Preface

This text offers a description and an account of the ‘ANNABEL approach’, in particular its starting point, the problem analysis.
ANNABEL is a general methodology for designing and executing methodologically sound and scientifically solid research.

ANNABEL is in principle based on methods and the body of thought of Verschuren (1986; 2007). However, these procedures were adapted and optimized (for a preliminary description see Groenland, 2001) for the research design in scientific (theory based) and practice based research. ANNABEL is an acronym of: ‘Analysing nasty research problems by elaborative logic’. Elaborated logic refers to a systematic formulation of, while making a distinction between: the management problem, research objectives and research questions, the conceptual model, and the intended use of the research outcomes. In practice, these aspects most often are treated at an intuitive or implicit level by researchers. The method is suitable for both qualitative and quantitative research.

This text discusses the problem analysis, as part of the ‘ANNABEL approach’. The choice was made to use a so-called toolbox, with Definition, Explanation, and Actions as subdivisions. We believe that in this way both readers of the text, and their users, may get acquainted and actually apply the methodology comfortably.

After the part of the text presenting the problem analysis a short case is added. The case describes and illustrates, with a briefing meeting as a starting point, the process a researcher has to pass through in order to arrive at a researchable and workable problem analysis. ANNABEL lends assistance.

The author is open to any remarks and comments, of both readers and users of this text.
1. Introduction

This toolbox describes how to conduct a good problem analysis. The purpose of this is to prepare the set-up of a research project. Problem analysis is without doubt the most difficult part of setting up a research project. Why? Because there are always several possibilities for working out a problem analysis. As a result, conducting a problem analysis is a creative process. This is why there is no ready-to-use form to fill in that will enable you to conduct a problem analysis on ‘automatic pilot’. Secondly, a client’s background always plays a role. For example, the objective the client hopes to achieve with the research, any previous research projects carried out, the role played by the competition, and so forth.

So, you might be wondering, ‘is there anything that offers a firm basis in this process?’ Yes, there is a tool available: the ANNABEL Toolbox. ANNABEL is a working method that is based on practical yet scientifically-responsible principles, and comprehensible methods. ANNABEL is essentially a step-by-step plan for devising, developing, and monitoring the components of the definition of a problem. By simply following and executing the steps, it is possible to create a responsible and valid problem analysis. So, no forms to fill in, but rather structural help for a difficult, yet challenging task.

We will first lay down the components of the problem analysis. We will then explain the seven steps in the step-by-step plan, and apply them. After the last step has been completed, the problem analysis is complete.
2. The overview

The ANNABEL Toolbox describes the problem analysis in two phases:

- I The management problem
  This is the *business problem* that the client, as ‘manager’, would like to solve.

- II The research problem
  This is the *knowledge problem* that must be ‘solved’ through research.

The analysis of the research problem consists of the following 7 steps:

- Background research
- Reason for the research
- Intended use of the research
- Research objective
- Research questions
- Conceptual model
- Deliverables

These steps are shown above in a fixed, logical order. If you are writing up a research proposal in its final form, it is best to adhere to this order. However, for the purpose of *developing* the research problem, we will be changing this order; this makes the task easier.

Our task is now to formulate the management problem, and to state the research problem. This is done as follows. For each component that we discuss, we provide a definition and an explanation. Next, we list the actions that must be taken. Once all the actions have been taken, the procedure ends with a complete problem analysis. This will allow you to expand on the remaining components of the research structure (sampling structure, method of data collection, analysis strategy).
3. The management problem

Definition
The management problem describes the specific objective the client would like to achieve for its company, business, or organization, from the CEO or CFO’s perspective.

Explanation
This type of business objective may be one that lies at the level of concrete objectives for the annual plan (tactical research) or at the mission statement level (strategic research). However, it often involves very specific business objectives. We need this information in order to enable us to deduce the research objectives later.

Don’t make the mistake of interpreting a management problem as a research problem! If the company’s objective is to achieve a 5% increase in sales within a year, then this is a non-researchable problem as such. What you need is an interpretation whereby you set up your own line of reasoning. Increased sales are data at the company level. However, sales are partially dependent on what buyers and potential buyers will do. This is the level of individuals. The behavior of many individuals at the individual level therefore will (hopefully) lead to a desired effect at the company level. We can conduct research at the individual level without problems. For example, we can measure why, or to what extent the buyers will purchase the product or service. In doing so, we examine factors such as: the image the buyers have of the product or service. How appealing it is to them, how different it is when compared with other competing products or services.

