

Chapter 3

Research Methodology and Questions

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Chapter 3

Research Methodology and Questions

3.0 Introduction

The nature of the problem under investigation places its origin from a variety of established disciplines. Decision analysis belongs traditionally to the field of operations research or management science. Group decision making on the other hand belongs to social-psychology and organizational science while group decision support systems belongs to the information systems field. Justification on its own as a concept belongs to philosophy. The literature review presented in chapter 2 provides this evidence.

The main question on our research methodology then becomes:

How then do we proceed with the choice of an appropriate research methodology in addressing our topic within the discipline of Information Systems ?

Addressing this question comprehensively in this thesis is not possible since research methodology within the discipline of information systems is the subject of an ongoing debate. It is, however, necessary to indicate some of the major guiding arguments embodied in these debates. To the extent that these limited guiding arguments enable us to position our topic within the discipline of information systems and allow us to investigate the research problem from different perspectives; we regard our discussions as presented in what follows to be sufficient.

3.1 Some guiding arguments on the discipline of Information Systems

Barki *et al.* (1993) presented a list of references for use in classifying information systems literature. The list includes: computer science, political science, psychology, behavioural science, decision theory, management theory, social science, economic theory, artificial intelligence, organization theory, system theory, amongst others. This

confirms the fact that the information systems field is interdisciplinary as illustrated in the following definition:

Information systems is an interdisciplinary field of study in which information, information systems and the integration thereof with the organization are studied in order to benefit the entire system(individual, organization and society),(Department of Informatics, University of Pretoria, 1991)

Its fundamental research question can be stated as follows:

'How to reconcile the contribution to the attainment of the mission of the organization through the development, implementation and management of information systems and information technology , on the one hand, with the responsibility of ensuring the social acceptability of these systems on the other hand'(Department of Informatics, 1991)

According to Banville and Landry(1989), the field is a '*fragmented adhocracy*'. This means that:

- *Research in information systems is rather personal and weakly coordinated in the field as a whole;*
- *A researcher can gain a reputation by contributing in a way that is largely specific to a group of colleagues or a research site;*
- *A field is largely open to an educated public and amateurs can affect the field's standards;*
- *Barriers to entry in the field are weak and going from one fragment to another is quite easy;*
- *Reputations are fairly fluid , control of resources is unstable, conditions are likely to be ephemeral and leadership is often of charismatic nature;*

- *Common-sense languages dominate the communication system*

The classification of the discipline by Barki *et al*, its definition and the above description of the field presented by Banville & Landry (*op. cit.*) answers the second part of our main question raised in 3.0 above. In other words our research problem is well placed within the information systems discipline.

3.2 Some guiding arguments on the choice of a research method in Information Systems

Petkova (1999), using the work of Banville & Landry (*op.cit.*) and Robey (1996), presents the following diagram as a starting point on the choice of a research method:

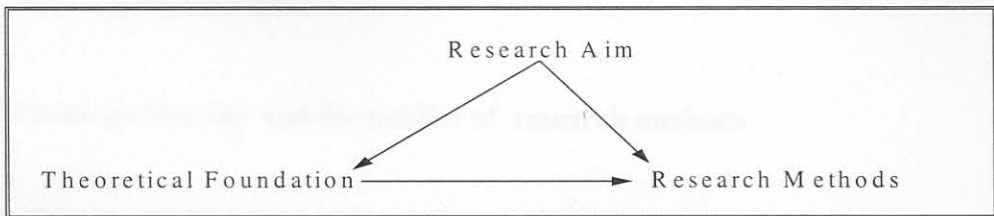


Figure 3.1: Triad for the justification of research (Petkova, 1999; adapted from Banville and Landry, 1992; Robey, 1996)

Following these authors, a suitable triad for the justification of research includes the research aim, the theoretical foundation and the research methods. The research aim determines both the research foundation and the research methods. At the same time, the research methods are determined by the theoretical foundation. Although we recognize the difference between a purpose and an aim in the sense that a purpose is broad and largely inactive, while an aim is more active and specific, we do not distinguish them here, but will regard the purpose as encompassing the aim. The purpose of this research is:

- *To acquire an enhanced understanding of the group decision making process and the potential benefits this process could obtain through the introduction of the concept of justification.*
- *To identify, describe and interpret the possible implications brought about by this justification process for GSS use and design ideals.*

We have presented some of the theoretical foundations of our research topic in chapter 2. Each of these theories illuminate a particular aspect(s) of the group decision making process. In addition, each is embodied or embodies a particular ‘*paradigm*’ in accordance with Kuhn (1970). Accordingly, each suggests a particular way of inquiry - its research method. The theoretical foundations are themselves underpinned by different philosophical perspectives. The question of research method has thus become an area of intense contention. We present below some of the recent arguments relevant to our research in this regard through the work of Introna (2000). The arguments relate very closely to the philosophical foundations (Descartes and Heidegger, in Guignon, 1979; presented in chapter 2) of the concept of justification as well as to the work of Klein and Hirschheim on the rationality of value choices in information systems research as presented in chapter 2. Introna’s work below is presented in some detail because we find it “liberating” to us, enabling us to continue with our search for knowledge on our topic while bearing in mind what could be regarded as the “truth” or otherwise within the information systems discipline.

3.2.1 Truth, philosophy and the politics of research methods

In his draft working paper presented at a colloquium of the School of Information Technology, University of Pretoria; Introna (2000) provided a critique of method as understood in what he calls the *modern* mind. We borrow heavily from his work in this section. According to Introna (2000), in the modern mind view, method must penetrate

the surface appearances to discover the structure behind it. Then we who employ them can legitimately claim that we 'know'. Method, according to the modern mind, filters out the noise so that we get to the real stuff - the truth. In contrast to this, he argues that method does not discover truth but creates truth through the order it imposes rather than exposes.

Introna argues, using the work of Foucault, and in particular his notion of *regimes of truth*, that understanding the politics of truth and methods is not only essential for the production of knowledge but that such understanding can also be exceedingly liberating to the researchers involved. Furthermore, that such understanding can help us focus on the pragmatics of getting the job done.

