

Designing a Research Project

DESIGNING A RESEARCH PROJECT

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PREFACE

Many handbooks have been written on the subject of research methods and these are all available to the reader when carrying out a research project. However, there is far less material available concerning the problems a researcher encounters when he or she is engaged in the previous process of *designing* a research project. This book was born from the idea that people are often faced with many problems during this initial stage of a research project. It is our aim to help the reader to design an adequate research project successfully.

The guidelines and methods presented for designing a research project have been developed from a clear vision on research. A current vision on research can be described as being linear-serial. In this vision the various components of a research project are dealt with consecutively in a methodical way. In contrast to this perspective is an iterative-parallel approach. Here a research project is seen more as a process during which various components are carried out simultaneously. The researcher is continuously returning to previous decisions and findings to determine to what extent it is desirable or necessary to adjust them on the basis of later decisions and findings. We wrote this book from an iterative-parallel perspective.

This book largely draws on insights that have been developed over the years within the scope of a course on 'research design', which was attended by students from a wide range of disciplines. This diversity of participants forced us to develop general methodological guidelines which are not restricted to certain disciplines. We would like to thank these students for sharing their experiences with us.

Notes to the second, revised edition

Despite the fact that the first edition of this book was well received and apparently met the demands and wishes of the educational programs, we have decided to introduce in this second edition several important adjustments, moderations and additional sections. We have extended the presentation of the intervention cycle, and the elaboration of the set of practice-oriented research types which are based upon the distinct phases of the intervention cycle (see Chapter 2). In addition, we further specified the technique of unravelling key concepts. We updated the numerous examples in our book and added many more examples in order to present the reader with a wide variety

of examples from many different social sciences. We also added an extended series of assignments throughout the book, which offers the readers multiple opportunities to test their knowledge and to practice their skills in designing a research project.

In the Appendix, we added a thorough discussion about designing conceptual (causal) models. We have presented a step-by-step plan with many examples, which will help the reader to master the difficult, but very important, subject of developing and applying these models.

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INTRODUCTION

The aim of this book

For many researchers, the initial stage of a research project often proves to be the most difficult. This holds true both for those whose job it is to carry out research projects as well as for bachelor and master students who are starting to write their assignments for their finals, and PhD candidates who are embarking on their dissertation projects. Experienced researchers are aware of the problems in formulating an exact definition for the problem that has to be solved, or in dealing with the specific way the commissioning party of the project precisely envisages the assignment. Students or PhD candidates face similar problems and very often they do not have a well-defined idea of what the project entails and what is expected of them. These starting-up problems can cause great uncertainty, both to those carrying out the project and their supervisors. As a consequence, this can be detrimental to the quality of the project. Moreover, such a poor start does not contribute to the pleasure found in carrying out the work. Therefore, it is important to be as well prepared as possible when embarking on a research project.

Apart from this general background, there are two specific reasons for training in designing research. The first reason regards contract researchers who are commissioned by an external principal. We call this practice-oriented research. One of the most recurring shortcomings of these researchers is that they set to work on the research project too hastily. The research project is often already underway before all of the parties have obtained a clear idea of which problem is to be tackled and what the problem is exactly. This often causes friction between the client and the researcher and, in hindsight, the results of these research projects will usually prove to be of little value. The second reason applies to students who start on their final research project. As soon as a place has been found to do the practical training and the topic of the research has more or less been established, they tend to plunge headfirst into a literature search. However, as they miss a steering set of well-defined research questions, they start reading everything on the subject matter. Much of this will appear unnecessary or of little relevance once the research questions are formulated. So they lose time compared with those who start by formulating a research design.

The root of the problem is that the bulk of the methodology literature implicitly or explicitly focuses on how to carry out a research project. Much attention is

paid to gathering, and particularly analysing research material. Too often one neglects the stage that *precedes* the actual performance. This stage concerns the designing of the research project. The aim of this book is to bridge this gap.

The objective and target group

The objective of this book is to instruct novice researchers, such as undergraduates and PhD candidates, but also the more experienced researchers in contract research, on how to set up an adequate research design in general. We provide them with a method that can be used to design a research project. By following and studying this method, and by carrying out the accompanying assignments, the reader can practice this planned approach. Our method can be applied to any type of research in the social, policy and management sciences, regardless of the precise contents and regardless of the research strategy to be chosen.

