Using qualitative research methodologies in IS development studies

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Abstract

The goal of this thesis is to explore the possibilities of 'qualitative research methodologies' for research in Information System development. The reason for choosing these methodologies is the fact that they have to deal with 'wicked', 'ill structured' and 'messy' characteristics of their subject. These characteristics are also typical for the IS development problems.

The different aspects of an IS development methodology can be described with the model of Seligman, using different 'ways of' modelling, -working, -controlling, -thinking and -supporting. In general, IS development is about creating different models on different levels of abstraction (product), using other models to guide the design process (process). The general strategy applied here is; if a development problem is too complex, it is split up into smaller pieces to make it manageable.

Qualitative research differs from quantitative research in several aspects. In general, qualitative research is subjective, holistic, interpretative and inductive in nature, whereas qualitative research is objective, reductionist, experimental and deductive. Qualitative research has different paradigms; a spectrum starting with a 'mechanical machine' paradigm and ending in the more interpretative paradigms.

The inductive, interpretive and holistic nature of quantitative methodologies makes concrete modelling as is known in information system development very difficult or even impossible. Qualitative research is therefore not very useful to 'study way of working' and 'way of modelling' since these aspects can be studied using (meta) models, and thus a more positivist (quantitative) research is in place. Qualitative research is very useful however to study the 'way of thinking'; for instance exploring how a philosophy of a methodology is applied in a certain situation; compared to the philosophy that is described in the textbooks.

On a more concrete level; the different research methodologies which are classified as qualitative have been studied. "How can these be applied to study information systems?" Each methodology has its own advantages and drawbacks, but they share a similar basis in the used paradigm. Because of this similarity, it is primarily the research goal and the research context which determines which methodology is to be used.

Contents

Chapter 1

Research Programme

1.1 Framework

There are many different information system development methodologies, each with its own foundation. For instance, one methdology is based on a process modelling, others on data modelling. Some are based on a 'top-down' approach and others on a 'bottum-up'. There are several of these distinctions discernable (Bemelmans, 1991, p142).

One reason to use a methodology is to increase the 'success rate' of an IS development project; or "These methods are needed because IS development is too complex to be conducted without plans or structure". (Sol 1982 in (Wijers, 1991, p13)).

However, in practise, these methodologies are not always used. Research by Fitzgerald (Fitzgerald, 1998b) (Fitzgerald, 1998a) indicates that 60 percent of the respondents where not using any form of methodology in system development. Some of the reasons that were mentioned where:

- limited empirical foundation and use of methodologies
- methodologies treat software development as a technical rational process, which is only one aspect of software development (for instance, there is also the social aspect)
- methodologies do not work for the unique situation the users are facing
- no attention for developer-embodied factors (creativity, intuition, etc)

This lack of trust of methodologies probably has something to do with the context in which these methodologies are used: the organisation. This context makes IS design all the more complicated; limited resources, shifts in design specification over time, different viewpoints on the system, etc. . . ; just to name a few problems that hinder the usage of a methodology. The IS design problem even has been classified as 'wicked' and 'ill-structured'.(Proper, 2003)

In reality, the designer decides when to stick to the prescribed methodology and when to deviate from it, trusting his or her own experiences. This is not an ideal situation for the field of science that studies these methodologies. There is the need to increase the scientific basis for much of these methodologies;

develop new methodologies, to test existing ones, etc. It is the hope that this will lead to a better trust in these methodologies and that the usage of these 'new' methodologies will lead to an improvement in the 'success rate'.

Research that has IS methodology as a subject should take into account the context of IS development, the organisation, and the related wicked, ill-structured properties of the IS design process. This requires a different approach than is usual in computing science. Perhaps it is interesting to look at the research methodologies of social and management sciences. Their subject of study is the organisation itself and therefore they have to deal with the wicked, ill-structured properties of their subject in order to generate new theories.

From these research methodologies, the ones which fit into the category 'qualitative research' are being studied in this paper. This 'class of research' is chosen because it is more suited to study the 'social aspects' than its quantitative counterpart and it specifically deals with the process of 'theory creation'. (See chapter 3 for more information on qualitative research.)

There are two sorts of 'methodologies' in this paper, the one which deals with qualitative research and the other that deals with information sytem development. To prevent misunderstanding, both methodologies are depicted in figure 1.1. The cloud depicts the 'wicked problem' that is to be solved by the IS design methodology, resulting into an information system. The qualitative research methodology is applied to this whole process in order to create theories about the IS design methodologies.

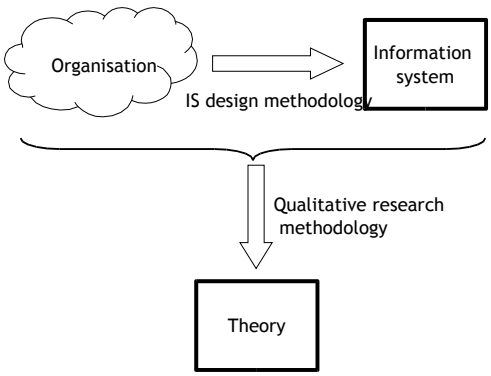


Figure 1.1: two methodologies

1.2 Goal of the research

The issues described above can be translated into the following, more specific, research goal:

> The goal of this research is to improve methodological *awareness* within the information system development community, by giving an overview of the qualitative research area.

Notice the word "awareness" within this research goal definition. There is not one right way of doing research, especially not in qualitative research. However, this does not mean that everything is allowed in this field. Therefore, this paper is only meant to give an overview of the qualitative research field and to provide some guidelines how they can be used in the field of IS development. In order to achieve this goal, the following research questions need to be answered:

1. What is information system development?
2. What is qualitative research?
   (a) What is scientific research in general?
   (b) What are the principles of qualitative research?
3. How can qualitative research be used to study IS development?
   (a) What are the concrete methodologies of qualitative research?
   (b) How can they be applied to study IS design methodologies?
   (c) How have these methodologies been used in IS research untill now?

The three main research questions are answered in chapters 2, 4 an 7 respectively. Chapter 3 will briefly deal with the question "What is scientific research?", in order relate qualitative research to the other forms of research. Chapter 5 contains a description of several concrete qualitative research strategies and their possible application in IS research. Chapter 6 will contain several cases of application of these strategies.

1.3 Research strategy

The following actions were performed in order to answer the research questions. Firstly, a literature study was done with the topics 'information system development' and 'qualitative research methodology'. Several books and articles were consulted and experts of these methodologies were interviewed.

Secondly, several cases were created in order to illustrate the usage of these methodologies in information system development. These cases are based on several master theses. Unfortunately, these cases where selected only on the basis on availability, instead of a predefined set of criteria; students needed to be interviewed if the process itself was not clearly described in the thesis itself . However, the information gathered here is only used as an illustration of the abstract theories described in the previous chapters, and not as a source of new theory development. Note that two of these cases are based on a research projects which involve 'developing countries' and 'ISPL'. One of them was performed by the writer of this paper, and did not end successfully.

Chapter 2

What are information system development methodologies?

2.1 Introduction

In order to understand IS development methodologies, it is best to first look at the concepts 'information system' and 'methodology'. Two aspects of this 'methodology' concept can be related towards the 'information system' concept in general; the 'way of working' and 'way of modelling'. This relationship remains general, so the complete methodology framework will be applied to two existing IS development methodologies: ISPL and RUP.

Finally, some issues of the usage of these methodologies will be presented. These issues are used in subsequent chapters to match IS development with qualitative research.

2.2 Information systems

The information system in an organisation exists in relationship to two other systems (Blumenthal, 1984). These are the primary transformation system; which creates the products or services of the organisation, the controlling system of that transformation system, and the information system; gathering information from within the organisation and the environment, converting it to useful information for the different levels of the control system. Note that the information system itself also has a controlling system, with a strategic, tactical and operational level. This has been omitted in figure 2.1 since this would make this figure needlessly complex.

2.3 IS design methodologies

The IS development process can be seen as a adjustment of the information system to the demands of the environment and internal organisation. This adjustment process is too complex for a person to understand directly; "IS development is too complex to be conducted without plans or structure (Sol in

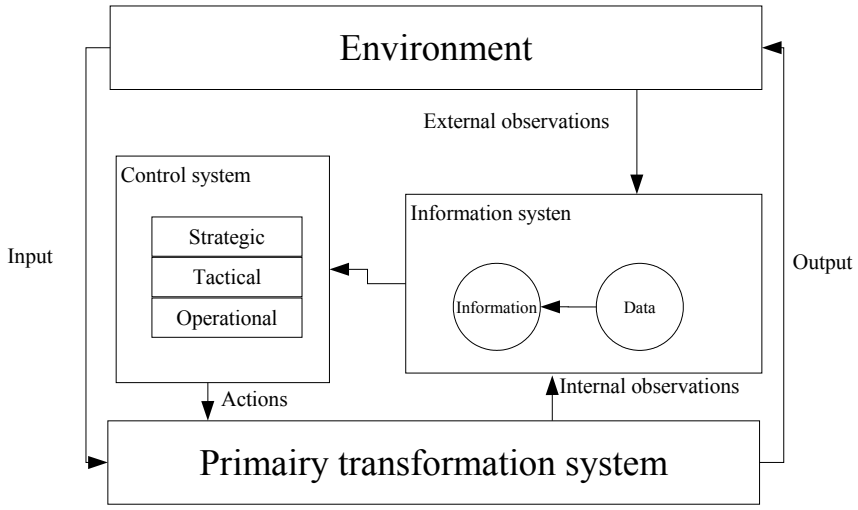


Figure 2.1: information system in relation to other systems

(Wijers, 1991)).” This is where methodologies come in.

A definition of IS development methodologies could be: “Design methods can provide strategies that will help to determine which choice may be most appropriate in a given situation (Budgen, 1994, p18). Another useful perspective on IS development is provided by Sol ; he sees IS design as a problem solving process:

> “The purpose of design is simply to produce a solution to a problem. The problem will typically be summarized by means of some form of requirement specification, and it’s the designer’s task to provide a description of how that requirement is going to be met. Design is therefore essentially a problem-solving task, . . . , it is not an analytical process. The process of design involves the designer in evaluating different options, and in making choices using decision criteria that may be complex and may involve trade-offs between factors such as size, speed and ease of adaptation, as well as other problem-specific factors.”

When solving a *problem*, you are concerned with both *product* and *process*; you create a solution that can be applied in the situation in which the problem was created. You also use a certain *philosophy* which makes sense of the choices you make during this process. Applied to IS design methods: most methods deal with both the *quality of the information system* that is being designed and the *quality of this design process* itself. Most methods have a *“foundation”* that could be classified a philosophy.

Seligman (Seligman, Wijers, & Sol, 1989) has organized these elements in a framework that can be used to classify different methodologies. It is often

used to describe IS design methodologies as well. See figure 2.2 for a graphical representation of this framework. It consists of the following components:

- A way of modelling (product)
- A way of working (process)
- A way of controlling (management)
- A way of thinking (underlying philosophy)
- A way of supporting (tools)

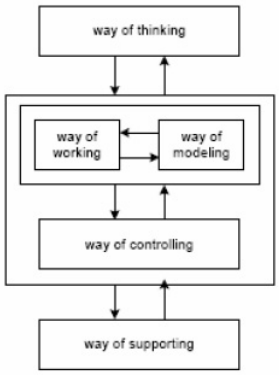


Figure 2.2: framework to classify methodologies (Seligman et al., 1989)

The **way of modelling** is concerned with the product; how do we categorize and structure the problems and the solutions to these problems. Since there are different categories of problems, there are also different categories of modelling. This allows us to see the system from different perspectives.

The **way of working** is concerned with the types of activities that need to be performed in order to implement the solutions. It describes the strategy of the implementation. What are the tasks that need to be performed, when they are performed, what are the decision points in this process, etc. These tasks can include model construction, model evaluation, education, management reporting, etc. Also, the participants, or actors, are described here.

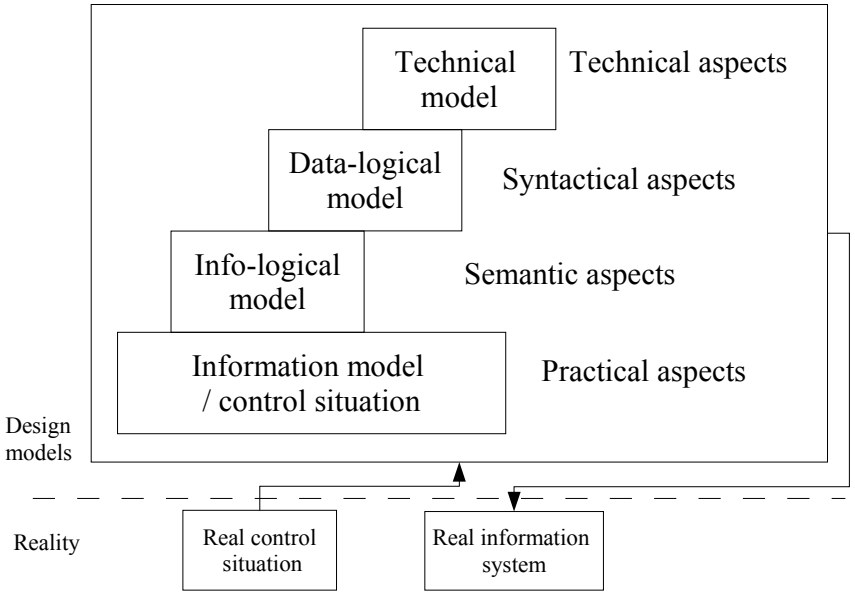
The **way of controlling** combines the two ways mentioned above to specify how the IS development process should be managed. In reality, 'modelling' and 'working' cannot exist without each other; controlling tunes the two processes to each other. Controlling requires a rough view of way there is going to be worked and modelled. The activities of 'working' provide input for 'controlling' and the way of controlling determines how there is going to be modelled.

