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Section 3: Analyzing and Reasoning

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Table of Contents

- 1. Getting Engagements
- 2. Framing Problems
- 3. Analyzing and Reasoning
- 4. Presenting Results

Five key points

- Once all selected sub problems (or focus areas) are formulated in a precise, testable way, you can start to solve these sub problems.
- The answers to the single sub problems then have to be put into relation to each other in order to reach the main, overarching key conclusions.
- This section tells you how to chose the appropriate methodology and how to collect the needed data.

Key points:

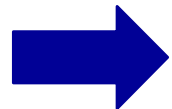
- 3.1 Fundamental changes in the data gathering process
- 3.2 Applying methodologies
- 3.3 Getting relevant data
- 3.4 Focusing on the quality of reasoning
- 3.5 Synthesizing

Key point 3.1: The data gathering process has changed

The data gathering process has changed fundamentally over the last 20 years!

- Earlier
 - Shortage of data or access to data
 - High uncertainty of validity

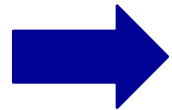
- Today
 - Data availability is no longer an issue
 - Internet
 - Worldwide databases
 - Research reports
 - Inconsistent data from multiple sources



Today, filtering useful data is the problem

Guiding principle for gathering data

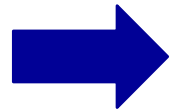
- Data availability is no longer the main problem. Therefore, don't let the a priori judgment of data availability guide your data gathering process.
- Some people think it is desirable to gather as much data as possible. However, **data are collected with purpose**, only the data required to reach the goal are important.



Don't get as much information as possible. Get the most important data as quickly as possible!

What do you want to achieve with your data collection?

1. Allow to make decision between different possible actions.
2. Enhance and/or illustrate the results.
3. Allow to estimate the parameters in models
4. Help to test a given hypothesis (is the hypothesis valid or not)



This requires to estimate the value of data even before the data are collected.

When to stop collecting data?

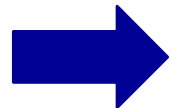
- With effort and resources, very often additional pieces of information can be received and processed
- However, knowing more is not per se valuable. The value of knowing more depends on the situation
- Getting more data or information appears beneficial only if, by eventually revising the original decision which would be optimal, an improved result warrants the costs of acquiring and processing additional information

“Forget about absolute precision”

- Try to get an answer that is directionally correct and of the right order of magnitude
 - Reaching an answer on that level of precision is often very quick, while attaining spurious precision would take much longer
- Achieving a satisfactory answer in a short time is more valuable than coming up with no answer
- Spending a lot of time improving the precision of data and models sometimes makes no sense
 - point of diminishing returns
 - losing time to market

However, make sure screening all relevant resources!

- Literature
- Interviews with industry experts
- Annual reports
- Analyst reports
- Industry magazines
- Press articles



Don't forget a relevant source that the client definitely knows!

Key point 3.2: Applying methodologies

- The scholarly framework to approach a question and come up with an answer is the “methodology.”
- Sometimes, there are several methodologies to approach. Which single methodology or combination of methodologies should be chosen?

Key actions:

- 3.2.1 Work with literature
- 3.2.2 Work with models (theories are dominant)
- 3.2.3 Work with data (empirical research)

Key action 3.2.1: Work with literature

- Don't skip the literature!
- We all have public information available, in particular articles published in professional journals.
- Thus, the “the literature” is easily accessible even if nobody has everything in mind. Use this as a benchmark to which you are referring yourself.
- Cite sources, quote what is known, indicate what is not yet published, tell what you are going to do.

Key action 3.2.2: Work with models (theories are dominant)

- A second “methodology” is to work with a model. Explain what your model is saying and how it is consistent with known theories in the field.
- Many models have a quantitative nature.
 - E.g. they tell how input entities result in certain output entities. This transformation depends on the parameters of the model.
- Calibrate your model
 - Find concrete values for all the parameters of the model first.
 - Then try to modify the input entities of the model, as if they were “variables”
 - Check which are the new values of the output variables. Explore sensitivities.
 - Explore how the model works if parameters were chosen differently.

Key action 3.2.3: Work with data (empirical research)

- Empirical Research is mainly based on using data of consistent quality to estimate parameters and to test hypothesis following accepted statistical methods.
- The quality of the data, and the professional depth of the statistical reasoning lead to acceptance of your results.

Example

- The University of Lausanne and Roland Berger Strategy Consultants did a research on how companies could free capital.
- This study was mainly based on empirics. They looked at the balance sheets of 200 companies from 19 sectors with an annual turnover of more than 1 billion.
- The study came to the conclusion that the major source of freeing capital would be an improved management of inventories.

Key point 3.3: Getting the relevant data

- Choose the information sources and collect data.
 - The weakest form of getting evidence about the real world is to ask other people.
 - Better is to use “internal sources” of data which are not publicly available and therefore always under suspicion of having a weak reliability only.
 - The strongest and best form to use data is to consult published and recognized data bases, which can be downloaded from the web.

- The degree of openness ensures quality.

