Contents

Chapter 6 (Research Strategies)

Research strategy ---- materials -------planning,

By *research strategy* we mean the decisions concerning the way in which the researcher is going to carry out the research. We refer especially **to gathering relevant material** and **processing this material into valid answers** to the research questions.
A particular research strategy is a **set of key decisions from which a number of other decisions will follow**. Following the key decisions:

1. ***Breadth or depth.***
   - **Breadth**: using a large-scale approach which enables a **generalisation of the results**, but which will impose **limits on depth, elaboration, complexity** and the sound foundation of the results.
   - **Depth**: aim for **a small-scale approach** that yields **knowledge that can be generalised** to a **lesser extent**, but nevertheless will **enable the researcher to achieve depth**, elaboration, **complexity** and soundness, **thus minimising the risk of uncertainties**.
2. ***Qualitative versus quantitative research; it concerns whether or not the researcher or the commissioning party prefers quantification, or qualification.***
3. ***Empirical versus desk research: whether the person involved is a true empirical researcher (who prefers doing research in the field, gathering data), or is more of a thinker (who finds the idea of doing desk research)- makes use of existing literature. Usually somewhere in between.***

The three key decisions mentioned above are interconnected with many other decisions.

- They **largely determine the number and the type of research** units to be selected, **The way in which these units are selected**,
- The **choice of sources** and the **method(s)** that will be used to open up these sources,
- The way in which the **data and literature** are going to be **processed into answers to** the set of research questions.

The five major strategies followed in final projects, are:

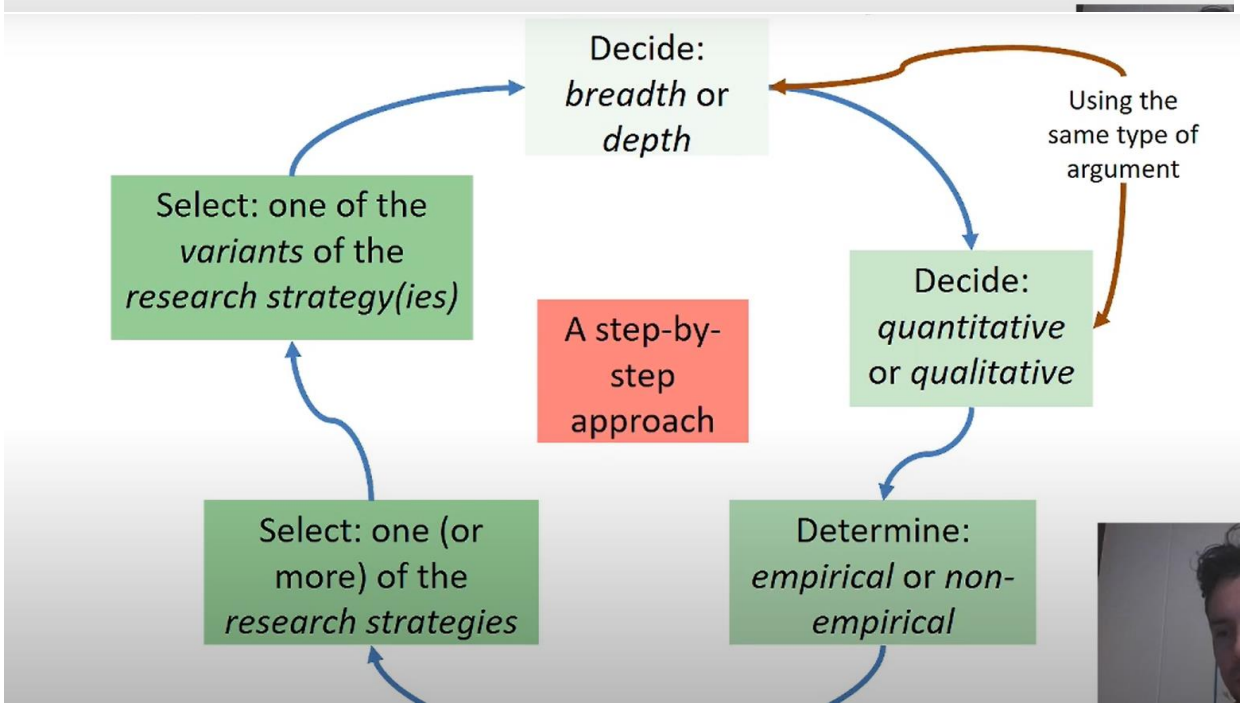
1. **Survey (I) empirical, quantitative, breadth,theory/practice-oriented**
2. **Experiment (II) empirical, quantitative, theory/practice-oriented**
3. **Case study (III) empirical, qualitative, depth, theory/practice-oriented**
4. **Grounded theory approach (IV) empirical, qualitative, theory-oriented**
5. **Desk research (V) theory-oriented**

Check page 158 for examples of the above.

1. Although the five strategies can be found as **independent, a mix of these strategies can be used**.
2. Each strategy relates to a **specific type of research objective** and research project. However, this **does not imply that with regard to the design process**, the **research strategy is purely a derivative of the research objective and set of research questions**. The researcher may have preferences for a certain strategy.
3. In **the implementation stage of a research project** the researcher **systematically works towards finding an answer to the set of research questions**. Therefore, this is the **first and foremos**t condition for a successful research project. The application of principles from the strategies presented could contribute to this by making it easier improving the validity.

Category of projects vs **Goal** vs **Method**

	Category	Goal	Method
1	Descriptive knowledge	True world descriptions	Empirical cycle
2	Design	Successful artifacts	Design cycle
3	Means-end knowledge	Reliable, efficient heuristics	Theory and practice support?
4	Modeling	Models with specific goals	Modeling cycle
5	Engineering optimization	Specified optimizations	Optimization progression
6	Mathematics	Mathematical claims and objects	'How-to-solve-it' heuristics



Bigger picture- one or more strategies are adapt for our specific research. Deciding is an iterative process.

1. Survey Research (I)

A survey is **a type of research in the course of which the researcher tries to gain an overall picture** of a comprehensive phenomenon spread out over a stretch of time and/or space.

Characteristics

A survey is characterised by:

1. A substantial domain, consisting of a *large number* of research units;
2. *Extensive* data generation;
3. More ***breadth* than depth**;
4. A ***random* sample rather than a strategic sample;**
5. An **assertion which consists of variables and the relationships between these variables**;
6. Preferably ***remote, closed* data generation**;
7. ***Quantitative data* and *quantitative data-analysis***.

These 7 characteristics are closely interrelated. The most distinctive characteristic is that the data is gathered **from relatively large numbers of research units (1).** A research unit can be anything the researcher intends to make statements about (i.e products manufactured by a company). Another main characteristic is that the **researcher uses less time-consuming methods to generate data (2),** which

is **essential considering the large number of research units that need to be approached**. As a rule, the researcher will stick to **one method that can be followed through fairly quickly**. The writ- ten poll is the most popular.
A survey is characterised by a large *breadth* of the research project (3). Carrying out a ***sample survey* is the most common approach for tackling the large number of research units** (population can easily range between 5,000 and 50,000 or more). Taking a ***random sample* is typical for a survey** (4). A random sample is a sample in which all potential research units in the population of interest have an equal chance of being included, regardless of their characteristics. It is the best guarantee of gaining a representative picture of the whole population, which in its turn is needed for generalisation of the results later on.
Another characteristic of the survey is that the **assertion is formulated in terms of several variables**, and the **relationship between these variables (5).** For this reason, a survey is said to be be a ***reductionist* one.** The reality is reduced to a **set of research units (first reduction**), and the latter **to a set of variables (second reduction).** Due to the large amount of data needed in this type of research, data collection has to take place in a **well-structured way and closed way (6).** Closed questions (questionnaires and structured interviews), and closed observation categories are used in systematic observation and content analysis of written and audio-visual documents and contents of media. Using larger amounts of data usually means that the data has been processed and analysed in a quantitative way based on statistical principles and procedures.

Variants

There are several variants of a survey research. These mainly depends on if **data is collected at one specific or several moments in time**, and from **one same group or from various groups**. Namely, the three variants are:

1. **Cross-sectional research**
2. **Panel research**
3. **Time-series research**

A **cross-sectional survey** is a type of research that has **all seven characteristics mentioned at the beginning**, and in the course of which material is gathered at a certain moment in time from one and the same group. For example: public opinion polls, market research surveys and election polls.

Panel research is a type of **quantitative survey** during which **measuring takes place at various moments in time within one and the same group**. This type of research is especially suitable for **showing changes that have taken place *within* research units.** The researcher carries out ex-ante and ex-post measurements, in which the exact same questions are asked. One of the major advantages of this survey design is that **coincidences can be eliminated due to the large number of observations. This means more security for the researcher.**

Time series research, or **trend study**, is characterised **by taking measurements of constantly *varying* sample surveys.** The objective of this type of **quantitative research** is to **find trends** or changes in some collective characteristic. For this reason, measurements are usually taken over a **number of years.** The researcher is most often **unable to gather the data in person**, but must use data that is constantly being gathered by different sorts of organisations (*official statistical material*). As in both panel and time sequenced research, quantitative data is being used that has been obtained from large numbers of research units by drawing a random sample.

Advantages and disadvantages

Advantages

- Most importantly, a **quantitative survey covers a large scope**. The large number of research units enables the researcher to determine **all sorts of statistical relationships and correlations.**
- Another practical advantage compared to other research strategies is the **large availability of methodological handbooks that describe in detail** how the various components of this type of

research should be carried out.