This book deals with many different aspects involved in designing a research project, such as: defining the project context, delineating the research project to manageable proportions, defining a realistic research objective, formulating a set of research questions that is sufficiently steering, giving a clear definition of the key concepts and operationalising these concepts in dimensions and aspects, selecting the necessary research material and research strategy, as well as drawing up a project plan. In the Appendix, we pay attention to the design of a conceptual model.

The intended target group for this book includes students and PhD candidates in the arts and humanities: social studies, public administration, human geography and spatial planning, social and political science of the environment, communication studies, organisational studies and business administration, to mention only the most important. The majority of examples in this book are taken from these disciplines.

In addition, we explicitly address the supervisors of students and PhD candidates. Many teachers in academic and vocational education are familiar with the problems associated with monitoring projects. Frequently noted problems are the ongoing preparation time and the duration of the final project. Another problem is the incoherent or poorly grounded statements found in the documents produced. In many cases, students are capable of writing short papers, but as soon as a more extensive document such as a thesis is required, they have trouble sticking to the plan and arriving at an intelligible argument. To a certain degree, this is occasioned by the absence of a detailed research design. Such a design can make clear in advance what the research project is to produce and what is necessary to achieve this. Supervisors of dissertation projects are also familiar with these problems. A dissertation project usually starts with a research proposal on the basis of which research funds have been awarded. In most cases these research proposals cannot be compared with what is defined in this book as a research design. In order to acquire a grant, the proposals

often tend to focus on the scientific merits and the complexity of the proposed project. A research design, however, with a set of sufficiently steering research questions, needs to be set up using entirely different elements. What is required here is not so much the scope of the project, but how to arrive at the required degree of practicality and delineation. The consequences of not paying enough attention to these issues are an inordinately long preparation time and a literature survey that may take up to eighteen months, including the risk of PhD candidates prematurely abandoning their project. Therefore, in this book the reader will find many guidelines and ways of reasoning that are useful to supervisors and assistant supervisors so that they can help to accelerate the start-up stage and shorten the time span of the total research project, not to mention the improvement in the quality of the research results, because they help to design an effective research before the project begins.

A third target group consists of professionals whose job it is to commission a research project and/or to deal with the results of scientific research, such as the policy advisors in governmental organisations, and the staff managers in profit organisations who want to make use of the results obtained in an adequate manner. An often heard complaint is that the results presented and recommendations made are not specific enough to support the required improvements. A main cause of this problem is the lack of fine-tuning between the actual problems in the commissioning organisation, and the paraphrasing of these problems into the research objective and the set of research questions. In Part I of this book, which deals with the *conceptual design* of a research project, we specifically focus on the fine-tuning between the actual organisational problems and the formulation of the research objective, the set of research questions and the conceptual model. The theoretical insights and the training assignments offered in Part I, will help the professionals in the commissioning organisation to make sure that the results of the proposed research will contribute to the improvement required for the organisational policies to be successful.

Finally, a word of warning is appropriate here. The application of the detailed design methodology offered in this book makes it possible to develop a well-structured and steering research design. One may compare the results of our methodology with the design and the specifications made by an architect. Usually, the architect's design and specifications form the start of a successful building process. The same goes for the designer who uses the design methodology offered in this book to make a successful start for the research project. Nevertheless, the reader is advised to delve further into the existing literature on data collection, data analysis and the research strategy that the researcher plans to use, before carrying out these activities. He or she should do this because in Part II of this book, in which we discuss several research strategies and methods of data gathering and data collection, we especially focus on the part of the research methodology that is needed when *designing* a research project, rather than on the execution of the research.

How to read this book

This book does not require specific prior methodological knowledge. The constructive line of reasoning, the many well-elaborated instructions and heuristics on how to obtain results, the abundance of examples and a set of assignments render it suitable for self-study. As a result, the reader is unlikely to run into problems while perusing the text. Designing a research project from the outset is difficult enough. That is why the instructions and the step-by-step plans presented in this book have been kept simple.

Another word of warning also is appropriate here. The straightforwardness of the book may lead to an underestimation of the difficulties encountered when designing a research project. This will change, however, as soon as the reader applies what he or she has learned to the practice of his or her own research. Then it will become clear that the distinct steps of the designing process are more difficult than they first appeared. The process of designing is even more complicated because, apart from the required knowledge and skills, the designer needs creativity and imagination.