Al these 'ways' have certain assumptions; about the information system, the organisation, reality in general, etc. These assumptions are described in the **way of thinking**. A **way of supporting** contains al the tools that are used in the information system development. These tools support different tasks in the IS development process.

2.4 Way of modelling in IS development

There are several different models in IS design, which can be grouped using semiotics see figure 2.4 (Bemelmans, 1991, p151):

- **The syntactic aspect.** The transfer of data is achieved by means of signs or combination thereof (language, code, etc.). Syntax involves all the rules of the possible combinations.
- **The semantic aspect.** This has to do with the meaning of the data. If the receiver and transmitter apply different meaning to a sign, the information system will not function.
- **The pragmatic aspect.** What behaviour does the signal trigger with the receiver of the sign.



Note that the creation of such a model is done in a 'top-down' approach. A global design is made, and each parts of this global design is refined in the next step of the modelling process. This is the standard way of dealing with the complexity of the design process in IS design. (Bemelmans, 1991, p153)

2.5 Way of working in IS development

The process of IS design involves several activities, mostly known as design, implementation, testing (validation), integration, and maintenance. Theses stage are from the software development model "the waterfall model", first proposed in 1970 by W. W. Royce. (Wikipedia, 2004) (See figure 2.3). Although

not every IS design needs the development of new software, this model still can be applied in IS design in general. Models from project management are similar to this model; roughly the same stages can be found: "diagnose, design, implement, evaluate" or "initiation, planning, executing, controlling and closing".

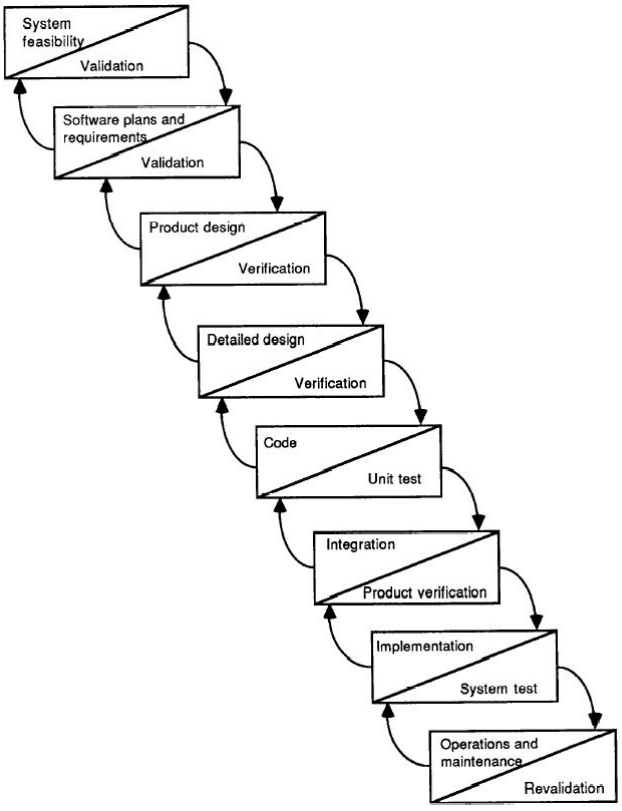


Figure 2.3: The waterfall model of the software life cycle.

The spiral model of Boehm is an extension of the waterfall model (see figure 2.4); it recognises the iterative nature of software design. "The angular dimension represents the progress made in completing each cycle of the spiral. The model reflects the underlying concept that each cycle involves a progression that addresses the same sequence of steps, for each portion of the product and for each of its levels of elaboration, from an overall concept of operation

document down to the coding of each individual program." (Boehm, 1988) This model therefore gives a fuller account of all the actions that need to be performed in order to create an IS design

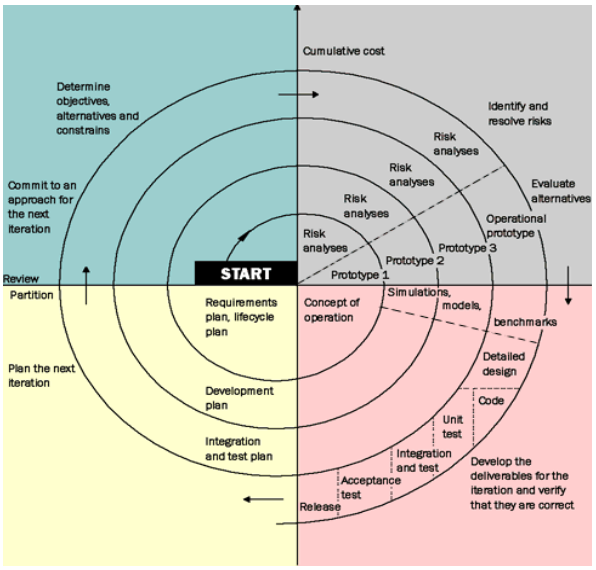


Figure 2.4: Spiral model of the software process.

In each stage the following activities are performed (Budgen, 1994, p46):

1. The objectives of the stage are identified
2. The options and constraints are listed and explored
3. The risks involved in choosing between the options are evaluated
4. A plan for how to proceed to the next phase is evaluated

Although the waterfall model is the most well known model, it is certainly not the only way to describe the IS design process. Boehm has identified two other types of models: the 'evolutionary development model' and the 'transform model'. The first method is based on developing high level prototypes that are gradually refined to produce the final system. The second model is based upon the automatic conversion of a formal specification of a software product into a product that satisfies the specification (Budgen, 1994, p45)

2.6 An example: Rational Unified Process

The Rational Unified Process is a software development process framework that provides a disciplined approach to assigning tasks and responsibilities within a development organization. Its goal is to ensure the production of high-quality software that meets the needs of its end users within a predictable schedule and budget ("better software faster"). (Eeles, Houston, & Kozaczynski, 2002) An effective software development process should describe who

does what, how, and when. RUP does exactly that in terms of the following key concepts (see figure 2.5 [1]):

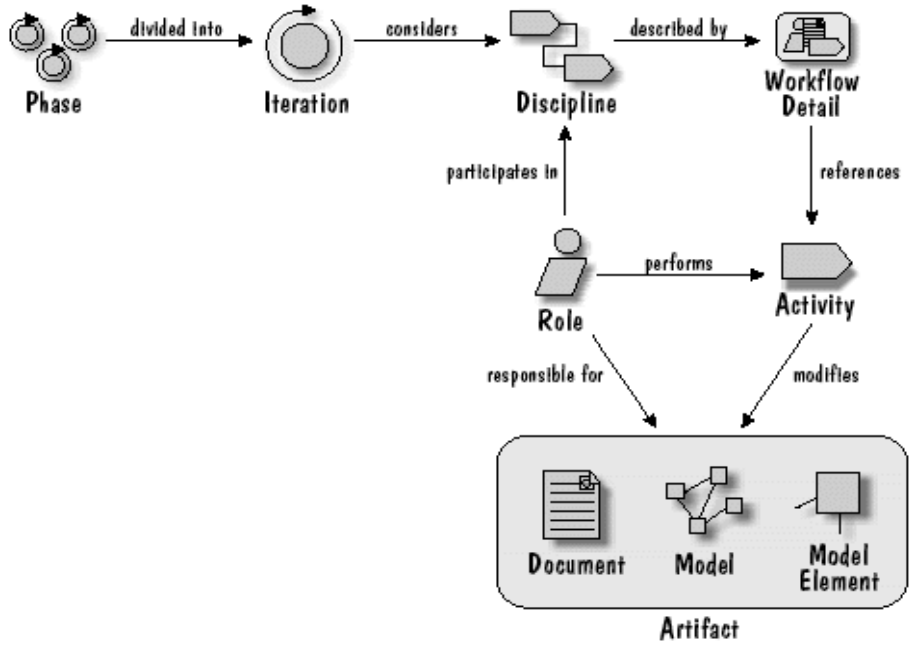


Figure 2.5: Rational Unified Process

- Roles: The who
- Artifacts: The what
- Activities: The how
- Phases, iterations, disciplines and workflow details: The when

2.6.1 Way of working

The way of working can primarily be found in the horizontal axis of figure 2.6. Here we find the different phases of each project. Each phase consists of several iterations. The horizontal axis however depicts the different disciplines required for each phase. Note for instance that the discipline of 'business modelling' is most present in the initial phase of the project. In short, the 'way of working' involves the activities and the phases.

2.6.2 Way of modelling

The way of modelling involves the artefacts. The artefacts are the results of the RUP process. "An artifact is a piece of information that is produced and/or used during the execution of the process. Artifacts are the tangible by-products

[1] All RUP images are from the Addison-Whesley site

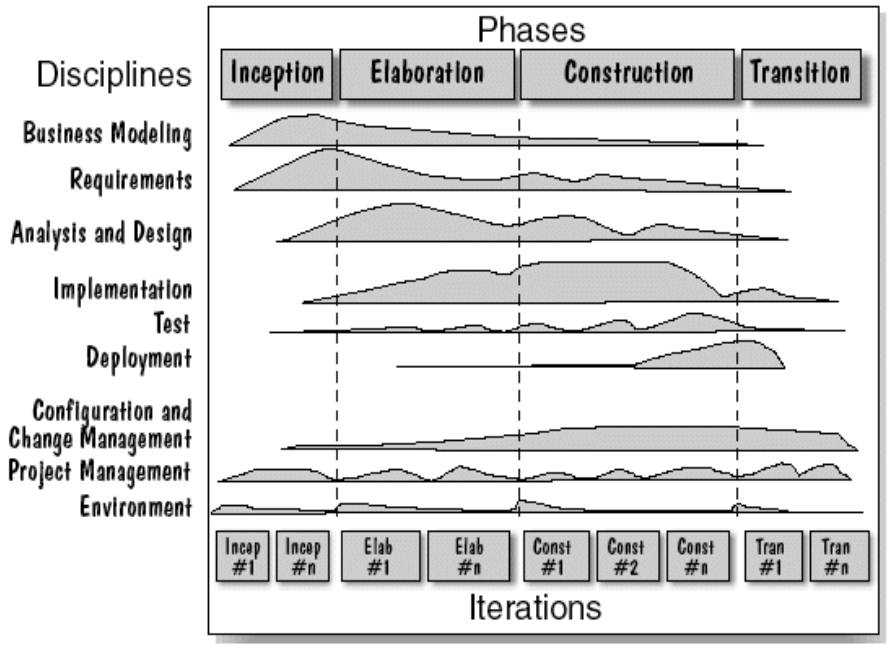


Figure 2.6: phases of RUP

of the process. The deliverables that end up in the hands of the customers and end users are only a subset of the artifacts that are produced on a project." (Eeles et al., 2002). Artifacts may take various shapes or forms.

- A model, such as a Use-Case Model or Design Model, which contains model elements
- A model element, such as a Use Case, Design Class, or Design Subsystem, which is part of a model
- A document, such as a Software Architecture Document
- Source code
- An executable
- A project plan

2.6.3 Way of controling

The way of controlling can be found in the modelling of the roles. A role is defined within RUP as "role defines the behavior and responsibilities of an individual, or a set of individuals working together as a team, within the context of a software development organization. A role is responsible for one or more artifacts and performs a set of activities." Modelling the roles is in fact making a meta model of the IS development process itself. It links the 'way of working' with the 'way of modelling'. It corresponds with the vertical axis in figure 2.6.

2.6.4 Way of thinking

The 'philosophical basis' of RUP can be found in several 'best practises' and the experiences of the company Rational with developing software. "Best practices are a set of commercially proven approaches to software development. When used in combination, best practices ensure the success of a software development project by striking at the root causes of typical software development problems. " Here are a couple of these best practises on which RUP was build.

- Develop iteratively.
- Manage requirements.
- Use component architectures.
- Model visually.
- Continuously verify quality.
- Manage change.

2.6.5 Way of supporting

Naturally, there exist a number of software tools for RUP. A well known tool is Rational Rose, which uses Unified Modeling Language for the component construction.

2.7 An example: The Information system procurement library

ISPL may not be the first methodology that comes to mind when you are thinking of IS design methodologies. The information system procurement library (ISPL) is a best practise library for the management of the acquisition process. An acquisition process is the process of obtaining a it consists of several books, a user group, a database, training, etc.