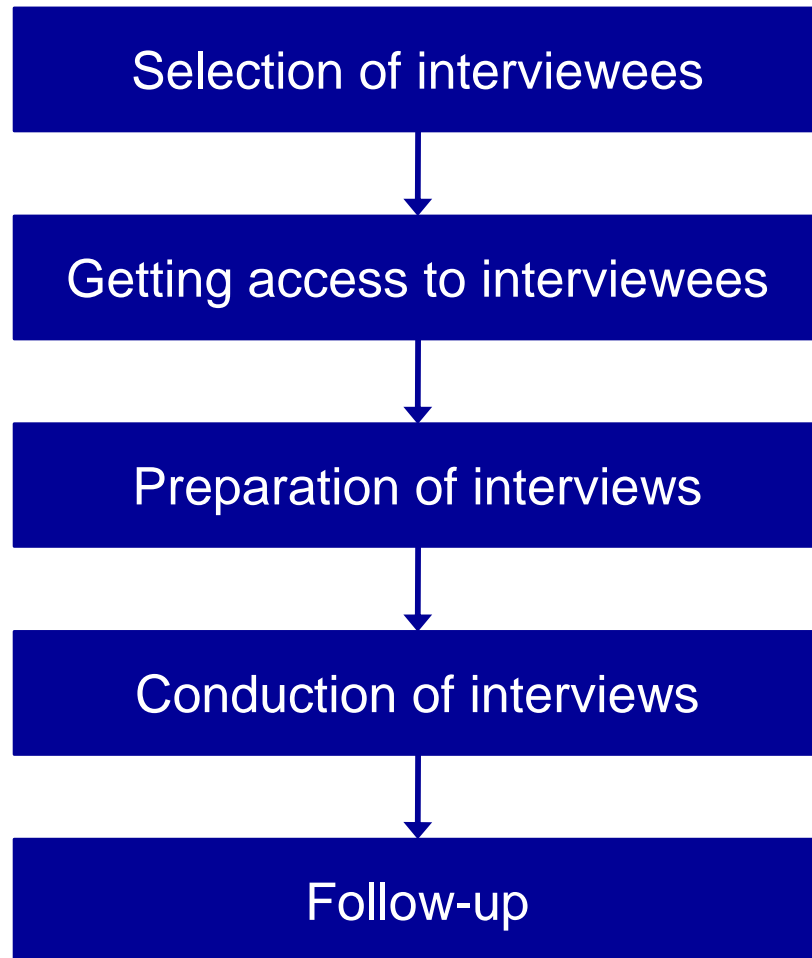
Key actions:

- 3.3.1 Arrange interviews with experts
- 3.3.2 Collect internal data and conduct own surveys
- 3.3.3 Consult published database

Key point 3.3.1: Arrange interviews with experts

- The weakest form of getting evidence about the real world is to ask other people.
- If there is no other possibility as to interview experts, follow a structure when selecting experts and set up a structure when you are going to ask questions.
- Do the interviews not as if you were collecting anecdotes. Rather than that, take it as if you have to repeat your research one year later and you should be able to come up with the same conclusion.