Disadvantages

- **depth is limited** and the knowledge obtained only concerns certain aspects of the research object i.e. the variables.
- as **research projects initially** cover such a **wide area in time and space**, the researcher usually has no choice but to examine **only certain aspects of the research object selected**. This is **different** from **qualitative methods of research where the emphasis is on gaining a complete overview of the research object.**
- the researcher may need to **know a lot about the subject in question beforehand,** as he needs to **generate the data quickly** and **build a measuring instrument** (ie. a questionnaire).
- Moreover, due to the **high degree of pre-structuring, the research project is *less flexible*.**

Effective use

The different variants of survey research are **effective** when the **objective is to obtain general knowledge of the subject or specific knowledge concerning research objects that are numerous and/ or wide spread**. **Panel research and time-series research are efficient research strategies** for examining changes that take place during a certain period.

In principle, time-series research does not show any ***test effects***, whereas panel research does, so this is an added advantage. Test effects are effects of ex-ante measurement. If different groups are being used, as is **always the case in time-series research**, no such after effects could interfere with the results of the ex-post measurement. Besides, in time-sequenced research, measuring can take place quite frequently without there being any risk of people becoming fed up or dropping out. After all, each individual is approached only once.

2. Experiment (II)

Suitable type of research for **acquiring experience with newly created situations**. This experience is used to **assess the effect of changes**. In order to obtain these effects at least two groups are needed which are as similar as possible. Group 1 receives an intervention, indicated as X, the other group does not, or it receives a different treatment. Afterwards, both groups are compared by means of **ex-post measurements** of expected Y.

Characteristics

1. At least **two grou**ps are formed: an ***experimental group*** **and a** ***control group***
2. Participants, or research units, are assigned **randomly** to either group. This is called *randomising*
3. The *researcher determines(*not the people being examined) which group is subjected to intervention X and what happens further within the groups
4. The researcher makes sure that there is **as *little outside influence as possible***
5. In addition to an ex-post measurement for the effect under study (Y), and ex-ante measurement is carried out preferably before the intervention takes place

(1) The groups subjected to the intervention, or to some interventions are called experimental groups. The groups not subjected to an intervention are the control groups. After the intervention the **behavior of the groups involved is studied (measured) in relation to their response** to **what the intervention was trying to achieve**, also known as ***variable (Y).*** If there are **differences in the target variable Y, these can be attributed to the intervention. (2)** If the researcher does not explicitly leave the division into groups to chance, there may be significant differences in the number of men/ women per group. This implies that it will not be clear to what extent the differences in measured results in the dependent variable Y can be attributed to the intervention or to the gender.

Self selection: people with special characteristics choose to undergo an intervention or not. Example: Researcher wishes to determine the effect of a smoking awareness campaign. If self selection occurs, people with positive attitude towards stop smoking (special characteristics) may chose to undergo intervention.

Matching: Used to **obtain comparable groups**. Using people with similar characteristics in both the experimental and the control group.

(4) The researcher should exclude the possibility of external causes affecting the expected behavior.

(5) Carrying out an ex-ante measurement is necessary in order to know whether anything has actually changed. If we have found differences between the experimental group and the control group during the course of the ex-post measurement, then we need to find out if these differences existed before the intervention.

Variants

1. Laboratory experiment

This is the **strongest variant**. No other type of research is capable of demonstrating more **convincingly a causal relationship between two phenomena** X and Y. A research project without ex- ante measurements is a weaker sub variant from the laboratory experiment. If this is the case, the causal proof **is usually slightly weaker**. In this case, the ex-post measurement of the control group acts as the ex-ante measurement of the experimental group. Not having an **ex-ante measurement** can **turn into an advantage given the lack of the *test effect***. Test effect involves the possibility that by **introducing an ex-ante measurement, the subject could develop a different view** on the matter based on this measurement

An even more **effective sub variant** of a **laboratory experiment** is known as the ***tfolomon four group design.*** This sub variant is compose by **three control groups**. An initial control group receives an **ex-ante measurement but no intervention**, a second group receives **no ex-ante measurement but does receive an intervention**, a third group receives **neither an ex-ante measurement nor an intervention. This** sub variant enables us to **detect test effects** and **possible interactions** between the **ex-ante measurement and the intervention**.

A second sub variant is **called f*actorial design*.** It is used to find **which combination of interventions is most effective**. The various groups act **as each other's control group.**

2. Quasi-experiment

Compared to regular laboratory experiments, these **are weaker variants because one or several of the five requirements have not been met.** In this case, a causal argumentation must be carried out **with fewer guarantees for the internal validity**. These variants are usually more representative of the object of study, which is beneficial to the external validity of the results.

A first sub variant is known as working with ***existing groups.*** This entails that the requirement that has not been met is randomizing or matching (2).

Second sub variant is ***field experiment.*** In this type of quasi-experiment, the researcher makes use of the differences he or she has observed 'in the field', instead of creating differences by means of an intervention.

3. Imitation

This variant does not use comparable groups. It involves **the imitation of the reality to be studied.** First sub variant is ***computer simulation.*** The most important advantage is that the iterations of the model can be made relatively **easily and cheap**. Moreover, the effects of computer simulation can be measured within a very limited time.

The second sub variant is ***gaming*. P**arty of the reality to be studied is turned into a game, consisting of a number of roles and rules that govern interactions between roles. Each role involves tasks, power and rules in which the player must adhere. The **consequences of these events can be studied**.

Third sub variant is **using *scale models*.** A certain **process can be imitated on a smaller scale**, making alterations **less costly, less time consuming and less risky.**

Advantages and disadvantage

Advantages

- **High degree of internal validity**. As stated before, there is no other research strategy which gives more guarantees for the validity of the causal proof.

Disadvantages

- **External validity**. We can therefore never be certain that the outcome corresponds with their daily life pattern.
- Another restriction is that **by no means all interventions can actually be carried out. There may be moral objections to certain experiments.**

Effective use

In an **assessment project.** An experiment is useful if the researcher wants to establish the **effectiveness of a certain government policy**, or if he or she wants to find out about the effects that re-organisation will have on the work atmosphere and the productivity within an organisation.

3. Case study (III)

The case study is a **research strategy in which the researcher tries to gain a profound and full insight into one or several objects** or processes that **are confined in time and space**. This may be an organisation, a company, the processes involved in passing legislation, the choice of a dumping site, and so on.

Characteristics

1. a small domain, consisting of a ***small number*** **of research units;**
2. ***intensive*** **data generation**;
3. **more *depth* than breadth**;
4. a ***selective,*** i.e. a **strategic sample**;
5. an assertion concerning the **object as a whole** (instead of an object that is unravelled in observation units and variables, as it is the case in a reductionist survey research);
6. an ***open*** **observation *on site;***
7. **qualitative data and research methods.**

Opposite characteristics than those of a survey.

The first **and most important characteristic** of a case study is the use of *a* relatively ***small number*** **of research units,** usually referred to as *cases.* Using small numbers has the following consequences: a quantitative analysis of the data is not possible. Therefore a different *qualitative* research method must be used.

Second characteristic is that the focus is on *depth* rather than breadth. Depth is realised by using ***various*** **and *intensive* methods for generating data**.

Triangulation of methods: when researcher uses a combination of individual interviews and, for example, group interviews, together with participant observation and content analysis of textual and audio-visual material. Used to achieve depth.

Triangulation of sources: achieving depth by working with several sources.

A third characteristic of a case study, which also follows from using a small number of cases, is that a ***strategic*** **sample** is taken instead of a *random* sample as in a survey.

Another characteristic of a case study is that we are trying to obtain a *general* idea of the object *as a whole.* In this case, the term ***holistic*** **method would be appropriate**, to be distinguished from a reductionist approach, which is typical of a survey. ***Triangulation*** **could be seen as an effective instrument for gaining an overall and holistic picture of the research object.**

Another typical aspect of a case study is that the object, i.e. the case, is studied in its *natural context.* Referred to as a research project on site, meaning to visit the place of study and interact there.

When selecting cases, the researcher has two options: **selecting cases that show a minimum number, or cases that show a maximum number of differences.**
Another, strategy that can be followed when drawing a sample, is to use cases that show a great number of differences in certain aspects *that have been carefully selected by the researcher,* and are similar in the remaining aspects.
Another option is to follow a strategy in which the ***dependent*** **variable (Y) shows a maximum variation or contrast.** In the example given (p.180), this appears to be an efficient strategy if we intend to find out which factors play a part in the quality of healthcare, i.e. the dependent variable mentioned above.
The so-called ***snowball sampling*** strategy*:* here the cases are selected one by one. The first case is studied and, **built on the results of the first case,** a second case is selected, and so forth. This specific methodology can be used when **the researcher knows little about the subject in question** or if the population of interest is unknown or not clearly demarcated.

Variants

1. Single case study

In the single case study only one case is thoroughly examined. Preferably the **emphasis lies on triangulation.** This strategy is used to **eliminate chance** as much as possible, which is important as we are only using an individual case. A sub-variant of the single case study is a case study in which various sub cases can be distinguished, a so-called embedded case study.

2. The comparative case study

The comparative case study can be distinguished from the single case study by the fact that several interrelated cases are compared instead of just one. Two sub-variants are discussed below.
(First variant) The ***hierarchic method*** **has two stages**:

1. In the **initial stage** the ***separate*** **cases are examined** as if they belong to a series of single case studies. Essential that the **cases are studied independently from each other.**
2. Next the **results from the first stage** can be used as **the input for a comparative analysis** of the **coherent body of all cases that are involved in the project**, In doing so, the researcher tries to **find explanations for the similarities and differences between the various cases** that have emerged from the first stage.

A variation of this method is that **during the initial stage** the **same case is studied by different researchers**. The ***independently obtained*** **research results are subsequently analysed in the second stage on a higher level of abstraction.** This procedure is a special variant of ***the triangulation of*** researchers.
(Second variant) The ***sequential method*** **starts off by thoroughly examining an individual case**. A second case is selected by using the results of the first one, ***which case is studied by comparing it with the results of the first case.*** Only after having drawn conclusions from this comparison is a third case selected on the basis of these conclusions, and so forth (similar to snowball sampling).