The research objective is focused on these factors. With the knowledge and insight generated by this type of research (and many other information sources), management can then take a series of focused marketing actions. These will (hopefully) lead to an increase in purchases of the product or service, in terms of quantity and frequency, thereby enabling the sales objective to be achieved.

Actions
- Ask your client which company objectives (for example, image campaign, product introduction) are at issue.
- Ask them what they would like to achieve in this regard: what; the extent; and when.
- Ask how this concrete plan fits into the annual plan, and perhaps the mission statement.
4. The research problem

Stating the research problem essentially consists of formulating research objectives and research questions, drawing a conceptual model, and formulating the intended use of the research results. This is where we will begin. After that, we will discuss the background for the research, the reason for the research, and the ‘deliverables’.

We will start with the formulation of the research objective.

4.1 The research objective

Definition
The research objective provides an exact description of the knowledge and insight you would like to obtain through the research, and provides an overall indication of the source from which you would like to acquire this knowledge and insight.

Explanation
A research objective describes the exact knowledge and insight you would like to obtain from the research. It is often easy to use a fixed formulation, and to fill in your own requirements. An example of such a sentence is:

“The research is focused on obtaining knowledge and insight concerning <research subject> among <target group>”

This allows you to indicate exactly what you want to find out from the research. In other words: the knowledge and insight you’re seeking. If something goes wrong, then this is usually due to the way in which limits are set for the research: what exactly do you want to study, and what do you not want to study?

An example: “The research aims to obtain knowledge and insight into how KPN’s marketing activities lead to the sale of cell phone subscriptions among young people.”

Wrong. Which marketing activities exactly are meant here? All of the marketing activities? And what exactly is a ‘marketing activity’?

This last question is an example of a second type of error that is frequently made: the use of concepts that are not specific. We can use ‘marketing activities’ in the broad sense of the word, or we can choose a specific, goal-oriented campaign. The advantage of the latter is that we will then also know what this campaign focused on.

Certain words always create problems here. For example, what is ‘performance’ or ‘quality’, exactly? Different researchers will provide different answers to this question. We refer to these as ‘container concepts’ or ‘umbrella concepts’. They are not practical in their use because they are not clear or specific. If you have to apply these concepts later to a questionnaire, for example, then the problem analysis does not indicate which meaning you should choose. This is a choice you have to make here and now.
You can see that you also have to indicate the target group you want to gather data for in the example sentence. Why is this necessary? The ‘target group’ is the first, overall reference to the population for which you would like to make statements. The population is the entire group of consumers, citizens, experts, or companies you would like to be able to make statements about later on, with the aid of a random sample. You will need this information later to create the random sample structure. In addition, you can already start thinking about whether or not your information suppliers (your respondents) even possess the information you would like to obtain. In other words: can they, in their role as respondent, answer your questions later on?

Remember that research can involve several research objectives. This is not a problem in and of itself. These research objectives must be related to one another in one form or another, otherwise you could end up with two completely separate studies. If you have several research objectives, you simply expand on each research objective separately.

**Actions**

- Take the example sentence, and make an initial attempt to complete it.
- Check to make sure that all of the concepts or terms in this first version of your research objective are specific.
- For each non-specific term, provide a brief description of the meaning that you would like to apply to this term.
- Check to see if there are clear, specific limits set for your research topic.
- If necessary, create a further demarcation of the field, domain or subject about which you would like to obtain knowledge and insight.
- Check to see if the target group is sufficiently limited, and if it is, make sure this has been done in an unambiguous manner; it must be obvious who does and does not belong to the target group. If necessary, adapt your formulation.
- Indicate the entities your target groups consist of: consumers, citizens, experts, businesses, organizations, and so forth. In other words: indicate your analysis entity.
- Perform one last check on the clarity, completeness and comprehensibility of your formulation.
- Do the above for each separate yet related research objective, and number them.
4.2 The research questions

Definition

The research questions consist of a set of related research questions. All of these have several characteristics:

- All of the research questions correspond to an extremely specific, and separate part of the research objective
- Collectively, the research questions cover the entire research objective

The relationship between the research objective and the corresponding research questions is the following: once all of the research questions have been answered, the research objective has been achieved.