“...the appeal to truth is no longer the self-evidence of the facts produced by the method but rather in the appeal to a community of informed individuals.” (Introna, 2000).

Introna notes that this is what the *regimes of truth* refers to. It is exactly this move from rational self-evident facts (of the modern project) to intersubjective agreement that Introna is concerned about. According to his argument, in information systems where the object of study is a complex socio-technical network of relations, there seems to be no obvious answer to the question of method. This has led to arguments that we should see the discipline as a fragmented adhococracy when it comes to research and method (Banville and Landry, 1989). He argues that for some this is a lamentable state of affairs that shows the immaturity of the discipline, while for others it is an opportunity for a multiplicity of perspectives and understandings of the complex domain that we study, and as such to be welcomed:

“It seems to me that these debates still function with the fundamental assumption that each of these approaches do in some way provide an essential window of access to the truth, each according to its own assumptions. This may be so or it may not be, it does not

really matter since truth - as a category that functions in the world - is in the final instance a political issue” (Introna, 2000).

Introna’s concern with method is not its supposed access to truth, *it is rather the way in which it functions to legitimise claims of truth within human institutions*. He argues that any claim to truth - irrespective of method or even lack of method - ultimately assumes an institution that would recognise it as such. In other words, *truth claims are ultimately a matter of politics* and not merely, or only, a matter of epistemology and ontology. He goes on to argue that every method (or lack thereof) is legitimate, not because it secures the truth in itself, but because it refers to an institution that accords it that status and which is itself dependent on that status. “*Or to put it differently the production of truth - and therefore the issue of method - is political all the way down*”, he concludes.

Introna continues to highlight a way in which the production of truth becomes linked to relations of power. He argues that since Kant’s critique of pure reason we have become increasingly aware of the way in which the categories of consciousness, such as time and space, co-constitutes the world. He notes that following Kant’s lead, Heidegger (1962) argued that we only know the world in our thrownness (*Befindlichkeit*). In being engaged in the world, our concepts, theories and prejudice becomes available as ready to hand dispositions that disappear from consciousness as we draw upon them in interpreting the world.

Although we may be aware - since Kant, that is - that we do not have access to the things themselves, that we only know the world as revealed through our categories, nevertheless, we (in our modernist tendencies) tend to come to believe *that the world according to our categories is the world as such*. In other words, we tend to claim ontological status for our epistemological categories - mostly for political purposes. We claim the world is our measurements, concepts, theories, and so forth. So instead of saying we make sense of our behaviour through the *concept of a self* we say *we have a self*. We then proceed through elaborate rituals and analysis to instantiate the self as fact. Once the self becomes

an ontological fact we conveniently forget that it started life as a mere category of our epistemological attempts at sense making. As we have already seen in chapter 2 when we introduced the philosophical foundations of the concept of justification, this was the basis on which Heidegger challenged Descartes' rational arguments.

In the scientific enterprise the process of transforming value choices into facts become implicitly built into the process - this is what method secures. Thus, knowledge production is always already, and only, value choices; it is always already to a greater or lesser degree prejudged.

According to Introna, this conclusion is not a good one for Habermas. He rather attempts to salvage modernity from the seeming relativism implied by the post-Kantian critique and proposes a new type of rationality which could offer us an opportunity to escape our prejudice. In what Habermas call communicative rationality, we can engage in a discourse guided by a set of rules that mediate the truth-value claims of our statements. These rules are encapsulated in the ideal speech situation. Thus, for Habermas (1979, 1984, 1987), communicative rationality emerges in the ideal speech situation when linguistically competent interlocutors can equally: raise issues by asking questions; give and refuse orders to permit or prohibit; call into question the truth, correctness, appropriateness or sincerity of what is said; and express their attitudes, feelings, concerns and doubts. Introna (and so do Klein and Hirschheim, 1996; Giddens, 1984) notes, however, that although there are obvious virtues in such a proposal, it denies the very fundamental link between knowledge and power. When choices of value are made not all choices are equal. Similarly, not all have equal power to make their preferred choices stick as 'true'. He therefore continues to claim with Foucault, that we would not understand the knowledge production process and method's role in it if we do not understand its intimate link with power.

The linking of *power* and *knowledge* through *discourse* gives rise to *regimes of truth*.

Truth is understood as statements in the discourse about the world that is held to be true within a particular regime of truth. He quotes Foucault (1977) who argued that each institution or society has its “regime of truth”, its ‘general politics’ of truth: that is,

- the *types of discourse* which it accepts and makes function as true;
- the *mechanisms and instances* which enable one to *distinguish true and false statements*,
- the *means by which each is sanctioned*;
- the *techniques and procedures accorded value* in the acquisition of truth;
- the *states of those who are charged with saying what counts as true*” (p.131)

In regimes of truth “[t]ruth is linked in a circular relation with systems of power which it induces and which extend it” (Foucault, 1977, p.133).

According to Introna, Latour (1993, 1986, 1987), has convincingly argued that what we find *in practice* is that “facts do not speak for themselves.” Facts are produced as ‘facts’ because we value them as such. It is political institutions (a prevailing regime of truth) that give facts a voice in the first instance. They become constituted as facts through processes, procedures and discursive practices that produce them and are likewise produced by them. For example in the modern scientific regime of truth we value scientific method and therefore we judge its products to be ‘facts’. We do not value intuition and therefore we judge its products to be ‘speculation’. One could say that ‘facts’ are merely legitimised value choices accorded that status through the prevailing regimes of truth. Thus, for every *recognised* fact (or set of facts) one could always, in principle, find the regime of truth that accords it that status and which is itself dependent on that status. In Table 3.1, Introna constructed a contrasting example to illustrate the notion of a regime of truth. He compares the *defence of a PhD thesis* (in Science) with *the publishing of the annual report in a company* (in the Capitalist enterprise), and *the delivery of a sermon in a church service* (in the Christian Church). In all of these discourses a particular regime of truth operates as is clear from the table. What is also apparent is the

interplay between power and knowledge (truth claims). Through a set of mechanisms, techniques, sanctions, and so forth, the truth is produced and confirmed as such. The value choices of the prevailing power structures function to confirm the legitimacy of itself. It is this relation between power and truth that stabilises the institution. He indicates that any regime of truth, irrespective of its power relations, is always under threat of new regimes of truth. He points out that it is important to indicate that every claim to truth whatsoever always implies a regime of truth. Some regimes are formal and institutionalised and others are more diffused and implicit. Nevertheless, no claim to truth can be made ‘outside’ of a regime of truth.