The best thing to do is to apply the methodology in this book to an actual research project. Therefore, after finishing each chapter, the reader is encouraged to apply the suggestions and assignments to his or her own research project. We strongly support teamwork in this respect. The process of designing works better with the support of a colleague who is engaged in the same process. Teamwork encourages the use of creativity and imagination. It also offers opportunities for critical reflection and discussions as to weaknesses, inconsistencies, and gaps during the 'work in progress'.

Besides self-study, the book can primarily be used in training courses in which participants in working groups discuss and practice the various elements of setting up a research project. At present, master students, bachelor students and, increasingly, PhD students are given the opportunity to follow these courses at various universities and research institutes.

In order to facilitate this type of usage, each chapter ends with a step-by-step approach enabling the researcher to carry out the relevant stage of his or her research project. Please note the following. If the researcher simply applies the step-by-step plans presented after each chapter to his or her research project, he or she risks losing the benefits of an *iterative design strategy* suggested in this book (see Chapter 1). In a nutshell, the iterative design strategy suggests that the designer continuously switches from the various parts that make up the designing process. That is why we suggest that the researcher acquires the skills of designing a research project in two separate phases. First, he or she should become acquainted with the different methods and heuristics of each individual stage in the designing process, by studying the contents of each of the following chapters in this book. Once the reader has become acquainted with the several techniques and has acquired the skills needed, he or she can

apply the methodology to a real-life project. Only then can the research project benefit best from the iterative design strategy.

In addition, the book can be used as an easy-reference manual for anyone who is about to carry out contract research or who is embarking on an activity comparable to research, such as writing reports and papers, drafting articles and setting up short-term applied research projects. In the past, it has proven to be quite practical when one has the opportunity to reread the basics of research design during a research project.

Again, there is a danger that, as a consequence of the step-by-step plans, the reader slavishly applies these steps, without critical reflection. This will reduce the learning effect, and increase the risk of developing a poor quality research project. Research is often too complex and too multiform to be designed entirely according to a set of previously fixed rules. The step-by-step plans presented in this book are meant to serve as rough guidelines for supporting the designing process. They should be used as initial steps which help the reader to structure his or her ideas. We strongly suggest that the readers maintain a critical attitude during each step of our methodology. You can never design a research project on the autopilot, without critical thinking.

Structure

Chapter 1 explains the logic underlying the project design and the structure of this book as a whole, by illustrating this with an authentic case. Chapters 2 through 8 and the Appendix elucidate and elaborate on the various elements of the design. For each individual chapter the text has been structured as follows. The beginning of each chapter gives an example from an everyday situation demonstrating the point we would like to make that is based on a specific problem. Subsequently, we go into further detail about the methods, procedures, methodologies and guidelines you can use when carrying out this particular stage of the research design. All this leads to a step-by-step approach. At the end of each chapter, the step-by-step approach is applied to the authentic case introduced at the beginning of the chapter.

Designing can be compared to making a painting. When you are engaged in this activity, you continuously work in all areas of the canvas. The shapes and colours of one section inspire the shapes and colours of another. From time to time you take a step back, your eyes half-closed, to view and ponder the quality and harmony of the whole.

1.1 INTRODUCTION

Designing and carrying out a research project is a complex activity. The researcher is bombarded by a host of new impressions. Moreover, the various parties who are involved in the process make different and often contradictory demands on him or her. In such a situation, many readers will find it difficult to develop a goal-oriented mode of action, in which it is clear to yourself and to the other parties what is going to transpire. The following example depicts such a situation.

Example 'A problem with logistics'

A student of organisational studies has been assigned a project for his master's thesis at a department store chain. After a quick tour around one of the company's department stores and after consulting his supervisor, the student immerses himself in literature on logistics and compiles a list of possible problems concerning the logistics. He presents this list to a number of employees within the company. It soon appears, however, that the problems with the logistics are not the real issue. What is more important are the different views held by the employees of the company regarding what has caused these problems. By now the student has been working on his final project for well over one month. He realises that he had better make haste with the people he still needs to interview concerning their views on this particular problem of the logistics. But who should he approach for these interviews? And what exactly should he ask? Should he delve into the problems revolving around the logistics or not? And what is actually part of the company logistics and what is not? Furthermore, it is now July and many people are on holiday. He feels under pressure and decides to conduct a number of interviews with some executives, but he

does not obtain very much of information. ‘When will you be finished with the report?’ his supervisor urges. The student quickly draws up some interview reports, but soon it is quite clear that this is not going to pass as a thesis. What should the thesis contain? How can theoretical depth into the subject be realised? All in all, the project does not look too promising.