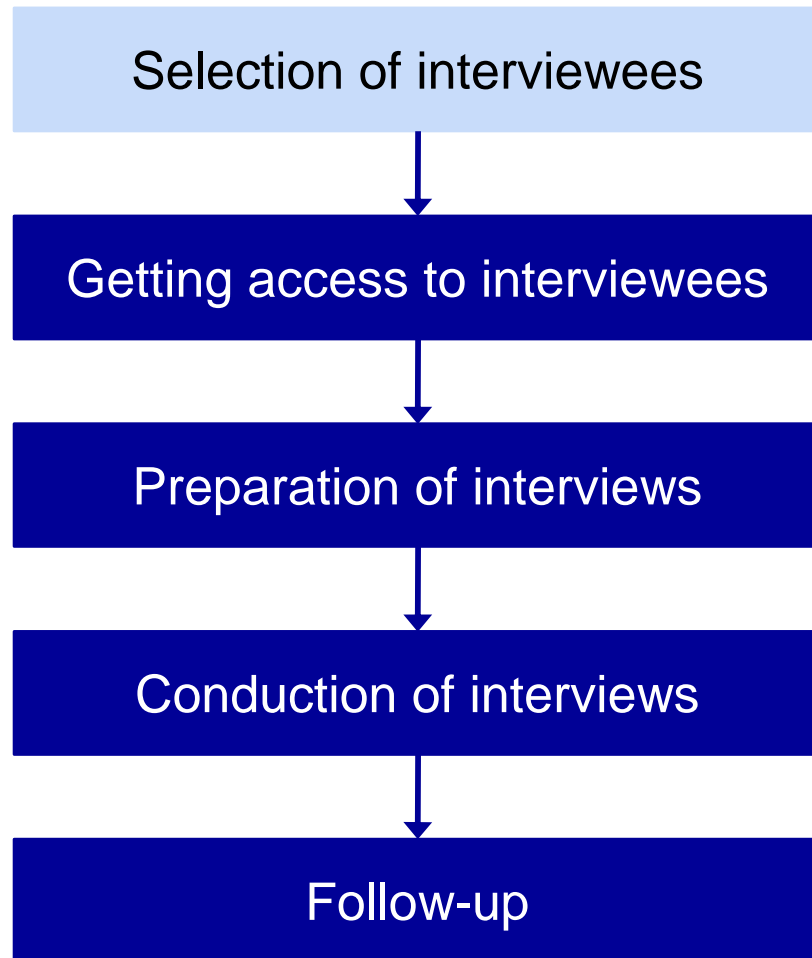
The interview process



Interview process

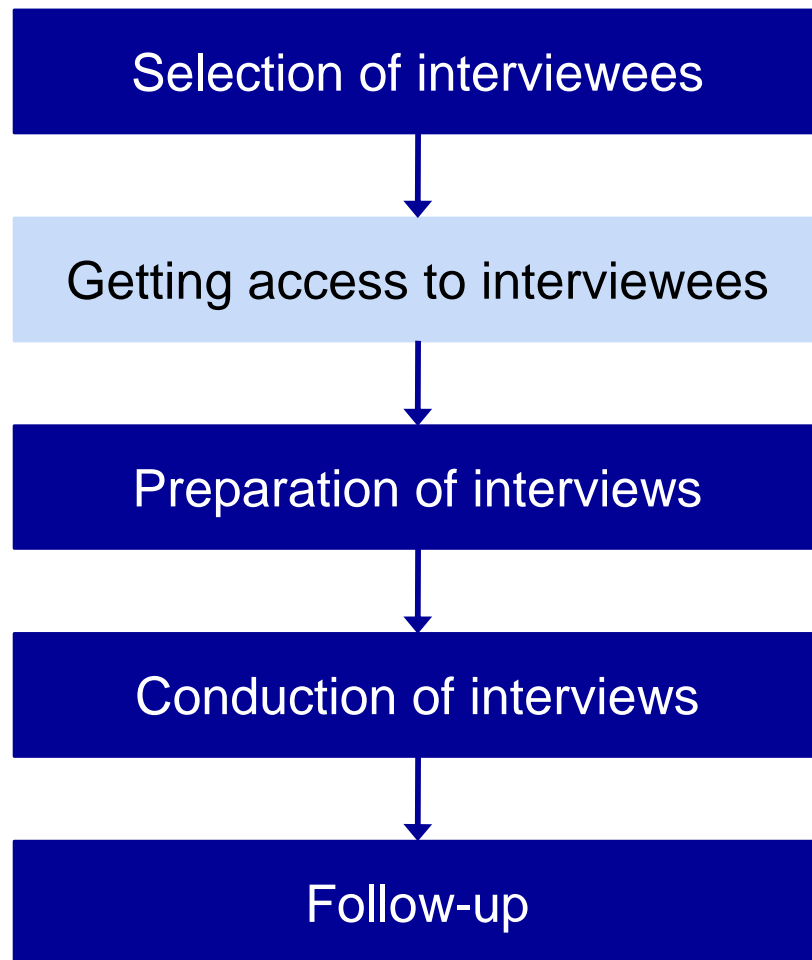
- Interviews are a very important tool for consultants

Selection criteria for interviewees



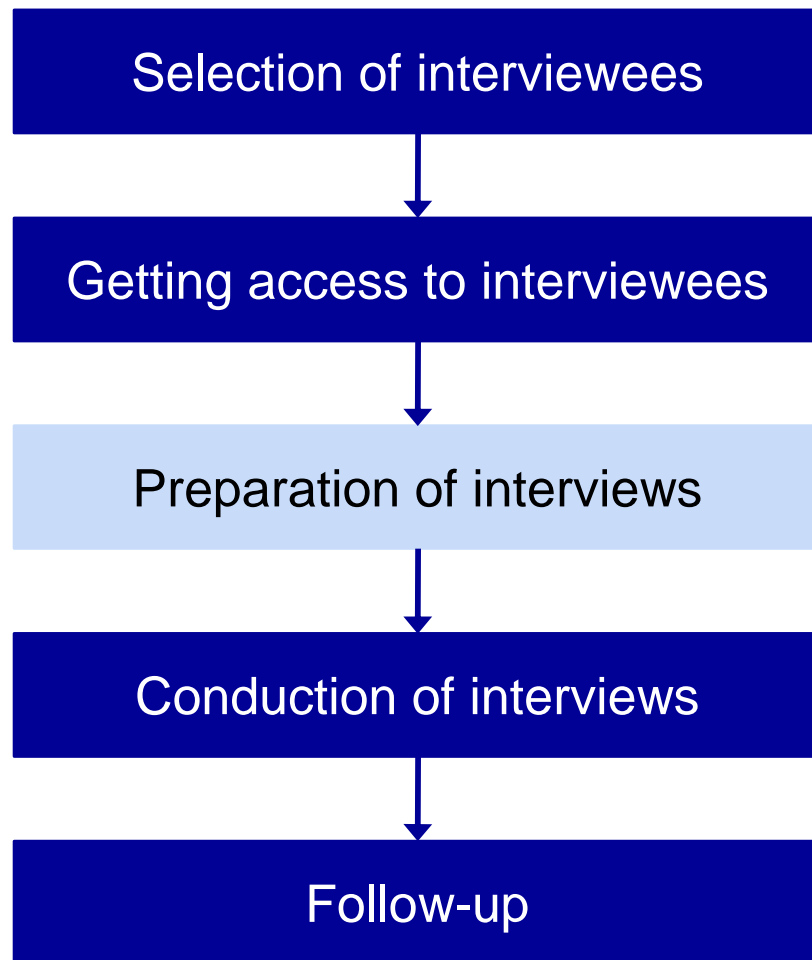
- Accessibility
- Willingness
- Competence
- Representativity