2.7.1 Way of modelling

The way of modelling in ISPL is quite straightforward. There a several checklists that classify the project en the environment of the projects. Each factor of the environment is classified as 'simple vs complex' and 'certain vs uncertain'. For example: the situational factors are classified as : target domain, service domain, (business)process, information, actors and technology.

2.7.2 Way of working

The way of working is also quite straightforward; ISPL describes the different phases of the project and several strategies of how to implement the system. It does not specify these in great detail.

2.7.3 Way of controlling

The way of controlling is the strength of ISPL. The factors mentioned in 'the way of modelling' can be translated into a development strategy ('way of working'). This translation is done by using a large number of tables which containing the environmental en project factors on the one side and the recommended strategies on the other. Each type of project has its own way of working.

2.7.4 Way of thinking

The way of thinking in ISPL consists of mainly three components: risk management, 'mutual understanding' and contingency. The mentioned the last component already; 'each type of project has its own way of working'. 'Mutual understanding' aims to improve the cooperation between the different suppliers and customer in order to improve the success of the project. The theory of risk management is used in the situational analysis: each situation has its risks which can be controlled by a certain project strategy.

2.8 Issues in IS design methodology studies

Information systems are not designed in a context free environment; these systems are part of a bigger system; the organisation. It is this organisation that determines what a "high quality information system" should look like (the requirements) and it is the organisation that places constraints on the design process. This 'context' gives rise to a set of IS design problems which have unique characteristics. These have been described as 'wicked', 'ill structured' (Budgen, 1994) and 'messy'.

1. A 'wicked' problem is defined by (Rittel & Weber, 1984):

   (a) *There is no definitive formulation of a wicked problem*. The difficulties of specifying the needs of software-based systems are well known, and the task of specification and design are often difficult to separate clearly. Rittel and Weber make the point that the understanding of such a problem is bound up with the ideas that we may have about solving it - which is why the simple life-cycle model in which task specification is followed neatly by that of design is rarely a realistic description of the actual practises.

   (b) *Wicked problems have no stopping rule*. Essentially this property implies that there is a lack of any criteria that can be used to establish when *the* solution to a problem has been found , such that any further work will not be able to improve on it. For software, this is demonstrated by our lack of any quality measures that can be used to establish that any one system design is the 'best' one possible.

   (c) *Solutions to wicked problems are not true or false, but good or bad.* For many scientific and classical engineering problems, we may be able to identify whether a solution is correct or false. Software designs usually come in 'shades of grey', in that there are usually no right or wrong solutions to structures.

(d) *Every wicked problem can be considered to be a symptom of another problem.* Resolving a discrepancy or inconsistency in a design may pose another problem in its turn. Again, in writing a computer program, a choice of data structure that helps with resolving one problem may well present an entirely new difficulty later.

2. A problem is 'ill-structured' when (Simon, 1984):

   (a) the problem solver finds a problem ill-structured if the power of his methods that are applicable to the problem lies below a certain threshold.

   (b) the set of alternative solutions seems to be unlimited

   (c) the solutions cannot be consistently derived from a model system that shows a good correspondence (with reality)

   (d) the effectiveness or the efficiency of the courses of action cannot be numerically evaluated

3. A problem is 'messy' when (Vennix, 1996, p1):

   (a) "different people hold widely dissimilar views on the situation and as a result they define problems differently."

   (b) In order to solve such a problem, these different views of the problem owners have to be integrated into one view. This results in a more complete view of the problem and less resistance to a solution that is based on this new view.

Note that the wicked property is related to the 'way of controlling'; "When does we perform what action?", "When do we stop modelling?", "When do we start building?" etc . The ill-structured property is obviously related to the 'way of modelling'; the modelling techniques are not adequate to structure the chaos. The messy property probably involves the 'way of working' and 'way of controlling' ; "Who do we involve with the design process?" and "How do we involve them in the design process? (human reseource planning)?".

It is difficult to say if these properties are casually related to each other. Is there no successful modelling because of the poor controlling mechanisms, or can the control mechanism not function because we cannot make an adequate model the problem situation?

Chapter 3

What is scientific research?

3.1 Introduction

If you want to describe qualitative research in relation to the other ways of doing research, you first need a framework of scientific research in general. This chapter has to be read with this goal in mind, instead of considering this to be a complete overview. It would be presumptuous to assume that such an overview can be given in only one chapter. Both the fields of philosophy and methodology deal extensively with this question. It touches some fundamental issues like: "what is knowledge", "how can we obtain it", etc . . . , which cannot be resolved in an easy way.

3.2 Methods of science

According to Kerlinger in (Bosman, 1977), there are four methods that have played a role in the history of science. They are:

- The method of regularity: "Here men hold firmly to the truth, the truth that they know to be true because they hold firmly to it, because they always known it to be true. Frequent repetition of such 'truths' seem to enhance their validity".
- The method of authority: "This is the method of established belief. If the Bible says it, it is so. If an idea has the weight of tradition and public sanction, it is so Actually, life could not go on without the method of authority."
- The a priory or axiomatic method: a group of people (experts, prophets) have accepted certain axiom's. They consider them to be true. These axioms are almost nearly impossible to (dis)prove. These axiom's "agree with reason", not necessarily with experience.
- The scientific method: this method is unique because it contains 'self correction'. There are built-in checks all along the way of scientific knowledge.

Nowadays, the last two methods are dominant in the scientific community, but the other two still influence science today. For instance: a more modern version of the method of authority can be found in the scientific forms who determine a path for a specific field of science. Also note that these methods are also "archetypes", each scientific community applies a mixture of these methods. These methods cannot exist without each other. For example, the a priory method often relies on the reason of a certain authority or scientific community.

3.3 The empirical cycle

The scientific method can be described using the empirical cycle. Empirical roughly [1] means: "derived from experiment and observation rather than theory" (Hyperdictionary, 2004). A more formal definition of empirical is "Empiricism is the school of Epistemology (in philosophy or psychology) that virtually all knowledge is the result of our experiences" (Wikipedia, 2004). This 'looking to reality' is the way empiricism corrects itself; one tries to describe or predict what is 'out there'. Empiricists look the world in order to discover truths. This sets them apart from followers from the a priory method, since they consider a language based on axioms to be 'true' . Mathematics and logic are examples of this a priori method.

In order to keep in touch with this reality, an empiricist can perform several activities. These activities are depicted as arrows in figure 3.1[2].

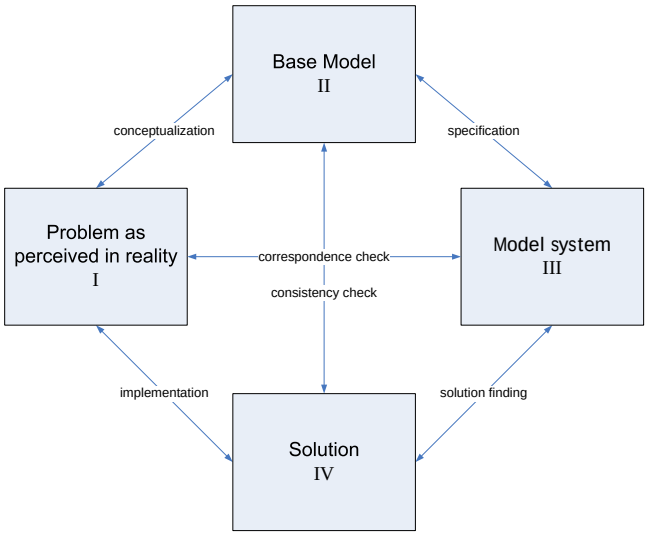


Figure 3.1: the empirical cycle

[1] the definitions in this paragraph are a bit 'light weight', but they are short and clear
[2] based on (Bosman, 1977) and (Sol, 1982)

You can discern four different cycles within figure 3.1. These cycles are:

1. II, III, IV, II : **traditional research** emphasis on creating a model(discovery) and solving it(validation)
2. I, II, IV, I : **description**: emphasis on imaging (and implementation)
3. I, II, III, I : **validation**: this cycle is concerned continuously checking and improving the image created
4. I, III, IV , I : **practical**: focus on finding an solution and implementation

Note that the first cycle is most common in philosophy of science and methodology. It also has several variances. (Bosman, 1977). Cycle 4 is mostly found in solving problems practically, for instance in organisations. Probably, this cycle can also be found in most IS methodologies. Qualitative research is mostly based on cycle 2, because of its descriptive nature.

In order to get a clearer view of this empirical cycle, here is a short description of a more concrete research. This research is based on cycle I. Firstly; a researcher formulates a number of hypotheses (specification) that as a whole forms a model. Such a hypothesis could be "organisations using ISPL have a higher success rate on IS projects." The model would consist of a number of lower level hypotheses which explain the main hypothesis. Secondly; he or she uses this model to make predications about 'reality' (solution finding and consistency check). "The organisations in the Netherlands that apply ISPL spend significantly less money on ICT projects compared to their non-ISPL counterparts". (Note that this predication has to be a specific as possible in order to measure it properly)

In this model cycle, the process of theory creation is not as important as theory validation:

> "The left half they label with as the origin of our ideas, or in their terms, the "context of discovery.". The right half they label as concerned with the testing of ideas, or in their terms, the "context of verification". Only the right half they contend is of importance to our understanding of science, or at least to that part of the philosophy of science that is concerned with explaining science in terms of machinery or symbolic logic. According to this view, the origin of our ideas is irrelevant; all that matters is their ability to stand up to demanding tests, to be 'validated' or better, 'invalidated'. Given the preoccupation with explicating science in terms of logic, this attitude is understandable." (Mitroff in (Bosman, 1977))

However, an overview of al these empirical cycles does not answer the question: "What cycle is best in my research project". There are several criteria. Obviously, one of them is the research goal; what do you want to achieve with your research. Other criteria are more fundamental in nature. These criteria are related to the process of *'specification'* and the process of *'validation'*. In short: "What methods do you use to create the model?", And "How do you 'test' these models" and "Why do you create or test a model in such way?". In the next chapter we will see that qualitative and quantitative research differ substantially here.

If you want to give an answer to this last question, you have to formulate your research paradigm. A research paradigm is similar to "weltanschaung" in the model of Seligman (see section 2.3). A paradigm consists of an epistemology and an ontology. In short, an epistemology defines what you consider to be "knowledge" and an ontology defines the means to obtain this knowledge. Here is a more complete overview of the terms and their definitions :

paradigm: a paradigm (according to Kuhn) provides a way of looking at the world. It exerts influence on the field of study by providing the assumptions, the rules, the direction and the the criteria by which normal science is carried out. (Erlandson, 1993)

epistemology: philosophical claims or theories that can be entertained about ways in which the world is to made known.(short: what are to count as facts) (J. Hughes, 1980)

ontology: claims about what exists (J. Hughes, 1980)

There are many different paradigms, especially within the social sciences. In the next chapter we will discuss the different paradigms of qualitative research. A couple of paradigms are described below. They are from Olaisen (Olaisen, 1991, p120). He describes of 4 different paradigms useful for 'information science'. For illustration purposes two of them are described here. The first one is what they call the 'empirical paradigm'[3]:

> ...its explanation consists of establishing causal relations between variables; and its theory consisting of interrelated sets of causal laws. It defines definitive concepts of small parts of the reality.
>
> ...(it) assumes that information and information technology relations have a concrete, real existence and a systematic character producing quantitative and qualitative findings according to the needs of the information users. Information systems are seen as equilibrium seeking. The real world is considered essential as conflict-free and harmonious at a higher level of aggregation. This corresponds with an ideal of science being objective and value free.

Here is a description of its counterpart; 'the action paradigm':

> The action paradigm takes as its data intersubjectively meaningful actions; its explanation consists of explanation of societal members' methods for assembling the sense of these meaningful actions; and its theory consists of the formal properties of these members methods
>
> The action paradigm also assumes that what passes for reality is socially determined. The paradigm draws attention to the "pathology of consciousness" by identifying the psychic and social processes which constrain a control for thought processes causing alienation. The role of science is to identify the actors in the system,

[3]this paradigm is very similar to the positivist paradigm, used to in the example of the first cycle.

> their goals, interests and power bases in order to describe the conflicts and contradictions in the system and show the way to emancipation.

As you can see, these questions are quite fundamental in nature. Therefore, it is nearly impossible to conclude that one research paradigm is 'better' than another. A good research design is a consistent set of ontology, epistemology and methodology. Unfortunately, ontology and epistemology are not formulated explicitly in many research designs. This makes comparison between studies, especially the social ones, very difficult.

3.4 Methodology

A word about the methodology of a research design. Methodology is the way you acquire your information about the real world. There are several methods: interviews, observation, surveys, etc. It would be inappropriate to discuss all these methods here, because each of these methods gets a whole different interpretation depending on the research paradigm.

> For example, participant observation in the hands of a positivist[4] may be used to document the number and length of interactions within a setting, but in the hands of an action theorist the technique may be used to explore the realms of subjective meaning of those interactions. (Morgan & Smircich, 1980, p498).