Explanation

The research questions have an effect on the research objective on a more concrete level. When viewed from this standpoint, there are actually three different levels of specification:

- A research objective is abstract, broad and general
- A research question is more concrete, more targeted and more specific
- The questions that you ask the respondents are truly concrete, targeted and specific.

In addition, objectives and questions are formulated in written language, whereas respondents’ questions are formulated in spoken language.

An example: “The objective of the research is to obtain knowledge and insight into the general satisfaction of employees at company X, as well as the factors that influence this satisfaction”. Possible questions corresponding to this research are: what is the degree of satisfaction perceived by the different departments in company X? What role does ‘financial compensation’ play in this? What role does the ‘educational facilities’ factor play in this? What role does the ‘child care’ factor play in this? And so on.

One example of a concrete question in a questionnaire (targeting a respondent) could be: “I am satisfied with the salary that I am paid in my current position” (5-point scale: from ‘very dissatisfied’ to ‘very satisfied’).

Actions

- Check to see if each of the research questions has their own effects on parts of the research objective, in terms of their content.
- If necessary, remove unnecessary questions, or broaden the research objective.
- If necessary, add to the list of research questions, or narrow the research objective.
- Now check to see if the questions collectively cover the entire research objective.
- If necessary, make the questions more specific or more general.
- Check to see if answering the research questions formulated in this way will later lead to the achievement of the research objective.
4.3 The conceptual model

Definition

The conceptual model is a diagram depicting all of the concepts to be studied, as well as the relationships that can be determined between these concepts.

Explanation

A conceptual model is therefore a picture which shows the position of all of the concepts that you are going to measure. A term, also referred to as a concept, is a ‘unit of thought’, and we need to explain this first.

When we, based on our experiences, try to understand the world, we give names to all of the phenomena that we observe. This is how we categorize the things around us, and how we create order in our complex reality. This is also how our mind works when it comes to thought processes. We give the things around us a name or an indication, whether they are concrete or abstract, and we connect them to one another. We have concepts for pretty much everything we do, and this includes research. Examples are: gender, age, image, satisfaction, purchasing behavior. All are concepts, and they form the building blocks for our thought processes. Some of these building blocks are very complex, such as customer loyalty. To use a technical term, these are called ‘constructs’. That they are complex is otherwise irrelevant; they are building blocks, and we use these building blocks to shape our reality, allowing us to understand our world.

You can draw a conceptual model, and there are a few conventions for doing this. All of the concepts are drawn in squares, and the arrows placed between these squares show the connections or effects between the concepts.

A conceptual model is a diagram, a graphic representation of the progression of a phenomenon. The convention is that the processes described progress from left to right. If the phenomenon described involves consumer behavior, you will often see a reflection of elements from consumer behavior models. This is how knowledge and experience with a certain product leads to the formation of an attitude towards a product and, together with the image developed, to an intention to purchase, and ultimately to the purchase of the product. All of these are concepts we can define and later put into operation (translate into concrete respondent questions).

If we translate the example we have just described into such a diagram (conceptual model), it would look like this:
The advantages are now also clear. We can see if we have included all of the concepts that we want to include in the research in the model. We can also determine whether there are any concepts left over that have unintentionally been left out of our problem analysis.

In both cases, we either modify the problem analysis text or the conceptual model. Naturally, a precise, limited definition is part of every concept, as was mentioned previously. We will use these definitions again later to formulate respondent questions for the questionnaire. We then say that we are making the concepts 'operational'.

Logically speaking, the concept shown on the far right will later be the target content variable during the measurement, since the process to be studied runs from left to right. Examples of target variables include purchasing behavior, satisfaction or preferences. This naturally depends on the research objective.

A conceptual model is often drawn in 'columns'. The left-hand column contains the background variables. The arrows shown emerge from this column only: background variables are used for the description and explanation of the phenomenon to be studied.

The center column is often 'psychological' in nature. Examples are: attitudes, image, and opinions/evaluations. The arrows now run from the background variables towards the 'psychological' variables.