The student in this example lacks insight into the various steps involved in the preparation of a research project. For him it is merely a jumble of activities that lack a well thought-out and planned approach.

This first chapter presents an overview of the various aspects involved in research, which will be elaborated on later in this book. Section 1.2 gives a survey of research design and an outline of its various aspects. This section shows how you should structure your designing activities. Section 1.3 sketches the process in which research design can be developed.

1.2 PROJECT DESIGN – IN A NUTSHELL

Designing research involves two separate sets of activities. The first involves determining everything you wish to achieve through the research project. This has to do with modelling the content of the research; we call this the *conceptual design* of a research project. The second set of activities concerns how to realise all this during the implementation stage of the project. This is called the *technical research design*.

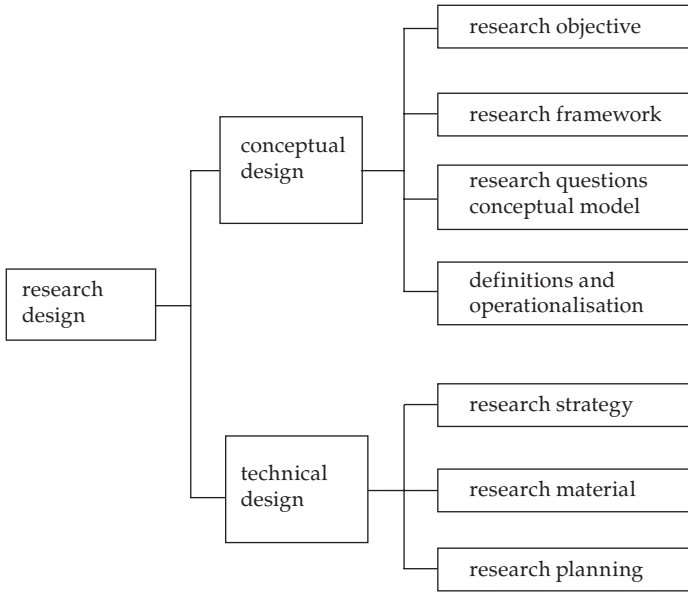
The conceptual design is the subject of Part I of this book. It determines *what, why and how much* we are going to study, and it consists of four elements. In the first place, the *objective* of the research project is formulated, i.e. the goal of the research. It concerns the contribution the researcher wishes to make to solve a problem outside the research itself. That is why the research objective is also called the **external** aim of the research, the goal **of** the project. The research objective, in other words, concerns the *use* of the knowledge the research produces, *not* the knowledge itself. Secondly, this research objective must be derived from and embedded in what we will be referring to as the *project context*. The draft of the research structure is then developed into a *research framework*. A research framework consists of a schematic representation of the most important research phases. Subsequently, the researcher must determine which information can contribute towards achieving the selected research objective. We are now at the stage of formulating the set of *research questions*. This set consists of a number of core questions and sub-questions that need to be answered during the different phases of the research project. The answers to the research questions provide the exact knowledge required

in order to achieve the research objective. This concerns the so-called **internal** aim of the research, the goal **within** the research project. An important part of formulating the research questions is determining which theoretical framework will be used to study the research object. In this book we call this theoretical framework the '*research perspective*'. Sometimes the theoretical framework consists of a ready-made theory that the researcher has found while studying the relevant literature. But more often than not, the researcher will have to derive a theoretical framework from different theories that need to be adjusted in order to fit the research project. Such a theoretical framework often takes the form of a so-called *conceptual model*. The conceptual model is the theoretical framework of the research project, and it consists of a set of assumed relationships between the core concepts of this project. In the Appendix of this book we present detailed instructions on how to develop such a conceptual model. The final part of the conceptual design concerns a set of activities in which the core concepts of the research objective, the research questions and the conceptual model are defined, refined and made concrete. It is particularly important that abstractly defined core concepts are translated into observable phenomena, i.e. indicators. This process is called *defining and operationalising* the key concepts. This process helps the researcher to demarcate his or her research object.