Getting access to interviewees



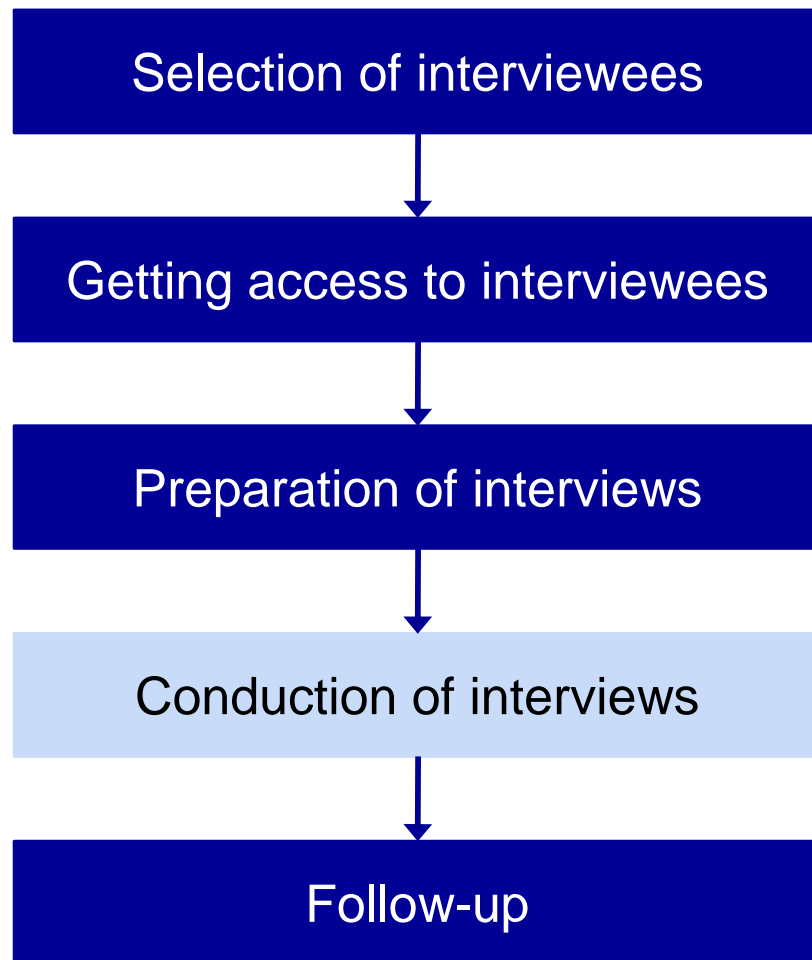
- Have the interviewee's boss set up the meeting
- If there is no boss, always try to be introduced by a
 - Friend
 - Customer
 - Supplier
 - Competitor
 - etc.

Preparation of interviews



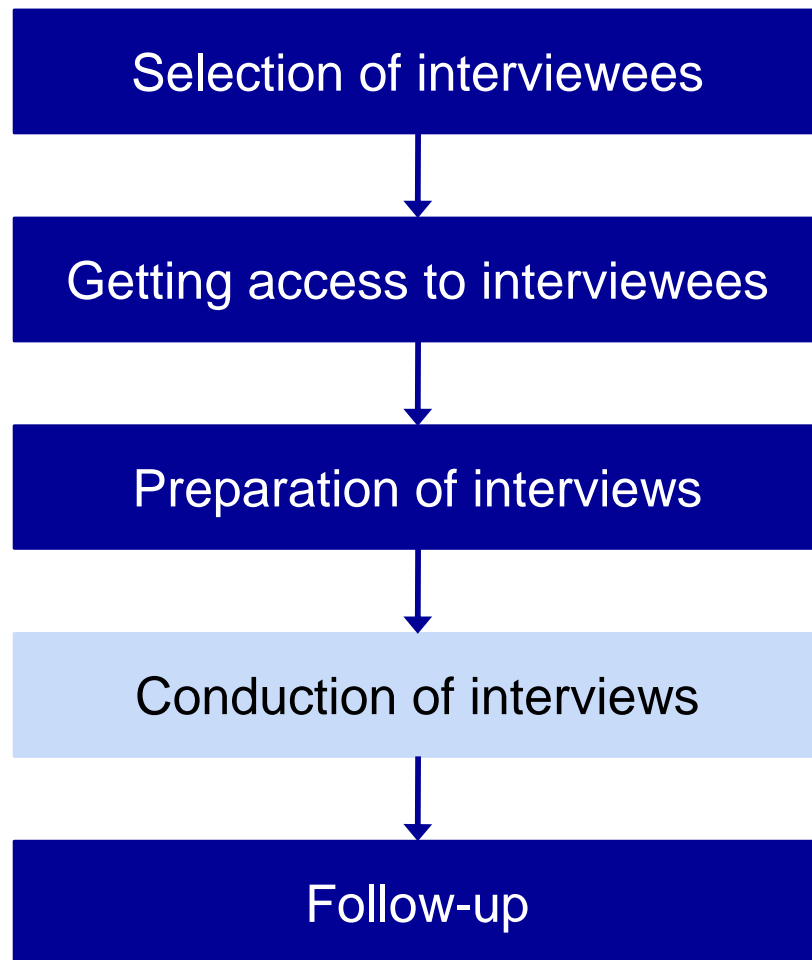
- Write an interview guide
 - List your objectives or the critical information you would like to obtain
 - Eliminate irrelevant points
- Send the interview guide
 - If you send it more than a week in advance, it may make sense to resend the guide
- Confirm the appointment