The same principle can be applied to interviews and other techniques. In chapter 5 we will discuss these methods from a qualitative point of view. Information about quantitative research can be found in standard textbooks.

3.5 Implications for IS research design

In the previous chapter we have described some of the issues that can befound in IS design methodologies. These issues, and the (implicit) goal of improving these IS design methodologies, can provide us with some criteria for IS research:

1. **Research should be holistic in nature.** Since it is difficult to define the problem, there is no telling when one problem starts and the other begin, it is important to study the process from as many viewpoints as possible. You do not know what is going to be relevant and what is not, so you have to keep an 'open mind'. Each IS design project is unique.

2. **There should be room for subjective experience.** There may be no single 'right solution', but some solutions are better accepted than others. The reaction of the actors involved on certain decisions of the designer are important to the success of an IS project. The subjective experience of the designer are also relevant.

[4] see page 25 for a definition of 'positivist'

3. **Complexity should be dealth with.** Any research which tries to apply to point 1 and 2 is going to provide an enormous amount of data. The research should contain methods and / or strategies to prevent the researcher from drowning in his or her own data.

4. **It does not disturb the natural process** Since IS design is a 'one shot problem', you do not want to reduce the success rate of the IS design process you are trying to study.

5. **It should provide concrete guidelines** You study IS design methodologies with the implicit goal of improving these methodologies. If the applied research methodology does lend itself to modify or create an new methodology, the research project becomes (perhaps an interesting) but 'academic exercise'.

Chapter 4

What is qualitative research?

4.1 Introduction

In this chapter we will try to define what "qualitative research" is. First, there is an overview of different definitions of qualitative research, followed by a tradition confrontation between qualitative and quantitative research. Next, we will take a look what the paradigms are of qualitative research. There are several different models which provide an overview of these paradigms. We will discuss two of them. Finally, we will have a look what a qualitative methodology looks like. In this description we find several principles that are the basis of the 'qualitative research strategies' we will discuss in the next chapter.

4.2 Definitions of qualitative research

The following quotes and definitions give us an impression of what qualitative research is:

- Qualitative research aims to help us to understand the world in which we live and why things are the way they are. It is concerned with finding the answers to questions which begin with: why? how? in what way? (Hancock, 1998).
- In qualitative research is about finding and labelling relevant properties. . . . , where the perspective of the researches is enriched through this gained insights by new concepts.(Wester & Peters, 2004, p11).

These definitions provide us with only a vague impression of what qualitative research is about. You can understand qualitative research better if you compare it to its counterpart, quantitative research.

4.3 Qualitative versus quantitative research

In the previous chapter we have seen a example of a quantitative research cycle (see section 3.3). The basic assumption of this approach is that there is an objective reality 'out there'. In this way, the theory determines the way you look to

the world out there; what is important, the way you measure, etc. Objectivity here means using the right method for the object you want to study, in order to reveal as much of this reality as possible. Other factors, like preferences of the researcher, should be filtered out as much as possible.

However, the empirical cycle can be used in another way. This method describe above has its drawbacks when you want to 'understand' social phenomena. Quantitative research 'models' human (behaviour) as black boxes; with input x they will respond with behaviour y. This is perhaps inevitable if you want to study human behaviour in certain large settings, but if you want to know why they behave like that, in other words you want to 'open the black box', quantitative methods will not suffice.

According to Albinski (in (Wester & Peters, 2004)), the quantitative method falls short to explain human behaviour. Humans are not 'objects' but 'subjects'. Their actions are not solely the result of external forces; there is also something like the 'free will'. Humans do not behave like particles of iron in a magnetic field; they can always make a choice in their behaviour.

If you want to 'open the box' and want to find out why people behave the way they do, you need to know how they (the input of the black box) and, very important, how they interpret what they see. Humans actively 'create' their own social environment through this interpretation. In this view of scientific research, this social reality is just as important as the objective reality. [1] In certain management sciences, where the goal is to solve organisational problems, this social reality receives special attention. In order to solve these problems, you need to have the support of the people who are involved. Possible solutions need to fit in their worldview, otherwise they are not accepted and implemented.

Objectivity in qualitative research means that the (new) theory matches with the interpretation of the people who are involved. The researcher tries to see the world in the same way as the person who he or she is studying and has to become aware of his own biases towards the subject. Concepts are used to communicate with the people who are involved. He or she tries to find out what these concepts mean those people. This means that these concepts cannot be defined beforehand. (Wester & Peters, 2004, p21). Naturally, this results in a completely different interpretation of the activities of 'specification' and 'consistency check' in the empirical cycle.

Note that the distinction between qualitative and quantitative research is partly only a theoretical one. In practise, each form of research will have a quantitative of qualitative research element, emphasising one element over the other.

4.4 Paradigms of qualitative research

The different paradigms can be grouped into different schemes, one which was created by Burrel and Morgan (Morgan & Smircich, 1980) and the other on Meyers (Klein & Myers, 1999) . The scheme of Burrel and Morgan is based on the dimension "subjective versus objective" and the scheme of Meyers divides the qualitative research area into a positivist, a interpretive and a critical one.

[1] the existence of an objective reality is denied in some scientific paradigms

	Subjectivist Approaches to Social Science					Objectivist Approaches to Social Science
Core Ontological Assumptions	reality as a projection of human imagination	reality as a social construction	reality as a realm of symbolic discourse	reality as a contextual field of information	reality as a concrete process	reality as a concrete structure
Assumptions About Human Nature	man as pure spirit, consciousness, being	man as a social constructor; the symbol creator	man as an actor; the symbol user	man as an information processor	man as an adaptor	man as a responder
Basic Epistemological Stance	to obtain phenomenological insight, revelation	to understand how social reality is created	to understand patterns of symbolic discourse	to map contexts	to study systems, process, change	to construct a positivist science
Some Favored Metaphors	transcendental	language game, accomplishment, text	theater, culture	cybernetic	organism	machine
Research Methods	exploration of pure subjectivity	hermeneutics	symbolic analysis	contextual analysis of Gestalten	historical analysis	lab experiments, surveys

Figure 4.1: network of basic assumptions characterizing the subjective - objective debate within social sciences

4.5 Subjective versus Objective

This scheme suggests that all approaches to social science are based on interrelated sets of assumptions regarding ontology, human nature and epistemology.(Morgan & Smircich, 1980, p491). This scheme can be found in figure 4.1.

In order to give a more complete overview, we will discuss the different views in the spectrum, from objective to the subjective continuum. Note that this scheme is a simplification of reality:

> The transition from one perspective to another must as a gradual one, and it is often the case the advocates of any given position may attempt to incorporate insights from others. The point is that the scheme provides a useful way for thinking about the assumptions that underlie continuing research and debate within the social sciences, and the thorny problems regarding epistemological and methodological adequacy. (Morgan & Smircich, 1980, p493)

Also each view has its own metaphor. This metaphor is more than an example; it is a way to create knowledge about the world.

> "It is the issue whether or not human beings can achieve any form of knowledge that is independent of their own subjective construc-

> tion, since they are the agents through which knowledge is perceived or experienced. A strong case can be made for the view, that science of all kinds, whether nominalist or realist in its basic orientation, is primarily metaphorical .... It is through the use of metaphors that scientist seek to create knowledge about the world. The metaphors that theorists use for basis for detailed theorizing usually derive from very fundamental, and often implicit, core assumptions about human nature and ontology." (Morgan & Smircich, 1980)

In the following sections, each paradigm (in the form of a metaphor) will be briefly discussed. Note that this is a summary of the original article of Morgan.

The machine The first metaphor in the scheme of Burrel and Morgan is that of the machine. Reality is to be considered to be one large mechanism, including the humans that populate it. This machine reacts always in the same way (an example of this view This viewpoint has already been described in section 3.3).

The organism In this paradigm the process of change in the machine is being studied. The machine, or better: organism, evolves, adapting itself to the environment. The main goal is to study what causes the changes in the organism. For example an evolution of grass will also cause an evolution in the organisms that depend on it for food, e.g. a deer. This paradigm is also popular in management sciences, where you can replace the term organism with 'organisation'.

Note that this second metaphor still upholds the notion of causality. This is rejected in the following metaphors. The reason therefore can be explained by using again the metaphor of the organism. In the previous paradigm, the organism (deer) adapts itself to the environment (grass). But this distinction between organism and environment can be considered to be highly random and subjective. Did the deer adapt to the grass or does the grass also adapt to the deer, causing the deer to 'evolve' and ...etc. If you start to reason like this, you quickly end up having a chain of causes of causes of causes. This chain cannot explain correctly what is happening.

Cybernetics cybernetics tries to rise above this game of cause and effect, and tries to look for "systemic wisdom" patterns in cause and effect; how do organisations and their environments evolve together.

The theatre the theatre adds the notion of people using patterns of symbols to negotiate their social reality. "It is an epistemological position that rejects the idea that the social world can be represented in terms of deterministic relationships, in favour of a view that the knowledge, understanding, and explanation of social affairs must take into account of how the social order is fashioned by human beings in ways that are meaningful to them". In organization studies this implies that attention has to be given to the role that language, symbols and myths play in the shaping of reality.

This has another result for research in general. The findings in this kind of study, and in the metaphors that follow, are not universally generisable , but does regard them as insightful and significant knowledge about the social world.

The language game In this methaphor, reality is considered to be a"social construction". People create their own reality ; this metaphor tries to find out how people make sense of their reality. How do people obtain commonsense knowledge of the world around them. This description gives the best account of being in the reality of the people that are being studied. What is also is taken into account, is the negotiation between people hat creates the social order that people experience in an environment.

Transcendental experience The last metaphor is located on the end of the spectrum; that of extreme subjectivism. Knowledge here resides with subjective experiences. The goal is to explore world in a way that is revelatory, but therefore also very 'unscientific'.

4.6 Positivist-, interpretive- and critical qualitative research

Klein and Myers (Klein & Myers, 1999) make another distinction within the qualitative paradigms. Based on several authors they define the three classes as follow:

- "Generally speaking, (IS) research can be classified as **positivist** if there is evidence of formal propositions, quantifiable measures of variables, hypothesis testing, and the drawing of inferences about a phenomenon from a representative sample to a stated population."
- "(IS) research can be classified as **critical** if the main task is seen as being one of social critique, whereby the restrictive and alienating conditions of the status quo are brought to light. Critical research seeks to be emancipatory in that it aims to help eliminate the causes of unwarranted alienation and domination and thereby enhance the opportunities for realizing human potential. To make this possible, critical theorists assume that people can consciously act to change their social and economic conditions. They do, however, recognize that human ability to improve their conditions is constrained by various forms of social, cultural, and political domination as well as natural laws and resource limitations."
- "(IS) research can be classified as interpretive if it is assumed that our knowledge of reality is gained only through social constructions such a language, consciousness, shared meanings, documents, tools, and other artifacts. Interpretive research does not predefine dependent and independent variables, but focuses on the complexity of human sense making as the situation emerges ; it attempts to understand phenomena through the meanings that people assign to them. Interpretive methods of research in IS are "aimed at producing an understanding of the context of the information system, and the process whereby the information system influences and is influenced by the context"."

The critical paradigm cannot be found in the model of Burrel and Morgan, but the distinction between interpretative and positivist can be seen in this model. Between the "reality as an organism" and "reality as cybernetics" the positivist paradigm ends. The interpretive paradigm starts between the "reality as cybernetics" and "reality as a theatre".

4.7 Qualitative (interpretive) research methodology

In the previous section we have seen that many of the research we classify as "qualitative" is interpretive in nature. It is this interpretative nature that has a fundamental impact on the way we build the image of reality; how you gather information and how you analyze it.

Note that not all qualitative research is interpretive, for instance the case study (as described by Yin), is based on the on a positivist way of doing quantitative research. We will discuss this research strategy in more detail in the next chapter. We will pay some extra attention to this "interpretive" methodology, since it differs significantly from the more normal traditional methodology.

Another reason to study the interpretative methodology in more detail, is the fact that, from a positivist point of view, this methodology seems to be very 'unscientific'. It only seems to be concerned with describing one (or a few) objects of study. In other words, the results of these studies are not generalisable, and therefore not useful for 'scientific' research. In this section we will see some mechanisms that interpretative methodology has to 'circumvent' this objection.