The right-hand column contains the effect variables/target variables: intention to purchase, purchasing behavior, customer behavior (services), and so on. The arrows only move toward this column, and do so from the background variables and the 'psychological' variables.
There is still more to say about the significance of the arrows. It is often possible to establish cause-and-effect relationships (“The more positive the attitude towards the product, the more the intention to purchase will increase”). This is useful for two reasons. First of all, later on in the research the arrows will indicate how the data should be analyzed. This will allow the relationship between the attitude towards the product and the intention to purchase to be studied using cross-tabulation analysis or regression analysis. Secondly, the conceptual model will show whether there might be any concepts which have no arrows leading to or away from them. A concept like this is separate from all of the other concepts in the model. As a result, this concept is unable to contribute to the description or explanation of the problem to be studied, and it will be removed from the model, and from the research.

**Actions**

- Take an inventory of all of the concepts that play a role in determining the objective and questions. As an aid, examine all of the nouns in your text.
- Order these concepts from cause to effect, in the form of a process that moves from left to right.
- For each concept, draw a square, and fill all of the squares with the names of the concepts.
- Draw arrows between the squares to illustrate the cause-and-effect relationships. Base these on 'scientific' sources, previous research, and your own, well-founded choices, and do this in that order.
- Check to see if all of the concepts from your problem statement are included in the conceptual model.
- Check to see if all of the concepts from the conceptual model are represented in your research objective and problem.
- If necessary, make adjustments to both the objective and questions, or to the conceptual model.
- Check to see if there is a logical, or at least a plausible ‘flow’, in the sequence from left to right.
- Check to see if the target content variable is shown at the far right side of the model.
4.4 The intended use of the research results

Definition

The ‘intended use of the research results’ specifies the way in which the client thinks he might be able to use the research results in solving its management problem.

Explanation

We have seen previously that the research objective indicates which types of knowledge and insight should emerge from the proposed research. We have also seen that the management problem is not the same as the research problem. Still (or: naturally), these two elements do actually relate to one another. The relationship between the two is the following.

In order to contribute to the solution of the management problem, certain (very) specific types of knowledge and insight are needed. The knowledge and insight that becomes available with the achievement of the research objective must later (after the research has been completed) be applied to the management problem. The goal is to use the research results in such a way that they may be applied in a worthwhile manner to make this contribution.

An example:
The management problem is the achievement of a 2% growth in sales within 2 years. After performing a problem analysis, it is thought that this can be achieved by improving the corporate image. The research questions specify knowledge and insight with regard to the nature and content of the image components as well as the interrelationship between these components. The intended use of the research results is now to apply the knowledge and insight regarding the content and structural characteristics of the corporate image to the design of a new corporate image campaign, whereby the research results are primarily used to further determine the content and purpose of this campaign.

Complicated? Perhaps. Logical? Yes, definitely logical and well thought-out. It might sound strange, but at the start of a research project, many clients have not really given much thought to how they plan to use the results of the research. If this doesn’t change, this will not do the usability of the research any good. However, if during the design of the research the client and the researcher specify this aspect together, this information may be used productively in the further structure of the research. Finally, and this is an important aspect, the specification of the intended use of the research results will be used at the end of the research to customize the research recommendations to this use. This renders these recommendations even stronger in terms of their power and influence.
Actions

- Take the formulation of the management problem as a starting point, and ask the client how he or she would like to apply the research results in solving this management problem, and to provide the reasoning behind this.
- Check the logic used by the client, and estimate the feasibility of his or her plans.
- Discuss with the client where the current research project stands within the bigger picture at the client’s company, and ask which guiding information is already available, and which information is expected to be generated by the research.
- If necessary, suggest adjustments to the formulation and the content of the intended use of the research results, and if necessary, streamline the research questions, or adapt the objective and questions.
- If necessary, consult with the client in the interim.
- Arrive at a final formulation together for the intended use.
4.5 The background of the research

Definition

The ‘background of the research’ describes the context, the scope, and the market environment within which the research will be conducted. This part of the project serves to create an interpretation framework within which the research design that has been chosen may be better evaluated and understood.

Explanation

Research never just drops out of the sky. It is always done within a certain setting, and there are certain parties involved. We can compare this with the centuries-old rules of the theater which describe the unity of time, place and actions. This part serves to place the client within a context, which will make the research problem more ‘real’, and the choices made easier to understand.