Table 3.1: Regimes of truth in different institutions (Introna, 2000)

Regime of Truth	Science	Capitalist Enterprise	Christian Church
Types of discourse which it accepts and makes function as true	<i>Defending a PhD;</i> presenting a conference paper; publishing a paper in a peer reviewed journal, etc.	<i>Publishing the annual company report, AGM, annual employment review, etc.</i>	<i>Delivering the sermon, administering the sacraments counselling a member of the church, etc.</i>
Mechanisms and instances for distinguishing true and false statements	Review by appointed supervisor, scientific argument and proof, (dis)agreements in viva, using canonical texts/ authority, etc.	Review by the auditors, economic argument (efficiency, profitability), appealing to canonical texts (Hammer, Porter, etc.) or consultants, etc.	Review of sermon by the church elders, use of canonical text for authority, appealing to a higher church authority (e.g., the bishop), etc.
The means by which each is sanctioned	Examination by institutionally approved examiners, public record, conferment of degree, etc.	Report presented to the board of directors, delivered at the AGM at the official financial position of the company, reaction of stock exchange, etc.	Sermon delivered as part of liturgy, starts with (or follows) the reading from bible, sermon starts or ends with “so says the Lord”
Techniques and procedures accorded value in the acquisition of truth	Scientific method/ Research method	General accepted accounting practices (GAAP), audit process, strategic planning, etc.	Biblical exegesis, interpretations of church edicts, etc.
The States of those who are charged with saying what counts as true	Supervisor must have a PhD, examiners must be recognised experts in their field, etc.	Auditor must be a chartered auditor, Managing director acts ex officio on behalf of the shareholders, etc.	Must be a licensed minister of religion, and an appointed leader in a congregation

If claims of truth are always made within an already existing sets of power relations, as Foucault claims, then we can only exchange one regime of truth for another. In knowledge production we cannot escape power (as assumed by Habermas). Every ideal speech situation will already assume a regime of truth for its truth claims. Introna argues that no attempt to 'level the playing field' will succeed since power to be effective must be non-egalitarian. Any attempts to make it egalitarian - such as the ideal speech situation - will itself become resources for the play of power.

He argues that for as much as one want his truth claims to be recognised as such one will have to appeal to the regime of truth that operates there. He goes on to say that one can claim all sorts of things about MISQ, but in as much as he wants to publish his work there, he will have to address himself to the regime of truth that operates there, likewise for all other discourses of science. Every form of relativism (or fundamentalism) will eventually be mediated by the regimes of truth that operate in the institutions where it seeks legitimacy.

What does the politics of truth mean for research and research methods? Introna asks.

He highlights that it is important to realise that research method is essentially a political rather than an epistemological issue. Obviously epistemological considerations are also important but it can never be seen separately from the regime of truth within which the ultimate truth claims will be made. Introna remarks that all research must be *reasonable* (as opposed to be rational), meaning that it should be congruent with the regime of truth it locates itself in. This implies that the researcher must make a significant effort to know the regime of truth that the researcher will eventually appeal to.

He concludes by sounding a strong warning:

“...It is very dangerous to try and challenge the existing regime of truth without significant legitimacy in that or a related regime of truth...” (Introna., *op.cit.*)

The significance of Introna’s arguments to our work is its well grounded “*liberating*” effect. This “*emancipatory*” approach to IS research relates closely to Klein and Hirschheim’s (1987) work as well as the emancipatory commitment of critical systems thinking (Jackson, 1991).

Fifteen years ago, Klein and Hirschheim (1987) conjectured that social change will affect the future of information systems development by influencing research directions, professional orientations, methods, and tools. In what they called an “*emancipatory IS research program*”, they presented the following argument:

“The research strategy of the third option, is to study the problem and interests of all groups by whatever approach appears most promising. There is no specific preferred reference discipline. Historical analysis, anthropological, ethno-methodological approaches, philosophical analysis and empirical data analysis, etc., can all be useful to broaden our understanding of the issues and to elicit better systems requirements. From this perspective, IS research aims to ‘transcend’ (look beyond and emancipate itself from) the prevailing ideology of whatever interest group that dominate government and industry. By taking a decidedly independence stance, IS research could contribute to improving the understanding and documentation of the interests and goals of different social groupings and forms of social development. The researcher would form an independent judgment of how IS work could contribute to improving the situation and ultimately to a better society. Hence IS research could help others to emancipate themselves from unwarranted constraints.” (Klein and Hirschheim (1987) , p. 298).

Once again, there is agreement in this last statement by Klein and Hirschheim and complementarism commitment of critical systems thinking (Jackson, 1991) as alluded to in chapter 2. In his paper entitled *Knowledge and Methods in IS research: from Beginning to Future*, Klein (1999) describes how “a quiet shift to pluralism” on IS research occurred. He points out that IS researchers who were more inclined to the

interpretive and critical research paradigms chose to quietly engage in several alternative research streams as viable Ph.D. thesis projects and “tenurable” research programs, as opposed to debating with the positivists. This, according to Klein (1999) has led to acceptance that there are three research paradigms in IS research, namely the *positivist*, *interpretivist* and *the critical*. He also describes how a dialectical inquiring system (originally due to Hegel) plays a role in the generation and growth of knowledge. He traces the historical trends in IS research paradigms from as far back as 1960, in what he calls the archtypical patterns in the pre-1989 era of IS research and concludes that the paradigm controversy in IS literature made more researchers aware of the importance of dialectical research methods and established the notion of methodological pluralism, which characterized the debates in the 1990s.

The conclusion to be drawn from this section is that debates on research methods in IS will continue and that the question of what constitutes knowledge, how it is created and the preferred methods of inquiry used to create it will always be contested. At the end however, the relevant regimes of truths have to be recognized and respected.

That said, we will now look at the current ‘*regimes of truth*’ in the information systems field which will guide the final choice of our research method.