The second set of core activities in designing a research project concerns the *technical research design*, or simply *technical design*. The technical design is the subject of Part II of this book. Roughly speaking, the technical design consists of the decisions concerning *how, where and when* we are going to do our research in order to answer the research questions. A first step to be taken is the selection of the *research strategy*. Core questions to be answered are: Is the researcher looking for breadth or depth, will he or she follow a quantitative or qualitative approach, first-hand observation or an analysis of information or data produced by others? Once the researcher has decided on a research strategy, he or she needs to choose a set of activities which establish the kind of research material needed to answer the research questions: where is this research material to be found, or how can it be produced? We call this carefully deliberated set of decisions the plan of *research material* generation, in quantitative research also known as the process of data gathering. The third and final category of activities and decisions that are needed within the framework of making a technical design concerns a clear and consistent *research plan*. Figure 1.1 summarises this.

The components listed to the right in Figure 1.1 represent the next seven chapters. Here, we will briefly explain each of these components while referring to the project 'A problem with logistics' that we discussed above.

Figure 1.1 Overall picture of the research design



Research objective

At the start of a research project there is a set of problems, the *project context*. As a rule, this context is far too extensive and too complex to be dealt with comprehensively in one single research project. Therefore, the first step in developing a conceptual design is *demarcation*. The research designer needs to isolate an area of the project context that is manageable for the purposes of a research project. The result is a well-defined and not overly extensive part of a problem, to which the research can conceivably make a significant contribution. When this part of the project context is formulated as an external goal, the solution of a practical problem, i.e. an organisational problem or a policy problem, we call the result of this delineation the *research objective*.

Example ‘A problem with logistics’

Project context or background

A department store chain is having problems with its supply of goods. This problem is multifaceted: logistic management, transport management, arrangements with suppliers, customer-friendliness, etc. Despite recent attempts to reorganise the logistical system, no improvement has been made. It is not quite clear where the logistical problems stem from. Some people in the organisation blame the

organisational structure. Others point at the lack of commercial orientation of the organisational culture. Some people claim that the core problem has to do with the employees' resistance to change their way of working. The Head of the Department Logistics and Distribution commissions a consultancy agency to carry out a research project which should provide clear insight into the background of the logistical problems.

Research objective

The research objective is to offer the Head of the Department Logistics and Distribution recommendations concerning how to improve the logistics policy, by making an inventory of the views held within the organisation (general management, staff Logistics and Distribution, transporters, management local offices) about the background of the problems with the logistics and the suggested solutions to these problems.

In our experience, this process of demarcating and defining a feasible and realistic research objective is an extremely difficult hurdle for most beginner researchers. Nevertheless, the formulation of such a research objective is a very important condition for designing a successful research project. In Chapter 2 we will elaborate more on how to formulate a research objective.