The setting may describe the client's company or organization, and its characteristics (main activity, product or service, size, mission, age); the market with its features (including the competitive position); the other players in the market, the technological status, the client’s recent history, and possibly even plans for the near future.

As such, this creates an initial point of recognition for the client: the person drawing up the research proposal has acquired sufficient in-depth knowledge of the company and truly 'knows' the company.

Of the multitude of contextual elements, those elements that have or could have a direct or indirect influence on how the research will be designed are chosen. As was previously mentioned this serves as a touchstone for the logic or the research topic to be presented.

Actions

- Gather the relevant background information, initially using public sources such as the Internet, the client’s site, the Chamber of Commerce, and so on.
- Next, gather the relevant information by asking the client about previous research relevant to the current study.
- Finally, ask the client for additional information that is relevant to an outline of the company’s background.
- Create a compact, balanced text on the basis of the above information.
4.6 The reason for the research

Definition

The ‘reason for the research’ describes the (recent) events which have led to the client’s decision to start the research.

Explanation

In principle, there is always a specific reason to perform the research at the time chosen. This involves changes which have occurred ‘somewhere’ within the context of the client’s company or organization, and which have motivated the client to consider the research. We make a distinction between this situation and a situation in which it is obvious that a research budget must be spent by the end of the year in order to secure the research budget for the following year.

Common changes involve marketing activities and the implementation of marketing plans, product introductions and market and sales problems that manifest themselves at a certain time.

This information is important because it partially guides the process of expanding on the objective and questions for the research to be designed. Moreover, this text represents a point of recognition specific to the client in evaluating the research proposal: the person writing the research proposal ‘understands what’s going on’.

Actions

- Analyze the business processes, with a special focus on the relevant, recent events.
- Ask the client to describe and explain these events him- or herself.
- Place the events within the larger picture of the activities, processes and objectives of the client’s company or organization.
- In consultation with the client, formulate the more concrete reason(s) for the research.
4.7 Deliverables

Definition

The ‘deliverables’ consist of a short and catchy description of all of the most important products of the research for the client, if the research were to be performed.

Explanation

The (extremely) observant reader will now ask him- or herself ‘why is this section part of the problem analysis?’ What is the new element being added here? Well, there isn’t one! It is a rewrite of the elements that were already included in the problem analysis.

So why include this section? The answer is simple: we now want to ‘sell’ the research. Of course, we need to say this in a more dignified manner. The objective is to persuade the client to grant the research assignment by pointing out the important products of the research separately. And to show the client that they are getting their money’s worth. We do this by using a type of language that is particularly concrete and expressive. We will also include sentences written in the client’s jargon and language. This is nearly always more concrete than what has been done in the other sections, and will communicate more as a result. This applies both from the researcher to the client, as well as (very important!) from the client to people and departments within his or her own company.

A good way to communicate the message is the following: “After the research is completed, you will have answers to the following questions: … …”. Of course, these are the questions that the client would ask himself, and which he feels are crucial. For the sake of clarity: these questions must essentially be the same as the research questions formulated previously!

Actions

- Re-analyze the management objective, background and reason for the research, and the intended use of the results of the research.
- Re-analyze what the client has said, particularly what was mentioned during the briefing meeting.
- On the basis of this, determine how the client perceives the problem.
- Determine how the problem is discussed within the client’s company, and the professional jargon used to discuss it.
- Formulate a handful of questions to which the client would like answers, and do so in the client’s language.
- Select those questions which correspond (in essence) to the research questions.
- Present these as ‘deliverables’, and do so in the previously described format.
- Check to see if there are any questions left that are both essential to the client and which are not included in the research questions, and consider a modification or expansion on the previously formulated objective and questions.
4.8 Conclusion

Of course the problem analysis is still just the start of a good, complete and professional research proposal. The next steps involve:

- The research method (qualitative, quantitative, observational)
  - To do this, we must streamline the research objective even further, and do so in the form of a quantitative or qualitative research objective!
- Design the (random) sample (population description and type of sample)
- The data collection method (questionnaires, experiments, interviews)
- The analysis strategy (which data will be analyzed and how, for the purpose of answering which research questions?)