3.2.2. On the current regimes of truth in choosing an appropriate research method in information systems

In accordance with the triad presented in section 3.2 above, we have now presented the research aim and some of the theoretical foundations of our research problem. We are thus ready to look at the choice of an appropriate research method. In the spirit of the previous discussion (3.2.1), we now have to appeal to the information systems “regime of truth” in choosing an appropriate research method.

It is not our intention in this thesis to make an exhaustive review of research methods normally followed in information systems. Such a review is readily available. Eminent

scholars in this regard include, but are not limited to the following: Banville and Landry (1989), Burrell and Morgan (1979), Hirschheim and Klein (1994), Jackson (1991), Ngwenyama (1991), Keen (1991b), Checkland (1981), Walsham (1993), Boland (1983), Orlikowski and Baroudi (1991), Lee (1991), Robey (1996), Myers (1999).

The most natural way to choose an appropriate research method is to look at the available options as presented by these scholars in the field as well as the contributions from other researchers. Rather than simply choosing a method, we will briefly describe those methods that we have found appropriate for our research problem.

There are two broad classifications of research methods. They are qualitative and quantitative (Myers, 1997). According to Myers, *quantitative research methods* were originally developed in the natural sciences to study natural phenomena. Examples of quantitative methods now well accepted in the social sciences include laboratory experiments, formal methods (e.g. econometrics) and numerical methods such as mathematical frameworking. *Qualitative research methods* were developed in the social sciences to enable researchers to study social and cultural phenomena. Myers (*op cit.*) identifies examples of qualitative methods such as action research, case study research and ethnography. Qualitative data sources include observation and participant observation (fieldwork), interviews and questionnaires, documents and texts, and the researcher's impressions and reactions.

Because IS is classified partly as a social science, qualitative research methods are regarded as the most appropriate because they are designed to help researchers understand people and the social and cultural contexts within which they live.

According to Myers (1997), in order to conduct and/or evaluate qualitative research, it is important to know what the underlying philosophical assumptions are. He then uses the work of Orlikowski and Baroudi (1991) to discuss the three epistemological categories of qualitative research: *positivist*, *interpretive*, and *critical*.

Myers (1997) points out and emphasizes the fact that although these three epistemological categories are philosophically distinct, in the practice of social science such a distinction is not always a clear cut, and hence there is considerable disagreement as to whether they are opposed or can be accommodated in one study. Qualitative research may or may not be interpretive, depending upon the underlying philosophical assumptions of the researcher. It can be *positivist*, *interpretive*, or *critical*. It follows from this that the choice of a specific qualitative research method (such as the case study method) is independent of the underlying philosophical position adopted. What follows is the epistemological categories as discussed by Myers (1997).

Positivist Research

Positivists generally assume that reality is objectively given and can be described by measurable properties which are independent of the observer (researcher) and his or her instruments. Positivist studies generally attempt to test theory, in an attempt to increase the predictive understanding of phenomena. In line with this Orlikowski and Baroudi (1991, p. 5) classified IS research as positivist if there was evidence of formal propositions, quantifiable measures of variables, hypothesis testing, and the drawing of inferences about a phenomenon from the sample to a stated population.

Examples of a positivist approach to qualitative research include Yin's (1994) and Benbasat *et al.*'s (1987) work on case study research.

Interpretive Research

Interpretive researchers start out with the assumption that access to reality (given or socially constructed) is only through social constructions such as language, consciousness and shared meanings. The philosophical base of interpretive research is hermeneutics and phenomenology (Boland, 1985). Interpretive studies generally attempt to understand phenomena through the meanings that people assign to them and 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" (Walsham 1993, p. 4-5). Interpretive research does not predefine dependent and independent variables, but focuses on the full complexity of human sense making as the situation emerges (Kaplan and Maxwell, 1994). Examples of an interpretive approach to qualitative research include Boland's (1991) and Walsham's (1993) work. Klein and Myers' (1999) paper suggests a set of principles for the conduct and evaluation of interpretive research.

Critical Research

Critical researchers assume that social reality is historically constituted and that it is produced and reproduced by people. Although people can consciously act to change their social and economic circumstances, critical researchers recognize that their ability to do so is constrained by various forms of social, cultural and political domination. The main task of critical research is seen as being one of social critique, whereby the restrictive and alienating conditions of the status quo are brought to light. Critical research focuses on the oppositions, conflicts and contradictions in contemporary society, and seeks to be emancipatory, i.e., it should help to eliminate the causes of alienation and domination.

One of the best known exponents of contemporary critical social theory is Jürgen Habermas, who is regarded by many as one of the leading philosophers of the twentieth century. Habermas was a member of the Frankfurt School, which included figures such as Adorno, Horkheimer, Lukacs, and Marcuse. Examples of a critical approach to qualitative research include Ngwenyama and Lee's (1997) and Hirschheim and Klein's (1994) work.

Qualitative research methods

Action Research

There are numerous definitions of action research. One of the most widely cited is that of Rapoport, who defines action research in the following way:

“Action research aims to contribute both to the practical concerns of people in an immediate problematic situation and to the goals of social science by joint collaboration within a mutually acceptable ethical framework”(Rapoport, 1970, p. 499).

This definition draws attention to the collaborative aspect of action research and to possible ethical dilemmas which arise from its use. It also makes clear, as Clark (1972) emphasizes, that action research is concerned to enlarge the stock of knowledge of the social science community. It is this aspect of action research that distinguishes it from applied social science, where the goal is simply to apply social scientific knowledge but not to add to the body of knowledge.

Action research has been accepted as a valid research method in applied fields such as organization development and education in information systems, however, action research was for a long time largely ignored, apart from one or two notable exceptions . More recently, there seems to be increasing interest in action research.

Case Study Research

Case study research is the most common qualitative method used in information systems (Orlikowski and Baroudi, 1991; Alavi and Carlson, 1992). Although there are numerous definitions, Yin (1994) defines the scope of a case study as follows:

"A case study is an empirical inquiry that investigates a contemporary phenomenon within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident" (Yin 1994, p. 13).