Advantages and Disadvantages

In practice oriented research:
Advantages

- offers the possibility to obtain a ***general*** **picture** of the research object. It differs from both quantitative surveys and experiments, because with these we will obtain **much more knowledge by focusing on various aspects.**
- **not much pre-structuring is required**. requires far less pre-structuring than a survey or an experiment. A case study is ***much more flexible*** compared to the two other strategies.
- the results will be accepted more readily by the people in the field than the results of a quantitative survey or a complex and often slightly artificial experiment.

Disadvantages

- the ***external validity*** of the results is often under pressure. The fewer cases studied, which is often needed for achieving in depth knowledge, the more difficult it is to apply the results to a broader population of interest or to similar cases.

Effective use

A case study offers interesting possibilities to fledgling researchers, three reasons for this:

1. A first advantage is that it **is easier for fledgling researchers to delimit** this type of research to manageable proportions than, for example, experiments and especially surveys (due to high degree of pre-structuring of surveys and experiments).
2. A second practical advantage is the **possibility of obtaining significant results** in spite of the lack of thorough methodological knowledge and training. Typical of the case study is that the methods the researcher will use show similarities with everyday thinking and acting.
3. A third and final practical advantage we would like to mention is that case studies, unlike most strategies, can be used in almost any situation. An experiment, for example, often meets with practical or moral difficulties and only causal issues can be studied.

Grounded Theory Approach (IV)

A grounded theory approach is a strategy that can be used to **gain theoretical insights** with only the **minimum of prior knowledge**, and by c**ontinuousl**y comparing phenomena that are involved.

Characteristics

The underlaying characteristics of this type of research are:

1. **An *inquisitive*** (tentative, hermeneutical, *'verstehende') attitude* from the researcher;
2. A **continuous process** of comparing empirical data and theoretical concepts
3. A **careful and consistent use of the *procedures and techniques*** as set out below

Each characteristic will be further addressed

An inquisitive attitude

A theory or theoretical concept materialises slowly but surely *during the course of* the research. The researcher must keep an open mind in order to absorb all the impressions received while studying research data and relevant literature. ***Theoretical sensitivity***: refers to the attribute of having insight, the ability to give meaning to data, the capacity to understand, and the ability to separate the pertinent from that which isn't. In the social sciences this attitude of the researcher is known as a **'hermeneutical' or *'verstehende'* attitude**. This can be distinguished from a hypothetical-deductive attitude of the survey-researcher who is often involved in testing hypotheses. An ***inquisitive attitude*** implies that the researcher is constantly alert and is not carried away by fantasy and creativity. Instead he or she must **maintain a critical and sceptical attitude towards** the development of the theory at hand. It is essential that the concepts developed are tested for their validity. If they cannot stand the empirical test, these concepts are to be set aside immediately.

A process of continuous comparison

The research technique associated with **the grounded theory approach** is **often referred to as the method of continuous comparison**. There are many ways of making comparisons:

a) ***Primary empirical comparison:*** The researcher may **compare a phenomenon** he or she has **observed with another phenomenon described** in the same research project.
b) ***Secondary empirical comparison***: The researcher compares the phenomenon he or she has observed in a **similar or comparable phenomenon described by others**.
c) ***Primary theoretical comparison***: The researcher **compares the phenomenon he or she has been observing with the theoretical insights developed** on the basis of **previously found**

phenomena.

d) ***Secondary theoretical comparison***: The researcher **compares a phenomenon with theories formulated by other researchers.**

e) ***Comparison of theories*:** The researcher compares the theoretical concepts he or she has developed **with other theoretical concepts**.

f) ***Deductive comparison***: On the basis of a theory, the researcher **derives the prevalence of a characteristic of a phenomenon**. In his or her research project, the researcher sets out to look for **similar characteristics**.

g) ***Inductive comparison***: The researcher establishes a **characteristic of a phenomenon** in reality and **subsequently searches in existing theories to find an explanation for this characteristic**.

The researcher can choose **different comparative methods**. This research strategy has an iterative nature with regard to both the designing of the research project and the research activity itself. Moreover, it is of crucial importance that the researcher carries out these activities in an **accurate and transparent way. Each step needs to be recorded in order to indicate how he or she has reached certain conclusions.**

Procedures and techniques

The following techniques are **complementary and the researcher may use them during any stage of the research project:**

1. ***Sensitising concepts and open coding***: The first stage involved in theory building following a **grounded theory approach** concerns **exploration of the field of study.** Sensitising concepts are vaguely defined, but inspiring or intriguing concepts. At **the start of the research project the precise meaning of these concepts is left open. During the course of the research a more precise meaning is gradually attached to these concepts according to the findings.**
2. ***Axial coding*:** The concepts and insights **then need to be improved with a new or more specific meaning.** This process **continues until the concepts have sufficiently crystallised into satisfactory clear concepts that cover important aspects regarding the field of study that is to be analysed.** In this process, the *conditions and context* associated with the *phenomenon* are indicated, as well as the *strategies for action* that bring out the phenomenon and the *effects* of these strategies.
3. ***Selective coding*:** The multitude of phenomena described, and the formulated concepts and key words, are reduced to a concise description of the theory that is to be developed. This is done by determining the key concepts and by formulating the essence of the relations between the key concepts on the one hand, and similar phenomena in a specific *line of argumentation* on the other.

After formulating the key concept and the central line of argumentation, the theory is further elaborated. It is essential to carefully formulate the connections between the distilled key concepts and the remaining substantive concepts of the research project.

Variants

There are **no standardised variants** of the **grounded theory approach**. You can make your own design by emphasising certain aspects and making a selection from the various comparison methods.

Advantages and disadvantages

Advantages

- it can be used to **develop a theory that is, despite its abstraction, easily recognised by the people referred to in this theory.**
- It is also a method that enables the researcher to obtain an **overall picture of a complex situation.**

Disadvantages

- there is a risk of getting **lost in this complexity and** letting one's imagination take over.

Effective use

The grounded theory approach is suitable when a theory is developed in a new area, or area not yet, or hardly, been studied. This strategy is also useful for developing *parts* of the set of research questions.

5. Desk Research (V)

Desk research is a research strategy in which the researcher does not gather empirical data herself or himself, but uses material produced by others.

Characteristics

1. the use of **existing materia**l, in combination with reflection;
2. the **absence of direct contact** with the research object;
3. the material is used from **a different perspective** than at the time of its production.

In desk research the material used has been produced entirely by others. This means that you do not conduct any interviews or observe any processes yourself.

Three categories of existing material can be used for carrying out desk research:

1. **Literature**: is understood to mean books, articles, conference proceedings and such works that contain the knowledge products of social scientists.
2. **Secondary data:** we mean empirical data compiled by other researchers or yourself during previous research projects (i.e. records of interviews). Secondary data can emerge from a survey, an experiment or a case study. Material from a grounded theory approach is generally unsuitable for use in secondary research.
3. **Official statistical material**: is understood to mean data gathered periodically or continuously for a broader public.

Characteristics 2 and 3 **result directly from using existing material**.

Variants

1. Literature survey

In a literature survey the researcher would use *knowledge* produced by others (knowledge sources). When carrying out a literature survey the researcher is completely dependent on existing specialist literature. This research strategy is for instance used to map out the latest theories pertaining to a certain subject. The way the selected literature is studied depends completely on the objective of the researcher.

2. Secondary research

Rearranging existing data, and analysing and interpreting this data from a different perspective during the course of the project. It requires the use of reliable scientific data. However, statistical data could misrepresent the facts completely, in spite of the fact that the data is correct from a technical point of view. In secondary empirical research the researcher frequently uses statistical data that is processed and analysed in a *quantitative* way. However, he can also make use of *qualitative* research data when carrying out a secondary research project.

Advantages and disadvantages

Advantages

- The most important advantage is that the researcher is able to use a **large amount of data quickly**.

Disadvantages

- The material used in principle has been gathered for ***purposes other*** **than those the researcher intends to use it for**. He or she must **simply use it as efficiently** as possible.
- The fact that the researcher does not produce his own material has the consequence that the formulation of the research objective and the set of research questions depends on whether all

the material can be found that is needed in the available sources.

Effective use

Basically, all research strategies that use research material that has been gathered by others can also be carried out as a desk research project. We can carry out a secondary analysis of the research material that will have all the advantages a survey research strategy has to offer, without the disadvantage of time-consuming data gathering.

Desk research strategy is efficient if the material available is appropriate for the research objective and the set of research questions at hand. A second circumstance, under which a secondary research project is the obvious choice, occurs when data carriers are used as research objects.

Step-by-step approach

1. Decide whether you will opt for ***breadth* or *depth*** in view of the research objective and your own expertise and interests.
2. Decide whether you will opt for **a *quantitative* or a *qualitative*** approach, by using the same type of arguments as in Step 1.
3. Determine whether you will opt for **an *empirical* or a *non-empirical* type of** research.
4. Select ***one of the five research strategies*** outlined in this chapter to use in the research project, not necessarily in its exact form, based on the decisions taken in the steps above.
5. **Choose one of the *variants* of the strategy selected** and determine its **detailed *characteristics***, on the basis of the research objective and the set of research questions.

Chapter 7 (Research material)

One of the first steps in constructing the technical research design is to decide what kind of material is needed and how and where to gather it, i.e. the data sources. The researcher needs to convert her or his thoughts into actions, and theory into empirical reality.

General aspects of research material:

1. In general there is an ***abundance and diversity of*** **available material** to choose from.
2. One needs to be ***resourceful*** to come up with interesting material.
3. It is necessary to **make *choices*** and to delineate the research project.
4. ***Different motives*** can play a part in making these choices within the limits of the research goal.
5. There is often great ***freedom*** in choosing from the options available**./flexible choices**
6. The researcher can even **change the set of research questions** according to their preference for a method of gathering material, but it must be part of an iterative design.
7. The research designer must also have some idea of the *advantages and dis* ***advantages*** **and the *possibilities*** of the options available, in order to achieve significant results.