Conduction of interviews I



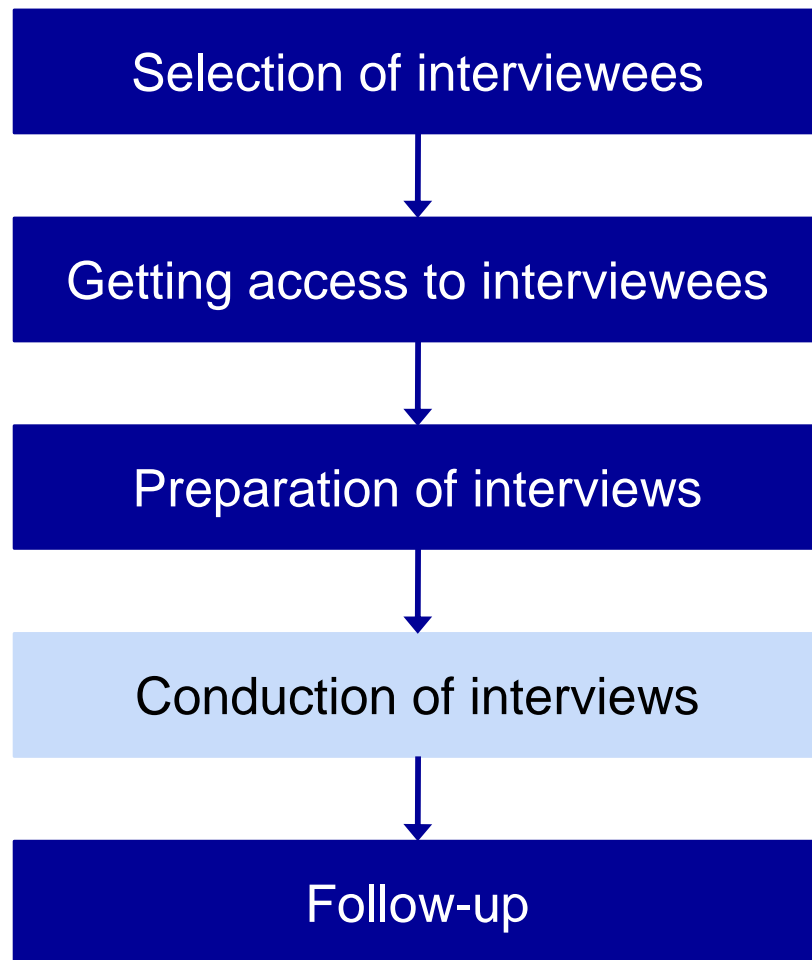
- Structure your interviews
 - Follow your interview guide
 - When conducting interviews, listen and guide
 - Politely but firmly keep the interviewee on track
- Interview in pairs
- Interviewing is about listening
 - Listen, don't lead
 - Paraphrase, paraphrase, paraphrase

Conduction of interviews II



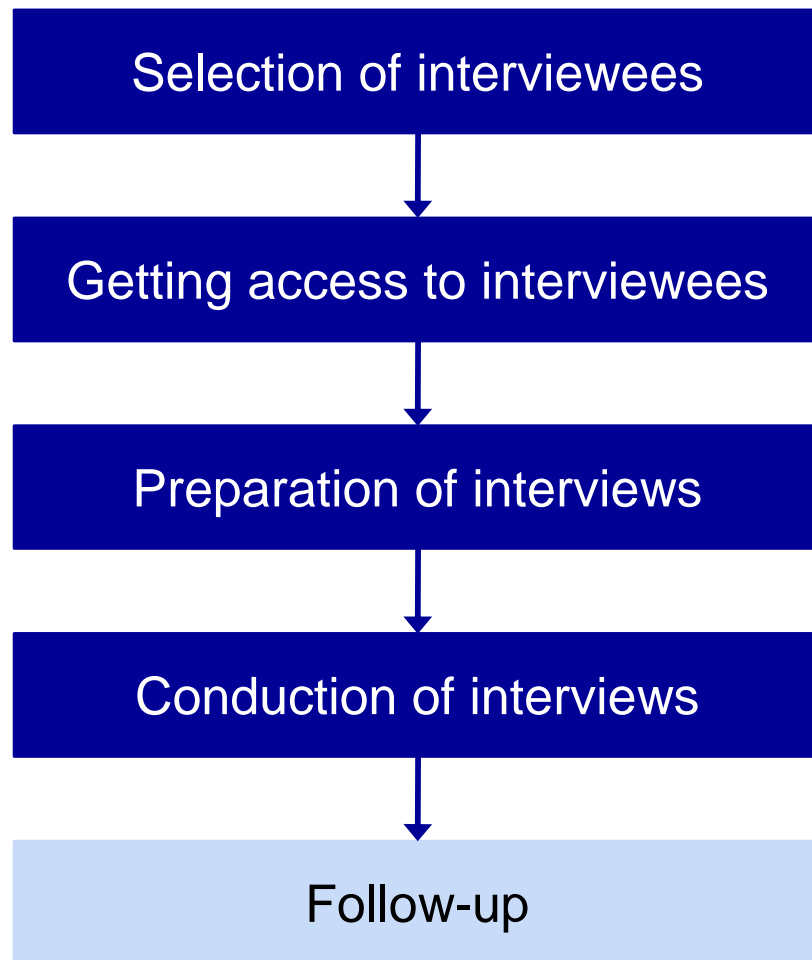
- Be sensitive
 - Don't leave your interviewee naked.
 - Try to establish a connection with the interviewee
- Don't ask for too much
- Bear in mind individual agendas
 - Express empathy for the interviewee's situation
 - Avoid issues that may cause unnecessary friction
 - Consider interviewee's agenda and watch for sensitive questions

