

Technical Research Design

Technical Research Design

- Set of activities needed to realize the objectives set out in the conceptual design phase
- Concerns decisions on how, where and when
- 3 phases:
 - Research Strategy
 - Research Material
 - Research Planning

Research Strategy (Chapter 6)

- This is where you plan the way to approach your research and pick the methods you are going to use.
- Take into account:
 - Suitability (e.g. Your skills, academic level of problem)
 - Availability (are resources such as test equipment available)
 - Duration (Can it be done within the set time)
 - Feasibility (can it be done at all at TUD?)
 - Ethics (should it be done, do you want to do it)
 - Etc.

Generic Research methods

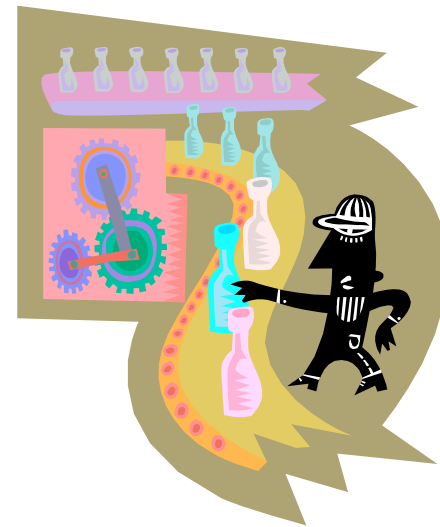
- Survey Research – empirical research
- Experiment – tests, simulations
- Case Studies – small domain/samples, suitable for new ideas
- Grounded Theory Approach – development of new theories
- Desk Research – mostly based on library, archive and media searches. Example is a literature survey

Key decisions here are:

- Breadth vs. depth
- Qualitative vs. quantitative
- Empirical vs. desk research

Where to find appropriate methods?

- Literature
- Group's Research Traditions
- Other Research Institutions
- Industry Practice



Get as much information on each possible method as you can and carry out a well argued **trade-off**

When selecting a method...

Check if the method of your choosing:

- Is suitable for your specific research objective and questions
- Produces reliable and valid results
- Is proven
- Is of sufficient academic level
- Is financially affordable
- Is ethically acceptable
- Can be used in the time you have allotted
- Can be carried out by someone of your experience
- Can be supported within your research group or its immediate surroundings (supervision & support, availability of equipment)

Research Material (Chapter 7)

- Many options available
- Make right choice within the framework of your research plan, taking into account:
 - Availability
 - Cost
 - Time span
 - Your experience & skill
 - Experience & skills available from support staff

Data acquisition

- Your research strategy should tell you what data you want to gather (aka what you want to measure)
- Your research material should tell you where you are going to get that data from (what is your research population)
- Your research planning will tell you what the time frame for all this is

Availability

Whatever your chosen research material is do check its availability!

Research Planning (Chapter 8)

- This will be covered in Lecture 5 & 6