Data:

Sources available

The reader needs to know the *objects* about which data will be gathered, and the *type of information* that is needed. The following questions need to be answered successively:

a. What are the main categories **of research objects** that can be distinguished? **(a)**

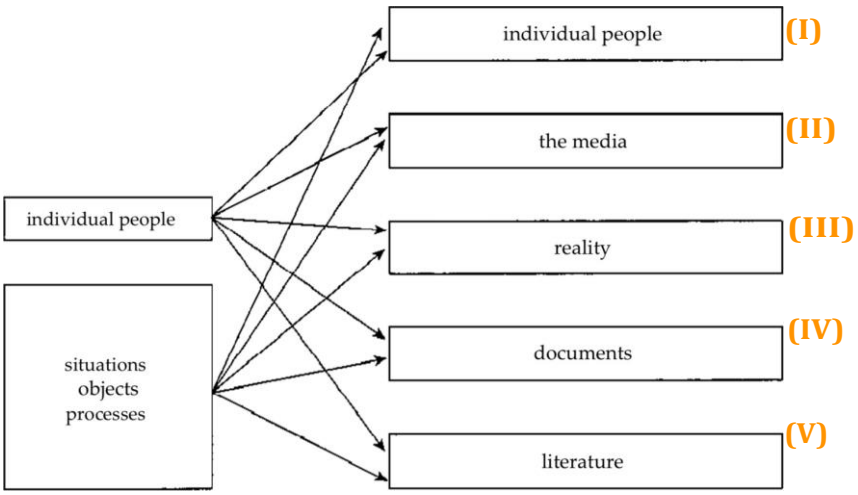
- **Empirical or deterministic objects**

b. **What types of information** on these objects are relevant to the research project, and how can this information be identified? **(b)**

- **Facts or knowledge**

c. **Where this information can be gathered** or how can it be generated?**(c)**

- **Sources may in itself also be the research object**



7 types of sources: people, the media, reality(direct measurements-experiments), documents, literature, previous set of data (other institutions) and simulations.

(a) The first question is about the objects in empirical reality that the information we are looking for relates to. In the left column of figure above is a classification of these phenomena into two broad categories, i.e. (1) individual people (or groups of people) and (2) situations, objects and processes. **Individual people** as the object of research are local government officials in charge of compliance with the Noise Pollution Act. We refer to a situation as a research **object** if, for example, the noise pollution at Schiphol Airport in Amsterdam is being studied. The object of research can also be a physical one. The object of research can be a **process** if we study the development or implementation of something.

(b) Regarding the second question, roughly speaking, two types of information are important in social science research:

a. **Data** (or facts): For data the emphasis is on the characteristics of research objects. In other words, anything that makes up a research object. In quantitative research we refer to these as variables, i.e. characteristics that vary in a research project. It is a characteristic of data that it can be represented very concisely using only a minimum indication. This is done through numeric codes, but in a qualitative research project this can consist of brief notes from the researcher.
b. **Knowledge**: The second type of information, i.e. knowledge, is found in the form of ready made *insights* and *theories* that have been developed previously by others. Knowledge involves reasoning and therefore more text is required.

In case of both data and knowledge, it is the researcher who is responsible for integrating the separate elements by thinking about them, analysing them and drawing conclusions.

(c) Regarding question three, in the right column in figure above, five types of sources have been distinguished. A sixth source of material that can be used for a research project is data that has been gathered earlier by other people or institutes. Following these types of sources will be discussed.

(I) People

In social science research the main sources of information are individuals. There are two potential advantages of people as sources of information:

a) People, either individually or as a group, can provide a very wide *diversity* of information.

b) This information can be gathered in a relatively *quick way.*

Diversity

There are three ways in which people can act as a source:

1. A person supplies information about himself or herself. This person is called the ***respondent***. For example: their opinions, beliefs, interests, motives, attitudes, skills.
2. Someone provides data about other people or about situations, objects or processes he knows about. Here, the person acts as an insights about the operator's compliance

   . An informant provides information about other people or about things not directly pertaining to himself or herself.
3. A person acts as the supplier of knowledge. This person is referred to as an ***expert*** (in the broadest sense of the word). The group of experts is not restricted to people who have specialised theoretical and practical knowledge. Expertise based on experience can often represent a welcome source of knowledge.

In the first two cases individuals serve as a data source, and in the third case they are a source of knowledge.

Speed

Two reasons account for the relatively high *speed* with which information can be obtained from people. First, distances in place and time can be easily bridged when using people (ie. somebody who has traveled to Russia can the researcher about it, rather than having to travel there himself). Secondly, this information can be tapped into through a specifically chosen stimulus-response technique (i.e an interview). We can stimulate someone to give information by means of questions and statements or we can use other stimuli such as pictures or actions, to give precisely the information that is required for the research project. In other words, we do not need to wait until something comes up, as is the case when observing a process or studying documents.

Advantages and Disadvantages

Advantages:

- Wide *diversity* of information.
- Speed of obtaining information.
- The researcher is able to *steer* the people he or she is interviewing, and therefore he or she can be *certain* to receive answers to his or her questions.

Disadvantages:

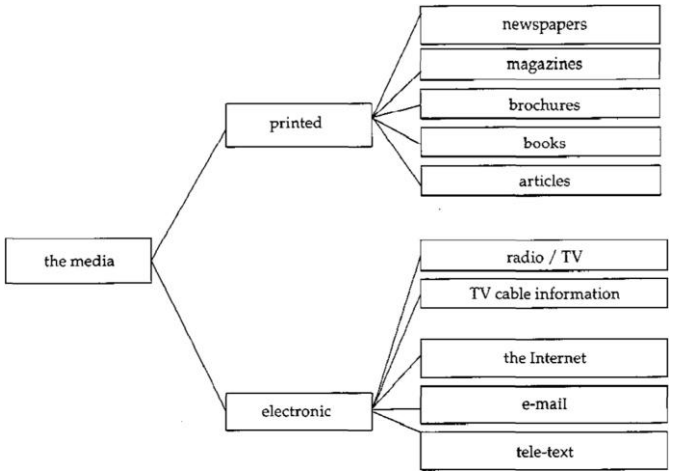
- When investigating something people find difficult speaking about.
- Strongly subjective answers.

Effective use

If the research objective is time-consuming, and if it is not certain whether it is feasible, then using people as a source of information may be the answer. Another reason for using people as a source occurs in some types of evaluation research.

(II) The media

The media is understood to be the communicators of information intended for large audiences. The difference with documents is that with documents there is an addressee. What the diagram below does not show is that in addition to the currently well-established public media, certain private media are becoming more popular, too.



The most important media source nowadays is the Internet. Most of the information on the Internet is provided by amateurs. Hence, the validity of the information can be presumed to be questionable.

Advantages and Disadvantages

Advantages

- The main advantage of using the media as a source of information for empirical research is the usually high *information density* that it provides when it comes to public issues; it has a high level of *topicality* and a wide *geographical scope,*

Disadvantages

- Not all types of research issues can be linked to relevant media reports. Moreover, you should be aware that some of the information provided by the media has a rather fleeting character and

should not be given any 'permanent' significance.

Effective use

If the research object is time-consuming, and/or if it covers large geographical regions, the media is often one of the few options available for obtaining a complete picture without making an extreme effort. In most cases the media provides information about situations, physical objects and processes in the empirical reality, but also individuals or groups can, in principle, be studied by using the media.

(III) Reality

There are two reasons why reality could also be included in the right column containing the types of sources:

1. The first reason is that reality is sometimes a *direct* object of measuring (i.e. if we determine the duration of a production process, in that case, the object examined is in itself a source of information). The category 'reality' only contains people if measurements have been carried out on them *directly,* such as measuring their height, or taking their temperature, and not indirectly, by asking them questions.
2. The second reason is that situations, objects and processes sometimes provide *indirect* information about people (i.e. the interior of a building will tell us something about the hierarchy within the organisation it accommodates).

Advantages and disadvantages

Advantages

- most important advantage of direct measurement and 'unobtrusive measures' is the high degree of objectivity that be obtained in the results.

Disadvantages

- A notable restriction that applies only to reality as a source of information is that it can only serve as a data source and not as a knowledge source.

Effective use

Generally, the use of reality as a source of information is always interesting if the set of research questions is about matters that people do not talk about easily, or matters of which they are not very aware.

(IV) Documents

Documents resemble the recorded media, but they differ in that, in principle, documents are addressed to a specific public, i.e. an addressee, whereas the media is addressed to a wider and undefined public. Documents could be filed in archives.

Advantages and disadvantages

Advantages

- often available in great quantity and in such a wide variety that, in general, they cost little to gather and to use.
- it requires relatively little specific skills to use them.
- A methodological advantage is that behavioural responses are not provoked, as is the case when questions are posed during an interview.
- They are 'durable', meaning that if we wish, we can refer to them constantly.

Disadvantages

- overwhelming amount of information at hand, could pose a difficult problem to the researcher, since he would need to make a deliberate selection or draw a random sample.

Effective use

In most research projects various types of documents can provide useful *additional* information. Documents can play a particularly important role in a research project that has a *historicising set of research questions.*

(V) Literature

Literature that contains information on a specific discipline is what the researcher should be looking for *first* if he or she is conducting research. We use literature as a *knowledge* source, but it can also serve as a *data* source. This could be the case if the literature consists of objective descriptions of reality (you will be looking at reality through the author's eyes).

Literature comes in various ***forms*** *and variants.*

- *Monographs*: much scientific research is published in this form; bulky books that deal with one subject only.
- *Editorial volumes*: These volumes deal with a coherent body of subjects, but the various chapters have been written by different scientific authors.
- *Specialist journals*: form of scientific publishing is to write scientific articles in specialist journals.
- *Hand-books*: scientific views are included in the so-called *hand books* on a particular subject.