Note that it is difficult to describe this qualitative methodology, since a methodology consists of many different research procedures, each with its own logic (Wester & Peters, 2004, p22). A description of such a methodology therefore can only be very generic. However, in the same book, Peters , based on several articles about "qualitative methodology", has mapped 7 basic principles of qualitative (/interpretative) methods and 4 principles of qualitative research. These guidelines are based on the symbolic interaction paradigm described in chapter 3, and can be considered to be also representative for the other interpretive paradigms. The methodological essence of this paradigm can be considered to be following quotes:

- Respect the nature of the empirical world and organize a methodological stance to reflect that aspect
- " ...needs to discover the actors "definition of the situation" - that is , his perception and interpretation of reality and how these relate to this behaviour. Further, the actor's perception of reality turns this ongoing interpretation of social interactions that he and the others participate in, which, in turn, pivots on his use of symbols in general and language in particular. Finally, in order for the researcher to come to such an understanding he must be able (albeit imperfectly) to put himself in the other persons shoes" (Scwartz en Jacobs in (Wester & Peters, 2004))

Klein and Myers (Myers, 1999) have proposed some principles for 'the evaluation of interpretative qualitative research'. They are:

1. The Fundamental Principle of the Hermeneutic Circle.
2. The Principle of Contextualization.
3. The Principle of Interaction Between the Researchers and the Subjects.
4. The Principle of Contextualization.
5. The Principle of Interaction Between the Researchers and the Subjects.
6. The Principle of Abstraction and Generalization.
7. The Principle of Dialogical Reasoning.
8. The Principle of Multiple Interpretations.
9. The Principle of Suspicion

In the following section we will discuss these principles[2], using the principles of Peters as an additional explanation of these principles.

The Fundamental Principle of the Hermeneutic Circle.

> *This principle suggests that all human understanding is achieved by iterating between considering the interdependent meaning of parts and the whole that they form. This principle of human understanding is fundamental to all the other principles.*

The hermeutic cycle is based on the work of Gadamer, as is the following example. Take for instance the sentence "they are playing football". You can only understand the parts of the sentence in relation to the whole sentence; e.g. what is "football". Also, the sentence as a whole can only be understood in it's context. If nobody is engaged in sport at all, you must conclude that it is only a metaphor.

Similar, Peters mentions the holistic principle; Understanding of a situation is gained through the whole, contrary to quantitative research which depends on the ability to identify only a set of relevant variables.

The Principle of Contextualization.

> *Requires critical reflection of the social and historical background of the research setting, so that the intended audience can see how the current situation under investigation emerged.*

The principle of conceptualisation is based on Gadamer's insight that there is an inevitable difference between the interpreter and the autor of a text that is created by the historical distance between them (Klein & Myers, 1999, p73). Therefore the subject matter of the research should be in its social and historical context so that the audience can see how the current situation under investigation emerged.

[2]Therefore, most quotes are from (Myers, 1999)

> "In distinction to this, interpretive researchers insist that any observable organizational patterns are constantly changing because, as Parmenides observed, "you cannot swim in the same river twice." Interpretivists argue that organizations are not static and that the relationships between people, organizations, and technology are not fixed but constantly changing. As a consequence, interpretive research seeks to understand a moving target. In so far as each instance is treated as a unique historical occurrence, interpretive research is idiographic. From this it has sometimes mistakenly been concluded that interpretive research cannot generalize . . . When the researcher does the field research, the results of his or her work are influenced by the total history of the organization and the research itself becomes a part of the organization's future history. The principle of contextualization requires that this be explicitly reflected. The researcher needs to see people as the producers and not just as products of history and the description of the historical context should reflect this in the write-up of the research study."

The Principle of Interaction Between the Researchers and the Subjects.

> *Requires critical reflection on how the research materials (or "data") were socially constructed through the interaction between the researchers and participants.*

In social research, the 'data' is not just sitting there waiting to be gathered, like rocks on the seashore. Rather, interpretivism suggests that the facts are produced as part and parcel of the social interaction of the researchers with the participants. (Myers, 1999, p74)

The Principle of Abstraction and Generalization.

> *Requires relating the idiographic details revealed by the data interpretation through the application of principles one and two to theoretical, general concepts that describe the nature of human understanding and social action.*

This principle is quite important. Until now, the results of interpretative research seem to be not usable in other situations, due to the principle mentioned above (every situation is unique). However, representativeness and even theory itself have a different meaning in interpretative research. The validity of the interferences drawn from one or more cases does not depend on a statistical sense, but on the plausibility and cogency of the logical reasoning used in describing the results from the cases, and in drawing conclusions from them. (Walsham in (Myers, 1999)). He argues that there are four types of generalizations of from interpretative study:

1. the development of concepts
2. the generation of theory
3. the drawing of specific implications

4. the contribution of rich insight

Theory is used in a different way than is common in positivist research; interpretive researchers are not so interested in "falsifying" theories as in using theory more as a "sensitizing device" to view the world in a certain way. The results of one interpretative results can be used as a starting point for the next cycle of interpretative research. The more a theory is used in research, the more 'thrust' it gains in a community of researchers.

The Principle of Dialogical Reasoning.

> *Requires sensitivity to possible contradictions between the theoretical preconceptions guiding the research design and actual findings ("the story which the data tell") with subsequent cycles of revision.*

The researcher has to know his own biases and preconceptions towards the subject and report these to the readers of his research as good as possible. During the research process, the researcher will experience a shift in his or her preconceptions. This shift or 'learning process' must also be recorded and reported.

> In positivist social science, "prejudice" or prejudgement is seen as a source of bias and therefore a hindranceto true knowledge; objectivity, according to positivism, is best attained if a social scientist adopts a value-free position and does not let biases interfere with his or her analysis. By contrast, hermeneutics recognizes that prejudice is the necessary starting point of our understanding. The critical task of hermeneutics then becomes one of distinguishing between "true prejudices, by which we understand, from the false ones by which we misunderstand".

The Principle of Multiple Interpretations.

> *Requires sensitivity to possible differences in interpretations among the participants as are typically expressed in multiple narratives or stories of the same sequence of events under study. Similar to multiple witness accounts even if all tell it as they saw it.*

The researcher has to study the influence of the social context on the actions under study. This influence can be studied from multiple viewpoints from different actors. This is often referred to 'triangulation', a term we will frequently encounter when we discuss the case study methodology in the next chapter.

The Principle of Suspicion

> *Requires sensitivity to possible "biases" and systematic "distortions" in the narratives collected from the participants.*

This last principle can be omitted from qualitative research. It depends heavily on the researcher; he has to be able to "read" social situations. He has to able to recognize the biases of the people he is interviewing. It tends more to the "critical" paradigm than the "interpretative".

4.8 Characteristics and guidelines of qualitative research

Peters mentions several characteristics of qualitative research. The characteristics give us a more concrete picture then the more fundamental principles described above

The first characteristic of qualitative research is its 'verstehend' nature. Typical questions which can be considered to be 'verstehend' are "What is the meaning that humans give to the objects in their environment?", "How does this meaning influences their behavior?" and "How do humans perceive their environment?".

The second characteristic is the fact that the researcher has to get involved in 'role taking'. In order to be effective in his or her research, the researcher must see the objects in the same way as the actors do. Qualitative research describes social phenomena as they occur naturally. No attempt is made to manipulate the situation under study as is the case with experimental quantitative research.

Another characteristic is "direct observation of the empirical world (Blummer 1969)". This has the following consequences regarding: *"the used concepts; do not construct, operationalize and then measure concepts (as in quantitative research), but try to find concepts in observed reality"* and *"gathering data: try to get into as much contact with the studied world as possible. Give preference to case studies and participative observation. "*

Since the researcher cannot limit himself only to the reconstruction of the 'inner perspective' of the actor. The goal of the research demands that this reality is 'objectified' into concepts. Another characteristic of qualitative research.

Also qualitative research only uses **small samples**. The intensive and time consuming nature of data collection necessitates the use of these small samples. However, different sampling techniques are used. In quantitative research, sampling seeks to demonstrate representativeness of findings through random selection of subjects. Qualitative sampling techniques are concerned with seeking information from specific groups and subgroups in the population.

All these principles can be translated into the following more concrete guidelines (Wester & Peters, 2004):

1. The researcher has to focus on both concrete actions taken by the actors and the meaning that these actors give to their actions

2. The researcher must not try to impose his own perspective on the respondents. First he must try to obtain their perspective and vocabulary.

3. The researches must try to avoid study behavior on an individual level; he must focus on the level of social relations and groups.

4. The respondents' actions were caused by situational factors. The researcher has to find these factors. These factors can also be social in nature

5. The researcher has to try to focus on both stable interactions and process-like interactions.

6. Research itself can be considered 'symbolic interaction', just like the symbolic interaction between the different respondents. Each research methods focuses on different aspects of this interaction. Therefore, it is recommended to use different methods along side of each other.

7. During the research, sensitizing concepts are used. These concepts are only given a formal definition at the end of the study, in order to communicate these to other researchers.

4.9 Conclusion

As stated in the introduction; the methodology described here remains general and vague. However, it does provide us with a bridge from the abstract 'paradigms' to the concrete 'qualitative strategies'. In the next section we will discuss several of these techniques, and will often refer to the principles mentioned in this chapter. Some interesting facts we need to keep in mind:

- qualitative research can roughly be devided into a positivist and an interpretive kind
- the results of qualitative research can be considered to be 'sensitizing devices' for the next qualitative or quantitative research project. Nothing more.
- A proper description of the context in which the research takes place is of paramount importance in qualitative research.
- The relationship between researcher and his or her subject of study is also relevant in qualitative, interpretative research.

Chapter 5

Qualitative methodologies

5.1 Introduction

In the previous chapters, the paradigms and methodology of qualitative research in general have been discussed. In this chapter we will discuss concrete methods of qualitative research that have emerged in different fields of science. They are the Grounded Theory, Action research, Ethnography and Case studies.

The structure of this paper may give you the impression that these methodologies emerged from the paradigms discussed in the previous chapter. This is not necessarily so. Some methodologies where created for practical reasons within and where later placed in a theoretical framework.

The model of Seligman (see page 6) can be used here as well to describe methodologies. The 'way of thinking' is often going to refer to the previous chapter, since a lot of these methods are normally used in an interpretative paradigm. In this chapter, this framework will be expanded a bit. Besides the different 'ways of', the usefulness of these methodologies for IS research will be discussed. We will be using the criteria mentioned at the end of chapter 3. Also, in order to understand certain methodologies, it is useful to describe its history.

To start, is a definition of a qualitative research methodology. Note the similarities with the problem soling metaphor in chapter 2.

> "Another way of thinking about a research design is as a 'blueprint' of research, dealing with at least four problems: what question to study, what data are relevant, what data to collect and how to analyze the results." (Yin, 1984)

5.2 Grounded theory

Lets start with some definition of the grounded theory (GT):

- Grounded theory is an inductive methodology that provides systematic guidelines for gathering, synthesizing, analyzing and conceptualizing qualitative data for the purpose of theory construction. (*International Encyclopedia of the Social & Behavioral Sciences*, 2001)

- Grounded theories are inductively discovered by careful collection and analysis of qualitative empirical data. That is, this method does not begin with a theory, and then seek proof. Instead, it begins with an area of study and allows the relevant theory to emerge from that area. (Strauss & Corbin, 1990, p23)

- The goal of field research is to develop a theory that is 'grounded', that is, closely and directly relevant to the particular setting under study. Using the grounded theory approach the researcher first develops conceptual categories from data and makes new observations to clarify and elaborate these categories. (Frankfort-Nachmias in (Baskerville & Hejeb, 1999))

Although these definitions are clear, you understand Grounded Theory better if you look at its origins.

5.2.1 History of Grounded theory

Grounded theory was developed by Glaser and Strauss, as a reaction to developments in the sociology, which they perceived as 'concerning':

> Glaser and Strauss developed Grounded Theory methods at a time when quantification had gained hegemony throughout the social sciences. Theory and research had become separate pursuits. The quest for quantified research findings resulted in the waning of qualitative studies. Except for an occasional classic study, most quantitative methodologists ignored qualitative research and relegated to disciplinary sidelines, or treated it only as a precursor to rigorous quantitative research. Qualitative research was deemed impressionistic and anecdotal, unfitting the scientific quest for quantified facts. In contrast, Glaser and Strauss argued that qualitative research could stand as science in its own right, demonstrating rigor, and generate theory.

5.2.2 Way of working

With the grounded theory you start with a general problem definition and a few theories that are relevant to this problem definition. These two provide the user with a set of topics or 'sensitizing concepts'. Thee concepts are used to create an open ended interview guide. In the interviews n which this guide is used, the respondent has to have a change to give his or her interpretation of the 'sensitising concepts'.

Grounded theory always needs such a starting point; you cannot start 'blank' you always have implicitly a theory how things work in the world out there. For your research, you need to make these implicit assumptions explicit.

After analyzing the results of first set of interviews, the researcher finds that he has not all the information or information that contradicts (two persons have a conflicting view on the matter). These gaps and conflicts form the basis for the next round of interviews.

Other resources can be used as well, like document analysis, literature study, group interviews, direct observation, etc. The bulk of the resources however

are the interviews, because (usually) these provide the most information and are the only way of seeing through the eyes of the respondent.

5.2.3 Way of modelling

During the analysis phase, the transcript of the interviews are being analysed; different codes are being assigned to relevant pages within the interviews. These codes are then grouped into different categories. Finally, the relationships between these categories can be established. More formally defined, the phases are:[1] [2]

- open coding: the part of the analysis concerned with identifying, naming, categorizing and describing phenomena found in the text.
- axial coding: the process of relating codes (categories and properties) to each other, via a combination of inductive and deductive thinking. A standard framework can be used here.
- selective coding: the process of choosing one category to be the core category, and relating all other categories to that category.