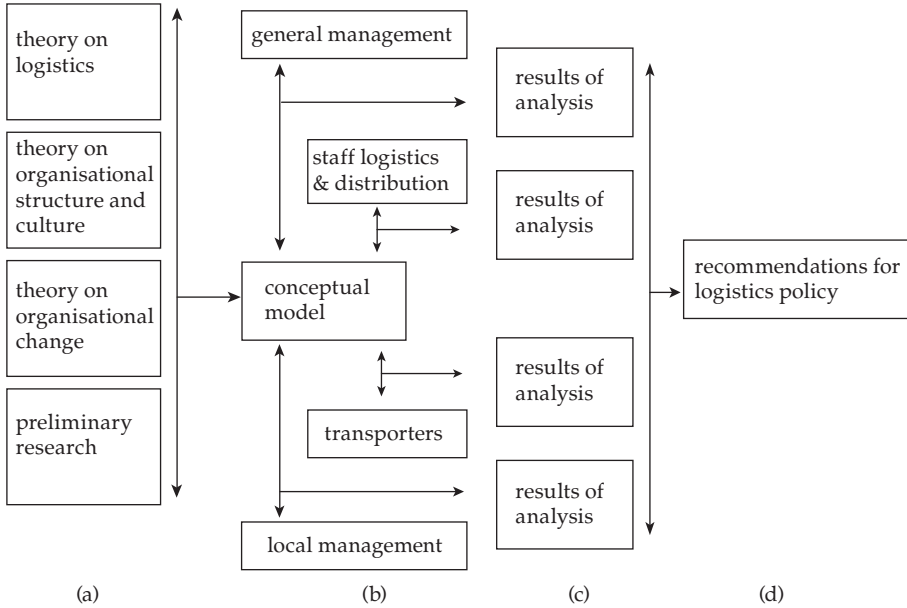
Research framework

Before formulating the research questions, you should start by sketching in broad lines how you intend to achieve this research objective. Drafting a neatly arranged research framework will prove helpful. The research framework is a *schematic* and *highly visualised* representation of the steps that need to be taken in order to achieve one's research objective. Such a representation will prove to be an extremely useful tool for getting a grip on the project. Chapter 3 will elaborate on the research framework.

Example 'A problem with logistics'

The reasoning by which you hope to realise your objective in this project is as follows. An analysis of the organisational literature on logistics, as well as the literature on organisational structure, organisational culture, organisational change, plus preliminary research, will give you a theoretical framework. In this and many other cases, this framework takes the form of a conceptual model, consisting of a set of factors that influence the effectiveness of the logistics. With the help of this conceptual model, you can map out and compare the opinions held by the various parties in the organisation on logistic problems and solutions. Figure 1.2 provides a visual representation of the above.

Figure 1.2 Research framework for researching the problem with the logistics



Research questions and theoretical framework

Next, the designer will need to formulate the *research questions* that must be answered during the course of the research project. These questions have been selected and formulated in such a way that the answers will yield information that is useful or necessary for accomplishing the research objective. Chapter 4 elaborates in greater detail on the method of how to compose this set of research questions. In the process, he or she subsequently will develop the theoretical framework for the research, mainly by studying relevant scientific literature. An example of this theoretical framework, in the form of a conceptual model, can be found in the Appendix. As soon as the reader has been able to develop a set of research questions and has come up with a theoretical framework which meets the requirements, further elaboration of the concrete research steps, that is, the technical design, should not pose a problem. The research designer may even consider using the following as a final criterion for the quality of the set of research questions. If the researcher experiences any problem when designing the technical part of the research or has to reconsider the choices that are made regarding the technical design, then it is likely that the cause of these problems has to do with having an inadequate set of research questions. In that case, the designer should consult again the instructions we have presented in this book for formulating an adequate research objective and a steering set of research questions. The reader will probably notice that the research objective and the research questions have to be adjusted.

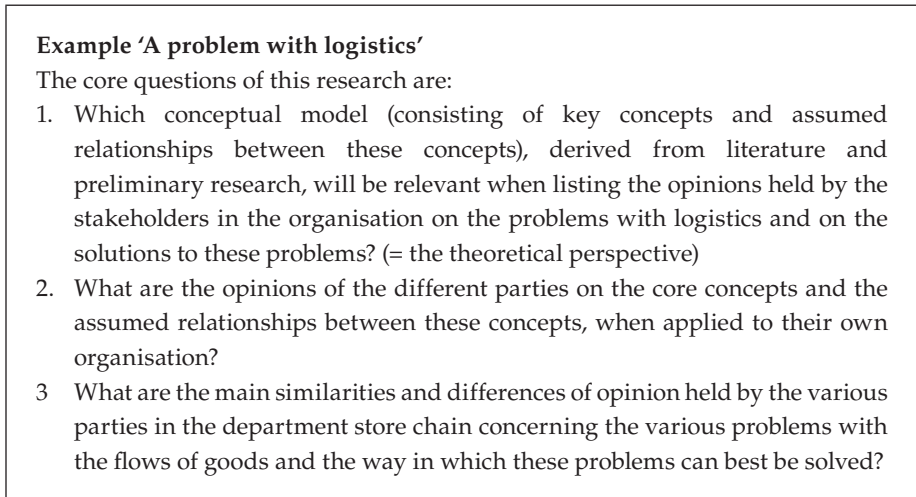
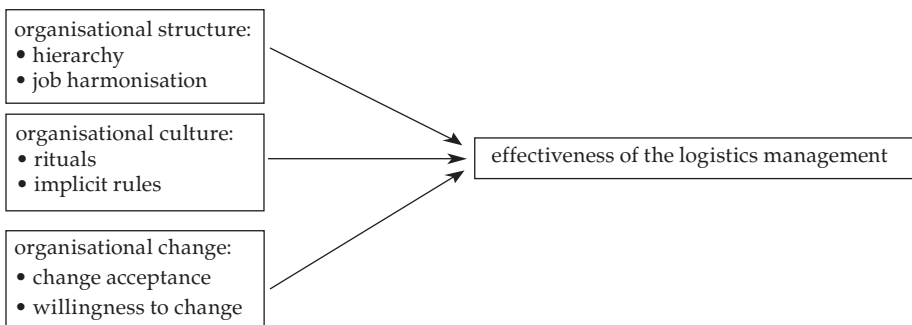


