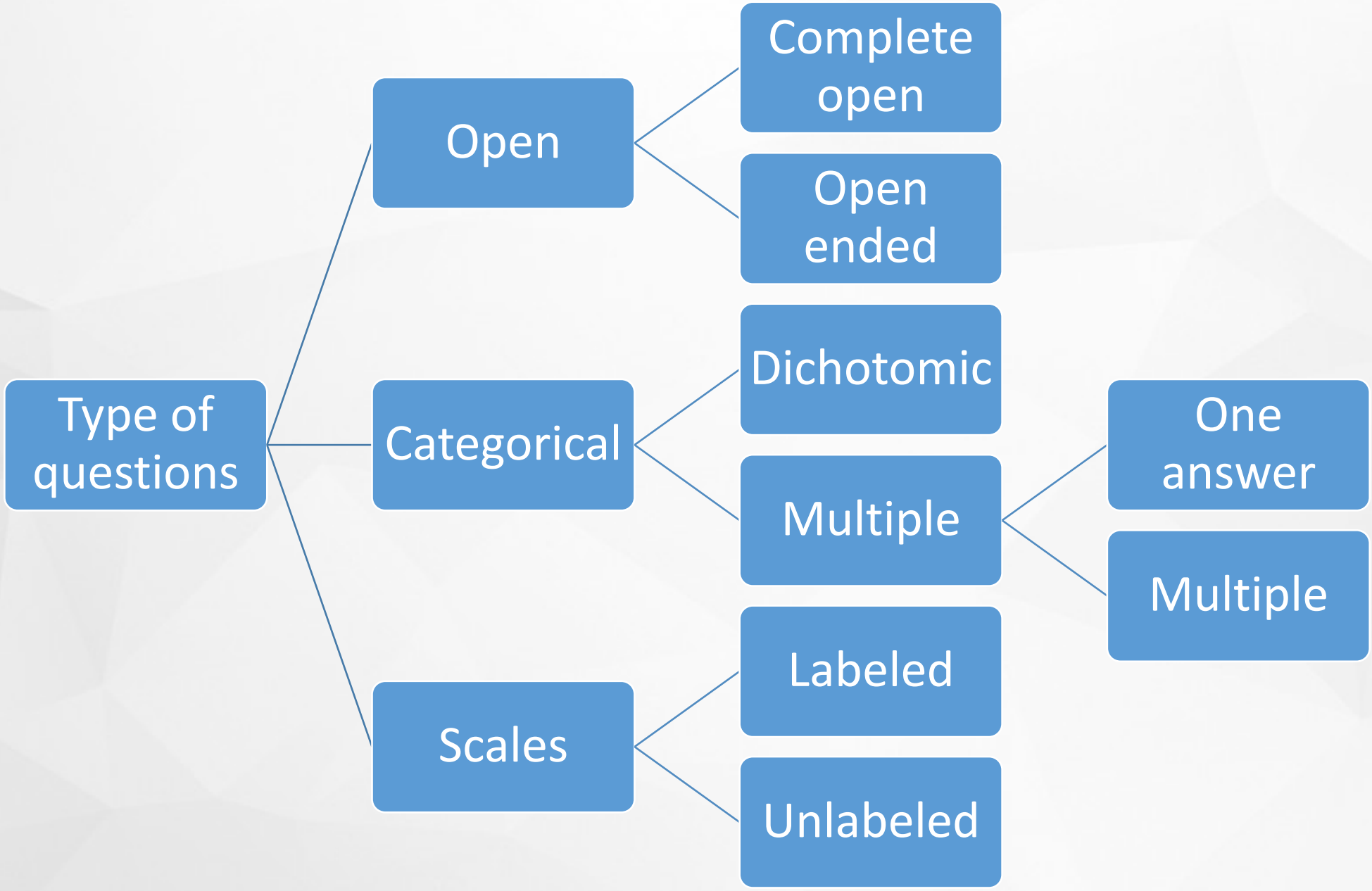
Unreliable, But Valid



Reliable, Not Valid



Both Reliable & Valid


Type of questions
Open
Complete open
Open ended
Categorical
Dichotomic
Multiple
One answer
Multiple
Scales
Labeled
Unlabeled

Case Example

1. **Defining the Research Question**: You start by clearly defining your research question: "Do students who study a little every day score higher on tests compared to those who cram the night before?"
2. **Literature Review**: You do some background research by looking up existing studies or articles about study habits and academic performance. This helps you understand what's already known and how your research could add to it.
3. **Hypothesis Formation**: Based on your background research, you form a hypothesis, like "Students who study regularly will have higher test scores than those who cram."
4. **Designing the Methodology**: You decide how you will conduct your research. You choose to survey your classmates, asking about their study habits and recent test scores.

5. **Data Collection**: You systematically collect data by distributing your survey to a representative sample of students in your school.
6. **Data Analysis**: Once the surveys are returned, you analyze the data, looking for patterns and correlations between study habits and test scores.
7. **Interpreting Results**: Based on your analysis, you draw conclusions. For example, you might find that regular study leads to better scores, supporting your hypothesis.
8. **Reporting**: You prepare a report or presentation summarizing your research process, findings, and conclusions.
9. **Reflecting on Limitations**: You also consider any limitations of your study (like sample size or self-reported data) and suggest areas for further research.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Thank you