Advantages and disadvantages

Advantages

- An advantage of specialist literature as *a knowledge source* is that in many areas profound insights have already been acquired, eliminating the necessity to start all over again.
- The advantage of literature as a *data* source is that the researcher does not need to go to great lengths to gather all the material himself or herself. However, he or she most probably will not find all data and information required for the research objective and the set of research questions in the literature.

Disadvantages

- The disadvantage of literature as a knowledge source is that all those carefully edited books that are often written in difficult language, often exude a great degree of authority, making the researcher follow the authors too closely.

Effective use

The existing literature on a specific discipline provides relevant and necessary information for various parts of a research project.

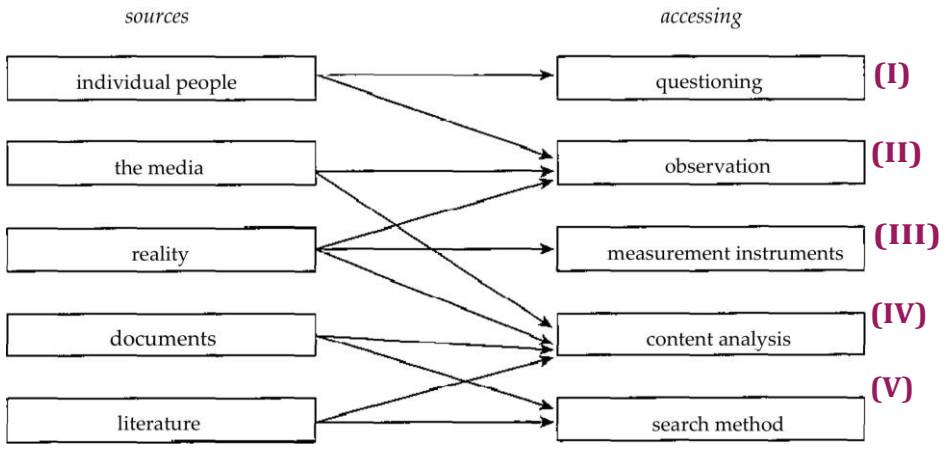
- literature is required when the research design is constructed.
- rough exploration of the literature can be useful for defining the perspective of a research project
- literature is usually essential for the unravelling, defining and operationalising of key concepts.

People, the **media** and **documents** function mainly as a *data source* and to a far lesser extent as a *knowledge source*. The opposite is true for **literature**. Reality itself functions almost by definition as a *data source*.

Source triangulation is suggested in general (consulting several sources when carrying out a research project).

Accessing sources

How the required information can be extracted from the sources selected. In the right-hand column of figure below five methods have been classified that we can use. Each method is specifically suitable for one or several types of sources.



1. *Questioning*

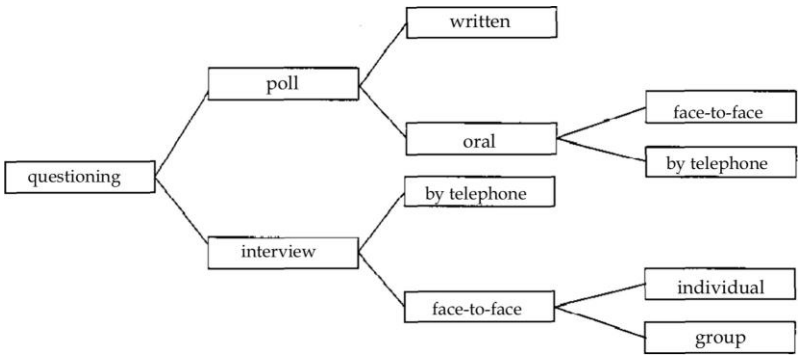
It is an activity that is steered by the set of research questions and the operationalising of key concepts, in the course of which the researcher will try to extract the necessary information from a pre-selected group of individuals by offering stimuli, usually a poll that contains questions and/or statements.

As shown in the diagram in figure below, there are different techniques for asking questions. These are classified into two main categories, ***interview*** **and** ***poll***, and they differ from each other in two aspects:

a. **the degree to which the interview has been pre-structured;**
b. **the degree to which the set of research questions is open**.

By **pre-structuring** we mean that **before the questioning takes place the questions have been consistently and precisely defined in the same way for all individuals to be questioned.** Based on the two aspects mentioned above, an interview can be characterised by a limited degree of pre-structuring, and an **open style of questioning**.

A **poll** is characterised by (a) a high degree of pre-structuring, and (b) closed questions. Both questioning techniques have their variants. The ***telephone*** variant takes up less time than the ***face- to-face*** variant of interviewing. Face-to- face variants, however, give the researcher the **advantage of observing the expression** on the face of the interviewee and other body language.



In the ***group interview*** or focus group interview, a number of people are brought together for a collective interview. Typical for this type of data gathering is that people can respond to one another. This may be an advantage if the researcher wants to extract information from people on subjects they have not previously thought about.

The ***Delphi*** method is an interviewing technique that resembles both a **group interview and a written poll.** It is specifically used for **questioning** ***experts*** and is, therefore, a method for **generating** ***knowledge,*** **rather than generating** ***data.*** The most important advantage of the *Delphi* method is that

the participants can form a **well-considered opinion** in which **various viewpoints** have been placed next to each other.

Effective use

Essentially, the method of interviewing *respondents* is an efficient way for the researcher to obtain data when the research objective and the set of research questions require people's views on a subject, on the emotions evoked by this subject and how the respondents would like the subject to be dealt with.

2. Gathering observational data

Gathering observational data is a method for generating data in which the researcher observes individuals, situations, objects or processes using a steering ***observational scheme***. An observational scheme is an **overview o**f the subjects that have been **derived from the research objective** and the **set of research questions**, and which are indicated in **key words** that need to be **examined and monitored during the observation.** These are also referred to as *observational* ***categories***. For gathering observations in the field there are two variants, a pre-structured and an open variant. The distinction between the two is roughly parallel to the difference between a poll and an open interview.
Participant observation: if the researcher participates regularly in the daily activities of the group in order to prevent people to behave differently to how they usually would.
Timekeeping: This method offers the possibility for the participants to keep track of their activities themselves from hour to hour (or from half hour to half hour) instead of the researcher.

Effective use

Observation and timekeeping are the appropriate methods for monitoring people's activities over a longer period if this is important for answering the research questions. However, gaining insight into people's behaviour does not necessarily have to be the only motive for choosing to make observations. This method could also be important for gaining a **proper *understanding*** of people's views and behaviour.

3. Measurement instruments

In this context a measurement instrument can be described as a **mechanism**, an object or a procedure by means of which we can ***directly*** **quantify or qualify phenomena** in real-life situations. **Written questionnaires, observational schemes and category** systems (see also the method of content analysis further in this summary) can, also be considered measurement instruments.

Effective use

More often, measurement takes place by means of questionnaires when interviewing, observational schemes when gathering observational data and category systems when analysing the contents of media and documents.

4. Content analysis

Content analysis **generates data from documents**, the **media and from reality**, often with the help of a ***category system***. Literature, too, can be studied by means of a content analysis, that is if it is used as a data source. When literature is used as a source of knowledge, such as in the case of a literature survey, the strategies as described in chapter 6 under Desk research can be followed. A category system is in fact a measurement instrument, as is the questionnaire that is used in interviews and the observational scheme in observations.

There are two main types **of content analysis, i.e. the qualitative and quantitative form.**

1. A strictly qualitative content analysis concerns extracting information from a large quantity of textual and/or audio-visual material that is relevant for the researcher.
2. If the contents are classified into closed categories, then a *quantitative* content analysis is carried out. In this type of content analysis the researcher mainly focuses on establishing the importance of certain subject matters, statements or approaches based on quantitative indications of the subject matter concerned (How often? How much? How long?).

Effective use

A content analysis of documents, media (literature included) is one of the most important elements for acquiring relevant research material, as these usually are:

- abundant and diverse and;
- consequently may be a welcome addition to interviews and observations;
- relatively easy to access and;
- fairly 'durable' By durable we mean that documents, unlike individuals, can be consulted as often and as much as we like without having to deal with tired or bored respondents.

5. Search methods

On most subject matters it will be easy to find an abundance of scientific literature. Obviously, it is impossible to study all this literature within the scope of a research project. A direct search has to be conducted for those articles and books that can assist in carrying out the research project. Therefore an effective search method needs to be used, which will help to select the appropriate literature.

1. Firstly, there are various ***search indices*** based on key words. These can be consulted in most libraries. By means of electronic networks the search indices of most major libraries are accessible through intranet or Internet providers. Limitation: There is usually no information available on the contents of the study.
2. Consulting other compilations, i.e. *extracts* and *reviews.* In several fields of scientific research there are compilations of extracts on major publications and articles in the relevant field. Often publications come with a commentary from experts.
3. Screening the specialist journals that have been selected. These journals present *o* of the articles that have been published in the course of one year. They often present additional *reviews* of recent articles that are considered important, prepared by the editors of the journal concerned. By browsing through several volumes and studying the surveys of these specialist journals, the researcher will soon find the literature that is relevant.
4. A fourth and final method of finding publications is the use of the so-called *snowball principle.* As a first step one or several of the major publications is chosen. Next the contents tables of these publications are read and the bibliographies the author has included at the back of the books are thoroughly studied, and so on.

Effective use

The use of search methods for finding relevant literature, documents and indirect material is important to all research projects. However, it is also obvious that the role of scientific literature in a literature survey or in a theory-oriented research project is usually more important than in an empirical, practice-oriented research project.

Advantages and disadvantages:

Interview vs poll (Two types of questioning)

Advantages

-The poll has the advantage that it is less time consuming.