Clearly, the case study research method is particularly well-suited to IS research, since the object of our discipline is the study of information systems in organizations, and "interest has shifted to organizational rather than technical issues" (Benbasat et al. 1987). Case study research can be positivist, interpretive, or critical, depending upon the underlying philosophical assumptions of the researcher

Grounded Theory

Grounded theory is a research method that seeks to develop theory that is grounded in data systematically gathered and analyzed. According to Martin and Turner (1986), grounded theory is "an inductive, theory discovery methodology that allows the researcher to develop a theoretical account of the general features of a topic while simultaneously grounding the account in empirical observations or data." The major difference between grounded theory and other methods is its specific approach to theory development - grounded theory suggests that there should be a continuous interplay between data collection and analysis.

Lehmann (1999) presents the major concepts and components of grounded theory as depicted in Figure 3.2:

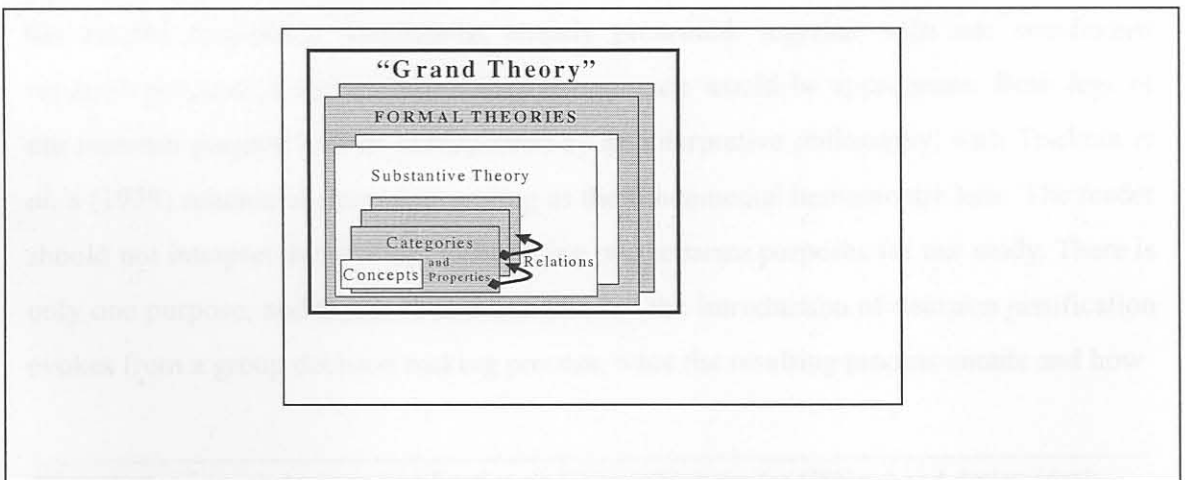


Figure 3.2: Taxonomy of Grounded Theory research elements. Source: Lehmann(1999)

As demonstrated in the Figure, the building blocks in grounded theory research are the 'seed concepts', often from the researcher own experiential background, which determine the field of research. The first, most basic elements of the emerging theory are the 'categories' of facts derived from the data and their 'properties', i.e., the various aspects, manifestations, etc., of the category so described. The 'derivation' process is a series of 'coding' activities, where facts are constantly compared and conceptualised in order to

find underlying structures and linkages. A system of 'relations' binds the categories together into a first theory. Linked initially only to the immediate research environment, the first, 'substantive' theories can then be enhanced and extended to 'formal theories', which in themselves may eventually link up to a 'Grand Theory'.

Glaser & Strauss (1967) see theory as a process, in which 'categories' – the key influence factors - act upon each other in the form of 'relations'. Categories are directly grounded in observed facts, whereas 'relations' are conceptualized by inference from the unfolding story in order to bring to it a temporal, correlational; or even causal order. According to Myers (1997), grounded theory approaches are becoming increasingly common in the IS research literature because the method is extremely useful in developing context-based, process-oriented descriptions and explanations of the phenomenon.

3.3 The research philosophy and method followed in this study

Having stated our *research purpose*, extensively explored the *theoretical foundations* related to our topic in chapter 2 and scrutinized the prevailing *regimes of truths* within the IS research community, the triad identified in section 3.1 allows us to choose an appropriate research method.

We will thus follow an *interpretivist* philosophy, with *hermeneutics* employed both at the philosophical level and as a specific mode of analysis (Bleicher, 1980). With the varying but related theoretical foundations already presented, together with our *two-legged research purpose*, a multi-methodological approach would be appropriate. Both legs of our research purpose will be underpinned by an interpretive philosophy, with Toulmin *et al.*'s (1979) schema of reasoning serving as the fundamental hermeneutic lens. The reader should not interpret the two legs as implying two separate purposes for our study. There is only one purpose, and that is to understand what the introduction of decision justification evokes from a group decision making process, what the resulting process entails and how

such a process could be supported through GSS use and design. Both legs of our research purpose are thus pursued in parallel, with results from one leg informing a further enhancement of the other in an interpretive hermeneutic fashion.

It is important to emphasize that we have taken a very fundamental philosophical position here. That position was articulated in chapter 2; and that is - we consider the need for decision justification as an essential component of every group-decision making process. We posit further that while this need has always been there since the beginning of human kind; it has not received sufficient attention from decision theorists. We have cited the relevant literature supporting this position in the last chapter and have indicated where it fell short. What we are researching is to find ways of introducing this concept into the group decision making process and to understand what its introduction evokes from in the process and what the resulting process entails. We will describe in full in the next chapter how these various theoretical foundations and methodologies will be used together to address different aspects of our research problem.

We have stated the first leg of our research purpose as:

To acquire an enhanced understanding of the group decision-making process and the potential benefits this process could obtain through the introduction of the concept of justification.

For this leg, Giddens' (1984) structuration theory through the work of Poole *et al.* (1985), Toulmin *et al.*'s (1979) schema of reasoning and the new decision making paradigm for DSS as proposed by Courtney (2001) will serve as guiding intellectual frameworks (Checkland, in Flood and Jackson, 1991, p. 61). They will be used as bases from which an enhanced understanding of the group decision making process in the presence of a need for decision justification would be sought through a hermeneutic interpretive process. Within this interpretivist philosophy, some aspects of *grounded theory* will be used both

as a research method and a technique for the collection and analysis of our empirical data. It is important to mention that we will not follow grounded theory in its original sense as proposed by Glaser and Strauss (1967), but only some aspects of it, in combination with some aspects of morphological analysis which we describe in the next section. The outcome of this leg will be a new and an enhanced understanding of the group decision justification process and its entailments.