Conduction of interviews III



- The beginning matters because it sets the tone for the rest of your time with the interviewee.
 - Start with the big picture of what you are trying to accomplish and why you are meeting with the particular person
 - Start with less sensitive issues
- Adopt the Columbo tactic: pause by the door to ask one more question.

Follow-up



- Post-interview follow up adds value to the interview process
 - Confirms what you heard
 - Ensures that you understood what was said

- Don't forget the Thank-you letters!

Exercise (10 minutes)

- Please gather in your project team.
- Develop a short interview guide
 - Identify your next interview opportunity
 - List your objectives or the critical information you would like to obtain
 - Pare the list down. Combine where possible and eliminate irrelevant points.
 - End up with two or three primary objectives for the interview
 - Structure the interview guide around those key questions
 - Consider interviewee's agenda and watch for sensitive questions

Key action 3.3.2: Collect internal data and conduct surveys

- The use of private data bases, for example the internal data bases of a consultancy firm, is considered to be superior to interviews.
- Most of the time, a lot of information and data are already available within the company of the clients.
- However, these data are not used in an appropriate form due to time or knowledge constraints.
- Try to get access to this easily available information and get most out of them.

Key action 3.3.3: Consult published database

- If possible, use published data which can be downloaded and which is acknowledged to have good quality.
- The degree of openness will ensure quality.

Key point 3.4: Focusing on the quality of reasoning

- Become clear about the logic of your reasoning and argumentation.
- Do you argue in an inductive or a deductive manner?

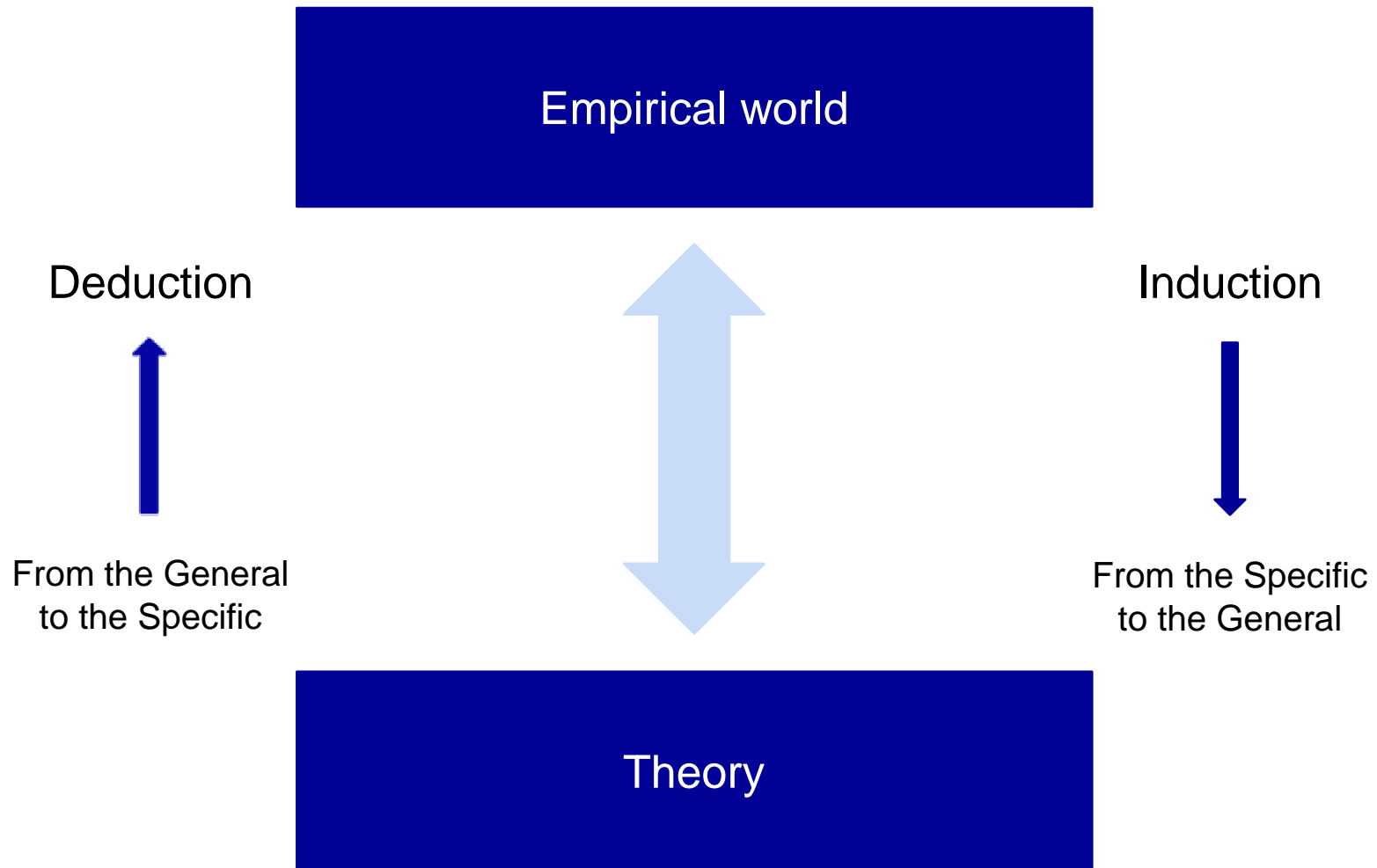
Key actions:

- 3.4.1 Focus on the research design
- 3.4.2 Focus on data quality
- 3.4.3 Focus on the logic of argumentation

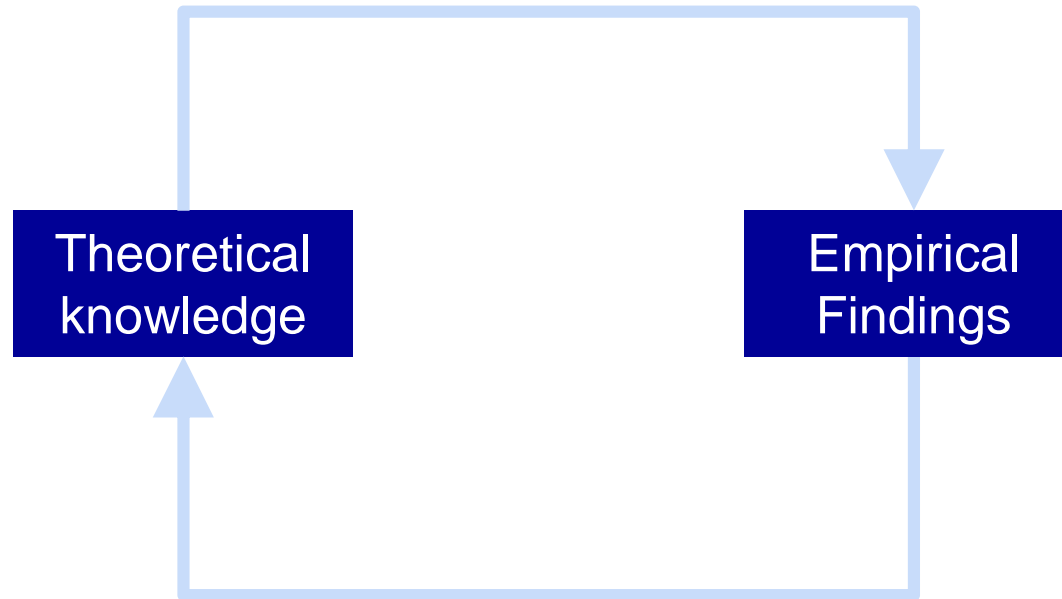
Key action 3.4.1: Focus on the research design

- Become clear about the research design!
- The logic of argumentation is built about empirical, statistical reasoning and also makes use of theoretical considerations.
 - Where, in the whole process, are the empirical findings and which are the theoretical ingredients.
 - Why did you choose this research design?
 - How is it related to other designs which likewise could have been helpful in coming up with an answer?

Induction and deduction



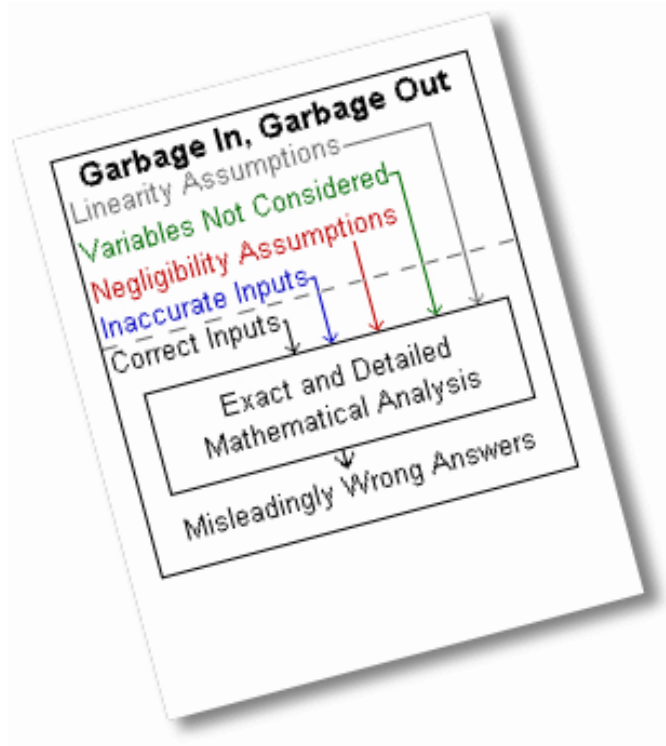
Connect empirical findings and theory



- Empirical findings and theory have to be connected, otherwise your work will not be accepted by the client.
 - Only theory: Ivory towers
 - Only empirical findings: Data mining

Key action 3.4.2: Focus on data quality

- An important saying in empirical analysis is “Garbage in, garbage out”. If the quality of your data is poor, the answers you get will have no reliability at all.