-The poll can also encompass a larger number of research units than an interview

-Interview subjects can deal with more complicated issues compared to a poll

Disadvantages

-Interviews have less reach (does not apply to telephone interviews)

-Telephone interviews neglect eye contact and body language making it less emotionally intense

-A written poll has higher non-response rate

-Chances of receiving evasive or strategic answers is high in the questionnaires

Interview vs other techniques (observation & content analysis)

Advantages

Interview

- Through interviews we can learn the motives of behaviour

Observation

-Observation are a more suitable instrument if the researcher intends to map the *actual* behavior
-Risk of strategic answers is reduced for observations. Applies in particular to *participant* observations
-There is no 'channel' of expression. Therefore no risk of distortion in observation
-No risk of 'bias' by playing a role in observation

Content analysis

-Little distortion due to strategic answer

Disadvantages

Interview

-It is easier to obtain behavioural *perspective, memories* and *intentions,* and not about the *actual* behaviour when interviewing.
-Interviews assume that the interviewee has the ability to clearly express their thoughts, feelings and experiences. Poses a problem when interviewing kids, sick elderly, mentally ill, etc
-Interviews face the possibility that people will give *strategic answers* when confronted something that is subject to social desirability
-Interviews offer little or unreliable information regarding the physical and social context
-During an interview the natural behavior of the interviewee is discarded as he/she may act differently

Observations

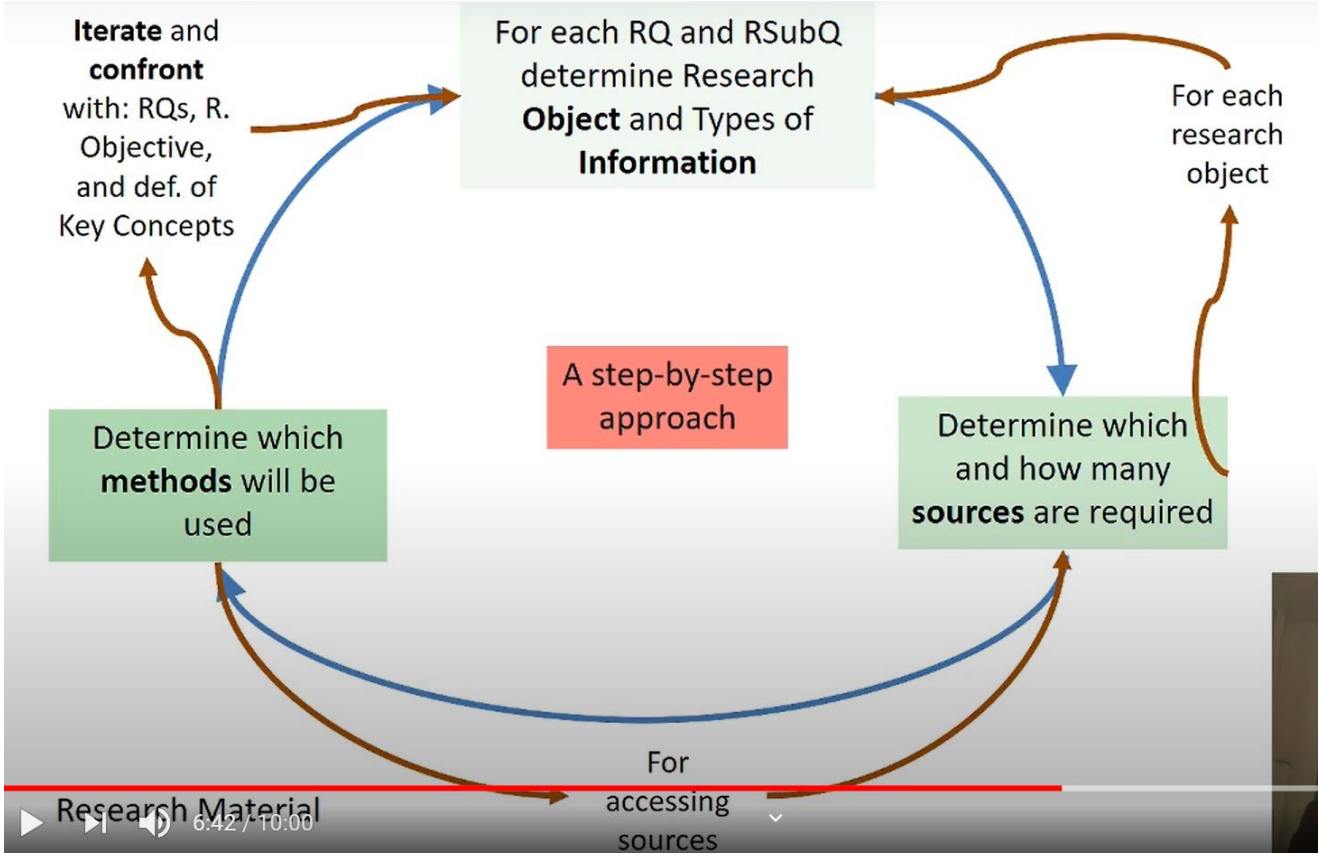
-In observations we do not learn the motives for behaviour.
-It can be troublesome or time consuming to process the outcome of the observation
-The controllability of the research outcome is usually more limited than if interviews were used.

Content analysis

-Documents and media, for instance, are subject to editing

Step-by-step approach

1. For each question or sub-question determine the relevant research objects and the types of information required for these objects. To do this, use the diagram in Figure 7.1.
2. For each research object or type of information formulated in Step 1, determine which and how many sources are required. To do this, use the diagrams in Figure 7.2 and 7.3.
3. For each source in Step 2, determine which methods will be used for accessing sources. To do this, use the diagrams in Figure 7.3 and 7.4.
4. Iterate Steps 1, 2 and 3 by confronting them with one another, with the research objective, with the set of research questions and with the definitions of key concepts. Make adaptations until everything has become a coherent whole. Particularly, pay attention to the feasibility and scope of the research project in relation to the internal and external validity, triangulation and the labour intensity of the various methods.


Iterate and confront with: RQs, R. Objective, and def. of Key Concepts
For each RQ and RSubQ determine Research Object and Types of Information
For each research object
A step-by-step approach
Determine which methods will be used
Determine which and how many sources are required
For accessing sources
Research Material
6:42 / 10:00

Chapter 8 (Research qualitative)

All that remains now is how the research material can be analysed and the results be reported. To a large extend this depends on what the researcher finds during the research. Therefore, these issues will be elaborated on as part of how to plan the research. Planning involves the '*when*' and the '*how much*' of the research project. Planning concerns both the decisions regarding the order and the periods of what must be done, and the decisions regarding the extent of these activities that is feasible.

Research design – should answer

- What
    - Research objective
    - Set of research questions

Then

- How
    - Research strategy
    - Research material
        - How the research material can be analyzed and the results reported

Planning is seen as an objective in itself instead of a means to achieve the objective. Planning is seen as two 'items':

- a *designing* and *stimulating* tool for building a research design on the one hand;
- and carrying out the research project in an efficient way on the other.

Afterwards, this notion of planning is converted into an *activity plan* and a *time schedule*.

What is the wrong conceptualization of planning?

- A time schedule with just a list of activities to be carried out
- Setting out the dates on which the activities should be done
- Dates seeing as definite deadlines
- Planning becomes the objective itself. – and we forget the real objective

How to fix this

- We have an overview of activities
- The intermediate and end products (deliverables)
- Their sequence and timeline
- Planning is a **combination** of process and their products

Research planning also has multiple functions

1. Formative monitoring function
    a. Keeping a finger on the pulse of the project = a time keeper
2. Design function
    a. First: overview
        i. Questions
        ii. Strategies
        iii. Materials
    b. Second: when and which order
        i. Serial
        ii. Parallel

Gnat diagram- Histogram. It establishes the critical route. Scheduling and time axis. Can use peral diagram too. Purpose is to get inspired about the elaboration of table of content.

How to incoreperate the research planning in the TBL. Take a look at qus, method tools and strategies. Should find stepping stones. Parallel or series. Define the critical route. Defende your assumptions (using

literature). Defense is evident in the deliverables.

Characteristics of planning

Planning a research project should be understood as follows (instead of just a control mechanism when doing research):

- **An overview must be made of the activities to be carried out** (and the intermediate/final products) which is the planning **process**
- Including the **sequence and timeline** according to which the activities must **be done**, which is the planning **product.**

It is argued that a plan (as a product) primarily serves to **obtain an optimal method for spending time** and getting **maximum results**. Two different notions of a plan compared to the usual meaning:

- If a goal stated in a plan cannot be achieved, then the cause must be found and measures need to be taken, which is the **monitoring function** of a plan.
- Planning also has two **design functions** (planning considered a process)**:**
    - The designer can contribute in an iterative way when it comes to constructing a feasible and harmonious design.
    - To consider the question *when,* and in which *order,* certain activities can best be carried out, how these activities can be linked with one another and which activities can be performed ***simultaneously.***

It is opted to do a parallel or simultaneous execution of tasks. This is because activities can influence each other in a positive way.

There is now a new concept of planning:

- Planning as a product is seen as an elegant and efficient means to properly guide the project.
- Planning as a process plays an important role in the iterative process that leads us to a feasible and harmonious design.

Serial and parallel planning

We prefer a research approach that can be characterised as an **iterative-parallel** process rather than a linear-serial process. This entails that, when making a research plan we do not aim for a fully serial plan but for a combination of a serial and a parallel plan.