The second leg of our research purpose was stated as follows:

To identify, describe and interpret the possible implications brought about by this justification process for GSS use and design ideals.

An interpretive case study approach in the form of an experiment will be followed in the identification, description and interpretation of GDSS use and design ideals analysis. Results obtained from specific cases of GSS use will be analyzed and interpreted using both the thinkLet approach (Briggs *et al.*, 2001) and some aspects of symbolic interaction (Gopal and Prasad, 2000). A new understanding resulting from this leg will be fed back into the first leg and *vice-versa*.

The literature we have presented thus far, coupled with our own fore-understanding, interests and prejudices consistent with the hermeneutic tradition, enables us to present our research framework as shown in Figure 3.3. The next chapter is devoted entirely to unpacking this research framework, explaining in detail its theoretical grounding, rationale and how it will be used to guide this research. The framework is our own construct which has emerged from the literature and the research purpose. It will be a mistake to regard the framework as a mechanistic construct. Its aim is to enable multiple interpretations using different theoretical perspectives bound together by a hermeneutic frame.

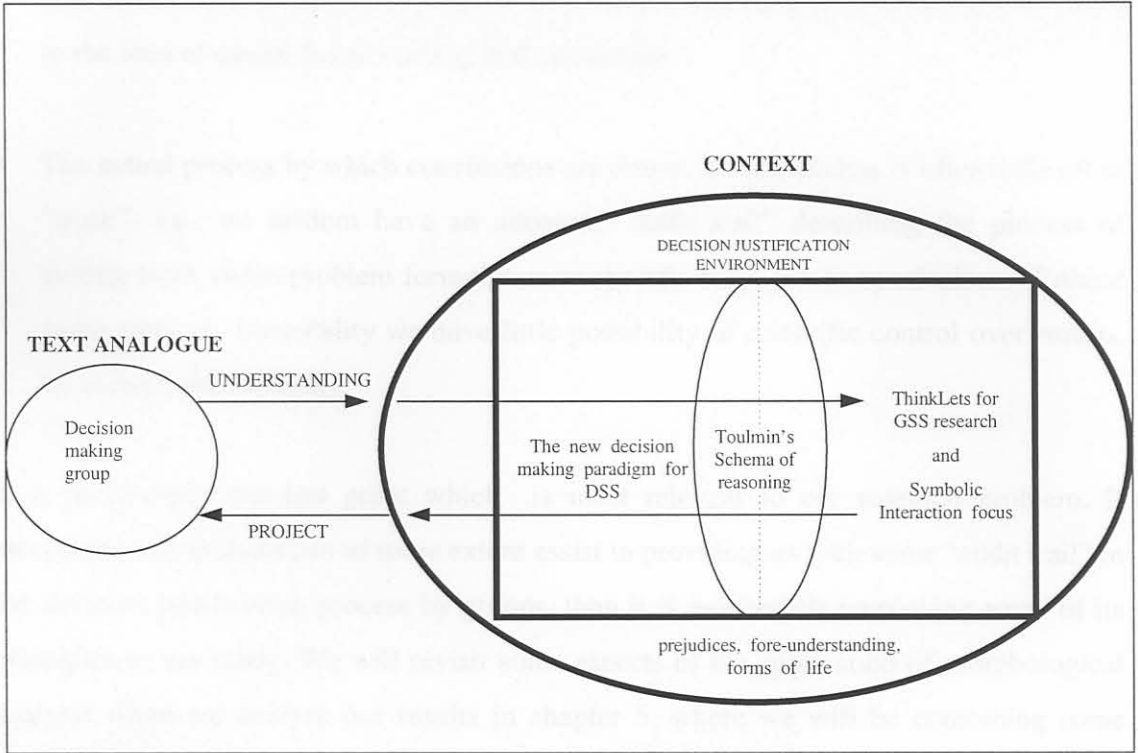


Figure 3.3: The systemic-interpretive-hermeneutic research framework

Combining grounded theory and morphological analysis

We have found the work of Ritchey (1997) on morphological analysis very useful. At a conceptual level, there are similarities between grounded theory and morphological analysis. Ritchey's work was developed on the basis of research done between 1945-1970 by, among others, Kurt Lewin (Lewin, 1952), Fritz Zwicky (Zwicky, 1966) and Wilson (Zwicky & Wilson, 1967) and R. Rhyne (Rhyne, 1981).

Morphological analysis was developed by Fritz Zwicky (1966) as a general method for structuring and investigating the total set of relationships contained in multi-dimensional, usually non-quantifiable, problems. The method is primarily based on defining a configuration space representing the variables and conditions of the problem complex being addressed (i.e., a morphological field), and on a special form of cross-impact

analysis relying on internal consistency or coherence, rather than on causal relations. Ritchey (1997) uses morphological analysis for scenario development and risk management. In this context, he identifies three major problems for which morphological analysis is most suitable for application:

- Many, if not all factors involved in analyzing complex policy fields and developing future scenarios are non-quantifiable, since they contain strong social-political dimensions and conscious self-reference among actors. This means that traditional quantitative methods, causal frameworking and simulation are relatively useless.
- The uncertainties inherent in such problem complexes are in principle non-reducible, and often cannot be fully described or delineated. This represents even a greater blow to the idea of causal frameworking and simulation.
- The actual process by which conclusions are drawn in such studies is often difficult to “trace”- i.e., we seldom have an adequate “audit trail” describing the process of getting from initial problem formulation to specific solutions or conclusions. Without some form of traceability we have little possibility of scientific control over results, let alone reproducibility.

It is particularly this last point which is most relevant to our research problem. If morphological analysis can to some extent assist in providing us with some “audit trail” in the decision justification process by groups, then it is worthwhile employing some of its principles in our study. We will revisit some aspects of the application of morphological analysis when we analyze our results in chapter 5, where we will be combining some aspects of grounded theory and some aspects of morphological analysis.