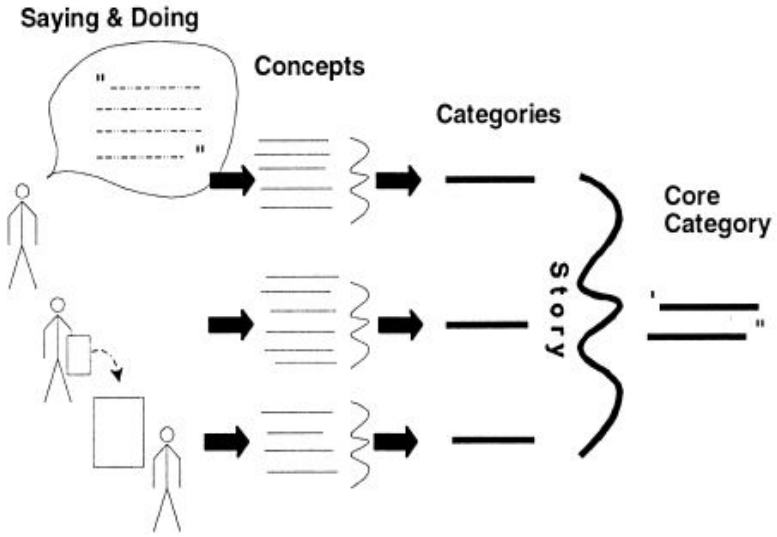


Figure 5.1: The coding process in GT

Existing theories are not only used at the beginning of the process. Sometimes they can be used to enhance the newly formed theory or to fill up gaps. The results of the interviews however determine what is right. In other words:

[1] http://www.analytech.com/mb870/introgt.htm
[2] figure 5.1 is derived from: (Baskerville & Hejeb, 1999)

because of the fact that the theory is found in literature does not make it more true than the theory that is being developed during interviews.

The new theory is not the only thing that is being recorded. The whole process of theory development is recorded in memos. These memos give an account of the actions that where undertaken by the researcher during the project. They also provide a 'timeline' of the interpretations of the researcher. You can see what point of view the researcher had when he started the research and how it changed during the research project.

5.2.4 Way of controlling

One of the most defining characteristic of the Grounded Theory is the 'constant comparison'. This means that analysis, reflection and information gathering are done in an iterative, cyclic way. Normally you would first collect all the information, analyze it and then reflect upon the whole process. With Grounded Theory you can start gathering information instantly and analyze shortly after.

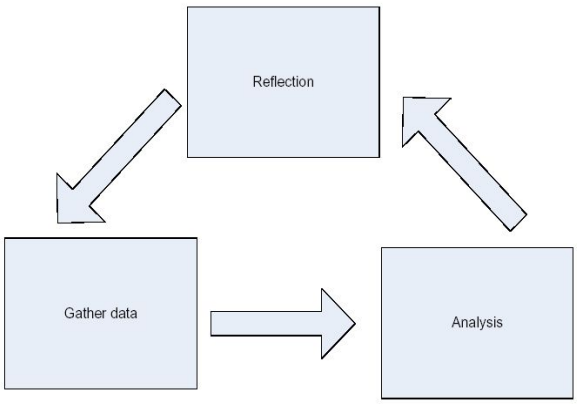


Figure 5.2: GT research cycle

The analysis phase determines how you are going to proceed into the next gathering phase; "what information am I missing", "who do I need to interview?", etc. This cycle only stops when in the analysis phase you find all of your (main) categories 'saturated'; new interviews do not provide you with new information or insights into the research problem. This process is also called 'snowball sampling'.

In the final phase of the research, the researcher chooses a 'core category' and describes the whole theory in relation to this core category. The researcher uses information (mostly quotes from interviews) to convince the reader of the quality of the research.

In literature about the Grounded theory, the following phases are always present:

1. Exploration: focus on the discovery of concepts
2. Specification: focus on development of concepts

3. Reduction: focus on determining core concept

4. Integration: developing the theory

5.2.5 Way of thinking

In the methodology we can clearly recognize the principle of 'researcher bias' of the previous chapter; the researcher makes note of his changing assumptions during the process. The principle of 'hermeutic'; the problem starts vague and only gets shape during the last phases of the research. In the coding process you detect the abstraction principle.

'Role taking' and 'small samples' are present in the interviews. It is crucial that the respondents get the opportunity to define the concepts themselves ('definition'). Glaser and Straus about this principle (Strauss & Corbin, 1990, p98-99):

> "Grounded formal theory is more trustworthy for consultations because both laymen and sociologists can readily see how its predictions and explanations fit the realities of the situation. This is strategically important [because] a layman will not accept a theoretical explanation unless he can readily see how it explains his situation and gives him a sound basis for corrections and future predictions. ...The transferability of formal theories to diverse substantive areas is seldom done in sociological consultation because most formal theories are ungrounded, and therefore not trusted by either sociologists or laymen when they face 'real-life circumstances' ".

5.2.6 Grounded theory and IS design

Grounded theory can be used to generate new or adjust existing theories concerning IS design. For instance, the model of Boehm and / or risk theory can be used as a starting point for the grounded theory processes. After a couple of interview cycles, these theories will be adjusted or enhanced with the viewpoints of the people you have interviewed.

Since only interviews are required, the natural process is not disturbed that much. The views that are required to understand the subjects emerge during the research process, so it is also holistic and subjective. However, you have to rely mostly on what people say or write about the IS design process. This can prevent you from getting the complete picture of the process. Grounded theory also has mechanism to deal with complexity of the subject. The result of Grounded theory is also concrete; a new theory emerges from the process. You need to have trust in this emergence process; you cannot tell in which direction your research will develop.

5.3 Action theory

Action theory refers to a class of research approaches, rather than a single, monolithic research method. It is therefore impossible to define it clearly. However, the class has he following characteristics:

- An action and change orientation
- A problem focus
- An 'organic' process involving systematic and (sometimes) iterative stages
- Collaboration among participants

Just like the grounded theory, action theory can be understood by looking at its roots.

5.3.1 History of action theory

The origins of action theory can be found in (social) psychology:

> "Action science originated in the social sciences out of the massive social changes of world war II. Kurt Lewin developed a method at the research center for group dynamics (University of Michigan) in order to study social psychology within the framework of field theory. Independently, the Travistock clinic (later Travistock institute) developed a similar method of psychosocial equivalent of operational research. Scientist sought to understand the complex causes of widely variant 'social illness' and idea of social action arose. Scientist intervened in each experimental case by changing some aspects of the being's or surroundings. Since scientists and therapists where locked together in research, the scientists where participants in their own research. The effects of the actions where recorded and studied. In this manner, a body of knowledge was developed about successful therapy for social illness." (Baskerville & Myers, 2004)

5.3.2 Way of working

In its simplest form action theory has two stages. In the first stage there is a collaborative analysis of the social situation by the researcher and the subjects of the research. Theories are formulated concerning the nature of the research domain. In the second stage, the researcher initiates with the 'subjects' several changes. The results of these changes are being studied (Baskerville, 1999). Most action researchers discern the following stages:

Do not underestimate the importance of the first phase of the research project; it is in this phase that the client-system infrastructure is created: (Baskerville, 1999, p14)

> The client-infrastructure is the specification and agreement that constitutes the research environment. It provides the authority, or sanctions, under which the researcher and host practitioners may specify actions. It also legitimates those actions with the express expectation that eventually these will prove beneficial to the client or host organisation.

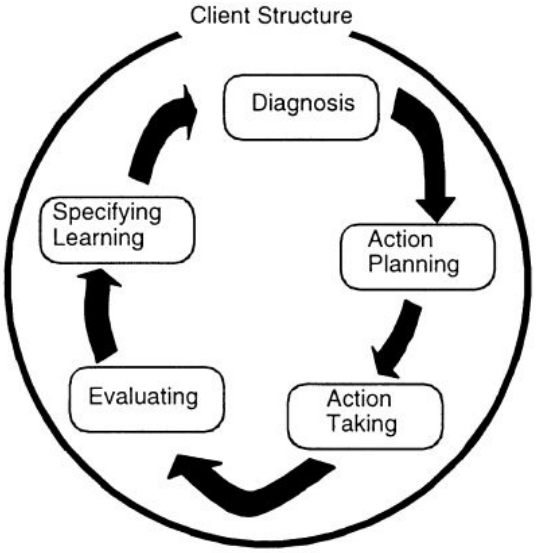


Figure 5.3: Cycle of action research

Not only is the relationship between host and researcher is defined here, also the theories are formulated in the first phase. In the second phase these theories are going to be tested. In certain forms of action theory, the hosts are also involved in the theory definition.

5.3.3 Way of modelling

There is no real model that is being created here; it is not made compulsory by the methodology itself. However, central to action theory is the theory that is being tested. Reporting naturally focuses on the same theory. In other words, it is the theory that defines how you are going to model.

The results of action learning are more elaborate than just a (modification) of a theory. Most authors stress the additional benefits of action learning (Baskerville, 1999)

- Increased understanding of an immediate complex social situation
- Assist in practical problem solving and expand scientific knowledge
- Enhance the competencies of all the actors involved
- Understanding of change processes in social systems
- Double loop learning (for the organisation) : restructuring the norms to reflect the new knowledge gained by the organisation
- If the change was unsuccessful, the additional knowledge may provide new foundations for diagnosing in preparation for further action interventions

- The success or failure of the theoretical framework provides important knowledge to the scientific community for dealing with future research settings

Note that the usage of theories is the main differences between Action research and consultancy. Consultancy can be based on experiences of the consultants themselves. Also, the results that are relevant in respect to the theory are made public. Consultancy is only focussed on problem solving.

5.3.4 Way of controlling

Action theory is cyclic in nature; you go though the process several times in order to solve the problem. At the end of each cycle there is a "learning phase"; in this phase the actions for the next cycle are determined. As a researcher, you probably learn as much from failures as you do from success, but the relationship between host and researcher demands a focus on problem solution. The whole process should be directed towards that.

5.3.5 Way of thinking

There are 4 essential premises of action research (Baskerville & Myers, 2004). These principles are similar, but not exactly the same as those of interpretive research.

1. The purpose of action must determined beforehand (pierce's pragmatism). To clarify our concepts, the research must explicate the theoretical purpose underlying the action. This also means that the theory must be explicit before the action is taken; otherwise there is the risk that the action is purposeless, and therefore meaningless
2. There must be practical action in the problem setting. This is necessary to reveal the relative truth value of the theoretical concepts underlying the action.
3. Practical action must inform the theory. The theory must be adjusted according to the practical outcome of the theory.
4. The reasoning and action must be socially situated. This social situation means that the action researchers must be participant observers (action and reasoning have to take place in the human problem setting)

Another two fundamental principles of action research from (Baskerville, 1999):

1. Action researchers are among those who assume that complex social systems cannot be reduced for meaningful study. They believe that human organizations, as a context that interacts with information technologies, can only be understood as whole entities. (social settings cannot be reduced for study)
2. The fundamental contention of the action researcher is that complex social process can be studied best by introducing changes into these processes and observing the effects of these changes. (action brings understanding)

In short; there is a lot of attention to the interaction principle and the dialogical reasoning principle, but the principle of abstraction is nearly neglected; although the result of action theory are also new propositions and definitions of concepts, just as the other interpretive methods.

5.3.6 Action theory and IS research

Action theory can easily be applied for IS design; for theory creation and testing. You need a theory / methodology and an organisation which is willing to implement this theory / methodology. With this organisation you start an IS design process based on a (new) theory and look for anomalies in this process.

Since actors are involved actively in this process, and you experience a design process in action, this is probably the most holistic and subjective methodology. The results of this research are also very concrete; adjustments of the theory. The methodology however does not specify mechanism to deal with complexity.

Not only does action theory fails our requirement of 'not disturbing the natural' process, it is one of its fundamental principles to do so. This principle should be seriously thought over before implementing it in a real research study.

5.4 Case study

The most typical characteristic of the case study is the fact that the researcher only studies one or just a few cases and the extensive use of triangulation. Case studies are used when detailed in depth understanding is required, social processes are being studied, and /or you have to study an object in its context over a long period of time. Most of the time case studies are used because the researcher has no other choice. Yin (1994) gives the following description of the case study methodology:

1. A case study is an imperical inquiry that
   (a) Investigates a contemporary phenomenon within its real life context, especially when
   (b) The boundaries between phenomenon and context are not clearly evident
2. The case study inquiry
   (a) Copes with the technically distinctive situation in where there will be many more variables of interest than data points, and as one result
   (b) Relies on multiple sources of evidence, with data needing to converge in triangulation fashion, and as another result
   (c) Benefits from the prior development of theoretical propositions to guide data collection and analysis

This last point indicates that case study is a more positivist and deductive methodology than the other methodologies discussed within this chapter.

5.4.1 Way of working

Case study methodologies is very flexible. You can focus on one case, or just a couple of them. The research can be exploratory, explanatory, or descriptive in nature.