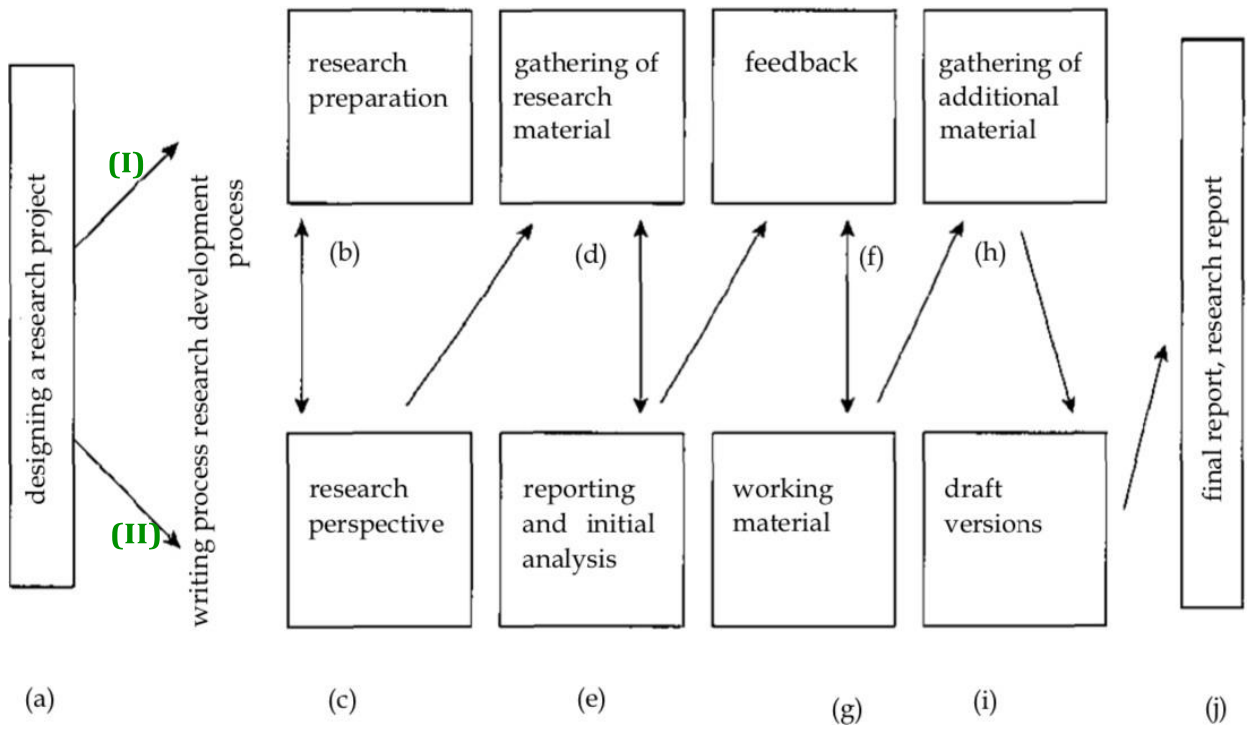
The main arguments:

- During research, periods of waiting are common. Difference between ***working hours*** (amount of time actually involved in an activity) and ***turnaround time*** (the length of time the activity takes). When these differ strongly, several activities must be planned at the same time.
- An iterative approach is also useful when carrying out the research. Therefore parallel actions and thus planning is useful in research.
- Doing activities simultaneously can lead to **synergy** (for instance directly processing interviews after conducting since it is still fresh in mind).

The main consequences for planning as a process are that, on the one hand, the researcher devotes more attention to planning than in the traditional view and, on the other, he or she proceeds in an iterative way. Thus, the researcher should constantly ask herself or himself what consequences the decisions made in the context of the plan have on the design as a whole.

Activity plan

Planning (as a product) can be defined as an overview of activities and its products that are subject to a time schedule. How the activities are related can be seen below. Note that both processes start directly after the design, both groups of activities are interrelated and there is no strict and consistent time schedule.



The above diagram distinguishes between two groups of activities during the execution of the research, namely the ***research trajectory*** **(I)** and the ***writing process*** **(II)**. When carrying out research, we need to be aware from the start that there are two parallel processes or paths involved, i.e. a ***research process*** and a ***writing process*** (both theory and practice research):

- **Research process:** the coherent body of activities concerning the gathering, processing and analysing of the research material
- **Writing process:** the study of research material and the finding of answers to the research questions from this material.

s must precede communicative writing. Conceptual writing is not about producing a text, but about developing ***clear thoughts.*** Only after writing down the separate thoughts, can you combine them into a ***line of reasoning,*** which has three stages to obtain it:

1. Develop *clear thoughts* on the basis of the material gathered.
2. Compare these thoughts and *confront* them with each other.
3. The *formulation* of thoughts.

Without conceptual writing you will be unaware of inconsistencies, leaps of thought, and implicit assumptions. It is therefore essential for delivering a final report that is understandable for others. Instead of the serial method, we imagine a process whereby analysing and conceptual writing is integrated. In addition, we propose that you conduct the writing process parallel to the gathering and processing of research material. In our view, by using this dynamic and efficient working method, you will start writing (conceptually) from the moment you embark on your research.

Working hours and turnaround time

The indicated times here are only rough estimates. All items below are activities in the diagram above.

a. **Designing the research project:** At the design stage, the following are time-consuming activities: exploring the project context, finding out exactly what the researcher and the client want, and overcoming uncertainties and aversions regarding delineation. In addition, a rough screening of the literature, and developing the research objective and the set of research questions in an iterative way are also time-consuming. ***Two working weeks*** and ***one or two months of turnaround time*** are reasonable estimates for building a research design for a

final project.

b. **Research preparation:** Firstly, the researcher will need time to *become familiar* with the context in which he or she is going to carry out the research, and or, with the theoretical material that needs to be studied. Furthermore, the preparation time for a research project depends on the research strategy that has been selected. Preparing research can easily take up to ***three or four working weeks*** with a similar turnaround time. Other research strategies,
i.e. the case study, the grounded theory approach and desk research, often require less time in preparation, but have the disadvantage that carrying out the research usually requires proportionally more time. If the researcher designs a research project using the above strategies, about ***one or two working weeks*** and ***two or three weeks of turnaround time*** should usually suffice.

c. **The research perspective:** After this stage the research perspective will have been specified, possibly in the form of a conceptual model. Please note that the research perspective will have been specified as part of the writing process rather than as part of the research process. We have based our recommendation on the fact that the research perspective should be developed in a conceptual form as soon as the research project has started. This specification is meant to be included after some iteration in the research report at a later stage. ***Two or three working weeks*** and the ***same amount of turnaround time*** will usually suffice.

d. **Gathering research material:** It is difficult to give general guidelines concerning the working hours involved in gathering the research material as they strongly depend on the research strategy selected.

- *Questioning*: Conducting a *written or oral poll* is usually time-consuming, despite the advanced technological tools the researcher has at her or his disposal. The *large number* of participants that are used in a written poll usually makes it a time-consuming activity.
- *Observation*: If the plan is to observe a work process using a method of timekeeping, for example an order flow or an administrative procedure, this could easily involve three full working days per workflow. A participant observation generally involves more working hours.
- *Content analysis*: Example with six weeks in order to categorise, process and analyse the data.
- *Search methods*: Example with a full five weeks

e. **Reporting and initial analysis:** This activity brings us back to the writing process. As soon as the research material has been gathered, notes should be taken of anything that has drawn attention during the gathering and initial processing of the material, and a report should be made. Consequently, this report furnishes an *initial analysis* of the research material as well. As a general guideline for making a time schedule, you should reserve ***as many working hours*** for activity (e) as is required for activity (d), i.e. 'gathering research material'

f. **Feedback:** The objective of this activity is to check whether the material that has been gathered is correctly reported and interpreted. When parties check if they can recognise their opinions in the report: ***member check***. This activity should involve a maximum of approximately ***one working week***.

g. **Working material:** The next part of the activity plan is also part of the writing process. At this stage the researcher *rearranges* the results of the activities by *writing them down* and *processing* them into working material. The researcher should reserve at least ***a few weeks*** of working hours for this activity.

h. **Gathering of additional material:** During the research project, the researcher often finds that not all of the material needed to fully answer the research questions is available yet. He or she may therefore decide to conduct additional interviews, study new documentation and literature, or carry out an additional experiment. The reader is well advised to reserve ***one or two working weeks*** in advance so that additional supplements can be made.

i. **Draft versions:** By this stage the researcher will have gathered sufficient and sufficiently detailed material to start writing the draft version(s) of the final report. Note that we still refer to conceptual writing. While writing and rewriting, the working material will be analysed again, but this time from the perspective of the research objective and the research questions, and

preferably one research question at a time. If multiple versions have to be written, then the

researcher will need to reserve at least ***four working weeks*** to write and rewrite the various draft versions.

j. **Final research report:** The research report does not only answer the research questions, it also states to which degree the objective of the research project can be achieved. Moreover, suggestions and recommendations are made, which are linked to the research objective. For converting the final draft version into a final version, the reader should reserve ***three to four working weeks.***

Table of contents

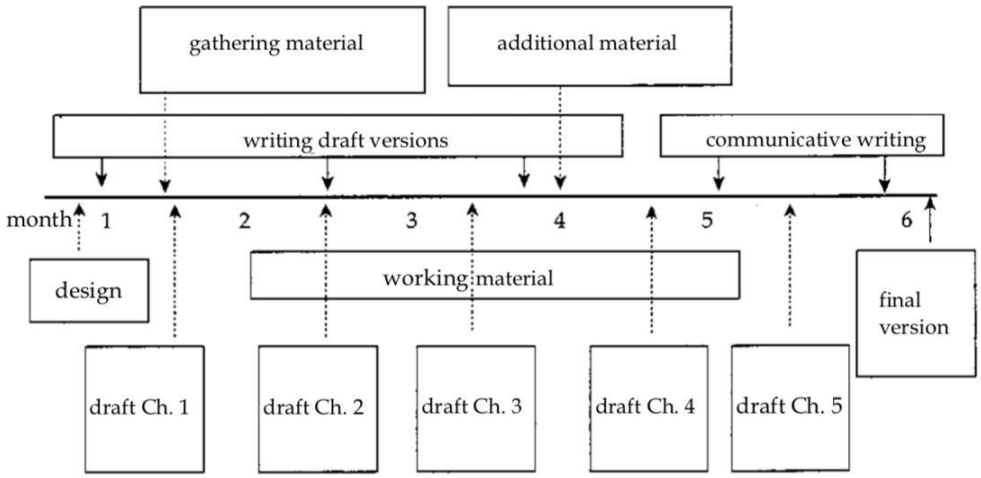
An important contribution to the designing of a research plan is the compilation of a generic and provisional *table of contents* for the research report. The most important design feature is the search for *significant* and especially *brief* titles for the various chapters and sections, where the search for titles is of strong iterative nature. The value of the designing activity is therefore more in the process than in the product, which in this case concerns the titles themselves.