All of the components of the complete research proposal must later be inter-related in a consistent and coherent manner. Um, consistent and coherent, what was that again? Here are the definitions:

- Consistency: ‘free from internal contradiction’
- Coherency: ‘with an orderly context’

In research methodology, a scientific domain that provides rules for scientifically-based and responsible research is indicated using the term ‘internal validity’ of the research proposal. In ‘normal’ English, this more or less means: given that you wish to acquire certain specific knowledge and insight using empirical research, will you achieve this using research the way it is described in the research proposal? When you look at it this way, it is a very reasonable and practical requirement!

However: the problem analysis still remains the most important component in the research proposal. It will never amount to anything without a good problem analysis. The problem analysis is the foundation, the basis on which the rest of the research proposal is built. It is a necessary but not sufficient condition.

4.9 References


From Briefing meeting to problem analysis: ‘The CroquetteEmperor’

The case describes and illustrates, with a briefing meeting as a starting point, the process a researcher has to pass through in order to arrive at a researchable and workable problem analysis. Obviously, ANNABEL lends assistance.

First of all, let’s recapitulate some points of departure and characteristics of the ANNABEL approach, and let’s make a few introductory remarks:

The heart of a problem analysis consists of the research objectives and the research questions.

- The objectives describe the exact knowledge and insight we would like to obtain from the research to be conducted (and among whom or which target group).
- The research questions are the questions in a general form, which the respondents will later have to answer in a concrete form.
- We must design these research questions so that we will be in a position to achieve the research objective after having analyzed the answers.
- What was this objective again? Oh, that’s right, to obtain very specific knowledge and insight. Easy, right?

Easy? Not really. The simple version is:

First think about what you want, and then think up a series of questions which involve what you want, and yes, if these questions have been answered, then you have achieved your goal.

Where are the possibilities? The first thing that is difficult is to be able to say exactly what you do want to know, and what you don’t want to know. Scholars call this limiting the research objective.

Our case:

“The objective of the research is to find out what our good customers actually think about our products, and please call me Willy”, says Mr. W. Warenworst, the young, self-made CroquetteEmperor, with 74 so-called CE snack bars located throughout the country. He looks at you triumphantly, as if he wants to say: You’ve got no comeback for that one!

And it’s true, we don’t have a comeback. What does that actually mean, what you ‘think about a product’? Is it about the image that you have of the flamboyant ‘Dolle Molly’ (Mad Molly) Croquette (Molly is his wife), the flagship of this Croquette Emperor’s product range? Or are we talking about the more restrained ‘Magere Hein Croquette’ (the Grim Reaper Croquette), with its prominent health claim regarding low animal-fat content?
Or is it about all of the products at the same time? And is that even possible, talking about all of the products as a whole? Suppose that one product evokes a rich, nutritional image, and the other, a healthy image, yet one low in nutrition? Are you allowed to take an average? An average image, does that even exist?

Perhaps we should view Willy’s question as an evaluation, rather than as a mental image. In other words, what the opinion is of the products. But what then should the opinion be about? The not king-size but emperor-size products, the taste, the fat content, the health claims, the price? Or again, the average?

While we start getting dizzy from it all, we suddenly notice that term: ‘good customers’, and realize that we could interpret this seven different ways as well. Thanks, Willy, for your crystal-clear briefing!

It has now become clear to us what the trick of this is. All of the concepts that have to fit into one perfect sentence, and which must describe the research objective will have to be carefully defined and limited, one by one. Each concept will have to have a single, precisely described meaning. And once we’ve done this, we will have to have another look to see if this is what the Willies of this world really meant.

Rule 1a: Make sure you create a clear, unambiguous definition and limits for all of the terms you use in your research objective.

Rule 1b: Use these terms to clearly define the research objective, and to set limits for it.

Rule 1c: Try to improve the formulation of the research objective several times, once again paying attention to ensure clarity and limitations.

Rule 1d: Check the formulation by comparing it with the original briefing.

Rule 1e: If several other possibilities are left open, formulate a separate, individual research objective for each one of these.

An improved yet brief version of the research objective for the emperor croquettes could be:

“The objective of the research is to obtain knowledge and insight into the dimensions used to develop the ‘Dolle Molly’ image among product customers who have visited a CE snack bar at least once a week over the past 12 months, as well as the relative weight of each of these dimensions.”

So, now we have a research objective we can work with. It may appear rather formal, but now we can see the exact information the research should generate, and who should be generating it. The first step in the problem analysis is now made.