The following sources can be used in a case study: documents, archival records, interviews, direct observation, participant-observation and physical artefacts. The researcher lets the propositions of the theory (see way of modelling) guide his information gathering. He strives to get the same information from multiple sources; triangulation.

Not only triangulation of data is possible in a case study, also triangulation of methods is possible. This can mean that two methods van be combined (interview and direct observation) or the fact that two researcher perform the information gathering. Theoretical triangulation is another possibility; you try to explain a phenomenon using different theories. Finally, there is something called mental triangulation; the researcher tries to take the viewpoint of different roles: employer, researcher, target audience, etc. This last form is optional; it is not recognized as a standard item of case study.

5.4.2 Way of modelling

A case study consists of the following elements (Yin, 1984, p20):

- A study question
- Its propositions
- Its unit of analysis
- Logic for linking the data to propositions
- Criteria for interpreting the findings

An example that Yin provides of a proposition, which has to do with 'decentralization in the organisation'; *"traditionally supervisory links will be threatened, as management control over work tasks and the central sources of information will be diminished."* A set of these propositions can be considered to be the model of case study research.

5.4.3 Way of controlling

Case study is one of the few qualitative methodologies that try to define internal validity, external validity and the construct validity. Yin describes a couple of techniques that can be used to enhance these properties. Since they are one of the defining elements of case study design, they can be considered to be the controlling factor for the researcher. (Yin, 1984, p40)

- **Internal validity** (only in explanatory case studies) You have to establish a casual relationship, whereby certain conditions are shown to lead to other conditions, as distinguished from spurious relationships. For example; you have to make sure that diminishing management control of the central source of information is indeed the cause of the diminishing traditional supervisory link, and not another factor like the appointment of a new manager with limited skills.

  - Pattern matching: a technique in which the researcher observes patterns which are predicted beforehand, on basis of the propositions. This type of logic compares an empirical pattern with a predicted one. Internal validity is enhanced when the patterns coincide. If the case study is an explanatory one, the patterns may be related to the dependent or independent variables. If it is a descriptive study, the predicted pattern must be defined prior to data collection. (Yin, 1984)
  - Explanation building: the researcher tries to explain the phenomena which he sees during the analysis phase (this is very similar to Grounded theory)
  - Time series analysis: one or few variables of a case are studied over a long period of time.

- **External validity.** External validity established the domain to which the research can be generalized. Here Case study applies the same procedure as interpretative research; analytical generalization. The results are propositions which can be applied to other cases. These propositions are hypothesis in themselves. The more cases these propositions cover, the more trustworthy they become.

- **Reliability** Demonstrating that the operations of a study, such as the data collection procedures, can be repeated, with the same results. Since no one can repeat your case study, the only thing you can do is to describe what you are going to do in a research protocol. This protocol can contain the following elements.

  - Overview of the project (project objectives and case study issues)
  - Field procedures (credentials and access to sites)
  - Questions (specific questions that the investigator must keep in mind during data collection)
  - Guide for the report (outline, format for the narrative)

5.4.4 Way of thinking

The way of thinking is quite different from the interpretative research methodology. The basis can be found in the way of controlling; case study tries to apply the more positivist (qualitative) research paradigm in a situation where only a few cases are available.

5.4.5 Case studies in IS research

Case study research have a lot of potential for IS research. Theories about project management (for instance ISPL) can be translated into a set of hypothesis, which can form the basis for case based research. There has to be sufficient trust that these theories are sufficient to provide a good framework for the cases.

These hypotheses hamper the holistic requirement considerably; the hypothesis can make you focus on the wrong elements of the process. The benefits however are that these hypotheses guarantee clear results and are also useful to structure your information gathering process (prevent chaos).

The triangulation methodology should provide the researcher with enough options to pay attention to the subjective experiences of the actors and the IS design process does not have to be disturb too much, since you do not have to go through multiple cycles of interviewing.

5.5 Ethnography

Ethnography originated in what we would now call anthropology; (roughly) the study of other peoples culture.Here is a definition of ethnography:

> Ethnography is a long term investigation of a group (often a culture) that is based on immersion and, optimally, participation in that group. Ethnography provides a detailed exploration of group activity and may include literature about and/or by the group. It is an approach which employs multiple methodologies to arrive at a theoretically comprehensive understanding of a group or culture. The issue for the observer is how the particulars in a given situation are interrelated. In other words, ethnography attempts to explain the Web of interdependence of group behaviours and interactions. [3]

5.5.1 Way of working

The way of working with ethnography is very similar to that of case study in the triangulation aspect, only that in ethnography stresses the importance of direct observation over interviewing. With ethnography, the user really has to immerse himself or herself with the social group under study. It is also similar to Action theory, because the ethnograph is participating in processes of the host organisation. The main differenence with Action Research is the fact that you are **not** trying to influence these 'natural processes'. You want to describe it in its natural state as much as possible.

> "(the ethnographer) will try to understand the culture of its people by making a 'conceptual map' of the way they perceive their world and have conceptualized it. Uncovering a people's conceptual world view (closely connected with worlds, and sometimes grammar) the is a crucial instrument - more crucial, perhaps, than merely obeserving the bahaviour of the tribes(wo)men, which can only indirectley render an insight in how they think." (Hoppenbrouwers, 2003, p263)

The following phases can be discerned in such a study: (Wester & Peters, 2004, p33)

1. Preparation phase: formulation of research problem, literature study

[3] http://writing.colostate.edu/references/research/observe/com3a1.cfm

2. Exploration phase: choices are made regarding the 'setting' o the research; which people you're goin to study, what kind of participation, etc.

3. Alignment phase: try to get 'settled' in the group, define observation / research strategies, define first categories

4. Description phase: try to map the field, sort material in categories

5. Thematic phase: try to discover themes in your material

6. Reporting phase: analysis and reflection of whole process

5.5.2 Way of modelling

Ethnography really does not have a clearly defined modelling technique, except for the same practises as mentioned by grounded theory. Field notes play a crucial role in ethnography The memory should never be relied upon, and a good maxim is 'if in doubt, write it down.' It is absolutely essential that one keep up to date in processing notes. During the research process, the researcher is already working on his theory using 'analytic memos' ; "periodic written notes whereby progress is assessed, emergent ideas identified, research strategy is sketched out. "

Analysis can be done in the same way as grounded theory; but there are also frameworks which can be used to systematic categorize cultural elements. (Spradley, 1980) mentions the 'nine major dimensions of social situations' that have to be taken into account:

1. Space: the physical place or spaces

2. Actor: the people involved

3. Activity: a set of realted acts people can do

4. Object: the physical things that are present

5. Act: single actions that people do

6. Event: a set of related activities that people carry out

7. Time: the sequence that takes place over time

8. Goal: the things people are trying to accomplish

9. Feeling: the emotions felt and expressed

Finally, an issue in ethnography is the final reporting of the study. Although ethnography has a sort of 'modelling technique'; the ideal medium to publish the results is still a book, since this is often the only way to do justice to the details which where found in the research. Also, there is often not one conclusion, but several that come out of an ethnographic study. This makes publishing results of ethnographic study in articles very difficult.

5.5.3 Way of controlling

There is no real way of working with ethnography. Naturally, the research question formulated at the beginning of the research can be seen as the guiding factor. However you perform an ethnography in stead of another (less time consuming) method because of the following reasons (Klein & Myers., 1999):

- **Depth**. The ethnographer sees what people are doing as well as what they say they are doing. Over time the researcher is able to gain an in-depth understanding of the people, the organization, and the broader context within which they work
- **Insiders view**. Knowledge of what happens in the field can provide vital information to challenge our assumptions. Ethnography often leads the researcher to question what we "take for granted."(Remember that ethnography is traditionally used to study cultures.)

Your actions should be focussed on trying to get as most out of these advantages as possible.

5.5.4 Way of thinking

Nearly all of the principles of interpretative research are present, although some principles are clearly present (holistic) and some less (abstraction). The central theme is however "sense making" and "culture"; how do people look to the world around them and how does this influence their behaviour.

5.5.5 Ethnography and IS design

Ethnography is all about the subjective experience and the holistic viewpoint. It stresses these requirements to such an amount, that the other requirements are simply overlooked.

The process is somewhat disturbed since the researcher has to become a part of the process. Concrete improvements of a methodology are not guaranteed nor does ethnography provide concrete guidelines to reduce the complexity. In fact, this complexity is valued in ethnography; you cannot simply a culture of a group of people to a simple model.

Still ethnography might be the only useful tool is organisational culture is involved in IS design (for instance power struggle of foreign / international cultures). This topic can probably only be truly understood from an 'insiders-perspective'.

5.6 Way of supporting

This element has of the framework of Seligman has not been discussed until now. There are many different software tools which can support the methodologies presented in this chapter. It would not be worth the effort to describe them in detail. It is obvious that the researcher memo's and the categorizing of information are tasks in which the computer can be an invaluable tool.

Figure 5.4 contains screenshots from the software tool Kwalitan. This is a tool which can be used for qualitative research in general, and especially for Grounded theory research.

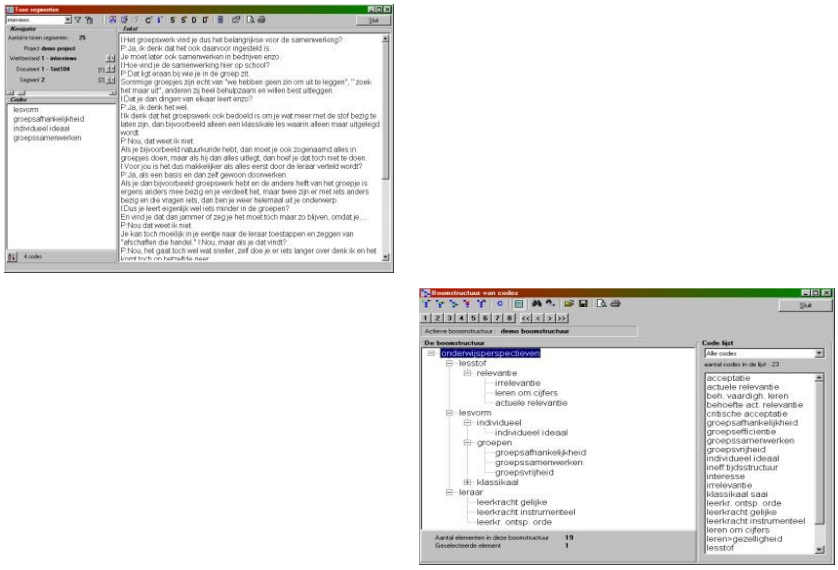


Figure 5.4: Screenshots of the program Kwalitan (Wester & Peters, 2004)

Chapter 6

Cases

6.1 Introduction

This section contains several cases bases on research projects of other students. The first two cases have the same subject: "applying the ISPL methodology in developing countries". The first case was especially created for this paper; the others are based on actual master thesis.

This chapter will mostly be concerned with the process of the creation of these cases and not with the results as such. Each case will consist of the following items:

- the goal of the research
- process: the applied methodology (and the differences with the 'text-book' methodology)
- the results of the methodology (optional)
- recommendations

6.2 Case 1: ISPL and the grounded theory

6.2.1 The goal of research

The goal of the first case was to extend the ISPL framework in such a way that it would become usable in developing countries. An additional booklet; a 'plug-in' would be the ideal solution.

6.2.2 The applied research methodology

Before this case started, an attempt was made to approach the subject from a more theoretical point of view; an attempt was made to study the literature that was available on the subject. However, since there was almost no literature that was directly relevant, another approach was chosen; interviews.

There were a couple of organizations that provide ict related aid to several development countries. The goal was to interview several people who participated in such projects using the grounded theory as described in the previous

chapter. The starting point for the grounded theory methodology would be two theoretical frameworks from ISPL related to deliverables and risk management (see figure 6.1).

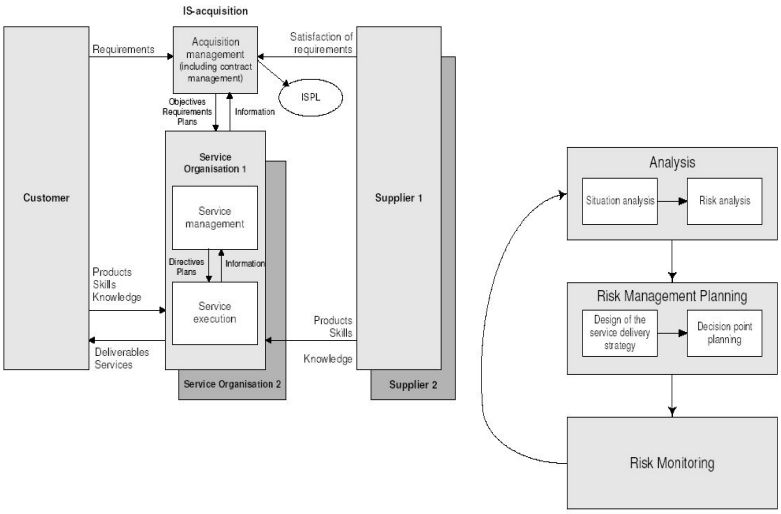


Figure 6.1: ISPL framework

In the beginning, there was doubt that this was the right method. Perhaps it was best to test first whether ISPL was suitable in development countries; using for instance the case study methodology. However, since there was not a single case available, the choice was made to proceed with the interviews. The assumption was made that ISPL would not be directly applicable in developing countries.