Figure 1.3 represents the theoretical framework of this research project. In this case as in many other cases, the theoretical framework consists of a conceptual model, that is to say, the key concepts and the assumed relationships between these concepts.

Figure 1.3 Conceptual framework 'A problem with logistics'



The conceptual model reads as follows: based upon a literature search and preliminary research, the researcher has chosen to study the influences of the organisational structure (hierarchy and job harmonisation), the organisational culture (rituals and implicit rules) and organisational change (change acceptance and willingness to change) on the effectiveness of the logistics management.

Definition and operationalisation

In defining the research objective and the set of research questions of a project, one or more concepts emerge which then take central stage in the research. The

way you define these concepts determines what will be done in the remainder of the project. So we need to describe the content of the key concepts in an *exact* definition. This means not only presenting an exact description of these concepts, but also providing a clear demarcation of which components and dimensions are included in this definition and which components and dimensions are left out. The researcher decisions are part of the process of operationalisation. In brief, by defining and operationalising the key concepts we can delineate the research project further and in this way more clarity can be given on where to look in the library and in the empirical field. These issues are elaborated on in Chapter 5.

Example 'A problem with logistics'

A key concept in this project is 'logistic management'.

Definition

For the purposes of this project, we will refer to 'logistic management' as the set of decisions with regard to the processes, products, partners and costs which influence both the flows of goods between the suppliers and the individual department stores of the company on the one hand, and the way in which these flows affect each other. This ignores the flows of goods between department stores. It will be clear that the researcher implies an important delineation of the project. This is precisely what is needed at this stage of the designing process.

Now that the conceptual design of the research project has been completed, we can start concentrating on the technical part of the design. As we mentioned earlier, the technical design consists of the decisions to be taken with regard to the research *strategy*, the research *material (data)*, and the research *planning*. More about this is presented below.

Research strategy

A subsequent decision concerns the way we plan to approach the research object. We can opt for a strategy that enables us to make valid observations. In this case it stands to reason that we should opt for an extensive research in which we strive for breadth rather than depth. The large quantity of data this necessitates usually requires quantitative data processing. We call this type of research a quantitative survey. It is also possible that we are more interested in making a thorough examination of a complex case. Then one may opt for a strategy known as case study. Here the research is generally approached along various paths and in a qualitative way.

Example 'A problem with logistics'

You opt for a case study, partly because you prefer qualitative research and partly because you would like to carry out an in-depth study. The price you pay for profoundness is that it is impossible to generalise the results. By means of various methods such as interviews and observations of production processes, as well as the study of documents, you can try to gain as deep an insight as possible into the problem at hand, taking into consideration all its aspects.

Research material

A next phase in the design process is the plan for gathering the research material. A first step of this plan is to define the research population. The research population is the actual segment of reality the researcher would like to study. Once he or she has defined the research population, the researcher is able to select the resources that will give information about this population. Research resources can be people, objects, situations, media and documents. The last step is to decide how to obtain the required information from these resources. Some of the best known gathering techniques are questionnaires, interviews, observation and content analysis of written and audio-visual documents and media contents. More information on research material can be found in Chapter 7.

Example 'A problem with logistics'

As part of the 'logistics' research project, you have decided to gather the opinions of the four groups of stakeholders through a combination of a half-structured questionnaire and in-depth interviews. You decide to approach five members of each group of stakeholders for information.