In order to give a somewhat complete picture of the method, we present in Table 3.2 a snapshot of a cross section of a morphological field taken from the work of Ritchey (1997):

Table 3.2: A Segment of a morphological field (Ritchey, 1997)

Geography Where to place	Functional priorities	SIZE	Compensation for shortages	New vs. Existing	General philosophy
Concentrate on metropolises	All socio- technical functions	Large and not crammed	Only in metropolises	More frequently + modernisation	Everyone has same shelter quality
All city centers with population >50 000	Technical support systems	Large and crammed	For some functions in 50 000 + cities	Build new only for defense build-up	Everyone takes same risk.
Residential and countryside	Residential	Small and not crammed	Only for defense build - up period	Build new now	Priority on key personnel
No geographical priority		Small and crammed	No compensation for shortages		Priority on needy

The above segment was developed by Ritchey during his work with the Swedish National Rescue Services concerning the future of Sweden's bomb shelter program. As indicated earlier, a morphological field is a complex configuration (e.g., a matrix) defining a set of inter-related variables (dimensions), each with a range of (discrete) conditions which it can express.

The idea behind the morphological field is that no single variable is regarded as the dominant one, or "driver". Any variable - indeed any single condition associated with a variable - could, given the right historical circumstances, become a dominant driving force for the evolution of the entire field. The number of possible states in a field is equal to the product of the number of conditions under each variable. For instance, for Table 3.2, the number of possible states is $4 \cdot 3 \cdot 4 \cdot 4 \cdot 3 \cdot 4 = 2304$. (This is only a segment of an actual matrix used. A typical field can involve between 50 and 100 thousand possible configurations.).

According to Ritchey (*op.cit.*,p.1056), not all combinations of conditions are plausible or *internally consistent*. For instance in Table 3.2, the Shelter Philosophy of “everyone receiving the same quality of shelter” is not consistent with the Functional Priority of “concentrating on technical support systems”. To the extent that such a relationship is considered to be a blatant contradiction, then all those possible configurations containing this pair of conditions would also be internally inconsistent. In this way, configurations containing inconsistent or contradictory relationships are weeded out of the total set of possible configurations by a process of cross-consistency judgment. This is done by constructing a cross-impact matrix (actually a cross-consistency matrix) which sets each condition against every other condition, in a pair-wise manner. Each pair of conditions is then examined, and a judgment is made as to whether - or to what extent - the pair can coexist, i.e., represent a consistent relationship. No reference here is made to causality, but only internal consistency.

This is where the difference lies between grounded theory and morphological analysis. In grounded theory, some degree of causality is assumed and necessary in the sense that one category of relationships lead to the other in building the theory, as illustrated by the work of Lehmann presented earlier. In combining these methods when our results are analyzed, particular attention will be paid to this difference when an emphasis becomes necessary.

Ritchey points out that when one examines all of the possible pair-wise relationships and the possible configurations in a matrix, it is usually the case that more than 99% of the configurations are “relaxed”, i.e., they fall out of running because they contain some sort of internal contradictions. This allows one to concentrate on a manageable number (100 - 200) of internally consistent configurations. These can then be ranked and examined as elements of scenarios or specific outcomes in a multi-dimensional problem complex.

As can be easily seen, the ‘dimensions’ in a morphological field relate closely to ‘categories’ in grounded theory, while ‘discreet conditions’ relate to grounded theory

‘properties’. Using these two techniques in combination to look at the same data set would thus enhance the analysis and increase the richness of the interpretation.

Research questions

A process based research approach proposed by Roode (1993) in formulating the research questions is employed. Roode’s process based approach is based on the taxonomic framework of Burrell and Morgan (1979). The purpose of the taxonomic framework of Burrell & Morgan is to create a set of perspectives on the problem space, in which one consciously traverses the problem space (with its underlying ontological and epistemological assumptions) in order to develop a richer understanding of the nature of the concept under investigation. But unlike Burrell and Morgans’ framework, Roode’s approach allows the researcher to deliberately pose different questions to explore different aspects of the problem or situation at hand. According to Roode, the researcher is not required to accept the assumptions associated with one question, but merely enquires about different facets of the research problem to obtain as much information about it as possible.

We have raised four primary research questions in chapter 2, to which we now return in order to put them in the process based framework perspective. The questions are as follows:

- *Having made its decision, that is, having satisfied all the information processing requirements and most of the social-psychological demands of the group; can a group be able to justify its decision when called upon or challenged to do so ?*
- *Assuming that a group can succeed in justifying its decision and that it has actually done so, could there be something new to learn or anything helpful to the group itself and others; which arise from the decision justification process?*

- *Can this social-psychological aspect of group decision-making be frameworked in a way that could inform the use of an information system aimed at supporting the decision justification process ?*
- *Are there some predominant design ideals embodied in such information systems and technologies which will emerge only as a result of the decision justification process ?*

These are questions that have guided our work thus far, enabling us to construct our research framework. The reader can see that the first two questions underpin the first leg of our research purpose, while the last two underpin the second. We now place these questions, together with other secondary questions in accordance with Roode’s process based approach. The framework for the approach is shown in Figure 3.4.