Unfortunately, only two people (from two different organizations) cooperated with one interview. A few relevant documents from them where obtained. This is clearly not enough for the grounded theory approach, especially if you consider the iterative nature of this methodology. Not even a single category can become 'saturated'. Not only is this a problem for the quantity of the information, but also for the quality. The bias of those two people would be clearly present in the result.

6.2.3 The results of the methodology

The reason for this lack of experts is twofold. Firstly, there weren't that many in the Netherlands. There are enough development organizations, but only a few of them work with ICT on such a scale that would benefit from the ISPL methodology. From the two organization that where left, one of them only provided financial support; they 'outsourced' their ICT projects to organizations there, because they had the necessary experience.

The organization that was willing to help me with an interview had their own vision on project management. This vision collided (in their eyes) with methods such as ISPL. Although this disagreement provided interesting information, it also had results for further cooperation. The organization was relatively small and was already helping other students with their projects, so there was no time for more interviews. A lot of the employees were very busy and spend a lot of their time abroad, so they had to use their time here wisely. They were willing to help students, only if their studies would help them in their work. Since they had their own vision on project management, there was no motivation to work with this project.

Some of the effects of the grounded theory where noticeable though. Both agreed on the fact that it was very important to get cooperation from high placed persons, and that it would sometimes be difficult for an outsider to determine who that person could be. Another agreement was the fact that long term relationships where important. The other party was more interested in the fact that they could cooperate with another organization (learning and financial support) than in the possible results of that cooperation. They disagreed about the role of 'culture'; one person saw the facts describe above embedded in their culture, the other person reacted irritated on this concept. He claimed that there was too much fuss about this topic; the reasons for failure should be sought in the extreme instability of the environment. People there have learnt do deal with that environment; so they are highly flexible and motivated to cooperate, but the circumstance often prevent them fro doing so.

Especially this focus on long term relationships (learning) and extreme instability in the environment might indicate that one of the ISPL fundamentals, the project view (start date, check points and end date), could be changed into another model.

6.2.4 Recommendations

The grounded theory methodology requires a lot of cooperation of the informants side. It is best to make sure if this cooperation is available before choosing this research methodology. Also, the grounded theory methodology should only be used for theory develoment, not theory testing ("is ISPL suitable in developing countries").

6.3 Case 2: "Managing risks in implementation of information communication technology in developing countries"

6.3.1 The goal of research

The goal of this research is identical to the previous case, allthough this case was more orientated to 'practise' than theory, right from the start.

6.3.2 The applied research methodology

In this thesis of Maarten Hendriks (Hendriks, 2004), two projects have been described. Firstly, he has been evaluating the eSAP project at the universities in the university Dar-el-salaam, the Sokoine University of Agriculture and the St. Augustine University of Tanzania. eSAP tries to enable researchers there to publish their work online so that they can participate in the international scientific community. Secondly, he involved in the start up of a 'telecentre' in Sumve. The ISPL methodology was used in both projects. For more information see the thesis itself (Hendriks, 2004).

The used methodology is a mixture of case study and action theory. In both projects Hendriks was only able to go through the cycle only once, therefore he was not able to benefit from the advantages of this methodology in full effect. However, since he has applied ISPL in more than one case / organization he has extra information that compromises this 'missed opportunity'. Note that Hendriks did not have a change to apply Action theory in full, because of the limited timeframe in which he had to perform his research.

In the first project, the eSAP project, the ISPL framework has proven to be a useful for analyzing the situation there. Although it has to said that the information that was collected outside of this framework contained several interesting elements. In the second project, the sumve telecentre, the ISPL framework proved to be less useful (also because of practical time related issues) and the most interesting information was placed into other frameworks (for instance culture).

6.3.3 The results of the methodology

The results of the research indicate that a couple of elements, like the decision point planning and strategic planning, should be used with caution. Also there is a considerable attention towards the end of the thesis concerning 'culture'. This element can not be analyzed using the framework of ISPL.

6.3.4 Recommedations

Because of the 'culture' issues encountered and the fact that the researcher was not able to influence the system itself; a more ethnographic analysis would be more in place here.

6.4 Case 3: ORM and organisational strategy

6.4.1 The goal of the research

The[1] goal of this research is to describe the relationship between organisational strategy, enterprise programme management and enterprise architecture. Note this is more a literature study than an empirical one. It does however contain a case.

[1]This case and the following cases are not mentioned by name or reference by request of the authors of these thesis

6.4.2 The applied methodology

In the paper, however, the case only serves as an example of the formulated framework created in these previous chapters. An interesting aspect of this paper is that the ORM modelling methodology is used in this research. This guarantees a certain 'rigor' and 'exactness' that seemed to be lacking in this field. This is the primary 'methodology' used in the cases.

However, it seems that this methodology also prevented that the 'lessons learned' from the case to find its way into the final model, since the model was created in an linear and 'top-down', as is usual in IS methodologies (see section 2.4). If the case influenced the final model, it is unclear from the paper how this influence took place.

6.4.3 The results of the methodology

There is not really a 'case study' as described in the previous chapter at all. The results are to be found in the ORM model. The reason for this can be found in the goal of the thesis; describe the theoretical relationships between different concepts.

6.4.4 Recommendations

It would be a bit out of place to make an recommendations here, considering the facts mentioned previously. However, it would be interesting if this model would be used in a 'action research programme'; try to formulate / create an architecture for an organisation using this framework. Also interesting is the usage of the ORM methodology; could this be used in the final phase of the Grounded theory approach?

6.5 Case 4: Knowledge management

The goal of this research is to improve the knowledge transfer in relation to a specific project in an organisation, using several 'knowledge management theories'. In order to achieve this, several 'user' groups with specific knowledge 'requirements' needed to be identified in this organisation.

6.5.1 The applied methodology

The research was conducted using several interviews; applying somewhat of a grounded theory approach, although this term is never mentioned in the paper. Several similarities between the GT methodology can be found. The usage of a theoretical framework to start with the initial questions, reporting the results using topics from the literature (sort of core categories). The appendix contains the interviews so that the reader gets a impression of the context in which the research has taken place.

The differences with grounded theory can be found in the fact that there is not a real theory adjustment; the theories are only used as a framework to look at the situation, and to give recommendations to the company.

Reasons can be found that the researcher simply did not know about the methodology and that she was not interested in adjusting / creation of a new theory. The focus is (understandably) on solving problems with the organisation.

6.5.2 Recommendations

A short summary of her field notes, the way she thought about several topics during the information gathering process would be a good supplement. A short evaluation of the used theoretical framework would also be a welcome and interesting addition.

6.6 Case 5: Domain engineering

The goal of this research is to compare several methods of domain engineering with respect to software reuse. In order to do that he has described a couple of methodologies and describes a framework to compare these methodologies.

6.6.1 The applied methodology

The author uses the term 'cases', but the research can be classified more as 'action research'. Together with several people from the field he tries several methodologies on 'real' situations. He evaluates them using the framework mentioned above. Unfortunately, due to political reasons, he was not allowed to access all information.

The results are however impressive; on a practical basis (recommendations) and on a theoretical basis (several inconsistencies in the used methodology are mentioned). It seems that all the parties involved had benefit from this thesis.

6.6.2 Recommendations

The paper is primarily focused on the results of the thesis; meaning that a little more attention to the process of applying these methodologies would be nice. This information is 'scattered' throughout the paper. Also, the 'context' information about the case is rather limited; perhaps some more information would be useful. Perhaps this was not possible because of the political issues mentioned above.

6.7 Conclusion

It is difficult to asses the methodologies based on these cases, since neither of them applied the methodology as was described in the literature. However, these cases illustrate that qualitative methods are not an easy 'escape' option. If you want to use these methodologies, a lot of time of the researcher and the informants is required. Especially this last factor is a 'critical success factor' for qualitative research; you have to be able to convince people of the mutual benefit of the research.

Chapter 7

Conclusion

7.1 Introduction

The main research questions from the first chapter:

1. What is information system development?
2. What is qualitative research?
3. How can qualitative research be used to study IS development?

The last questions can be answered on two levels: on a fundamental and a pragmatic level.

7.2 How can qualitative research be used to study IS development (fundamental)?

What strikes as a difference between IS development and interpretative qualitative research is the difference in philosophy. In chapter two we have seen that IS development is very occupied with modelling, whereas the interpretative paradigms find modelling insufficient to described 'reality' adequately. [1] (see section 4.5. A sort of incompatibility on the philosophical level.

It is not strange therefore that interpretative qualitative research has limited uses when you want to study 'way of modelling', 'way of working' and 'way of controlling', since these can be described using a modelling technique. Quantitative and positivist qualitative research are better suited in this kind of situation. Interpretative qualitative research shines when it is used to study the 'way of thinking' in concrete applications of a methodology. For example: "Are project management methodologies, like ISPL, usable in the African culture?". This shift in paradigm has considerable effects on how you perform your research, as described in chapter 4.

Also, interpretative qualitative research attaches different value to a theory than other research methods. A theory is a useful way of 'structuring' a certain

[1] this does not mean that they consider models to be utterly useless, just that models are limited in their ability to describe (social) reality

empirical situation. If the theory does not suffice, it is easily replaced for something more fitting. The result of the research are new hypothesis; not theories which are useable for generalizations.

The choice to use an interpretive is therefore also a matter of trust in your theory. For instance; if you have enough trust in ISPL to be useful in development countries, you can proceed with a positivist, quantitative approach. If you think ISPL is still 'lacking' certain elements, a more interpretive approach would be in place.

7.3 How can qualitative research be used to study IS development (pragmatic)?

On a more pragmatic level, it is the context of the research and the goal of the research which determines what the concrete methodology is that she is going to use. Note that the methodologies that have the interpretative paradigm are very similar; it is best to start with the interpretative principles mentioned in chapter 4. From these principles, the situational factors and the goal of your research, you can make a balanced account from what you want to do and what you are able to do. Table 7.1, which is a summary of chapter 5, can help with this decision making process. Note that if you choose a positivist paradigm, Yin proves a good starting point for your research study.

	Grounded theory	**Action research**	**Case studies**	**Ethnography**
holistic	+	++	-	++
subjective experience	+	+	0	++
complexity	++	0	++	–
natural process	+	(special)	+	+
concrete guidelines	+	++	+	-

Table 7.1: Sumary chapter 5

For instance, if you have the ability to cooperate with an organization to implement a new methodology, this gives you the (unique) opportunity to perform an Action research. If you do not have this opportunity, then (a form of) Grounded Theory seems to be your best hope for results. Ethnography is the best choice if culture is part of your subject of study; since this topic requires a special approach.

7.4 Further research

The most disappointing from qualitative research methodology is the fact that they have limited ways to structure the chaotic nature of messy problems. Some methodologies, like group model building (Vennix) and Checklands' soft system methodology try to structure these problems in a more advanced way. However, they are primarily focused on problem solving from the organizational perspective, involving processes, like 'group think' and 'power struggle' , and not on the generation of new theories. Perhaps this would be better if these methodologies would be put next to information system design. This is probably already done for Checklands soft system methodology.

Another useful approach is depicted in figure 7.1. It is a modification of figure 1.1 found in chapter one. During my literature study, a couple of articles where found which combined qualitative methodologies with traditional information system methodologies in order to create a new information system. For instance in (J. A. Hughes, O'Brien, Rodden, Rouncefield, & Blythin, 1997), an ethnographer, who studied a particular user group, was used as a proxy during the design process of an information system that was going to support that group. In another research , action theory and grounded theory where combined to do a preliminary analysis of an information system design. The concepts from the grounded theory methodology were used as a basis for the logical structure of the information system. In general, you can conclude that these combinations make the process more 'inductive' and cautious; firstly we try to understand the situation before we build an information system.

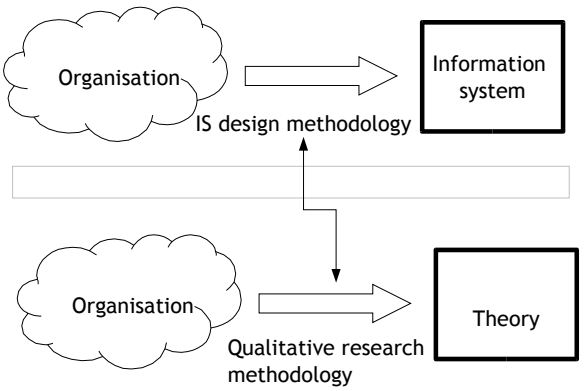


Figure 7.1: Modified conceptual scheme

Despite these shortcomings, I hope that the main goal of this thesis is achieved, that the reader of this paper has gained more insight ('awareness') of the qualitative research area.

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