Research planning

One of the remaining design activities to carry out is to draw up a plan. This refers both to processing the research project and writing the research report. As for the process of carrying out the research project, it is not only advisable to draw up a time schedule with deadlines for various 'products'. It is also important to specify beforehand what activities should lead to these 'products'. In order to analyse the data and report the results, it is highly valuable to have a mental image of the final report in the form of a table of contents. More details about this follow in Chapter 8, which deals with research planning.

Example 'A problem with logistics'

The project assignment will take some six months or twenty-five working weeks. Three of these weeks have already been spent on developing a conceptual design. The activities you are going to carry out within the framework of the assignment consist of conducting interviews and making observations. You decide on a total of twenty interviews and allocate three weeks of your time to this. This decision has been based upon the golden rule that it takes 8 hours to deal with each individual interview, in total. This includes formulating the interview questions, making appointments with the respondents, travel time, the actual interview, the interview analysis, and the selection of the information needed to answer the research questions. You have calculated that these activities will take a month and a half in total to complete. Moreover, you intend to spend five full days on making observations. You allocate another fourteen days for systematising and recording the impressions you have obtained. To optimise the link between interviews and observations, you plan these days in the same six-week term as the interview sessions. You further allocate five weeks for analysing all the material and writing the draft. Finally you have another six weeks to relate your findings to the theoretical framework and to process all of this into a final report in the form of a thesis.

1.3 DESIGNING ITERATIVELY

The reader has just been given a brief outline of what the result of your design activities should roughly look like according to our perspective. This result can be viewed as the *product* of the research design. The next question is how to achieve this design product. Here we focus on the research design as a *process*. This is the topic of Section 1.3.

We may have provided the reader with the impression that designing a research project is a linear and consecutive process. It may appear as if the project context, from which a research objective has been derived and a research framework has been created, should be mapped out first. Only then is the research objective to be translated into a set of research questions and, if appropriate, into a conceptual model. Subsequently, in this linear approach the necessary material and a research strategy are selected. In this erroneous conception of the process, all decisions are subjected to a meticulous plan.

When viewing design as a *product*, the steps outlined above can indeed be logically derived from one another. For instance, in the final design the research questions should be logically derived from the research objective, because the answers to these questions should provide sufficient information in order to achieve the research objective. Likewise, the technical design should furnish a logical translation of the problem into a number of research steps, because

carrying out the planned research project should provide the answers to the research questions. However, although this linearity is inevitably part of the design as a *product*, this is not the way the design will be established. Designing is a *process*. In other words: what has been presented is a *logical* sequence, not a *time* sequence. The process of designing a research project is far more disorderly than the reader may think. For example, in the beginning of designing the research project the researcher may have planned to conduct interviews. In the past, the researcher has been trained to do this and it seemed interesting to try this technique out for him.

The design approach we support is an iterative process. The notion of iteration stems from mathematics, in which iteration means that the result of a calculation is taken as the input for a second set of calculations. This process is to be continued until the final calculation no longer leads to recognisable changes in the calculation results. In that case the calculations converge. In everyday language we would say that the design has been fully crystallised out. In terms of the design, iteration means that the designer must constantly switch from the one part of the design to the other. Each time, he or she reconsiders the consequences that the provisional decision concerning the one part will have on each of the other parts of the design to be. That is, both the parts that are still to follow, and the parts that have already been designed must be adapted if necessary. This process stops as soon as an adjustment does not have recognisable consequences for any of the other parts of the design.

Such an iterative design approach has a number of consequences for the design of a research project. The reader should comprehend that making a final decision in the area of the technical design depends on a number of other decisions that have been made in the area of the conceptual design. For example, the decision to opt for interviews as a method of data gathering may be a suitable starting point for the design process. If the researcher is attracted to this method of data collection, it will motivate him or her to undertake the heavy workload that a research project inevitably entails. Of course, the decision to opt for interviews has consequences for the subsequent decisions to be made with regard to the other parts of the conceptual and technical design. For example, the researcher may have to reconsider the various insights and knowledge about companies that your interviews have produced or will produce (the set of research questions). Or you may even decide to return to an earlier stage and to give consideration to other types of management problems that organisations are faced with nowadays (the project context). Then, it is usually not so hard to develop both a conceptual and a technical research design, in which interviews have a meaningful place in the whole. In short, in this conception of designing a research there are continual movements back and forwards between the various stages of the design to be.

Not only will you need this oscillating motion if you wish to fit in your own preferences and interests; it will also be needed because designing is a very