Control your data quality

- Accuracy (Trueness)
- Precision
- Completeness
- Compatibility
- Reproducibility / Representativeness

Control your data for biases

Definition

Bias is a term used to describe a tendency or preference towards a particular perspective, ideology or result, especially when the tendency interferes with the ability to be impartial, unprejudiced, or objective.

- Examples:
 - Easy data bias
 - Selection bias
 - Survival bias
 - Confirmation bias
 - etc.

Use different methods to collect data

- Use different methods and measures to balance the strength and weaknesses of single methods
- Methods should be able to capture the research question
 - Be aware of the strength and weaknesses of the methods
- Develop a research design that offers the best possible combination to minimize irritations and biases

Question and discussion (5 minutes)

- Have you had to deal with one of the mentioned biases or any other bias while making your analysis?
- Please describe your problem and how you handled it.

Key action 3.4.3: Focus on the logic of argumentation

- Is, what you are going to say, a “confirmation” or a rejection of an hypothesis?
- Are the results statistically powerful (significant)?
- To which degree is your argumentation based on using a theoretical model?

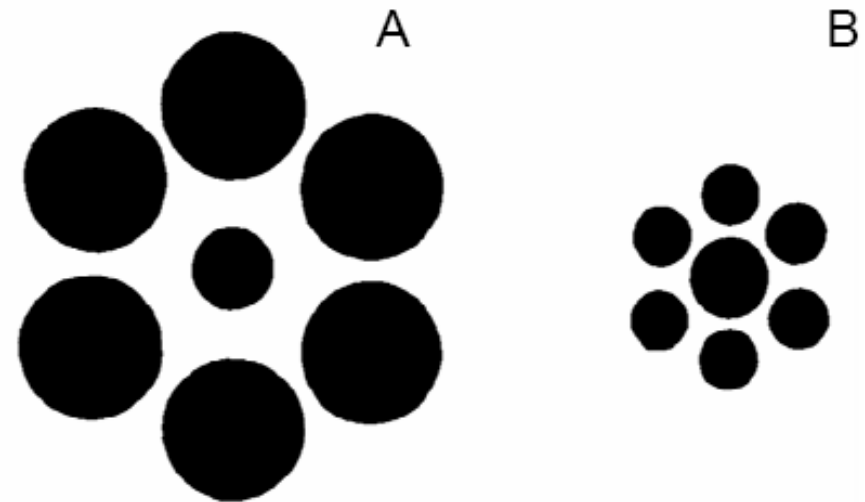
Perform sanity checks

- One wants to be as accurate as possible. However, there may be no time for very detailed checks.
- Check with the “quick-and-dirty test” if your results are directionally right.
- Check at least if a particular analysis is within the bounds of probability.

Go beyond initial impressions



Beautiful princess or ugly man?



The ball in the middle: Is it bigger in A or in B?

Key point 3.5: Synthesizing

- In a sense, you have answers to the elementary questions and must now move up in the pyramid from the bottom to the top. Synthesize and to draw main conclusion from your study.
- Sometimes, your conclusions will not cover perfectly with the original issues. You must therefore bridge between your main conclusions and the original issues mentioned in the Letter of Commitment.
 - Build a synthesis between the original topics and your findings.
 - This synthesis will also tell, which of your findings are particularly relevant for the principal.

Key actions:

- 3.5.1 Find key conclusions
- 3.5.2 Match the answers to the original issues
- 3.5.3 Be able to tell your 3 main findings in a minute

Key action 3.5.1: Find key conclusions

- As a preparation of presentation and communication, it is of utmost importance to be brief and concentrated on the point.
- Importance can be seen from different sides, though.
 - The agent might find to be “important” what he finally managed to achieve in his study. The agent is judging according how difficult it was to produce the results.
 - The principal sees a result to be of importance if it helps in his decision making.
- Thus, it would also be possible to draw different sets of conclusions, one for the principal, another set of conclusions for the community to which you, the agent, are regularly reporting about work in progress.
- Always be aware that you are producing your analysis for the client!

Key action 3.5.2: Match the answers to the original issues

- When you have your conclusions, you must confront them to the original issues you wanted to address.
- What could be said about them, what not?

Key action 3.5.3: Tell your three main findings in one minute

- You have a lot to say.
- However, condense and concentrate on 3 main findings.
 - How would you formulate these 3 important findings of your study and communicate them?
 - Which table, which figure describes best the findings?

Lessons of Section 3

- Answers to questions and solutions to problems must not only be found.
- Today, the quality of argumentation is at least important as the statement itself.
 - The quality of argumentation depends on the methodology and the quality of the empirical data used.
- “Solving” became more and more distant from “finding the solution” and moved in the direction of methodological “argumentation” that (what everybody already anticipated) should be seen to be the bases of further decision making and action taking.
- In the five sections of this chapter, we discussed these points:
 - Changes in the data gathering process
 - Applying methodologies.
 - Getting relevant data.
 - Focusing on the quality of reasoning.
 - Synthesizing.