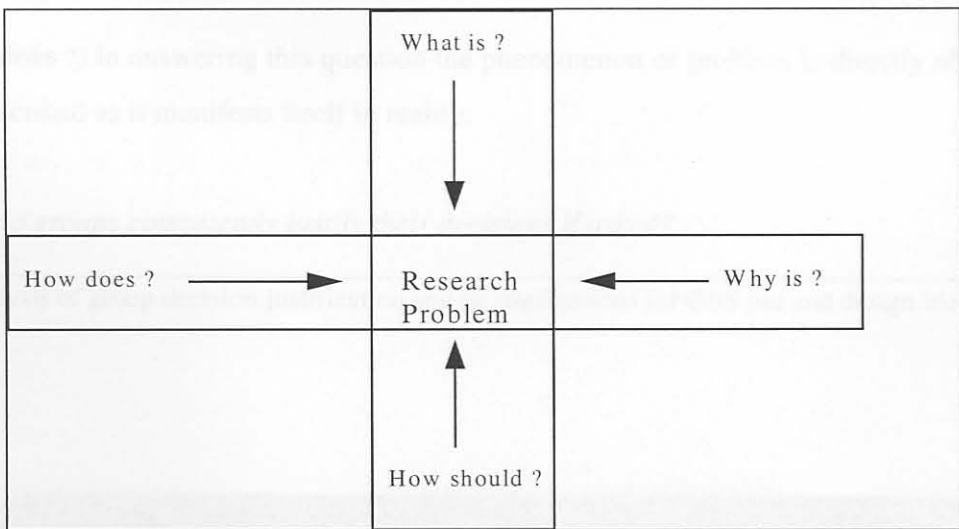


Figure 3.4: Research questions space (Roode, 1993, p. 11)

(What is ?) With this question the fundamental nature or essence of the research problem is first explored. The question aims at exposing the structure of the problem or the meaning of the underlying concepts or ideas. The purpose is to enquire radically and critically about the problem domain and its accompanying paradigm (s) in order to be able to describe the problem precisely and unambiguously. The fundamental assumption here, is that such universally accepted descriptions for the concepts, ideas and problems do exist.

Accordingly, our questions here are the following:

What is decision justification?

What constitute the theoretical justification of a group choice as an outcome?

What constitute the empirical justification of a group choice as an outcome?

(Why is ?) The purpose of this question is to explain the real-life behaviour or characteristics of the phenomenon or problem. In doing so, the focus is on determining relationships between aspects of and/or variables within the problem domain. There is a fundamental assumption underlying this question, viz. that these relationships, when uncovered, can be used to generalise about the problem domain and causal consequences. We thus seek to respond to the following questions:

Why should groups justify their decisions?

To whom should their justification be directed?

Are there some benefits to be derived from the decision justification process, by the group itself and society at large?

Assuming that a group can succeed in justifying its decision and that it has actually done so, could there be something new to learn or anything helpful to the group itself and others; which arises from the decision justification process?

(How does ?) In answering this question the phenomenon or problem is directly observed and described as it manifests itself in reality.

How do groups competently justify their decisions if asked?

Can we say that groups are able to ‘act’, just like individuals would do in justifying decisions?

Which tools, procedures and frameworks do groups commonly use in organizations to support their decisions?

How does a decision-making group ‘behave’ within the context of decision justification?

(How Should ?) This question focuses on the conclusions, implications or normative aspects of the research results. It is an evaluation of the results or new insights obtained during the research. In some cases it might lead to prescriptive conclusions regarding the problem domain - in other cases it might enhance the understanding of the problem domain or redefine it.

How should groups justify their decision?

How should the justification process be structured and carried out?

Group Decision Support Systems use and design implications

In addition to the research questions raised above, we are also interested in finding out what their implications are with respect to the use and design ideals of group decision support systems. In this respect, we will seek to respond to the following questions:

Can the social-psychological aspect of group decision-making be frameworked in a way that could inform the design of an information system aimed at supporting the decision justification process? [How should?]

Are there some predominant design ideals embodied in such information systems and technologies which will emerge only as a result of the decision justification process ?

[How does?]

Our analysis approach

Guided by these sets of research questions, and the hermeneutic research framework we have presented earlier, we will next explore our research problem space. The different theories mentioned earlier on will be used to illuminate certain aspects of our research problem. In the process of employing these different theories in our analysis, we expect to also discover, describe, interpret and explain aspects that are sufficiently illuminated as well as those that are not sufficiently illuminated by certain theories under consideration. In this respect, our analysis will partly be guided by an approach which was also used by Walsham (1993), who developed an interpretive approach to understanding ‘the process of organizational change associated with a computer-based information system’ (page 52).

Although Walsham does not propose a particular framework of ‘organization’, he develops an analytical framework through which to examine IS case studies which leans heavily on the process view of organizations. The first element in his framework is an examination of change *content*, in terms of organization products or processes; he then draws on several other bodies of work. Following Morgan (1986), he draws on the ‘culture’ and ‘political system’ frameworks of organization in order to examine the *social process* of organizational change, on Kling’s ‘web frameworks’ to explore *social context*, and on Giddens’ ‘structuration theory’ (1979 and 1984) to conceptualize the link between social context and social process. We will adopt this style of interpretation in our work.

The research framework indicates that the analysis process started with the literature review in chapter 2, where some theoretical as well as philosophical foundations of our topic were explored. In this context, our analysis is not a *stage* as in the Systems

Development Life Cycle, but a process of seeking responses to our research problem space guided by the set of stated research questions and the use of existing theory. As proposed by the research framework, we will draw on the various theories mentioned earlier on as well as the empirical data obtained and analysed through the combination of grounded theory, morphological analysis and case studies. These theories will be used within an interpretive hermeneutic framework. Giddens' (1984) structuration theory through the work of Poole *et al.* (1985) and Toulmin *et al.*'s (1979) schema of reasoning will be used as central lenses in illuminating the group decision-making and the decision justification processes respectively.

3.4. Conclusion

We have described in this chapter our research approach and method. Some of the key guiding arguments on the choice of a research method in information systems research have been presented. We have also constructed a research framework to be used in guiding the research as a whole. In addition to the primary research questions raised earlier in chapter 2, secondary research question have also been generated in accordance with the process based approach described by Roode. In seeking responses to the research questions, different theoretical perspectives will be used, with empirical data analysed using an interpretive approach. Central to our analysis will be Toulmin *et al.*'s schema of reasoning and Giddens' structuration theory through the work of Poole *et al.* (1985). A combination of grounded theory and morphological analysis will be used in coding and analysing part of the empirical data for the first leg of our problem, while empirical data for the second leg will be coded and analysed using an interpretive case study method. In the next chapter we discuss the theoretical grounding of the research framework presented in this chapter. We also discuss in detail how the framework will be used to guide our further analysis. Because the research framework falls within the interpretive hermeneutic tradition, Klein and Meyers' (1999) set of principles for conducting and evaluating interpretive field studies in IS will be implicitly used as a guide throughout the study.