A rough outline of a final report:

- Chapter I .....: The first chapter includes an introduction to the research project.
- Chapter II....: In this chapter an elaboration of the theories that have been used takes place. This chapter contains an answer to the first central research question.
- Chapter III Methodological justification: This chapter provides a justification of the research methods and procedures, as determined in the technical design.
- Chapter IV Results: Here the results of the research project are presented.
- Chapter V Conclusions and recommendations: Finally we report the conclusions that have been deduced from the results, and we present the recommendations which have been concisely formulated in such a way that they help achieve the research objective.

Time schedule

The ***Time schedule*** indicates during which period the various activities will be carried out, and when certain activities and intermediate products (for example draft chapters) will be completed. A useful way to represent a time schedule is with a ***time-axis***



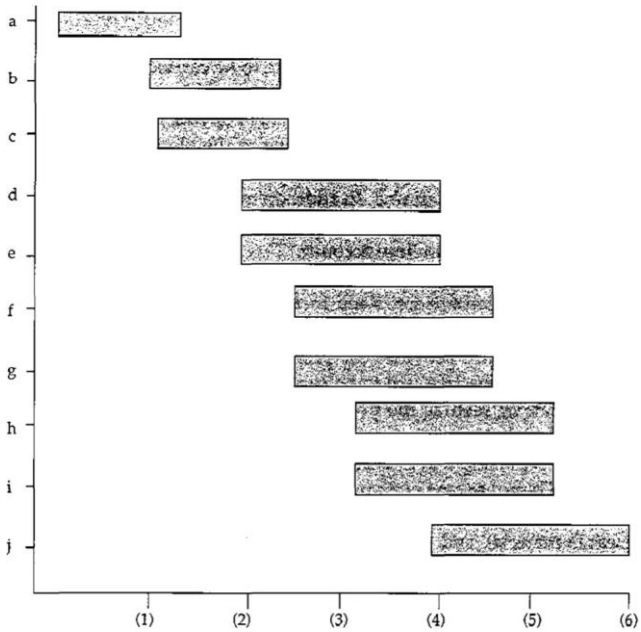
The length of this axis represents the entire duration of the project. On the line we mark the relevant dates of the planning. Above the line we indicate in each relevant position which activities are to be carried out during this period. Below the line the products and intermediate products of these activities are indicated. An **advantage** of the time-axis is that we can see at a glance which activities and results in the project as a whole must be completed at the various stages. One **disadvantage** is that parallel planning is not shown.

A better way to illustrate parallel planning is using a ***Histogram***, which is shown below. The vertical line represents the activities that are to be carried out during the research project. When drawing up a histogram, the researcher needs to consider the proportional division between serial and parallel planning. There are a few considerations:

- First, activity (a) 'designing a research project' is of course the *start* of all the activities that will be carried out.
- Subsequently, activities (b) 'preparatory research' and (c) 'specifying the research perspective' are to be carried out *simultaneously.*
- Next, in most cases activities (d) 'gathering research material' and (e) 'reporting and making an initial analysis' can be carried out simultaneously
- The activities (f) 'feedback', (g) 'working material', (h) 'additional research material' and, (i) 'draft versions' often merge together and in most cases it is wise to make a plan to carry out these activities *simultaneously.*
- The activities relating to the final versions of the products (j) of the research project have been placed at the *end* of the trajectory.

Note that some research strategies are more difficult to plan in a parallel way that others. In this

Figure 8.3 Time schedule for a research project



respect, the survey and case study are each other's opposites. Regardless of the strategy chosen, it is still recommended to determine for each part of the activity plan when serial planning is necessary and parallel planning is useful.

Systems thinking

we will address different concepts mostly on hard system thinking. and how a potential case u may handle can be categorized depending on the participants and depending on the complexity of the project.

There are 4 reasons of why we should the thinking in systems

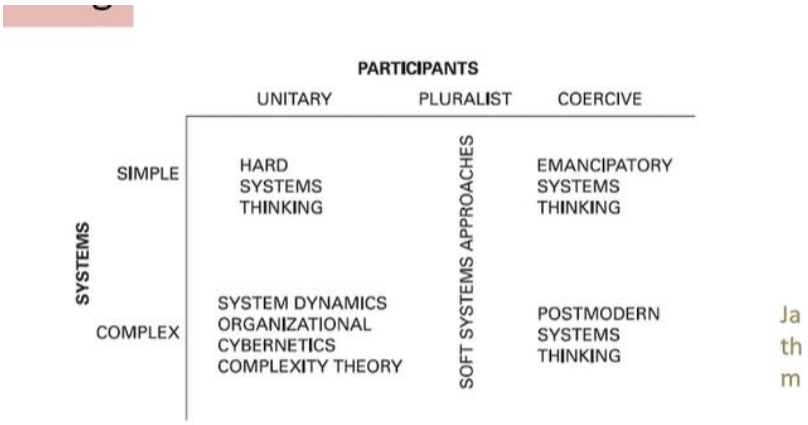
- Emphasis on holism offers a useful corrective to the reductionism.
- Emphasis on process as well as structure
- Transdisciplinary
- Suitable for getting to grips with real-world problems

Soft systems thinking.

- Problem context are pluralist and provide recommendations for the analysis and intervention on that basis.
- The notion that is was possible to assume easily identifiable. Agreed-on goals is abandoned
- Notion that could not be used to provide an objective account of the system and its purposes.

Hard systems thinking

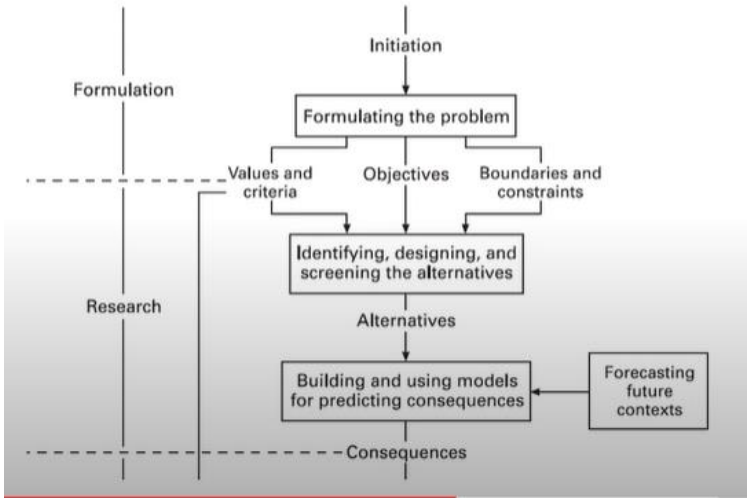
- Participants defined as being in a unitary relationship have similar values, beliefs, and interests. They share common purposes
- Problem contexts are not extremely complex



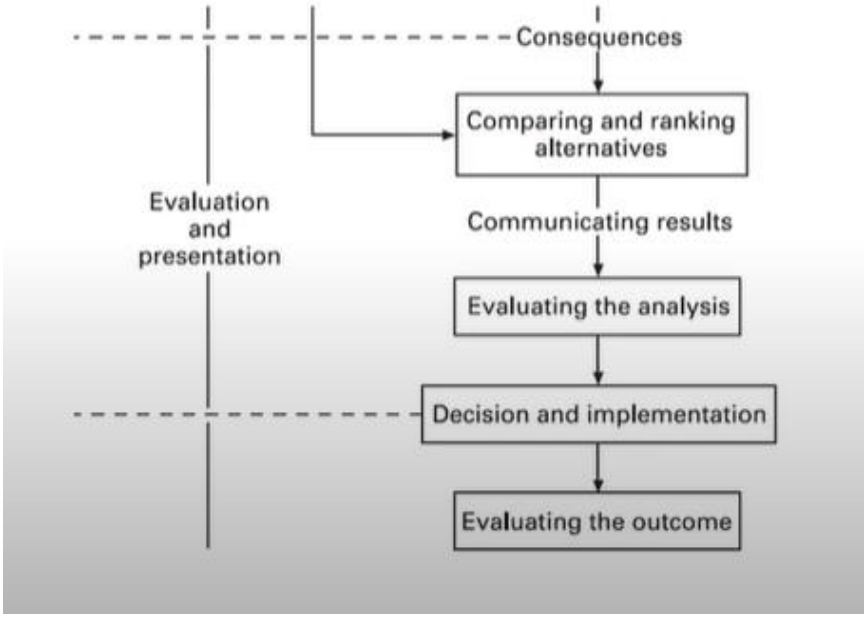
Systems approaches related to problem contexts in the system of Systems Methodologies

Systems analysis methodology:

The systems analysis methodology: **Formulation and Research**



Formulation to research then the operationalization, the research itself, and building models in terms of systems thinking.



Example: Types of analytic model

	Steady state	Dynamic
Deterministic	Algebraic equations	Differential equations
Non-deterministic	Statistical and probability relationships	Discrete-event simulation

Dynamic is time based. Steady state means not time dependent.

This matrix represents thinking systems and is a way to address your system or model.

The holistic approach when formulating a problem statement. And before that analyzing the problem context, in terms of a system defining inputs and outputs. Defining if its if hard of soft.